APPENDIX B

FLOOD MODEL REFERENCE DOCUMENTS

TECHNICAL MEMORANDUM

TO:	John Truscinski, CFM Director of Resilience Planning Connecticut Institute for Resilience and Climate Adaptation (CIRCA) 1080 Shennecossett Road Groton, CT 06340
FROM:	Neil Kulikauskas, Kleinfelder Daniel Pasquale, Kleinfelder Kyle Johnson, Kleinfelder Greg Avenia, Kleinfelder
DATE :	January 9, 2025 Revised January 24, 2025
SUBJECT:	Resilient East Haddam – Current and Future Conditions Analysis
CC:	Nicole Govert, CIRCA Mary Buchanan, CIRCA Yaprak Onat, CIRCA

1 INTRODUCTION AND PROJECT BACKGROUND

This memorandum presents the results of a hydrologic and hydraulic study of Succor Brook in East Haddam, Connecticut. Kleinfelder performed the study as part of the Resilient East Haddam (REH) project to improve understanding of present-day and future flood risks to properties within the Goodspeed / Succor Brook Resilience Opportunity Area (ROAR) identified by the Connecticut Institute for Resilience and Climate Adaptation (CIRCA). The results of this study serve as a benchmark for evaluating interventions to reduce flood risks along Succor Brook.

During past storms, flows from Succor Brook have overtopped its banks downstream of Trouble Pond Dam, inundating portions of Norwich Road (Route CT-82) and Creamery Road and damaging adjacent properties. Flooding has occurred at this location historically, notably during the flood of June 1982. Recent flood events have occurred following significant rainstorms in September 2018, September 2021, and January 2024.

This memorandum also includes a discussion of current and future flood risks to the East Haddam Wastewater Treatment Plant (WWTP) located at 17 Lumber Yard Road, as well as a wastewater pump station located at the intersection of Lumber Yard Road and Dock Road. Both the WWTP and the pump station are susceptible to inundation if a flood event occurs along the Connecticut River. While the WWTP is outside of the Succor Brook floodplain, the area surrounding the pump station is subject to inundation from Succor Brook.

2 STUDY AREA AND VERTICAL DATUM USED

The hydrologic study analyzed the entire Succor Brook watershed. The hydraulic study area included Succor Brook and adjacent areas from a point near the intersection of Norwich Road and Hem Street to the Connecticut River. A portion of the Connecticut River from the East Haddam Swing Bridge to approximately 750 feet downstream of Succor Brook was included in the hydraulic study area. This reach was included to increase the stability of the hydraulic model in the area where Succor Brook converges with the Connecticut River. The limits of the hydrologic and hydraulic study areas are shown on Figures 1 and 6, respectively.

All elevations in this memorandum refer to the North American Vertical Datum of 1988 (NAVD88). Elevation data from historic surveys or record information referenced to the National Geodetic Vertical Datum of 1929 (NGVD29) were converted to NAVD88 based on a conversion factor obtained from the NOAA National Geodetic Survey Coordinate Conversion and Transformation Tool (Reference 18):

Elevation (NAVD88) = Elevation (NGVD29) – 0.981 feet

3 HYDROLOGY

3.1 SUCCOR BROOK WATERSHED CHARACTERISTICS

Succor Brook has a 3.47-square-mile watershed, as delineated using the United States Geological Survey (USGS) StreamStats application. The brook flows generally from northeast to southwest. The upper reaches of the brook flow through steeply sloped forested areas leading to a series of ponds located near Daniels Road. Downstream of the ponds, the brook passes a commercial area near the intersection of Mount Parnassus Road and Town Street (Routes CT-434 and CT-151), and then flows through a reach consisting of forested wetlands with some low-density residential developments.

As it continues downstream, Succor Brook passes through the breached Boardman Pond Dam, then through a relatively steep reach leading to a settling pond upstream of Trouble Pond Dam. Immediately downstream of the dam, the brook flows into a channelized section with vertical stone masonry walls leading to a box culvert beneath a historic mill building at 21 Norwich Road, currently used as a rehearsal studio by the Goodspeed Foundation. After emerging from the box culvert, the brook turns sharply and passes through a three-sided box culvert carrying Norwich Road. The Succor Brook channel between Norwich Road and Creamery Road is characterized by a flat right bank with residential developments and a steep, forested left bank. Succor Brook crosses Creamery Road in a box culvert, then flows through a low-lying grass/wetland area between Creamery Road and Lumber Yard Road. The brook passes through the Lumber Yard Road box culvert and beneath a timber footbridge before reaching the Connecticut River. A topographic map of the subbasins comprising the Succor Brook watershed is provided in Figure 2.

3.2 PRECIPITATION DATA USED TO ESTIMATE PEAK FLOWS

Precipitation depth estimates for East Haddam were downloaded from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Precipitation Frequency Data Server (Atlas 14). Atlas 14 precipitation depth data for 24-hour duration storm events were used in this study to represent present-day precipitation amounts.

Future precipitation estimates were obtained from Table 4.5 of the August 2019 Connecticut Physical Climate Science Assessment Report (CT-PCSAR) published by CIRCA. The CT-PCSAR study forecasted changes to statewide-average 24-hour duration precipitation depths from a 1970-1999 baseline period to mid-century (2040-2069) and late-century (2070-2099) time horizons. Precipitation amounts were projected for the 10-year, 20-year, 50-year, and 100-year average recurrence interval storm events based on a high carbon dioxide (CO_2) emissions future climate change scenario. According to the results of the CT-PCSAR study, future precipitation amounts are anticipated to increase from the baseline period and peak during the mid-century time horizon, then decrease by late-century. Because the mid-century precipitation depth estimates were larger than the late-century estimates and are anticipated by the CT-PCSAR study to occur sooner, the mid-century values were chosen as the benchmark for future conditions planning in this study. The Atlas 14 and CT-PCSAR estimates of 24-hour precipitation depths are shown in Table 3-1 below.

KLEINFELDER 400 Capital Blvd., Suite 104, Rocky Hill, CT 06067 p | 860.563.7775 f | 860.563.6744

Table 3-1: Precipitation Data Summary

24 Hour Precipitation Depth Estimates, Inches (Range)				
Average Recurrence Interval	NOAA Atlas 14 for East Haddam, CT (Present Day)	1970-99 Baseline (CT-PCSAR)	Mid-Century (2040-69) Projection (CT-PCSAR)	Late-Century (2070-99) Projection (CT-PCSAR)
2 Year	3.44 (2.77-4.15)	N/A	N/A	N/A
5 Year	4.41 (3.54-5.34)	N/A	N/A	N/A
10 Year	5.22 (4.16-6.35)	4.1 (3.9-4.3)	6.1 (5.3-6.9)	5.4 (4.6-6.2)
20 Year	N/A	4.7 (4.5-4.9)	7.5 (6.2-8.8)	6.4 (5.2-7.6)
25 Year	6.32 (4.88-8.02)	N/A	N/A	N/A
50 Year	7.15 (5.40-9.24)	5.7 (5.4-6)	10.0 (7.6-12.4)	8.1 (5.9-10.3)
100 Year	8.03 (5.90-10.8)	6.6 (6.2-7)	12.5 (8.8-16.2)	9.7 (6.5-12.9)
200 Year	9.10 (6.24-12.3)	N/A	N/A	N/A
500 Year	10.70 (7.04-14.9)	N/A	N/A	N/A

3.3 RAINFALL FROM PREVIOUS FLOOD EVENTS

A list of recent storms that have caused flooding in the Succor Brook hydraulic study area was provided to Kleinfelder and CIRCA by members of the Resilient East Haddam Community and Technical Advisory Committee (CTAC). Kleinfelder obtained rainfall data associated with these storms to better understand precipitation patterns that have resulted in past flooding.

Kleinfelder downloaded NOAA Next Generation Weather Radar (NEXRAD) radar-based estimates of precipitation from the NOAA radar station in Oxford, NY (KOKX) for a point at the approximate geometric center of the Succor Brook watershed for select past storm events. Kleinfelder also downloaded daily precipitation records for the Cockaponset Ranger Station (approximately 3 miles from the intersection of routes CT-82 and CT-149) from the NOAA Climate Data Online database to determine precipitation depths for the June 1982 storm, as this storm occurred before radar data archives were established. The June 1982 storm was noted by members of the East Haddam community as causing a significant amount of inundation within the Town and was mentioned in the Middlesex County Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) as being a major historical storm in the area. Table 3-2 summarizes the characteristics of each precipitation event. Kleinfelder noted that two flood events occurred during the 2014 replacement of two bridges carrying CT-82 (Norwich Road) over Succor Brook. During these events, a temporary stream bypass piping system was installed to convey brook flows around the bridge construction zones. Because it was unclear whether the functioning of the temporary bypass system contributed to flooding, precipitation data was not obtained for these events.

Table 3-2: Previous Rainfall Events Causing Flooding in the Hydraulic Study Area

Date of Storm Event	Duration (hh:mm)	Total Rainfall Accumulation (in)	Notes/Approximate Return Period based on Atlas 14 Precipitation Depths
June 5-7, 1982	--	13.26	Rainfall totals were obtained from daily records. Precise duration of event unknown. Total rainfall was between the 200-year and 500-year 3-day event. The 10.47-inch total recorded on 6/6/82 was close to the 500-year precipitation depth of 10.7 inches.
March 28-30, 2010	40:27	4.44	Total rainfall was between the 2-year and 5-year 48-hour storm. 2.76 inches fell in 24 hours, approximately equaling the 1-year, 24-hour storm.
March 30, 2014	--	--	Based on photos, flood occurred during the 2014 reconstruction of the two Norwich Road bridges upstream and downstream of the rehearsal studio. A temporary stream bypass system (to allow bridge reconstruction) was in place when this event occurred. It is unclear if the temporary bypass system was a factor contributing to flood conditions.
May 16-17, 2014	--	--	Similar to the March 2014 event, the temporary stream bypass was in place at the time this event occurred.
September 25-26, 2018	27:53	5.60	Total rainfall was between the 10-year and 25-year 24-hour storm.
September 2, 2021	21:05	6.45	Total rainfall was approximately equal to the 25-year 24-hour storm.
January 10, 2024	16:06	3.08	Total rainfall was approximately equal to the 2-year 12-hour storm.

3.4 HYDROLOGIC ANALYSIS

Kleinfelder prepared a hydrologic model of the Succor Brook watershed to develop synthetic storm flow hydrographs for Succor Brook. Based on guidance for ungauged stream hydrology provided in the Connecticut Department of Transportation Drainage Manual, Kleinfelder developed multiple hydrologic analyses to estimate flows in the brook. Peak flows from Kleinfelder's analyses were compared to peak flows derived from USGS regression equations obtained from the StreamStats application (Reference 24) and the published FEMA FIS flows for Succor Brook (Reference 14) originally developed in a 1977 hydrologic analysis.

To model the Succor Brook watershed, Kleinfelder used version 4.12 of the US Army Corps of Engineers Hydrologic Engineering Center Hydrologic Modeling System (HEC-HMS) software package. Kleinfelder developed hydrologic analyses using two unit hydrograph methods to model the transformation of excess precipitation into runoff: the Soil Conservation Service (SCS) unit hydrograph method and the Snyder unit hydrograph method.

Using the Geographic Information System (GIS)-based tools in HEC-HMS and the 2016 Digital Elevation Model (DEM) data (Reference 1), the Succor Brook watershed was split into 10 subbasins, and physical characteristics of each subbasin were calculated. Five reach segments for Succor Brook were developed from the pond south of Daniels Road to the Connecticut River. The reach segments were connected by junctions at points where flows from subbasins downstream of the Daniels Road pond entered the brook. The Muskingum method was used to route flows along the reaches. Figure 2 shows the HEC-HMS basin model framework, which was used for both hydrologic analyses.

For both hydrologic analyses, land cover (Reference 2) and hydrologic soil group data (Reference 3) were used to estimate a SCS Curve Number (CN) for each subbasin to model the amount of infiltration in each subbasin. Using ArcGIS Pro geoprocessing tools, Kleinfelder developed a GIS layer capturing all combinations of land cover types and hydrologic soil groups in the Succor Brook watershed. Based on the curve number guidance provided in the HEC-HMS user manual and aerial imagery, a CN value was assigned to each land cover/soil group combination. Then, a spatially-averaged curve number for each subbasin was computed using ArcGIS Pro based on the land cover types within the subbasin. Maps of land cover data and hydrologic soil groups are shown in Figure 3 and 4, respectively.

For the analysis using the SCS Unit Hydrograph method, times of concentration and watershed lag times for each subbasin were calculated using the SCS Lag method, as defined in the National Engineering Handbook Part 630 Hydrology document. The analysis based on the Snyder Unit Hydrograph method was calculated based on the HEC-HMS Technical Reference Manual guidance. Hydrologic parameter calculations for both the SCS Unit Hydrograph analysis and the Snyder analysis are provided in Appendix B. The present day and mid-century 24-hour precipitation depths provided in Table 3-1 above were applied to a SCS Type III 24-hour rainfall distribution curve, and the resulting hyetographs were entered into the model.

Peak flow results from both the Snyder Unit Hydrograph and SCS Unit Hydrograph analyses, along with USGS and FEMA FIS flows, are presented in Table 3-3 and Figure G1 below. The regression equation flows included 90% prediction interval ranges for each peak flow estimate, denoting the range of flow values for which there is 90% confidence that the true peak flow value is within the range based on the USGS regression analysis.

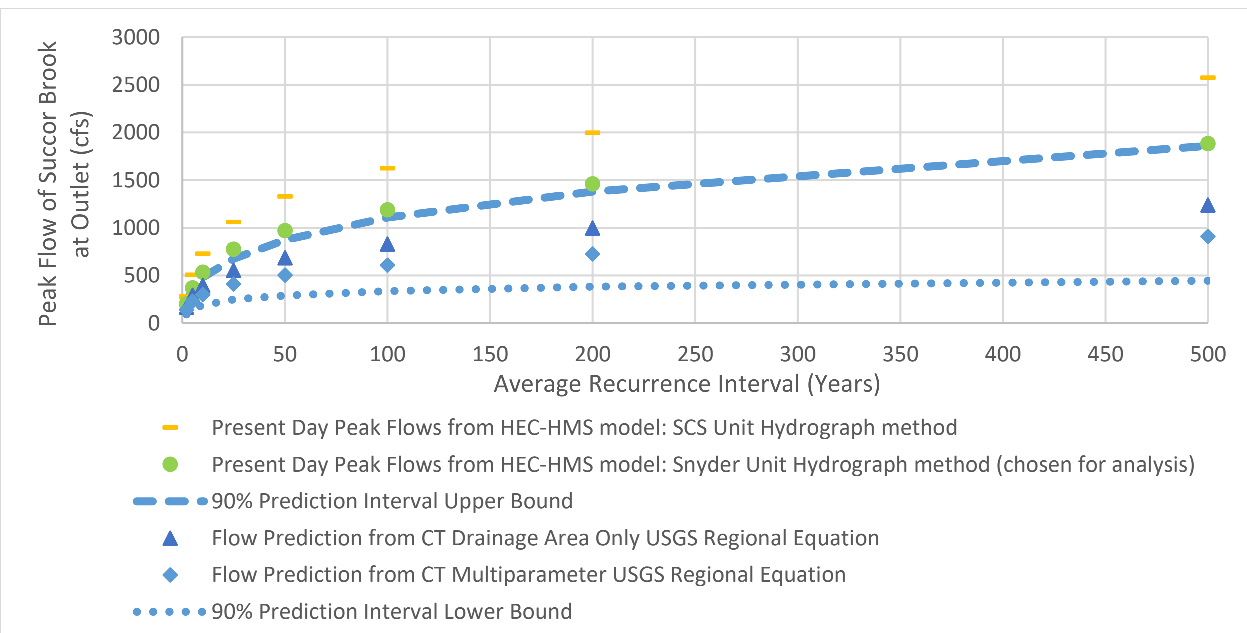
The flows predicted with the Snyder Unit Hydrograph method were near the upper range of the 90% USGS regression equation prediction intervals, while the flows developed based on the SCS unit hydrograph method were farther above the 90% prediction intervals. It is likely that peak flows from the SCS unit hydrograph analysis were larger due to the times of concentration used to derive the basin lag times.

Calculated times of concentration were sensitive to the steepness of the watershed, resulting in shorter basin lag times and higher peak flow responses from each subbasin. The Snyder Unit Hydrograph method was originally developed for the Appalachian Highlands region. Because East Haddam is located within this region, and considering the generally steep topography of the Succor Brook watershed the parameters used in the Snyder unit hydrograph analysis may have been more appropriate for the brook. Given that the modeled peak flows using the Snyder method were near the upper bound of the 90% prediction interval of the USGS regression equations, the Snyder method appeared to be a conservative yet reasonable means of modeling the runoff response of the Succor Brook watershed. Because of these factors, the hydrologic model using the Snyder unit hydrograph method was chosen as the preferred means of representing the Succor Brook watershed.

Table 3-3: Flow Estimates in Succor Brook

Peak Flow Estimates for Annual Exceedance Probability (AEP) Events (cfs)									
	50% (2-yr)	20% (5-yr)	10% (10-yr)	5% (20-yr)	4% (25-yr)	2% (50-yr)	1% (100-yr)	0.5% (200-yr)	0.2% (500-yr)
StreamStats: CT Multiparameter (90% prediction interval in parentheses)	142 (92-220)	230 (150-353)	301 (189-480)	-	410 (249-674)	503 (289-875)	609 (335-1110)	725 (382-1380)	911 (445-1860)
StreamStats: CT Drainage Area	169	294	398	-	553	684	831	996	1240
FEMA FIS	-	-	330	-		550	650	-	940
HEC-HMS - Present Day (NOAA Atlas 14, Snyder UH)	203	371	533	-	775	971	1188	1461	1884
HEC-HMS - Present Day (NOAA Atlas 14, SCS UH)	278	508	729	-	1061	1329	1626	1999	2575
HEC-HMS - 2040-69 (CT PCSAR, Snyder UH)	-	-	725	1056	-	1697	2374	-	-
HEC-HMS - 2040-69 (CT PCSAR, SCS UH)	-	-	992	1446	-	2321	3243	-	-

Figure G1: Peak Flow Estimates in Succor Brook



3.5 ANALYSIS OF BEAVER DAM AT POND DOWNSTREAM OF DANIELS ROAD

CIRCA requested that Kleinfelder complete a limited analysis to obtain an order of magnitude estimate of dam breach flows from a beaver dam located on Succor Brook. At meetings of the Resilient East Haddam CTAC, attendees noted that some previous Succor Brook flood events were partly influenced by beaver dam failures.

This analysis examines a beaver dam located at the outlet of a pond south of Daniels Road, east of Town Street (route CT-151), west of Bogel Road, and north of Mt. Parnassus Road. The beaver dam is visible in aerial imagery at the southwest corner of the pond and is located upstream of a forested reach of Succor Brook. In the 2016 DEM dataset, the shape of the beaver dam was visible in the same location as shown in the aerial photos. The location, aerial view, and DEM representation of the dam are shown in Figure 5.

Dimensions of the beaver dam were estimated using the 2016 DEM. The dam crest was 170± feet long, with a crest elevation of 269.5± ft NAVD88. The height of the dam was estimated by subtracting the Succor Brook thalweg elevation at the downstream toe of the beaver dam from the crest elevation. The lowest downstream elevation at the toe of the dam was 264± ft NAVD88.

As bathymetry of the Daniels Road pond was not available, the 2016 DEM was used to estimate the available water storage volume in the pond. Kleinfelder developed a linear area/depth curve for the pond based on the visible elevation contours surrounding the pond up to the elevation of the beaver dam embankments where they met adjacent high ground. The curve was used to extrapolate the volume in the pond from the lowest contour encircling the pond visible in the DEM (at elevation 269) to the bottom elevation of the pond, which was assumed equal to the lowest downstream elevation of 264. The storage volume in the pond below the beaver dam crest elevation of 269.5 was estimated at 78.2 acre-feet. A bathymetric survey of the pond would be required to verify this estimate.

Kleinfelder reviewed a report prepared by Northwest Hydraulic Consultants Ltd. (NHC) (Reference 32) which included a list of potential failure modes and breach characteristics for a beaver dam. The authors of the study found that beaver dams can fail catastrophically when overtopping occurs during high flows. They can also fail from leakage through the dam itself and at the interface of the dam with the ground and surrounding banks. The authors found that beaver dams are strongest when food sources are abundant, and when vegetation grows on the material forming a beaver dam. Factors reported by the authors as increasing the likelihood of beaver dam failure included depletion of food sources for beavers (which would cause them to abandon their dams or perish, resulting in an unmaintained dam), or tunneling through the dam by other animals such as muskrats.

Kleinfelder used HEC-HMS to simulate a range of dry-weather breach scenarios at the beaver dam. Analysis of combined dam breach and storm scenarios was beyond the scope of the present study. To create conservative estimates of dam breach flows, the amount of time for the dam failure to fully develop was assumed to be 0.02 hours. Typical minimum failure times for earthen dams cited in the HEC-RAS manual range from 0.1 hours to 0.5 hours (6 minutes to 30 minutes). A shorter breach development time would result in a larger peak outflow from the pond than a longer breaching time. A likely mode of failure for beaver dams is displacement of a large piece forming the dam (i.e. a log or branch) which may cause other interlocking pieces to fail. By contrast, an engineered earthen dam constructed of aggregate materials such as sands, gravels, or cobbles would be more likely to fail due to erosion during a breach. A sudden displacement of a log in a beaver dam would likely cause the full development of a dam failure to occur faster than erosion of a typical earthen dam. Because of this, using a shorter failure time than typical for an earthen dam appeared reasonable. Side slopes of 1H:1V were assumed for the shape of the breach opening.

The size of a breach in the beaver dam, and therefore the resulting peak flow, is highly variable from event to event. Given this, Kleinfelder varied the height and width of simulated beaver dam breaches to obtain a range of approximate peak flows from the beaver dam. The HEC-RAS manual includes several regression equation based methods from past dam studies to estimate breach widths. Based on the Froehlich (2008) method, considered to be the method best suited for the beaver dam as it is applicable to earthen dams closest in size to the beaver dam, a bottom width of 40.9 ft was calculated. This was taken as an upper limit of the size of the beaver dam breach. For a lower limit of the breach width, the baseline breach width of 26.2 ft from the NHC study was used. Given that the NHC study analyzed a beaver dam with similar dimensions (6.6 ft – 8.2 ft in height, 180 ft in length) to the Daniels Road pond beaver dam, Kleinfelder considered this breach width to be reasonable for use in this study. For the two dam breach widths, scenarios with the height of the dam crest increased by one foot were added. The results of the analysis are presented in the table below.

Table 3-4: Beaver Dam Breach Analysis Results

Breach Bottom Width (ft)	Breach Side Slopes	Height of Beaver Dam (ft)	Time of Breach Development (hr)	Estimated Dry Weather Peak Flow at Point of Beaver Dam Breach (cfs)
26.2	1H:1V	5.5	0.02	1186
26.2	1H:1V	6.5	0.02	1565
40.9	1H:1V	5.5	0.02	1738
40.9	1H:1V	6.5	0.02	2276

The two simulated dam breaches with the smaller 26.2-foot bottom width had peak flow magnitudes approximately between the present-day 1% AEP and 0.5% AEP (present-day 100-year and 200-year) peak flows in Succor Brook resulting from extreme precipitation. The two breaches with larger 40.9-foot bottom widths had peak flow magnitudes similar to the mid-century 2% AEP and 1% AEP (mid-century 50-year and 100-year) storm flow events, respectively.

It is important to note that the flows shown in Table 3-4 reflect dry-weather peak discharge estimates at the beaver dam location. Peak flows from a combination of a dam breach with heavy rainfall may be higher than the estimated dry-weather flows. Also, flows from the dam would be reduced as they pass through constrictions such as bridges and culverts before reaching the lower Succor Brook study area. Due to limitations in project scope, combined storm and breach scenarios were not evaluated. In Kleinfelder's opinion, predicted flood impacts from storm flows in Succor Brook with peak flow magnitudes similar to the flows in Table 3-4 represent conservative estimates of flooding from a full-height dam breach in dry-weather conditions.

If the beaver dam were to be studied in a future project, Kleinfelder recommends obtaining bathymetric survey of the pond upstream of the dam to confirm the storage volume. On-the-ground survey of the dimensions of the beaver dam, as well as surveys and observations of the dam following an actual breach event would further improve parameterization of a simulated breach. Also, more detailed hydraulic modeling of the reaches of Succor Brook between the beaver dam and the study area would allow for refinement of beaver dam breach flood impact estimates.

4 HYDRAULICS

4.1 HYDRAULIC MODEL DEVELOPMENT

Kleinfelder developed a hydraulic analysis of Succor Brook from a point adjacent to the intersection of Norwich Road and Hem Road to the Connecticut River using the US Army Corps of Engineers Hydrologic Engineering Center River Analysis System (HEC-RAS) software package, version 6.4.1. The two-dimensional (2D) modeling capability of HEC-RAS was used for the hydraulic analysis. As opposed to one-dimensional (1D) hydraulic models, 2D models are capable of simulating water flow in multiple directions, which can more accurately represent flood flows in overbank areas. Because the flow patterns known to occur during Succor Brook flood events include significant overbank flows outside of the main channel, Kleinfelder considered using a 2D model to be appropriate for this study.

4.1.1 Effective FEMA Model of Succor Brook

The FEMA FIS for Middlesex County includes a detailed study of a 1,135-foot segment of Succor Brook from immediately downstream of the Creamery Road crossing to its confluence with the Connecticut River. The detailed FEMA study area of Succor Brook is shown on the effective Flood Insurance Rate Map (FIRM) panel for Succor Brook (Reference 14). The FIRM panel shows areas adjacent to Succor Brook south of Creamery Road mapped as a Zone AE with regulatory floodway. Backwater influence on Succor Brook from the FEMA 100-year floodplain of the Connecticut River extends approximately 860 feet upstream of the brook's confluence with the river.

Upstream of the detailed study area terminus, FEMA evaluated flood zones associated with Succor Brook using approximate methods. Certain areas near the brook are mapped as Zone A without Base Flood Elevations on the effective FIRM panel. The lack of detailed FEMA mapping along Succor Brook upstream of Creamery Road was a primary motivation for this analysis.

Kleinfelder requested the backup data for the effective Succor Brook hydraulic model from the FEMA Engineering Library. FEMA provided the data to Kleinfelder in the form of printouts of the original HEC-2 step-backwater computations, completed in 1977. The one-dimensional HEC-2 model represented flows, terrain, bridges and other hydraulic data in tabular format. Given the age of the effective model, availability of newer survey and DEM data, and the two-dimensional approach of the present study, only flow values and downstream boundary condition water surface elevation data from the effective model were used in this study.

4.1.2 Topography and Two-Dimensional Mesh Development

The 2016 Connecticut Light Detection and Ranging (LiDAR)-based DEM (Reference 1) was used as a base surface to define topography throughout the study area. Kleinfelder supplemented the information in the DEM in key areas with higher-resolution survey and record drawing information.

In August 2024, Kleinfelder's survey subcontractor Martinez Couch and Associates (MCA) carried out a survey of key elevations, bridge openings, building first floor elevations, and cross-sections along the Succor Brook reach (Reference 5). The 2024 survey was limited to certain critical areas along the brook. Kleinfelder used point data from this survey to construct topographic surfaces to improve the accuracy of the topography in areas where the DEM was not representative of the terrain, particularly the reaches of Succor Brook upstream and downstream of the rehearsal studio.

Additional sources of survey data included a 2002 study of Succor Brook prepared by Close, Jensen and Miller, P.C. (Reference 6), a 2003 survey of East Haddam by Fuss & O'Neil (Reference 7), and two hydraulic studies of Succor Brook completed for the CTDOT Norwich Road bridge replacements prepared by Close, Jensen and Miller, P.C. (References 10 and 11). Point survey data obtained from these sources were used to create surfaces adding detail to the base DEM topography or to create terrain modifications in HEC-RAS representing key elevations. For buildings with known first floor elevations, the terrain within the building footprints was modified to reflect the building first floor elevation.

A computational mesh made up of 20-foot grid cells was generated to conduct the analysis. This mesh size was chosen to obtain sufficient detail from the terrain and generate reasonable results without overloading the computational engine. Smaller cells were used in certain areas to obtain additional detail. Hydraulic breaklines were used to align the grid cells to important topographic features such as Succor Brook, roadway crowns, and bridges. The Eulerian-Lagrangian shallow water equations were utilized as they presented more accurate results while maintaining reasonable model runtimes. A 0.5-second timestep was used for each model run.

4.1.3 Bridges and Hydraulic Structures

Table 4-1 lists bridges crossing Succor Brook that were included in the model. Each bridge was included in the HEC-RAS model as a Storage Area/2D Connection, except for CTDOT bridge 02501. Bridge 02501 was modeled as a culvert and the terrain was modified to represent the bridge deck, allowing the 2D computational mesh to more accurately represent flows over the bridge deck in the direction perpendicular to Succor Brook. Small single-span footbridges crossing Succor Brook were not included in the model.

Table 4-1: Bridges Over Succor Brook Included in Hydraulic Model (Listed from Upstream to Downstream)

Roadway/ Pathway Carried	Ownership	Description	Overall Length	Out to Out Width
Norwich Road (CT 82) (near Ray Hill Road)	CTDOT (Bridge No. 02502)	Precast concrete three-sided culvert	25 ft	35.8 ft
Norwich Road (CT 82) (Near 20 Norwich Road)	CTDOT (Bridge No. 02501)	Precast concrete three-sided culvert with concrete scour protection blanket	30 ft	36.8 ft
Creamery Road	Town of East Haddam	Precast concrete four-sided box culvert	12.8 ft	21.7 ft
Lumber Yard Road	Town of East Haddam	Precast concrete four-sided box culvert	9 ft	24.2 ft
Goodspeed Opera House Parking Lot Footbridge	Private	Timber deck footbridge with eight spans supported by seven pairs of timber piles. Each pile is approximately 10 inches in diameter. Spans vary in length from 8± ft to 12± ft	91.4 ft	8 ft

The box culvert below the rehearsal studio was included in the two-dimensional mesh as a culvert object. The culvert is constructed of masonry units with mortar, and photos of the inside of the culvert show large stones in the channel. Although the culvert has a consistent width, its height is larger at the downstream end than at the upstream end. The smaller opening at the upstream end of the culvert, surveyed at 7.44 feet wide by 6.07 feet in height, was used to define the culvert in the model. The bottom and sides of the culvert were assigned a Manning's roughness of 0.035 due to the large stones inside the culvert.

The Trouble Pond Dam spillway was included in the model as a Storage Area/2D connection. The dam consists of a 26-foot-wide primary spillway bounded by 4-foot-high training walls constructed of concrete and stone masonry. The left training wall is integral with a two-story building, which forms the southeast corner of Trouble Pond. An earthen embankment with a stone masonry wall parallel to Norwich Road forms the eastern side of the pond. Elevations of the spillway and training walls were captured in the 2024 MCA survey.

Figure 7 shows the hydraulic model framework, including limits of the study area and locations of the hydraulic structures in the model domain.

4.1.4 Land Cover and Manning's Roughness Values

The CT High Resolution Land Cover GIS layer (Reference 2) was used as the basis for representing land cover conditions within the hydraulic study area. Manning's n roughness values were assigned to each land cover classification based on typical values given in the reference Open Channel Hydraulics by V.T. Chow (1959) and a review of aerial imagery. Manning's roughness values used in the model are shown in Table 4-2 below. Figure 8 shows a map of the land coverages used in the hydraulic study area.

Table 4-2: Manning's Roughness Values

Manning's n Value	Land Cover Classification
0.12	Mixed Forest
0.04	Grassland-Herbaceous
0.035	Open Water
0.035	Developed - Open Space
0.015	Developed - High Intensity*
0.08	Scrub-Shrub
0.03	Unconsolidated Shore
0.05	Succor Brook and Riverbank Areas
0.06	Palustrine Emergent Wetland
0.08	Palustrine Scrub-Shrub Wetland
0.08	Palustrine Forested Wetland
0.5	Buildings**

*The Developed – High Intensity land cover classification corresponded to roadways and driveways in the GIS layer. Therefore, a Manning's n value for asphalt was chosen for this classification.

**All building footprints in the hydraulic model domain were given a Manning's n value of 0.5, except for the building at 20 Norwich Road which was given an n value of 10 as discussed in Section 4.1.6.

4.1.5 Simulation Boundary Conditions

Kleinfelder selected flow and downstream water surface elevation boundary conditions for each model scenario. Flow boundary conditions were obtained from the HEC-HMS model output. The HEC-HMS model included a junction at Trouble Pond Dam—flow hydrographs from that point were used as the upstream boundary condition for Succor Brook. Flow hydrographs from the subbasin downstream of Trouble Pond Dam were used as an internal boundary condition, located in the mesh within the wetland area between Creamery Road and Lumber Yard Road.

A portion of the Connecticut River from the East Haddam Swing Bridge to approximately 750 feet downstream of Succor Brook was included in the hydraulic model domain. A constant flow upstream boundary condition and a normal depth downstream boundary condition was applied to the Connecticut River. For each event, Connecticut River inflows were adjusted as necessary to achieve the downstream water surface elevations near the mouth of Succor Brook. Table 4-3 below summarizes the boundary conditions used for the modeled scenarios.

Table 4-3: Succor Brook Hydraulic Model Boundary Conditions

Simulated Event	Upstream Peak Flow (cfs)	Goodspeed Landing Subbasin Peak Flow (cfs)	Downstream Water Surface Elevation (ft above NAVD88)
10-year flow, present day	505	38	4.6
10-year flow, mid-century	687	52	4.6
50-year flow, present day	920	71	5.2
50-year flow, mid-century	1609	124	5.2
100-year flow, present day	1126	87	5.4
100-year flow, mid-century	2251	174	5.4
500-year flow, present day	1786	138	6.0

4.1.6 Model Calibration

Rainfall data and photo documentation of flood damage from the January 2024 flood event was used to calibrate the hydraulic model. The January 2024 event was considered ideal for model calibration because it was associated with a relatively small amount of precipitation compared to the 2018 and 2021 storms, though it still caused flooding. Precipitation data for the January 2024 event was entered into the HEC-HMS model to generate Succor Brook storm hydrographs for the event. The upstream peak flow for the event was 215 cfs, and the Goodspeed Landing subbasin peak flow was 17 cfs. These boundary conditions were applied to the model and used to test the sensitivity of the model.

Based on photographs taken during the 2024 storm, Succor Brook flows exceeded the capacity of the rehearsal studio box culvert and overtopped the stone masonry channel between Trouble Pond Dam and the box culvert, resulting in flooding on Norwich Road. A photo of floodwaters adjacent to the rehearsal studio showed water levels reaching slightly above the door at the northeast corner of the building. A photo of the interior of the rehearsal studio after the flood event showed no visible high water marks on the walls and no significant mud intrusion, indicating that peak inundation inside the building did not significantly exceed the level of the floor during this event (by comparison, in the larger 2018 and 2021 events, photos of the rehearsal studio showed mud damage and deeper, high-velocity flows through the building). Photos of the event also showed small areas of flooding inside the library at 20 Norwich Road, across from the rehearsal studio.

Review of photos from the January 2024, September 2018, and September 2021 events showed significant amounts of debris (logs and tree branches) were carried in flood flows. The rehearsal studio box culvert has been susceptible to debris jamming in past flood events. Also, high flows from the Trouble Pond Dam spillway are shown flowing onto the concrete pad next to the rehearsal studio and hitting the wall of the studio building before entering the channel upstream of the culvert. This occurs because the channel is significantly narrower than the Trouble Pond Dam spillway, and the culvert is not aligned horizontally with the spillway, exacerbating flooding outside of the channel. As shown in photos of flood events, the current configuration of the channel and box culvert is unable to handle the high-velocity peak flood flows from the Trouble Pond Dam spillway.

By iteratively running the model for the January 2024 event and adjusting model parameters, the model was calibrated to more accurately reflect documented flood conditions. To adjust the model to account for the debris jamming, a debris blockage height was added to the bottom of the rehearsal studio box culvert in the model. Through trial and error, the culvert debris blockage height was set to 1.5 feet. Also, to more accurately simulate the hydraulic inefficiency in the channel upstream of the studio, a calibration region was used to increase the Manning's n values within the area between the rehearsal studio and the Trouble Pond Dam spillway to 0.1. These parameters caused the model to predict overtopping in the channel upstream of the studio, sheet flow flooding on Norwich Road, and the water surface elevation in the channel to reach 0.1 feet above the floor elevation of the studio, consistent with documented flood conditions. Another calibration region was added to the footprint of the library at 20 Norwich Road to limit the amount of conveyance through the building predicted by the model, raising its Manning's n value from 0.5 to 10.

Except for the rehearsal studio box culvert, the bridges and culverts in the hydraulic study area were modeled without any debris restrictions.

The calibrated model was used to run the present-day and mid-century hydraulic analyses, described in the following sections.

4.2 PRESENT-DAY HYDRAULIC ANALYSIS

Modeled floodplain extents for the present-day 10-year, 50-year, 100-year, and 500-year flood events are shown in Figure 9. Figures 11 and 12 show predicted maximum floodwater depths and velocities, respectively, for the present-day 100-year flood event.

Inundation patterns for each event are generally similar, with more extreme events resulting in progressively deeper flood depths and higher velocities. Similar to observed conditions during previous flood events, the model predicts that in the 10-year, 50-year, and 100-year events, the channel upstream of the rehearsal studio box culvert will become overwhelmed and overtop. Floodwaters flow southwest over Norwich Road, impacting buildings at 21 and 20 Norwich Road. Although a portion of the overtopped flow can return to the Succor Brook channel downstream of the rehearsal studio, floodwaters continue to flow downhill over the top of the Norwich Road bridge. This flow runs onto a driveway and lawn area on 12 Norwich Road, flowing back into Succor Brook. In larger storms, flow also collects in a low point on Norwich Road. The low point is adjacent to 12 Norwich Road and elevated above the 12 Norwich Road property with a retaining wall. Floodwaters overtop the retaining wall and spill onto the lawn in front of the semi-circular row of houses on the 12 Norwich Road property, used by the Goodspeed Foundation for actor housing.

Floodwaters unable to return to Succor Brook flow south on a driveway between the brook and the row of actor housing. This flow primarily travels adjacent to the home at 66 Creamery Road, then onto Creamery Road itself, impacting buildings between 66 Creamery Road and the Creamery Road box culvert except for 63 and 65 Creamery Road, which are located on higher adjacent grades. Flood flows travel across Creamery Road and reach the adjacent wetland area. The model predicts that for each flood event, the constriction caused by the Creamery Road culvert results in flood flows overtopping the roadway at a low point west of the bridge, rather than at the culvert itself. Overtopping of the Lumber Yard Road box culvert occurs during the 50-year and 100-year events but does not occur in the 10-year event.

In the present-day 500-year flood event, the model predicts Succor Brook will overtop the Norwich Road bridge near Ray Hill Road (CTDOT bridge 02502). Because of the slope of Norwich Road and the skew angle of the bridge relative to the brook, a significant amount of overtopping flow would run down the road rather than back into Succor Brook. Also, overtopping of the earthen berm section of Trouble Pond Dam is anticipated in the 500-year flood.

4.3 MID-CENTURY (2040-2069) HYDRAULIC ANALYSIS

Refer to Figure 10 for a map of predicted floodplain extents for the mid-century 10-year, 50-year, and 100-year flood events. Figures 13 and 14 show predicted maximum flood depths and velocities, respectively, for the mid-century 100-year flood event.

As discussed in Section 3.2, future storm flows were derived from the hydrologic model based on future extreme precipitation estimates from the CT-PCSAR report. The CT-PCSAR study did not predict future precipitation from a 500-year event, and therefore Kleinfelder did not prepare a future 500-year hydraulic analysis.

In general, impacts from a mid-century 10-year storm are projected to be similar to present-day impacts from a 25-year storm. A mid-century 50-year storm is anticipated to be similar to an event between the present-day 200-year and 500-year events, and a mid-century 100-year storm is projected to have a greater impact than a present-day 500-year storm. Each mid-century event will have greater flood depths, flood extents, and floodwater velocities compared to the present-day event with the same average return period. Notable increases in flood impact between the present-day and mid-century flood events are discussed below.

The model predicts that during the mid-century 10-year event, Lumber Yard Road will overtop. Flood flows in the mid-century 50-year event are anticipated to overtop the Norwich Road bridge near Ray Hill Road and the earthen berm section of Trouble Pond Dam, with slightly less flood impact than the present-day 500-year storm. The mid-century 100-year storm, the largest flood event modeled in this study, is also expected to overtop those structures. In the mid-century 100-year event, the floodplain is expected to reach structures at 63, 65, and 47 Creamery Road, each of which are not impacted in any other modeled event.

5 WASTEWATER TREATMENT PLANT AND PUMP STATION FLOOD RISKS

Kleinfelder evaluated flood risks to the East Haddam Wastewater Treatment Plant (WWTP) located at 17 Lumber Yard Road, as well as the wastewater pump station located at the intersection of Dock Road and Lumber Yard Road.

5.1 EXISTING CONDITIONS

Designed in 1995 and opened in 1997, the WWTP treats an average daily flow of 55,000 gpd of wastewater and generally serves buildings within the Succor Brook study area south of Ray Hill Road, as well as buildings along/near Main Street. A low-pressure sewer collection system brings wastewater from the service area to the WWTP. The WWTP consists of a Process Building and a Control Building—the Process Building contains a fine screening unit, Sequencing Batch Reactor (SBR) tanks, an equalization basin, gravity decanters, and a sludge holding tank. The Control Building contains an ultraviolet disinfection unit, air blower machines, a control room, space to store effluent samples, and a restroom. Treated effluent from the plant is discharged by gravity to the Connecticut River.

An 8” diameter gravity sewer main discharges to the wetwell of the Dock Road pump station, which was constructed along with the low-pressure sewer collection system serving the WWTP. The pump station originally used duplex pumps mounted above the wetwell to discharge effluent to a force main leading to the low-pressure sewer collection system, but the original pumps were replaced with a submersible pump system.

5.2 PRESENT-DAY FLOOD RISKS TO THE WWTP

The WWTP is located approximately 400 feet from the Connecticut River, which poses the most significant flood risk to the facility. From the Succor Brook hydraulic model results discussed in Section 6, the WWTP is separated from both the present-day and projected mid-century 100-year floodplain associated with Succor Brook by a high elevation area where Lumber Yard Road curves east to intersect with Creamery Road.

From the effective FEMA FIS for Middlesex County (Reference 14), the current 1% AEP flood elevation of the Connecticut River at the WWTP site is 12.2 ft NAVD 88 as shown on profile 45P. Based on available record plans for the WWTP (Reference 8), the Process and Control buildings have a FFE of 13.0 ft NGVD29, or 12.0± ft NAVD88. From the FIS, the flood of record on the Connecticut River in Middlesex County occurred in March 1936 and was estimated to have a return frequency of more than 200 years. Based on discussions with the wastewater treatment plant operator, the WWTP has not experienced flood damage since its construction.

The 10% AEP flood elevation at the WWTP site is shown at elevation 7 ft NAVD88 on the FIS profile. Based on lidar elevation data, the crown of the access driveway to the WWTP has an elevation of approximately 7 ft NAVD88—some ponding in lower points along the eastern edge of the access road may occur due to backwater from the Connecticut River flowing into an unnamed creek at the rear of the WWTP buildings. However, the 10% AEP flood event is not anticipated to significantly impact access or operations at the WWTP. If a Connecticut River flood occurred with an elevation equal to or greater than the 2% AEP flood elevation (10.6 ft NAVD88), the airport property between the unnamed creek and the Connecticut River would be inundated and vehicle access to the Process Building and Control buildings would be lost until the flood receded. However, floodwaters are not expected to enter the WWTP buildings as a result of the 2% AEP flood.

If a 1% AEP flood occurs, floodwaters are anticipated to enter the Process Building and Control Building as the buildings presently have no floodproofing provisions in place above the FFE of 12.0 ft NAVD88. Floodwaters would enter wastewater treatment tanks in the Process Building that are covered with aluminum grating, potentially disrupting treatment processes. Objects and equipment on the floor of the WWTP buildings would be susceptible to flood damage.

If floodwaters were to reach the 0.2% annual chance flood elevation (500-year average recurrence interval), electrical panels and equipment located up to four feet above the floor of the WWTP buildings are anticipated tobe inundated and susceptible to damage if not floodproofed. A backup generator located on a concrete landing outside of the Process Building entrance would also be inundated. Two propane tanks feeding the generator are located behind the Process and Control Buildings, but they are anchored by a concrete pad to resist floatation.

5.3 PRESENT-DAY FLOOD RISKS TO THE PUMP STATION

Based on field observations and available record plans for the Dock Road pump station, the station is constructed on an elevated concrete foundation, with the top of the concrete foundation elevation set to 13.0 ft NGVD29, or 12.0± ft NAVD88. A control panel and the station's alarm system are installed in a fiberglass enclosure above the level of the concrete foundation. A backup generator is located on the concrete foundation outside of the fiberglass enclosure.

Under both the present-day and mid-century 100-year flood scenarios on Succor Brook, the water surface elevation is not expected to exceed the level of the concrete foundation. Therefore, similar to the WWTP, the Connecticut River poses the most significant flood risk to the pump station.

In a flood similar to the 1% AEP event, floodwaters from the Connecticut River would reach slightly above the level of the concrete foundation, posing a risk of damage to the lowest-mounted control panels at the pump station. If a flood equal to the 0.2% AEP event occurs, the controls/electrical panels and the backup generator would be subject to damage from inundation at a level approximately four feet above the top of the concrete foundation.

5.4 FUTURE FLOOD ELEVATIONS ALONG THE CONNECTICUT RIVER

Based on published information, Kleinfelder estimated future peak flood levels in the Connecticut River anticipated to affect the WWTP and the Dock Road pump station.

In both the effective 2013 FIS for Middlesex County and the historical 1979 FIS for East Haddam (Reference 15), backwater flood elevations shown on the Connecticut River profile are based on storm tide elevation estimates for Long Island Sound developed by the US Army Corps of Engineers in 1973. On the effective FIS, the Long Island Sound backwater influence ends approximately 2.5 miles downstream of the WWTP site. On the 1979 FIS, the Long Island Sound backwater influence extends upstream of the Route 82 bridge over the Connecticut River, including the reach adjacent to the WWTP and pump station. Comparing the 1979 FIS to the 2013 FIS, the Long Island Sound backwater was held at the same level, but the amount of riverine discharge was larger in the 2013 FIS. Kleinfelder noted that Connecticut River gauge height measurements at USGS gauge 01193050, upstream of East Haddam, showed a tidal signature.

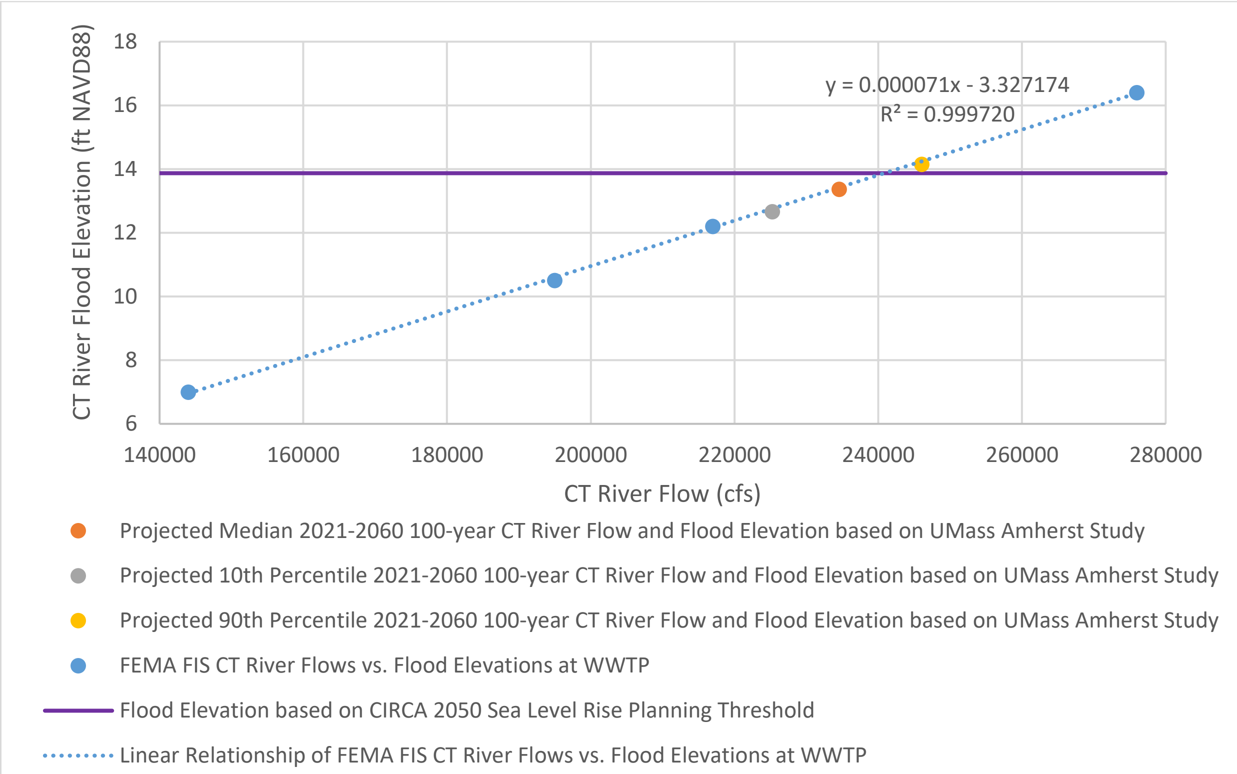
With future sea level rise, the Long Island Sound backwater influence could shift upstream along the Connecticut River, closer to the study area. Although a sea level rise estimate could be applied to the Long Island Sound storm tide estimates, doing this would ignore the impact of increased future riverine flood flows in the Connecticut River due to larger future storm events. However, a detailed study of future riverine flows in the Connecticut River was outside the scope of this project. Given a lack of published future riverine flow data for the Connecticut River within the state of Connecticut and considering that the reach of the Connecticut River through East Haddam has an observable tidal influence, Kleinfelder applied the CIRCA year 2050 sea level rise estimate to the effective FEMA Connecticut River flood profile elevations at the WWTP/pump station site to obtain an order-of-magnitude estimate of future flood elevations at the site.

The 20-inch (1.7 ft) projection, published in the February 2019 Sea Level Rise in Connecticut Final Report, is based on sea level rise forecasts from two climate change scenarios (Intermediate Low and Intermediate High) that consider varying levels of future carbon emissions reduction. The two scenarios project a consistent amount of sea level rise through the year 2050, but they diverge towards late century. Due to the amount of uncertainty related to sea level rise projections beyond the year 2050 and considering that the WWTP will likely be approaching the end of its useful life at that point, flood elevation predictions beyond 2050 are not provided in this memorandum.

Kleinfelder searched for additional data to support the future flood elevation estimate. Kleinfelder reviewed a study carried out by the University of Massachusetts Amherst in 2019 which projected changes to 100-year peak riverine flow magnitudes in the main stem of the Connecticut River within Massachusetts through the year 2099. The study estimated future flows based on high- and low carbon emission scenarios. The results of the study found that the median percent increases to peak 100-year flows for the time period from 2021 to 2060 across the studied reach of the Connecticut River were 8.1% and 2.9% in the high and low emission scenarios, respectively. Along with the median values, the study reported the 10^{th} and 90^{th} percentile estimates of percent increases to 100-year flows (3.8% and 13.4%, respectively, for the high emissions scenario).

Kleinfelder developed a linear equation that computed the 10% AEP through 0.2% AEP Connecticut River FIS flood elevations based on the corresponding peak riverine flow rates closest to the WWTP site. Kleinfelder applied the 10^{th} percentile, median, and 90^{th} percentile high-emissions scenario increases in peak flow from the UMass Amherst study to the 100-year FIS flow magnitude to obtain a range of future 100-year peak flow estimates near the site. Then, Kleinfelder used the linear equation to estimate the flood elevations corresponding to the projected future flows. The linear peak flow/elevation relationship and the projected future peak flow and corresponding elevation are shown graphically below.

Figure G2: Future 100-year Connecticut River Flood Elevation Estimate at the East Haddam WWTP and Pump Station



The estimated 100-year flood elevations derived from the 2021-2060 1% flows in the Connecticut River ranged from 12.7 ft to 14.1 ft. The 2050 1% AEP flood elevation estimate of 13.9 ft based on applying the CIRCA factor is within this range. Although the percentage change to peak flow within the state of Connecticut may differ from the changes to flow within Massachusetts, the analysis suggests that 1.7 ft is a reasonable order-of-magnitude estimate of change in 100-year flood elevation from the present-day to mid-century. The UMass Amherst study did not address flood events other than the 100-year (1% AEP) flood event.

5.5 FUTURE FLOOD RISKS TO THE WWTP AND PUMP STATION

Kleinfelder applied the CIRCA year 2050 sea level rise planning threshold of 20 inches to the 10%, 2%, 1%, and 0.2% effective FIS elevations for the Connecticut River near the WWTP and pump station. As discussed above, Kleinfelder had the highest amount of confidence in applying the CIRCA factor to predict the future 1% AEP flood elevation, and Kleinfelder anticipates this event will serve as the benchmark for adaptation planning for the WWTP in subsequent phases of this project. At the WWTP, the 2050 10% AEP flood elevation would inundate the access road with at least 1.7 feet of water, restricting access to the facility. The 2050 2% AEP flood elevation of 12.3 feet would slightly exceed the present-day 1% AEP flood elevation and is anticipated to cause a similar amount of flood damage to that event at the WWTP and the pump station. The 2050 1% AEP and 0.2% AEP flood events would inundate objects and equipment in the WWTP buildings up to 1.9 ft and 5.7 ft above the floor of the WWTP, respectively. Non-flood-resistant equipment at the Dock Road pump station at 0.3 ft, 1.9 ft, and 5.7 ft above the concrete foundation would be vulnerable to the effects of the 2%, 1%, and 0.2% flood events, respectively.

6 SUMMARY AND CONCLUSIONS

Kleinfelder developed a hydrologic model of Succor Brook, an ungauged tributary of the Connecticut River, to evaluate present-day and future flood flows from the Brook. The present-day peak flows predicted by the hydrologic model appeared to be conservative, yet reasonable for the watershed when compared to other sources of flow data. Future peak flows in the brook, based on predictions of future extreme precipitation in Connecticut, are expected to be significantly greater than present-day flows. Kleinfelder prepared a limited analysis of a beaver dam in the Succor Brook watershed to estimate peak flows from a potential failure of the dam. The range of flows predicted by the dam failure analysis are comparable to flows resulting from the larger present-day and mid-century storm events.

Using survey data, record information, field observations, and GIS datasets, Kleinfelder prepared a hydraulic model of the Goodspeed / Succor Brook Resilience Opportunity Area (ROAR) identified by CIRCA. Kleinfelder calibrated the model using precipitation data from a storm event known to cause flooding in the study area. After calibrating the model, flow data from the hydrologic model was input into the hydraulic model to predict flood impacts from present-day and future (mid-century) flood events. For events of the same average recurrence interval, flood impacts were predicted to become more severe towards mid-century. The rehearsal studio located at 21 Norwich Road as well as the Creamery Road box culvert were found to impede riverine flow in Succor Brook during high flow events.

Based on a field visit to the facility and record plan information, and a review of present-day and future flooding on the Connecticut River and Succor Brook, Kleinfelder determined present-day and future flood risks to the East Haddam WWTP and the Dock Road pump station. The present-day 100-year flood was found to be 0.2’ higher than the first-floor elevation of the WWTP buildings and the pump station foundation. In 2050, the 100-year flood elevation of the Connecticut River at the facilities may rise by 1.7 feet. Treatment process infrastructure should be raised or floodproofed relative to the projected future Connecticut River 100-year flood elevation to protect the facilities for the remainder of their useful life.

7 FIGURES AND APPENDICES

List of Figures:

1. Succor Brook Watershed Overview Map
2. Succor Brook HEC-HMS Model Framework
3. Succor Brook Watershed Land Cover
4. Succor Brook Watershed Hydrologic Soil Groups
5. Daniels Road Pond Beaver Dam
6. Hydraulic Study Area Overview Map
7. Hydraulic Study Area HEC-RAS Model Framework
8. Hydraulic Study Area Land Cover
9. Present-Day Floodplain Map
10. Mid-Century Floodplain Map
11. Present-Day 100-year Event Flood Depths
12. Present-Day 100-year Event Flood Velocities
13. Mid-Century 100-year Event Flood Depths
14. Mid-Century 100-year Event Flood Velocities

G1. Peak Flow Estimates in Succor Brook

G2. Future 100-year Connecticut River Flood Elevation Estimate at the East Haddam WWTP and Pump Station

List of Appendices:

Appendix A – NOAA Atlas 14 Precipitation Data
Appendix B – Hydrologic Calculations
Appendix C – USGS StreamStats Report and Regression Equation Worksheet
Appendix D – FEMA FIRM Panel for Succor Brook
Appendix E – Excerpts from Middlesex County FEMA Flood Insurance Study
Appendix F – Excerpts from East Haddam WWTP and Pump Station Record Drawings

8 DATA SOURCES AND PREVIOUS STUDIES

Kleinfelder referenced the following sources of data to prepare the hydrologic and hydrologic models and the information in this memorandum.

GIS data:

1. Hydro-flattened bare earth digital elevation model (DEM) derived from the 2016 Connecticut Statewide LiDAR dataset, downloaded from the Connecticut Environmental Conditions Online database
2. CT High Resolution Land Cover layer derived from 2016 aerial imagery, obtained from the NOAA Coastal Change Analysis Program (C-CAP) dataset
3. USDA Web Soil Survey spatial data
4. Microsoft Maps "USBuildingFootprints" database of GIS building footprints (https://github.com/microsoft/USBuildingFootprints)

2024 survey:

5. Survey file titled 2024-196 Succor Brook – E Haddam.dwg dated 8/6/2024, and plan titled "Data Accumulation Plan Bridge, Dam/Spillway Details" dated 9/11/2024, prepared by Martinez Couch & Associates LLC

Previous studies of Succor Brook and record drawings provided to Kleinfelder and CIRCA by the Town of East Haddam:

6. Survey of Succor Brook from 50' upstream of Creamery Road to the Connecticut River prepared by Close, Jensen and Miller, P.C., dated March 2002
7. Record plans titled "Right of Way and Topographic Survey Prepared for East Haddam Mobility Study East Haddam, Connecticut" prepared by Fuss & O'Neil, dated 12/8/2003
8. Record plans titled "Town of East Haddam, Connecticut Water Pollution Control Plant" prepared by Camp Dresser & McKee Inc., revised 5/6/1996
9. Record plans titled "Town of East Haddam, Connecticut Wastewater Collection System" prepared by Camp Dresser & McKee Inc., revised 9/18/1995 (sheets 18 and 19)

Previous hydrologic and hydraulic studies of Succor Brook provided to Kleinfelder and CIRCA by the Connecticut Department of Transportation (CTDOT):

10. Final Hydraulic Analysis Report Proposed Replacement of Bridge No. 02501, prepared by Close, Jensen and Miller, P.C., dated 9/23/2011
11. Final Hydraulic Analysis Report Proposed Replacement of Bridge No. 02502, prepared by Close, Jensen and Miller, P.C., dated 9/23/2011

Additional data sources:

12. FEMA effective HEC-2 model for Succor Brook, prepared by Anderson-Nichols & Company, obtained from the Federal Emergency Management Agency (FEMA) Engineering Library, completed 1977
13. USGS StreamStats application, version 4.19.4
14. FEMA Flood Insurance Study (FIS) 09007CV001B for Middlesex County, Connecticut, effective 8/28/2008, revised 2/6/2013, and Flood Insurance Rate Map panel 09007C0254G, effective 8/28/2008

KLEINFELDER 400 Capital Blvd., Suite 104, Rocky Hill, CT 06067 p | 860.563.7775 f | 860.563.6744

15. Federal Insurance Administration Flood Insurance Study, Town of East Haddam, Connecticut dated May 1979
16. Record plans titled “Dam on Succor Brook at McMillian Rehearsal Hall Modifications to Dam” prepared by Nathan L. Jacobson & Associates, revised 5/6/1983
17. NOAA Precipitation Frequency Data Server (Atlas 14)
18. National Geodetic Survey Coordinate Conversion and Transformation Tool (https://www.ngs.noaa.gov/NCAT/)
19. Connecticut Physical Climate Science Assessment Report, prepared by the Connecticut Institute for Resilience and Climate Adaptation (CIRCA), dated August 2019
20. Sea Level Rise in Connecticut Final Report, prepared by James O’Donnell, Department of Marine Sciences and Connecticut Institute for Resilience and Climate Adaptation (CIRCA), dated February 2019
21. Estimating Future Changes in 100-year Floods on the Connecticut and Merrimack Rivers, prepared by Dr. Richard Palmer, University of Massachusetts Amherst and Dr. Ridwan Siddique, North East Climate Adaptation Science Center, dated November 2019
22. Coats Marsh Weir Decommissioning Beaver Dam Risk Assessment Final Report, Rev. 0, prepared by Northwest Hydraulic Consultants Ltd. Dated 1/10/2024
23. Hydrology and Floodplain Analysis, prepared by Bedient, P.B., and Huber, W.C., dated 1992.
24. Estimating Flood Magnitude and Frequency on Streams and Rivers in Connecticut, Based on Data Through Water Year 2015: U.S. Geological Survey Scientific Investigations Report 2020-5054, prepared by Ahearn, E.A., and Hodgkins, G.A.

KLEINFELDER 400 Capital Blvd., Suite 104, Rocky Hill, CT 06067 p | 860.563.7775 f | 860.563.6744

FIGURES

KLEINFELDER 400 Capital Blvd., Suite 104, Rocky Hill, CT 06067 p | 860.563.7775 f | 860.563.6744

Date: 12/17/2024 User: DPasquale Path: \\azrgisstorp03\GIS_Projects\Client\UCONN\Resilient_East_Haddam\MAPS\UCONN_Resilient_East_Haddam_Figures\UCONN_Resilient_East_Haddam_Figures.aprx

0 500 1,000 2,000

Feet

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT NO.	24003600.001A
CREATED:	12/17/2024
CREATED BY:	SZ
CHECKED BY:	DP
FILE NAME:	UCONN_Resilient_East_Haddam_Figures.mxd

Succor Brook Watershed Overview Map

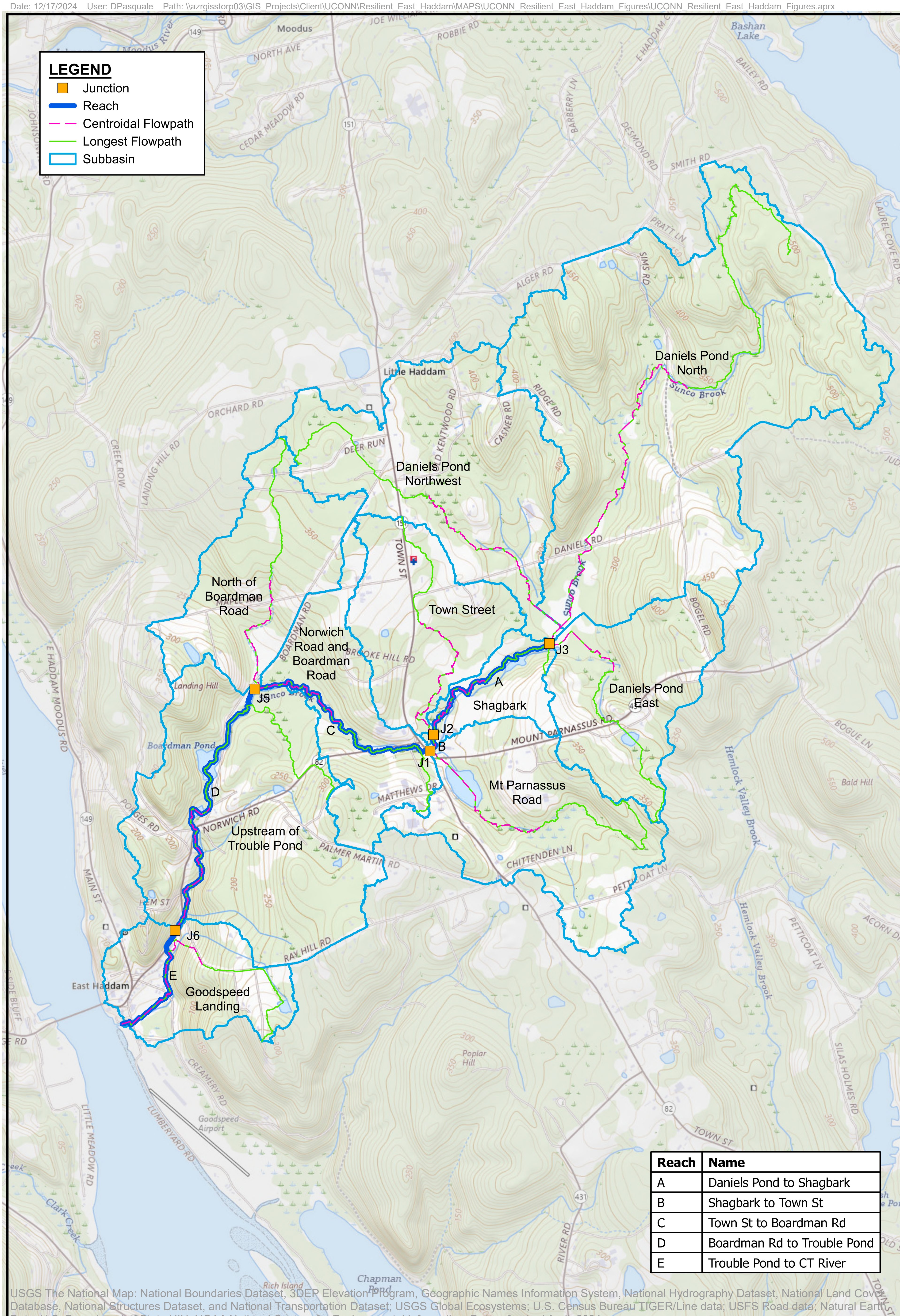
Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Resilient East Haddam

FIGURE

1

Date: 12/17/2024 User: DPasquale Path: \\azrgisstorp03\GIS_Projects\Client\UCONN\Resilient_East_Haddam\MAPS\UCONN_Resilient_East_Haddam_Figures\UCONN_Resilient_East_Haddam_Figures.aprx



Reach	Name
A	Daniels Pond to Shagbark
B	Shagbark to Town St
C	Town St to Boardman Rd
D	Boardman Rd to Trouble Pond
E	Trouble Pond to CT River

N

0 375 750 1,500

Feet

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT NO.	24003600.001A
CREATED:	12/17/2024
CREATED BY:	SZ
CHECKED BY:	DP
FILE NAME:	UCONN_Resilient_East_Haddam_Figures

HEC-HMS Hydrologic Model of Succor Brook Watershed Model Framework

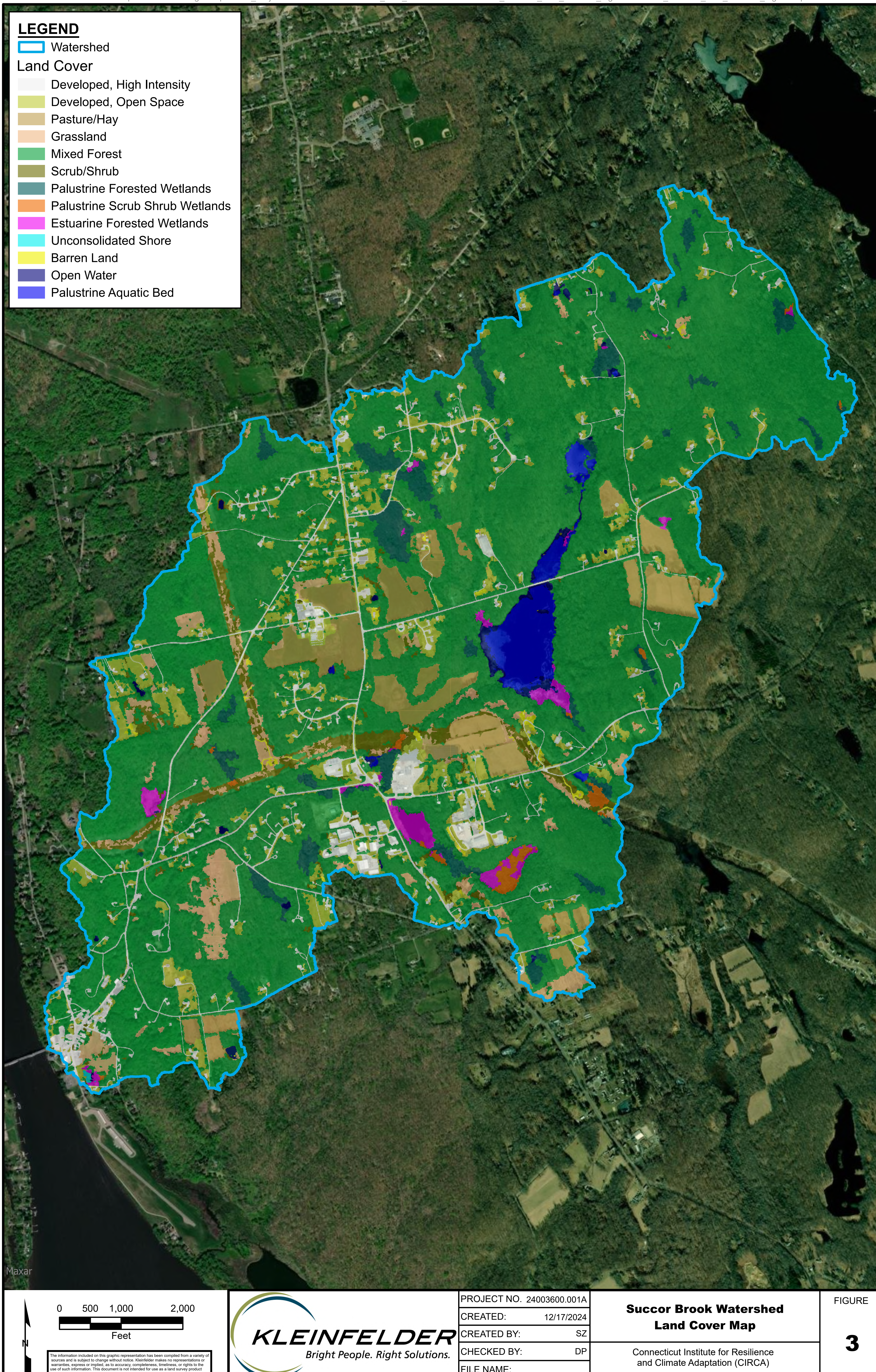
Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Resilient East Haddam

FIGURE

2

Date: 12/17/2024 User: DPasquale Path: \\azrgisstorp03\GIS_Projects\Client\UCONN\Resilient_East_Haddam\MAPS\UCONN_Resilient_East_Haddam_Figures\UCONN_Resilient_East_Haddam_Figures.aprx



KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

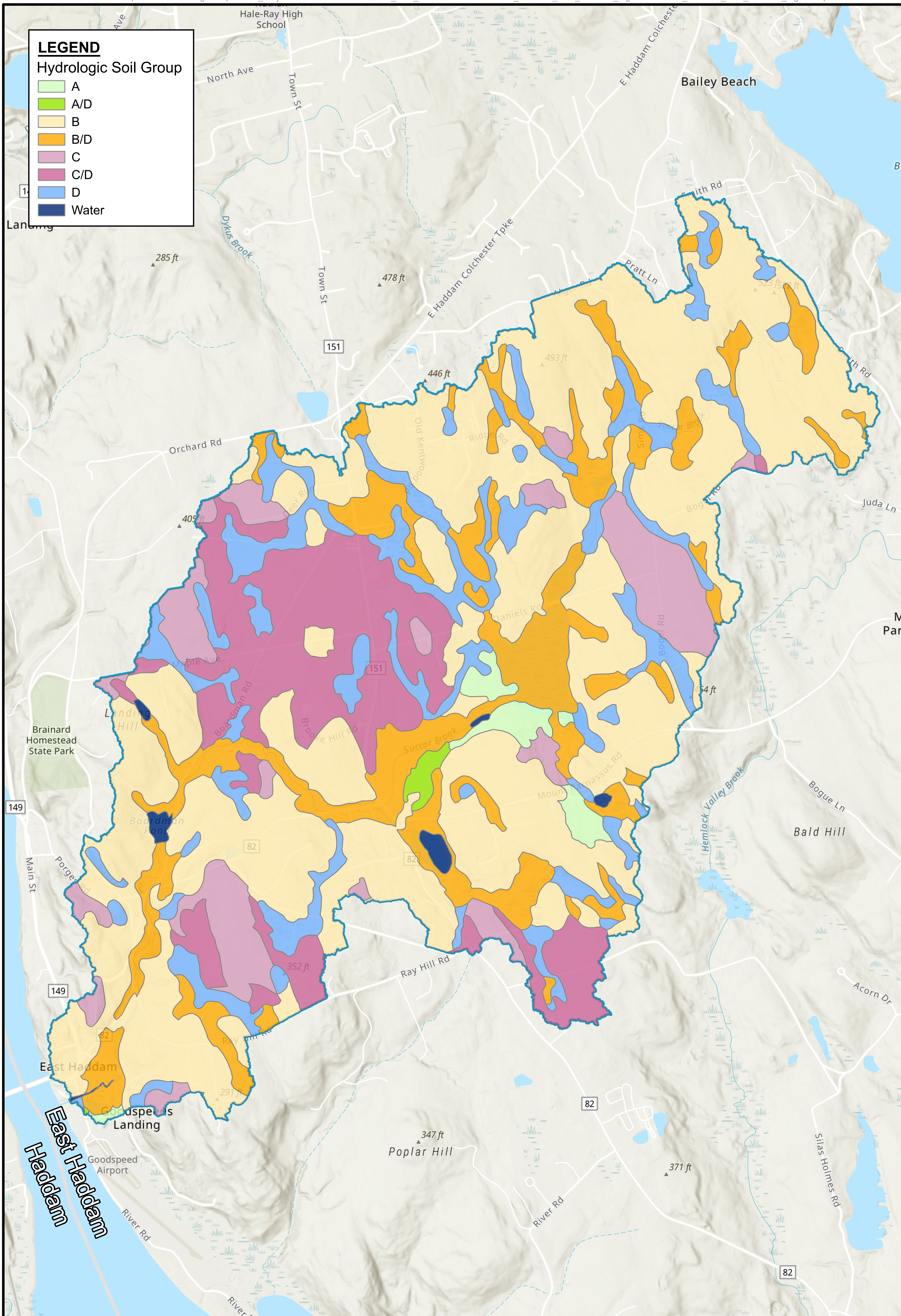
PROJECT NO.	24003600.001A
CREATED:	12/17/2024
CREATED BY:	SZ
CHECKED BY:	DP
FILE NAME:	UCONN_Resilient_East_Haddam_Figures

Succor Brook Watershed
Land Cover Map

Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Resilient East Haddam

FIGURE
3



N

0 500 1,000 2,000
Feet

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

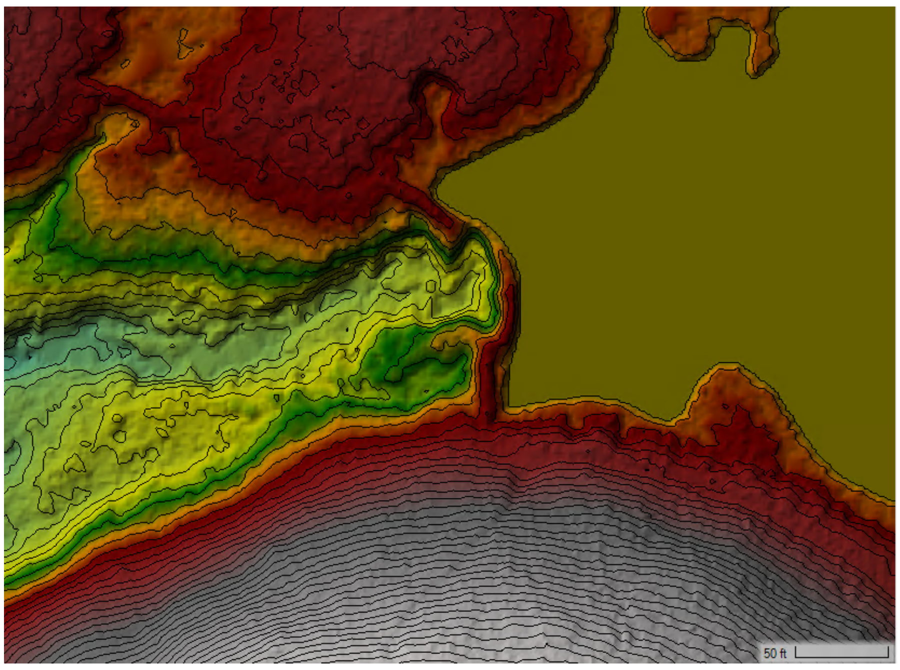
PROJECT NO.	24003600.001A
CREATED:	12/17/2024
CREATED BY:	SZ
CHECKED BY:	DP
FILE NAME:	
UCONN_Resilient_East_Haddam_Figures	

Succor Brook Watershed
Hydrologic Soil Group Map

Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

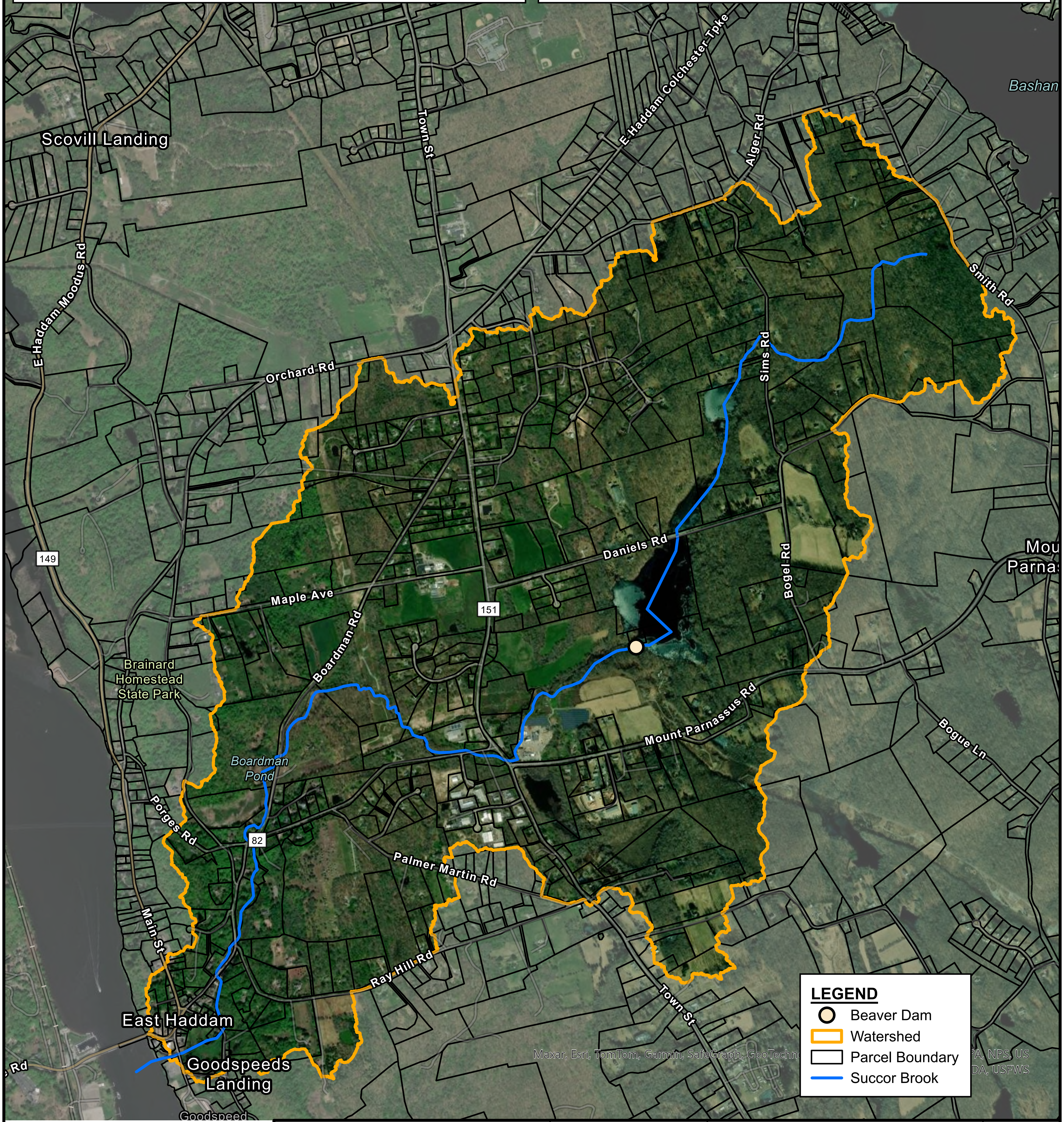
Resilient East Haddam

FIGURE
4



Beaver dam as shown in 2016 CT Statewide LiDAR Dataset

Beaver dam as shown on Nearmap imagery (4/3/2023)



0 500 1,000 2,000

Feet

N

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT NO.	24003600.001A
CREATED:	12/14/2024
CREATED BY:	DP
CHECKED BY:	DP
FILE NAME:	UCONN_Resilient_East_Haddam_Figures.mxd

Daniels Road Pond
Beaver Dam

Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Resilient East Haddam

FIGURE

5

Date: 1/9/2025 User: SZaff Path: \\azrgisstorp03\GIS_Projects\Client\UCONN\Resilient_East_Haddam\MAPS\UCONN_Resilient_East_Haddam_Figures\UCONN_Resilient_East_Haddam_Figures.aprx

N

0 50 100 200

Feet

KLEINFELDER

Bright People. Right Solutions.

www.kleinfelder.com

PROJECT NO.	24003600.001A
CREATED:	1/9/2025
CREATED BY:	SZ
CHECKED BY:	DP
FILE NAME:	UCONN_Resilient_East_Haddam_Figures

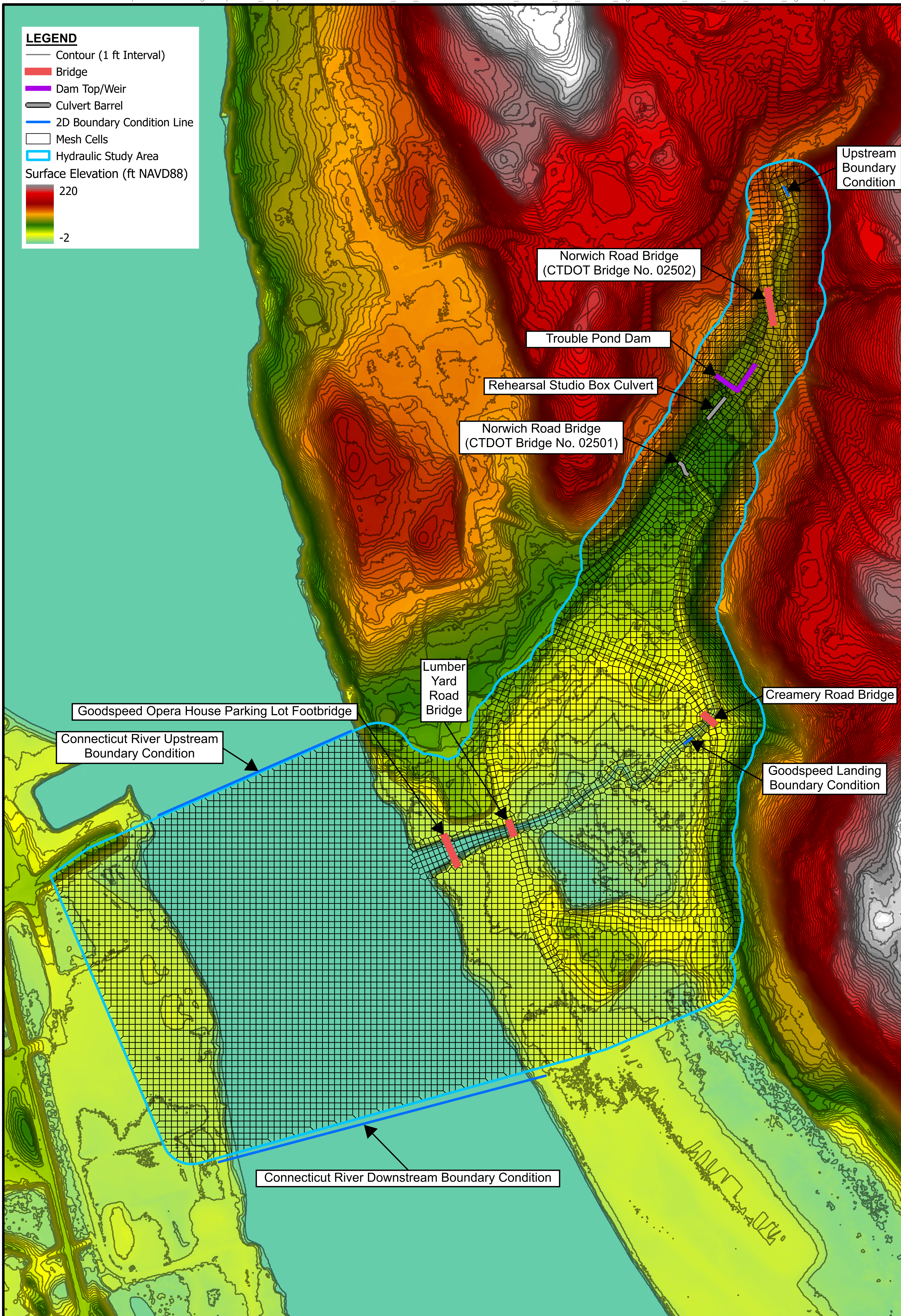
Hydraulic Study Area Overview Map

Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Resilient East Haddam

FIGURE

6



N

0 50 100 200
Feet

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT NO.	24003600.001A
CREATED:	12/17/2024
CREATED BY:	SZ
CHECKED BY:	DP
FILE NAME:	UCONN_Resilient_East_Haddam_Figures

Hydraulic Study Area
HEC-RAS Model Framework

Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Resilient East Haddam

FIGURE
7

Date: 12/18/2024 User: DPasquale Path: \\azrgisstorp03\GIS_Projects\Client\UCONN\Resilient_East_Haddam\MAPS\UCONN_Resilient_East_Haddam_Figures\UCONN_Resilient_East_Haddam_Figures.aprx

N

0 50 100 200

Feet

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT NO.	24003600.001A
CREATED:	12/18/2024
CREATED BY:	SZ
CHECKED BY:	DP
FILE NAME:	UCONN_Resilient_East_Haddam_Figures

Hydraulic Study Area Land Cover

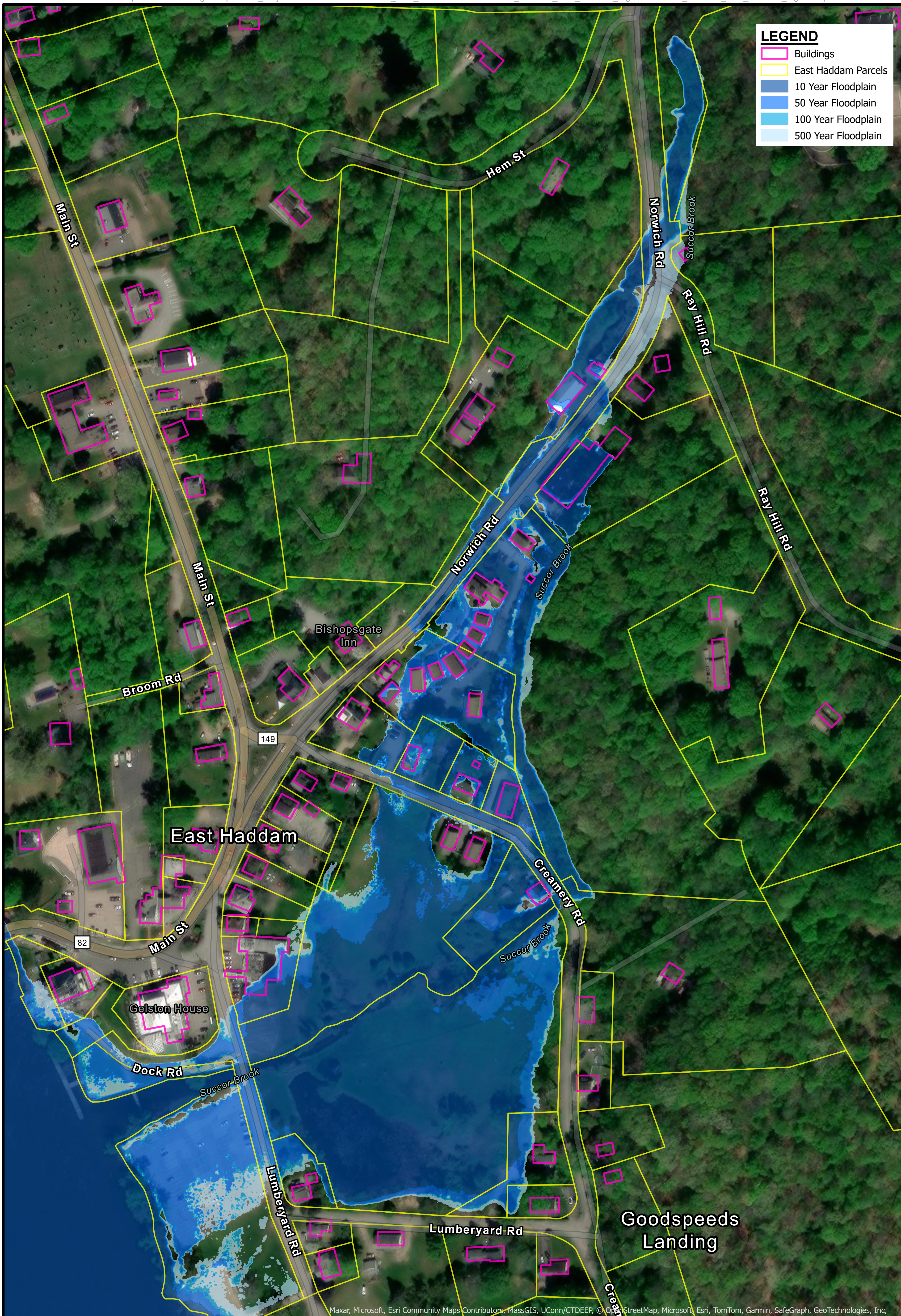
Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Resilient East Haddam

FIGURE

8

Date: 12/18/2024 User: DPasquale Path: \\azrgisstorp03\GIS_Projects\Client\UCONN\Resilient_East_Haddam\MAPS\UCONN_Resilient_East_Haddam_Figures\UCONN_Resilient_East_Haddam_Figures.aprx



N

0 50 100 200

Feet

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT NO.	24003600.001A
CREATED:	12/18/2024
CREATED BY:	SZ
CHECKED BY:	DP
FILE NAME:	UCONN_Resilient_East_Haddam_Figures

Present Day Floodplain Map
10, 50, 100, and 500-year, 24-hour Storm Event

Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Resilient East Haddam

FIGURE

9

N

0 50 100 200
Feet

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT NO.	24003600.001A
CREATED:	12/18/2024
CREATED BY:	SZ
CHECKED BY:	DP
FILE NAME:	UCONN_Resilient_East_Haddam_Figures

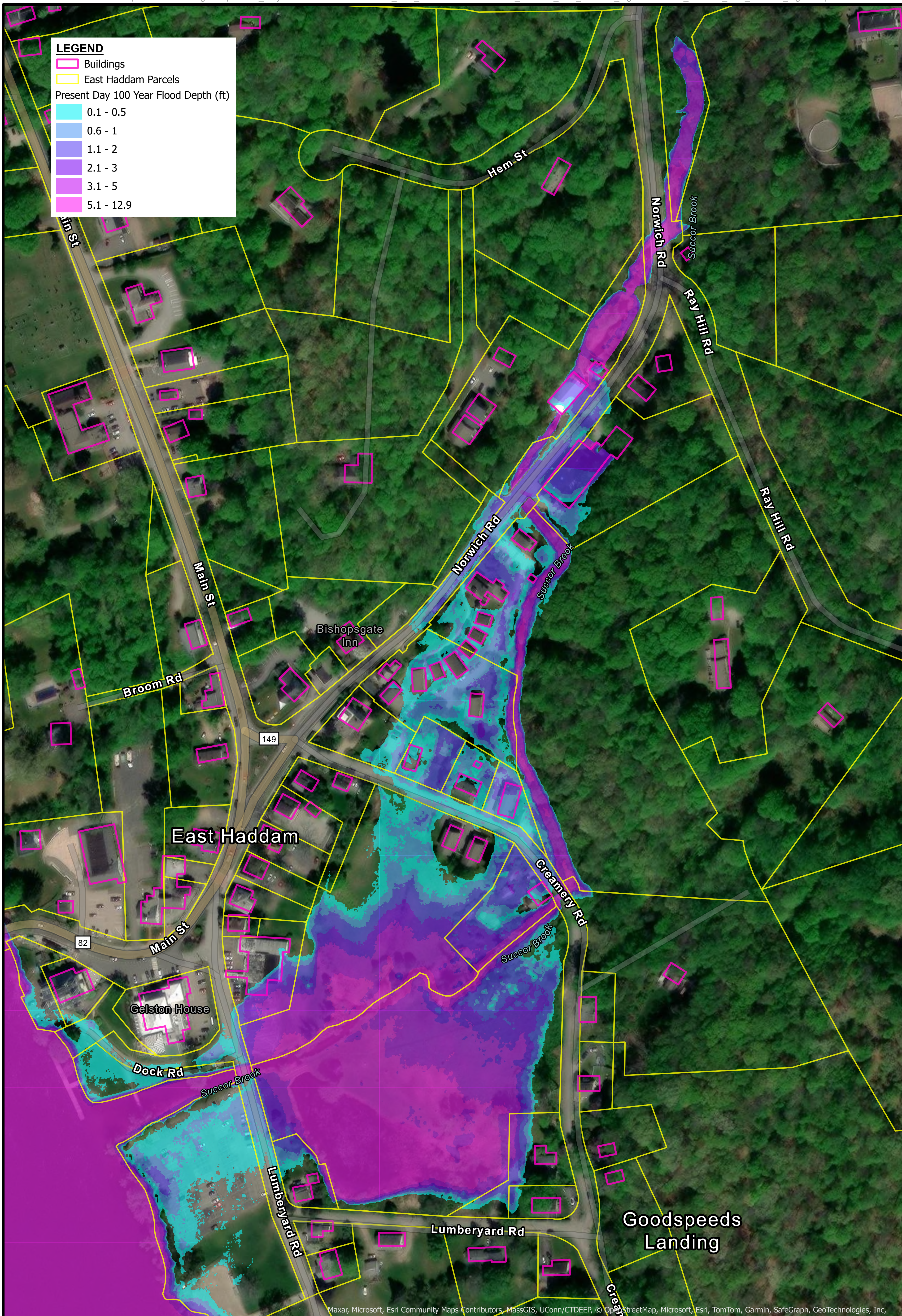
Mid-Century Floodplain Map 10, 50, and 100-year, 24-hour Storm Event

Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Resilient East Haddam

FIGURE
10

Date: 12/18/2024 User: DPasquale Path: \\azrgisstorp03\GIS_Projects\Client\UCONN\Resilient_East_Haddam\MAPS\UCONN_Resilient_East_Haddam_Figures\UCONN_Resilient_East_Haddam_Figures.aprx



N

0 50 100 200
Feet

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT NO.	24003600.001A
CREATED:	12/18/2024
CREATED BY:	SZ
CHECKED BY:	DP
FILE NAME:	UCONN_Resilient_East_Haddam_Figures

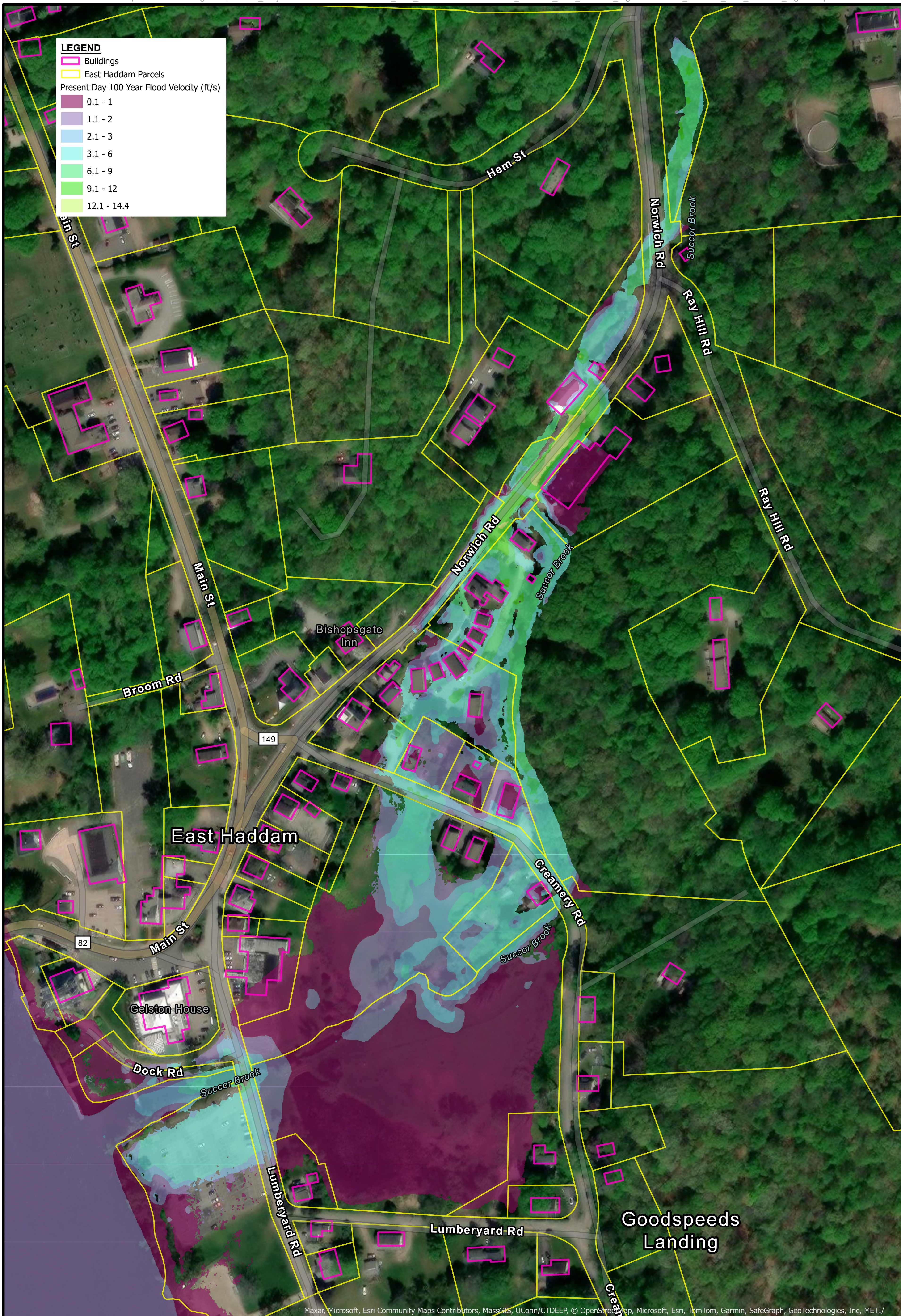
Present Day 100-year Event Maximum Flood Depths

Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Resilient East Haddam

FIGURE

11



0 50 100 200
Feet

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT NO.	24003600.001A
CREATED:	12/18/2024
CREATED BY:	SZ
CHECKED BY:	DP
FILE NAME:	UCONN_Resilient_East_Haddam_Figures

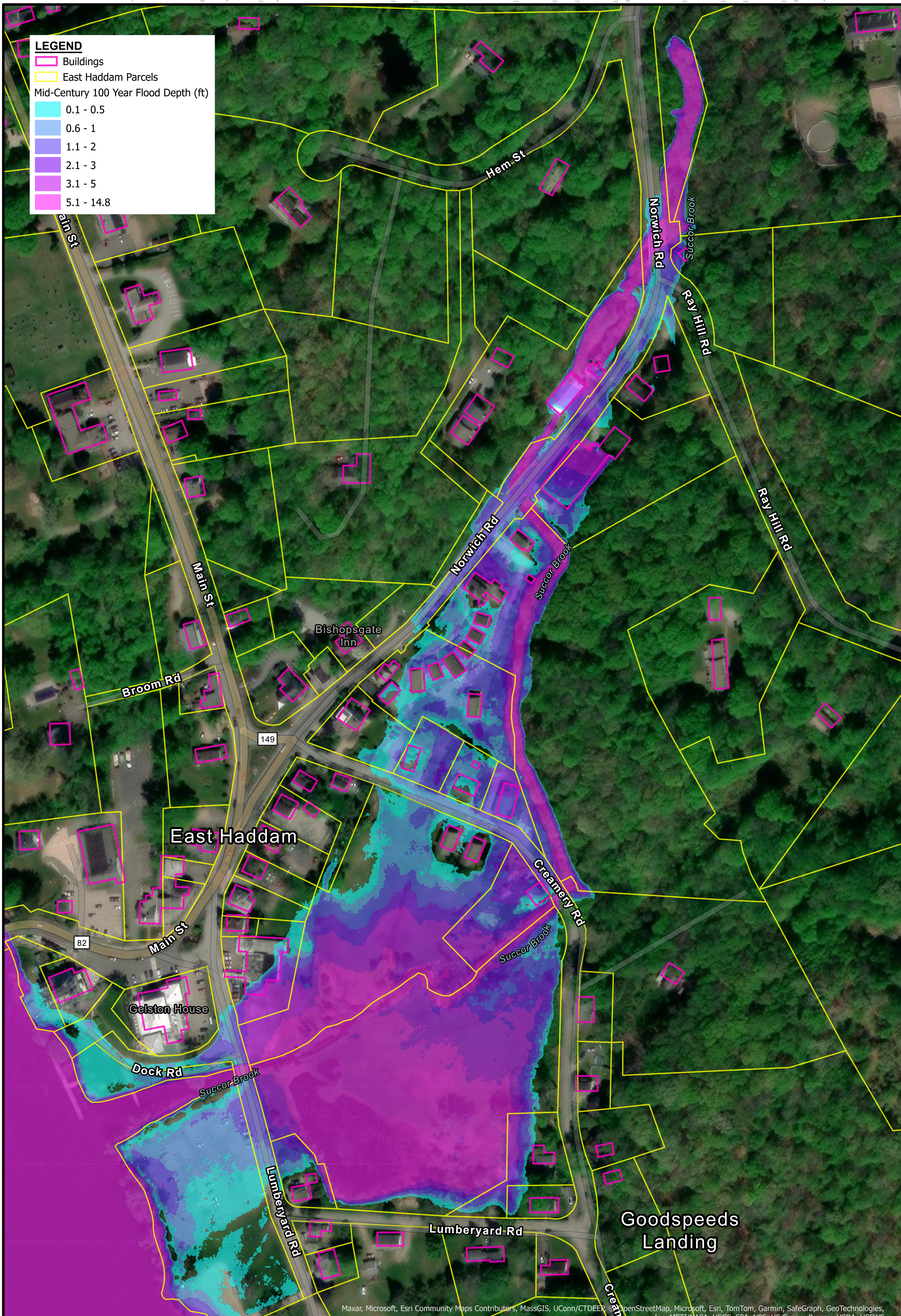
Present Day 100-year Event Maximum Flood Velocities

Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Resilient East Haddam

FIGURE
12

Date: 12/18/2024 User: DPasquale Path: \\azrgisstorp03\GIS_Projects\Client\UCONN\Resilient_East_Haddam\MAPS\UCONN_Resilient_East_Haddam_Figures\UCONN_Resilient_East_Haddam_Figures.aprx



N

0 50 100 200

Feet

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

KLEINFELDER

Bright People. Right Solutions.

www.kleinfelder.com

PROJECT NO.	24003600.001A
CREATED:	12/18/2024
CREATED BY:	SZ
CHECKED BY:	DP
FILE NAME:	UCONN_Resilient_East_Haddam_Figures

Mid-Century 100-year Event Maximum Flood Depths

Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Resilient East Haddam

FIGURE

13

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT NO.	24003600.001A
CREATED:	12/18/2024
CREATED BY:	SZ
CHECKED BY:	DP
FILE NAME:	UCONN_Resilient_East_Haddam_Figures

Mid-Century 100-year Event Maximum Flood Velocities

Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Resilient East Haddam

FIGURE 14

APPENDIX A

KLEINFELDER 400 Capital Blvd., Suite 104, Rocky Hill, CT 06067 p | 860.563.7775 f | 860.563.6744

NOAA Atlas 14, Volume 10, Version 3
Location name: East Haddam, Connecticut, USA*
Latitude: 41.4538°, Longitude: -72.4594°
Elevation: 26 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.332** (0.257-0.416)	**0.401** (0.309-0.502)	**0.514** (0.395-0.645)	**0.607** (0.464-0.765)	**0.735** (0.545-0.963)	**0.831** (0.604-1.11)	**0.932** (0.660-1.29)	**1.04** (0.702-1.47)	**1.21** (0.782-1.75)	**1.34** (0.848-1.98)
10-min	**0.471** (0.364-0.589)	**0.568** (0.438-0.711)	**0.727** (0.559-0.913)	**0.859** (0.657-1.08)	**1.04** (0.772-1.36)	**1.18** (0.857-1.57)	**1.32** (0.934-1.82)	**1.48** (0.995-2.08)	**1.71** (1.11-2.48)	**1.90** (1.20-2.80)
15-min	**0.554** (0.428-0.693)	**0.669** (0.515-0.836)	**0.856** (0.658-1.07)	**1.01** (0.773-1.28)	**1.22** (0.908-1.61)	**1.39** (1.01-1.85)	**1.55** (1.10-2.15)	**1.74** (1.17-2.45)	**2.01** (1.30-2.92)	**2.23** (1.41-3.30)
30-min	**0.761** (0.588-0.951)	**0.918** (0.708-1.15)	**1.18** (0.903-1.47)	**1.39** (1.06-1.75)	**1.68** (1.25-2.20)	**1.90** (1.38-2.54)	**2.13** (1.51-2.94)	**2.39** (1.61-3.36)	**2.76** (1.79-4.00)	**3.06** (1.94-4.52)
60-min	**0.968** (0.747-1.21)	**1.17** (0.901-1.46)	**1.50** (1.15-1.88)	**1.76** (1.35-2.23)	**2.14** (1.58-2.80)	**2.42** (1.76-3.23)	**2.71** (1.92-3.74)	**3.04** (2.04-4.28)	**3.51** (2.27-5.09)	**3.89** (2.46-5.75)
2-hr	**1.29** (1.01-1.60)	**1.55** (1.20-1.92)	**1.96** (1.52-2.44)	**2.31** (1.78-2.89)	**2.78** (2.08-3.62)	**3.14** (2.30-4.17)	**3.52** (2.51-4.83)	**3.95** (2.66-5.50)	**4.58** (2.98-6.58)	**5.10** (3.24-7.46)
3-hr	**1.51** (1.19-1.87)	**1.81** (1.42-2.24)	**2.29** (1.78-2.84)	**2.69** (2.08-3.35)	**3.23** (2.43-4.19)	**3.64** (2.69-4.82)	**4.08** (2.93-5.58)	**4.58** (3.10-6.36)	**5.33** (3.47-7.62)	**5.95** (3.79-8.66)
6-hr	**1.95** (1.54-2.39)	**2.32** (1.84-2.85)	**2.94** (2.31-3.62)	**3.45** (2.70-4.26)	**4.15** (3.15-5.34)	**4.67** (3.47-6.13)	**5.23** (3.78-7.11)	**5.88** (4.00-8.09)	**6.86** (4.48-9.71)	**7.67** (4.90-11.1)
12-hr	**2.43** (1.94-2.95)	**2.91** (2.32-3.54)	**3.69** (2.93-4.50)	**4.34** (3.43-5.32)	**5.23** (4.00-6.68)	**5.90** (4.42-7.68)	**6.61** (4.81-8.91)	**7.45** (5.09-10.1)	**8.70** (5.70-12.2)	**9.74** (6.24-13.9)
24-hr	**2.84** (2.29-3.43)	**3.44** (2.77-4.15)	**4.41** (3.54-5.34)	**5.22** (4.16-6.35)	**6.32** (4.88-8.02)	**7.15** (5.40-9.24)	**8.03** (5.90-10.8)	**9.10** (6.24-12.3)	**10.7** (7.04-14.9)	**12.1** (7.75-17.0)
2-day	**3.16** (2.58-3.79)	**3.87** (3.15-4.64)	**5.03** (4.08-6.05)	**5.99** (4.82-7.24)	**7.31** (5.70-9.22)	**8.29** (6.32-10.7)	**9.35** (6.94-12.5)	**10.7** (7.35-14.3)	**12.7** (8.39-17.5)	**14.5** (9.32-20.2)
3-day	**3.43** (2.81-4.09)	**4.20** (3.43-5.01)	**5.46** (4.45-6.53)	**6.51** (5.27-7.82)	**7.94** (6.22-9.97)	**9.00** (6.90-11.5)	**10.2** (7.58-13.5)	**11.6** (8.02-15.4)	**13.8** (9.16-18.9)	**15.8** (10.2-21.9)
4-day	**3.68** (3.02-4.37)	**4.49** (3.69-5.35)	**5.83** (4.77-6.95)	**6.94** (5.64-8.31)	**8.46** (6.64-10.6)	**9.58** (7.37-12.2)	**10.8** (8.08-14.3)	**12.3** (8.54-16.3)	**14.7** (9.74-20.0)	**16.7** (10.8-23.2)
7-day	**4.40** (3.64-5.19)	**5.30** (4.39-6.26)	**6.78** (5.59-8.04)	**8.01** (6.56-9.53)	**9.70** (7.67-12.0)	**10.9** (8.46-13.8)	**12.3** (9.22-16.1)	**14.0** (9.72-18.4)	**16.5** (11.0-22.3)	**18.7** (12.1-25.7)
10-day	**5.11** (4.26-6.01)	**6.07** (5.05-7.14)	**7.64** (6.33-9.01)	**8.94** (7.36-10.6)	**10.7** (8.51-13.2)	**12.1** (9.34-15.1)	**13.5** (10.1-17.5)	**15.2** (10.6-19.9)	**17.8** (11.9-23.9)	**19.9** (12.9-27.2)
20-day	**7.34** (6.18-8.57)	**8.38** (7.05-9.79)	**10.1** (8.44-11.8)	**11.5** (9.56-13.5)	**13.4** (10.7-16.3)	**14.9** (11.6-18.4)	**16.4** (12.3-20.9)	**18.1** (12.7-23.4)	**20.5** (13.8-27.3)	**22.4** (14.6-30.3)
30-day	**9.22** (7.81-10.7)	**10.3** (8.72-12.0)	**12.1** (10.2-14.1)	**13.6** (11.3-15.9)	**15.6** (12.5-18.8)	**17.1** (13.4-20.9)	**18.7** (14.0-23.4)	**20.3** (14.4-26.1)	**22.5** (15.2-29.7)	**24.2** (15.8-32.5)
45-day	**11.6** (9.86-13.4)	**12.7** (10.8-14.7)	**14.6** (12.3-16.9)	**16.1** (13.6-18.8)	**18.2** (14.7-21.8)	**19.9** (15.5-24.1)	**21.5** (16.0-26.6)	**23.0** (16.4-29.4)	**25.0** (16.9-32.8)	**26.4** (17.2-35.2)
60-day	**13.5** (11.6-15.6)	**14.7** (12.6-17.0)	**16.6** (14.2-19.2)	**18.3** (15.4-21.2)	**20.5** (16.5-24.3)	**22.2** (17.4-26.7)	**23.9** (17.8-29.3)	**25.3** (18.1-32.2)	**27.1** (18.4-35.4)	**28.3** (18.5-37.7)

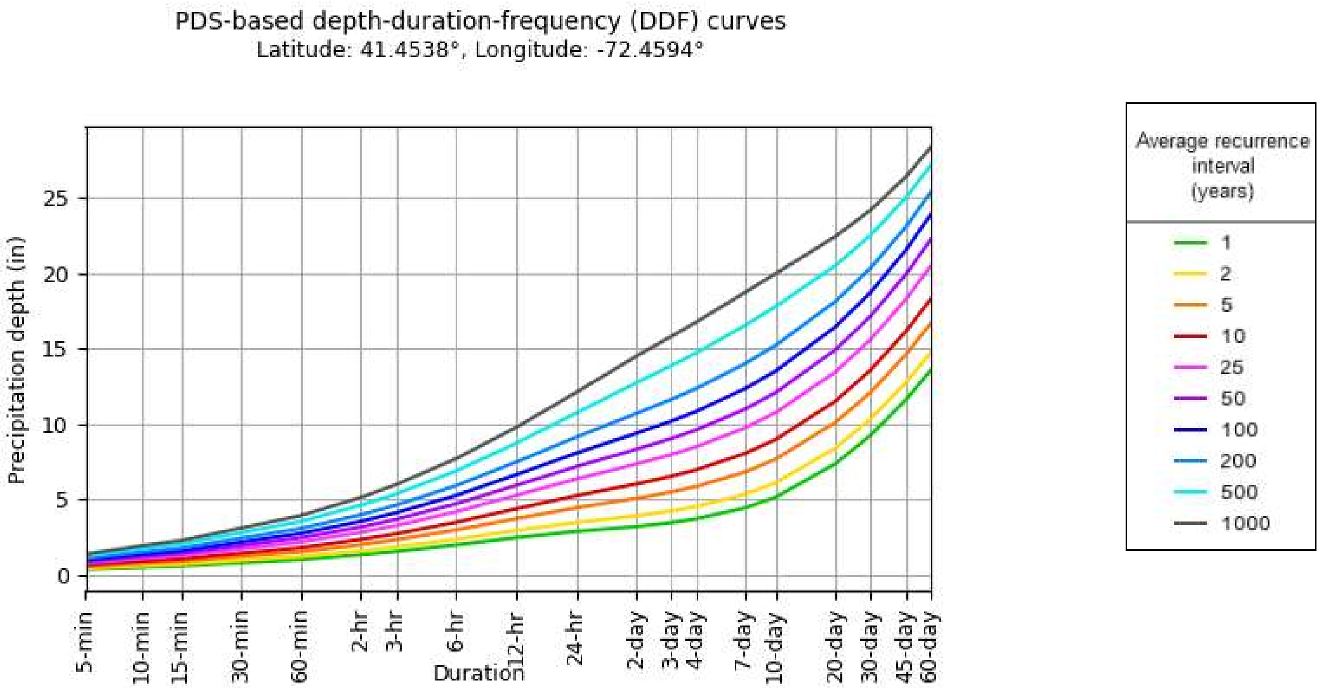
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

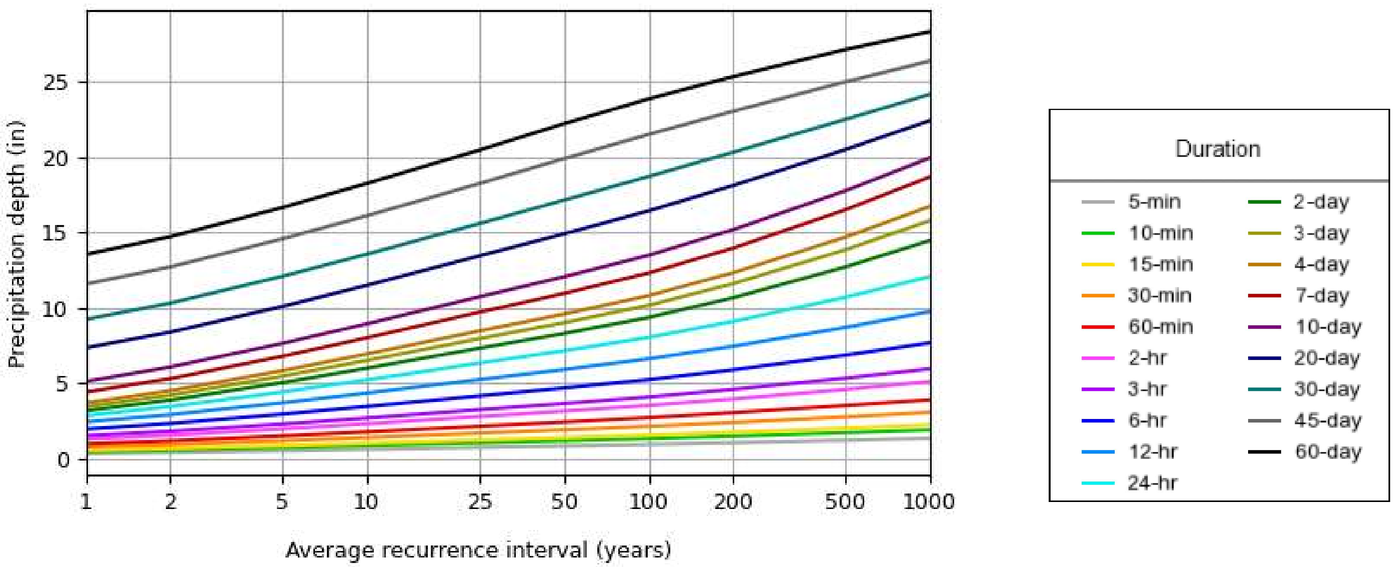
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical





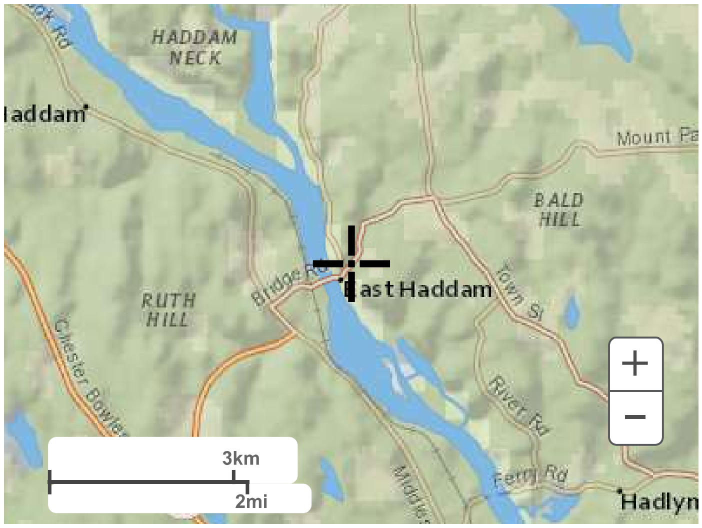
NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Mon Mar 11 20:19:50 2024

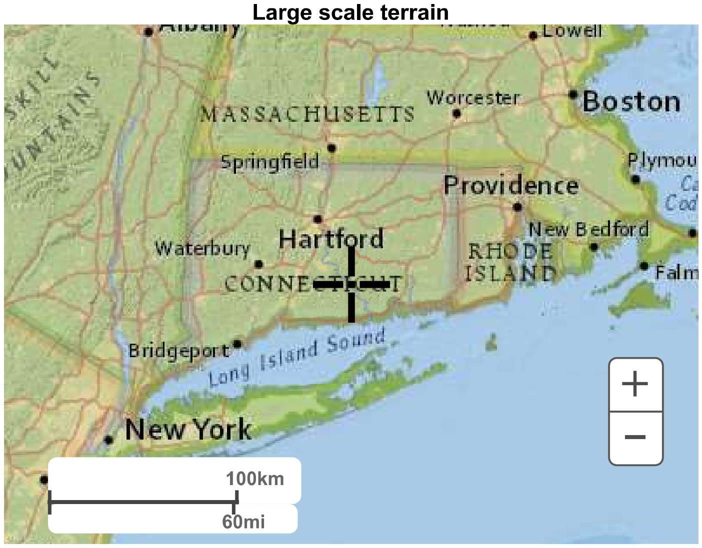
Back to Top

Maps & aerials

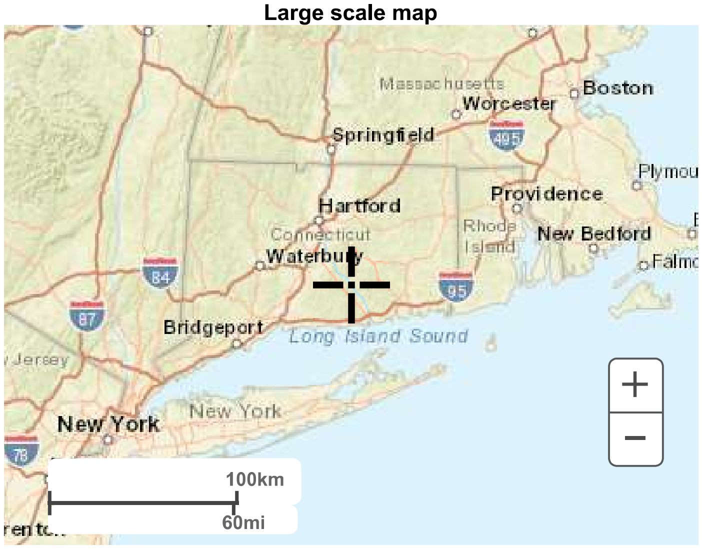
Small scale terrain



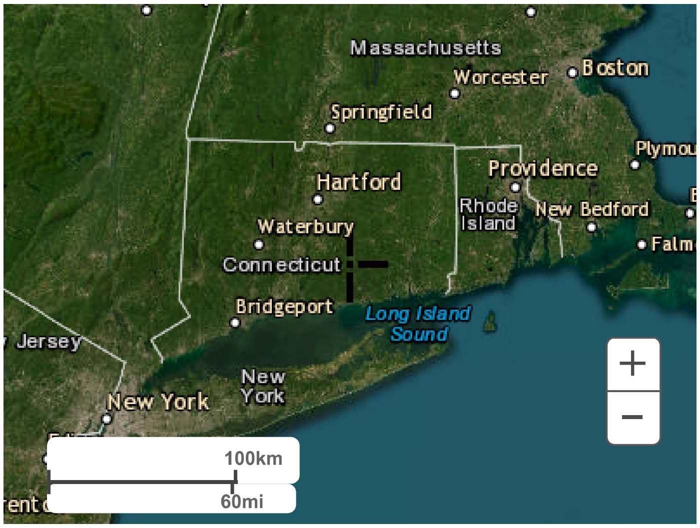
Large scale terrain



Large scale map



Large scale aerial



[Back to Top](#)

[US Department of Commerce](#)
[National Oceanic and Atmospheric Administration](#)
[National Weather Service](#)
[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

[Disclaimer](#)

APPENDIX B

KLEINFELDER 400 Capital Blvd., Suite 104, Rocky Hill, CT 06067 p | 860.563.7775 f | 860.563.6744

CN Reference:	https://www.hec.usace.army.mil/confluence/hmsdocs/hmstrm/cn-tables		
Land cover category (Formatted as "Land Cover Code_Hydrologic Soil Group")	**Curve Number assigned to each land cover category**	**NLCD Land Cover Code**	**NLCD Land Cover Description**
<Null>_			WATER
11_A	30	11	Mixed Forest
11_B	49	11	Mixed Forest
11_C	66	11	Mixed Forest
11_D	74	11	Mixed Forest
12_A	30	12	Scrub/Shrub
12_B	48	12	Scrub/Shrub
12_C	65	12	Scrub/Shrub
12_D	73	12	Scrub/Shrub
13_A	30	13	Palustrine Forested Wetland
13_B	49	13	Palustrine Forested Wetland
13_C	66	13	Palustrine Forested Wetland
13_D	74	13	Palustrine Forested Wetland
14_B	48	14	Palustrine Scrub/Wetland
14_C	65	14	Palustrine Scrub/Wetland
14_D	73	14	Palustrine Scrub/Wetland
15_A	94	15	Palustrine Emergent Wetland
15_B	86	15	Palustrine Emergent Wetland
15_C	94	15	Palustrine Emergent Wetland
15_D	94	15	Palustrine Emergent Wetland
19_B	98	19	Unconsolidated Shore
19_D	98	19	Unconsolidated Shore
2_A	98	2	Impervious
2_B	98	2	Impervious
2_C	98	2	Impervious
2_D	98	2	Impervious
20_A	77	20	Bare Land
20_B	86	20	Bare Land
20_C	91	20	Bare Land
20_D	94	20	Bare Land
21_A	98	21	Open Water
21_B	98	21	Open Water
21_C	98	21	Open Water
21_D	98	21	Open Water
22_A	98	22	Palustrine Aquatic Bed
22_B	98	22	Palustrine Aquatic Bed
22_D	98	22	Palustrine Aquatic Bed
5_A	49	5	Developed Open Space
5_B	61	5	Developed Open Space
5_C	79	5	Developed Open Space
5_D	80	5	Developed Open Space
7_A	39	7	Pasture/Hay

7_B	61	7	Pasture/Hay
7_C	74	7	Pasture/Hay
7_D	80	7	Pasture/Hay
8_A	39	8	Grassland
8_B	61	8	Grassland
8_C	74	8	Grassland
8_D	80	8	Grassland

SCS Curve Number and SCS Basin Lag Worksheet		
Resilient East Haddam		
Prepared by:	DLP	10/3/2024
Checked by:	KC	10/3/2024

Subbasin Name	CN	L (mi)	Basin Slope (Y) (ft/ft)	Potential Maximum Retention (S) (in)	L (ft)	Y (%)	Tc (hr)	Lag (hr)	Lag (min)
Daniels Pond East	61.078	1.166	0.1381	6.372381112	6158.3	13.81	1.03	0.62	37.0
Daniels Pond North	61.246	2.908	0.14051	6.327550401	15701.1	14.051	2.15	1.29	77.2
Daniels Pond Northwest	66.697	1.663	0.10868	4.993122057	8779.7	10.868	1.33	0.80	47.9
Goodspeed Landing	65.501	1.185	0.18263	5.266882187	6256.5	18.263	0.81	0.48	29.1
Mt Parnassus Road	69.481	1.436	0.11444	4.392435896	7583.6	11.444	1.07	0.64	38.6
North of Boardman Road	71.663	1.113	0.11874	3.954221116	5877.4	11.874	0.81	0.49	29.1
Norwich Road and Boardman Ro	67.459	1.152	0.13121	4.823837718	6083.1	13.121	0.89	0.53	31.9
Shagbark	61.427	0.867	0.1084	6.27940512	4578.1	10.84	0.91	0.54	32.7
Town Street	74.465	1.188	0.09232	3.42905288	6271.0	9.232	0.89	0.54	32.1
Upstream of Trouble Pond	63.968	1.804	0.15882	5.632706942	9523.3	15.882	1.26	0.76	45.4

$$T_c = \frac{\ell^{0.8}(S+1)^{0.7}}{1{,}140Y^{0.5}}$$

where:
L = lag, h
T_c = time of concentration, h
ℓ = flow length, ft
Y = average watershed land slope, %
S = maximum potential retention, in

$$= \frac{1{,}000}{cn'} - 10$$

where:
cn′ = the retardance factor

$$t_p = 0.6 * T_c$$

Notes:
Lag (hr) calculated with the SCS curve number method. Values were converted to minutes and used as inputs to the SCS Unit Hydrograph transform method in HEC-HMS. Subbasin composite curve number (CN) values were calculated using ArcGIS Pro based on land cover and soil data CN values were used in the SCS Unit Hydrograph and Snyder Unit Hydrograph analyses.
In the set of equations above, cn' is approximately equal to CN.

Muskingum Reach Routing Parameter Worksheet		
Resilient East Haddam		
Prepared by:	DLP	10/3/2024
Checked by:	KC	10/3/2024

Muskingum Parameter Computations:

Reach Name	Length (mi)	Slope (ft/ft)	Slope (ft/mi)	Relief (ft)	Sinuosity	Length (ft)	Flow Area (sf)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Average Velocity (ft/s)	Floodwave Velocity (ft/s)	K (hr)	X
Daniels Pond to Shagbark	0.68	0.01	37.12	25.23	1.46	3591.51	65.44	71.4	0.92	1.38	2.0	0.50	0.0
Shagbark to Town St	0.07	0.00	3.12	0.21	1.31	360.89	168.1	108.67	1.55	0.44	0.6	0.16	0.0
Town St to Boardman Rd	0.87	0.01	40.97	35.70	1.49	4600.99	84.55	65.83	1.28	1.96	2.8	0.45	0.0
Boardman Rd to Trouble Pond	1.18	0.03	137.07	161.27	1.47	6212.03	71	47.4	1.50	3.41	4.9	0.35	0.0
Trouble Pond to CT River	0.49	0.02	96.94	47.23	1.44	2571.99	56.5	23.1	2.45	4.78	6.9	0.10	0.0

Composite Manning's n estimate for each reach:

Reach Name	Wetted Perimeter (ft)	LOB n	LOB WP (ft)	Main Ch. n	Main Ch. WP (ft)	ROB n	ROB WP (ft)	Composite Manning's n
Daniels Pond to Shagbark	71.4	0.12	29.9	0.05	34.5	0.12	3.8	0.09
Shagbark to Town St	108.67	0.12	74.85	0.05	18.75	0.12	15.1	0.11
Town St to Boardman Rd	65.83	0.1	5.64	0.05	29.99	0.1	30.19	0.08
Boardman Rd to Trouble Pond	47.4	0.1	26.1	0.05	15	0.1	10.5	0.09
Trouble Pond to CT River	23.1	0.12	6.2	0.05	13.13	0.08	3.84	0.08

Notes:

The Muskingum method relies on two coefficients: K, used to represent travel time through the reach, and X, used to represent attenuation. Muskingum K parameters were calculated by estimating a flood wave velocity for each reach based on the reaches' approximate bankfull flow velocity, found using Manning's equation at a representative cross-section for each reach. Bankfull flow velocity were multiplied by a factor of 1.44 to obtain the estimated floodwave velocity based on guidance from the US Army Corps of Engineers report EM 1110-2-1417, Flood-Runoff Analysis.

The Muskingum X parameter for each reach was chosen to be 0—values range between 0 and 5, with 0 maximizing attenuation through the reach.
Because the basin model did not directly include bridges and culverts which would constrict and attenuate flow, Muskingum X values of zero were considered appropriate.

Snyder Unit Hydrograph Coefficient Worksheet		
Resilient East Haddam		
Prepared by:	DLP	10/3/2024
Checked by:	KC	10/3/2024

Subbasin Name	Longest Flowpath Length L (mi)	Longest Flowpath Slope (ft/ft)	Centroidal Flowpath Length L_c (mi)	Centroidal Flowpath Slope (ft/ft)	10-85 Flowpath Length (ft/ft)	10-85 Flowpath Slope (ft/ft)	Basin Slope (ft/ft)	Basin Relief (ft)	Relief Ratio	Elongation Ratio	Drainage Density (mi/mi^2)	Time to Peak t_p (hr)	Basin Coefficient (C_t)	Peaking Coefficient
Daniels Pond East	1.17	0.015	0.34	0.001	0.875	0.009	0.138	255.01	0.04	0.48	0.38	1.51	2.0	0.6
Daniels Pond North	2.91	0.015	1.34	0.007	2.181	0.017	0.141	275.53	0.02	0.39	1.85	3.01	2.0	0.6
Daniels Pond Northwest	1.66	0.012	0.88	0.012	1.247	0.013	0.109	170.29	0.02	0.44	1.07	2.24	2.0	0.6
Goodspeed Landing	1.18	0.049	0.59	0.052	0.889	0.058	0.183	306.99	0.05	0.40	2.80	1.79	2.0	0.6
Mt Parnassus Road	1.44	0.015	0.58	0.009	1.077	0.012	0.114	123.74	0.02	0.45	1.09	1.89	2.0	0.6
North of Boardman Road	1.11	0.030	0.50	0.030	0.835	0.033	0.119	177.84	0.03	0.50	0.93	1.68	2.0	0.6
Norwich Road and Boardman Ro	1.15	0.016	0.43	0.004	0.864	0.013	0.131	154.55	0.03	0.45	4.10	1.62	2.0	0.6
Shagbark	0.87	0.021	0.46	0.004	0.650	0.006	0.108	110.23	0.02	0.37	9.37	1.51	2.0	0.6
Town Street	1.19	0.017	0.68	0.013	0.891	0.016	0.092	119.94	0.02	0.45	0.56	1.87	2.0	0.6
Upstream of Trouble Pond	1.80	0.029	0.63	0.040	1.353	0.022	0.159	318.76	0.03	0.44	2.34	2.07	2.0	0.6

Time to peak equation:

$$t_p = CC_t(LL_c)^{0.3}$$

Notes:

1. C is a unit conversion constant, equal to 1.0 in the Foot-Pound System
2. A basin coefficient (C_t) of 2.0 was chosen for each subbasin. Per the guidance in the HEC-HMS manual, typical values range from 1.8 to 2.2, though values between 0.4 in mountainous areas to 8.0 along the Gulf of Mexico have been used in prior studies.
3. A peaking coefficient of 0.6 was chosen for each subbasin. Per the guidance in the HEC-HMS manual, typical values range from 0.4 to 0.8.

Project: R E Hhydro S C S
Simulation Run: A14-2
Simulation Start: 31 December 1999, 24:00
Simulation End: 2 January 2000, 24:00

HMS Version: 4.12
Executed: 15 October 2024, 20:33

Global Parameter Summary - Subbasin

Location

Element Name	Longitude Degrees	Latitude Degrees
Daniels Pond North	-72.43	41.48
Daniels Pond Northwest	-72.44	41.48
Daniels Pond East	-72.43	41.47
Town Street	-72.44	41.47
Mt Parnassus Road	-72.44	41.46
Shagbark	-72.44	41.47
North of Boardman Road	-72.45	41.47
Norwich Road and Boardman Ro	-72.45	41.47
Upstream of Trouble Pond	-72.45	41.46
Goodspeed Landing	-72.46	41.45

Area (MI2)

Element Name	Area (MI2)
Daniels Pond North	0.99
Daniels Pond Northwest	0.42
Daniels Pond East	0.25
Town Street	0.23
Mt Parnassus Road	0.33
Shagbark	0.08
North of Boardman Road	0.25
Norwich Road and Boardman Ro	0.21
Upstream of Trouble Pond	0.5
Goodspeed Landing	0.17

Downstream

Element Name	Downstream
Daniels Pond North	J3
Daniels Pond Northwest	J3
Daniels Pond East	J3
Town Street	J2
Mt Parnassus Road	J1
Shagbark	J1
North of Boardman Road	J5
Norwich Road and Boardman Ro	J5
Upstream of Trouble Pond	J6
Goodspeed Landing	Sink - 1

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Daniels Pond North	0	61.25
Daniels Pond Northwest	0	66.7
Daniels Pond East	0	61.08
Town Street	0	74.47
Mt Parnassus Road	0	69.48
Shagbark	0	61.43
North of Boardman Road	0	71.66
Norwich Road and Boardman Ro	0	67.46
Upstream of Trouble Pond	0	63.97
Goodspeed Landing	0	65.5

Transform: Snyder

Element Name	Snyder Method	Snyder Tp	Snyder Cp
Daniels Pond North	Standard	3.01	0.6
Daniels Pond Northwest	Standard	2.24	0.6
Daniels Pond East	Standard	1.51	0.6
Town Street	Standard	1.87	0.6
Mt Parnassus Road	Standard	1.89	0.6
Shagbark	Standard	1.51	0.6
North of Boardman Road	Standard	1.68	0.6
Norwich Road and Boardman Ro	Standard	1.62	0.6
Upstream of Trouble Pond	Standard	2.07	0.6
Goodspeed Landing	Standard	1.79	0.6

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
Daniels Pond to Shagbark	J2
Shagbark to Town St	J1
Town St to Boardman Rd	J5
Boardman Rd to Trouble Pond	J6
Trouble Pond to CT River	Sink - 1

Route: Muskingum

Element Name	Method	Initial Variable	Muskingum K	Muskingum x	Muskingum Steps
Daniels Pond to Shagbark	Muskingum	Combined Inflow	0.5	0	1
Shagbark to Town St	Muskingum	Combined Inflow	0.16	0	1
Town St to Boardman Rd	Muskingum	Combined Inflow	0.45	0	1
Boardman Rd to Trouble Pond	Muskingum	Combined Inflow	0.35	0	1
Trouble Pond to CT River	Muskingum	Combined Inflow	0.1	0	1

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Daniels Pond North	0.99	38.81	01Jan2000, 15:48	0.56
Daniels Pond Northwest	0.42	31.12	01Jan2000, 14:36	0.8
Daniels Pond East	0.25	14.27	01Jan2000, 13:54	0.55
J3	1.66	79.34	01Jan2000, 15:12	0.62
Daniels Pond to Shagbark	1.66	77.12	01Jan2000, 15:48	0.62
Town Street	0.23	32	01Jan2000, 14:00	1.23
J2	1.89	100.76	01Jan2000, 15:24	0.69
Shagbark to Town St	1.89	100.54	01Jan2000, 15:36	0.69
Mt Parnassus Road	0.33	33.18	01Jan2000, 14:06	0.94
Shagbark	0.08	4.79	01Jan2000, 13:54	0.56
J1	2.29	131.61	01Jan2000, 15:18	0.72
Town St to Boardman Rd	2.29	129.21	01Jan2000, 15:48	0.72
North of Boardman Road	0.25	31.69	01Jan2000, 13:54	1.06
Norwich Road and Boardman Ro	0.21	20.65	01Jan2000, 13:54	0.84
J5	2.75	166.56	01Jan2000, 15:24	0.76
Boardman Rd to Trouble Pond	2.75	164.85	01Jan2000, 15:48	0.76
Upstream of Trouble Pond	0.5	31.48	01Jan2000, 14:30	0.67
J6	3.25	192.79	01Jan2000, 15:36	0.75
Trouble Pond to CT River	3.25	192.65	01Jan2000, 15:42	0.75
Goodspeed Landing	0.17	13.59	01Jan2000, 14:06	0.74
Sink - 1	3.43	203.45	01Jan2000, 15:42	0.75

Subbasin: Daniels Pond North

Area (MI2) : 0.99
Latitude Degrees : 41.48
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

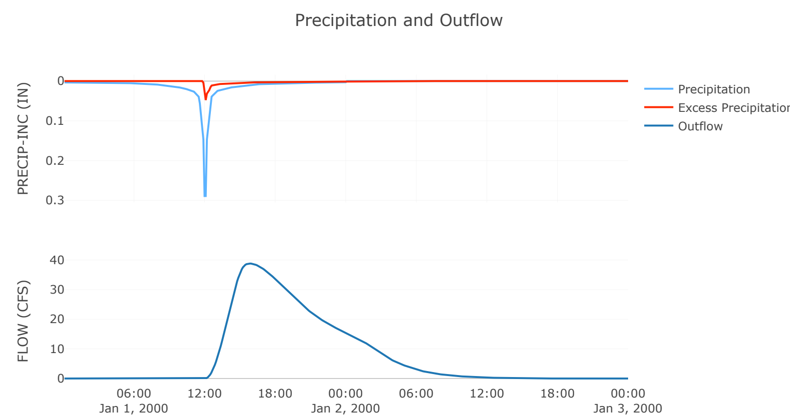
Percent Impervious Area	0
Curve Number	61.25

Transform: Snyder

Snyder Method	Standard
Snyder Tp	3.01
Snyder Cp	0.6

Results: Daniels Pond North

Peak Discharge (CFS)	38.81
Time of Peak Discharge	01Jan2000, 15:48
Volume (IN)	0.56
Precipitation Volume (AC - FT)	182.16
Loss Volume (AC - FT)	152.71
Excess Volume (AC - FT)	29.45
Direct Runoff Volume (AC - FT)	29.45
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond Northwest

Area (MI2) : 0.42
Latitude Degrees : 41.48
Longitude Degrees : -72.44
Downstream : J3

Loss Rate: Scs

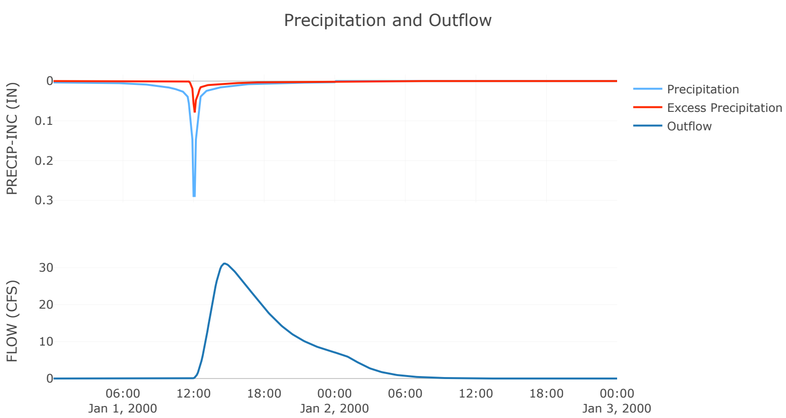
Percent Impervious Area	0
Curve Number	66.7

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.24
Snyder Cp	0.6

Results: Daniels Pond Northwest

Peak Discharge (CFS)	31.12
Time of Peak Discharge	01Jan2000, 14:36
Volume (IN)	0.8
Precipitation Volume (AC - FT)	77.37
Loss Volume (AC - FT)	59.34
Excess Volume (AC - FT)	18.03
Direct Runoff Volume (AC - FT)	18.03
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond East

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

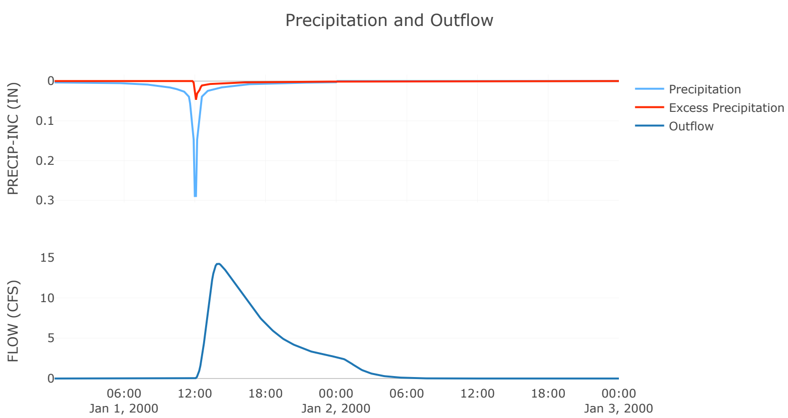
Percent Impervious Area	0
Curve Number	61.08

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Daniels Pond East

Peak Discharge (CFS)	14.27
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	0.55
Precipitation Volume (AC - FT)	45.17
Loss Volume (AC - FT)	37.96
Excess Volume (AC - FT)	7.21
Direct Runoff Volume (AC - FT)	7.21
Baseflow Volume (AC - FT)	0

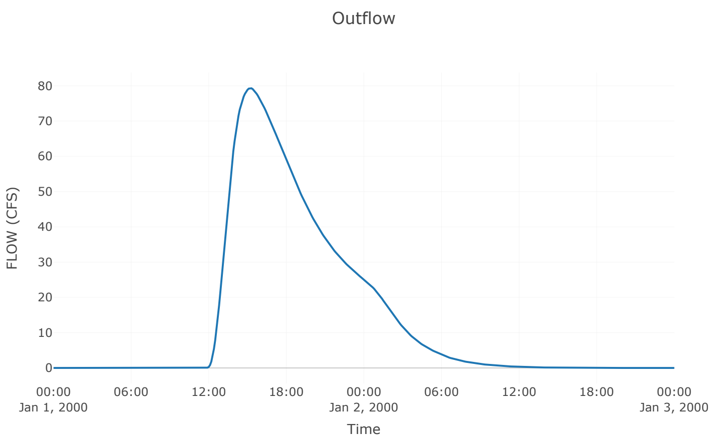


Junction: J3

Downstream : Daniels Pond to Shagbark

Results: J3

Peak Discharge (CFS)	79.34
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	0.62



Reach: Daniels Pond to Shagbark

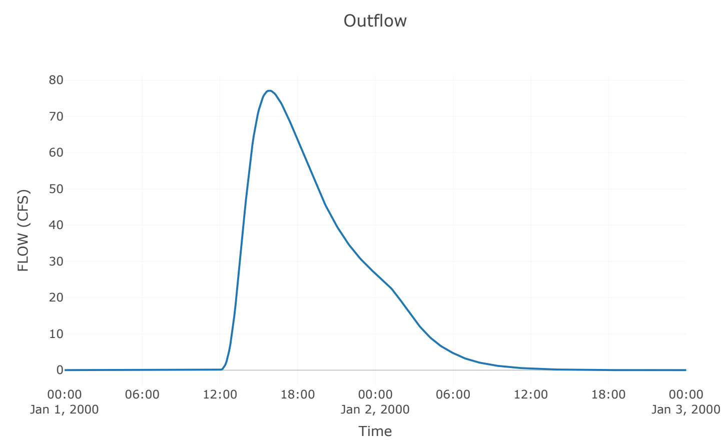
Downstream : J2

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.5
Muskingum x	0
Muskingum Steps	1

Results: Daniels Pond to Shagbark

Peak Discharge (CFS)	77.12
Time of Peak Discharge	01Jan2000, 15:48
Volume (IN)	0.62
Peak Inflow (CFS)	79.34
Inflow Volume (AC - FT)	54.69



Subbasin: Town Street

Area (MI2) : 0.23
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J2

Loss Rate: Scs

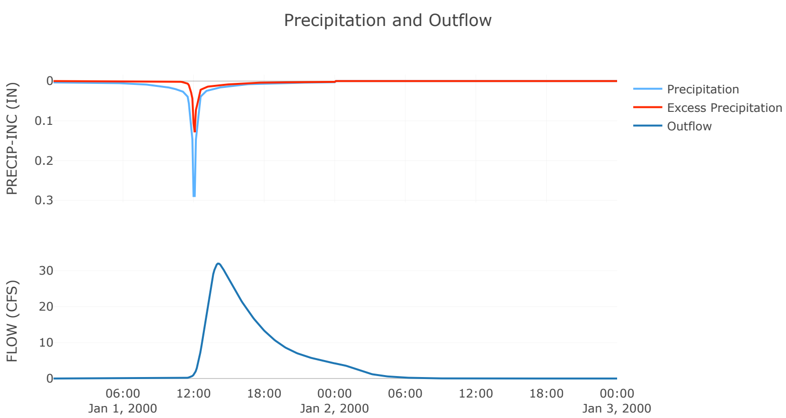
Percent Impervious Area	0
Curve Number	74.47

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.87
Snyder Cp	0.6

Results: Town Street

Peak Discharge (CFS)	32
Time of Peak Discharge	01Jan2000, 14:00
Volume (IN)	1.23
Precipitation Volume (AC - FT)	41.34
Loss Volume (AC - FT)	26.59
Excess Volume (AC - FT)	14.74
Direct Runoff Volume (AC - FT)	14.74
Baseflow Volume (AC - FT)	0

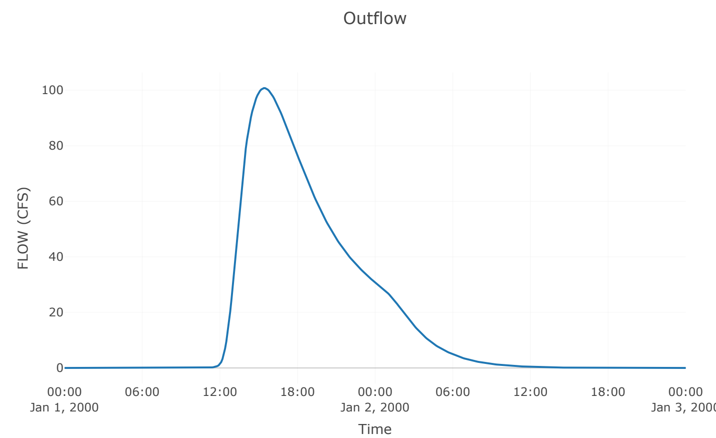


Junction: J2

Downstream : Shagbark to Town St

Results: J2

Peak Discharge (CFS)	100.76
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	0.69



Reach: Shagbark to Town St

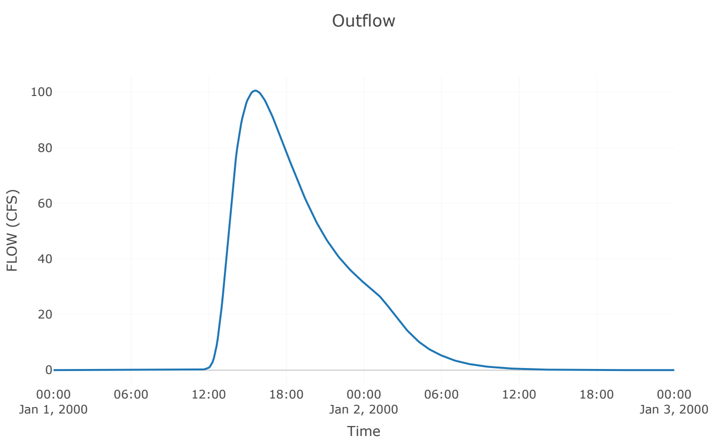
Downstream : J1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.16
Muskingum x	0
Muskingum Steps	1

Results: Shagbark to Town St

Peak Discharge (CFS)	100.54
Time of Peak Discharge	01Jan2000, 15:36
Volume (IN)	0.69
Peak Inflow (CFS)	100.76
Inflow Volume (AC - FT)	69.44



Subbasin: Mt Parnassus Road

Area (MI2) : 0.33
Latitude Degrees : 41.46
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

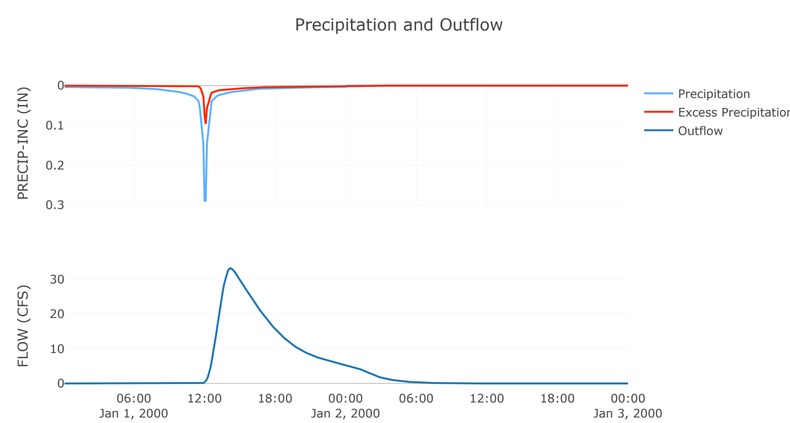
Percent Impervious Area	0
Curve Number	69.48

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.89
Snyder Cp	0.6

Results: Mt Parnassus Road

Peak Discharge (CFS)	33.18
Time of Peak Discharge	01Jan2000, 14:06
Volume (IN)	0.94
Precipitation Volume (AC - FT)	59.7
Loss Volume (AC - FT)	43.33
Excess Volume (AC - FT)	16.37
Direct Runoff Volume (AC - FT)	16.37
Baseflow Volume (AC - FT)	0



Subbasin: Shagbark

Area (MI2) : 0.08
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

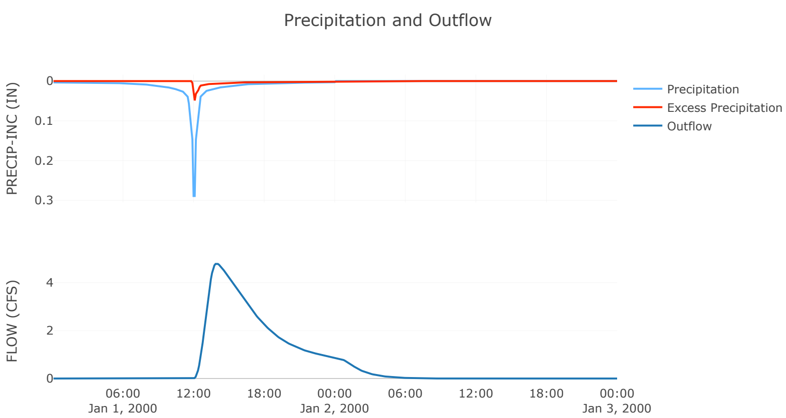
Percent Impervious Area	0
Curve Number	61.43

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Shagbark

Peak Discharge (CFS)	4.79
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	0.56
Precipitation Volume (AC - FT)	14.65
Loss Volume (AC - FT)	12.25
Excess Volume (AC - FT)	2.4
Direct Runoff Volume (AC - FT)	2.4
Baseflow Volume (AC - FT)	0

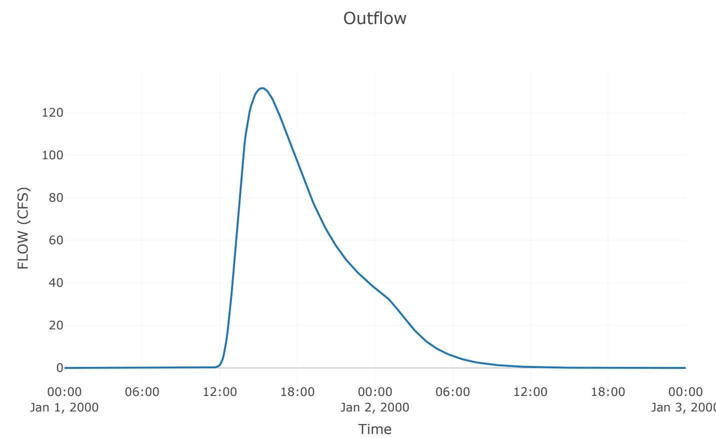


Junction: J1

Downstream : Town St to Boardman Rd

Results: J1

Peak Discharge (CFS)	131.61
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	0.72



Reach: Town St to Boardman Rd

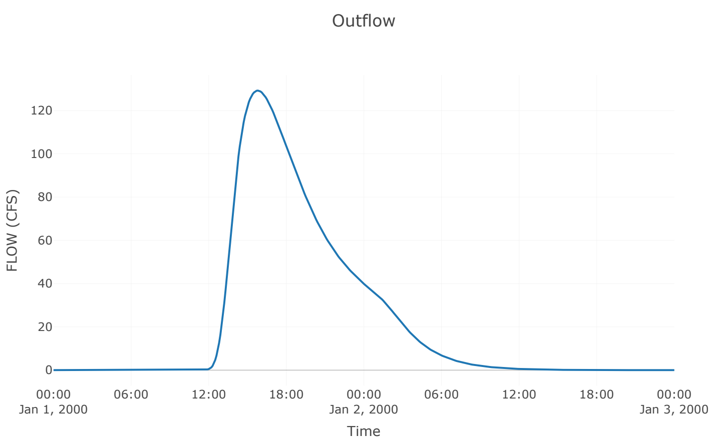
Downstream : J5

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.45
Muskingum x	0
Muskingum Steps	1

Results: Town St to Boardman Rd

Peak Discharge (CFS)	129.21
Time of Peak Discharge	01Jan2000, 15:48
Volume (IN)	0.72
Peak Inflow (CFS)	131.61
Inflow Volume (AC - FT)	88.21



Subbasin: North of Boardman Road

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

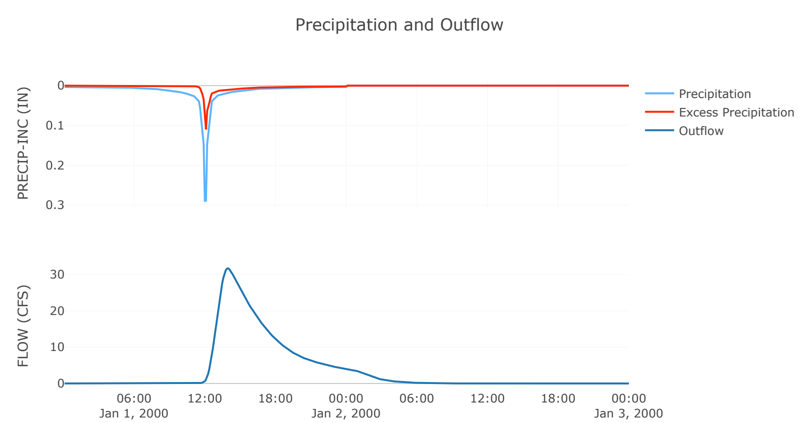
Percent Impervious Area	0
Curve Number	71.66

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.68
Snyder Cp	0.6

Results: North of Boardman Road

Peak Discharge (CFS)	31.69
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	1.06
Precipitation Volume (AC - FT)	45.33
Loss Volume (AC - FT)	31.33
Excess Volume (AC - FT)	14.01
Direct Runoff Volume (AC - FT)	14.01
Baseflow Volume (AC - FT)	0



Subbasin: Norwich Road and Boardman Ro

Area (MI2) : 0.21
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

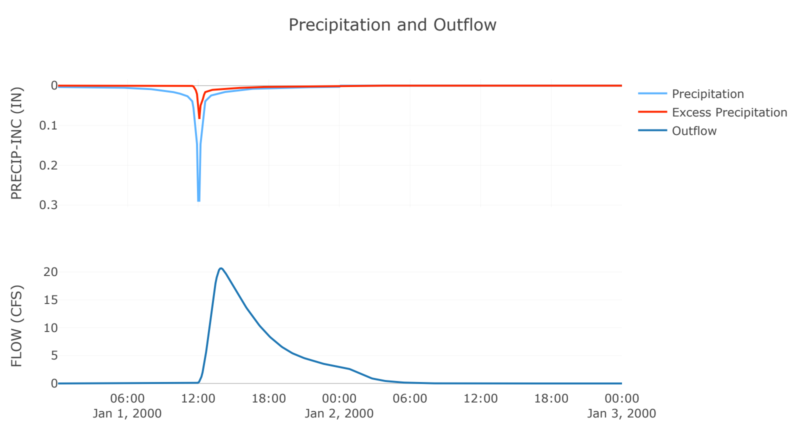
Percent Impervious Area	0
Curve Number	67.46

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.62
Snyder Cp	0.6

Results: Norwich Road and Boardman Ro

Peak Discharge (CFS)	20.65
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	0.84
Precipitation Volume (AC - FT)	39.01
Loss Volume (AC - FT)	29.49
Excess Volume (AC - FT)	9.52
Direct Runoff Volume (AC - FT)	9.52
Baseflow Volume (AC - FT)	0

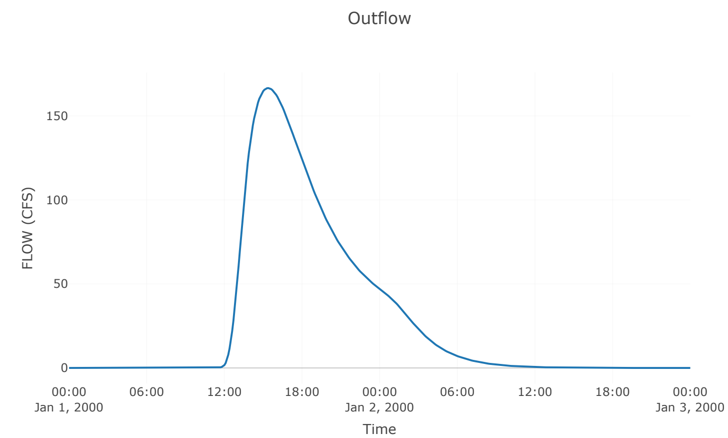


Junction: J5

Downstream : Boardman Rd to Trouble Pond

Results: J5

Peak Discharge (CFS)	166.56
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	0.76



Reach: Boardman Rd to Trouble Pond

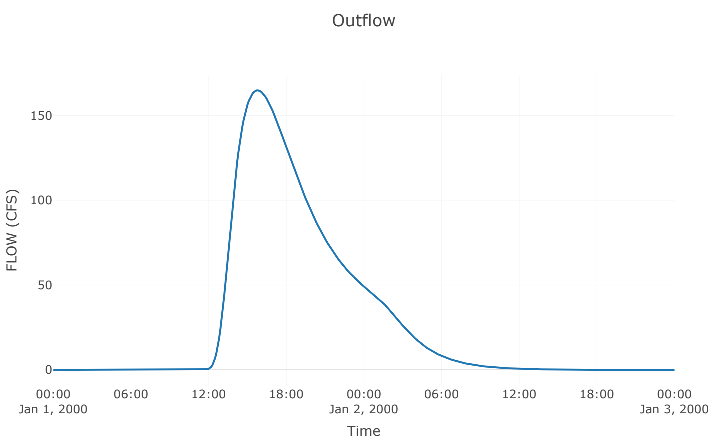
Downstream : J6

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.35
Muskingum x	0
Muskingum Steps	1

Results: Boardman Rd to Trouble Pond

Peak Discharge (CFS)	164.85
Time of Peak Discharge	01Jan2000, 15:48
Volume (IN)	0.76
Peak Inflow (CFS)	166.56
Inflow Volume (AC - FT)	111.73



Subbasin: Upstream of Trouble Pond

Area (MI2) : 0.5
Latitude Degrees : 41.46
Longitude Degrees : -72.45
Downstream : J6

Loss Rate: Scs

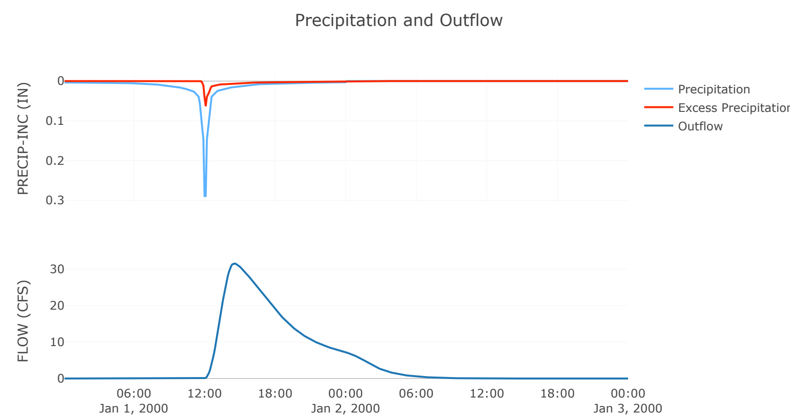
Percent Impervious Area	0
Curve Number	63.97

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.07
Snyder Cp	0.6

Results: Upstream of Trouble Pond

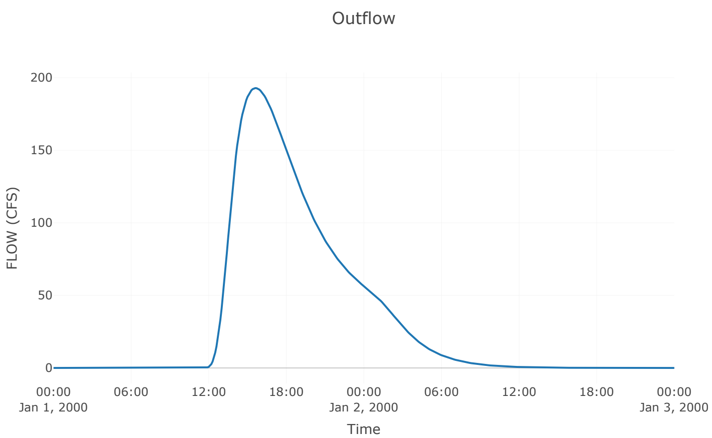
Peak Discharge (CFS)	31.48
Time of Peak Discharge	01Jan2000, 14:30
Volume (IN)	0.67
Precipitation Volume (AC - FT)	92.19
Loss Volume (AC - FT)	74.14
Excess Volume (AC - FT)	18.05
Direct Runoff Volume (AC - FT)	18.05
Baseflow Volume (AC - FT)	0



Junction: J6

Downstream : Trouble Pond to CT River

Results: J6	
Peak Discharge (CFS)	192.79
Time of Peak Discharge	01Jan2000, 15:36
Volume (IN)	0.75

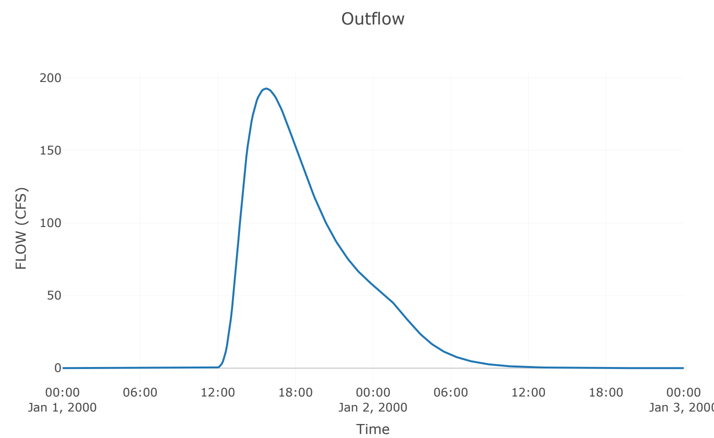


Reach: Trouble Pond to CT River

Downstream : Sink - 1

Route: Muskingum	
Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.1
Muskingum x	0
Muskingum Steps	1

Results: Trouble Pond to CT River	
Peak Discharge (CFS)	192.65
Time of Peak Discharge	01Jan2000, 15:42
Volume (IN)	0.75
Peak Inflow (CFS)	192.79
Inflow Volume (AC - FT)	129.78



Subbasin: Goodspeed Landing

Area (MI2) : 0.17
Latitude Degrees : 41.45
Longitude Degrees : -72.46
Downstream : Sink - 1

Loss Rate: Scs

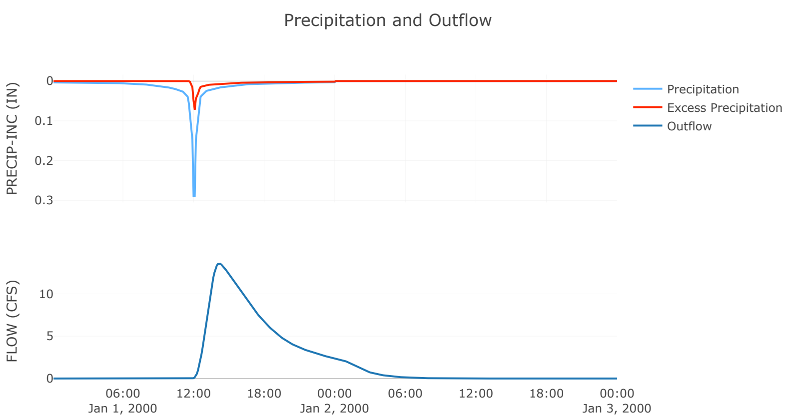
Percent Impervious Area	0
Curve Number	65.5

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.79
Snyder Cp	0.6

Results: Goodspeed Landing

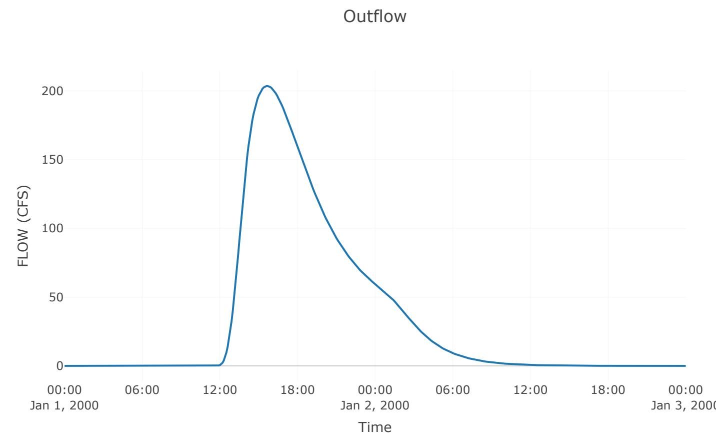
Peak Discharge (CFS)	13.59
Time of Peak Discharge	01Jan2000, 14:06
Volume (IN)	0.74
Precipitation Volume (AC - FT)	31.98
Loss Volume (AC - FT)	25.06
Excess Volume (AC - FT)	6.92
Direct Runoff Volume (AC - FT)	6.92
Baseflow Volume (AC - FT)	0



Sink: Sink-1

Results: Sink-1

Peak Discharge (CFS)	203.45
Time of Peak Discharge	01Jan2000, 15:42
Volume (IN)	0.75



Project: R E Hhydro S C S
Simulation Run: A14-5
Simulation Start: 31 December 1999, 24:00
Simulation End: 2 January 2000, 24:00

HMS Version: 4.12
Executed: 15 October 2024, 20:33

Global Parameter Summary - Subbasin

Location

Element Name	Longitude Degrees	Latitude Degrees
Daniels Pond North	-72.43	41.48
Daniels Pond Northwest	-72.44	41.48
Daniels Pond East	-72.43	41.47
Town Street	-72.44	41.47
Mt Parnassus Road	-72.44	41.46
Shagbark	-72.44	41.47
North of Boardman Road	-72.45	41.47
Norwich Road and Boardman Ro	-72.45	41.47
Upstream of Trouble Pond	-72.45	41.46
Goodspeed Landing	-72.46	41.45

Area (MI2)

Element Name	Area (MI2)
Daniels Pond North	0.99
Daniels Pond Northwest	0.42
Daniels Pond East	0.25
Town Street	0.23
Mt Parnassus Road	0.33
Shagbark	0.08
North of Boardman Road	0.25
Norwich Road and Boardman Ro	0.21
Upstream of Trouble Pond	0.5
Goodspeed Landing	0.17

Downstream

Element Name	Downstream
Daniels Pond North	J3
Daniels Pond Northwest	J3
Daniels Pond East	J3
Town Street	J2
Mt Parnassus Road	J1
Shagbark	J1
North of Boardman Road	J5
Norwich Road and Boardman Ro	J5
Upstream of Trouble Pond	J6
Goodspeed Landing	Sink - 1

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Daniels Pond North	0	61.25
Daniels Pond Northwest	0	66.7
Daniels Pond East	0	61.08
Town Street	0	74.47
Mt Parnassus Road	0	69.48
Shagbark	0	61.43
North of Boardman Road	0	71.66
Norwich Road and Boardman Ro	0	67.46
Upstream of Trouble Pond	0	63.97
Goodspeed Landing	0	65.5

Transform: Snyder

Element Name	Snyder Method	Snyder Tp	Snyder Cp
Daniels Pond North	Standard	3.01	0.6
Daniels Pond Northwest	Standard	2.24	0.6
Daniels Pond East	Standard	1.51	0.6
Town Street	Standard	1.87	0.6
Mt Parnassus Road	Standard	1.89	0.6
Shagbark	Standard	1.51	0.6
North of Boardman Road	Standard	1.68	0.6
Norwich Road and Boardman Ro	Standard	1.62	0.6
Upstream of Trouble Pond	Standard	2.07	0.6
Goodspeed Landing	Standard	1.79	0.6

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
Daniels Pond to Shagbark	J2
Shagbark to Town St	J1
Town St to Boardman Rd	J5
Boardman Rd to Trouble Pond	J6
Trouble Pond to CT River	Sink - 1

Route: Muskingum

Element Name	Method	Initial Variable	Muskingum K	Muskingum x	Muskingum Steps
Daniels Pond to Shagbark	Muskingum	Combined Inflow	0.5	0	1
Shagbark to Town St	Muskingum	Combined Inflow	0.16	0	1
Town St to Boardman Rd	Muskingum	Combined Inflow	0.45	0	1
Boardman Rd to Trouble Pond	Muskingum	Combined Inflow	0.35	0	1
Trouble Pond to CT River	Muskingum	Combined Inflow	0.1	0	1

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Daniels Pond North	0.99	78.97	01Jan2000, 15:24	1.04
Daniels Pond Northwest	0.42	57.57	01Jan2000, 14:30	1.38
Daniels Pond East	0.25	30.48	01Jan2000, 13:48	1.03
J3	1.66	155.38	01Jan2000, 15:00	1.13
Daniels Pond to Shagbark	1.66	150.46	01Jan2000, 15:36	1.13
Town Street	0.23	52.49	01Jan2000, 14:00	1.94
J2	1.89	189.48	01Jan2000, 15:18	1.23
Shagbark to Town St	1.89	188.96	01Jan2000, 15:24	1.23
Mt Parnassus Road	0.33	58.69	01Jan2000, 14:06	1.57
Shagbark	0.08	10.14	01Jan2000, 13:48	1.05
J1	2.29	243.84	01Jan2000, 15:06	1.27
Town St to Boardman Rd	2.29	238.77	01Jan2000, 15:36	1.27
North of Boardman Road	0.25	54.18	01Jan2000, 13:48	1.73
Norwich Road and Boardman Ro	0.21	38.04	01Jan2000, 13:48	1.44
J5	2.75	302.49	01Jan2000, 15:18	1.32
Boardman Rd to Trouble Pond	2.75	299.08	01Jan2000, 15:42	1.32
Upstream of Trouble Pond	0.5	61.74	01Jan2000, 14:18	1.21
J6	3.25	351.51	01Jan2000, 15:30	1.31
Trouble Pond to CT River	3.25	351.24	01Jan2000, 15:36	1.31
Goodspeed Landing	0.17	25.94	01Jan2000, 14:00	1.31
Sink - 1	3.43	370.94	01Jan2000, 15:30	1.31

Subbasin: Daniels Pond North

Area (MI2) : 0.99
Latitude Degrees : 41.48
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

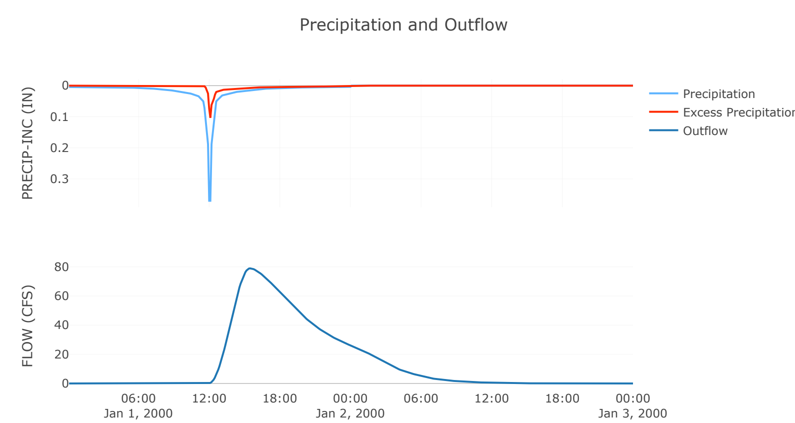
Percent Impervious Area	0
Curve Number	61.25

Transform: Snyder

Snyder Method	Standard
Snyder Tp	3.01
Snyder Cp	0.6

Results: Daniels Pond North

Peak Discharge (CFS)	78.97
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	1.04
Precipitation Volume (AC - FT)	233.53
Loss Volume (AC - FT)	178.25
Excess Volume (AC - FT)	55.28
Direct Runoff Volume (AC - FT)	55.28
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond Northwest

Area (MI2) : 0.42
Latitude Degrees : 41.48
Longitude Degrees : -72.44
Downstream : J3

Loss Rate: Scs

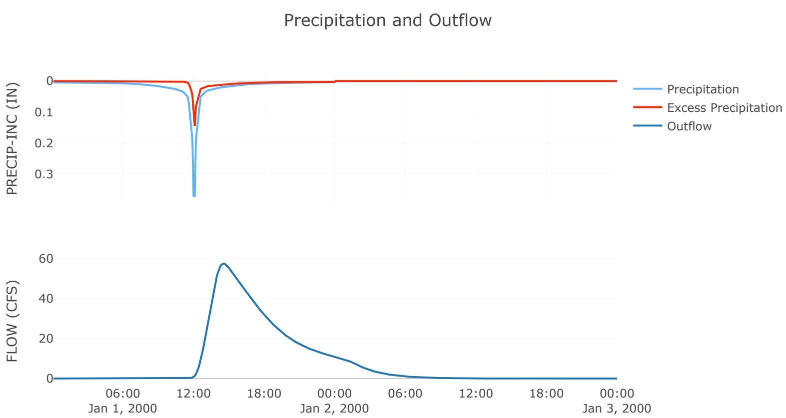
Percent Impervious Area	0
Curve Number	66.7

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.24
Snyder Cp	0.6

Results: Daniels Pond Northwest

Peak Discharge (CFS)	57.57
Time of Peak Discharge	01Jan2000, 14:30
Volume (IN)	1.38
Precipitation Volume (AC - FT)	99.19
Loss Volume (AC - FT)	68.05
Excess Volume (AC - FT)	31.14
Direct Runoff Volume (AC - FT)	31.14
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond East

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

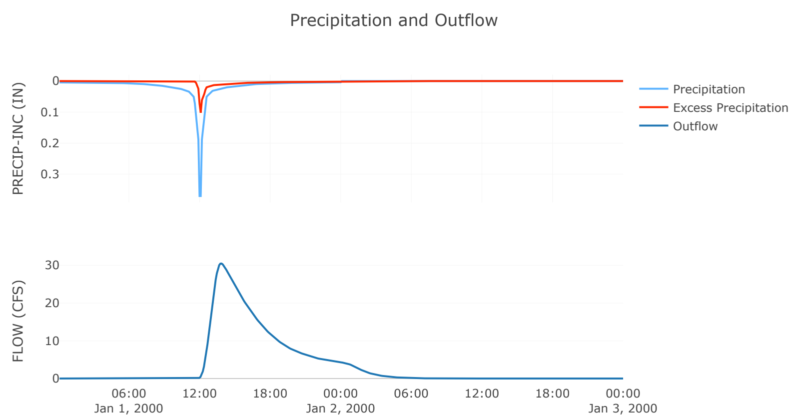
Percent Impervious Area	0
Curve Number	61.08

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Daniels Pond East

Peak Discharge (CFS)	30.48
Time of Peak Discharge	01Jan2000, 13:48
Volume (IN)	1.03
Precipitation Volume (AC - FT)	57.91
Loss Volume (AC - FT)	44.33
Excess Volume (AC - FT)	13.58
Direct Runoff Volume (AC - FT)	13.58
Baseflow Volume (AC - FT)	0

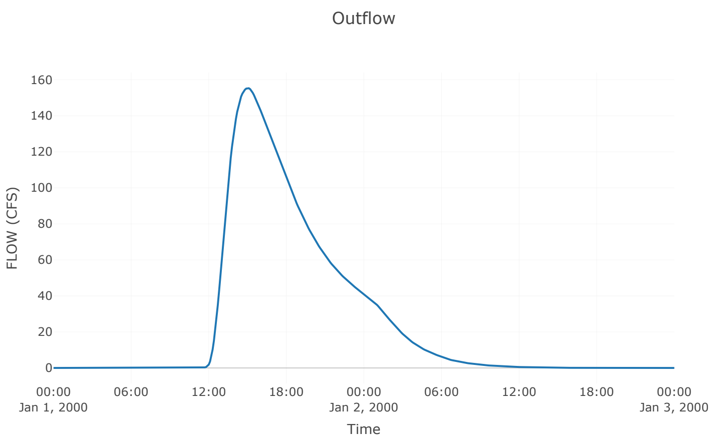


Junction: J3

Downstream : Daniels Pond to Shagbark

Results: J3

Peak Discharge (CFS)	155.38
Time of Peak Discharge	01Jan2000, 15:00
Volume (IN)	1.13



Reach: Daniels Pond to Shagbark

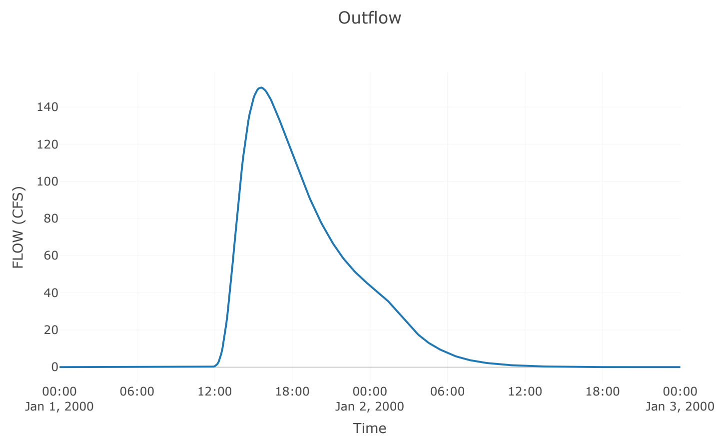
Downstream : J2

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.5
Muskingum x	0
Muskingum Steps	1

Results: Daniels Pond to Shagbark

Peak Discharge (CFS)	150.46
Time of Peak Discharge	01Jan2000, 15:36
Volume (IN)	1.13
Peak Inflow (CFS)	155.38
Inflow Volume (AC - FT)	100



Subbasin: Town Street

Area (MI2) : 0.23
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J2

Loss Rate: Scs

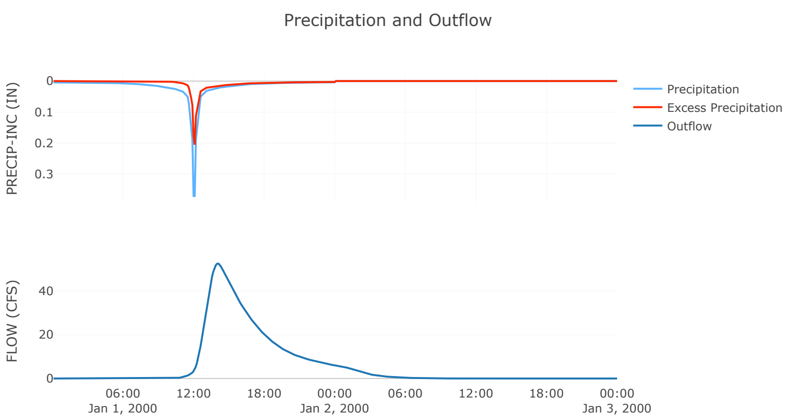
Percent Impervious Area	0
Curve Number	74.47

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.87
Snyder Cp	0.6

Results: Town Street

Peak Discharge (CFS)	52.49
Time of Peak Discharge	01Jan2000, 14:00
Volume (IN)	1.94
Precipitation Volume (AC - FT)	52.99
Loss Volume (AC - FT)	29.69
Excess Volume (AC - FT)	23.3
Direct Runoff Volume (AC - FT)	23.3
Baseflow Volume (AC - FT)	0

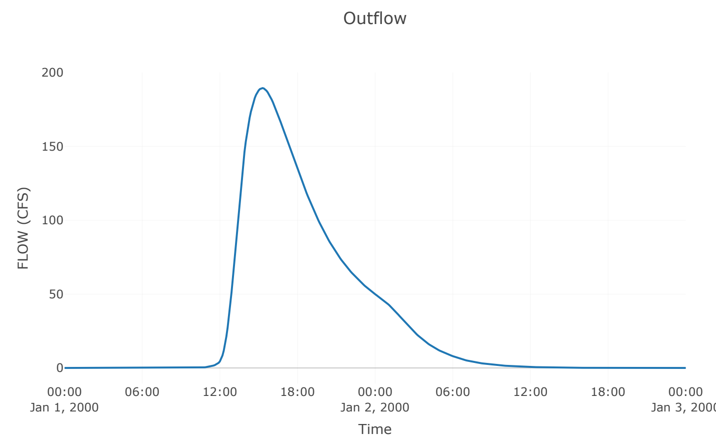


Junction: J2

Downstream : Shagbark to Town St

Results: J2

Peak Discharge (CFS)	189.48
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	1.23



Reach: Shagbark to Town St

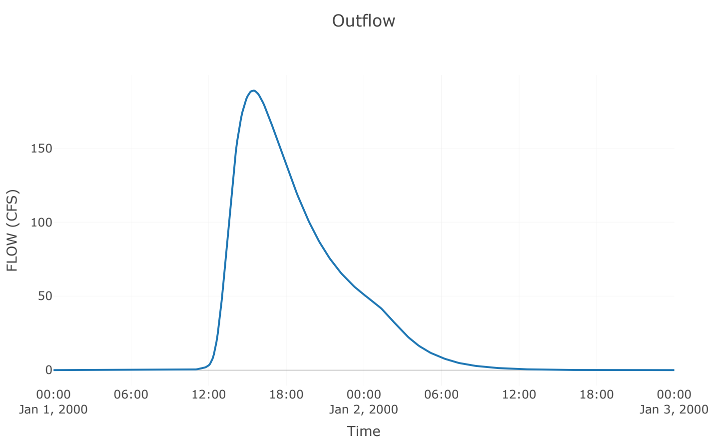
Downstream : J1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.16
Muskingum x	0
Muskingum Steps	1

Results: Shagbark to Town St

Peak Discharge (CFS)	188.96
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	1.23
Peak Inflow (CFS)	189.48
Inflow Volume (AC - FT)	123.3



Subbasin: Mt Parnassus Road

Area (MI2) : 0.33
Latitude Degrees : 41.46
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

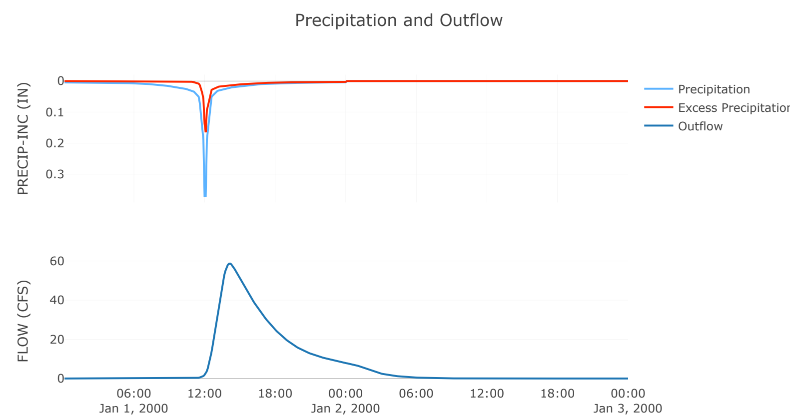
Percent Impervious Area	0
Curve Number	69.48

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.89
Snyder Cp	0.6

Results: Mt Parnassus Road

Peak Discharge (CFS)	58.69
Time of Peak Discharge	01Jan2000, 14:06
Volume (IN)	1.57
Precipitation Volume (AC - FT)	76.53
Loss Volume (AC - FT)	49.22
Excess Volume (AC - FT)	27.31
Direct Runoff Volume (AC - FT)	27.31
Baseflow Volume (AC - FT)	0



Subbasin: Shagbark

Area (MI2) : 0.08
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

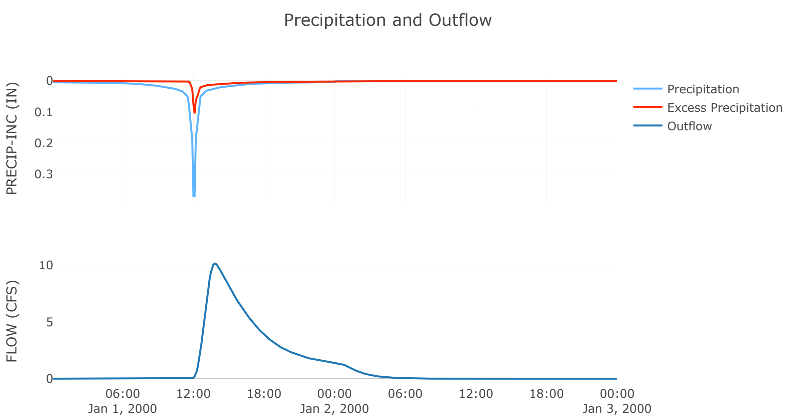
Percent Impervious Area	0
Curve Number	61.43

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Shagbark

Peak Discharge (CFS)	10.14
Time of Peak Discharge	01Jan2000, 13:48
Volume (IN)	1.05
Precipitation Volume (AC - FT)	18.78
Loss Volume (AC - FT)	14.29
Excess Volume (AC - FT)	4.49
Direct Runoff Volume (AC - FT)	4.49
Baseflow Volume (AC - FT)	0

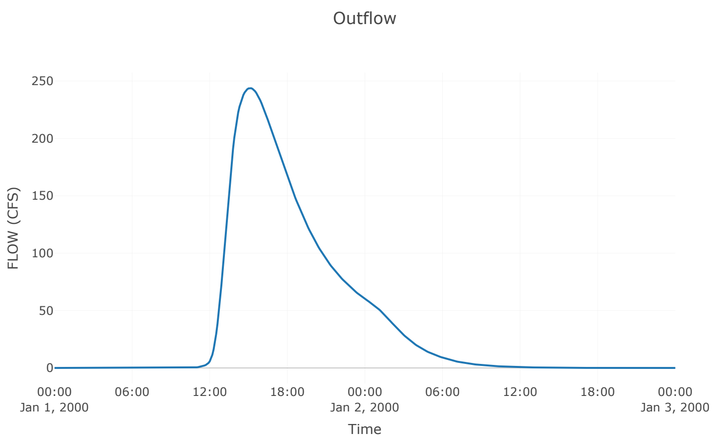


Junction: J1

Downstream : Town St to Boardman Rd

Results: J1

Peak Discharge (CFS)	243.84
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	1.27



Reach: Town St to Boardman Rd

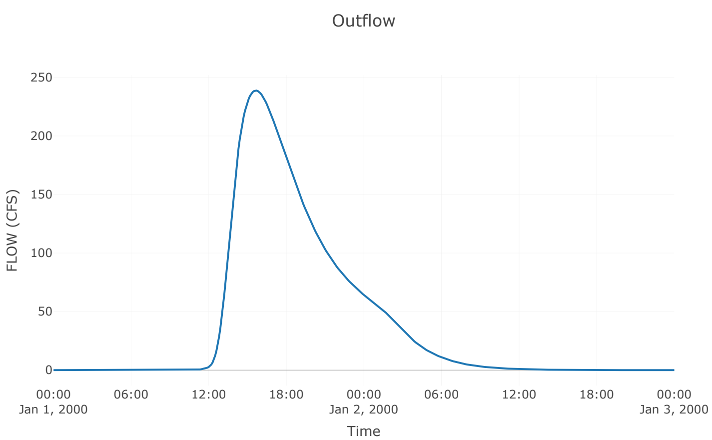
Downstream : J5

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.45
Muskingum x	0
Muskingum Steps	1

Results: Town St to Boardman Rd

Peak Discharge (CFS)	238.77
Time of Peak Discharge	01Jan2000, 15:36
Volume (IN)	1.27
Peak Inflow (CFS)	243.84
Inflow Volume (AC - FT)	155.1



Subbasin: North of Boardman Road

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

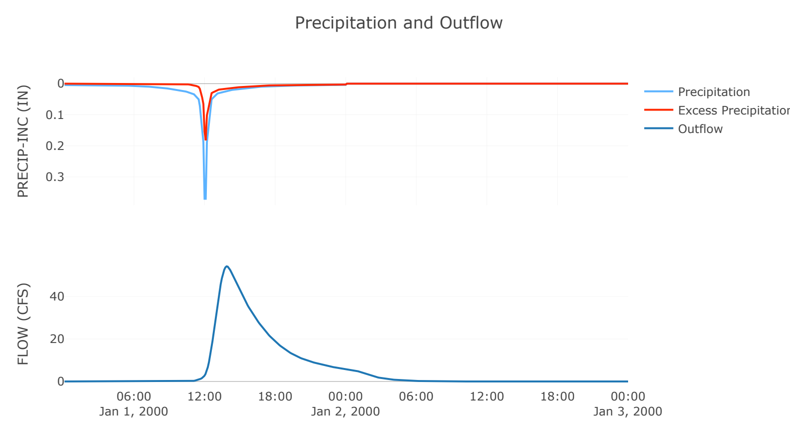
Percent Impervious Area	0
Curve Number	71.66

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.68
Snyder Cp	0.6

Results: North of Boardman Road

Peak Discharge (CFS)	54.18
Time of Peak Discharge	01Jan2000, 13:48
Volume (IN)	1.73
Precipitation Volume (AC - FT)	58.12
Loss Volume (AC - FT)	35.33
Excess Volume (AC - FT)	22.79
Direct Runoff Volume (AC - FT)	22.79
Baseflow Volume (AC - FT)	0



Subbasin: Norwich Road and Boardman Ro

Area (MI2) : 0.21
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

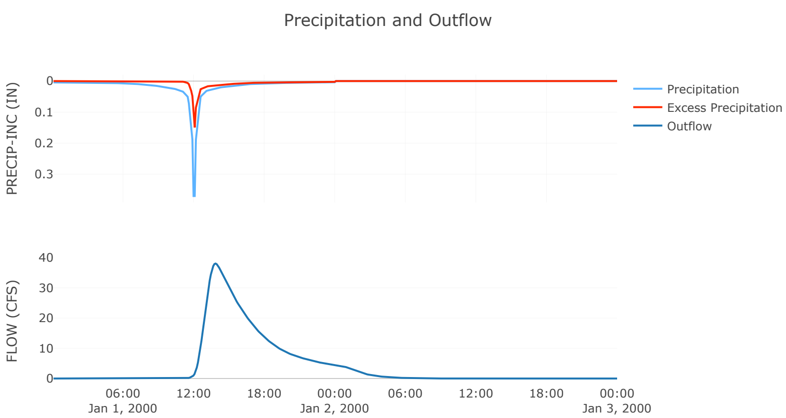
Percent Impervious Area	0
Curve Number	67.46

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.62
Snyder Cp	0.6

Results: Norwich Road and Boardman Ro

Peak Discharge (CFS)	38.04
Time of Peak Discharge	01Jan2000, 13:48
Volume (IN)	1.44
Precipitation Volume (AC - FT)	50
Loss Volume (AC - FT)	33.73
Excess Volume (AC - FT)	16.28
Direct Runoff Volume (AC - FT)	16.28
Baseflow Volume (AC - FT)	0

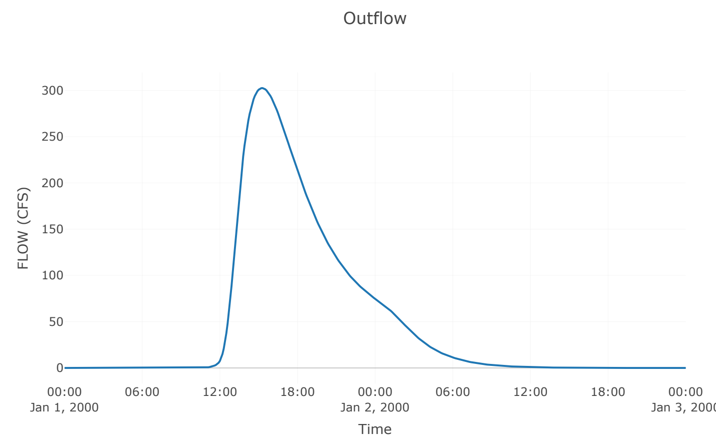


Junction: J5

Downstream : Boardman Rd to Trouble Pond

Results: J5

Peak Discharge (CFS)	302.49
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	1.32



Reach: Boardman Rd to Trouble Pond

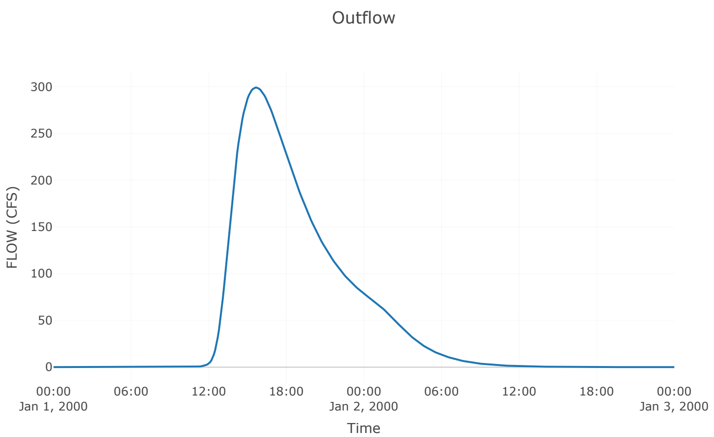
Downstream : J6

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.35
Muskingum x	0
Muskingum Steps	1

Results: Boardman Rd to Trouble Pond

Peak Discharge (CFS)	299.08
Time of Peak Discharge	01Jan2000, 15:42
Volume (IN)	1.32
Peak Inflow (CFS)	302.49
Inflow Volume (AC - FT)	194.17



Subbasin: Upstream of Trouble Pond

Area (MI2) : 0.5
Latitude Degrees : 41.46
Longitude Degrees : -72.45
Downstream : J6

Loss Rate: Scs

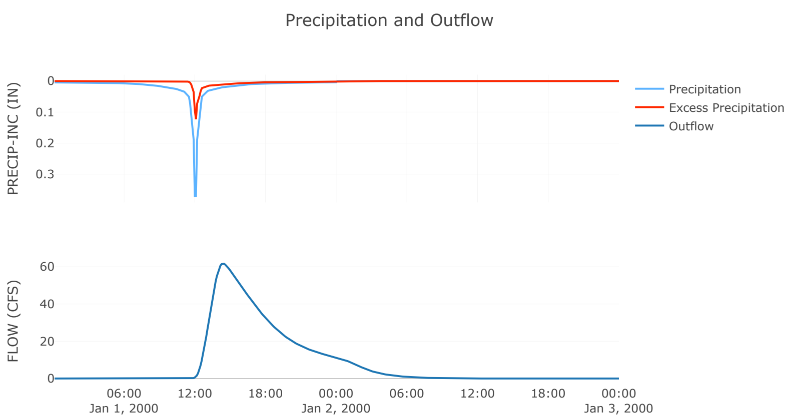
Percent Impervious Area	0
Curve Number	63.97

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.07
Snyder Cp	0.6

Results: Upstream of Trouble Pond

Peak Discharge (CFS)	61.74
Time of Peak Discharge	01Jan2000, 14:18
Volume (IN)	1.21
Precipitation Volume (AC - FT)	118.19
Loss Volume (AC - FT)	85.78
Excess Volume (AC - FT)	32.4
Direct Runoff Volume (AC - FT)	32.4
Baseflow Volume (AC - FT)	0

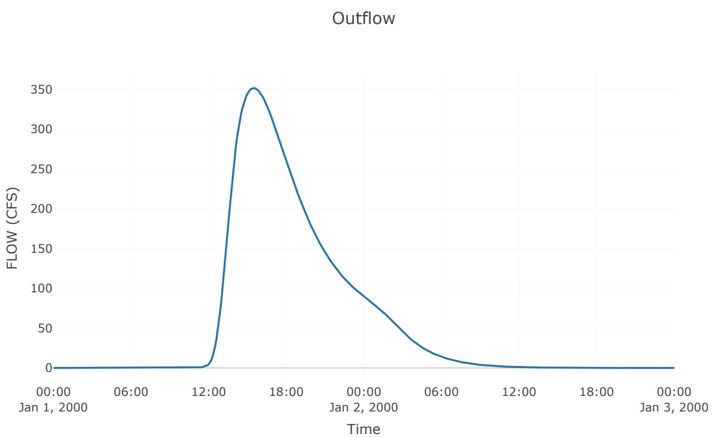


Junction: J6

Downstream : Trouble Pond to CT River

Results: J6

Peak Discharge (CFS)	351.51
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	1.31



Reach: Trouble Pond to CT River

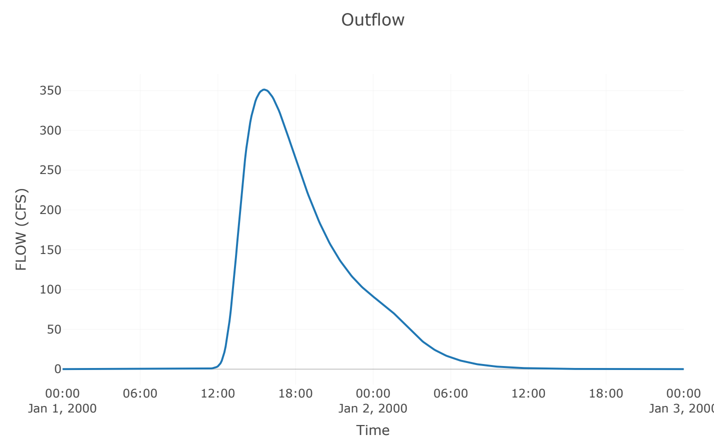
Downstream : Sink - 1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.1
Muskingum x	0
Muskingum Steps	1

Results: Trouble Pond to CT River

Peak Discharge (CFS)	351.24
Time of Peak Discharge	01Jan2000, 15:36
Volume (IN)	1.31
Peak Inflow (CFS)	351.51
Inflow Volume (AC - FT)	226.58



Subbasin: Goodspeed Landing

Area (MI2) : 0.17
Latitude Degrees : 41.45
Longitude Degrees : -72.46
Downstream : Sink - 1

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	65.5

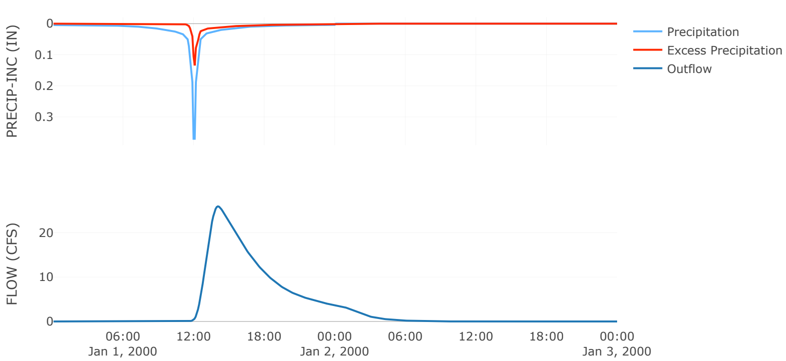
Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.79
Snyder Cp	0.6

Results: Goodspeed Landing

Peak Discharge (CFS)	25.94
Time of Peak Discharge	01Jan2000, 14:00
Volume (IN)	1.31
Precipitation Volume (AC - FT)	41
Loss Volume (AC - FT)	28.85
Excess Volume (AC - FT)	12.15
Direct Runoff Volume (AC - FT)	12.15
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

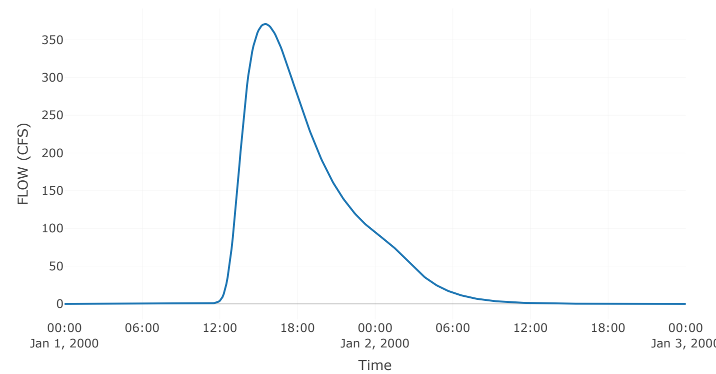


Sink: Sink-1

Results: Sink-1

Peak Discharge (CFS)	370.94
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	1.31

Outflow



Project: R E Hhydro S C S
Simulation Run: A14-10
Simulation Start: 31 December 1999, 24:00
Simulation End: 2 January 2000, 24:00

HMS Version: 4.12
Executed: 15 October 2024, 20:32

Global Parameter Summary - Subbasin

Location

Element Name	Longitude Degrees	Latitude Degrees
Daniels Pond North	-72.43	41.48
Daniels Pond Northwest	-72.44	41.48
Daniels Pond East	-72.43	41.47
Town Street	-72.44	41.47
Mt Parnassus Road	-72.44	41.46
Shagbark	-72.44	41.47
North of Boardman Road	-72.45	41.47
Norwich Road and Boardman Ro	-72.45	41.47
Upstream of Trouble Pond	-72.45	41.46
Goodspeed Landing	-72.46	41.45

Area (MI2)

Element Name	Area (MI2)
Daniels Pond North	0.99
Daniels Pond Northwest	0.42
Daniels Pond East	0.25
Town Street	0.23
Mt Parnassus Road	0.33
Shagbark	0.08
North of Boardman Road	0.25
Norwich Road and Boardman Ro	0.21
Upstream of Trouble Pond	0.5
Goodspeed Landing	0.17

Downstream

Element Name	Downstream
Daniels Pond North	J3
Daniels Pond Northwest	J3
Daniels Pond East	J3
Town Street	J2
Mt Parnassus Road	J1
Shagbark	J1
North of Boardman Road	J5
Norwich Road and Boardman Ro	J5
Upstream of Trouble Pond	J6
Goodspeed Landing	Sink - 1

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Daniels Pond North	0	61.25
Daniels Pond Northwest	0	66.7
Daniels Pond East	0	61.08
Town Street	0	74.47
Mt Parnassus Road	0	69.48
Shagbark	0	61.43
North of Boardman Road	0	71.66
Norwich Road and Boardman Ro	0	67.46
Upstream of Trouble Pond	0	63.97
Goodspeed Landing	0	65.5

Transform: Snyder

Element Name	Snyder Method	Snyder Tp	Snyder Cp
Daniels Pond North	Standard	3.01	0.6
Daniels Pond Northwest	Standard	2.24	0.6
Daniels Pond East	Standard	1.51	0.6
Town Street	Standard	1.87	0.6
Mt Parnassus Road	Standard	1.89	0.6
Shagbark	Standard	1.51	0.6
North of Boardman Road	Standard	1.68	0.6
Norwich Road and Boardman Ro	Standard	1.62	0.6
Upstream of Trouble Pond	Standard	2.07	0.6
Goodspeed Landing	Standard	1.79	0.6

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
Daniels Pond to Shagbark	J2
Shagbark to Town St	J1
Town St to Boardman Rd	J5
Boardman Rd to Trouble Pond	J6
Trouble Pond to CT River	Sink - 1

Route: Muskingum

Element Name	Method	Initial Variable	Muskingum K	Muskingum x	Muskingum Steps
Daniels Pond to Shagbark	Muskingum	Combined Inflow	0.5	0	1
Shagbark to Town St	Muskingum	Combined Inflow	0.16	0	1
Town St to Boardman Rd	Muskingum	Combined Inflow	0.45	0	1
Boardman Rd to Trouble Pond	Muskingum	Combined Inflow	0.35	0	1
Trouble Pond to CT River	Muskingum	Combined Inflow	0.1	0	1

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Daniels Pond North	0.99	119.88	01Jan2000, 15:18	1.52
Daniels Pond Northwest	0.42	83.06	01Jan2000, 14:24	1.93
Daniels Pond East	0.25	47.19	01Jan2000, 13:42	1.51
J3	1.66	231.2	01Jan2000, 14:54	1.62
Daniels Pond to Shagbark	1.66	223.61	01Jan2000, 15:30	1.62
Town Street	0.23	70.99	01Jan2000, 14:00	2.58
J2	1.89	276.55	01Jan2000, 15:12	1.74
Shagbark to Town St	1.89	275.77	01Jan2000, 15:24	1.74
Mt Parnassus Road	0.33	82.65	01Jan2000, 14:00	2.16
Shagbark	0.08	15.64	01Jan2000, 13:42	1.53
J1	2.29	353.08	01Jan2000, 15:00	1.79
Town St to Boardman Rd	2.29	345.44	01Jan2000, 15:36	1.79
North of Boardman Road	0.25	74.96	01Jan2000, 13:48	2.34
Norwich Road and Boardman Ro	0.21	54.58	01Jan2000, 13:48	1.99
J5	2.75	433.65	01Jan2000, 15:12	1.86
Boardman Rd to Trouble Pond	2.75	428.55	01Jan2000, 15:36	1.86
Upstream of Trouble Pond	0.5	91.66	01Jan2000, 14:18	1.72
J6	3.25	504.83	01Jan2000, 15:24	1.84
Trouble Pond to CT River	3.25	504.41	01Jan2000, 15:30	1.84
Goodspeed Landing	0.17	37.95	01Jan2000, 14:00	1.84
Sink - 1	3.43	532.63	01Jan2000, 15:24	1.84

Subbasin: Daniels Pond North

Area (MI2) : 0.99
Latitude Degrees : 41.48
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

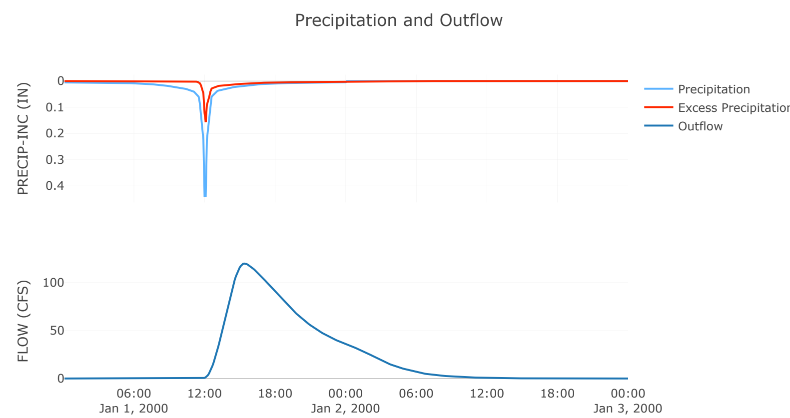
Percent Impervious Area	0
Curve Number	61.25

Transform: Snyder

Snyder Method	Standard
Snyder Tp	3.01
Snyder Cp	0.6

Results: Daniels Pond North

Peak Discharge (CFS)	119.88
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	1.52
Precipitation Volume (AC - FT)	276.42
Loss Volume (AC - FT)	195.89
Excess Volume (AC - FT)	80.54
Direct Runoff Volume (AC - FT)	80.54
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond Northwest

Area (MI2) : 0.42
Latitude Degrees : 41.48
Longitude Degrees : -72.44
Downstream : J3

Loss Rate: Scs

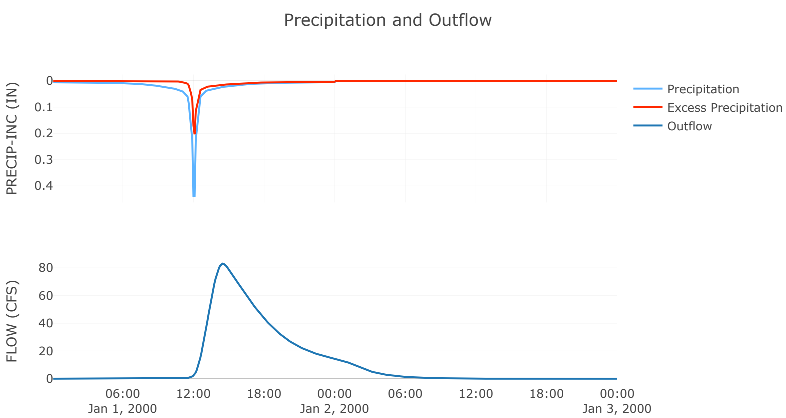
Percent Impervious Area	0
Curve Number	66.7

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.24
Snyder Cp	0.6

Results: Daniels Pond Northwest

Peak Discharge (CFS)	83.06
Time of Peak Discharge	01Jan2000, 14:24
Volume (IN)	1.93
Precipitation Volume (AC - FT)	117.41
Loss Volume (AC - FT)	73.91
Excess Volume (AC - FT)	43.5
Direct Runoff Volume (AC - FT)	43.5
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond East

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

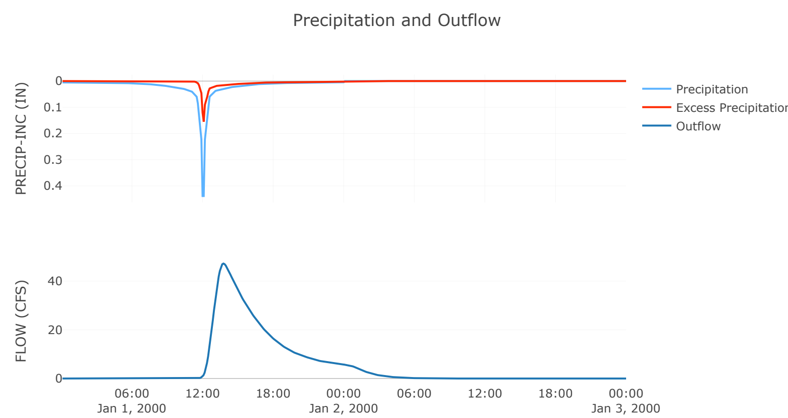
Percent Impervious Area	0
Curve Number	61.08

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Daniels Pond East

Peak Discharge (CFS)	47.19
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	1.51
Precipitation Volume (AC - FT)	68.54
Loss Volume (AC - FT)	48.73
Excess Volume (AC - FT)	19.81
Direct Runoff Volume (AC - FT)	19.81
Baseflow Volume (AC - FT)	0

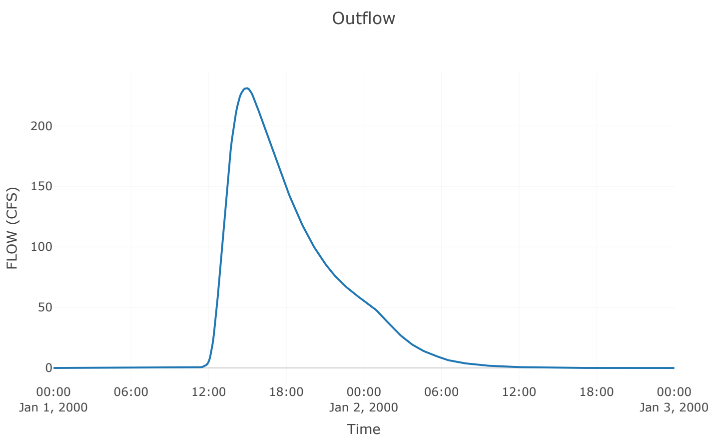


Junction: J3

Downstream : Daniels Pond to Shagbark

Results: J3

Peak Discharge (CFS)	231.2
Time of Peak Discharge	01Jan2000, 14:54
Volume (IN)	1.62



Reach: Daniels Pond to Shagbark

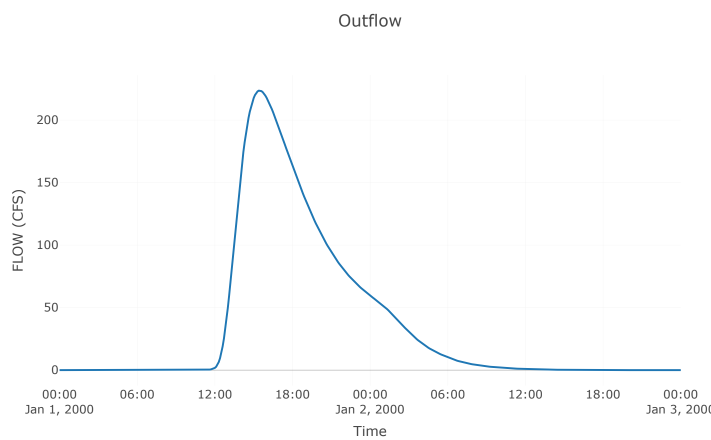
Downstream : J2

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.5
Muskingum x	0
Muskingum Steps	1

Results: Daniels Pond to Shagbark

Peak Discharge (CFS)	223.61
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	1.62
Peak Inflow (CFS)	231.2
Inflow Volume (AC - FT)	143.85



Subbasin: Town Street

Area (MI2) : 0.23
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J2

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	74.47

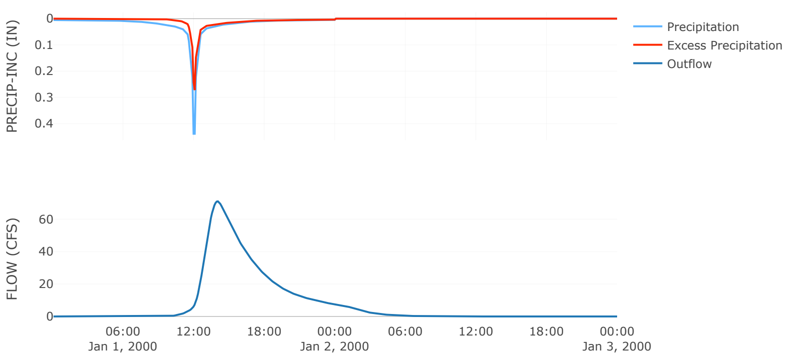
Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.87
Snyder Cp	0.6

Results: Town Street

Peak Discharge (CFS)	70.99
Time of Peak Discharge	01Jan2000, 14:00
Volume (IN)	2.58
Precipitation Volume (AC - FT)	62.72
Loss Volume (AC - FT)	31.7
Excess Volume (AC - FT)	31.02
Direct Runoff Volume (AC - FT)	31.02
Baseflow Volume (AC - FT)	0

Precipitation and Outflow



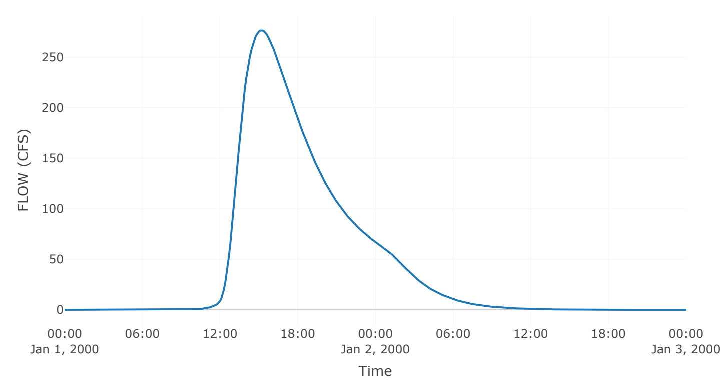
Junction: J2

Downstream : Shagbark to Town St

Results: J2

Peak Discharge (CFS)	276.55
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	1.74

Outflow

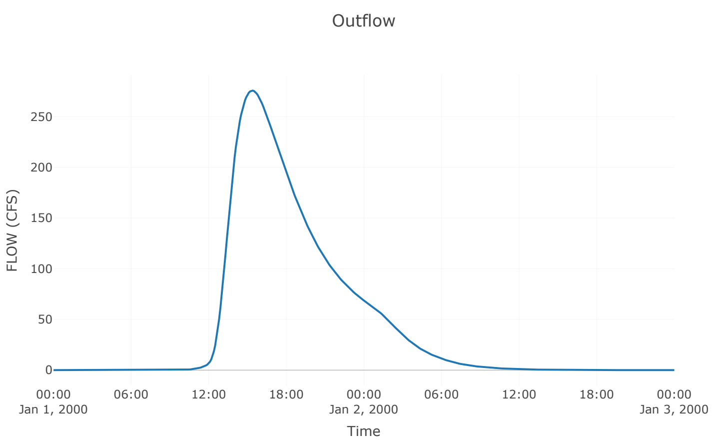


Reach: Shagbark to Town St

Downstream : J1

Route: Muskingum	
Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.16
Muskingum x	0
Muskingum Steps	1

Results: Shagbark to Town St	
Peak Discharge (CFS)	275.77
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	1.74
Peak Inflow (CFS)	276.55
Inflow Volume (AC - FT)	174.87



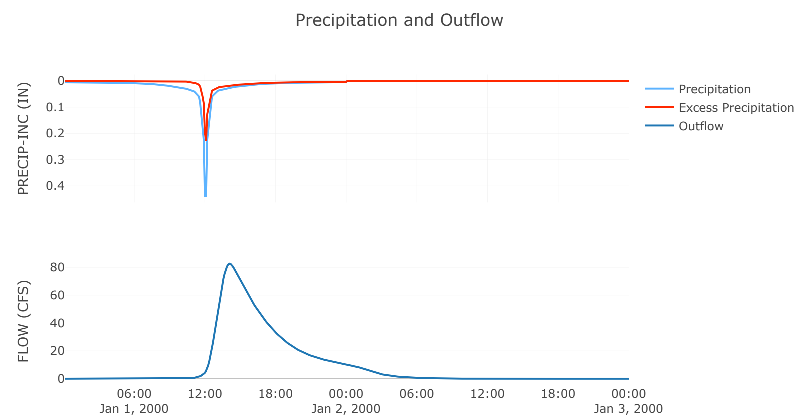
Subbasin: Mt Parnassus Road

Area (MI2) : 0.33
Latitude Degrees : 41.46
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs	
Percent Impervious Area	0
Curve Number	69.48

Transform: Snyder	
Snyder Method	Standard
Snyder Tp	1.89
Snyder Cp	0.6

Results: Mt Parnassus Road	
Peak Discharge (CFS)	82.65
Time of Peak Discharge	01Jan2000, 14:00
Volume (IN)	2.16
Precipitation Volume (AC - FT)	90.59
Loss Volume (AC - FT)	53.14
Excess Volume (AC - FT)	37.45
Direct Runoff Volume (AC - FT)	37.45
Baseflow Volume (AC - FT)	0



Subbasin: Shagbark

Area (MI2) : 0.08
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

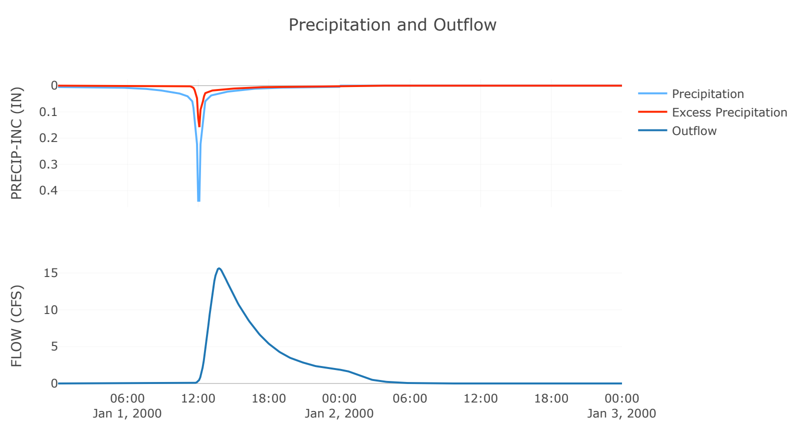
Percent Impervious Area	0
Curve Number	61.43

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Shagbark

Peak Discharge (CFS)	15.64
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	1.53
Precipitation Volume (AC - FT)	22.23
Loss Volume (AC - FT)	15.7
Excess Volume (AC - FT)	6.53
Direct Runoff Volume (AC - FT)	6.53
Baseflow Volume (AC - FT)	0

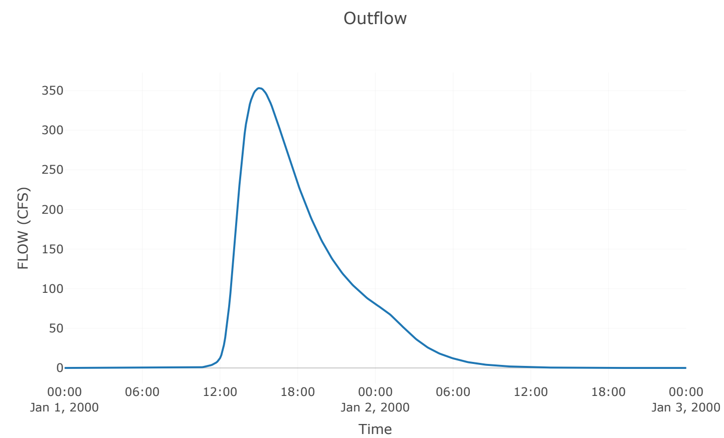


Junction: J1

Downstream : Town St to Boardman Rd

Results: J1

Peak Discharge (CFS)	353.08
Time of Peak Discharge	01Jan2000, 15:00
Volume (IN)	1.79



Reach: Town St to Boardman Rd

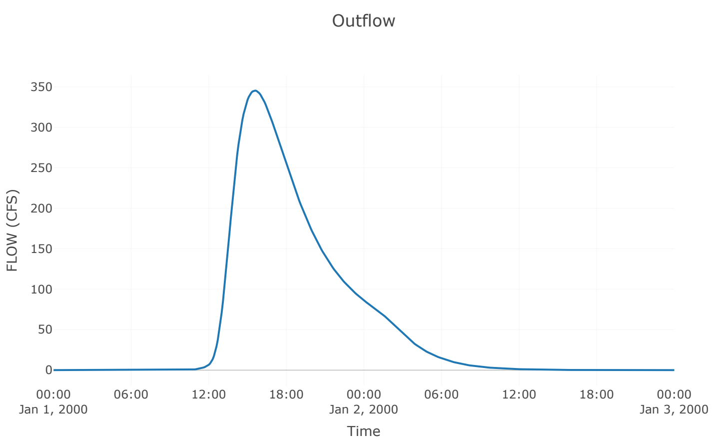
Downstream : J5

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.45
Muskingum x	0
Muskingum Steps	1

Results: Town St to Boardman Rd

Peak Discharge (CFS)	345.44
Time of Peak Discharge	01Jan2000, 15:36
Volume (IN)	1.79
Peak Inflow (CFS)	353.08
Inflow Volume (AC - FT)	218.85



Subbasin: North of Boardman Road

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

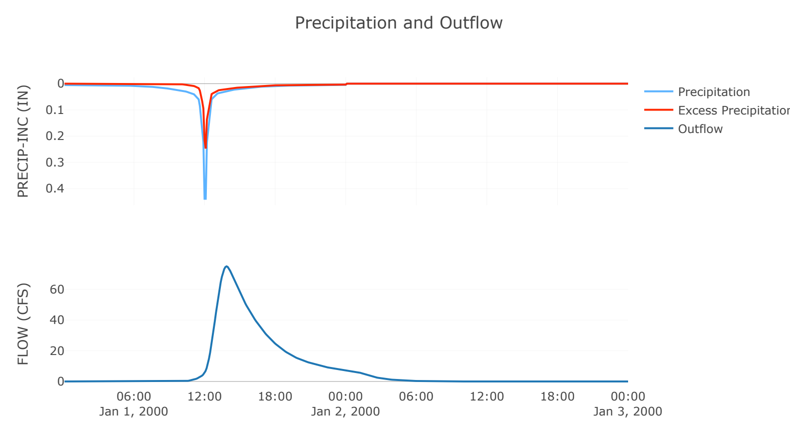
Percent Impervious Area	0
Curve Number	71.66

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.68
Snyder Cp	0.6

Results: North of Boardman Road

Peak Discharge (CFS)	74.96
Time of Peak Discharge	01Jan2000, 13:48
Volume (IN)	2.34
Precipitation Volume (AC - FT)	68.79
Loss Volume (AC - FT)	37.95
Excess Volume (AC - FT)	30.84
Direct Runoff Volume (AC - FT)	30.84
Baseflow Volume (AC - FT)	0



Subbasin: Norwich Road and Boardman Ro

Area (MI2) : 0.21
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

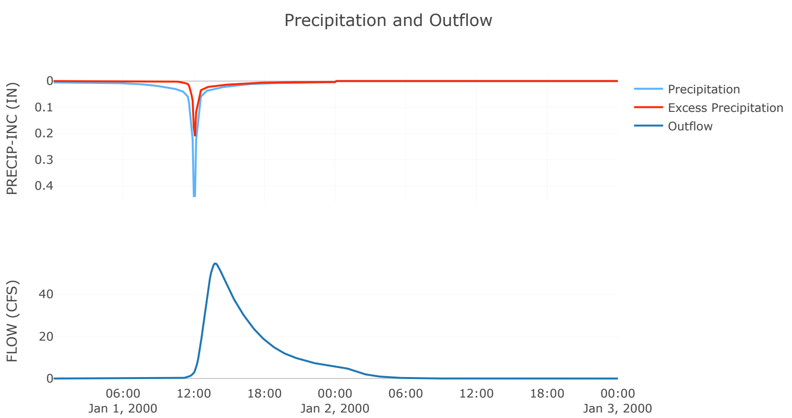
Percent Impervious Area	0
Curve Number	67.46

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.62
Snyder Cp	0.6

Results: Norwich Road and Boardman Ro

Peak Discharge (CFS)	54.58
Time of Peak Discharge	01Jan2000, 13:48
Volume (IN)	1.99
Precipitation Volume (AC - FT)	59.19
Loss Volume (AC - FT)	36.57
Excess Volume (AC - FT)	22.61
Direct Runoff Volume (AC - FT)	22.61
Baseflow Volume (AC - FT)	0

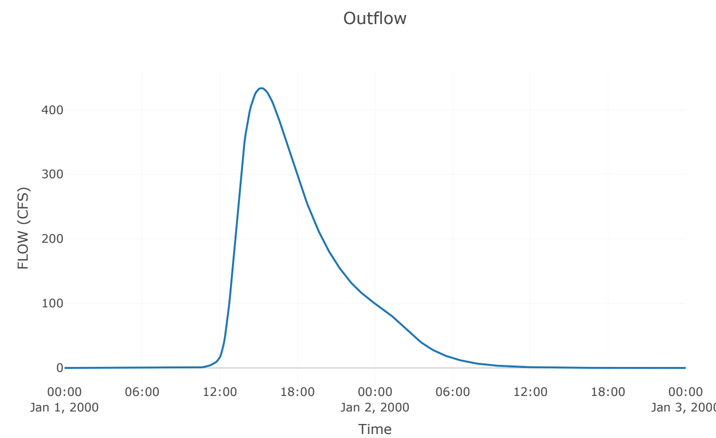


Junction: J5

Downstream : Boardman Rd to Trouble Pond

Results: J5

Peak Discharge (CFS)	433.65
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	1.86



Reach: Boardman Rd to Trouble Pond

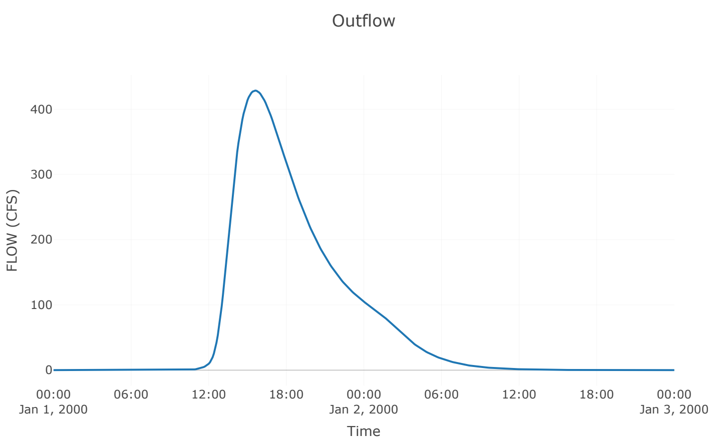
Downstream : J6

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.35
Muskingum x	0
Muskingum Steps	1

Results: Boardman Rd to Trouble Pond

Peak Discharge (CFS)	428.55
Time of Peak Discharge	01Jan2000, 15:36
Volume (IN)	1.86
Peak Inflow (CFS)	433.65
Inflow Volume (AC - FT)	272.31



Subbasin: Upstream of Trouble Pond

Area (MI2) : 0.5
Latitude Degrees : 41.46
Longitude Degrees : -72.45
Downstream : J6

Loss Rate: Scs

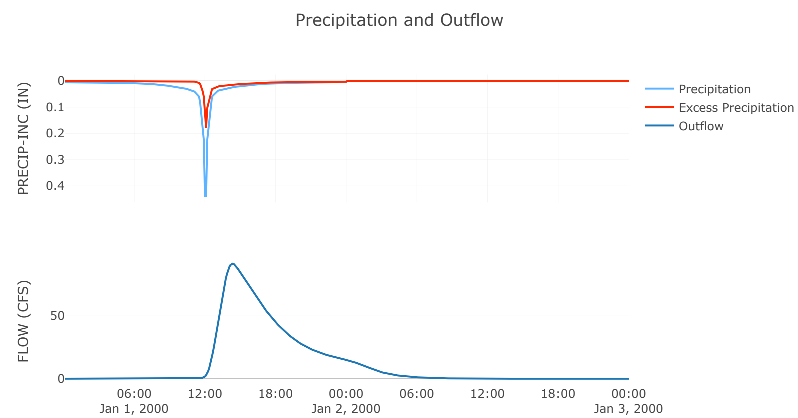
Percent Impervious Area	0
Curve Number	63.97

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.07
Snyder Cp	0.6

Results: Upstream of Trouble Pond

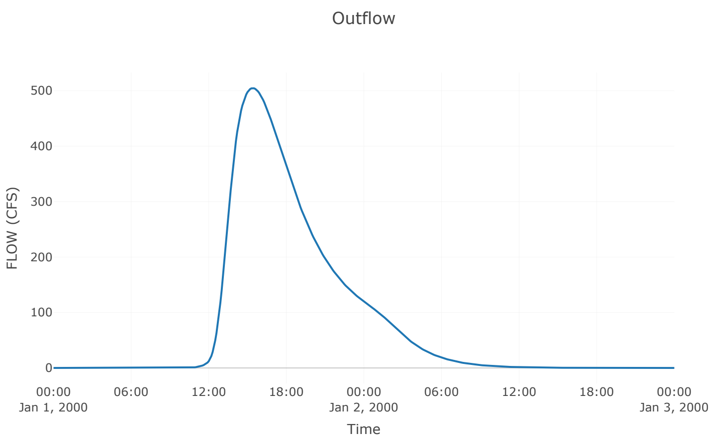
Peak Discharge (CFS)	91.66
Time of Peak Discharge	01Jan2000, 14:18
Volume (IN)	1.72
Precipitation Volume (AC - FT)	139.9
Loss Volume (AC - FT)	93.73
Excess Volume (AC - FT)	46.17
Direct Runoff Volume (AC - FT)	46.17
Baseflow Volume (AC - FT)	0



Junction: J6

Downstream : Trouble Pond to CT River

Results: J6	
Peak Discharge (CFS)	504.83
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	1.84

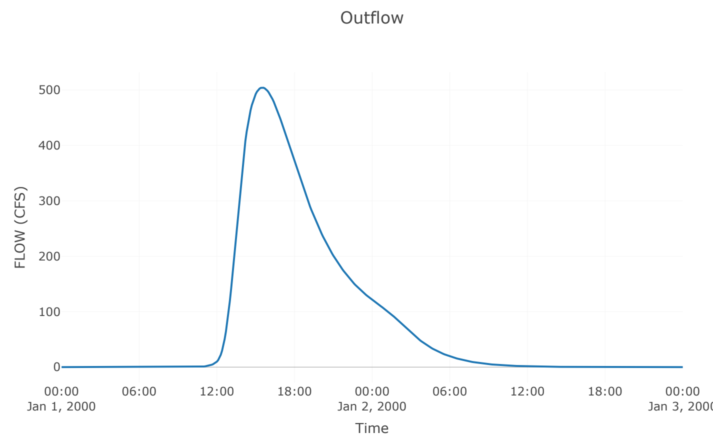


Reach: Trouble Pond to CT River

Downstream : Sink - 1

Route: Muskingum	
Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.1
Muskingum x	0
Muskingum Steps	1

Results: Trouble Pond to CT River	
Peak Discharge (CFS)	504.41
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	1.84
Peak Inflow (CFS)	504.83
Inflow Volume (AC - FT)	318.48



Subbasin: Goodspeed Landing

Area (MI2) : 0.17
Latitude Degrees : 41.45
Longitude Degrees : -72.46
Downstream : Sink - 1

Loss Rate: Scs

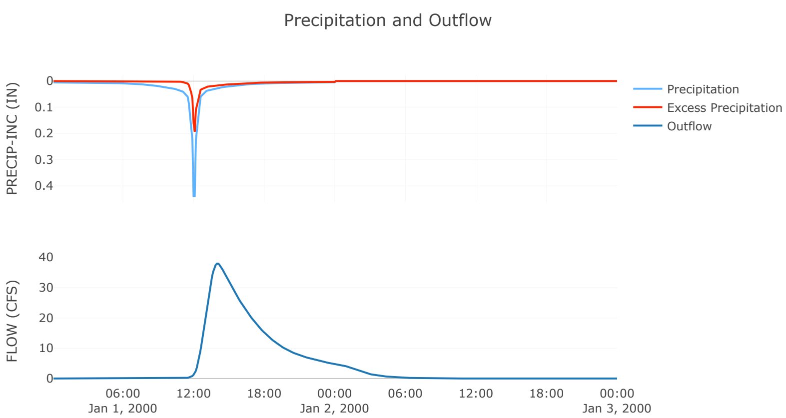
Percent Impervious Area	0
Curve Number	65.5

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.79
Snyder Cp	0.6

Results: Goodspeed Landing

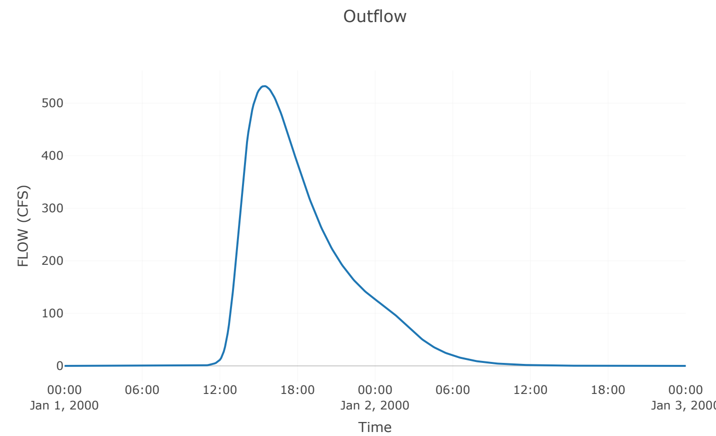
Peak Discharge (CFS)	37.95
Time of Peak Discharge	01Jan2000, 14:00
Volume (IN)	1.84
Precipitation Volume (AC - FT)	48.53
Loss Volume (AC - FT)	31.42
Excess Volume (AC - FT)	17.11
Direct Runoff Volume (AC - FT)	17.11
Baseflow Volume (AC - FT)	0



Sink: Sink-1

Results: Sink-1

Peak Discharge (CFS)	532.63
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	1.84



Project: R E Hhydro S C S
Simulation Run: A14-25
Simulation Start: 31 December 1999, 24:00
Simulation End: 2 January 2000, 24:00

HMS Version: 4.12
Executed: 15 October 2024, 20:33

Global Parameter Summary - Subbasin

Location

Element Name	Longitude Degrees	Latitude Degrees
Daniels Pond North	-72.43	41.48
Daniels Pond Northwest	-72.44	41.48
Daniels Pond East	-72.43	41.47
Town Street	-72.44	41.47
Mt Parnassus Road	-72.44	41.46
Shagbark	-72.44	41.47
North of Boardman Road	-72.45	41.47
Norwich Road and Boardman Ro	-72.45	41.47
Upstream of Trouble Pond	-72.45	41.46
Goodspeed Landing	-72.46	41.45

Area (MI2)

Element Name	Area (MI2)
Daniels Pond North	0.99
Daniels Pond Northwest	0.42
Daniels Pond East	0.25
Town Street	0.23
Mt Parnassus Road	0.33
Shagbark	0.08
North of Boardman Road	0.25
Norwich Road and Boardman Ro	0.21
Upstream of Trouble Pond	0.5
Goodspeed Landing	0.17

Downstream

Element Name	Downstream
Daniels Pond North	J3
Daniels Pond Northwest	J3
Daniels Pond East	J3
Town Street	J2
Mt Parnassus Road	J1
Shagbark	J1
North of Boardman Road	J5
Norwich Road and Boardman Ro	J5
Upstream of Trouble Pond	J6
Goodspeed Landing	Sink - 1

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Daniels Pond North	0	61.25
Daniels Pond Northwest	0	66.7
Daniels Pond East	0	61.08
Town Street	0	74.47
Mt Parnassus Road	0	69.48
Shagbark	0	61.43
North of Boardman Road	0	71.66
Norwich Road and Boardman Ro	0	67.46
Upstream of Trouble Pond	0	63.97
Goodspeed Landing	0	65.5

Transform: Snyder

Element Name	Snyder Method	Snyder Tp	Snyder Cp
Daniels Pond North	Standard	3.01	0.6
Daniels Pond Northwest	Standard	2.24	0.6
Daniels Pond East	Standard	1.51	0.6
Town Street	Standard	1.87	0.6
Mt Parnassus Road	Standard	1.89	0.6
Shagbark	Standard	1.51	0.6
North of Boardman Road	Standard	1.68	0.6
Norwich Road and Boardman Ro	Standard	1.62	0.6
Upstream of Trouble Pond	Standard	2.07	0.6
Goodspeed Landing	Standard	1.79	0.6

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
Daniels Pond to Shagbark	J2
Shagbark to Town St	J1
Town St to Boardman Rd	J5
Boardman Rd to Trouble Pond	J6
Trouble Pond to CT River	Sink - 1

Route: Muskingum

Element Name	Method	Initial Variable	Muskingum K	Muskingum x	Muskingum Steps
Daniels Pond to Shagbark	Muskingum	Combined Inflow	0.5	0	1
Shagbark to Town St	Muskingum	Combined Inflow	0.16	0	1
Town St to Boardman Rd	Muskingum	Combined Inflow	0.45	0	1
Boardman Rd to Trouble Pond	Muskingum	Combined Inflow	0.35	0	1
Trouble Pond to CT River	Muskingum	Combined Inflow	0.1	0	1

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Daniels Pond North	0.99	183.17	01Jan2000, 15:12	2.24
Daniels Pond Northwest	0.42	121.05	01Jan2000, 14:24	2.75
Daniels Pond East	0.25	72.99	01Jan2000, 13:42	2.23
J3	1.66	347.2	01Jan2000, 14:48	2.37
Daniels Pond to Shagbark	1.66	335.54	01Jan2000, 15:24	2.37
Town Street	0.23	97.43	01Jan2000, 13:54	3.5
J2	1.89	408.34	01Jan2000, 15:06	2.5
Shagbark to Town St	1.89	407.25	01Jan2000, 15:18	2.5
Mt Parnassus Road	0.33	117.82	01Jan2000, 14:00	3.01
Shagbark	0.08	24.08	01Jan2000, 13:42	2.26
J1	2.29	517.89	01Jan2000, 15:00	2.57
Town St to Boardman Rd	2.29	506.11	01Jan2000, 15:30	2.57
North of Boardman Road	0.25	104.99	01Jan2000, 13:48	3.22
Norwich Road and Boardman Ro	0.21	79.22	01Jan2000, 13:42	2.82
J5	2.75	629.93	01Jan2000, 15:06	2.65
Boardman Rd to Trouble Pond	2.75	622.26	01Jan2000, 15:30	2.65
Upstream of Trouble Pond	0.5	137.11	01Jan2000, 14:12	2.49
J6	3.25	734.6	01Jan2000, 15:18	2.62
Trouble Pond to CT River	3.25	733.97	01Jan2000, 15:24	2.62
Goodspeed Landing	0.17	56	01Jan2000, 13:54	2.63
Sink - 1	3.43	774.96	01Jan2000, 15:24	2.62

Subbasin: Daniels Pond North

Area (MI2) : 0.99
Latitude Degrees : 41.48
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

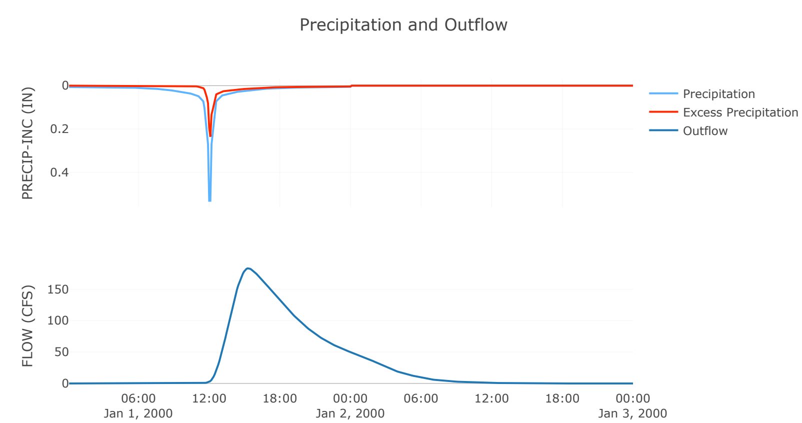
Percent Impervious Area	0
Curve Number	61.25

Transform: Snyder

Snyder Method	Standard
Snyder Tp	3.01
Snyder Cp	0.6

Results: Daniels Pond North

Peak Discharge (CFS)	183.17
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	2.24
Precipitation Volume (AC - FT)	334.67
Loss Volume (AC - FT)	215.81
Excess Volume (AC - FT)	118.86
Direct Runoff Volume (AC - FT)	118.86
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond Northwest

Area (MI2) : 0.42
Latitude Degrees : 41.48
Longitude Degrees : -72.44
Downstream : J3

Loss Rate: Scs

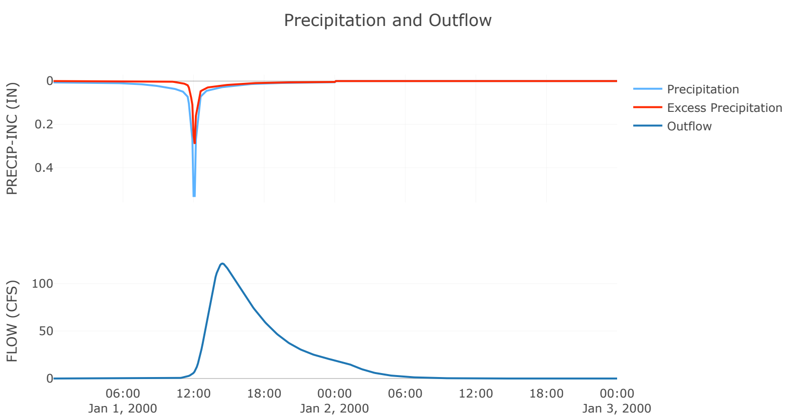
Percent Impervious Area	0
Curve Number	66.7

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.24
Snyder Cp	0.6

Results: Daniels Pond Northwest

Peak Discharge (CFS)	121.05
Time of Peak Discharge	01Jan2000, 14:24
Volume (IN)	2.75
Precipitation Volume (AC - FT)	142.15
Loss Volume (AC - FT)	80.4
Excess Volume (AC - FT)	61.75
Direct Runoff Volume (AC - FT)	61.75
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond East

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

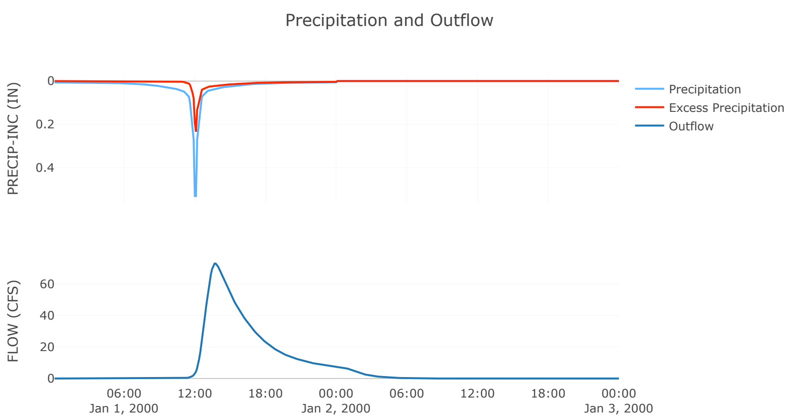
Percent Impervious Area	0
Curve Number	61.08

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Daniels Pond East

Peak Discharge (CFS)	72.99
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	2.23
Precipitation Volume (AC - FT)	82.99
Loss Volume (AC - FT)	53.71
Excess Volume (AC - FT)	29.28
Direct Runoff Volume (AC - FT)	29.28
Baseflow Volume (AC - FT)	0

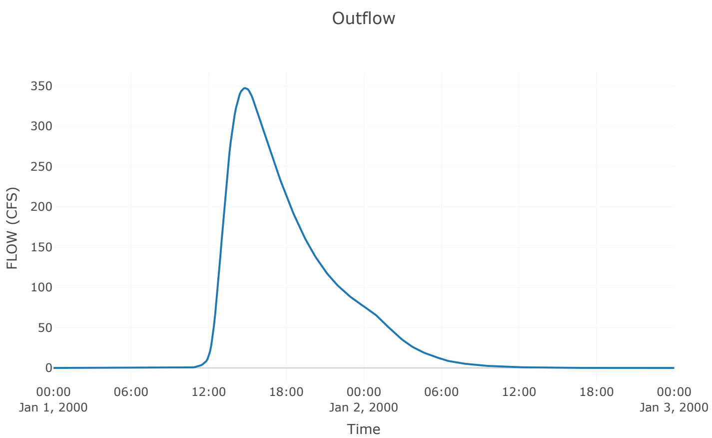


Junction: J3

Downstream : Daniels Pond to Shagbark

Results: J3

Peak Discharge (CFS)	347.2
Time of Peak Discharge	01Jan2000, 14:48
Volume (IN)	2.37



Reach: Daniels Pond to Shagbark

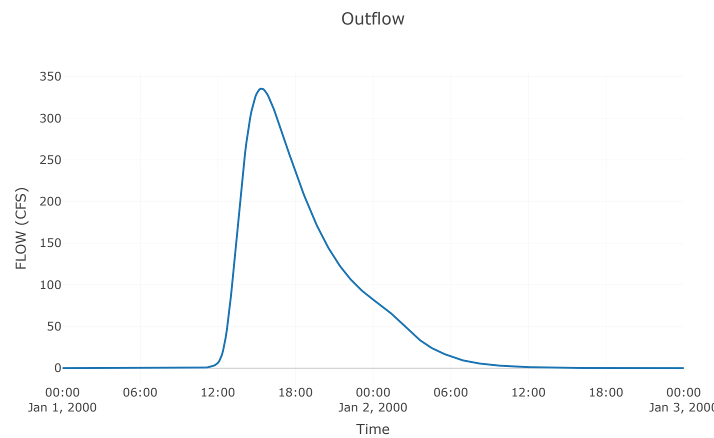
Downstream : J2

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.5
Muskingum x	0
Muskingum Steps	1

Results: Daniels Pond to Shagbark

Peak Discharge (CFS)	335.54
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	2.37
Peak Inflow (CFS)	347.2
Inflow Volume (AC - FT)	209.88



Subbasin: Town Street

Area (MI2) : 0.23
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J2

Loss Rate: Scs

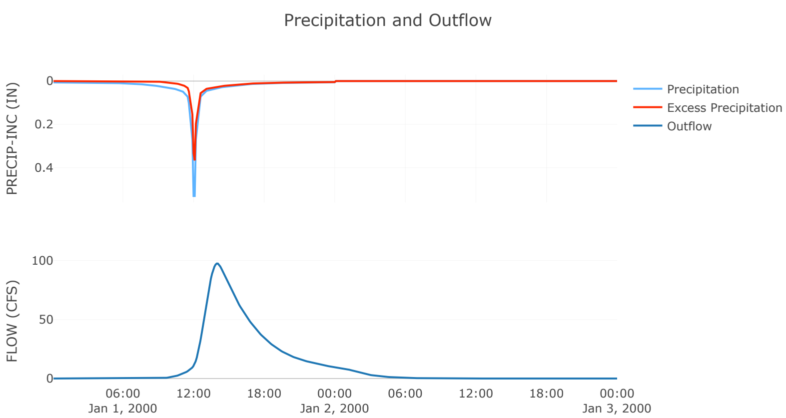
Percent Impervious Area	0
Curve Number	74.47

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.87
Snyder Cp	0.6

Results: Town Street

Peak Discharge (CFS)	97.43
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	3.5
Precipitation Volume (AC - FT)	75.94
Loss Volume (AC - FT)	33.86
Excess Volume (AC - FT)	42.09
Direct Runoff Volume (AC - FT)	42.09
Baseflow Volume (AC - FT)	0

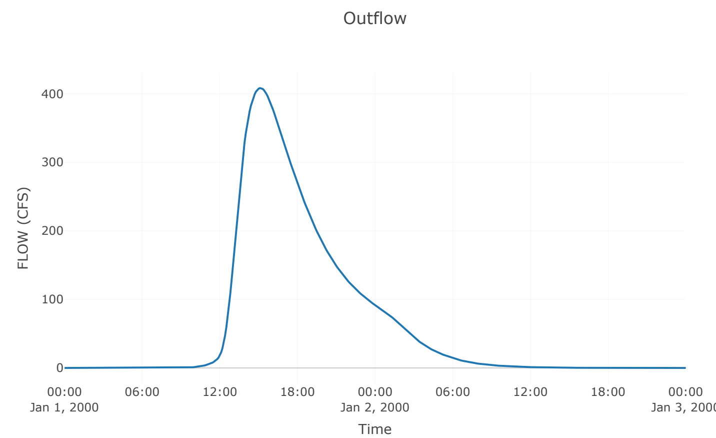


Junction: J2

Downstream : Shagbark to Town St

Results: J2

Peak Discharge (CFS)	408.34
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	2.5



Reach: Shagbark to Town St

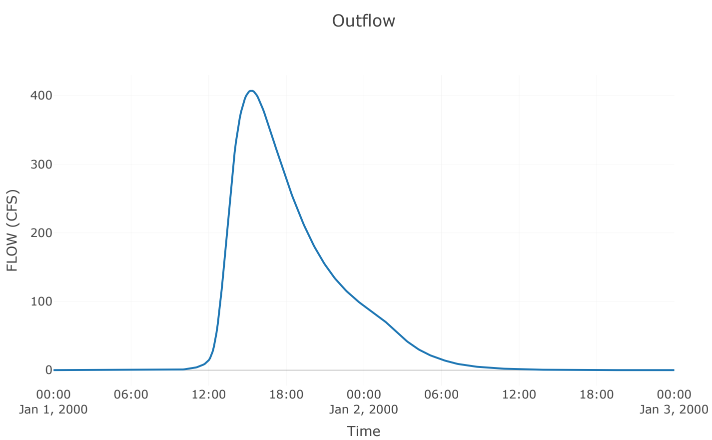
Downstream : J1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.16
Muskingum x	0
Muskingum Steps	1

Results: Shagbark to Town St

Peak Discharge (CFS)	407.25
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	2.5
Peak Inflow (CFS)	408.34
Inflow Volume (AC - FT)	251.97



Subbasin: Mt Parnassus Road

Area (MI2) : 0.33
Latitude Degrees : 41.46
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

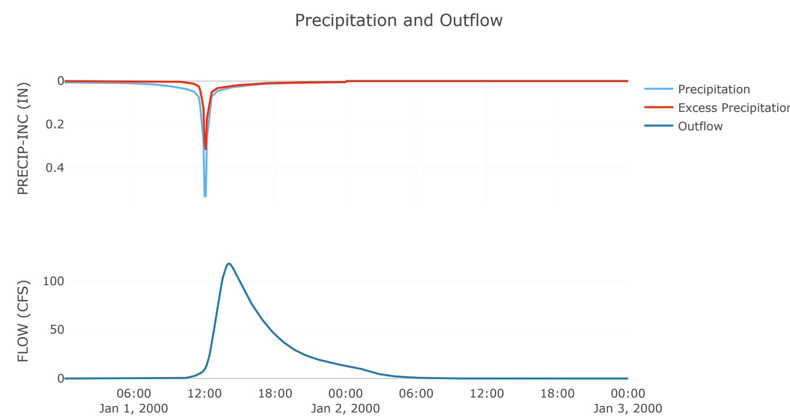
Percent Impervious Area	0
Curve Number	69.48

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.89
Snyder Cp	0.6

Results: Mt Parnassus Road

Peak Discharge (CFS)	117.82
Time of Peak Discharge	01Jan2000, 14:00
Volume (IN)	3.01
Precipitation Volume (AC - FT)	109.68
Loss Volume (AC - FT)	57.43
Excess Volume (AC - FT)	52.26
Direct Runoff Volume (AC - FT)	52.26
Baseflow Volume (AC - FT)	0



Subbasin: Shagbark

Area (MI2) : 0.08
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

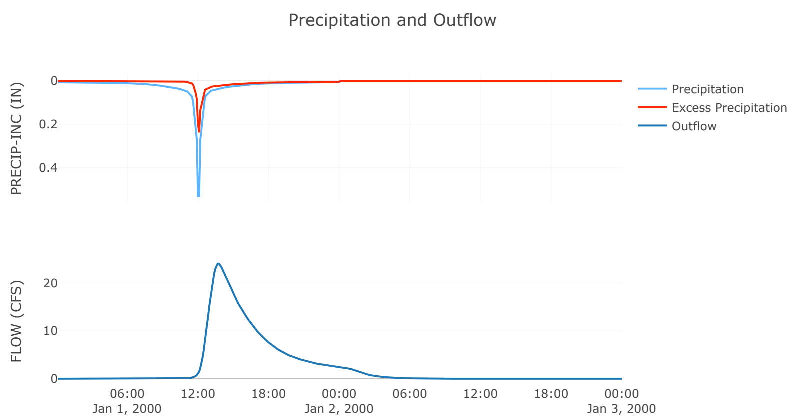
Percent Impervious Area	0
Curve Number	61.43

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Shagbark

Peak Discharge (CFS)	24.08
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	2.26
Precipitation Volume (AC - FT)	26.92
Loss Volume (AC - FT)	17.29
Excess Volume (AC - FT)	9.63
Direct Runoff Volume (AC - FT)	9.63
Baseflow Volume (AC - FT)	0

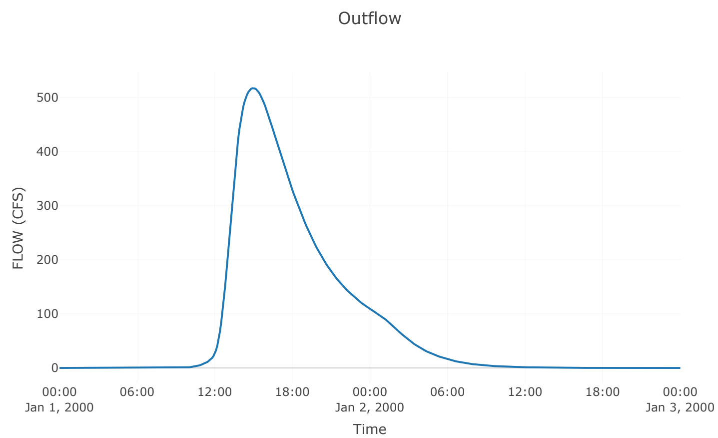


Junction: J1

Downstream : Town St to Boardman Rd

Results: J1

Peak Discharge (CFS)	517.89
Time of Peak Discharge	01Jan2000, 15:00
Volume (IN)	2.57



Reach: Town St to Boardman Rd

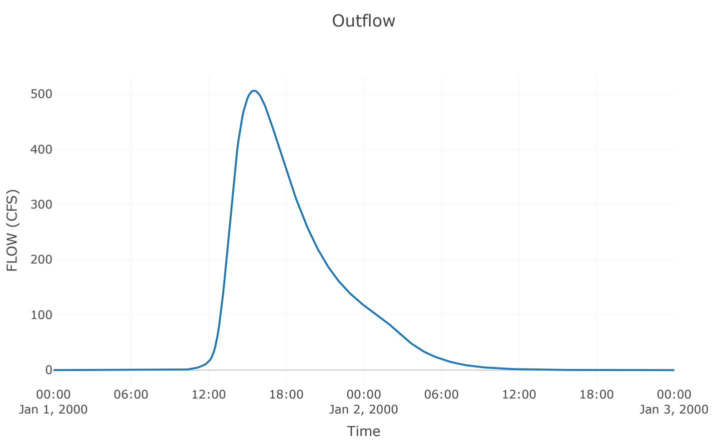
Downstream : J5

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.45
Muskingum x	0
Muskingum Steps	1

Results: Town St to Boardman Rd

Peak Discharge (CFS)	506.11
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	2.57
Peak Inflow (CFS)	517.89
Inflow Volume (AC - FT)	313.85



Subbasin: North of Boardman Road

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

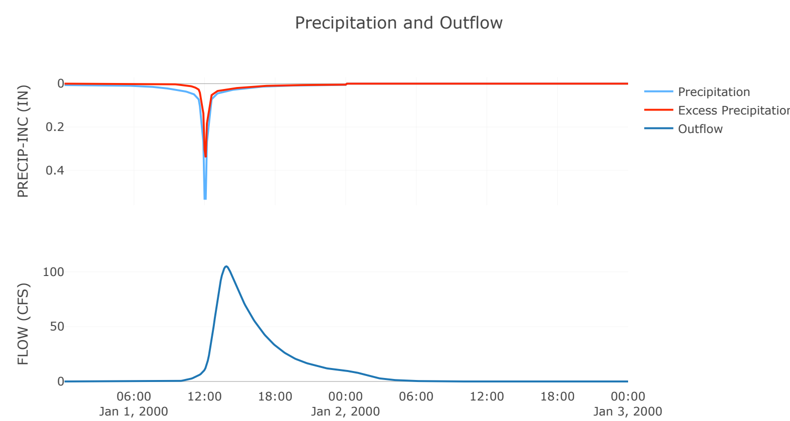
Percent Impervious Area	0
Curve Number	71.66

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.68
Snyder Cp	0.6

Results: North of Boardman Road

Peak Discharge (CFS)	104.99
Time of Peak Discharge	01Jan2000, 13:48
Volume (IN)	3.22
Precipitation Volume (AC - FT)	83.29
Loss Volume (AC - FT)	40.8
Excess Volume (AC - FT)	42.48
Direct Runoff Volume (AC - FT)	42.48
Baseflow Volume (AC - FT)	0



Subbasin: Norwich Road and Boardman Ro

Area (MI2) : 0.21
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

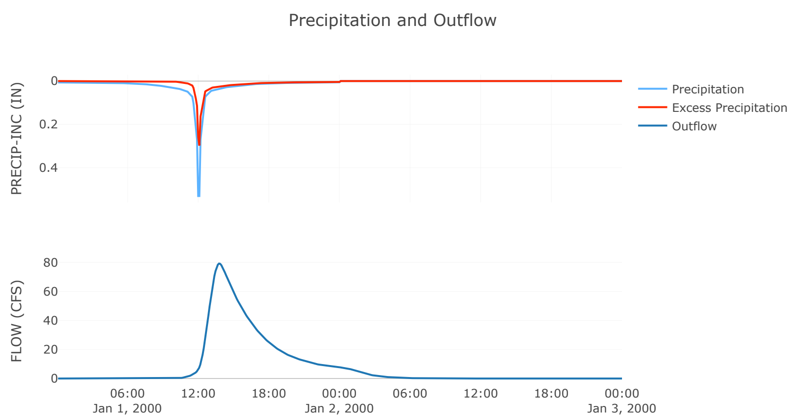
Percent Impervious Area	0
Curve Number	67.46

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.62
Snyder Cp	0.6

Results: Norwich Road and Boardman Ro

Peak Discharge (CFS)	79.22
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	2.82
Precipitation Volume (AC - FT)	71.66
Loss Volume (AC - FT)	39.71
Excess Volume (AC - FT)	31.95
Direct Runoff Volume (AC - FT)	31.95
Baseflow Volume (AC - FT)	0

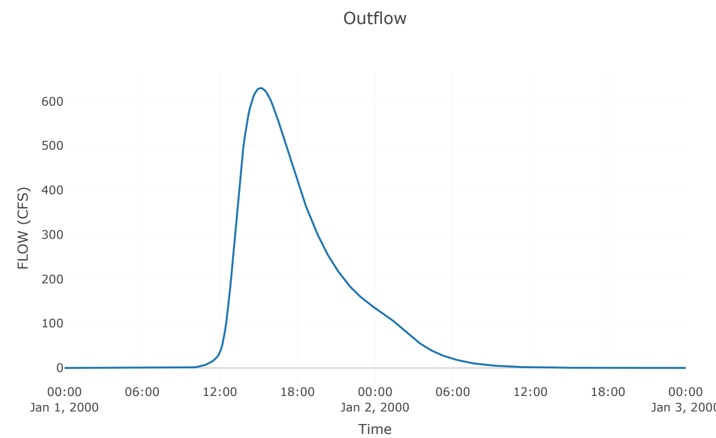


Junction: J5

Downstream : Boardman Rd to Trouble Pond

Results: J5

Peak Discharge (CFS)	629.93
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	2.65



Reach: Boardman Rd to Trouble Pond

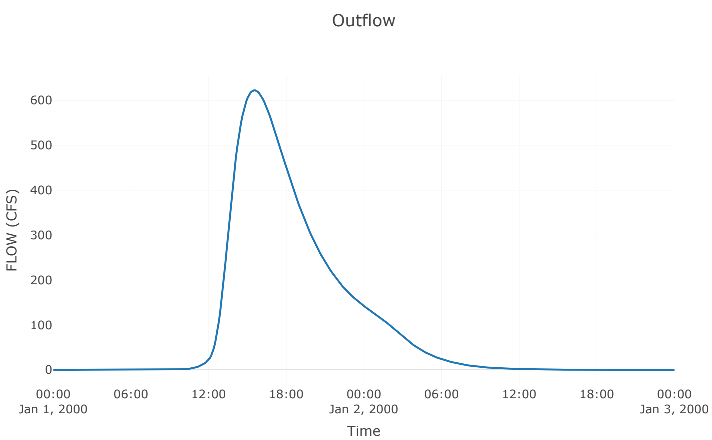
Downstream : J6

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.35
Muskingum x	0
Muskingum Steps	1

Results: Boardman Rd to Trouble Pond

Peak Discharge (CFS)	622.26
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	2.65
Peak Inflow (CFS)	629.93
Inflow Volume (AC - FT)	388.28



Subbasin: Upstream of Trouble Pond

Area (MI2) : 0.5
Latitude Degrees : 41.46
Longitude Degrees : -72.45
Downstream : J6

Loss Rate: Scs

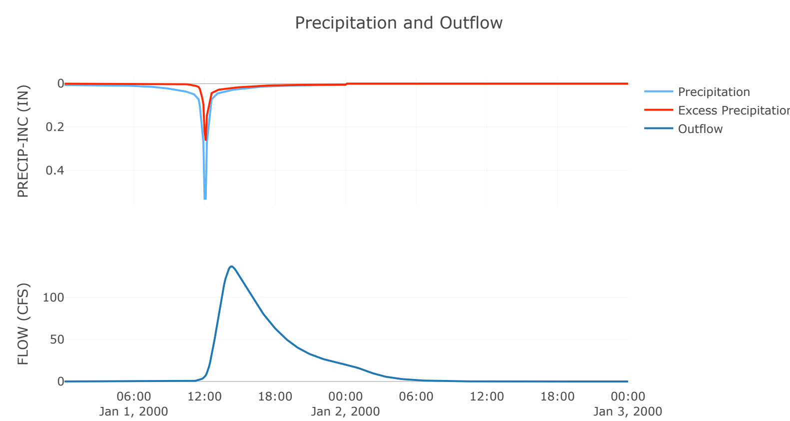
Percent Impervious Area	0
Curve Number	63.97

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.07
Snyder Cp	0.6

Results: Upstream of Trouble Pond

Peak Discharge (CFS)	137.11
Time of Peak Discharge	01Jan2000, 14:12
Volume (IN)	2.49
Precipitation Volume (AC - FT)	169.38
Loss Volume (AC - FT)	102.61
Excess Volume (AC - FT)	66.77
Direct Runoff Volume (AC - FT)	66.77
Baseflow Volume (AC - FT)	0

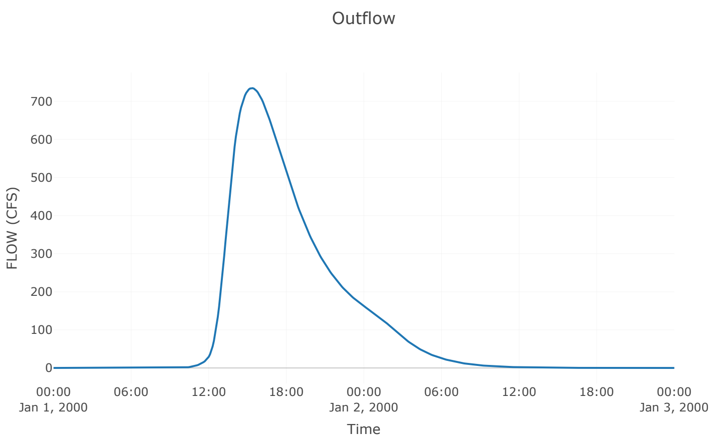


Junction: J6

Downstream : Trouble Pond to CT River

Results: J6

Peak Discharge (CFS)	734.6
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	2.62



Reach: Trouble Pond to CT River

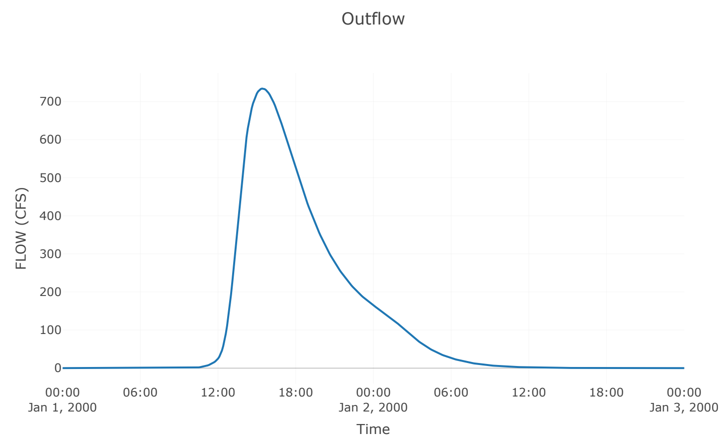
Downstream : Sink - 1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.1
Muskingum x	0
Muskingum Steps	1

Results: Trouble Pond to CT River

Peak Discharge (CFS)	733.97
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	2.62
Peak Inflow (CFS)	734.6
Inflow Volume (AC - FT)	455.05



Subbasin: Goodspeed Landing

Area (MI2) : 0.17
Latitude Degrees : 41.45
Longitude Degrees : -72.46
Downstream : Sink - 1

Loss Rate: Scs

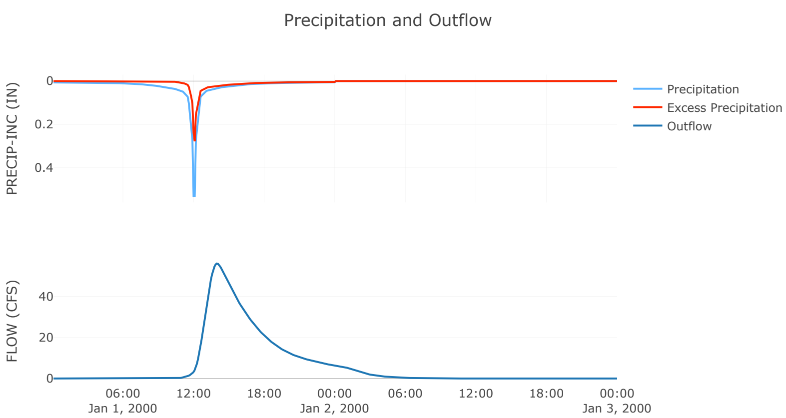
Percent Impervious Area	0
Curve Number	65.5

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.79
Snyder Cp	0.6

Results: Goodspeed Landing

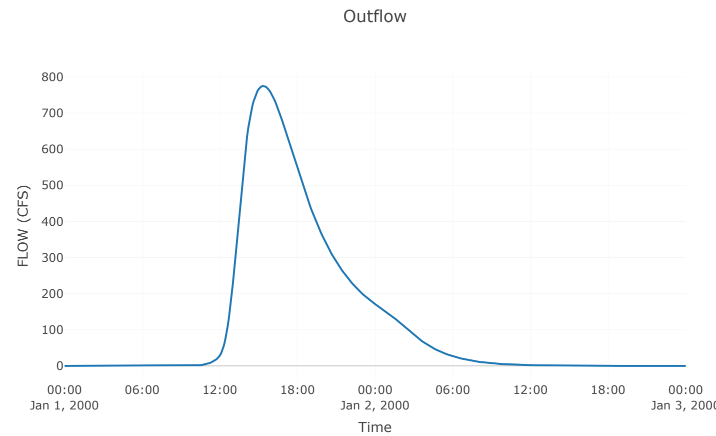
Peak Discharge (CFS)	56
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	2.63
Precipitation Volume (AC - FT)	58.75
Loss Volume (AC - FT)	34.27
Excess Volume (AC - FT)	24.48
Direct Runoff Volume (AC - FT)	24.48
Baseflow Volume (AC - FT)	0



Sink: Sink-1

Results: Sink-1

Peak Discharge (CFS)	774.96
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	2.62



Project: R E Hhydro S C S
Simulation Run: A14-50
Simulation Start: 31 December 1999, 24:00
Simulation End: 2 January 2000, 24:00

HMS Version: 4.12
Executed: 15 October 2024, 20:33

Global Parameter Summary - Subbasin

Location

Element Name	Longitude Degrees	Latitude Degrees
Daniels Pond North	-72.43	41.48
Daniels Pond Northwest	-72.44	41.48
Daniels Pond East	-72.43	41.47
Town Street	-72.44	41.47
Mt Parnassus Road	-72.44	41.46
Shagbark	-72.44	41.47
North of Boardman Road	-72.45	41.47
Norwich Road and Boardman Ro	-72.45	41.47
Upstream of Trouble Pond	-72.45	41.46
Goodspeed Landing	-72.46	41.45

Area (MI2)

Element Name	Area (MI2)
Daniels Pond North	0.99
Daniels Pond Northwest	0.42
Daniels Pond East	0.25
Town Street	0.23
Mt Parnassus Road	0.33
Shagbark	0.08
North of Boardman Road	0.25
Norwich Road and Boardman Ro	0.21
Upstream of Trouble Pond	0.5
Goodspeed Landing	0.17

Downstream

Element Name	Downstream
Daniels Pond North	J3
Daniels Pond Northwest	J3
Daniels Pond East	J3
Town Street	J2
Mt Parnassus Road	J1
Shagbark	J1
North of Boardman Road	J5
Norwich Road and Boardman Ro	J5
Upstream of Trouble Pond	J6
Goodspeed Landing	Sink - 1

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Daniels Pond North	0	61.25
Daniels Pond Northwest	0	66.7
Daniels Pond East	0	61.08
Town Street	0	74.47
Mt Parnassus Road	0	69.48
Shagbark	0	61.43
North of Boardman Road	0	71.66
Norwich Road and Boardman Ro	0	67.46
Upstream of Trouble Pond	0	63.97
Goodspeed Landing	0	65.5

Transform: Snyder

Element Name	Snyder Method	Snyder Tp	Snyder Cp
Daniels Pond North	Standard	3.01	0.6
Daniels Pond Northwest	Standard	2.24	0.6
Daniels Pond East	Standard	1.51	0.6
Town Street	Standard	1.87	0.6
Mt Parnassus Road	Standard	1.89	0.6
Shagbark	Standard	1.51	0.6
North of Boardman Road	Standard	1.68	0.6
Norwich Road and Boardman Ro	Standard	1.62	0.6
Upstream of Trouble Pond	Standard	2.07	0.6
Goodspeed Landing	Standard	1.79	0.6

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
Daniels Pond to Shagbark	J2
Shagbark to Town St	J1
Town St to Boardman Rd	J5
Boardman Rd to Trouble Pond	J6
Trouble Pond to CT River	Sink - 1

Route: Muskingum

Element Name	Method	Initial Variable	Muskingum K	Muskingum x	Muskingum Steps
Daniels Pond to Shagbark	Muskingum	Combined Inflow	0.5	0	1
Shagbark to Town St	Muskingum	Combined Inflow	0.16	0	1
Town St to Boardman Rd	Muskingum	Combined Inflow	0.45	0	1
Boardman Rd to Trouble Pond	Muskingum	Combined Inflow	0.35	0	1
Trouble Pond to CT River	Muskingum	Combined Inflow	0.1	0	1

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Daniels Pond North	0.99	235.53	01Jan2000, 15:12	2.84
Daniels Pond Northwest	0.42	151.53	01Jan2000, 14:24	3.4
Daniels Pond East	0.25	94.33	01Jan2000, 13:36	2.82
J3	1.66	442.19	01Jan2000, 14:48	2.98
Daniels Pond to Shagbark	1.66	427.22	01Jan2000, 15:18	2.98
Town Street	0.23	118.14	01Jan2000, 13:54	4.22
J2	1.89	515.64	01Jan2000, 15:06	3.12
Shagbark to Town St	1.89	514.09	01Jan2000, 15:18	3.12
Mt Parnassus Road	0.33	145.71	01Jan2000, 14:00	3.69
Shagbark	0.08	31.06	01Jan2000, 13:36	2.85
J1	2.29	651.38	01Jan2000, 14:54	3.19
Town St to Boardman Rd	2.29	636.26	01Jan2000, 15:30	3.19
North of Boardman Road	0.25	128.59	01Jan2000, 13:48	3.92
Norwich Road and Boardman Ro	0.21	98.92	01Jan2000, 13:42	3.48
J5	2.75	788.58	01Jan2000, 15:06	3.28
Boardman Rd to Trouble Pond	2.75	778.79	01Jan2000, 15:30	3.28
Upstream of Trouble Pond	0.5	174.12	01Jan2000, 14:12	3.11
J6	3.25	920.37	01Jan2000, 15:18	3.26
Trouble Pond to CT River	3.25	919.58	01Jan2000, 15:24	3.26
Goodspeed Landing	0.17	70.59	01Jan2000, 13:54	3.27
Sink - 1	3.43	970.92	01Jan2000, 15:18	3.26

Subbasin: Daniels Pond North

Area (MI2) : 0.99
Latitude Degrees : 41.48
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

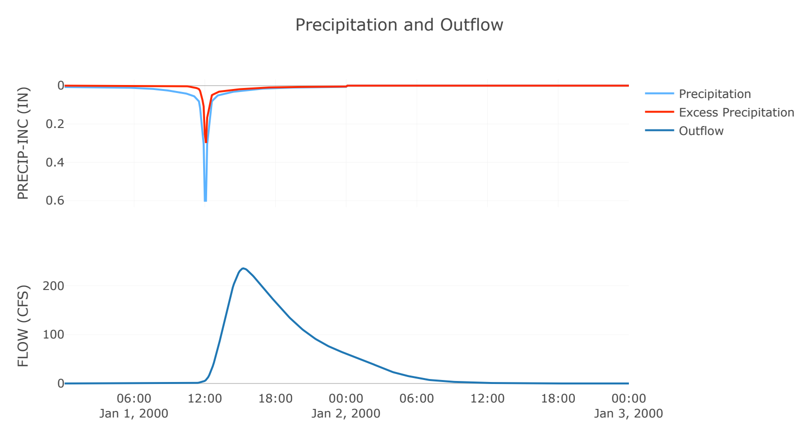
Percent Impervious Area	0
Curve Number	61.25

Transform: Snyder

Snyder Method	Standard
Snyder Tp	3.01
Snyder Cp	0.6

Results: Daniels Pond North

Peak Discharge (CFS)	235.53
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	2.84
Precipitation Volume (AC - FT)	378.63
Loss Volume (AC - FT)	228.47
Excess Volume (AC - FT)	150.15
Direct Runoff Volume (AC - FT)	150.15
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond Northwest

Area (MI2) : 0.42
Latitude Degrees : 41.48
Longitude Degrees : -72.44
Downstream : J3

Loss Rate: Scs

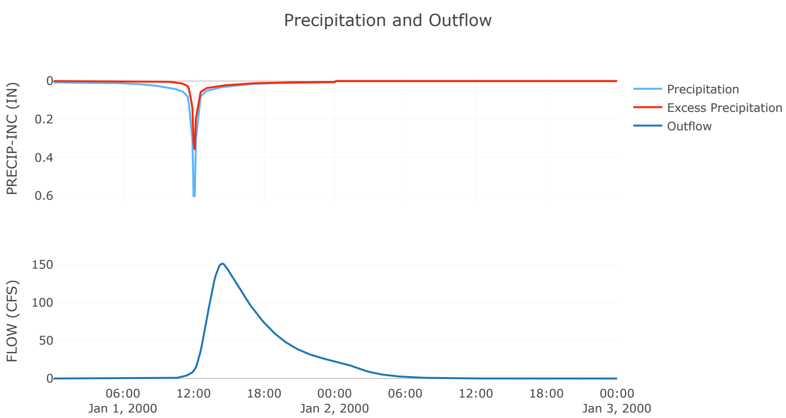
Percent Impervious Area	0
Curve Number	66.7

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.24
Snyder Cp	0.6

Results: Daniels Pond Northwest

Peak Discharge (CFS)	151.53
Time of Peak Discharge	01Jan2000, 14:24
Volume (IN)	3.4
Precipitation Volume (AC - FT)	160.82
Loss Volume (AC - FT)	84.45
Excess Volume (AC - FT)	76.37
Direct Runoff Volume (AC - FT)	76.37
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond East

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

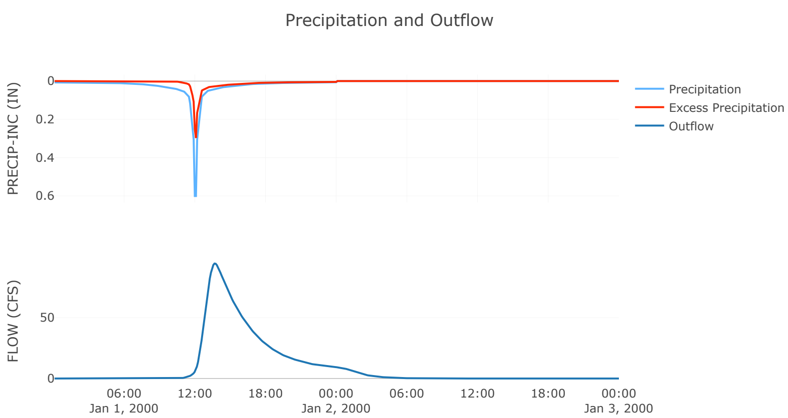
Percent Impervious Area	0
Curve Number	61.08

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Daniels Pond East

Peak Discharge (CFS)	94.33
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	2.82
Precipitation Volume (AC - FT)	93.88
Loss Volume (AC - FT)	56.87
Excess Volume (AC - FT)	37.01
Direct Runoff Volume (AC - FT)	37.01
Baseflow Volume (AC - FT)	0

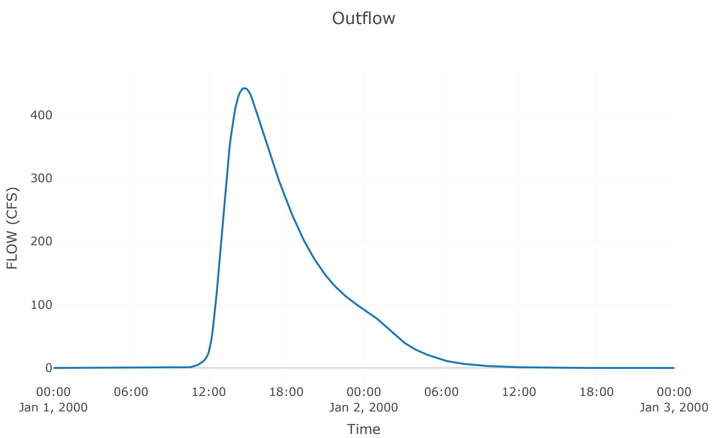


Junction: J3

Downstream : Daniels Pond to Shagbark

Results: J3

Peak Discharge (CFS)	442.19
Time of Peak Discharge	01Jan2000, 14:48
Volume (IN)	2.98



Reach: Daniels Pond to Shagbark

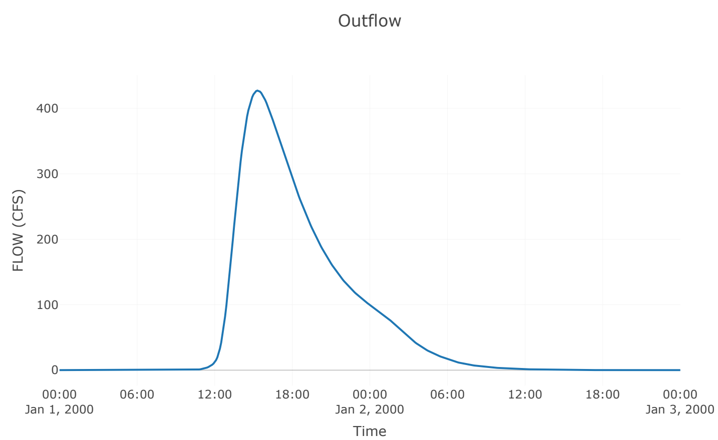
Downstream : J2

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.5
Muskingum x	0
Muskingum Steps	1

Results: Daniels Pond to Shagbark

Peak Discharge (CFS)	427.22
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	2.98
Peak Inflow (CFS)	442.19
Inflow Volume (AC - FT)	263.53



Subbasin: Town Street

Area (MI2) : 0.23
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J2

Loss Rate: Scs

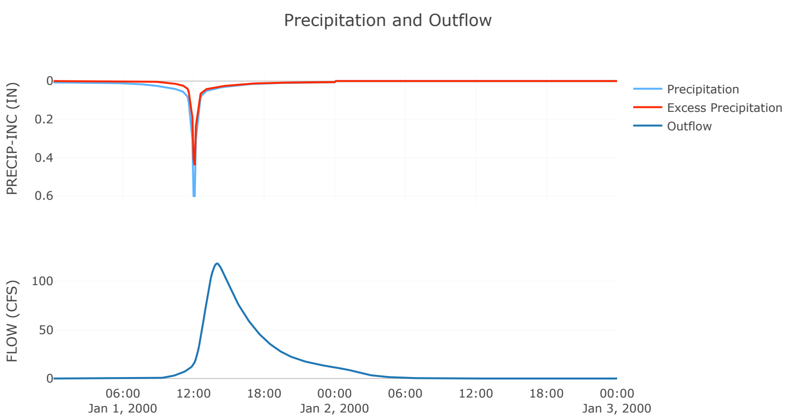
Percent Impervious Area	0
Curve Number	74.47

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.87
Snyder Cp	0.6

Results: Town Street

Peak Discharge (CFS)	118.14
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	4.22
Precipitation Volume (AC - FT)	85.91
Loss Volume (AC - FT)	35.16
Excess Volume (AC - FT)	50.75
Direct Runoff Volume (AC - FT)	50.75
Baseflow Volume (AC - FT)	0

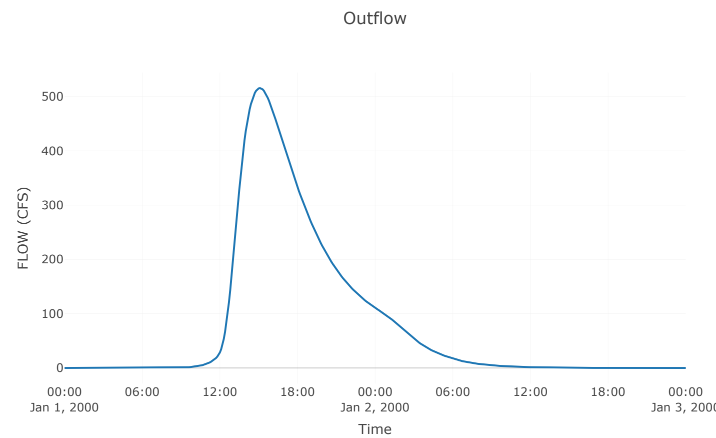


Junction: J2

Downstream : Shagbark to Town St

Results: J2

Peak Discharge (CFS)	515.64
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	3.12



Reach: Shagbark to Town St

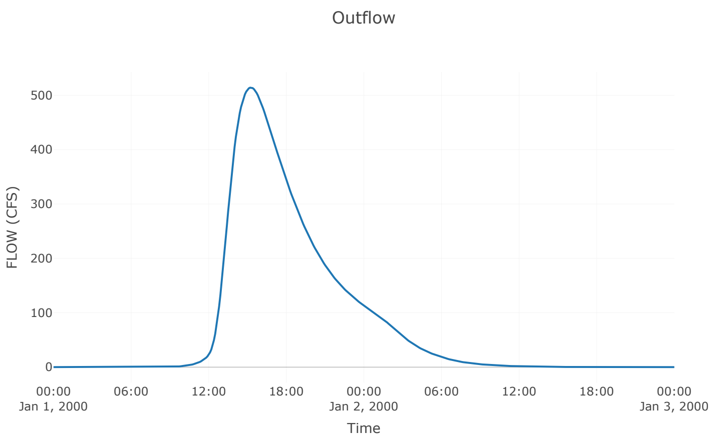
Downstream : J1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.16
Muskingum x	0
Muskingum Steps	1

Results: Shagbark to Town St

Peak Discharge (CFS)	514.09
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	3.12
Peak Inflow (CFS)	515.64
Inflow Volume (AC - FT)	314.28



Subbasin: Mt Parnassus Road

Area (MI2) : 0.33
Latitude Degrees : 41.46
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

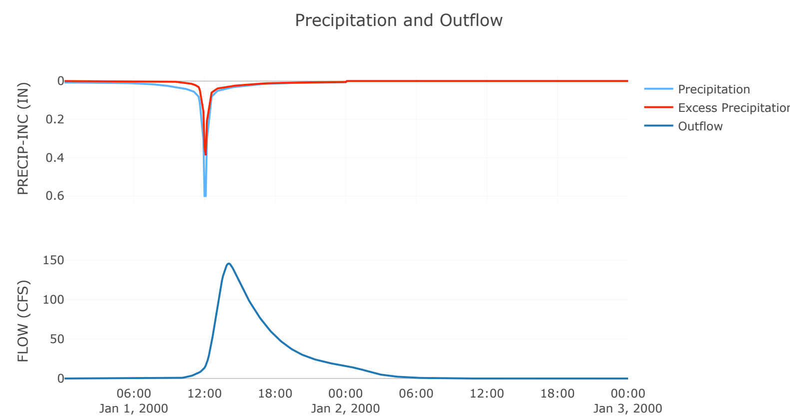
Percent Impervious Area	0
Curve Number	69.48

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.89
Snyder Cp	0.6

Results: Mt Parnassus Road

Peak Discharge (CFS)	145.71
Time of Peak Discharge	01Jan2000, 14:00
Volume (IN)	3.69
Precipitation Volume (AC - FT)	124.09
Loss Volume (AC - FT)	60.08
Excess Volume (AC - FT)	64.01
Direct Runoff Volume (AC - FT)	64.01
Baseflow Volume (AC - FT)	0



Subbasin: Shagbark

Area (MI2) : 0.08
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

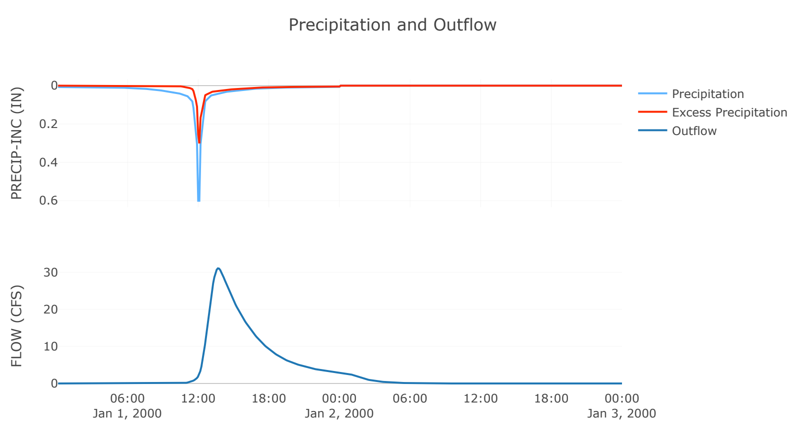
Percent Impervious Area	0
Curve Number	61.43

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Shagbark

Peak Discharge (CFS)	31.06
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	2.85
Precipitation Volume (AC - FT)	30.45
Loss Volume (AC - FT)	18.3
Excess Volume (AC - FT)	12.15
Direct Runoff Volume (AC - FT)	12.15
Baseflow Volume (AC - FT)	0

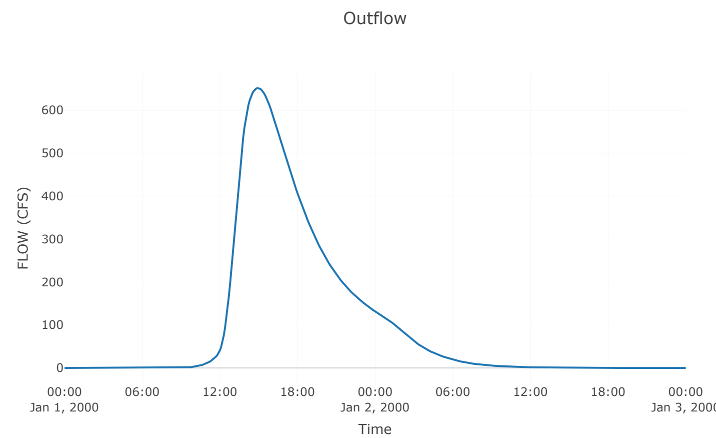


Junction: J1

Downstream : Town St to Boardman Rd

Results: J1

Peak Discharge (CFS)	651.38
Time of Peak Discharge	01Jan2000, 14:54
Volume (IN)	3.19



Reach: Town St to Boardman Rd

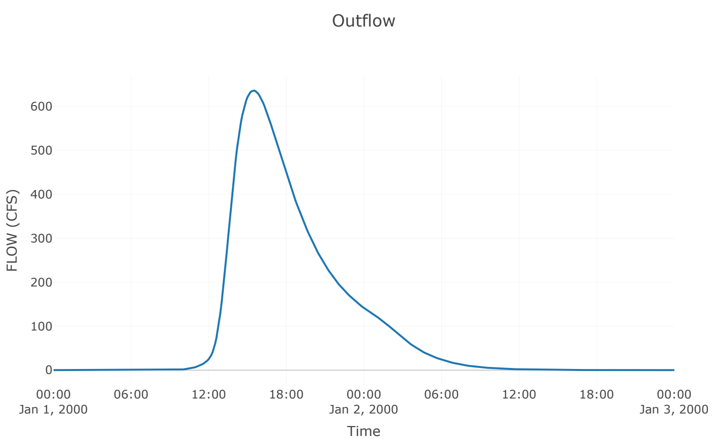
Downstream : J5

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.45
Muskingum x	0
Muskingum Steps	1

Results: Town St to Boardman Rd

Peak Discharge (CFS)	636.26
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	3.19
Peak Inflow (CFS)	651.38
Inflow Volume (AC - FT)	390.44



Subbasin: North of Boardman Road

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

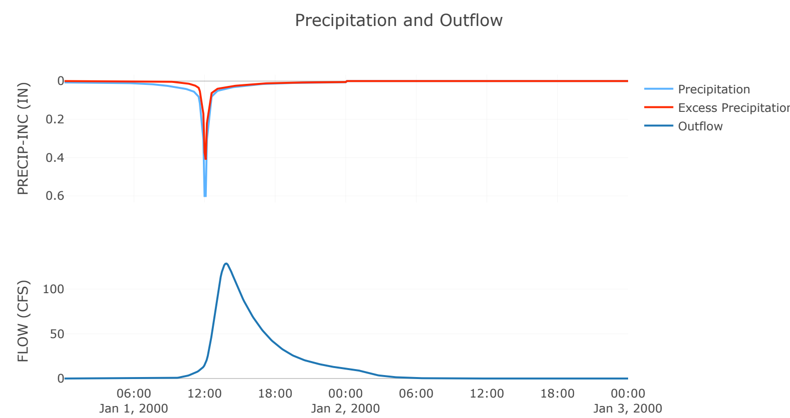
Percent Impervious Area	0
Curve Number	71.66

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.68
Snyder Cp	0.6

Results: North of Boardman Road

Peak Discharge (CFS)	128.59
Time of Peak Discharge	01Jan2000, 13:48
Volume (IN)	3.92
Precipitation Volume (AC - FT)	94.23
Loss Volume (AC - FT)	42.55
Excess Volume (AC - FT)	51.67
Direct Runoff Volume (AC - FT)	51.67
Baseflow Volume (AC - FT)	0



Subbasin: Norwich Road and Boardman Ro

Area (MI2) : 0.21
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

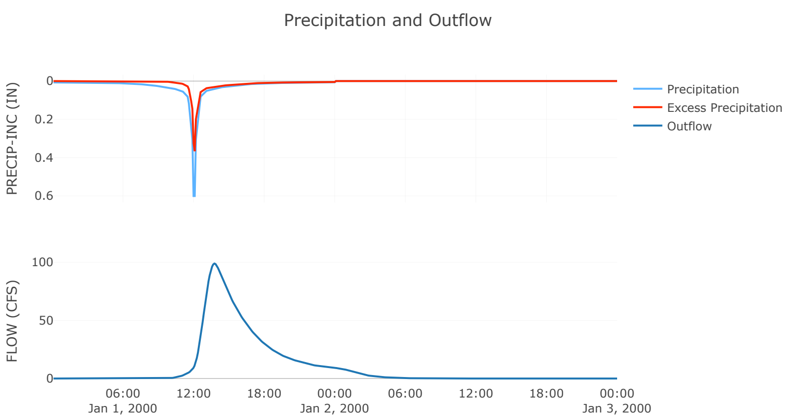
Percent Impervious Area	0
Curve Number	67.46

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.62
Snyder Cp	0.6

Results: Norwich Road and Boardman Ro

Peak Discharge (CFS)	98.92
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	3.48
Precipitation Volume (AC - FT)	81.07
Loss Volume (AC - FT)	41.67
Excess Volume (AC - FT)	39.4
Direct Runoff Volume (AC - FT)	39.4
Baseflow Volume (AC - FT)	0

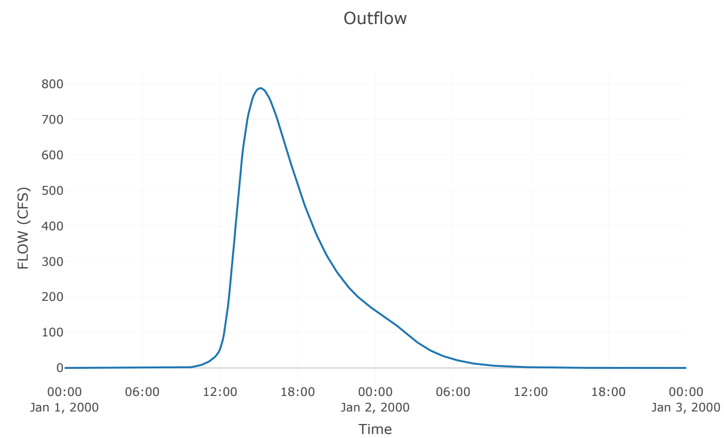


Junction: J5

Downstream : Boardman Rd to Trouble Pond

Results: J5

Peak Discharge (CFS)	788.58
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	3.28



Reach: Boardman Rd to Trouble Pond

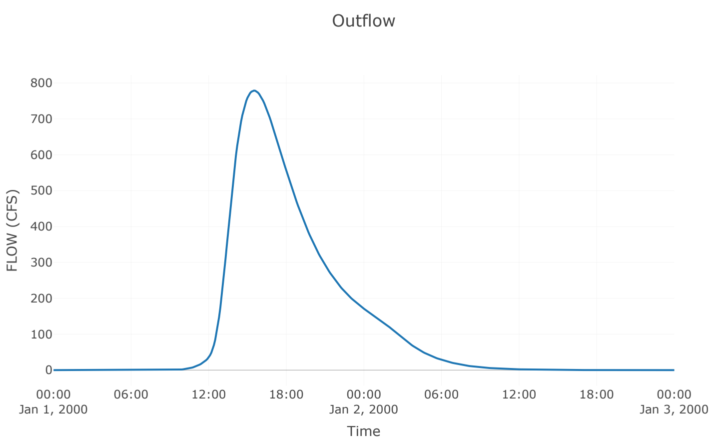
Downstream : J6

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.35
Muskingum x	0
Muskingum Steps	1

Results: Boardman Rd to Trouble Pond

Peak Discharge (CFS)	778.79
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	3.28
Peak Inflow (CFS)	788.58
Inflow Volume (AC - FT)	481.52



Subbasin: Upstream of Trouble Pond

Area (MI2) : 0.5
Latitude Degrees : 41.46
Longitude Degrees : -72.45
Downstream : J6

Loss Rate: Scs

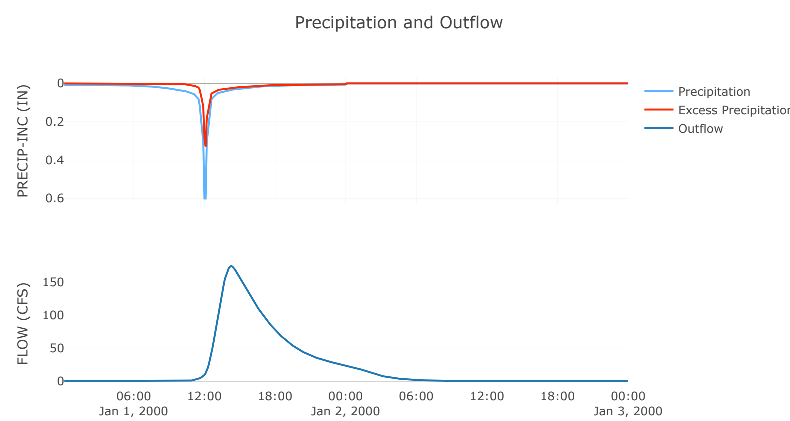
Percent Impervious Area	0
Curve Number	63.97

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.07
Snyder Cp	0.6

Results: Upstream of Trouble Pond

Peak Discharge (CFS)	174.12
Time of Peak Discharge	01Jan2000, 14:12
Volume (IN)	3.11
Precipitation Volume (AC - FT)	191.62
Loss Volume (AC - FT)	108.2
Excess Volume (AC - FT)	83.42
Direct Runoff Volume (AC - FT)	83.42
Baseflow Volume (AC - FT)	0

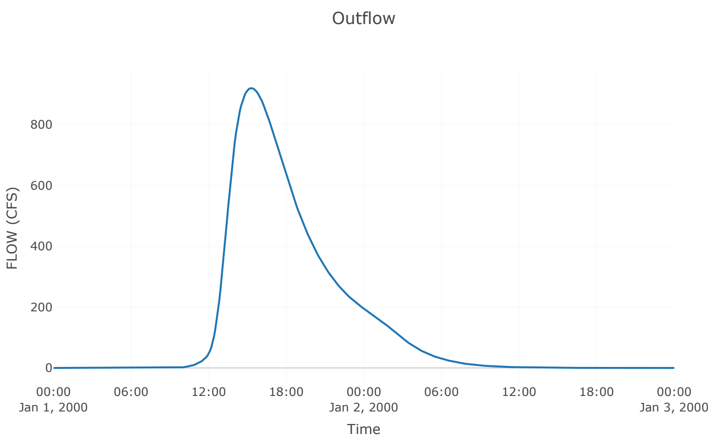


Junction: J6

Downstream : Trouble Pond to CT River

Results: J6

Peak Discharge (CFS)	920.37
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	3.26



Reach: Trouble Pond to CT River

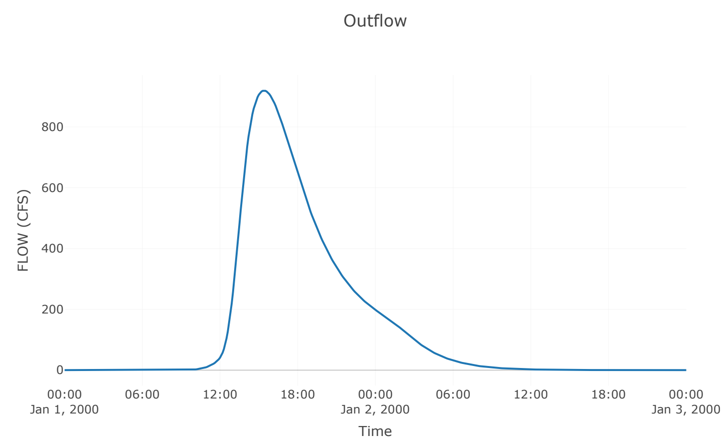
Downstream : Sink - 1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.1
Muskingum x	0
Muskingum Steps	1

Results: Trouble Pond to CT River

Peak Discharge (CFS)	919.58
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	3.26
Peak Inflow (CFS)	920.37
Inflow Volume (AC - FT)	564.94



Subbasin: Goodspeed Landing

Area (MI2) : 0.17
Latitude Degrees : 41.45
Longitude Degrees : -72.46
Downstream : Sink - 1

Loss Rate: Scs

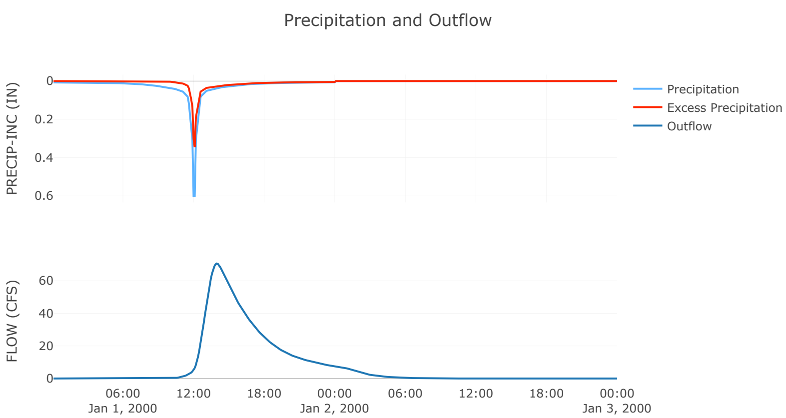
Percent Impervious Area	0
Curve Number	65.5

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.79
Snyder Cp	0.6

Results: Goodspeed Landing

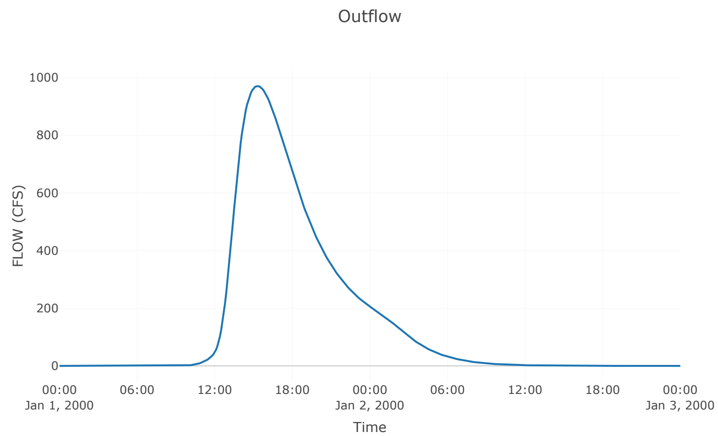
Peak Discharge (CFS)	70.59
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	3.27
Precipitation Volume (AC - FT)	66.47
Loss Volume (AC - FT)	36.06
Excess Volume (AC - FT)	30.41
Direct Runoff Volume (AC - FT)	30.41
Baseflow Volume (AC - FT)	0



Sink: Sink-1

Results: Sink-1

Peak Discharge (CFS)	970.92
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	3.26



Project: R E Hhydro S C S
Simulation Run: A14-100
Simulation Start: 31 December 1999, 24:00
Simulation End: 2 January 2000, 24:00

HMS Version: 4.12
Executed: 15 October 2024, 20:32

Global Parameter Summary - Subbasin

Location

Element Name	Longitude Degrees	Latitude Degrees
Daniels Pond North	-72.43	41.48
Daniels Pond Northwest	-72.44	41.48
Daniels Pond East	-72.43	41.47
Town Street	-72.44	41.47
Mt Parnassus Road	-72.44	41.46
Shagbark	-72.44	41.47
North of Boardman Road	-72.45	41.47
Norwich Road and Boardman Ro	-72.45	41.47
Upstream of Trouble Pond	-72.45	41.46
Goodspeed Landing	-72.46	41.45

Area (MI2)

Element Name	Area (MI2)
Daniels Pond North	0.99
Daniels Pond Northwest	0.42
Daniels Pond East	0.25
Town Street	0.23
Mt Parnassus Road	0.33
Shagbark	0.08
North of Boardman Road	0.25
Norwich Road and Boardman Ro	0.21
Upstream of Trouble Pond	0.5
Goodspeed Landing	0.17

Downstream

Element Name	Downstream
Daniels Pond North	J3
Daniels Pond Northwest	J3
Daniels Pond East	J3
Town Street	J2
Mt Parnassus Road	J1
Shagbark	J1
North of Boardman Road	J5
Norwich Road and Boardman Ro	J5
Upstream of Trouble Pond	J6
Goodspeed Landing	Sink - 1

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Daniels Pond North	0	61.25
Daniels Pond Northwest	0	66.7
Daniels Pond East	0	61.08
Town Street	0	74.47
Mt Parnassus Road	0	69.48
Shagbark	0	61.43
North of Boardman Road	0	71.66
Norwich Road and Boardman Ro	0	67.46
Upstream of Trouble Pond	0	63.97
Goodspeed Landing	0	65.5

Transform: Snyder

Element Name	Snyder Method	Snyder Tp	Snyder Cp
Daniels Pond North	Standard	3.01	0.6
Daniels Pond Northwest	Standard	2.24	0.6
Daniels Pond East	Standard	1.51	0.6
Town Street	Standard	1.87	0.6
Mt Parnassus Road	Standard	1.89	0.6
Shagbark	Standard	1.51	0.6
North of Boardman Road	Standard	1.68	0.6
Norwich Road and Boardman Ro	Standard	1.62	0.6
Upstream of Trouble Pond	Standard	2.07	0.6
Goodspeed Landing	Standard	1.79	0.6

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
Daniels Pond to Shagbark	J2
Shagbark to Town St	J1
Town St to Boardman Rd	J5
Boardman Rd to Trouble Pond	J6
Trouble Pond to CT River	Sink - 1

Route: Muskingum

Element Name	Method	Initial Variable	Muskingum K	Muskingum x	Muskingum Steps
Daniels Pond to Shagbark	Muskingum	Combined Inflow	0.5	0	1
Shagbark to Town St	Muskingum	Combined Inflow	0.16	0	1
Town St to Boardman Rd	Muskingum	Combined Inflow	0.45	0	1
Boardman Rd to Trouble Pond	Muskingum	Combined Inflow	0.35	0	1
Trouble Pond to CT River	Muskingum	Combined Inflow	0.1	0	1

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Daniels Pond North	0.99	294.19	01Jan2000, 15:12	3.5
Daniels Pond Northwest	0.42	185.16	01Jan2000, 14:18	4.11
Daniels Pond East	0.25	118.29	01Jan2000, 13:36	3.48
J3	1.66	548.33	01Jan2000, 14:42	3.65
Daniels Pond to Shagbark	1.66	529.55	01Jan2000, 15:18	3.65
Town Street	0.23	140.53	01Jan2000, 13:54	5.01
J2	1.89	634.77	01Jan2000, 15:06	3.81
Shagbark to Town St	1.89	632.99	01Jan2000, 15:12	3.81
Mt Parnassus Road	0.33	176.18	01Jan2000, 14:00	4.43
Shagbark	0.08	38.88	01Jan2000, 13:36	3.52
J1	2.29	799.63	01Jan2000, 14:54	3.89
Town St to Boardman Rd	2.29	780.62	01Jan2000, 15:24	3.89
North of Boardman Road	0.25	154.22	01Jan2000, 13:48	4.68
Norwich Road and Boardman Ro	0.21	120.56	01Jan2000, 13:42	4.2
J5	2.75	963.95	01Jan2000, 15:06	3.98
Boardman Rd to Trouble Pond	2.75	951.8	01Jan2000, 15:30	3.98
Upstream of Trouble Pond	0.5	215.17	01Jan2000, 14:12	3.8
J6	3.25	1125.75	01Jan2000, 15:18	3.96
Trouble Pond to CT River	3.25	1124.8	01Jan2000, 15:24	3.96
Goodspeed Landing	0.17	86.7	01Jan2000, 13:54	3.98
Sink - 1	3.43	1187.61	01Jan2000, 15:18	3.96

Subbasin: Daniels Pond North

Area (MI2) : 0.99
Latitude Degrees : 41.48
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

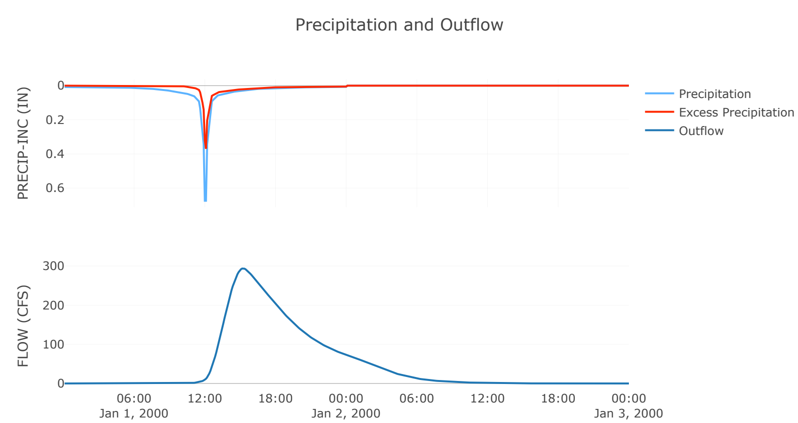
Percent Impervious Area	0
Curve Number	61.25

Transform: Snyder

Snyder Method	Standard
Snyder Tp	3.01
Snyder Cp	0.6

Results: Daniels Pond North

Peak Discharge (CFS)	294.19
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	3.5
Precipitation Volume (AC - FT)	425.23
Loss Volume (AC - FT)	240.14
Excess Volume (AC - FT)	185.08
Direct Runoff Volume (AC - FT)	185.08
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond Northwest

Area (MI2) : 0.42
Latitude Degrees : 41.48
Longitude Degrees : -72.44
Downstream : J3

Loss Rate: Scs

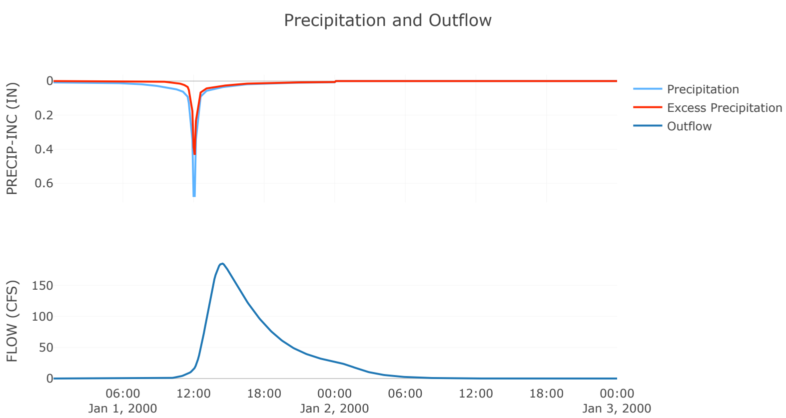
Percent Impervious Area	0
Curve Number	66.7

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.24
Snyder Cp	0.6

Results: Daniels Pond Northwest

Peak Discharge (CFS)	185.16
Time of Peak Discharge	01Jan2000, 14:18
Volume (IN)	4.11
Precipitation Volume (AC - FT)	180.61
Loss Volume (AC - FT)	88.13
Excess Volume (AC - FT)	92.48
Direct Runoff Volume (AC - FT)	92.48
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond East

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

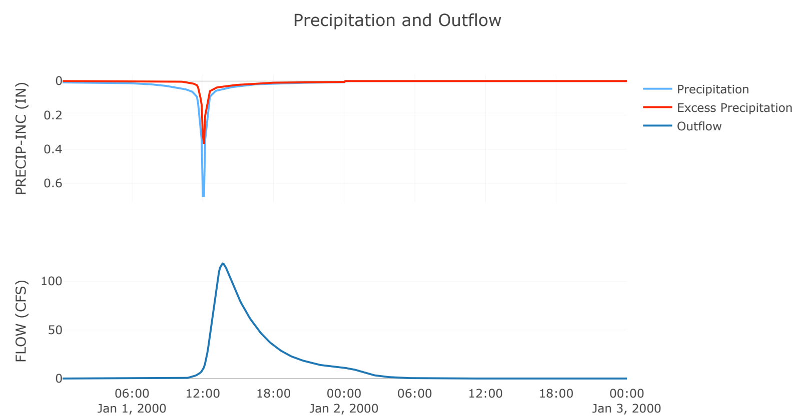
Percent Impervious Area	0
Curve Number	61.08

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Daniels Pond East

Peak Discharge (CFS)	118.29
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	3.48
Precipitation Volume (AC - FT)	105.44
Loss Volume (AC - FT)	59.79
Excess Volume (AC - FT)	45.65
Direct Runoff Volume (AC - FT)	45.65
Baseflow Volume (AC - FT)	0

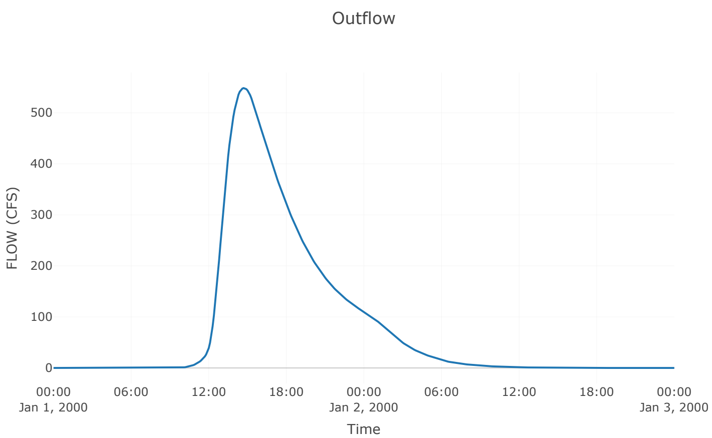


Junction: J3

Downstream : Daniels Pond to Shagbark

Results: J3

Peak Discharge (CFS)	548.33
Time of Peak Discharge	01Jan2000, 14:42
Volume (IN)	3.65



Reach: Daniels Pond to Shagbark

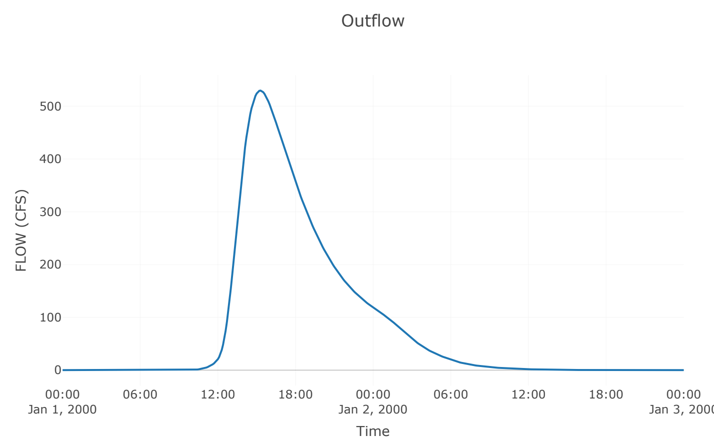
Downstream : J2

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.5
Muskingum x	0
Muskingum Steps	1

Results: Daniels Pond to Shagbark

Peak Discharge (CFS)	529.55
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	3.65
Peak Inflow (CFS)	548.33
Inflow Volume (AC - FT)	323.21



Subbasin: Town Street

Area (MI2) : 0.23
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J2

Loss Rate: Scs

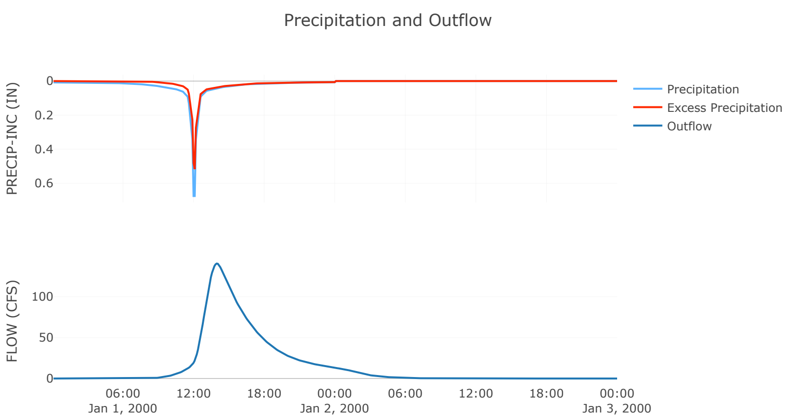
Percent Impervious Area	0
Curve Number	74.47

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.87
Snyder Cp	0.6

Results: Town Street

Peak Discharge (CFS)	140.53
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	5.01
Precipitation Volume (AC - FT)	96.49
Loss Volume (AC - FT)	36.33
Excess Volume (AC - FT)	60.16
Direct Runoff Volume (AC - FT)	60.16
Baseflow Volume (AC - FT)	0

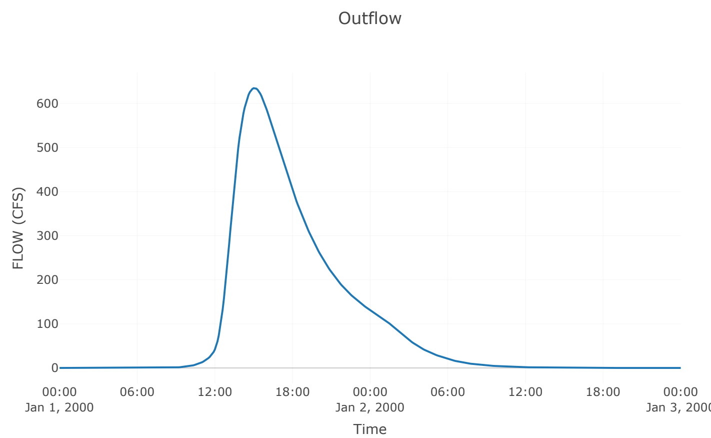


Junction: J2

Downstream : Shagbark to Town St

Results: J2

Peak Discharge (CFS)	634.77
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	3.81



Reach: Shagbark to Town St

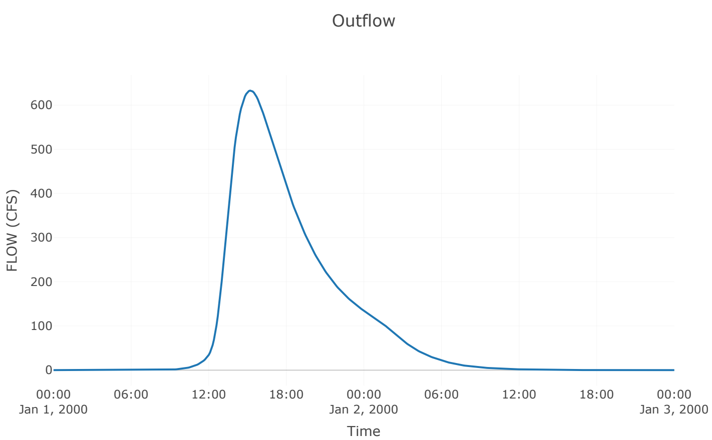
Downstream : J1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.16
Muskingum x	0
Muskingum Steps	1

Results: Shagbark to Town St

Peak Discharge (CFS)	632.99
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	3.81
Peak Inflow (CFS)	634.77
Inflow Volume (AC - FT)	383.37



Subbasin: Mt Parnassus Road

Area (MI2) : 0.33
Latitude Degrees : 41.46
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

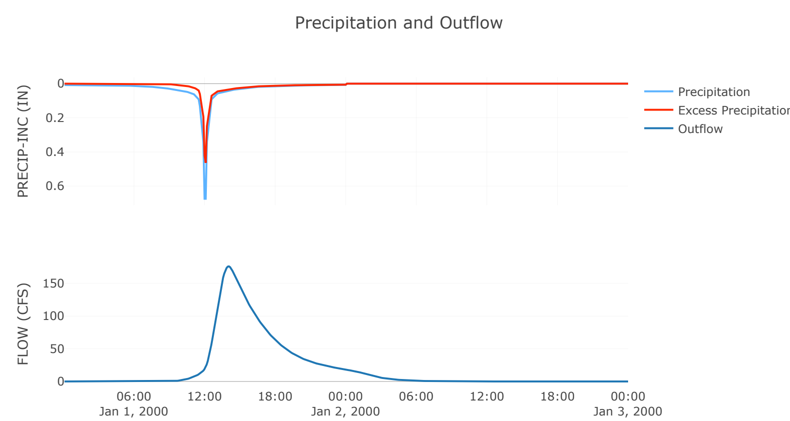
Percent Impervious Area	0
Curve Number	69.48

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.89
Snyder Cp	0.6

Results: Mt Parnassus Road

Peak Discharge (CFS)	176.18
Time of Peak Discharge	01Jan2000, 14:00
Volume (IN)	4.43
Precipitation Volume (AC - FT)	139.36
Loss Volume (AC - FT)	62.47
Excess Volume (AC - FT)	76.89
Direct Runoff Volume (AC - FT)	76.89
Baseflow Volume (AC - FT)	0



Subbasin: Shagbark

Area (MI2) : 0.08
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

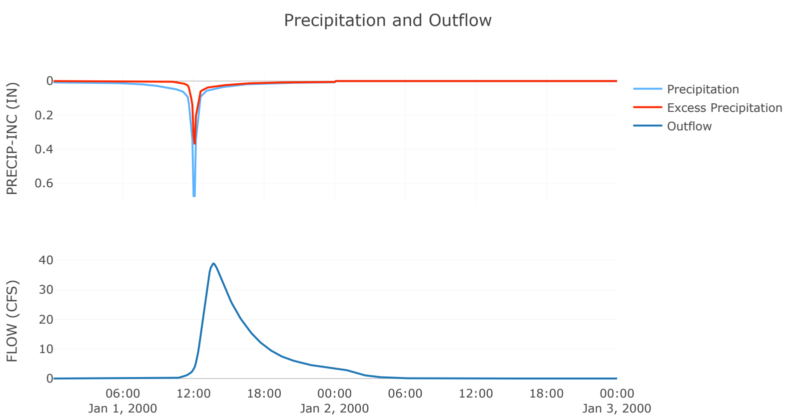
Percent Impervious Area	0
Curve Number	61.43

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Shagbark

Peak Discharge (CFS)	38.88
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	3.52
Precipitation Volume (AC - FT)	34.2
Loss Volume (AC - FT)	19.23
Excess Volume (AC - FT)	14.97
Direct Runoff Volume (AC - FT)	14.97
Baseflow Volume (AC - FT)	0

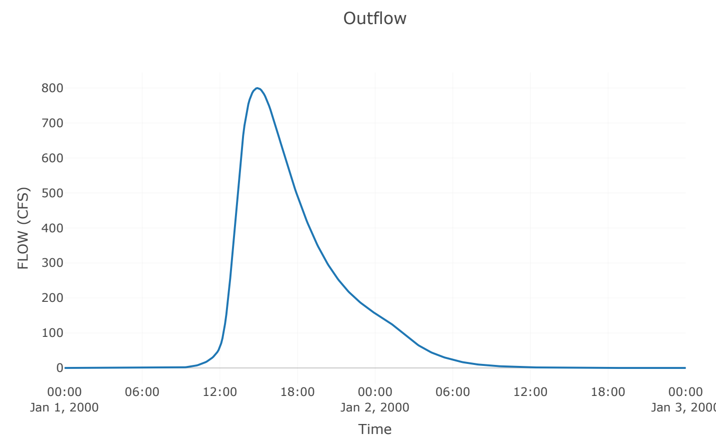


Junction: J1

Downstream : Town St to Boardman Rd

Results: J1

Peak Discharge (CFS)	799.63
Time of Peak Discharge	01Jan2000, 14:54
Volume (IN)	3.89

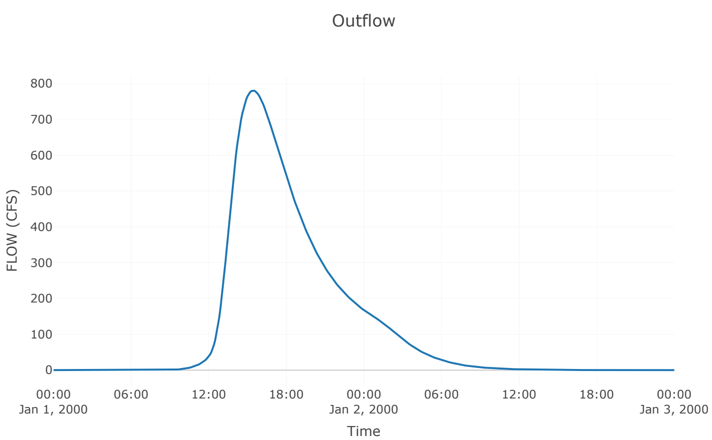


Reach: Town St to Boardman Rd

Downstream : J5

Route: Muskingum	
Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.45
Muskingum x	0
Muskingum Steps	1

Results: Town St to Boardman Rd	
Peak Discharge (CFS)	780.62
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	3.89
Peak Inflow (CFS)	799.63
Inflow Volume (AC - FT)	475.23



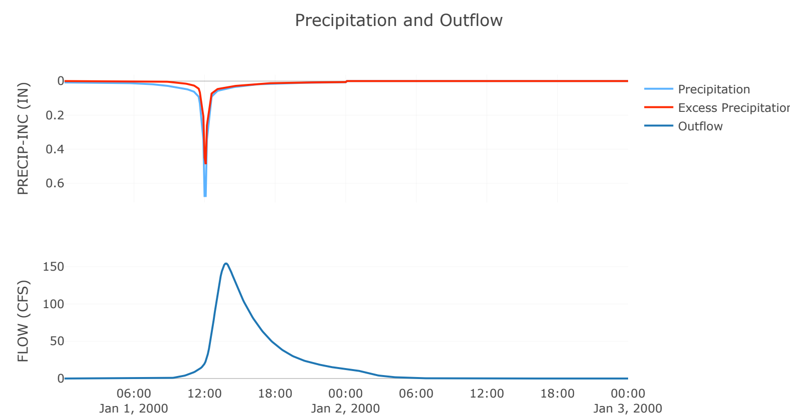
Subbasin: North of Boardman Road

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs	
Percent Impervious Area	0
Curve Number	71.66

Transform: Snyder	
Snyder Method	Standard
Snyder Tp	1.68
Snyder Cp	0.6

Results: North of Boardman Road	
Peak Discharge (CFS)	154.22
Time of Peak Discharge	01Jan2000, 13:48
Volume (IN)	4.68
Precipitation Volume (AC - FT)	105.82
Loss Volume (AC - FT)	44.12
Excess Volume (AC - FT)	61.7
Direct Runoff Volume (AC - FT)	61.7
Baseflow Volume (AC - FT)	0



Subbasin: Norwich Road and Boardman Ro

Area (MI2) : 0.21
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

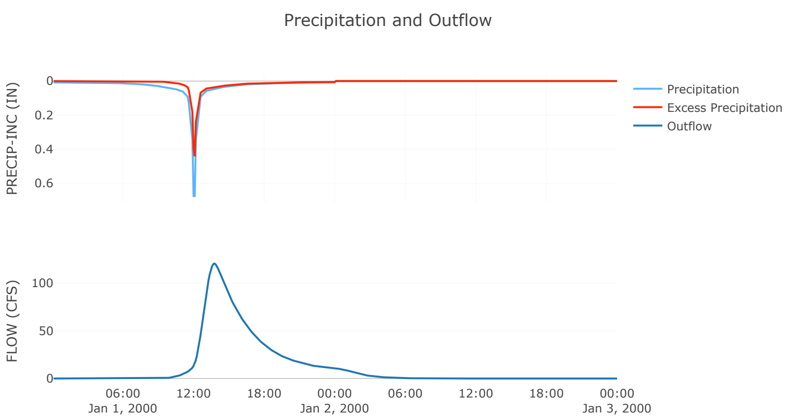
Percent Impervious Area	0
Curve Number	67.46

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.62
Snyder Cp	0.6

Results: Norwich Road and Boardman Ro

Peak Discharge (CFS)	120.56
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	4.2
Precipitation Volume (AC - FT)	91.05
Loss Volume (AC - FT)	43.44
Excess Volume (AC - FT)	47.61
Direct Runoff Volume (AC - FT)	47.61
Baseflow Volume (AC - FT)	0

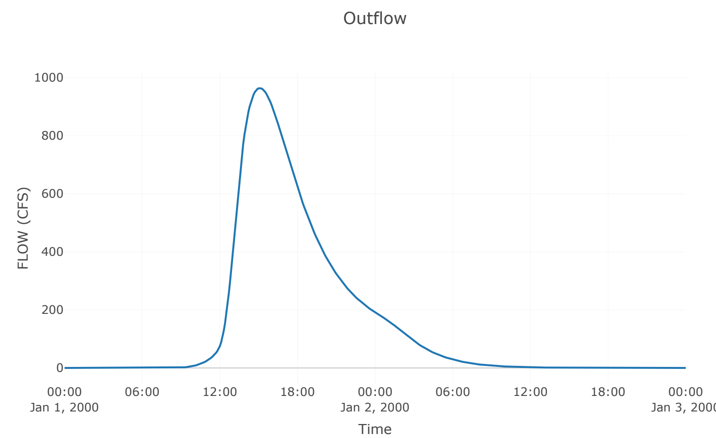


Junction: J5

Downstream : Boardman Rd to Trouble Pond

Results: J5

Peak Discharge (CFS)	963.95
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	3.98



Reach: Boardman Rd to Trouble Pond

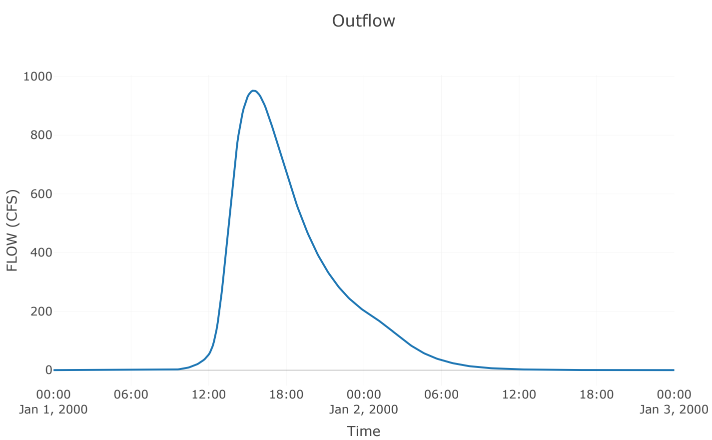
Downstream : J6

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.35
Muskingum x	0
Muskingum Steps	1

Results: Boardman Rd to Trouble Pond

Peak Discharge (CFS)	951.8
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	3.98
Peak Inflow (CFS)	963.95
Inflow Volume (AC - FT)	584.53



Subbasin: Upstream of Trouble Pond

Area (MI2) : 0.5
Latitude Degrees : 41.46
Longitude Degrees : -72.45
Downstream : J6

Loss Rate: Scs

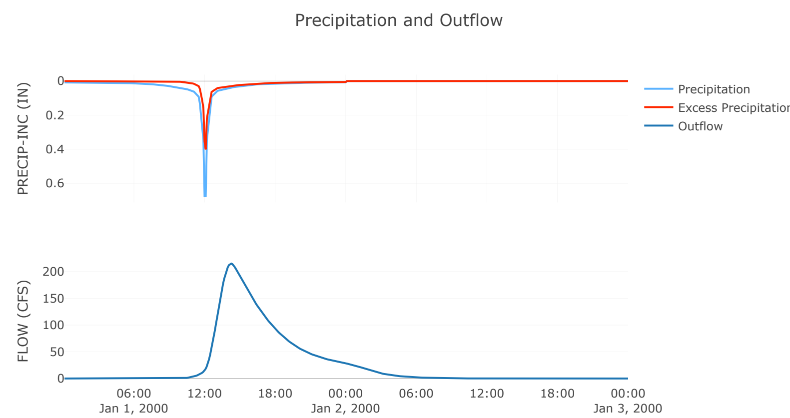
Percent Impervious Area	0
Curve Number	63.97

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.07
Snyder Cp	0.6

Results: Upstream of Trouble Pond

Peak Discharge (CFS)	215.17
Time of Peak Discharge	01Jan2000, 14:12
Volume (IN)	3.8
Precipitation Volume (AC - FT)	215.2
Loss Volume (AC - FT)	113.32
Excess Volume (AC - FT)	101.88
Direct Runoff Volume (AC - FT)	101.88
Baseflow Volume (AC - FT)	0

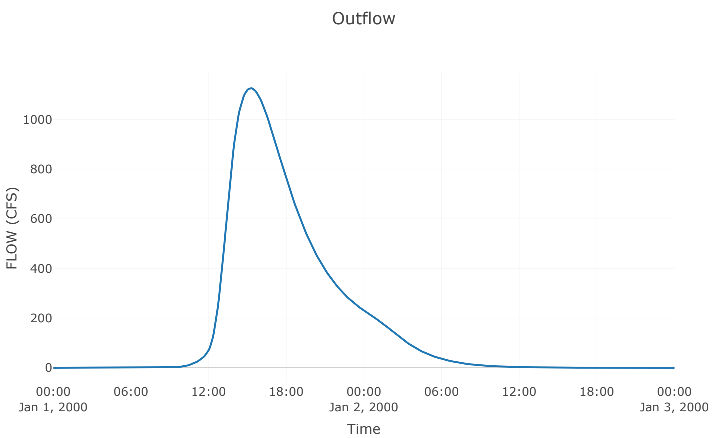


Junction: J6

Downstream : Trouble Pond to CT River

Results: J6

Peak Discharge (CFS)	1125.75
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	3.96



Reach: Trouble Pond to CT River

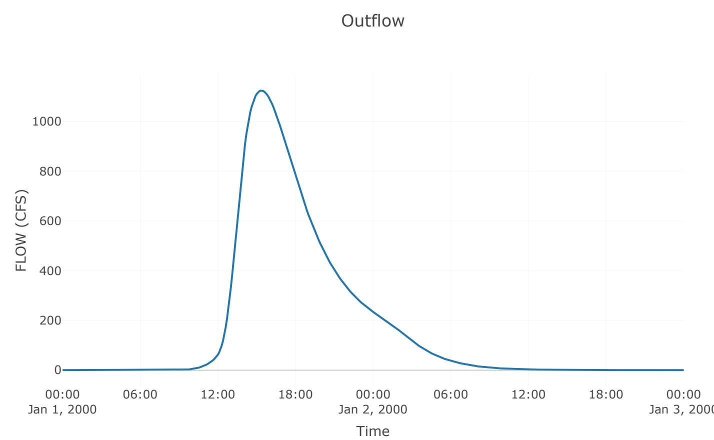
Downstream : Sink - 1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.1
Muskingum x	0
Muskingum Steps	1

Results: Trouble Pond to CT River

Peak Discharge (CFS)	1124.8
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	3.96
Peak Inflow (CFS)	1125.75
Inflow Volume (AC - FT)	686.41



Subbasin: Goodspeed Landing

Area (MI2) : 0.17
Latitude Degrees : 41.45
Longitude Degrees : -72.46
Downstream : Sink - 1

Loss Rate: Scs

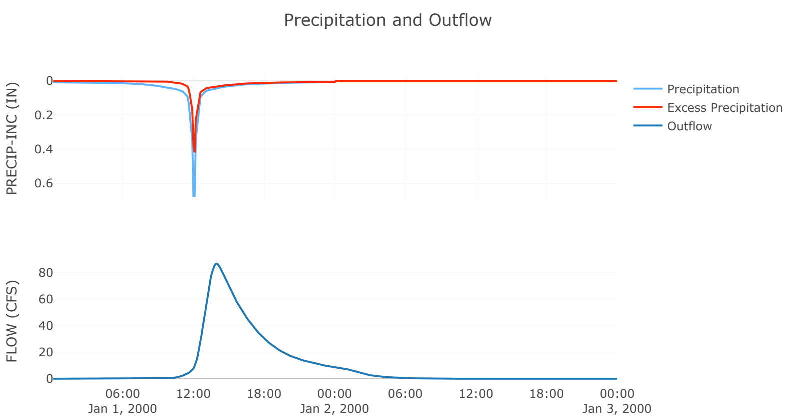
Percent Impervious Area	0
Curve Number	65.5

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.79
Snyder Cp	0.6

Results: Goodspeed Landing

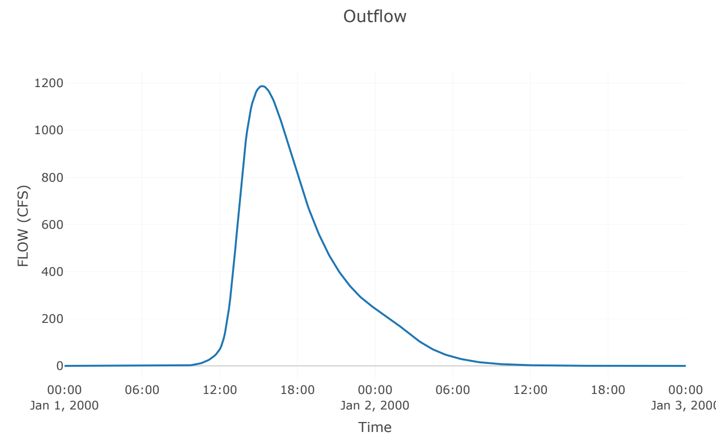
Peak Discharge (CFS)	86.7
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	3.98
Precipitation Volume (AC - FT)	74.65
Loss Volume (AC - FT)	37.69
Excess Volume (AC - FT)	36.96
Direct Runoff Volume (AC - FT)	36.96
Baseflow Volume (AC - FT)	0



Sink: Sink-1

Results: Sink-1

Peak Discharge (CFS)	1187.61
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	3.96



Project: R E Hhydro S C S
Simulation Run: A14-200
Simulation Start: 31 December 1999, 24:00
Simulation End: 2 January 2000, 24:00

HMS Version: 4.12
Executed: 15 October 2024, 20:33

Global Parameter Summary - Subbasin

Location

Element Name	Longitude Degrees	Latitude Degrees
Daniels Pond North	-72.43	41.48
Daniels Pond Northwest	-72.44	41.48
Daniels Pond East	-72.43	41.47
Town Street	-72.44	41.47
Mt Parnassus Road	-72.44	41.46
Shagbark	-72.44	41.47
North of Boardman Road	-72.45	41.47
Norwich Road and Boardman Ro	-72.45	41.47
Upstream of Trouble Pond	-72.45	41.46
Goodspeed Landing	-72.46	41.45

Area (MI2)

Element Name	Area (MI2)
Daniels Pond North	0.99
Daniels Pond Northwest	0.42
Daniels Pond East	0.25
Town Street	0.23
Mt Parnassus Road	0.33
Shagbark	0.08
North of Boardman Road	0.25
Norwich Road and Boardman Ro	0.21
Upstream of Trouble Pond	0.5
Goodspeed Landing	0.17

Downstream

Element Name	Downstream
Daniels Pond North	J3
Daniels Pond Northwest	J3
Daniels Pond East	J3
Town Street	J2
Mt Parnassus Road	J1
Shagbark	J1
North of Boardman Road	J5
Norwich Road and Boardman Ro	J5
Upstream of Trouble Pond	J6
Goodspeed Landing	Sink - 1

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Daniels Pond North	0	61.25
Daniels Pond Northwest	0	66.7
Daniels Pond East	0	61.08
Town Street	0	74.47
Mt Parnassus Road	0	69.48
Shagbark	0	61.43
North of Boardman Road	0	71.66
Norwich Road and Boardman Ro	0	67.46
Upstream of Trouble Pond	0	63.97
Goodspeed Landing	0	65.5

Transform: Snyder

Element Name	Snyder Method	Snyder Tp	Snyder Cp
Daniels Pond North	Standard	3.01	0.6
Daniels Pond Northwest	Standard	2.24	0.6
Daniels Pond East	Standard	1.51	0.6
Town Street	Standard	1.87	0.6
Mt Parnassus Road	Standard	1.89	0.6
Shagbark	Standard	1.51	0.6
North of Boardman Road	Standard	1.68	0.6
Norwich Road and Boardman Ro	Standard	1.62	0.6
Upstream of Trouble Pond	Standard	2.07	0.6
Goodspeed Landing	Standard	1.79	0.6

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
Daniels Pond to Shagbark	J2
Shagbark to Town St	J1
Town St to Boardman Rd	J5
Boardman Rd to Trouble Pond	J6
Trouble Pond to CT River	Sink - 1

Route: Muskingum

Element Name	Method	Initial Variable	Muskingum K	Muskingum x	Muskingum Steps
Daniels Pond to Shagbark	Muskingum	Combined Inflow	0.5	0	1
Shagbark to Town St	Muskingum	Combined Inflow	0.16	0	1
Town St to Boardman Rd	Muskingum	Combined Inflow	0.45	0	1
Boardman Rd to Trouble Pond	Muskingum	Combined Inflow	0.35	0	1
Trouble Pond to CT River	Muskingum	Combined Inflow	0.1	0	1

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Daniels Pond North	0.99	368.89	01Jan2000, 15:12	4.33
Daniels Pond Northwest	0.42	227.53	01Jan2000, 14:18	5.01
Daniels Pond East	0.25	148.76	01Jan2000, 13:36	4.31
J3	1.66	683.13	01Jan2000, 14:42	4.5
Daniels Pond to Shagbark	1.66	659.38	01Jan2000, 15:12	4.5
Town Street	0.23	168.13	01Jan2000, 13:54	5.98
J2	1.89	785.68	01Jan2000, 15:00	4.68
Shagbark to Town St	1.89	783.48	01Jan2000, 15:12	4.68
Mt Parnassus Road	0.33	214.14	01Jan2000, 14:00	5.36
Shagbark	0.08	48.82	01Jan2000, 13:36	4.36
J1	2.29	986.73	01Jan2000, 14:54	4.76
Town St to Boardman Rd	2.29	963.1	01Jan2000, 15:24	4.76
North of Boardman Road	0.25	186.15	01Jan2000, 13:42	5.63
Norwich Road and Boardman Ro	0.21	147.62	01Jan2000, 13:42	5.11
J5	2.75	1184.78	01Jan2000, 15:06	4.87
Boardman Rd to Trouble Pond	2.75	1169.62	01Jan2000, 15:30	4.87
Upstream of Trouble Pond	0.5	267.01	01Jan2000, 14:12	4.67
J6	3.25	1384.92	01Jan2000, 15:12	4.84
Trouble Pond to CT River	3.25	1383.67	01Jan2000, 15:18	4.84
Goodspeed Landing	0.17	106.96	01Jan2000, 13:54	4.86
Sink - 1	3.43	1460.7	01Jan2000, 15:12	4.84

Subbasin: Daniels Pond North

Area (MI2) : 0.99
Latitude Degrees : 41.48
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

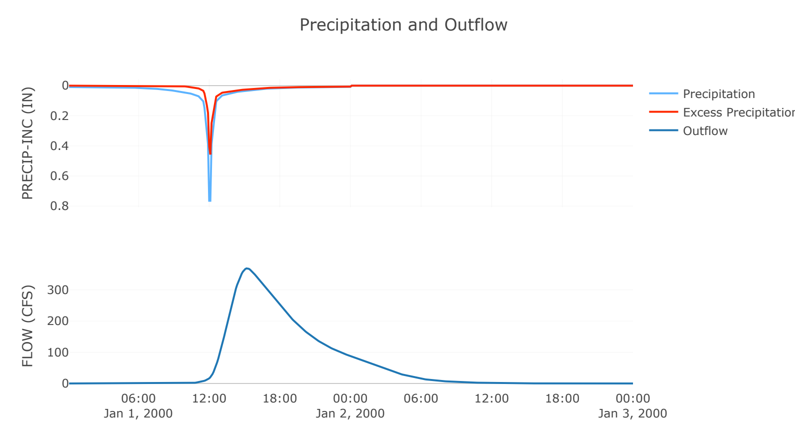
Percent Impervious Area	0
Curve Number	61.25

Transform: Snyder

Snyder Method	Standard
Snyder Tp	3.01
Snyder Cp	0.6

Results: Daniels Pond North

Peak Discharge (CFS)	368.89
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	4.33
Precipitation Volume (AC - FT)	481.89
Loss Volume (AC - FT)	252.38
Excess Volume (AC - FT)	229.51
Direct Runoff Volume (AC - FT)	229.51
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond Northwest

Area (MI2) : 0.42
Latitude Degrees : 41.48
Longitude Degrees : -72.44
Downstream : J3

Loss Rate: Scs

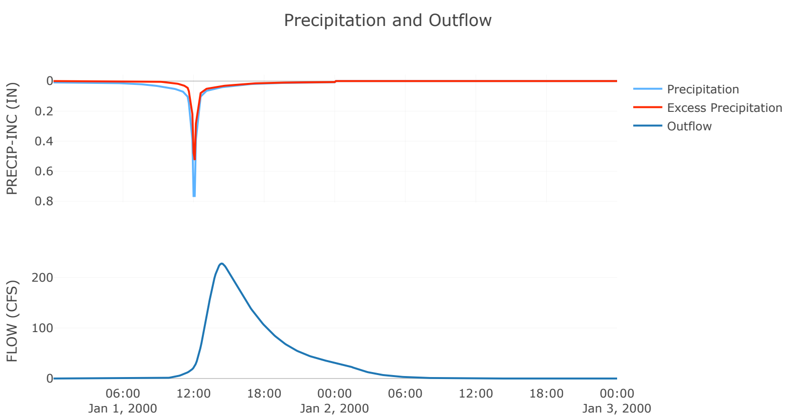
Percent Impervious Area	0
Curve Number	66.7

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.24
Snyder Cp	0.6

Results: Daniels Pond Northwest

Peak Discharge (CFS)	227.53
Time of Peak Discharge	01Jan2000, 14:18
Volume (IN)	5.01
Precipitation Volume (AC - FT)	204.68
Loss Volume (AC - FT)	91.94
Excess Volume (AC - FT)	112.74
Direct Runoff Volume (AC - FT)	112.74
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond East

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

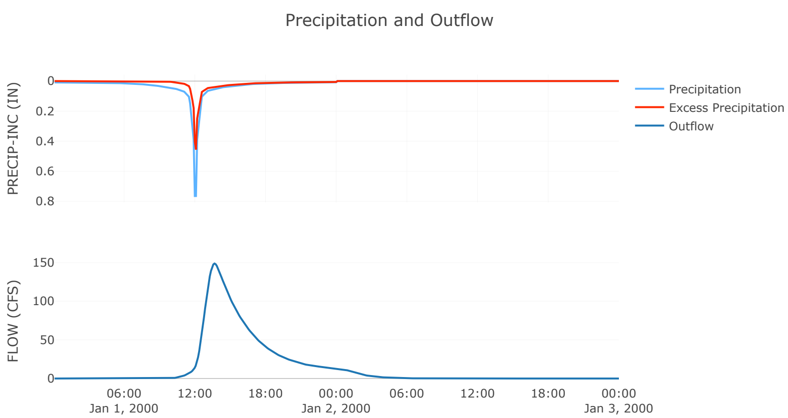
Percent Impervious Area	0
Curve Number	61.08

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Daniels Pond East

Peak Discharge (CFS)	148.76
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	4.31
Precipitation Volume (AC - FT)	119.49
Loss Volume (AC - FT)	62.85
Excess Volume (AC - FT)	56.63
Direct Runoff Volume (AC - FT)	56.63
Baseflow Volume (AC - FT)	0

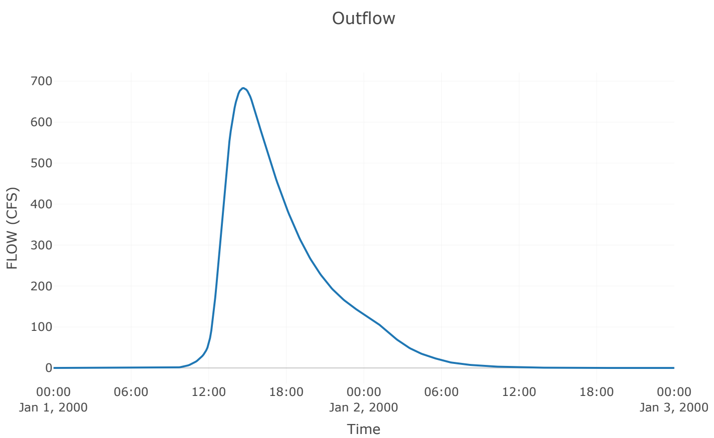


Junction: J3

Downstream : Daniels Pond to Shagbark

Results: J3

Peak Discharge (CFS)	683.13
Time of Peak Discharge	01Jan2000, 14:42
Volume (IN)	4.5



Reach: Daniels Pond to Shagbark

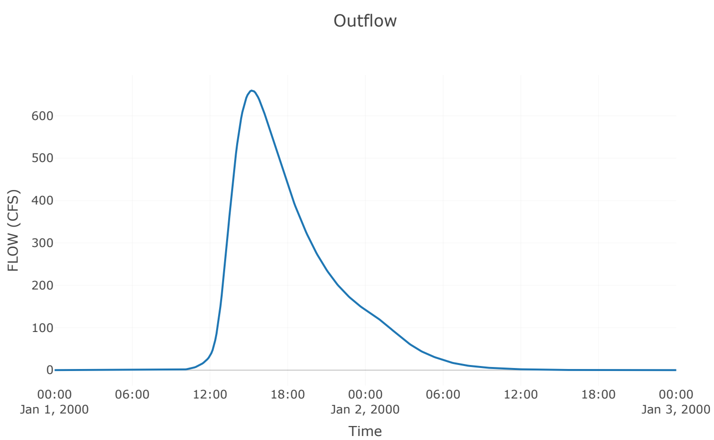
Downstream : J2

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.5
Muskingum x	0
Muskingum Steps	1

Results: Daniels Pond to Shagbark

Peak Discharge (CFS)	659.38
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	4.5
Peak Inflow (CFS)	683.13
Inflow Volume (AC - FT)	398.88



Subbasin: Town Street

Area (MI2) : 0.23
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J2

Loss Rate: Scs

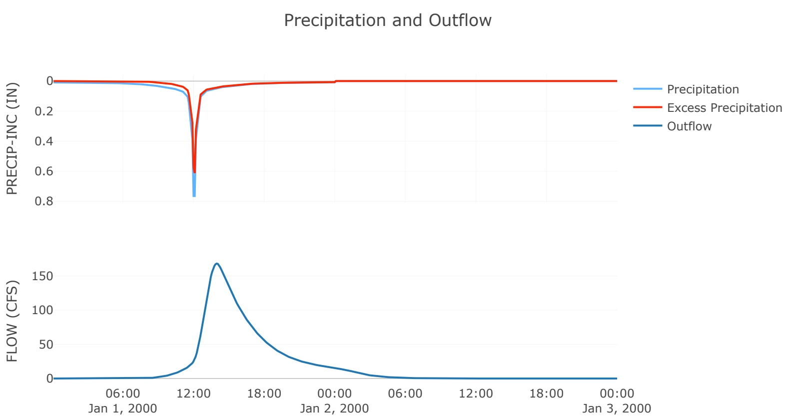
Percent Impervious Area	0
Curve Number	74.47

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.87
Snyder Cp	0.6

Results: Town Street

Peak Discharge (CFS)	168.13
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	5.98
Precipitation Volume (AC - FT)	109.35
Loss Volume (AC - FT)	37.51
Excess Volume (AC - FT)	71.83
Direct Runoff Volume (AC - FT)	71.83
Baseflow Volume (AC - FT)	0

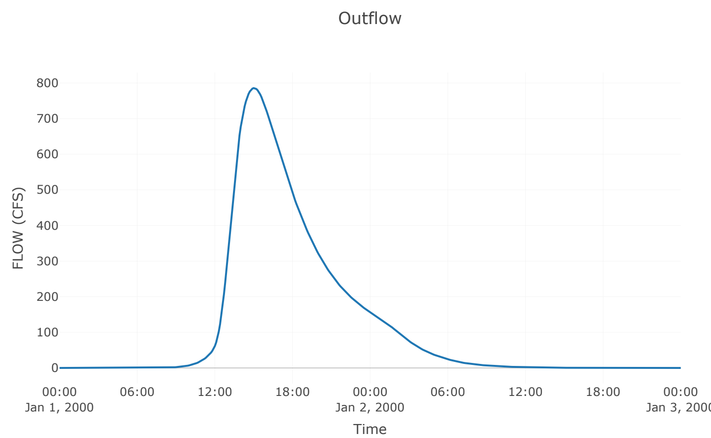


Junction: J2

Downstream : Shagbark to Town St

Results: J2

Peak Discharge (CFS)	785.68
Time of Peak Discharge	01Jan2000, 15:00
Volume (IN)	4.68

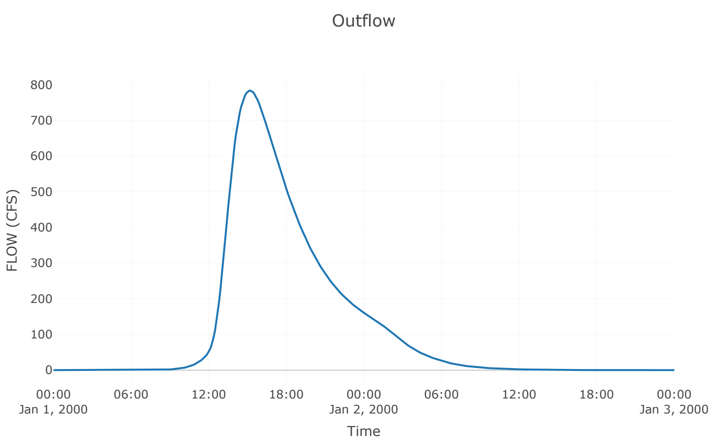


Reach: Shagbark to Town St

Downstream : J1

Route: Muskingum	
Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.16
Muskingum x	0
Muskingum Steps	1

Results: Shagbark to Town St	
Peak Discharge (CFS)	783.48
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	4.68
Peak Inflow (CFS)	785.68
Inflow Volume (AC - FT)	470.71



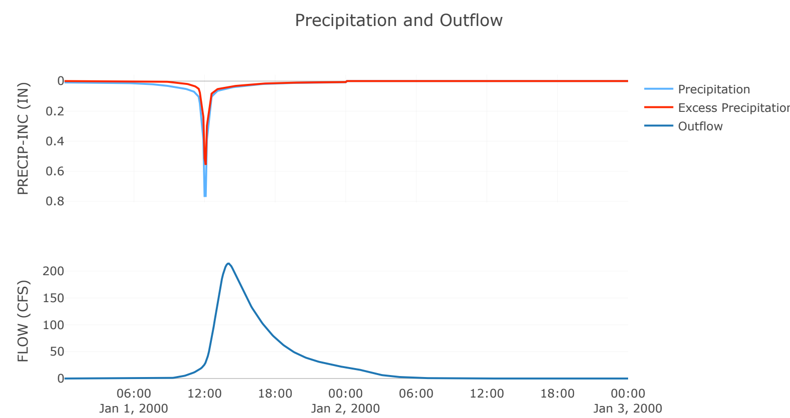
Subbasin: Mt Parnassus Road

Area (MI2) : 0.33
Latitude Degrees : 41.46
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs	
Percent Impervious Area	0
Curve Number	69.48

Transform: Snyder	
Snyder Method	Standard
Snyder Tp	1.89
Snyder Cp	0.6

Results: Mt Parnassus Road	
Peak Discharge (CFS)	214.14
Time of Peak Discharge	01Jan2000, 14:00
Volume (IN)	5.36
Precipitation Volume (AC - FT)	157.93
Loss Volume (AC - FT)	64.93
Excess Volume (AC - FT)	93
Direct Runoff Volume (AC - FT)	93
Baseflow Volume (AC - FT)	0



Subbasin: Shagbark

Area (MI2) : 0.08
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

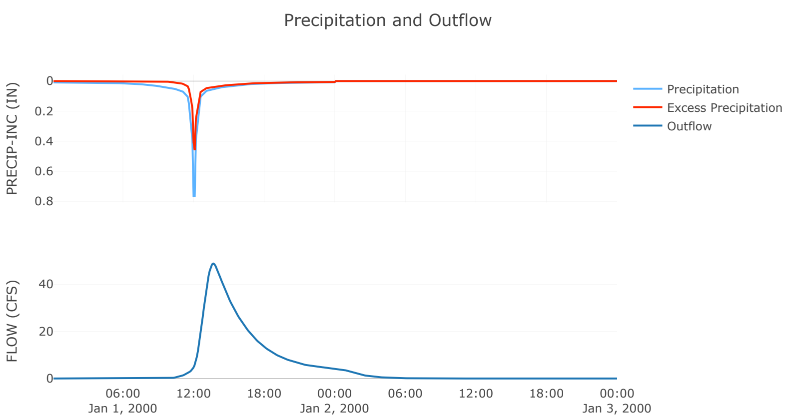
Percent Impervious Area	0
Curve Number	61.43

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Shagbark

Peak Discharge (CFS)	48.82
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	4.36
Precipitation Volume (AC - FT)	38.76
Loss Volume (AC - FT)	20.2
Excess Volume (AC - FT)	18.55
Direct Runoff Volume (AC - FT)	18.55
Baseflow Volume (AC - FT)	0

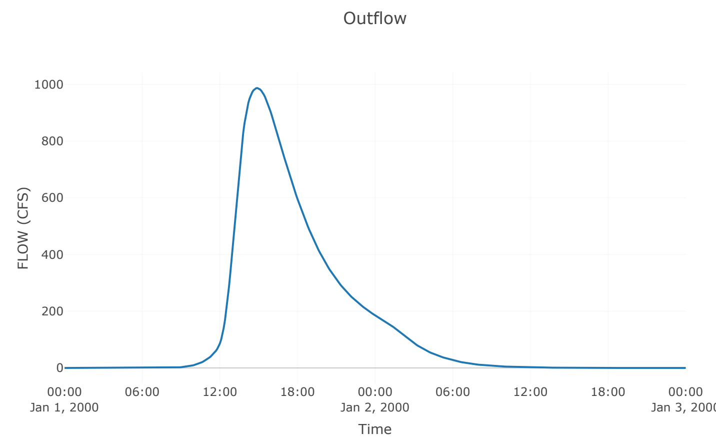


Junction: J1

Downstream : Town St to Boardman Rd

Results: J1

Peak Discharge (CFS)	986.73
Time of Peak Discharge	01Jan2000, 14:54
Volume (IN)	4.76



Reach: Town St to Boardman Rd

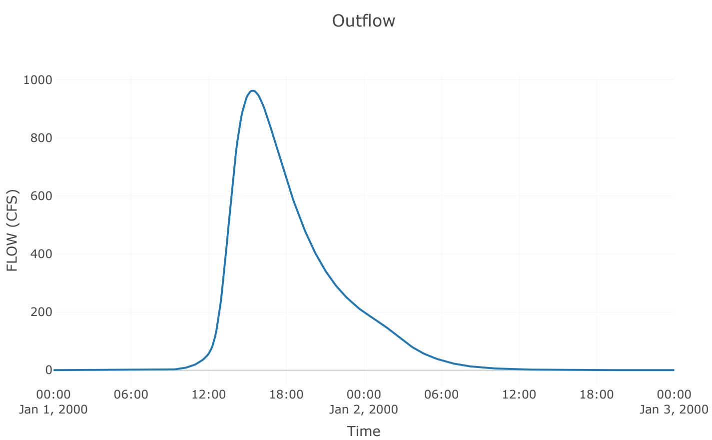
Downstream : J5

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.45
Muskingum x	0
Muskingum Steps	1

Results: Town St to Boardman Rd

Peak Discharge (CFS)	963.1
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	4.76
Peak Inflow (CFS)	986.73
Inflow Volume (AC - FT)	582.26



Subbasin: North of Boardman Road

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

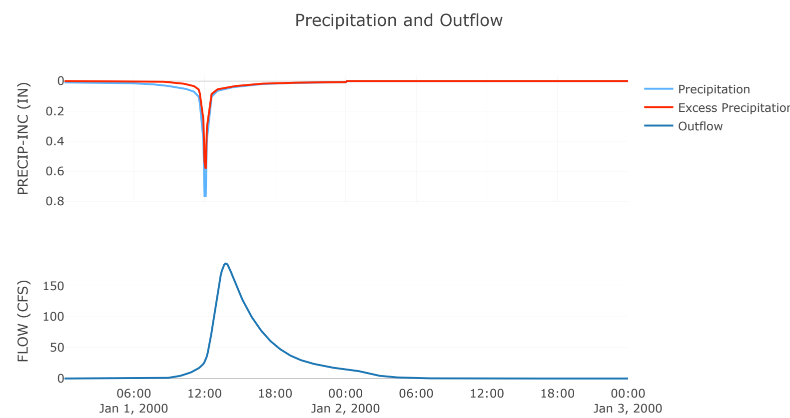
Percent Impervious Area	0
Curve Number	71.66

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.68
Snyder Cp	0.6

Results: North of Boardman Road

Peak Discharge (CFS)	186.15
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	5.63
Precipitation Volume (AC - FT)	119.93
Loss Volume (AC - FT)	45.73
Excess Volume (AC - FT)	74.2
Direct Runoff Volume (AC - FT)	74.2
Baseflow Volume (AC - FT)	0



Subbasin: Norwich Road and Boardman Ro

Area (MI2) : 0.21
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

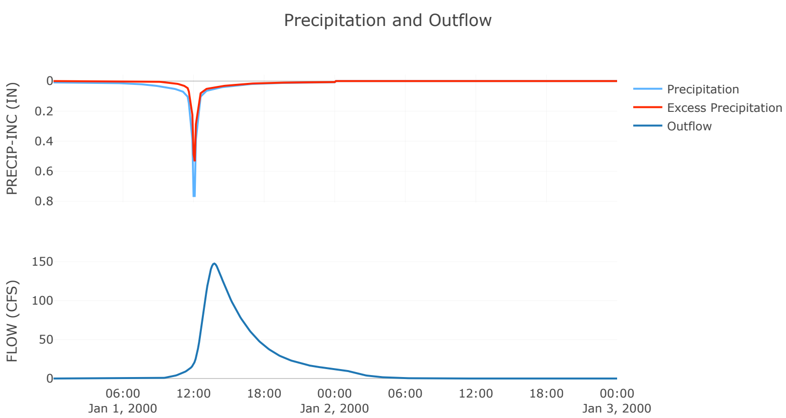
Percent Impervious Area	0
Curve Number	67.46

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.62
Snyder Cp	0.6

Results: Norwich Road and Boardman Ro

Peak Discharge (CFS)	147.62
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	5.11
Precipitation Volume (AC - FT)	103.18
Loss Volume (AC - FT)	45.28
Excess Volume (AC - FT)	57.91
Direct Runoff Volume (AC - FT)	57.91
Baseflow Volume (AC - FT)	0

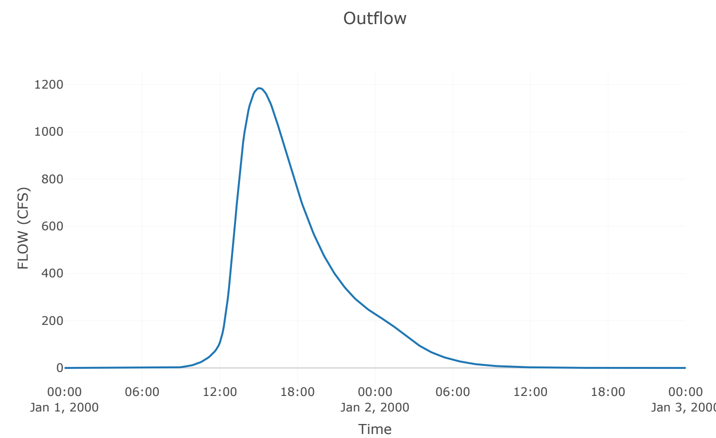


Junction: J5

Downstream : Boardman Rd to Trouble Pond

Results: J5

Peak Discharge (CFS)	1184.78
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	4.87



Reach: Boardman Rd to Trouble Pond

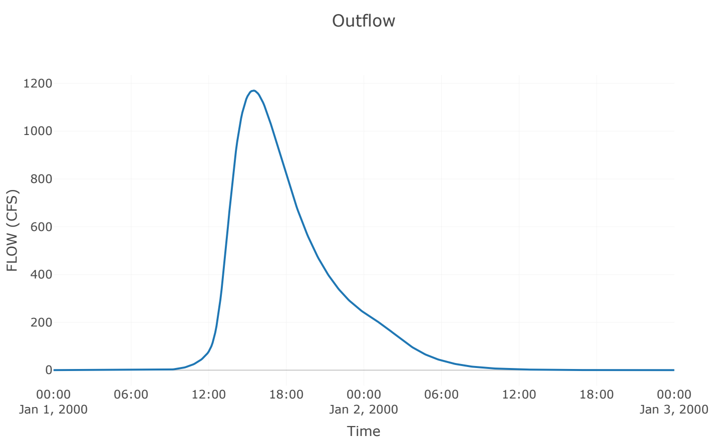
Downstream : J6

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.35
Muskingum x	0
Muskingum Steps	1

Results: Boardman Rd to Trouble Pond

Peak Discharge (CFS)	1169.62
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	4.87
Peak Inflow (CFS)	1184.78
Inflow Volume (AC - FT)	714.36



Subbasin: Upstream of Trouble Pond

Area (MI2) : 0.5
Latitude Degrees : 41.46
Longitude Degrees : -72.45
Downstream : J6

Loss Rate: Scs

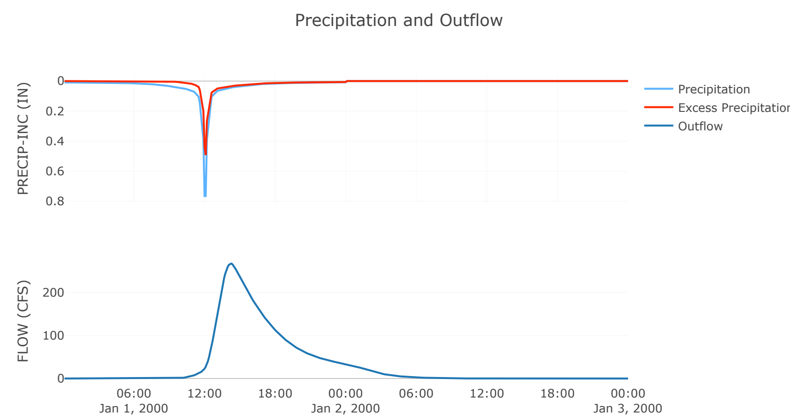
Percent Impervious Area	0
Curve Number	63.97

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.07
Snyder Cp	0.6

Results: Upstream of Trouble Pond

Peak Discharge (CFS)	267.01
Time of Peak Discharge	01Jan2000, 14:12
Volume (IN)	4.67
Precipitation Volume (AC - FT)	243.88
Loss Volume (AC - FT)	118.66
Excess Volume (AC - FT)	125.22
Direct Runoff Volume (AC - FT)	125.22
Baseflow Volume (AC - FT)	0

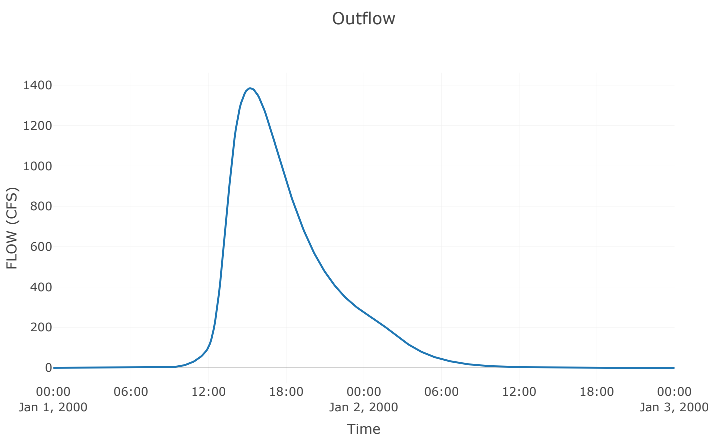


Junction: J6

Downstream : Trouble Pond to CT River

Results: J6

Peak Discharge (CFS)	1384.92
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	4.84



Reach: Trouble Pond to CT River

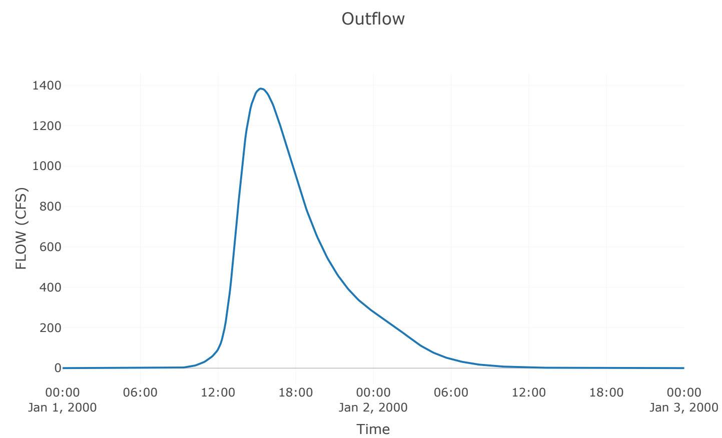
Downstream : Sink - 1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.1
Muskingum x	0
Muskingum Steps	1

Results: Trouble Pond to CT River

Peak Discharge (CFS)	1383.67
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	4.84
Peak Inflow (CFS)	1384.92
Inflow Volume (AC - FT)	839.59



Subbasin: Goodspeed Landing

Area (MI2) : 0.17
Latitude Degrees : 41.45
Longitude Degrees : -72.46
Downstream : Sink - 1

Loss Rate: Scs

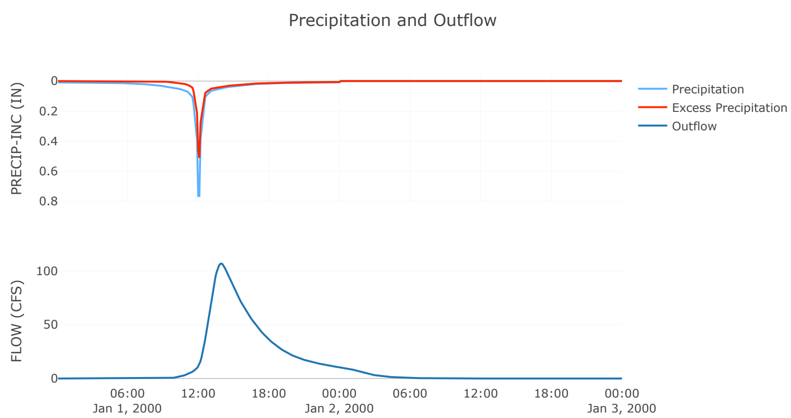
Percent Impervious Area	0
Curve Number	65.5

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.79
Snyder Cp	0.6

Results: Goodspeed Landing

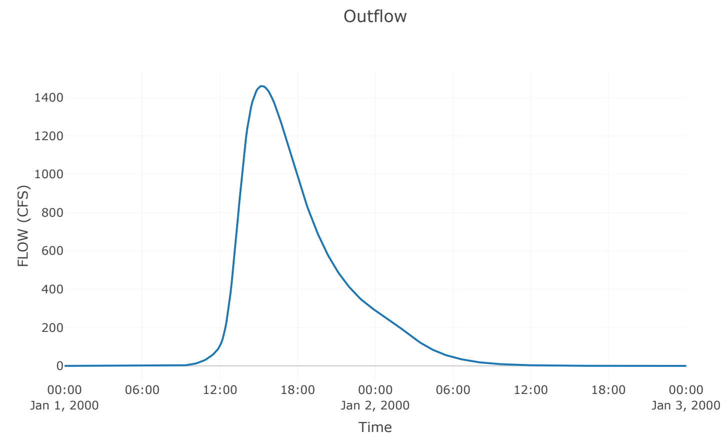
Peak Discharge (CFS)	106.96
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	4.86
Precipitation Volume (AC - FT)	84.59
Loss Volume (AC - FT)	39.38
Excess Volume (AC - FT)	45.21
Direct Runoff Volume (AC - FT)	45.21
Baseflow Volume (AC - FT)	0



Sink: Sink-1

Results: Sink-1

Peak Discharge (CFS)	1460.7
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	4.84



Project: R E Hhydro S C S
Simulation Run: A14-500
Simulation Start: 31 December 1999, 24:00
Simulation End: 2 January 2000, 24:00

HMS Version: 4.12
Executed: 15 October 2024, 20:33

Global Parameter Summary - Subbasin

Location

Element Name	Longitude Degrees	Latitude Degrees
Daniels Pond North	-72.43	41.48
Daniels Pond Northwest	-72.44	41.48
Daniels Pond East	-72.43	41.47
Town Street	-72.44	41.47
Mt Parnassus Road	-72.44	41.46
Shagbark	-72.44	41.47
North of Boardman Road	-72.45	41.47
Norwich Road and Boardman Ro	-72.45	41.47
Upstream of Trouble Pond	-72.45	41.46
Goodspeed Landing	-72.46	41.45

Area (MI2)

Element Name	Area (MI2)
Daniels Pond North	0.99
Daniels Pond Northwest	0.42
Daniels Pond East	0.25
Town Street	0.23
Mt Parnassus Road	0.33
Shagbark	0.08
North of Boardman Road	0.25
Norwich Road and Boardman Ro	0.21
Upstream of Trouble Pond	0.5
Goodspeed Landing	0.17

Downstream

Element Name	Downstream
Daniels Pond North	J3
Daniels Pond Northwest	J3
Daniels Pond East	J3
Town Street	J2
Mt Parnassus Road	J1
Shagbark	J1
North of Boardman Road	J5
Norwich Road and Boardman Ro	J5
Upstream of Trouble Pond	J6
Goodspeed Landing	Sink - 1

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Daniels Pond North	0	61.25
Daniels Pond Northwest	0	66.7
Daniels Pond East	0	61.08
Town Street	0	74.47
Mt Parnassus Road	0	69.48
Shagbark	0	61.43
North of Boardman Road	0	71.66
Norwich Road and Boardman Ro	0	67.46
Upstream of Trouble Pond	0	63.97
Goodspeed Landing	0	65.5

Transform: Snyder

Element Name	Snyder Method	Snyder Tp	Snyder Cp
Daniels Pond North	Standard	3.01	0.6
Daniels Pond Northwest	Standard	2.24	0.6
Daniels Pond East	Standard	1.51	0.6
Town Street	Standard	1.87	0.6
Mt Parnassus Road	Standard	1.89	0.6
Shagbark	Standard	1.51	0.6
North of Boardman Road	Standard	1.68	0.6
Norwich Road and Boardman Ro	Standard	1.62	0.6
Upstream of Trouble Pond	Standard	2.07	0.6
Goodspeed Landing	Standard	1.79	0.6

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
Daniels Pond to Shagbark	J2
Shagbark to Town St	J1
Town St to Boardman Rd	J5
Boardman Rd to Trouble Pond	J6
Trouble Pond to CT River	Sink - 1

Route: Muskingum

Element Name	Method	Initial Variable	Muskingum K	Muskingum x	Muskingum Steps
Daniels Pond to Shagbark	Muskingum	Combined Inflow	0.5	0	1
Shagbark to Town St	Muskingum	Combined Inflow	0.16	0	1
Town St to Boardman Rd	Muskingum	Combined Inflow	0.45	0	1
Boardman Rd to Trouble Pond	Muskingum	Combined Inflow	0.35	0	1
Trouble Pond to CT River	Muskingum	Combined Inflow	0.1	0	1

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Daniels Pond North	0.99	486.19	01Jan2000, 15:06	5.65
Daniels Pond Northwest	0.42	292.8	01Jan2000, 14:18	6.4
Daniels Pond East	0.25	196.34	01Jan2000, 13:36	5.62
J3	1.66	893.46	01Jan2000, 14:36	5.84
Daniels Pond to Shagbark	1.66	862.35	01Jan2000, 15:12	5.84
Town Street	0.23	209.92	01Jan2000, 13:54	7.46
J2	1.89	1020.36	01Jan2000, 15:00	6.03
Shagbark to Town St	1.89	1017.19	01Jan2000, 15:12	6.03
Mt Parnassus Road	0.33	272.22	01Jan2000, 13:54	6.79
Shagbark	0.08	64.31	01Jan2000, 13:36	5.67
J1	2.29	1276.99	01Jan2000, 14:48	6.12
Town St to Boardman Rd	2.29	1245.92	01Jan2000, 15:24	6.12
North of Boardman Road	0.25	234.81	01Jan2000, 13:42	7.08
Norwich Road and Boardman Ro	0.21	189.16	01Jan2000, 13:42	6.51
J5	2.75	1526.96	01Jan2000, 15:00	6.24
Boardman Rd to Trouble Pond	2.75	1507.28	01Jan2000, 15:24	6.24
Upstream of Trouble Pond	0.5	347.46	01Jan2000, 14:06	6.03
J6	3.25	1786.22	01Jan2000, 15:12	6.21
Trouble Pond to CT River	3.25	1784.64	01Jan2000, 15:18	6.21
Goodspeed Landing	0.17	138.21	01Jan2000, 13:54	6.24
Sink - 1	3.43	1884	01Jan2000, 15:12	6.21

Subbasin: Daniels Pond North

Area (MI2) : 0.99
Latitude Degrees : 41.48
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

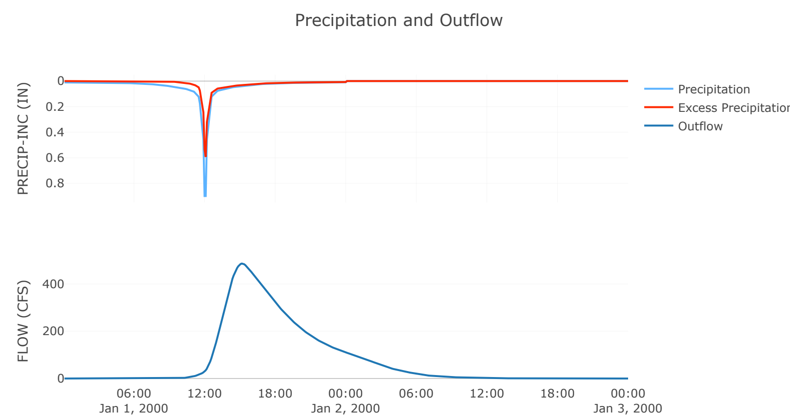
Percent Impervious Area	0
Curve Number	61.25

Transform: Snyder

Snyder Method	Standard
Snyder Tp	3.01
Snyder Cp	0.6

Results: Daniels Pond North

Peak Discharge (CFS)	486.19
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	5.65
Precipitation Volume (AC - FT)	566.61
Loss Volume (AC - FT)	267.58
Excess Volume (AC - FT)	299.04
Direct Runoff Volume (AC - FT)	299.04
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond Northwest

Area (MI2) : 0.42
Latitude Degrees : 41.48
Longitude Degrees : -72.44
Downstream : J3

Loss Rate: Scs

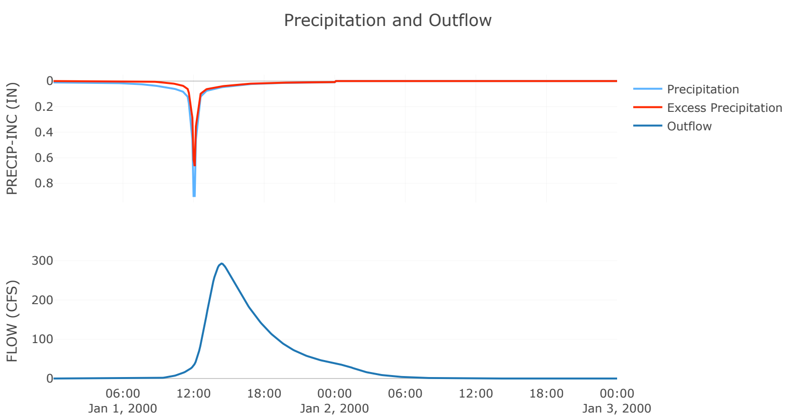
Percent Impervious Area	0
Curve Number	66.7

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.24
Snyder Cp	0.6

Results: Daniels Pond Northwest

Peak Discharge (CFS)	292.8
Time of Peak Discharge	01Jan2000, 14:18
Volume (IN)	6.4
Precipitation Volume (AC - FT)	240.67
Loss Volume (AC - FT)	96.61
Excess Volume (AC - FT)	144.06
Direct Runoff Volume (AC - FT)	144.06
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond East

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

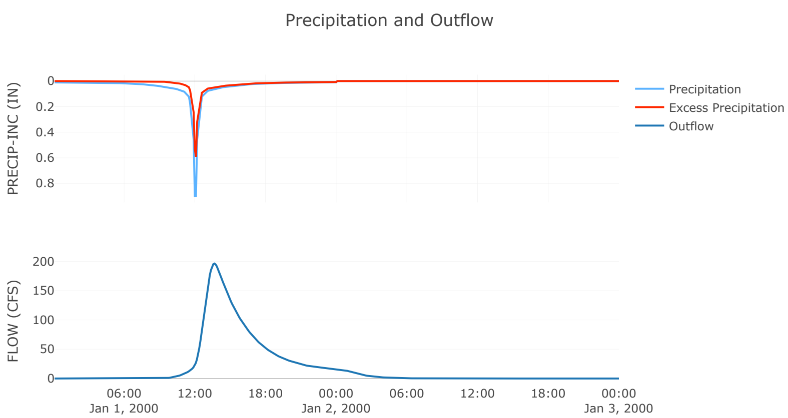
Percent Impervious Area	0
Curve Number	61.08

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Daniels Pond East

Peak Discharge (CFS)	196.34
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	5.62
Precipitation Volume (AC - FT)	140.5
Loss Volume (AC - FT)	66.66
Excess Volume (AC - FT)	73.84
Direct Runoff Volume (AC - FT)	73.84
Baseflow Volume (AC - FT)	0

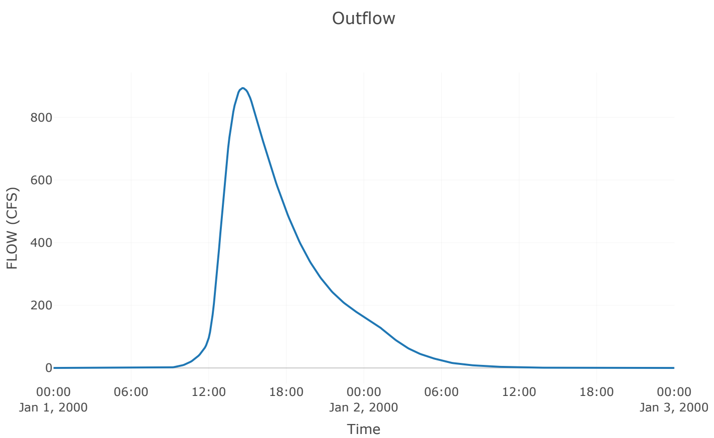


Junction: J3

Downstream : Daniels Pond to Shagbark

Results: J3

Peak Discharge (CFS)	893.46
Time of Peak Discharge	01Jan2000, 14:36
Volume (IN)	5.84



Reach: Daniels Pond to Shagbark

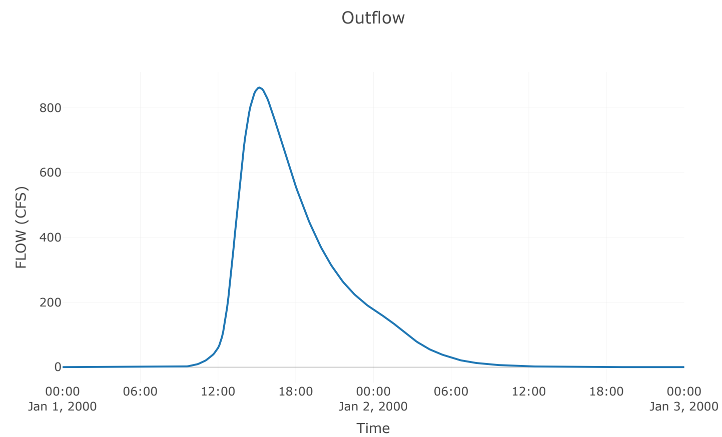
Downstream : J2

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.5
Muskingum x	0
Muskingum Steps	1

Results: Daniels Pond to Shagbark

Peak Discharge (CFS)	862.35
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	5.84
Peak Inflow (CFS)	893.46
Inflow Volume (AC - FT)	516.94



Subbasin: Town Street

Area (MI2) : 0.23
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J2

Loss Rate: Scs

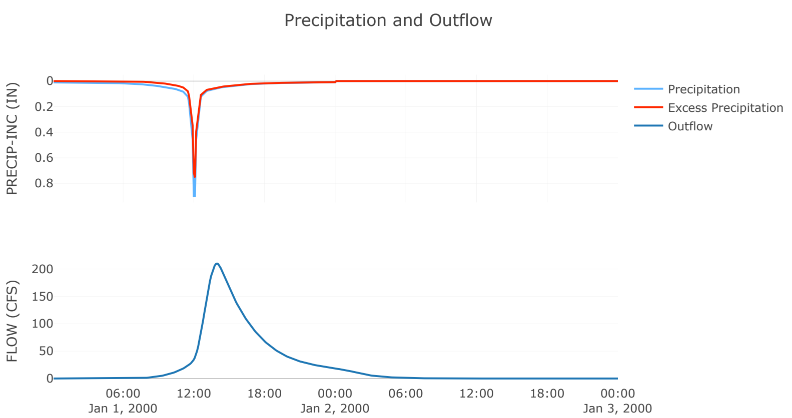
Percent Impervious Area	0
Curve Number	74.47

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.87
Snyder Cp	0.6

Results: Town Street

Peak Discharge (CFS)	209.92
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	7.46
Precipitation Volume (AC - FT)	128.57
Loss Volume (AC - FT)	38.93
Excess Volume (AC - FT)	89.64
Direct Runoff Volume (AC - FT)	89.64
Baseflow Volume (AC - FT)	0

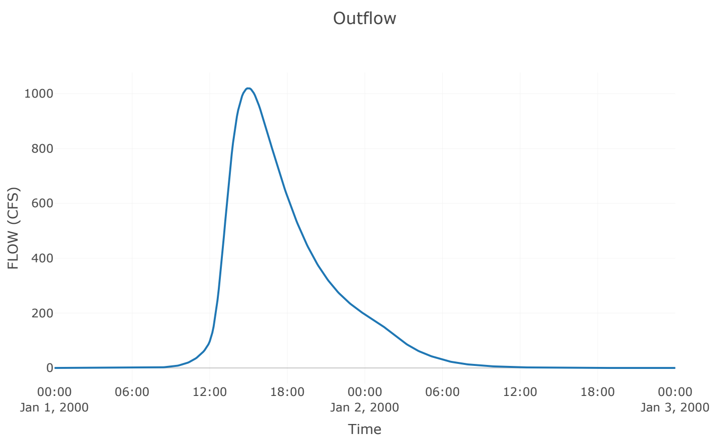


Junction: J2

Downstream : Shagbark to Town St

Results: J2

Peak Discharge (CFS)	1020.36
Time of Peak Discharge	01Jan2000, 15:00
Volume (IN)	6.03



Reach: Shagbark to Town St

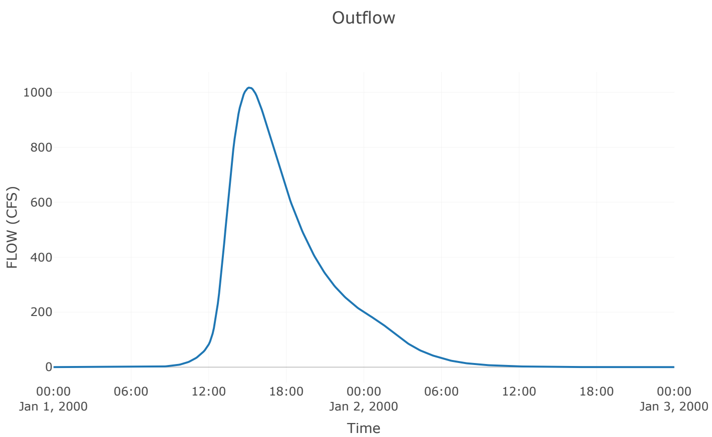
Downstream : J1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.16
Muskingum x	0
Muskingum Steps	1

Results: Shagbark to Town St

Peak Discharge (CFS)	1017.19
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	6.03
Peak Inflow (CFS)	1020.36
Inflow Volume (AC - FT)	606.57



Subbasin: Mt Parnassus Road

Area (MI2) : 0.33
Latitude Degrees : 41.46
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

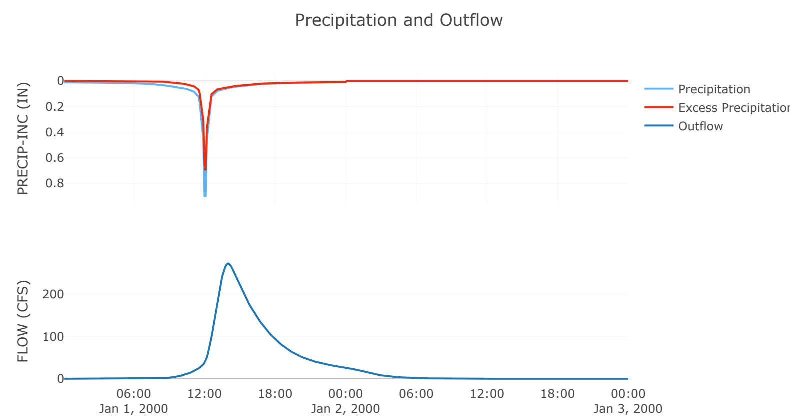
Percent Impervious Area	0
Curve Number	69.48

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.89
Snyder Cp	0.6

Results: Mt Parnassus Road

Peak Discharge (CFS)	272.22
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	6.79
Precipitation Volume (AC - FT)	185.69
Loss Volume (AC - FT)	67.92
Excess Volume (AC - FT)	117.78
Direct Runoff Volume (AC - FT)	117.78
Baseflow Volume (AC - FT)	0



Subbasin: Shagbark

Area (MI2) : 0.08
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

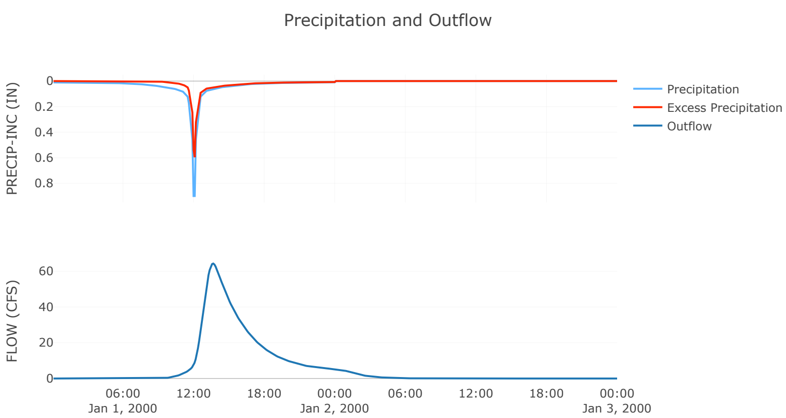
Percent Impervious Area	0
Curve Number	61.43

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Shagbark

Peak Discharge (CFS)	64.31
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	5.67
Precipitation Volume (AC - FT)	45.57
Loss Volume (AC - FT)	21.41
Excess Volume (AC - FT)	24.16
Direct Runoff Volume (AC - FT)	24.16
Baseflow Volume (AC - FT)	0

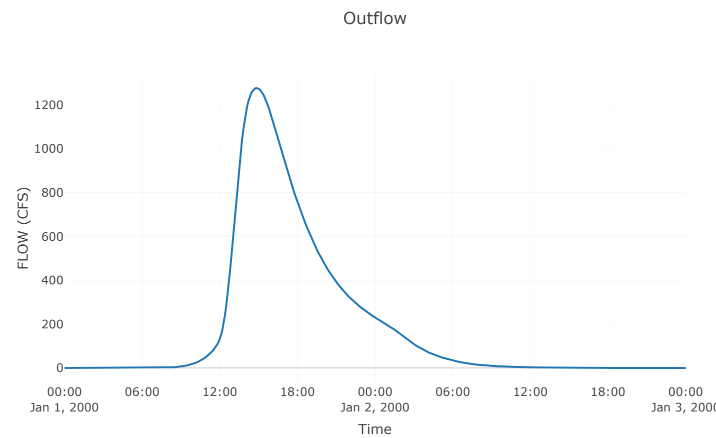


Junction: J1

Downstream : Town St to Boardman Rd

Results: J1

Peak Discharge (CFS)	1276.99
Time of Peak Discharge	01Jan2000, 14:48
Volume (IN)	6.12



Reach: Town St to Boardman Rd

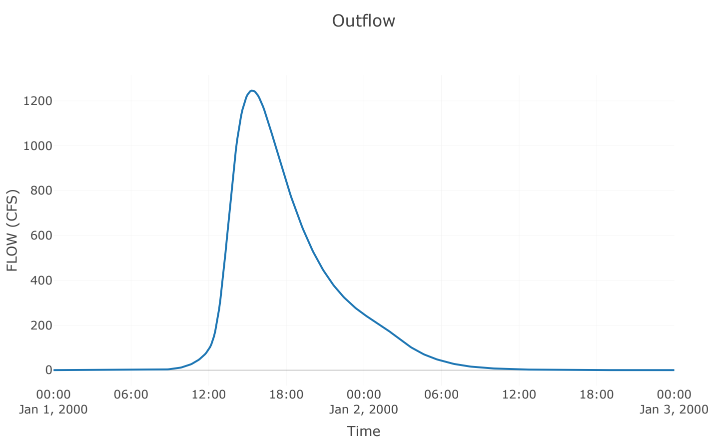
Downstream : J5

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.45
Muskingum x	0
Muskingum Steps	1

Results: Town St to Boardman Rd

Peak Discharge (CFS)	1245.92
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	6.12
Peak Inflow (CFS)	1276.99
Inflow Volume (AC - FT)	748.51



Subbasin: North of Boardman Road

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

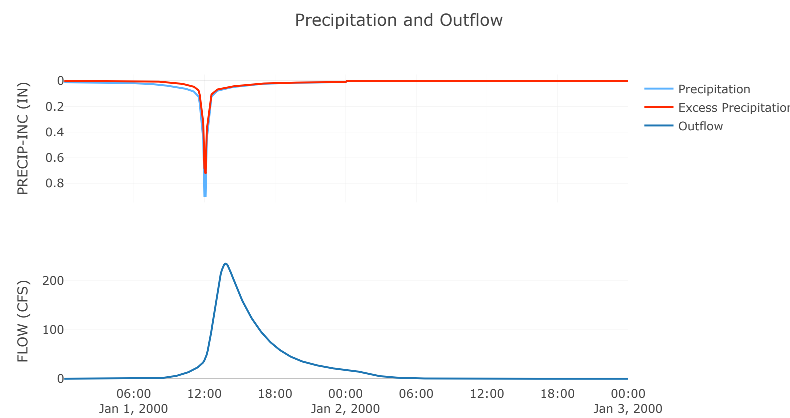
Percent Impervious Area	0
Curve Number	71.66

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.68
Snyder Cp	0.6

Results: North of Boardman Road

Peak Discharge (CFS)	234.81
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	7.08
Precipitation Volume (AC - FT)	141.01
Loss Volume (AC - FT)	47.67
Excess Volume (AC - FT)	93.34
Direct Runoff Volume (AC - FT)	93.34
Baseflow Volume (AC - FT)	0



Subbasin: Norwich Road and Boardman Ro

Area (MI2) : 0.21
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

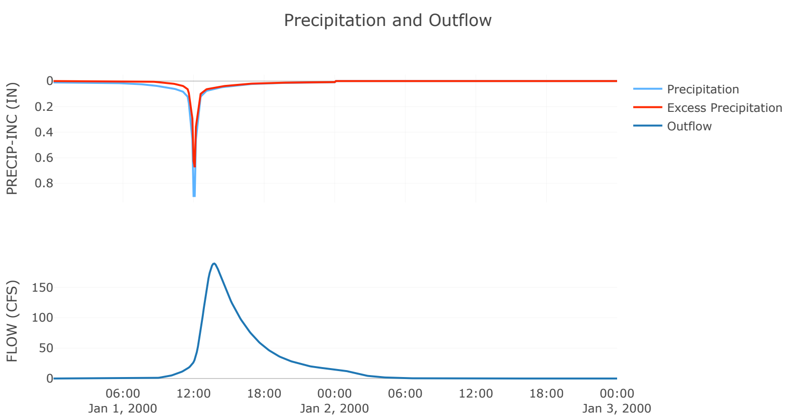
Percent Impervious Area	0
Curve Number	67.46

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.62
Snyder Cp	0.6

Results: Norwich Road and Boardman Ro

Peak Discharge (CFS)	189.16
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	6.51
Precipitation Volume (AC - FT)	121.32
Loss Volume (AC - FT)	47.51
Excess Volume (AC - FT)	73.81
Direct Runoff Volume (AC - FT)	73.81
Baseflow Volume (AC - FT)	0

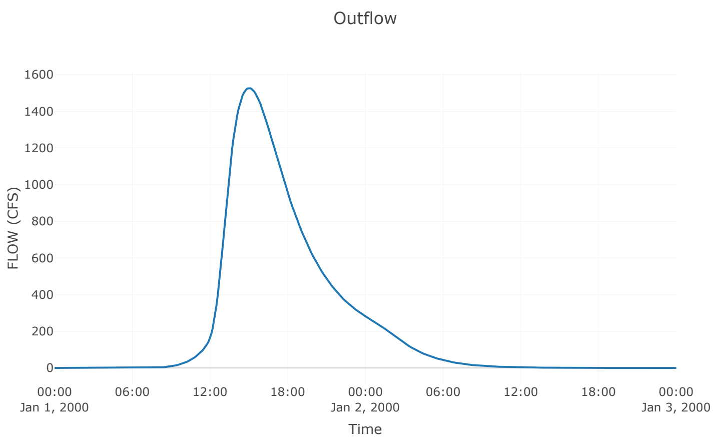


Junction: J5

Downstream : Boardman Rd to Trouble Pond

Results: J5

Peak Discharge (CFS)	1526.96
Time of Peak Discharge	01Jan2000, 15:00
Volume (IN)	6.24



Reach: Boardman Rd to Trouble Pond

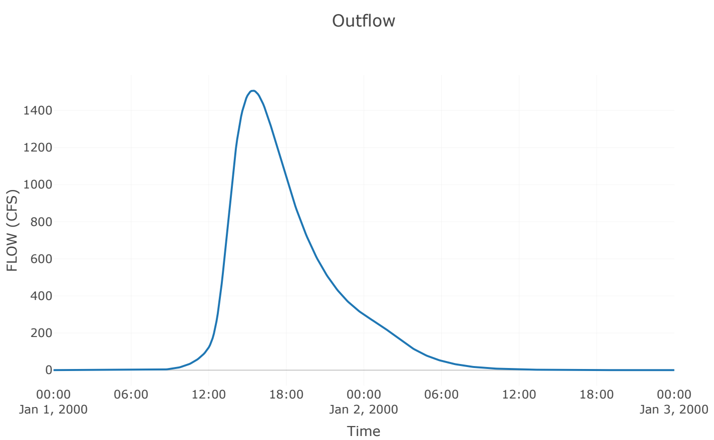
Downstream : J6

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.35
Muskingum x	0
Muskingum Steps	1

Results: Boardman Rd to Trouble Pond

Peak Discharge (CFS)	1507.28
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	6.24
Peak Inflow (CFS)	1526.96
Inflow Volume (AC - FT)	915.66



Subbasin: Upstream of Trouble Pond

Area (MI2) : 0.5
Latitude Degrees : 41.46
Longitude Degrees : -72.45
Downstream : J6

Loss Rate: Scs

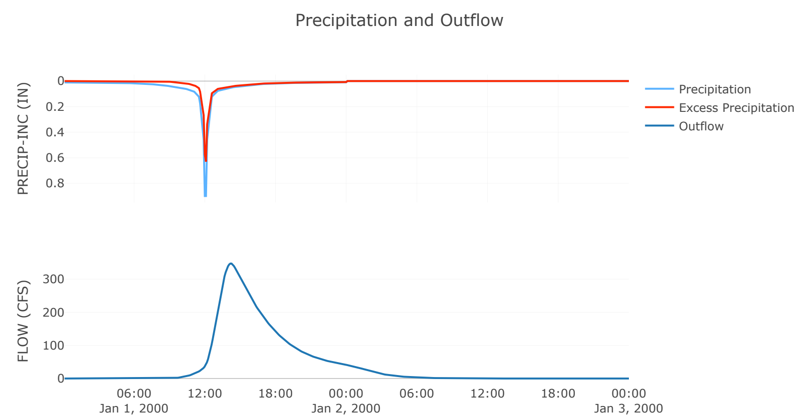
Percent Impervious Area	0
Curve Number	63.97

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.07
Snyder Cp	0.6

Results: Upstream of Trouble Pond

Peak Discharge (CFS)	347.46
Time of Peak Discharge	01Jan2000, 14:06
Volume (IN)	6.03
Precipitation Volume (AC - FT)	286.76
Loss Volume (AC - FT)	125.23
Excess Volume (AC - FT)	161.53
Direct Runoff Volume (AC - FT)	161.53
Baseflow Volume (AC - FT)	0

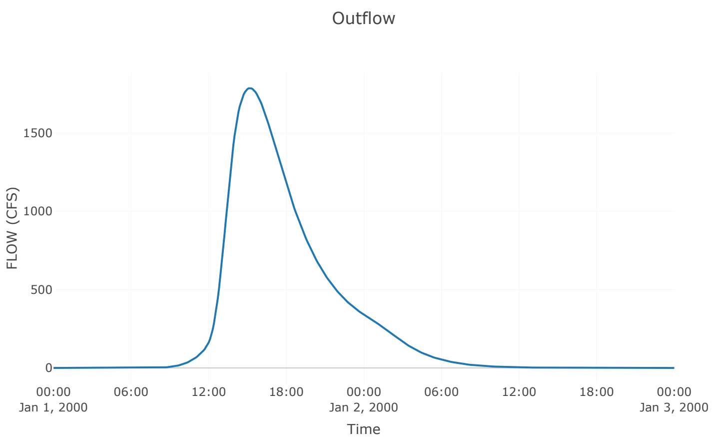


Junction: J6

Downstream : Trouble Pond to CT River

Results: J6

Peak Discharge (CFS)	1786.22
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	6.21



Reach: Trouble Pond to CT River

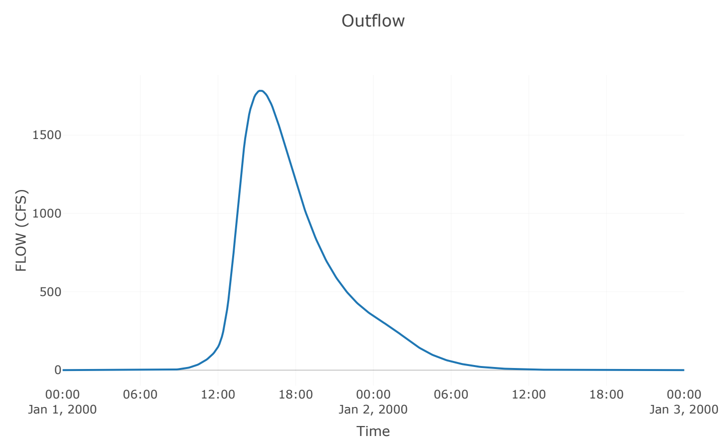
Downstream : Sink - 1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.1
Muskingum x	0
Muskingum Steps	1

Results: Trouble Pond to CT River

Peak Discharge (CFS)	1784.64
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	6.21
Peak Inflow (CFS)	1786.22
Inflow Volume (AC - FT)	1077.19



Subbasin: Goodspeed Landing

Area (MI2) : 0.17
Latitude Degrees : 41.45
Longitude Degrees : -72.46
Downstream : Sink - 1

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	65.5

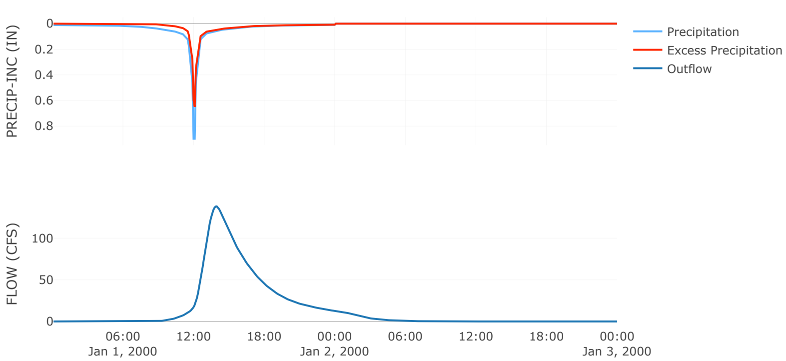
Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.79
Snyder Cp	0.6

Results: Goodspeed Landing

Peak Discharge (CFS)	138.21
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	6.24
Precipitation Volume (AC - FT)	99.47
Loss Volume (AC - FT)	41.46
Excess Volume (AC - FT)	58
Direct Runoff Volume (AC - FT)	58
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

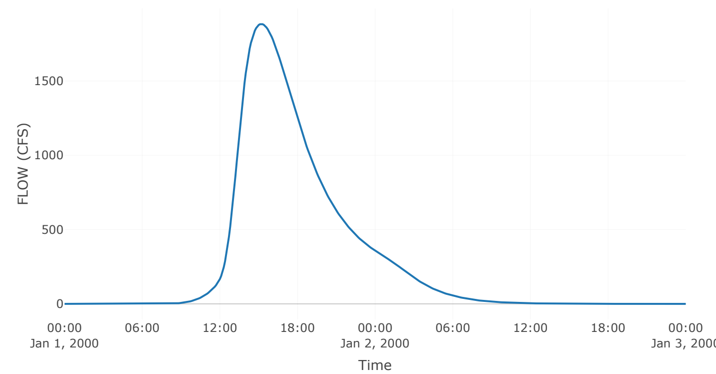


Sink: Sink-1

Results: Sink-1

Peak Discharge (CFS)	1884
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	6.21

Outflow



Project: R E Hhydro S C S
Simulation Run: CIRCA-2040-69-10
Simulation Start: 31 December 1999, 24:00
Simulation End: 2 January 2000, 24:00

HMS Version: 4.12
Executed: 15 October 2024, 20:33

Global Parameter Summary - Subbasin

Location

Element Name	Longitude Degrees	Latitude Degrees
Daniels Pond North	-72.43	41.48
Daniels Pond Northwest	-72.44	41.48
Daniels Pond East	-72.43	41.47
Town Street	-72.44	41.47
Mt Parnassus Road	-72.44	41.46
Shagbark	-72.44	41.47
North of Boardman Road	-72.45	41.47
Norwich Road and Boardman Ro	-72.45	41.47
Upstream of Trouble Pond	-72.45	41.46
Goodspeed Landing	-72.46	41.45

Area (MI2)

Element Name	Area (MI2)
Daniels Pond North	0.99
Daniels Pond Northwest	0.42
Daniels Pond East	0.25
Town Street	0.23
Mt Parnassus Road	0.33
Shagbark	0.08
North of Boardman Road	0.25
Norwich Road and Boardman Ro	0.21
Upstream of Trouble Pond	0.5
Goodspeed Landing	0.17

Downstream

Element Name	Downstream
Daniels Pond North	J3
Daniels Pond Northwest	J3
Daniels Pond East	J3
Town Street	J2
Mt Parnassus Road	J1
Shagbark	J1
North of Boardman Road	J5
Norwich Road and Boardman Ro	J5
Upstream of Trouble Pond	J6
Goodspeed Landing	Sink - 1

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Daniels Pond North	0	61.25
Daniels Pond Northwest	0	66.7
Daniels Pond East	0	61.08
Town Street	0	74.47
Mt Parnassus Road	0	69.48
Shagbark	0	61.43
North of Boardman Road	0	71.66
Norwich Road and Boardman Ro	0	67.46
Upstream of Trouble Pond	0	63.97
Goodspeed Landing	0	65.5

Transform: Snyder

Element Name	Snyder Method	Snyder Tp	Snyder Cp
Daniels Pond North	Standard	3.01	0.6
Daniels Pond Northwest	Standard	2.24	0.6
Daniels Pond East	Standard	1.51	0.6
Town Street	Standard	1.87	0.6
Mt Parnassus Road	Standard	1.89	0.6
Shagbark	Standard	1.51	0.6
North of Boardman Road	Standard	1.68	0.6
Norwich Road and Boardman Ro	Standard	1.62	0.6
Upstream of Trouble Pond	Standard	2.07	0.6
Goodspeed Landing	Standard	1.79	0.6

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
Daniels Pond to Shagbark	J2
Shagbark to Town St	J1
Town St to Boardman Rd	J5
Boardman Rd to Trouble Pond	J6
Trouble Pond to CT River	Sink - 1

Route: Muskingum

Element Name	Method	Initial Variable	Muskingum K	Muskingum x	Muskingum Steps
Daniels Pond to Shagbark	Muskingum	Combined Inflow	0.5	0	1
Shagbark to Town St	Muskingum	Combined Inflow	0.16	0	1
Town St to Boardman Rd	Muskingum	Combined Inflow	0.45	0	1
Boardman Rd to Trouble Pond	Muskingum	Combined Inflow	0.35	0	1
Trouble Pond to CT River	Muskingum	Combined Inflow	0.1	0	1

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Daniels Pond North	0.99	169.92	01Jan2000, 15:18	2.09
Daniels Pond Northwest	0.42	113.21	01Jan2000, 14:24	2.58
Daniels Pond East	0.25	67.6	01Jan2000, 13:42	2.08
J3	1.66	322.97	01Jan2000, 14:48	2.21
Daniels Pond to Shagbark	1.66	312.22	01Jan2000, 15:24	2.21
Town Street	0.23	92.02	01Jan2000, 13:54	3.31
J2	1.89	380.89	01Jan2000, 15:06	2.35
Shagbark to Town St	1.89	379.92	01Jan2000, 15:18	2.35
Mt Parnassus Road	0.33	110.6	01Jan2000, 14:00	2.84
Shagbark	0.08	22.32	01Jan2000, 13:42	2.11
J1	2.29	483.72	01Jan2000, 15:00	2.41
Town St to Boardman Rd	2.29	472.76	01Jan2000, 15:30	2.41
North of Boardman Road	0.25	98.85	01Jan2000, 13:48	3.04
Norwich Road and Boardman Ro	0.21	74.13	01Jan2000, 13:42	2.65
J5	2.75	589.29	01Jan2000, 15:12	2.48
Boardman Rd to Trouble Pond	2.75	582.12	01Jan2000, 15:36	2.48
Upstream of Trouble Pond	0.5	127.65	01Jan2000, 14:12	2.33
J6	3.25	686.93	01Jan2000, 15:18	2.46
Trouble Pond to CT River	3.25	686.35	01Jan2000, 15:30	2.46
Goodspeed Landing	0.17	52.25	01Jan2000, 13:54	2.47
Sink - 1	3.43	724.8	01Jan2000, 15:24	2.46

Subbasin: Daniels Pond North

Area (MI2) : 0.99
Latitude Degrees : 41.48
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

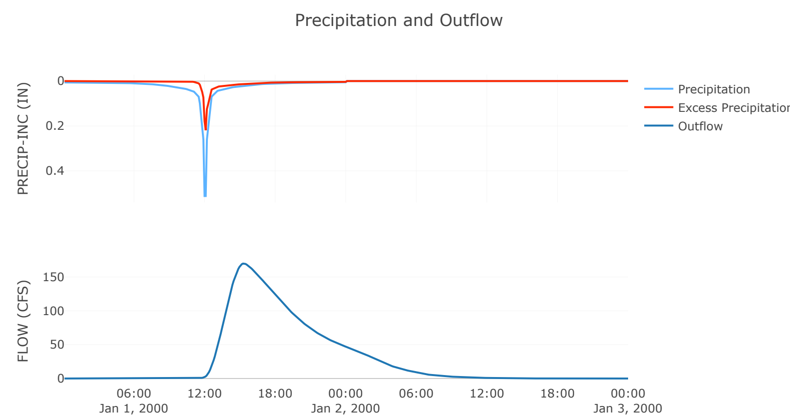
Percent Impervious Area	0
Curve Number	61.25

Transform: Snyder

Snyder Method	Standard
Snyder Tp	3.01
Snyder Cp	0.6

Results: Daniels Pond North

Peak Discharge (CFS)	169.92
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	2.09
Precipitation Volume (AC - FT)	323.02
Loss Volume (AC - FT)	212.14
Excess Volume (AC - FT)	110.88
Direct Runoff Volume (AC - FT)	110.88
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond Northwest

Area (MI2) : 0.42
Latitude Degrees : 41.48
Longitude Degrees : -72.44
Downstream : J3

Loss Rate: Scs

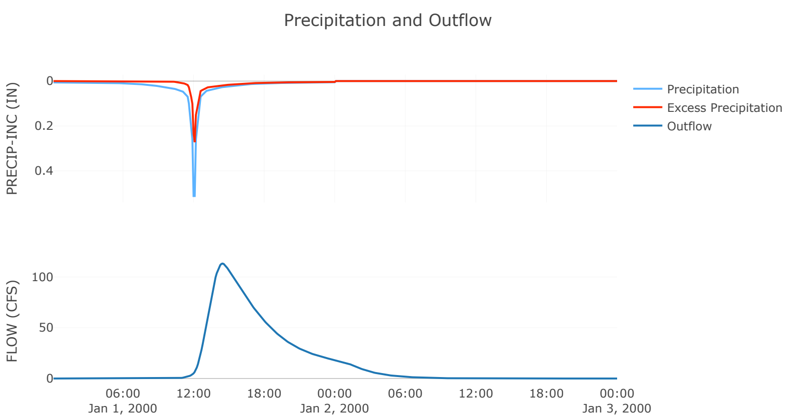
Percent Impervious Area	0
Curve Number	66.7

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.24
Snyder Cp	0.6

Results: Daniels Pond Northwest

Peak Discharge (CFS)	113.21
Time of Peak Discharge	01Jan2000, 14:24
Volume (IN)	2.58
Precipitation Volume (AC - FT)	137.2
Loss Volume (AC - FT)	79.22
Excess Volume (AC - FT)	57.99
Direct Runoff Volume (AC - FT)	57.99
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond East

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

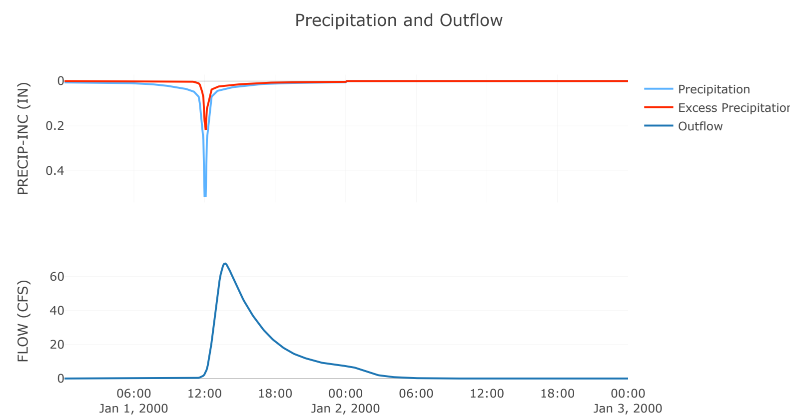
Percent Impervious Area	0
Curve Number	61.08

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Daniels Pond East

Peak Discharge (CFS)	67.6
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	2.08
Precipitation Volume (AC - FT)	80.1
Loss Volume (AC - FT)	52.79
Excess Volume (AC - FT)	27.3
Direct Runoff Volume (AC - FT)	27.3
Baseflow Volume (AC - FT)	0

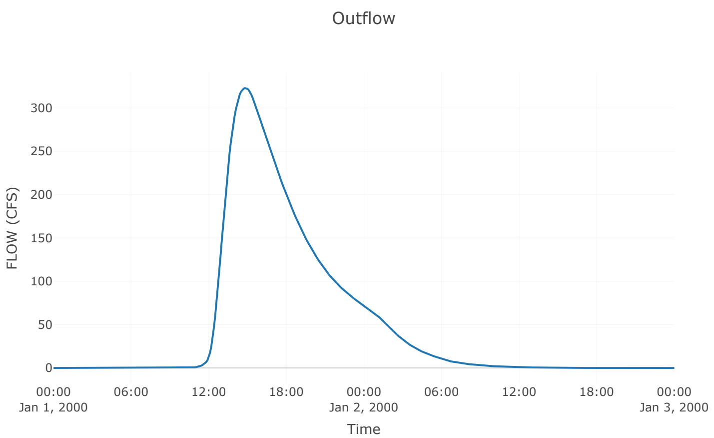


Junction: J3

Downstream : Daniels Pond to Shagbark

Results: J3

Peak Discharge (CFS)	322.97
Time of Peak Discharge	01Jan2000, 14:48
Volume (IN)	2.21



Reach: Daniels Pond to Shagbark

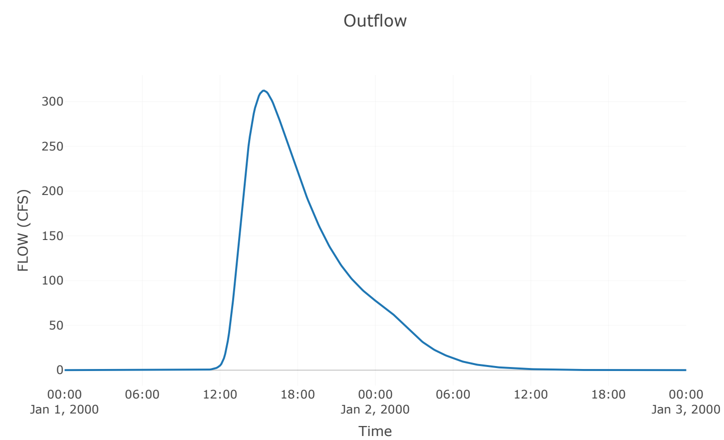
Downstream : J2

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.5
Muskingum x	0
Muskingum Steps	1

Results: Daniels Pond to Shagbark

Peak Discharge (CFS)	312.22
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	2.21
Peak Inflow (CFS)	322.97
Inflow Volume (AC - FT)	196.17



Subbasin: Town Street

Area (MI2) : 0.23
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J2

Loss Rate: Scs

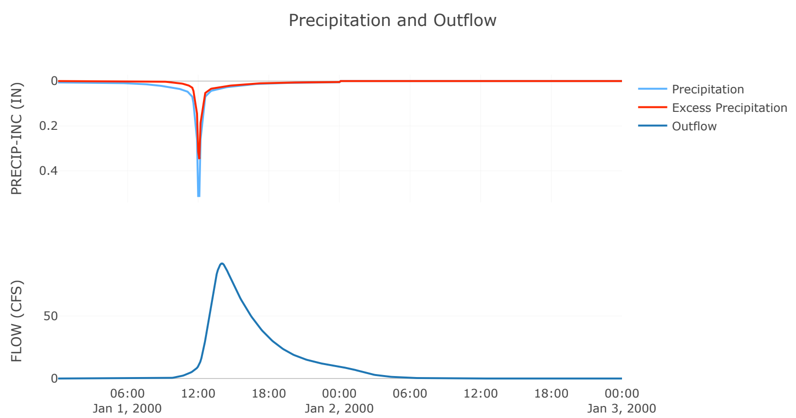
Percent Impervious Area	0
Curve Number	74.47

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.87
Snyder Cp	0.6

Results: Town Street

Peak Discharge (CFS)	92.02
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	3.31
Precipitation Volume (AC - FT)	73.3
Loss Volume (AC - FT)	33.47
Excess Volume (AC - FT)	39.83
Direct Runoff Volume (AC - FT)	39.83
Baseflow Volume (AC - FT)	0

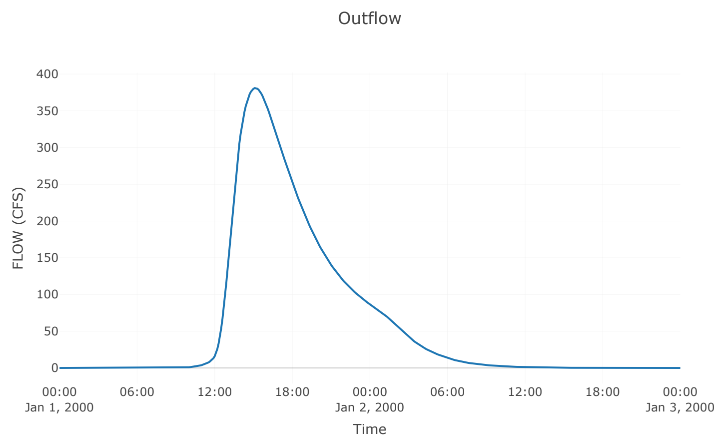


Junction: J2

Downstream : Shagbark to Town St

Results: J2

Peak Discharge (CFS)	380.89
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	2.35



Reach: Shagbark to Town St

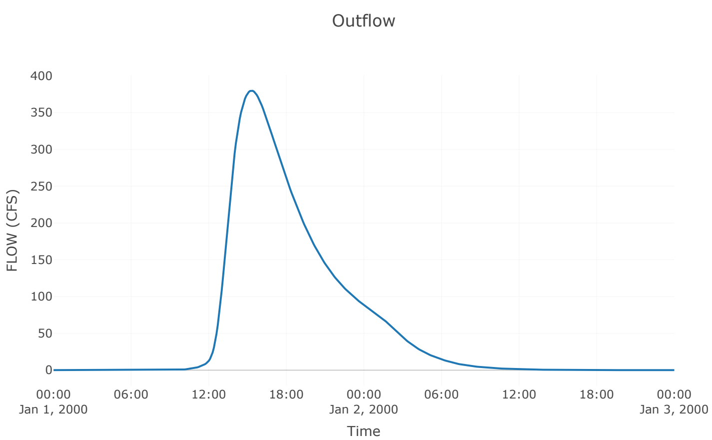
Downstream : J1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.16
Muskingum x	0
Muskingum Steps	1

Results: Shagbark to Town St

Peak Discharge (CFS)	379.92
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	2.35
Peak Inflow (CFS)	380.89
Inflow Volume (AC - FT)	236



Subbasin: Mt Parnassus Road

Area (MI2) : 0.33
Latitude Degrees : 41.46
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

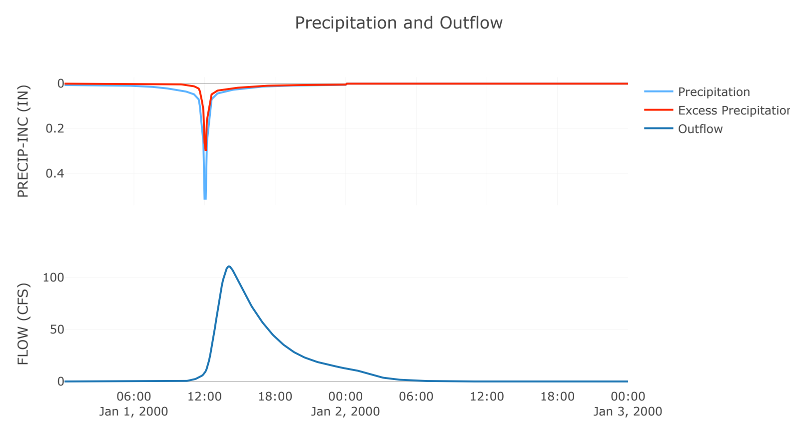
Percent Impervious Area	0
Curve Number	69.48

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.89
Snyder Cp	0.6

Results: Mt Parnassus Road

Peak Discharge (CFS)	110.6
Time of Peak Discharge	01Jan2000, 14:00
Volume (IN)	2.84
Precipitation Volume (AC - FT)	105.86
Loss Volume (AC - FT)	56.65
Excess Volume (AC - FT)	49.22
Direct Runoff Volume (AC - FT)	49.22
Baseflow Volume (AC - FT)	0



Subbasin: Shagbark

Area (MI2) : 0.08
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

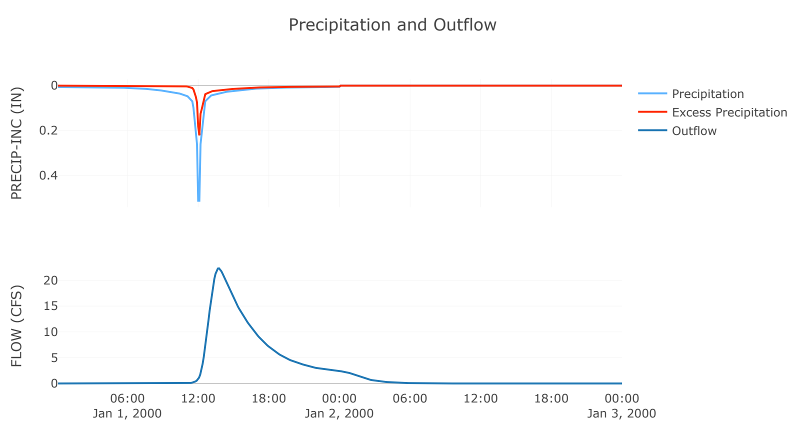
Percent Impervious Area	0
Curve Number	61.43

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Shagbark

Peak Discharge (CFS)	22.32
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	2.11
Precipitation Volume (AC - FT)	25.98
Loss Volume (AC - FT)	17
Excess Volume (AC - FT)	8.98
Direct Runoff Volume (AC - FT)	8.98
Baseflow Volume (AC - FT)	0

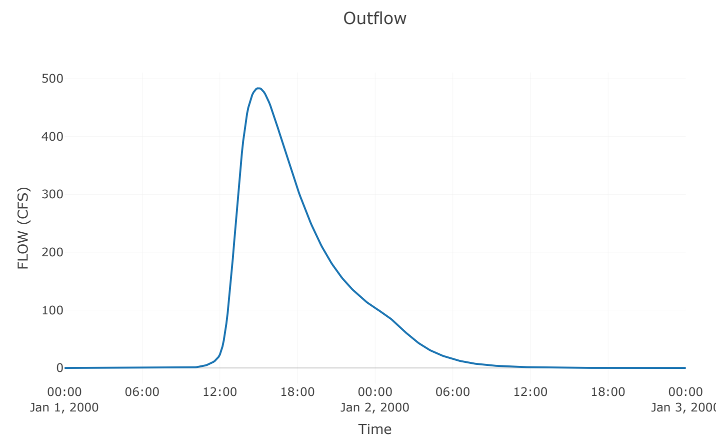


Junction: J1

Downstream : Town St to Boardman Rd

Results: J1

Peak Discharge (CFS)	483.72
Time of Peak Discharge	01Jan2000, 15:00
Volume (IN)	2.41



Reach: Town St to Boardman Rd

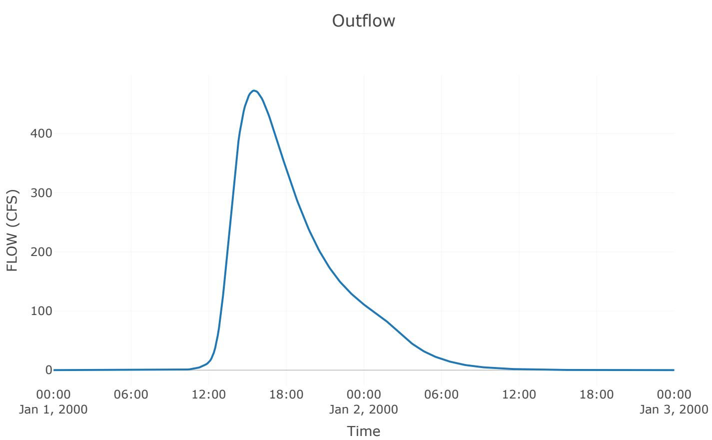
Downstream : J5

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.45
Muskingum x	0
Muskingum Steps	1

Results: Town St to Boardman Rd

Peak Discharge (CFS)	472.76
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	2.41
Peak Inflow (CFS)	483.72
Inflow Volume (AC - FT)	294.2



Subbasin: North of Boardman Road

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

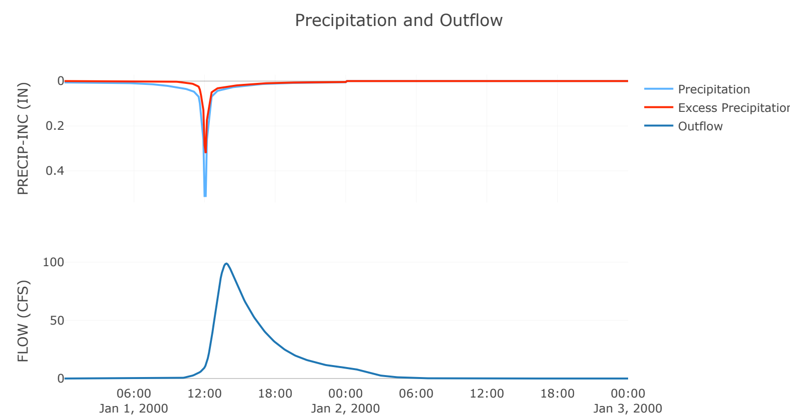
Percent Impervious Area	0
Curve Number	71.66

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.68
Snyder Cp	0.6

Results: North of Boardman Road

Peak Discharge (CFS)	98.85
Time of Peak Discharge	01Jan2000, 13:48
Volume (IN)	3.04
Precipitation Volume (AC - FT)	80.39
Loss Volume (AC - FT)	40.29
Excess Volume (AC - FT)	40.1
Direct Runoff Volume (AC - FT)	40.1
Baseflow Volume (AC - FT)	0



Subbasin: Norwich Road and Boardman Ro

Area (MI2) : 0.21
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	67.46

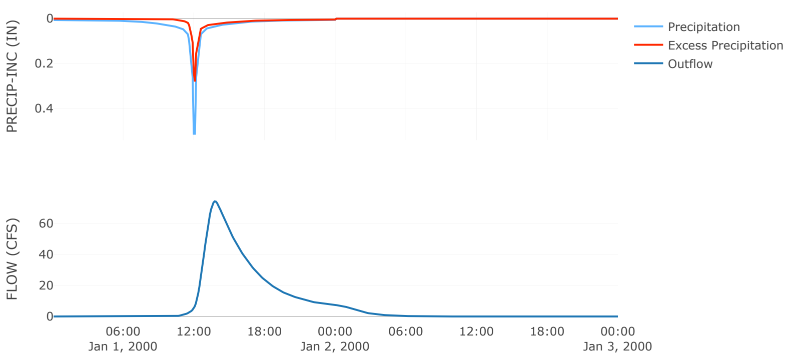
Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.62
Snyder Cp	0.6

Results: Norwich Road and Boardman Ro

Peak Discharge (CFS)	74.13
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	2.65
Precipitation Volume (AC - FT)	69.17
Loss Volume (AC - FT)	39.14
Excess Volume (AC - FT)	30.02
Direct Runoff Volume (AC - FT)	30.02
Baseflow Volume (AC - FT)	0

Precipitation and Outflow



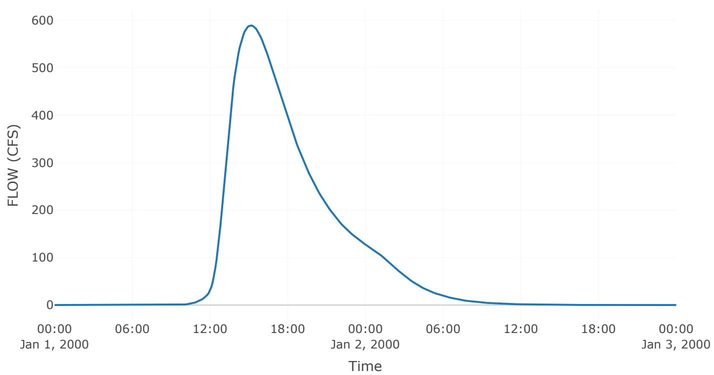
Junction: J5

Downstream : Boardman Rd to Trouble Pond

Results: J5

Peak Discharge (CFS)	589.29
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	2.48

Outflow



Reach: Boardman Rd to Trouble Pond

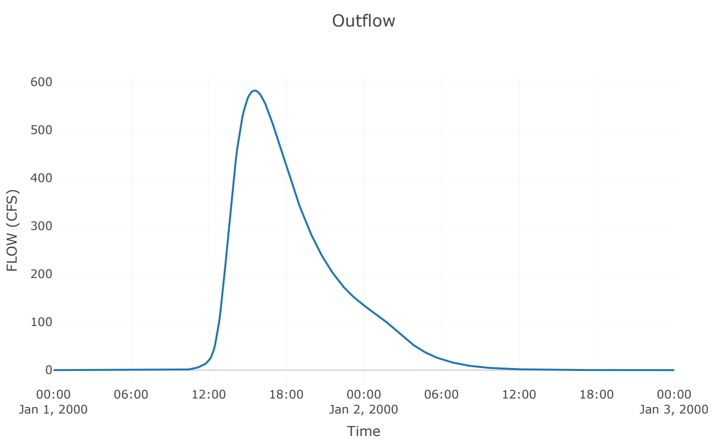
Downstream : J6

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.35
Muskingum x	0
Muskingum Steps	1

Results: Boardman Rd to Trouble Pond

Peak Discharge (CFS)	582.12
Time of Peak Discharge	01Jan2000, 15:36
Volume (IN)	2.48
Peak Inflow (CFS)	589.29
Inflow Volume (AC - FT)	364.33



Subbasin: Upstream of Trouble Pond

Area (MI2) : 0.5
Latitude Degrees : 41.46
Longitude Degrees : -72.45
Downstream : J6

Loss Rate: Scs

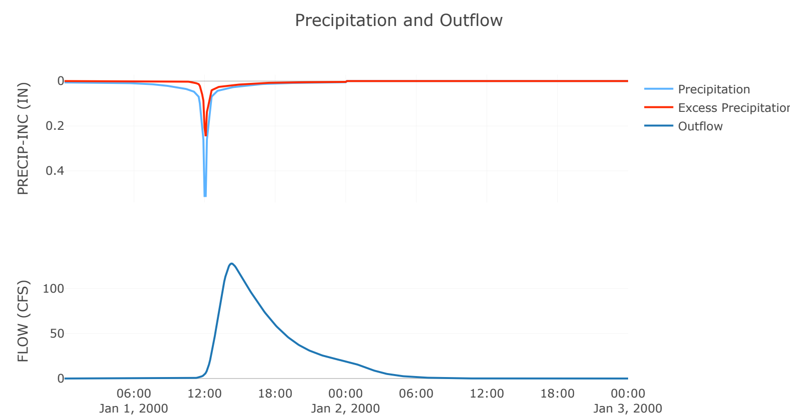
Percent Impervious Area	0
Curve Number	63.97

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.07
Snyder Cp	0.6

Results: Upstream of Trouble Pond

Peak Discharge (CFS)	127.65
Time of Peak Discharge	01Jan2000, 14:12
Volume (IN)	2.33
Precipitation Volume (AC - FT)	163.48
Loss Volume (AC - FT)	100.98
Excess Volume (AC - FT)	62.5
Direct Runoff Volume (AC - FT)	62.5
Baseflow Volume (AC - FT)	0

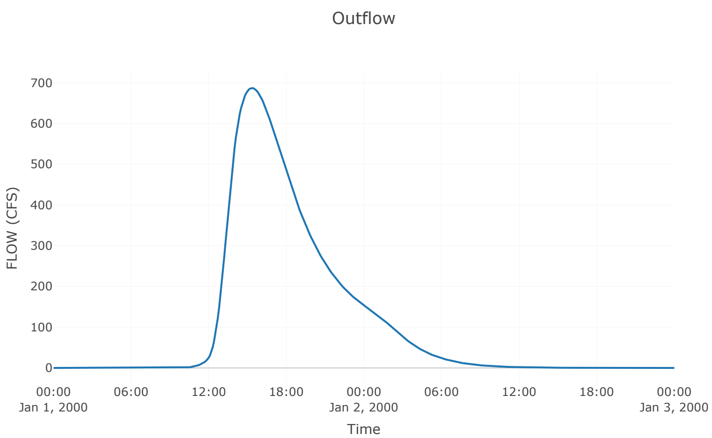


Junction: J6

Downstream : Trouble Pond to CT River

Results: J6

Peak Discharge (CFS)	686.93
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	2.46



Reach: Trouble Pond to CT River

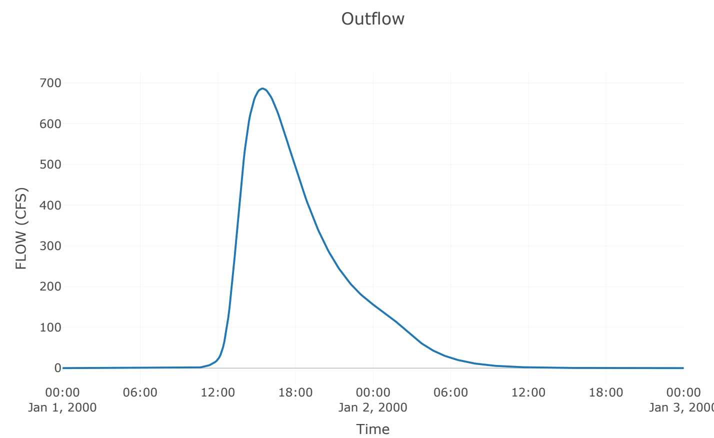
Downstream : Sink - 1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.1
Muskingum x	0
Muskingum Steps	1

Results: Trouble Pond to CT River

Peak Discharge (CFS)	686.35
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	2.46
Peak Inflow (CFS)	686.93
Inflow Volume (AC - FT)	426.83



Subbasin: Goodspeed Landing

Area (MI2) : 0.17
Latitude Degrees : 41.45
Longitude Degrees : -72.46
Downstream : Sink - 1

Loss Rate: Scs

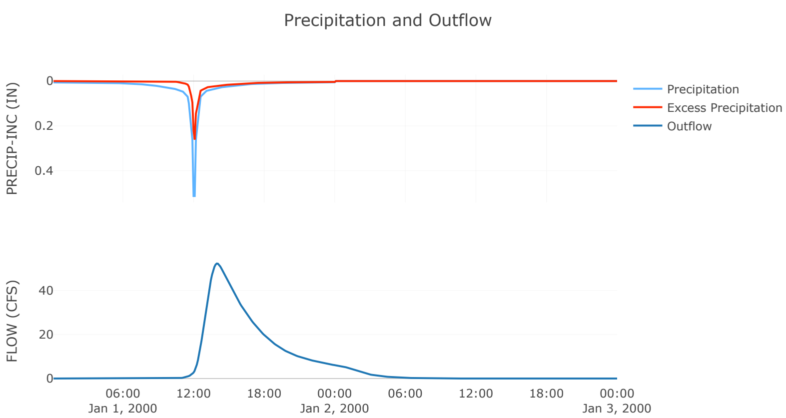
Percent Impervious Area	0
Curve Number	65.5

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.79
Snyder Cp	0.6

Results: Goodspeed Landing

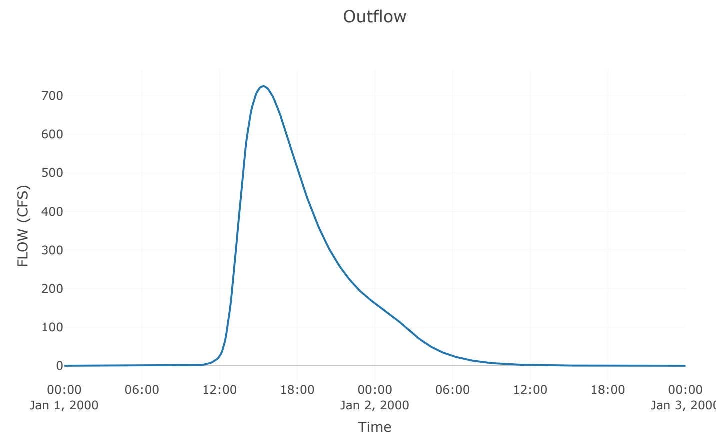
Peak Discharge (CFS)	52.25
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	2.47
Precipitation Volume (AC - FT)	56.71
Loss Volume (AC - FT)	33.75
Excess Volume (AC - FT)	22.96
Direct Runoff Volume (AC - FT)	22.96
Baseflow Volume (AC - FT)	0



Sink: Sink-1

Results: Sink-1

Peak Discharge (CFS)	724.8
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	2.46



Project: R E Hhydro S C S
Simulation Run: CIRCA-2040-69-20
Simulation Start: 31 December 1999, 24:00
Simulation End: 2 January 2000, 24:00

HMS Version: 4.12
Executed: 15 October 2024, 20:33

Global Parameter Summary - Subbasin

Location

Element Name	Longitude Degrees	Latitude Degrees
Daniels Pond North	-72.43	41.48
Daniels Pond Northwest	-72.44	41.48
Daniels Pond East	-72.43	41.47
Town Street	-72.44	41.47
Mt Parnassus Road	-72.44	41.46
Shagbark	-72.44	41.47
North of Boardman Road	-72.45	41.47
Norwich Road and Boardman Ro	-72.45	41.47
Upstream of Trouble Pond	-72.45	41.46
Goodspeed Landing	-72.46	41.45

Area (MI2)

Element Name	Area (MI2)
Daniels Pond North	0.99
Daniels Pond Northwest	0.42
Daniels Pond East	0.25
Town Street	0.23
Mt Parnassus Road	0.33
Shagbark	0.08
North of Boardman Road	0.25
Norwich Road and Boardman Ro	0.21
Upstream of Trouble Pond	0.5
Goodspeed Landing	0.17

Downstream

Element Name	Downstream
Daniels Pond North	J3
Daniels Pond Northwest	J3
Daniels Pond East	J3
Town Street	J2
Mt Parnassus Road	J1
Shagbark	J1
North of Boardman Road	J5
Norwich Road and Boardman Ro	J5
Upstream of Trouble Pond	J6
Goodspeed Landing	Sink - 1

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Daniels Pond North	0	61.25
Daniels Pond Northwest	0	66.7
Daniels Pond East	0	61.08
Town Street	0	74.47
Mt Parnassus Road	0	69.48
Shagbark	0	61.43
North of Boardman Road	0	71.66
Norwich Road and Boardman Ro	0	67.46
Upstream of Trouble Pond	0	63.97
Goodspeed Landing	0	65.5

Transform: Snyder

Element Name	Snyder Method	Snyder Tp	Snyder Cp
Daniels Pond North	Standard	3.01	0.6
Daniels Pond Northwest	Standard	2.24	0.6
Daniels Pond East	Standard	1.51	0.6
Town Street	Standard	1.87	0.6
Mt Parnassus Road	Standard	1.89	0.6
Shagbark	Standard	1.51	0.6
North of Boardman Road	Standard	1.68	0.6
Norwich Road and Boardman Ro	Standard	1.62	0.6
Upstream of Trouble Pond	Standard	2.07	0.6
Goodspeed Landing	Standard	1.79	0.6

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
Daniels Pond to Shagbark	J2
Shagbark to Town St	J1
Town St to Boardman Rd	J5
Boardman Rd to Trouble Pond	J6
Trouble Pond to CT River	Sink - 1

Route: Muskingum

Element Name	Method	Initial Variable	Muskingum K	Muskingum x	Muskingum Steps
Daniels Pond to Shagbark	Muskingum	Combined Inflow	0.5	0	1
Shagbark to Town St	Muskingum	Combined Inflow	0.16	0	1
Town St to Boardman Rd	Muskingum	Combined Inflow	0.45	0	1
Boardman Rd to Trouble Pond	Muskingum	Combined Inflow	0.35	0	1
Trouble Pond to CT River	Muskingum	Combined Inflow	0.1	0	1

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Daniels Pond North	0.99	258.52	01Jan2000, 15:12	3.09
Daniels Pond Northwest	0.42	164.74	01Jan2000, 14:24	3.68
Daniels Pond East	0.25	103.72	01Jan2000, 13:36	3.08
J3	1.66	483.75	01Jan2000, 14:42	3.24
Daniels Pond to Shagbark	1.66	467.38	01Jan2000, 15:18	3.24
Town Street	0.23	127	01Jan2000, 13:54	4.53
J2	1.89	562.43	01Jan2000, 15:06	3.39
Shagbark to Town St	1.89	560.72	01Jan2000, 15:12	3.39
Mt Parnassus Road	0.33	157.73	01Jan2000, 14:00	3.98
Shagbark	0.08	34.13	01Jan2000, 13:36	3.11
J1	2.29	709.64	01Jan2000, 14:54	3.47
Town St to Boardman Rd	2.29	692.92	01Jan2000, 15:30	3.47
North of Boardman Road	0.25	138.72	01Jan2000, 13:48	4.22
Norwich Road and Boardman Ro	0.21	107.45	01Jan2000, 13:42	3.76
J5	2.75	857.55	01Jan2000, 15:06	3.56
Boardman Rd to Trouble Pond	2.75	846.83	01Jan2000, 15:30	3.56
Upstream of Trouble Pond	0.5	190.25	01Jan2000, 14:12	3.38
J6	3.25	1001.14	01Jan2000, 15:18	3.53
Trouble Pond to CT River	3.25	1000.29	01Jan2000, 15:24	3.53
Goodspeed Landing	0.17	76.93	01Jan2000, 13:54	3.55
Sink - 1	3.43	1056.14	01Jan2000, 15:18	3.53

Subbasin: Daniels Pond North

Area (MI2) : 0.99
Latitude Degrees : 41.48
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

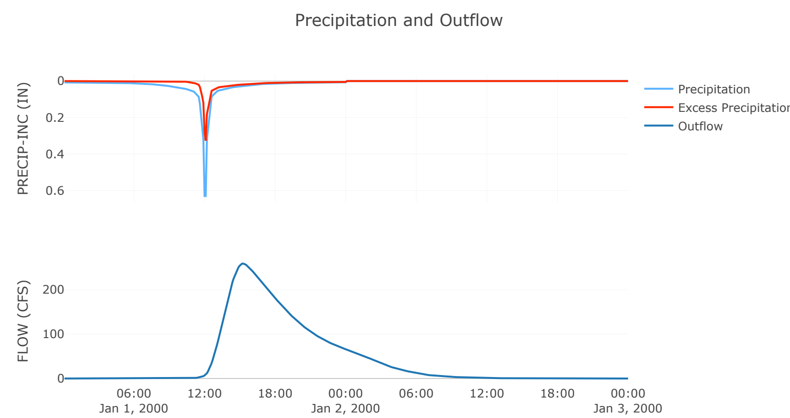
Percent Impervious Area	0
Curve Number	61.25

Transform: Snyder

Snyder Method	Standard
Snyder Tp	3.01
Snyder Cp	0.6

Results: Daniels Pond North

Peak Discharge (CFS)	258.52
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	3.09
Precipitation Volume (AC - FT)	397.16
Loss Volume (AC - FT)	233.31
Excess Volume (AC - FT)	163.85
Direct Runoff Volume (AC - FT)	163.85
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond Northwest

Area (MI2) : 0.42
Latitude Degrees : 41.48
Longitude Degrees : -72.44
Downstream : J3

Loss Rate: Scs

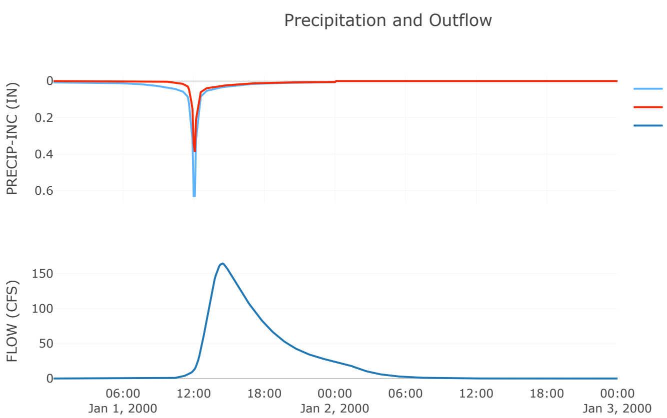
Percent Impervious Area	0
Curve Number	66.7

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.24
Snyder Cp	0.6

Results: Daniels Pond Northwest

Peak Discharge (CFS)	164.74
Time of Peak Discharge	01Jan2000, 14:24
Volume (IN)	3.68
Precipitation Volume (AC - FT)	168.69
Loss Volume (AC - FT)	85.98
Excess Volume (AC - FT)	82.71
Direct Runoff Volume (AC - FT)	82.71
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond East

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

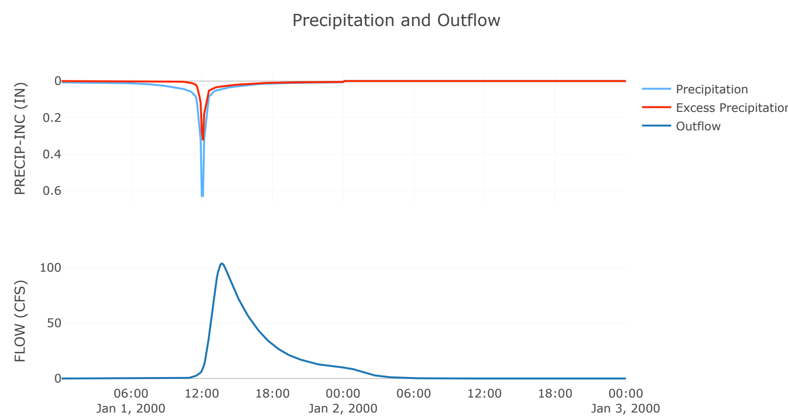
Percent Impervious Area	0
Curve Number	61.08

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Daniels Pond East

Peak Discharge (CFS)	103.72
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	3.08
Precipitation Volume (AC - FT)	98.48
Loss Volume (AC - FT)	58.08
Excess Volume (AC - FT)	40.4
Direct Runoff Volume (AC - FT)	40.4
Baseflow Volume (AC - FT)	0

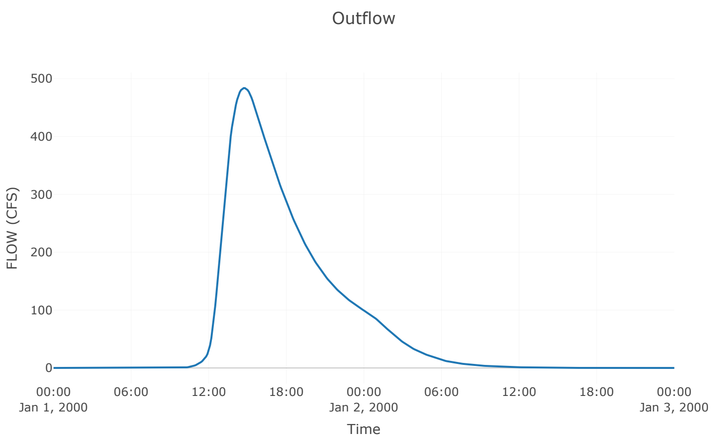


Junction: J3

Downstream : Daniels Pond to Shagbark

Results: J3

Peak Discharge (CFS)	483.75
Time of Peak Discharge	01Jan2000, 14:42
Volume (IN)	3.24



Reach: Daniels Pond to Shagbark

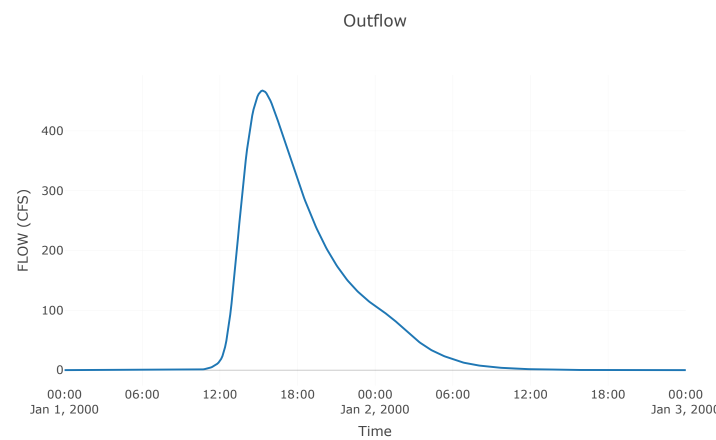
Downstream : J2

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.5
Muskingum x	0
Muskingum Steps	1

Results: Daniels Pond to Shagbark

Peak Discharge (CFS)	467.38
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	3.24
Peak Inflow (CFS)	483.75
Inflow Volume (AC - FT)	286.95



Subbasin: Town Street

Area (MI2) : 0.23
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J2

Loss Rate: Scs

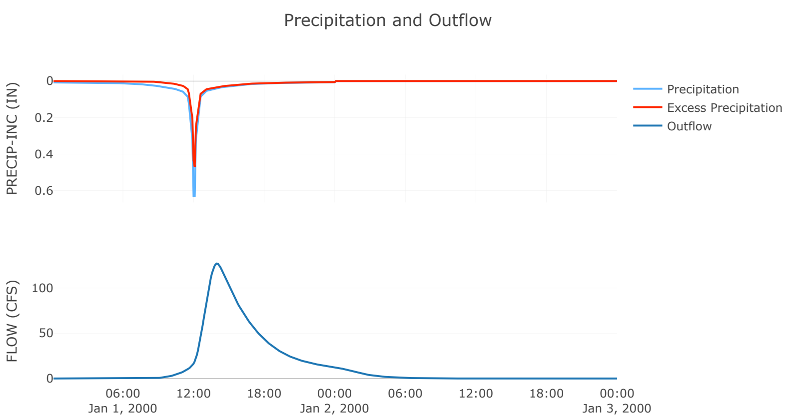
Percent Impervious Area	0
Curve Number	74.47

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.87
Snyder Cp	0.6

Results: Town Street

Peak Discharge (CFS)	127
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	4.53
Precipitation Volume (AC - FT)	90.12
Loss Volume (AC - FT)	35.65
Excess Volume (AC - FT)	54.47
Direct Runoff Volume (AC - FT)	54.47
Baseflow Volume (AC - FT)	0

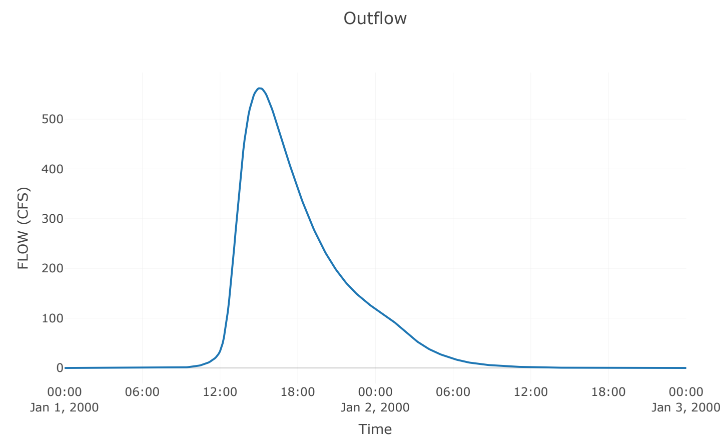


Junction: J2

Downstream : Shagbark to Town St

Results: J2

Peak Discharge (CFS)	562.43
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	3.39



Reach: Shagbark to Town St

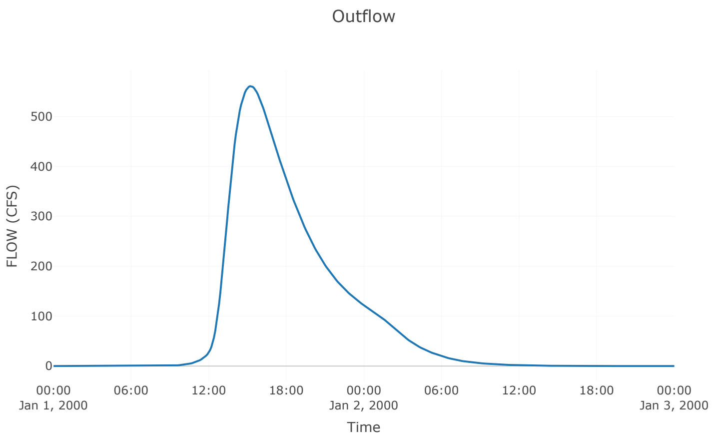
Downstream : J1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.16
Muskingum x	0
Muskingum Steps	1

Results: Shagbark to Town St

Peak Discharge (CFS)	560.72
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	3.39
Peak Inflow (CFS)	562.43
Inflow Volume (AC - FT)	341.42



Subbasin: Mt Parnassus Road

Area (MI2) : 0.33
Latitude Degrees : 41.46
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

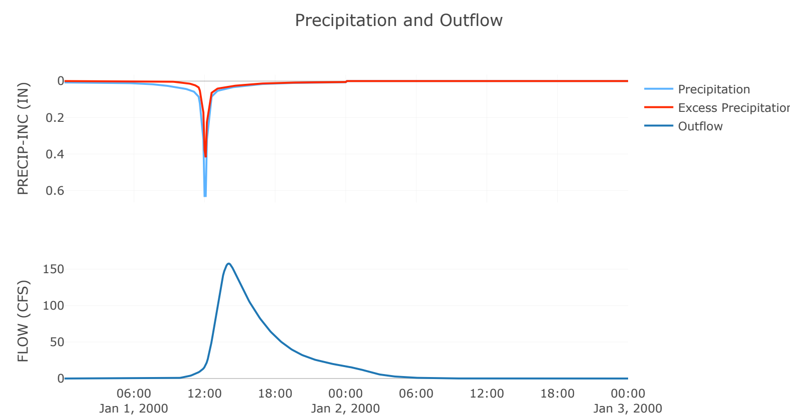
Percent Impervious Area	0
Curve Number	69.48

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.89
Snyder Cp	0.6

Results: Mt Parnassus Road

Peak Discharge (CFS)	157.73
Time of Peak Discharge	01Jan2000, 14:00
Volume (IN)	3.98
Precipitation Volume (AC - FT)	130.16
Loss Volume (AC - FT)	61.07
Excess Volume (AC - FT)	69.09
Direct Runoff Volume (AC - FT)	69.09
Baseflow Volume (AC - FT)	0



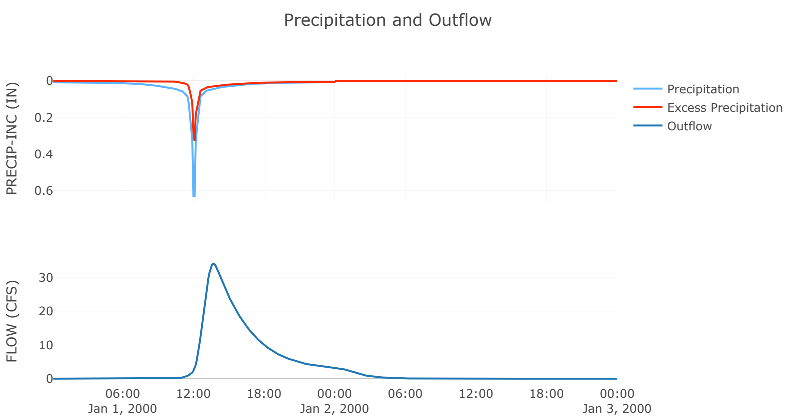
Subbasin: Shagbark

Area (MI2) : 0.08
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs	
Percent Impervious Area	0
Curve Number	61.43

Transform: Snyder	
Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

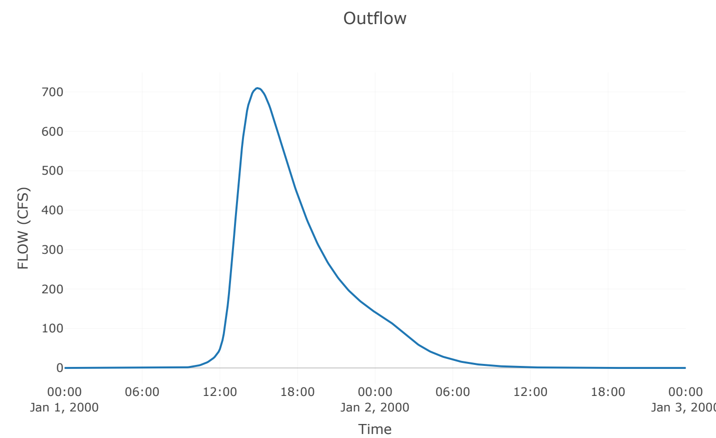
Results: Shagbark	
Peak Discharge (CFS)	34.13
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	3.11
Precipitation Volume (AC - FT)	31.94
Loss Volume (AC - FT)	18.68
Excess Volume (AC - FT)	13.26
Direct Runoff Volume (AC - FT)	13.26
Baseflow Volume (AC - FT)	0



Junction: J1

Downstream : Town St to Boardman Rd

Results: J1	
Peak Discharge (CFS)	709.64
Time of Peak Discharge	01Jan2000, 14:54
Volume (IN)	3.47



Reach: Town St to Boardman Rd

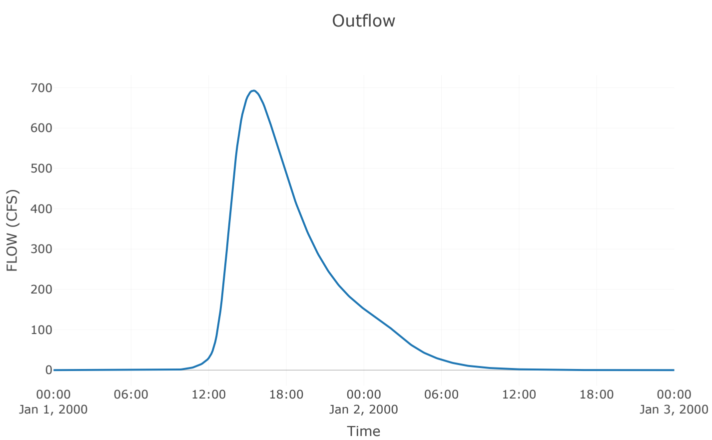
Downstream : J5

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.45
Muskingum x	0
Muskingum Steps	1

Results: Town St to Boardman Rd

Peak Discharge (CFS)	692.92
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	3.47
Peak Inflow (CFS)	709.64
Inflow Volume (AC - FT)	423.77



Subbasin: North of Boardman Road

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

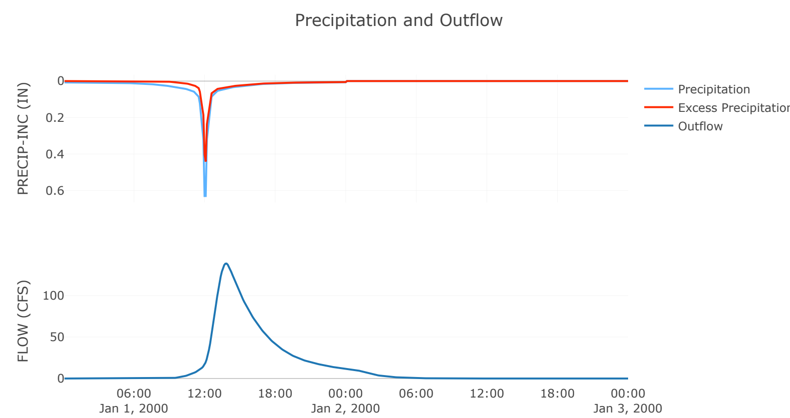
Percent Impervious Area	0
Curve Number	71.66

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.68
Snyder Cp	0.6

Results: North of Boardman Road

Peak Discharge (CFS)	138.72
Time of Peak Discharge	01Jan2000, 13:48
Volume (IN)	4.22
Precipitation Volume (AC - FT)	98.84
Loss Volume (AC - FT)	43.21
Excess Volume (AC - FT)	55.63
Direct Runoff Volume (AC - FT)	55.63
Baseflow Volume (AC - FT)	0



Subbasin: Norwich Road and Boardman Ro

Area (MI2) : 0.21
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

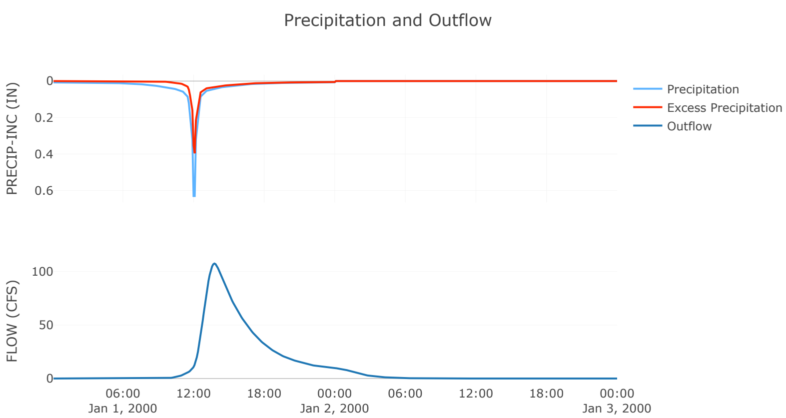
Percent Impervious Area	0
Curve Number	67.46

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.62
Snyder Cp	0.6

Results: Norwich Road and Boardman Ro

Peak Discharge (CFS)	107.45
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	3.76
Precipitation Volume (AC - FT)	85.04
Loss Volume (AC - FT)	42.41
Excess Volume (AC - FT)	42.63
Direct Runoff Volume (AC - FT)	42.63
Baseflow Volume (AC - FT)	0

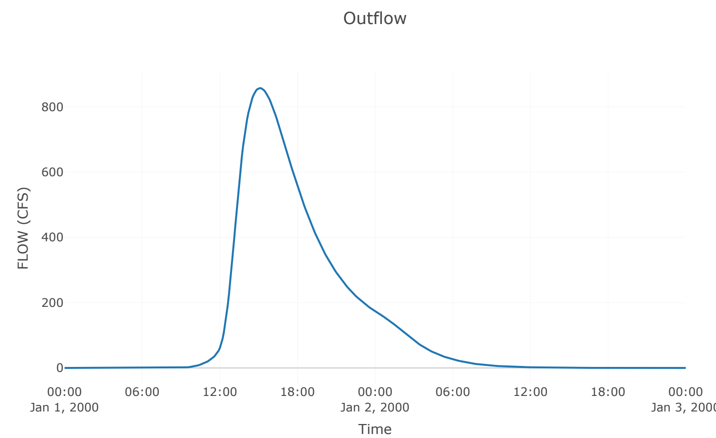


Junction: J5

Downstream : Boardman Rd to Trouble Pond

Results: J5

Peak Discharge (CFS)	857.55
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	3.56



Reach: Boardman Rd to Trouble Pond

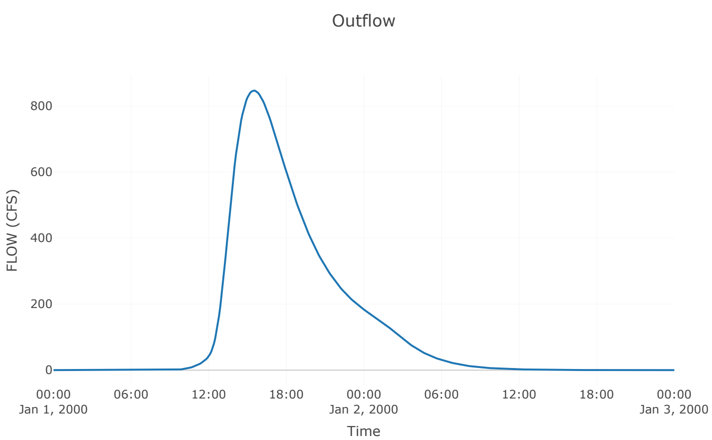
Downstream : J6

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.35
Muskingum x	0
Muskingum Steps	1

Results: Boardman Rd to Trouble Pond

Peak Discharge (CFS)	846.83
Time of Peak Discharge	01Jan2000, 15:30
Volume (IN)	3.56
Peak Inflow (CFS)	857.55
Inflow Volume (AC - FT)	522.03



Subbasin: Upstream of Trouble Pond

Area (MI2) : 0.5
Latitude Degrees : 41.46
Longitude Degrees : -72.45
Downstream : J6

Loss Rate: Scs

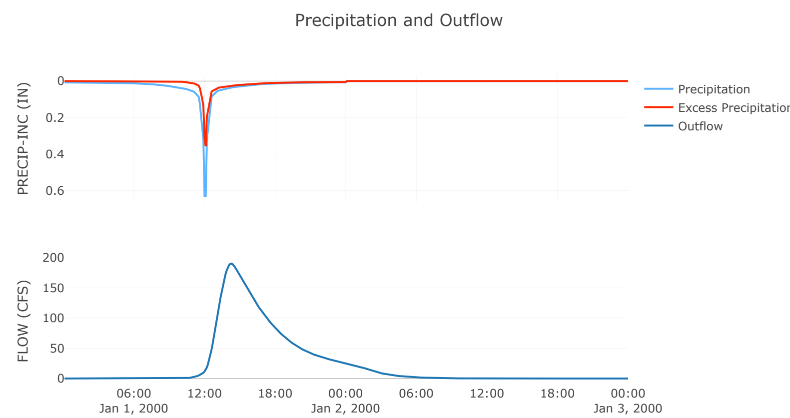
Percent Impervious Area	0
Curve Number	63.97

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.07
Snyder Cp	0.6

Results: Upstream of Trouble Pond

Peak Discharge (CFS)	190.25
Time of Peak Discharge	01Jan2000, 14:12
Volume (IN)	3.38
Precipitation Volume (AC - FT)	201
Loss Volume (AC - FT)	110.33
Excess Volume (AC - FT)	90.67
Direct Runoff Volume (AC - FT)	90.67
Baseflow Volume (AC - FT)	0

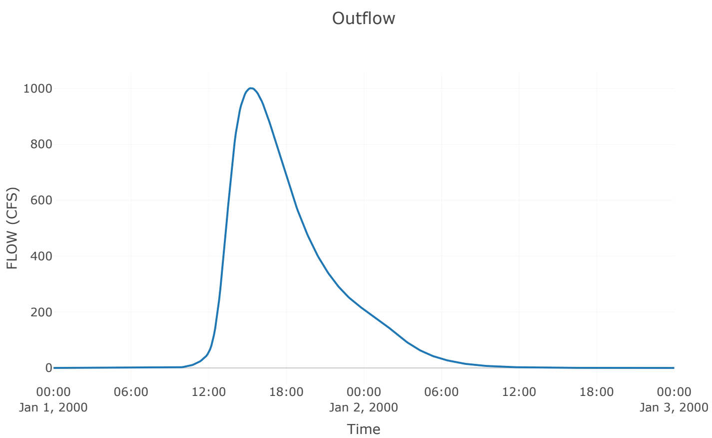


Junction: J6

Downstream : Trouble Pond to CT River

Results: J6

Peak Discharge (CFS)	1001.14
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	3.53



Reach: Trouble Pond to CT River

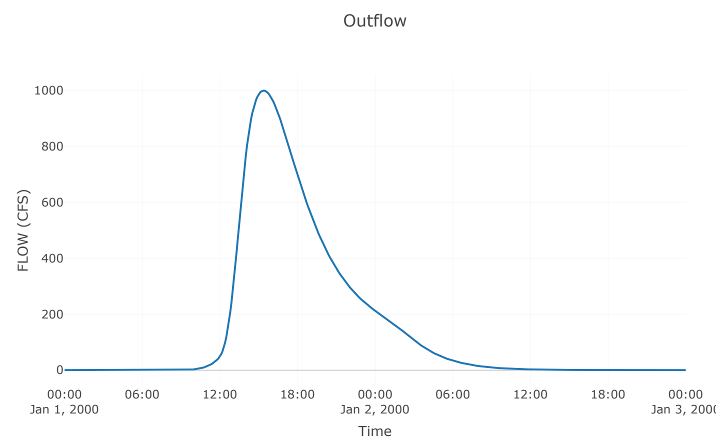
Downstream : Sink - 1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.1
Muskingum x	0
Muskingum Steps	1

Results: Trouble Pond to CT River

Peak Discharge (CFS)	1000.29
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	3.53
Peak Inflow (CFS)	1001.14
Inflow Volume (AC - FT)	612.7



Subbasin: Goodspeed Landing

Area (MI2) : 0.17
Latitude Degrees : 41.45
Longitude Degrees : -72.46
Downstream : Sink - 1

Loss Rate: Scs

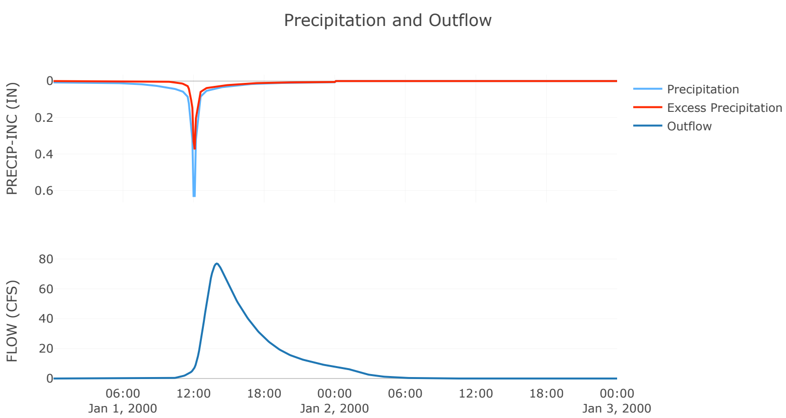
Percent Impervious Area	0
Curve Number	65.5

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.79
Snyder Cp	0.6

Results: Goodspeed Landing

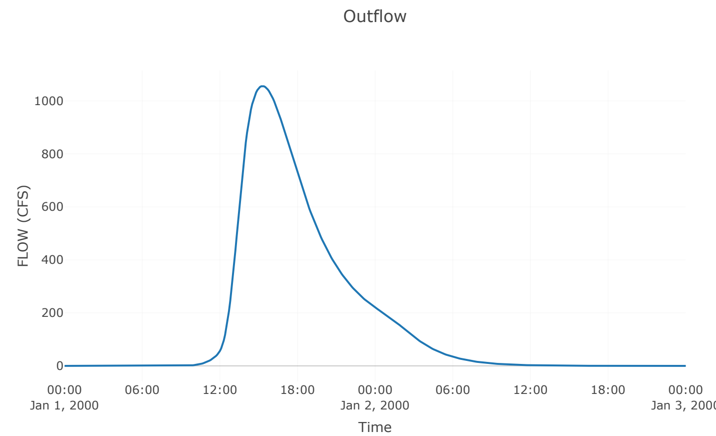
Peak Discharge (CFS)	76.93
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	3.55
Precipitation Volume (AC - FT)	69.72
Loss Volume (AC - FT)	36.74
Excess Volume (AC - FT)	32.98
Direct Runoff Volume (AC - FT)	32.98
Baseflow Volume (AC - FT)	0



Sink: Sink-1

Results: Sink-1

Peak Discharge (CFS)	1056.14
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	3.53



Project: R E Hhydro S C S
Simulation Run: CIRCA-2040-69-50
Simulation Start: 31 December 1999, 24:00
Simulation End: 2 January 2000, 24:00

HMS Version: 4.12
Executed: 15 October 2024, 20:34

Global Parameter Summary - Subbasin

Location

Element Name	Longitude Degrees	Latitude Degrees
Daniels Pond North	-72.43	41.48
Daniels Pond Northwest	-72.44	41.48
Daniels Pond East	-72.43	41.47
Town Street	-72.44	41.47
Mt Parnassus Road	-72.44	41.46
Shagbark	-72.44	41.47
North of Boardman Road	-72.45	41.47
Norwich Road and Boardman Ro	-72.45	41.47
Upstream of Trouble Pond	-72.45	41.46
Goodspeed Landing	-72.46	41.45

Area (MI2)

Element Name	Area (MI2)
Daniels Pond North	0.99
Daniels Pond Northwest	0.42
Daniels Pond East	0.25
Town Street	0.23
Mt Parnassus Road	0.33
Shagbark	0.08
North of Boardman Road	0.25
Norwich Road and Boardman Ro	0.21
Upstream of Trouble Pond	0.5
Goodspeed Landing	0.17

Downstream

Element Name	Downstream
Daniels Pond North	J3
Daniels Pond Northwest	J3
Daniels Pond East	J3
Town Street	J2
Mt Parnassus Road	J1
Shagbark	J1
North of Boardman Road	J5
Norwich Road and Boardman Ro	J5
Upstream of Trouble Pond	J6
Goodspeed Landing	Sink - 1

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Daniels Pond North	0	61.25
Daniels Pond Northwest	0	66.7
Daniels Pond East	0	61.08
Town Street	0	74.47
Mt Parnassus Road	0	69.48
Shagbark	0	61.43
North of Boardman Road	0	71.66
Norwich Road and Boardman Ro	0	67.46
Upstream of Trouble Pond	0	63.97
Goodspeed Landing	0	65.5

Transform: Snyder

Element Name	Snyder Method	Snyder Tp	Snyder Cp
Daniels Pond North	Standard	3.01	0.6
Daniels Pond Northwest	Standard	2.24	0.6
Daniels Pond East	Standard	1.51	0.6
Town Street	Standard	1.87	0.6
Mt Parnassus Road	Standard	1.89	0.6
Shagbark	Standard	1.51	0.6
North of Boardman Road	Standard	1.68	0.6
Norwich Road and Boardman Ro	Standard	1.62	0.6
Upstream of Trouble Pond	Standard	2.07	0.6
Goodspeed Landing	Standard	1.79	0.6

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
Daniels Pond to Shagbark	J2
Shagbark to Town St	J1
Town St to Boardman Rd	J5
Boardman Rd to Trouble Pond	J6
Trouble Pond to CT River	Sink - 1

Route: Muskingum

Element Name	Method	Initial Variable	Muskingum K	Muskingum x	Muskingum Steps
Daniels Pond to Shagbark	Muskingum	Combined Inflow	0.5	0	1
Shagbark to Town St	Muskingum	Combined Inflow	0.16	0	1
Town St to Boardman Rd	Muskingum	Combined Inflow	0.45	0	1
Boardman Rd to Trouble Pond	Muskingum	Combined Inflow	0.35	0	1
Trouble Pond to CT River	Muskingum	Combined Inflow	0.1	0	1

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Daniels Pond North	0.99	434.14	01Jan2000, 15:06	5.07
Daniels Pond Northwest	0.42	264.01	01Jan2000, 14:18	5.79
Daniels Pond East	0.25	175.28	01Jan2000, 13:36	5.04
J3	1.66	800.19	01Jan2000, 14:36	5.25
Daniels Pond to Shagbark	1.66	772.53	01Jan2000, 15:12	5.25
Town Street	0.23	191.58	01Jan2000, 13:54	6.81
J2	1.89	916.6	01Jan2000, 15:00	5.43
Shagbark to Town St	1.89	913.87	01Jan2000, 15:12	5.43
Mt Parnassus Road	0.33	246.62	01Jan2000, 14:00	6.16
Shagbark	0.08	57.46	01Jan2000, 13:36	5.09
J1	2.29	1148.58	01Jan2000, 14:54	5.52
Town St to Boardman Rd	2.29	1120.96	01Jan2000, 15:24	5.52
North of Boardman Road	0.25	213.42	01Jan2000, 13:42	6.44
Norwich Road and Boardman Ro	0.21	170.85	01Jan2000, 13:42	5.89
J5	2.75	1375.78	01Jan2000, 15:00	5.63
Boardman Rd to Trouble Pond	2.75	1358.14	01Jan2000, 15:24	5.63
Upstream of Trouble Pond	0.5	311.86	01Jan2000, 14:12	5.43
J6	3.25	1609	01Jan2000, 15:12	5.6
Trouble Pond to CT River	3.25	1607.56	01Jan2000, 15:18	5.6
Goodspeed Landing	0.17	124.42	01Jan2000, 13:54	5.63
Sink - 1	3.43	1697.06	01Jan2000, 15:12	5.6

Subbasin: Daniels Pond North

Area (MI2) : 0.99
Latitude Degrees : 41.48
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

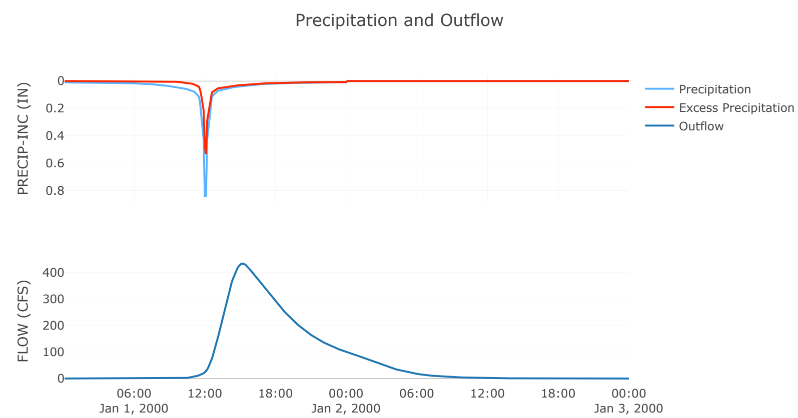
Percent Impervious Area	0
Curve Number	61.25

Transform: Snyder

Snyder Method	Standard
Snyder Tp	3.01
Snyder Cp	0.6

Results: Daniels Pond North

Peak Discharge (CFS)	434.14
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	5.07
Precipitation Volume (AC - FT)	529.55
Loss Volume (AC - FT)	261.33
Excess Volume (AC - FT)	268.22
Direct Runoff Volume (AC - FT)	268.22
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond Northwest

Area (MI2) : 0.42
Latitude Degrees : 41.48
Longitude Degrees : -72.44
Downstream : J3

Loss Rate: Scs

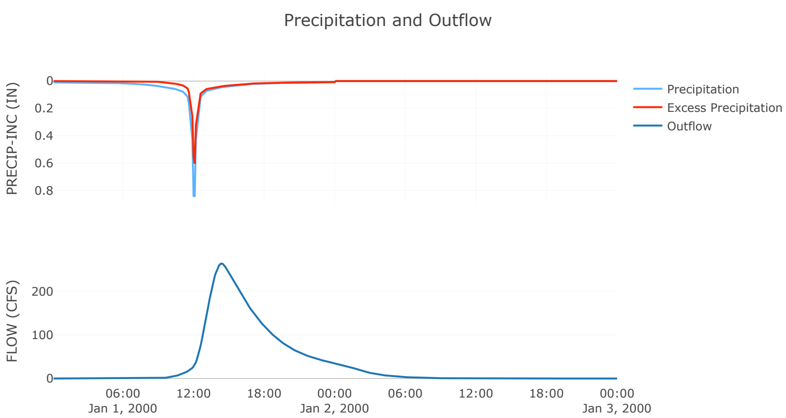
Percent Impervious Area	0
Curve Number	66.7

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.24
Snyder Cp	0.6

Results: Daniels Pond Northwest

Peak Discharge (CFS)	264.01
Time of Peak Discharge	01Jan2000, 14:18
Volume (IN)	5.79
Precipitation Volume (AC - FT)	224.92
Loss Volume (AC - FT)	94.7
Excess Volume (AC - FT)	130.22
Direct Runoff Volume (AC - FT)	130.22
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond East

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

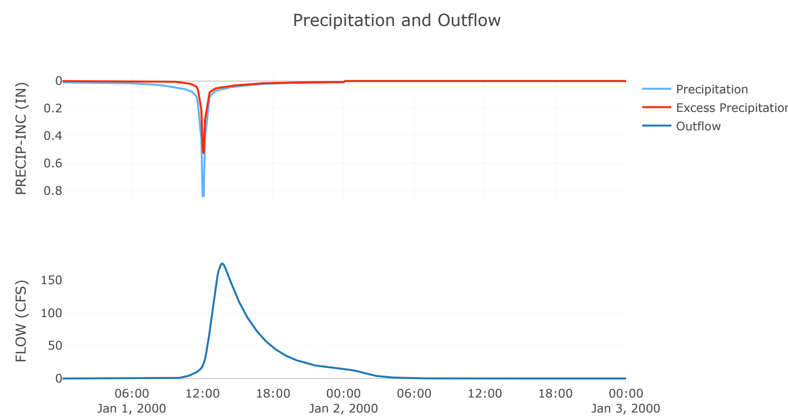
Percent Impervious Area	0
Curve Number	61.08

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Daniels Pond East

Peak Discharge (CFS)	175.28
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	5.04
Precipitation Volume (AC - FT)	131.31
Loss Volume (AC - FT)	65.09
Excess Volume (AC - FT)	66.21
Direct Runoff Volume (AC - FT)	66.21
Baseflow Volume (AC - FT)	0

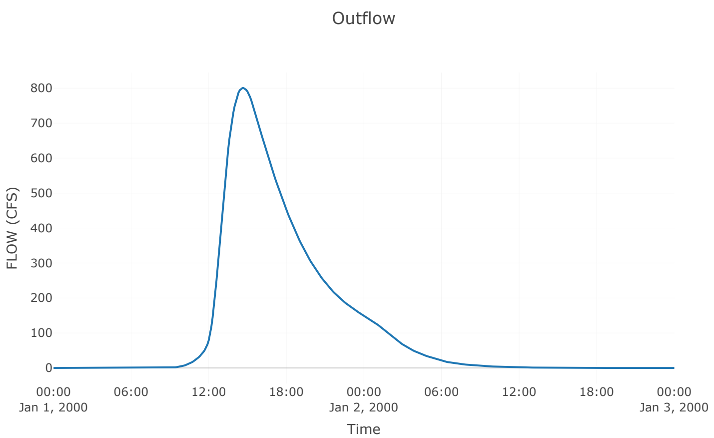


Junction: J3

Downstream : Daniels Pond to Shagbark

Results: J3

Peak Discharge (CFS)	800.19
Time of Peak Discharge	01Jan2000, 14:36
Volume (IN)	5.25



Reach: Daniels Pond to Shagbark

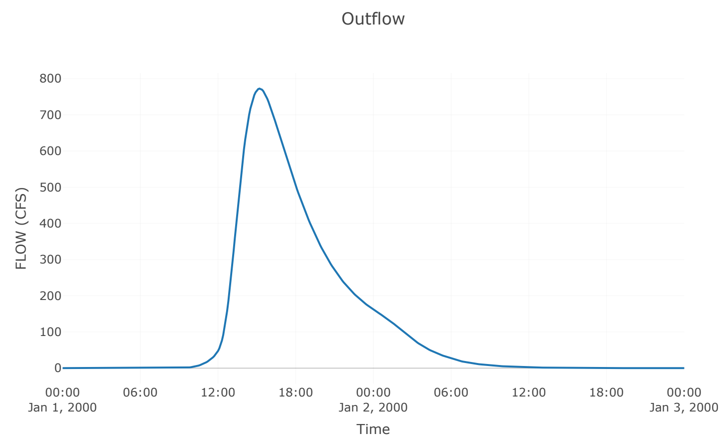
Downstream : J2

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.5
Muskingum x	0
Muskingum Steps	1

Results: Daniels Pond to Shagbark

Peak Discharge (CFS)	772.53
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	5.25
Peak Inflow (CFS)	800.19
Inflow Volume (AC - FT)	464.66



Subbasin: Town Street

Area (MI2) : 0.23
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J2

Loss Rate: Scs

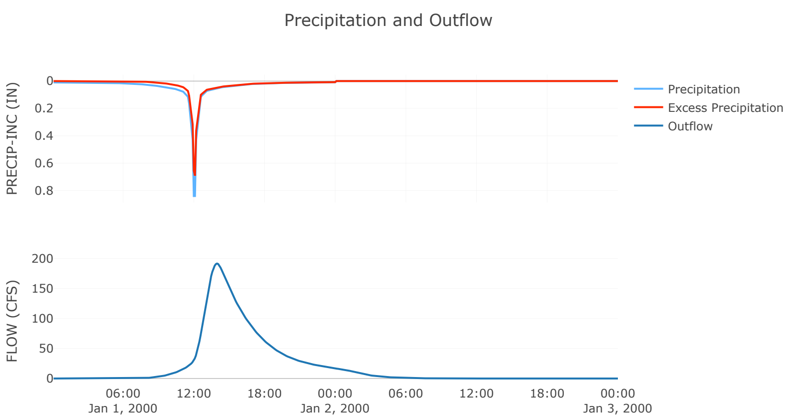
Percent Impervious Area	0
Curve Number	74.47

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.87
Snyder Cp	0.6

Results: Town Street

Peak Discharge (CFS)	191.58
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	6.81
Precipitation Volume (AC - FT)	120.16
Loss Volume (AC - FT)	38.36
Excess Volume (AC - FT)	81.8
Direct Runoff Volume (AC - FT)	81.8
Baseflow Volume (AC - FT)	0

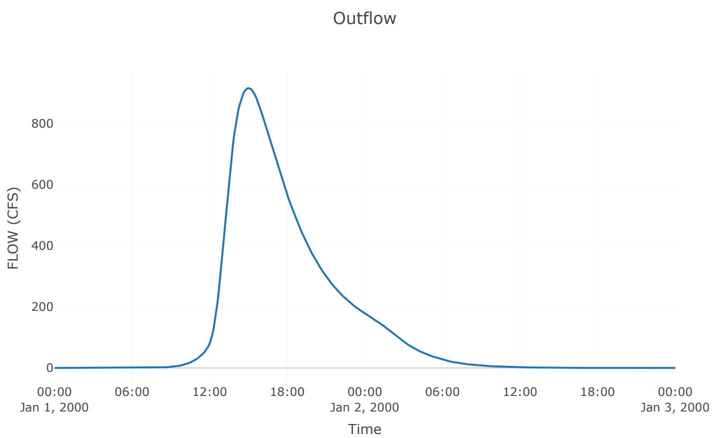


Junction: J2

Downstream : Shagbark to Town St

Results: J2

Peak Discharge (CFS)	916.6
Time of Peak Discharge	01Jan2000, 15:00
Volume (IN)	5.43



Reach: Shagbark to Town St

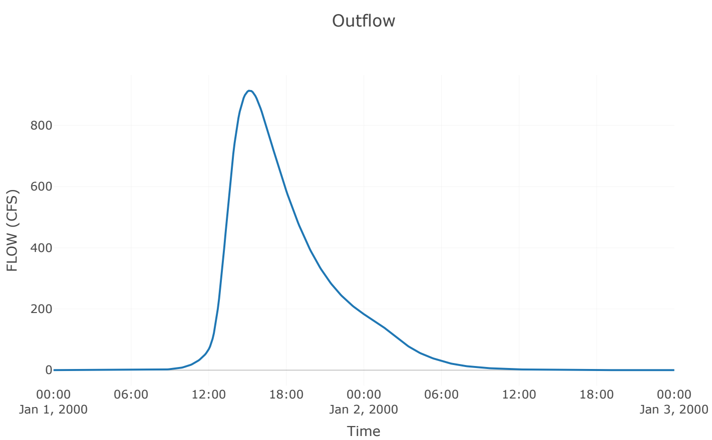
Downstream : J1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.16
Muskingum x	0
Muskingum Steps	1

Results: Shagbark to Town St

Peak Discharge (CFS)	913.87
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	5.43
Peak Inflow (CFS)	916.6
Inflow Volume (AC - FT)	546.46



Subbasin: Mt Parnassus Road

Area (MI2) : 0.33
Latitude Degrees : 41.46
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

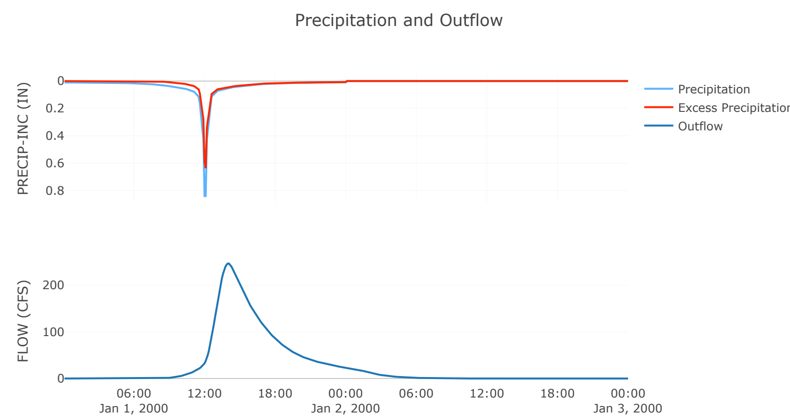
Percent Impervious Area	0
Curve Number	69.48

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.89
Snyder Cp	0.6

Results: Mt Parnassus Road

Peak Discharge (CFS)	246.62
Time of Peak Discharge	01Jan2000, 14:00
Volume (IN)	6.16
Precipitation Volume (AC - FT)	173.55
Loss Volume (AC - FT)	66.7
Excess Volume (AC - FT)	106.85
Direct Runoff Volume (AC - FT)	106.85
Baseflow Volume (AC - FT)	0



Subbasin: Shagbark

Area (MI2) : 0.08
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

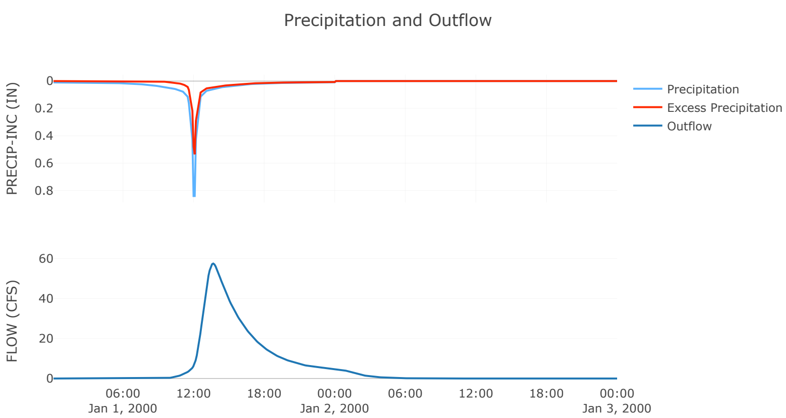
Percent Impervious Area	0
Curve Number	61.43

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Shagbark

Peak Discharge (CFS)	57.46
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	5.09
Precipitation Volume (AC - FT)	42.59
Loss Volume (AC - FT)	20.91
Excess Volume (AC - FT)	21.68
Direct Runoff Volume (AC - FT)	21.68
Baseflow Volume (AC - FT)	0

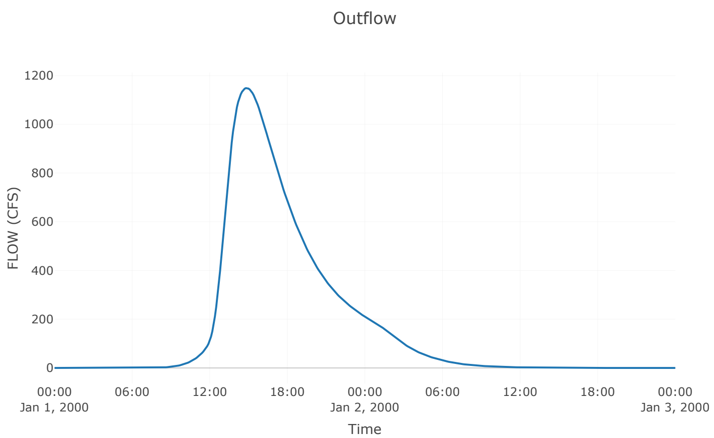


Junction: J1

Downstream : Town St to Boardman Rd

Results: J1

Peak Discharge (CFS)	1148.58
Time of Peak Discharge	01Jan2000, 14:54
Volume (IN)	5.52



Reach: Town St to Boardman Rd

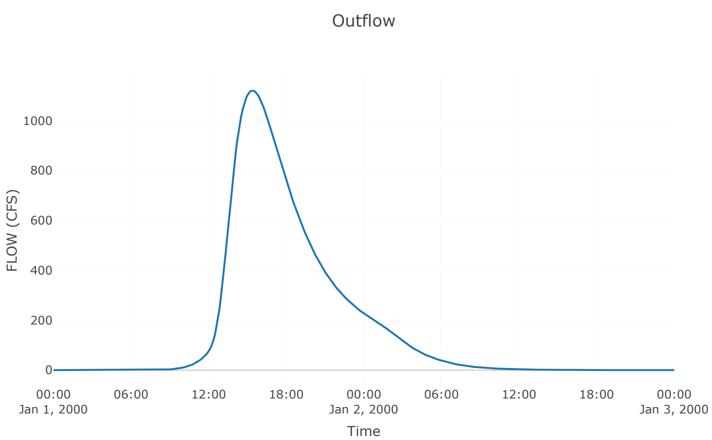
Downstream : J5

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.45
Muskingum x	0
Muskingum Steps	1

Results: Town St to Boardman Rd

Peak Discharge (CFS)	1120.96
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	5.52
Peak Inflow (CFS)	1148.58
Inflow Volume (AC - FT)	674.99



Subbasin: North of Boardman Road

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

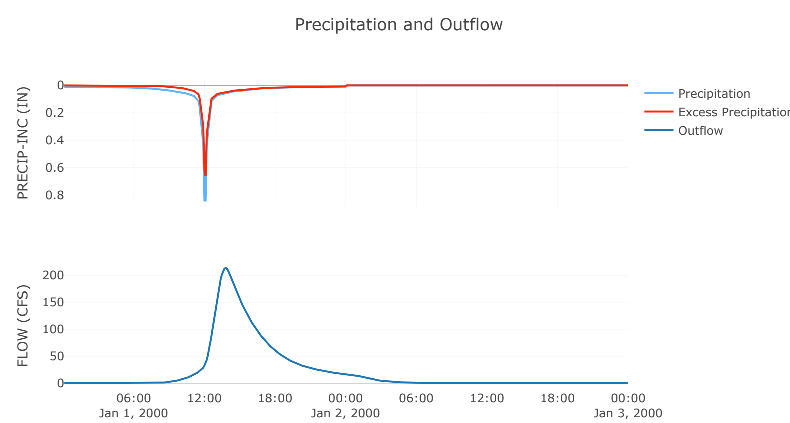
Percent Impervious Area	0
Curve Number	71.66

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.68
Snyder Cp	0.6

Results: North of Boardman Road

Peak Discharge (CFS)	213.42
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	6.44
Precipitation Volume (AC - FT)	131.79
Loss Volume (AC - FT)	46.88
Excess Volume (AC - FT)	84.91
Direct Runoff Volume (AC - FT)	84.91
Baseflow Volume (AC - FT)	0



Subbasin: Norwich Road and Boardman Ro

Area (MI2) : 0.21
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

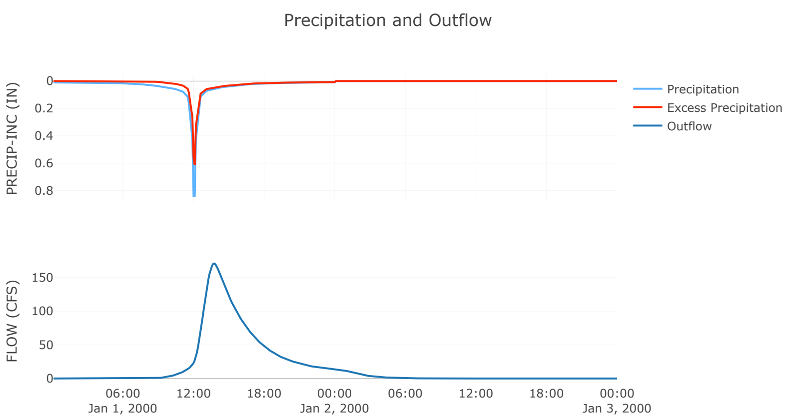
Percent Impervious Area	0
Curve Number	67.46

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.62
Snyder Cp	0.6

Results: Norwich Road and Boardman Ro

Peak Discharge (CFS)	170.85
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	5.89
Precipitation Volume (AC - FT)	113.39
Loss Volume (AC - FT)	46.6
Excess Volume (AC - FT)	66.79
Direct Runoff Volume (AC - FT)	66.79
Baseflow Volume (AC - FT)	0

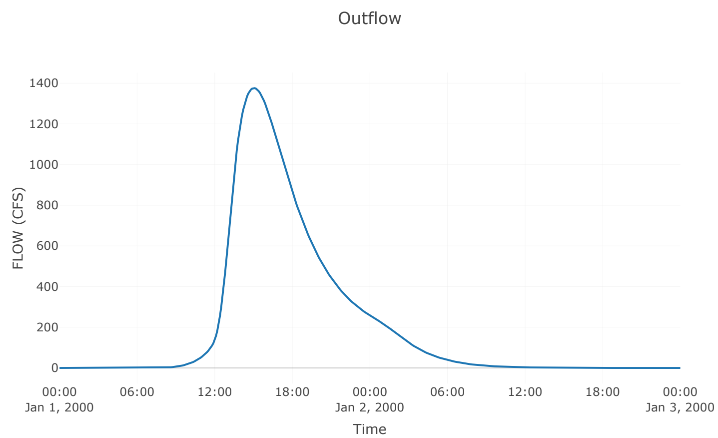


Junction: J5

Downstream : Boardman Rd to Trouble Pond

Results: J5

Peak Discharge (CFS)	1375.78
Time of Peak Discharge	01Jan2000, 15:00
Volume (IN)	5.63



Reach: Boardman Rd to Trouble Pond

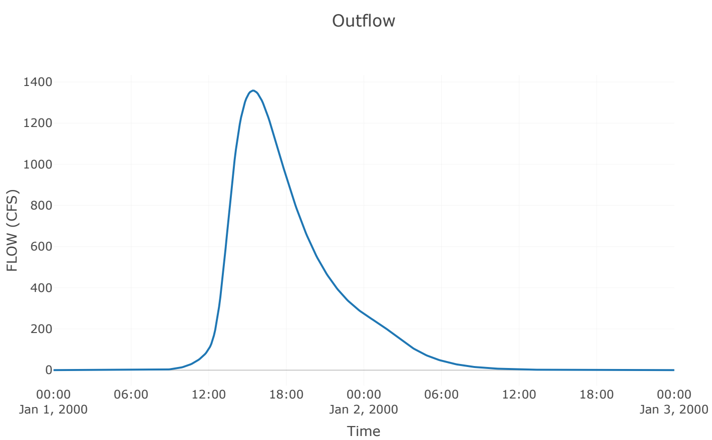
Downstream : J6

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.35
Muskingum x	0
Muskingum Steps	1

Results: Boardman Rd to Trouble Pond

Peak Discharge (CFS)	1358.14
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	5.63
Peak Inflow (CFS)	1375.78
Inflow Volume (AC - FT)	826.68



Subbasin: Upstream of Trouble Pond

Area (MI2) : 0.5
Latitude Degrees : 41.46
Longitude Degrees : -72.45
Downstream : J6

Loss Rate: Scs

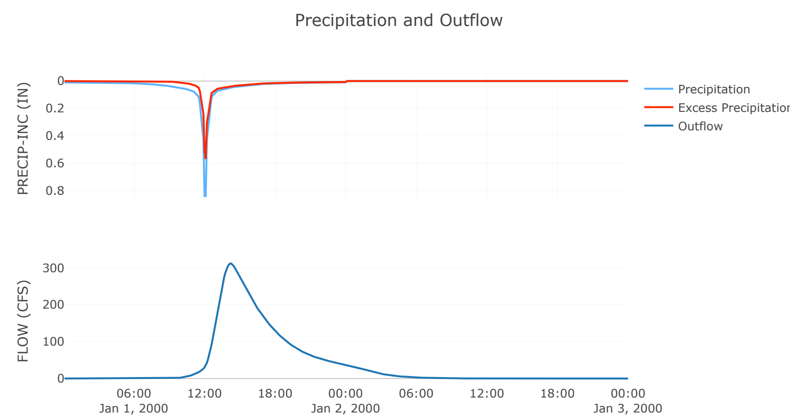
Percent Impervious Area	0
Curve Number	63.97

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.07
Snyder Cp	0.6

Results: Upstream of Trouble Pond

Peak Discharge (CFS)	311.86
Time of Peak Discharge	01Jan2000, 14:12
Volume (IN)	5.43
Precipitation Volume (AC - FT)	268
Loss Volume (AC - FT)	122.53
Excess Volume (AC - FT)	145.47
Direct Runoff Volume (AC - FT)	145.47
Baseflow Volume (AC - FT)	0

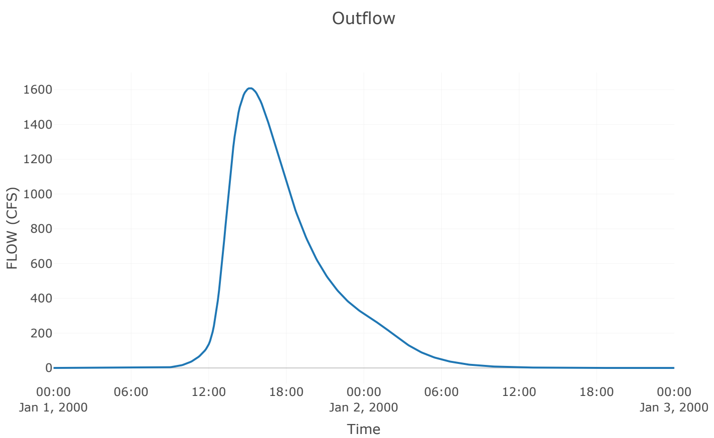


Junction: J6

Downstream : Trouble Pond to CT River

Results: J6

Peak Discharge (CFS)	1609
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	5.6



Reach: Trouble Pond to CT River

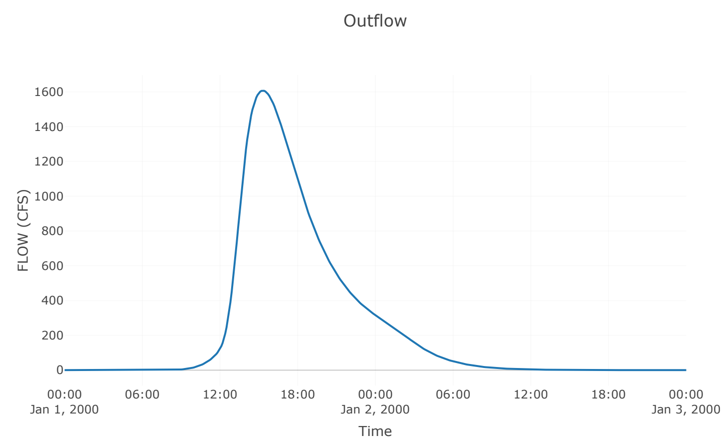
Downstream : Sink - 1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.1
Muskingum x	0
Muskingum Steps	1

Results: Trouble Pond to CT River

Peak Discharge (CFS)	1607.56
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	5.6
Peak Inflow (CFS)	1609
Inflow Volume (AC - FT)	972.15



Subbasin: Goodspeed Landing

Area (MI2) : 0.17
Latitude Degrees : 41.45
Longitude Degrees : -72.46
Downstream : Sink - 1

Loss Rate: Scs

Percent Impervious Area	0
Curve Number	65.5

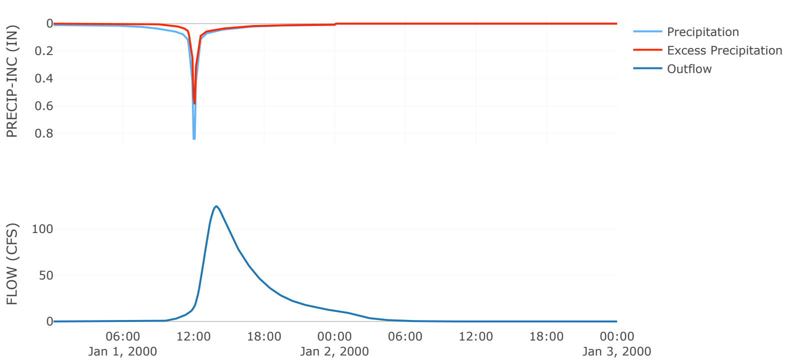
Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.79
Snyder Cp	0.6

Results: Goodspeed Landing

Peak Discharge (CFS)	124.42
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	5.63
Precipitation Volume (AC - FT)	92.96
Loss Volume (AC - FT)	40.61
Excess Volume (AC - FT)	52.35
Direct Runoff Volume (AC - FT)	52.35
Baseflow Volume (AC - FT)	0

Precipitation and Outflow

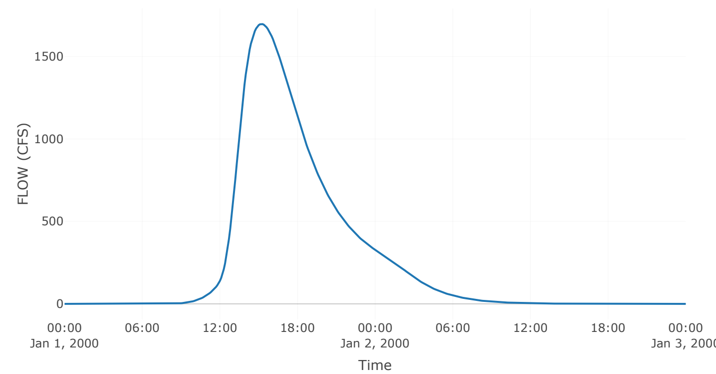


Sink: Sink-1

Results: Sink-1

Peak Discharge (CFS)	1697.06
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	5.6

Outflow



Project: R E Hhydro S C S
Simulation Run: CIRCA-2040-69-100
Simulation Start: 31 December 1999, 24:00
Simulation End: 2 January 2000, 24:00

HMS Version: 4.12
Executed: 15 October 2024, 20:33

Global Parameter Summary - Subbasin

Location

Element Name	Longitude Degrees	Latitude Degrees
Daniels Pond North	-72.43	41.48
Daniels Pond Northwest	-72.44	41.48
Daniels Pond East	-72.43	41.47
Town Street	-72.44	41.47
Mt Parnassus Road	-72.44	41.46
Shagbark	-72.44	41.47
North of Boardman Road	-72.45	41.47
Norwich Road and Boardman Ro	-72.45	41.47
Upstream of Trouble Pond	-72.45	41.46
Goodspeed Landing	-72.46	41.45

Area (MI2)

Element Name	Area (MI2)
Daniels Pond North	0.99
Daniels Pond Northwest	0.42
Daniels Pond East	0.25
Town Street	0.23
Mt Parnassus Road	0.33
Shagbark	0.08
North of Boardman Road	0.25
Norwich Road and Boardman Ro	0.21
Upstream of Trouble Pond	0.5
Goodspeed Landing	0.17

Downstream

Element Name	Downstream
Daniels Pond North	J3
Daniels Pond Northwest	J3
Daniels Pond East	J3
Town Street	J2
Mt Parnassus Road	J1
Shagbark	J1
North of Boardman Road	J5
Norwich Road and Boardman Ro	J5
Upstream of Trouble Pond	J6
Goodspeed Landing	Sink - 1

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Daniels Pond North	0	61.25
Daniels Pond Northwest	0	66.7
Daniels Pond East	0	61.08
Town Street	0	74.47
Mt Parnassus Road	0	69.48
Shagbark	0	61.43
North of Boardman Road	0	71.66
Norwich Road and Boardman Ro	0	67.46
Upstream of Trouble Pond	0	63.97
Goodspeed Landing	0	65.5

Transform: Snyder

Element Name	Snyder Method	Snyder Tp	Snyder Cp
Daniels Pond North	Standard	3.01	0.6
Daniels Pond Northwest	Standard	2.24	0.6
Daniels Pond East	Standard	1.51	0.6
Town Street	Standard	1.87	0.6
Mt Parnassus Road	Standard	1.89	0.6
Shagbark	Standard	1.51	0.6
North of Boardman Road	Standard	1.68	0.6
Norwich Road and Boardman Ro	Standard	1.62	0.6
Upstream of Trouble Pond	Standard	2.07	0.6
Goodspeed Landing	Standard	1.79	0.6

Global Parameter Summary - Reach

Downstream

Element Name	Downstream
Daniels Pond to Shagbark	J2
Shagbark to Town St	J1
Town St to Boardman Rd	J5
Boardman Rd to Trouble Pond	J6
Trouble Pond to CT River	Sink - 1

Route: Muskingum

Element Name	Method	Initial Variable	Muskingum K	Muskingum x	Muskingum Steps
Daniels Pond to Shagbark	Muskingum	Combined Inflow	0.5	0	1
Shagbark to Town St	Muskingum	Combined Inflow	0.16	0	1
Town St to Boardman Rd	Muskingum	Combined Inflow	0.45	0	1
Boardman Rd to Trouble Pond	Muskingum	Combined Inflow	0.35	0	1
Trouble Pond to CT River	Muskingum	Combined Inflow	0.1	0	1

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Daniels Pond North	0.99	623.68	01Jan2000, 15:06	7.19
Daniels Pond Northwest	0.42	368.06	01Jan2000, 14:18	8.02
Daniels Pond East	0.25	251.86	01Jan2000, 13:36	7.16
J3	1.66	1139.12	01Jan2000, 14:36	7.39
Daniels Pond to Shagbark	1.66	1098.86	01Jan2000, 15:12	7.39
Town Street	0.23	257.32	01Jan2000, 13:54	9.16
J2	1.89	1293.07	01Jan2000, 15:00	7.6
Shagbark to Town St	1.89	1289.4	01Jan2000, 15:06	7.6
Mt Parnassus Road	0.33	339.02	01Jan2000, 13:54	8.43
Shagbark	0.08	82.38	01Jan2000, 13:36	7.21
J1	2.29	1614.36	01Jan2000, 14:48	7.71
Town St to Boardman Rd	2.29	1574.35	01Jan2000, 15:18	7.71
North of Boardman Road	0.25	290.25	01Jan2000, 13:42	8.75
Norwich Road and Boardman Ro	0.21	236.86	01Jan2000, 13:42	8.13
J5	2.75	1923.35	01Jan2000, 15:00	7.84
Boardman Rd to Trouble Pond	2.75	1898.26	01Jan2000, 15:24	7.84
Upstream of Trouble Pond	0.5	441.23	01Jan2000, 14:06	7.61
J6	3.25	2250.87	01Jan2000, 15:12	7.8
Trouble Pond to CT River	3.25	2248.9	01Jan2000, 15:18	7.8
Goodspeed Landing	0.17	174.29	01Jan2000, 13:54	7.84
Sink - 1	3.43	2374.1	01Jan2000, 15:12	7.8

Subbasin: Daniels Pond North

Area (MI2) : 0.99
Latitude Degrees : 41.48
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

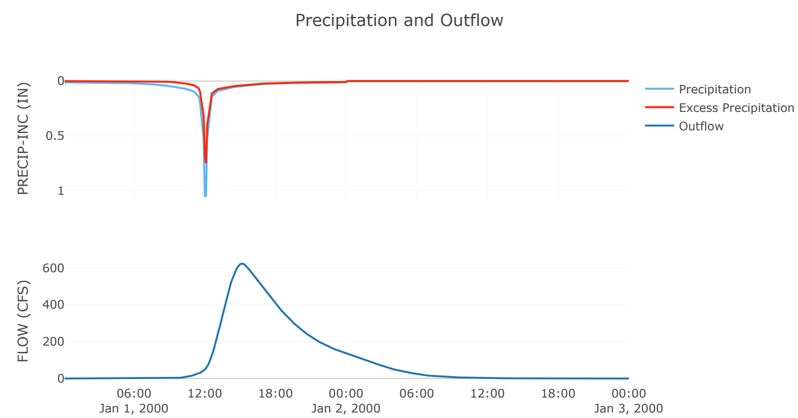
Percent Impervious Area	0
Curve Number	61.25

Transform: Snyder

Snyder Method	Standard
Snyder Tp	3.01
Snyder Cp	0.6

Results: Daniels Pond North

Peak Discharge (CFS)	623.68
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	7.19
Precipitation Volume (AC - FT)	661.93
Loss Volume (AC - FT)	281.36
Excess Volume (AC - FT)	380.57
Direct Runoff Volume (AC - FT)	380.57
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond Northwest

Area (MI2) : 0.42
Latitude Degrees : 41.48
Longitude Degrees : -72.44
Downstream : J3

Loss Rate: Scs

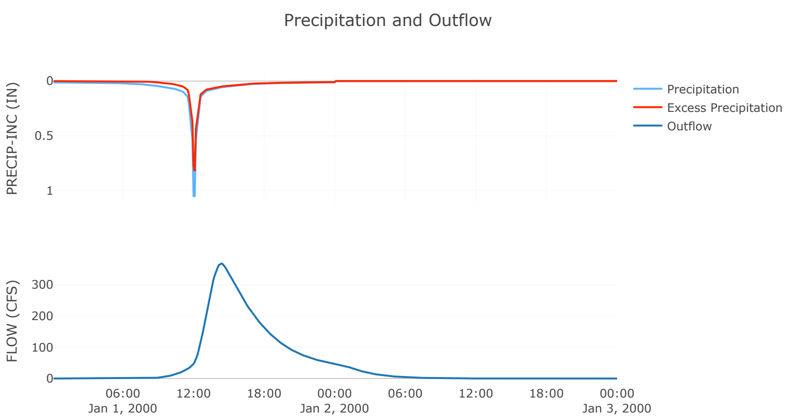
Percent Impervious Area	0
Curve Number	66.7

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.24
Snyder Cp	0.6

Results: Daniels Pond Northwest

Peak Discharge (CFS)	368.06
Time of Peak Discharge	01Jan2000, 14:18
Volume (IN)	8.02
Precipitation Volume (AC - FT)	281.15
Loss Volume (AC - FT)	100.77
Excess Volume (AC - FT)	180.38
Direct Runoff Volume (AC - FT)	180.38
Baseflow Volume (AC - FT)	0



Subbasin: Daniels Pond East

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.43
Downstream : J3

Loss Rate: Scs

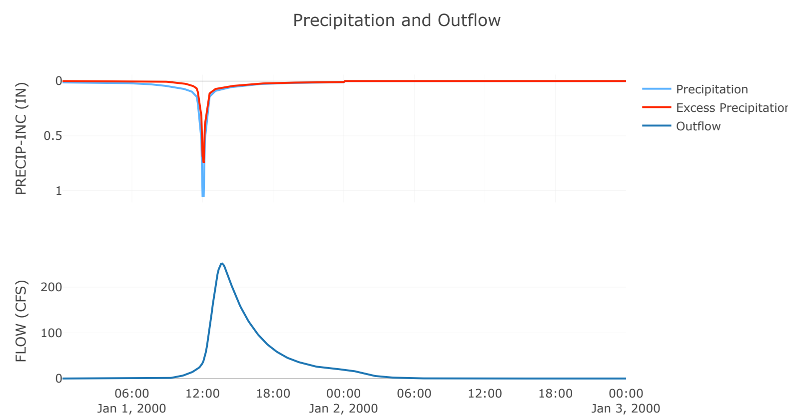
Percent Impervious Area	0
Curve Number	61.08

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Daniels Pond East

Peak Discharge (CFS)	251.86
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	7.16
Precipitation Volume (AC - FT)	164.13
Loss Volume (AC - FT)	70.11
Excess Volume (AC - FT)	94.02
Direct Runoff Volume (AC - FT)	94.02
Baseflow Volume (AC - FT)	0

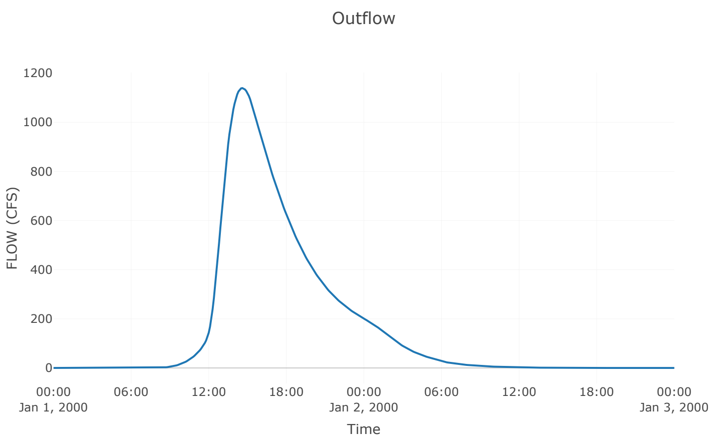


Junction: J3

Downstream : Daniels Pond to Shagbark

Results: J3

Peak Discharge (CFS)	1139.12
Time of Peak Discharge	01Jan2000, 14:36
Volume (IN)	7.39



Reach: Daniels Pond to Shagbark

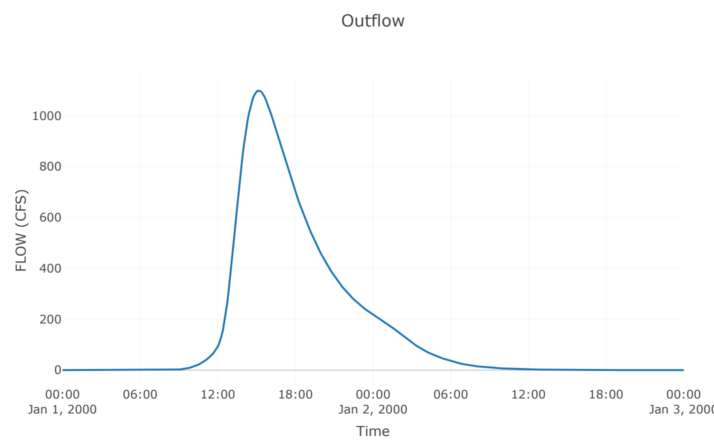
Downstream : J2

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.5
Muskingum x	0
Muskingum Steps	1

Results: Daniels Pond to Shagbark

Peak Discharge (CFS)	1098.86
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	7.39
Peak Inflow (CFS)	1139.12
Inflow Volume (AC - FT)	654.97



Subbasin: Town Street

Area (MI2) : 0.23
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J2

Loss Rate: Scs

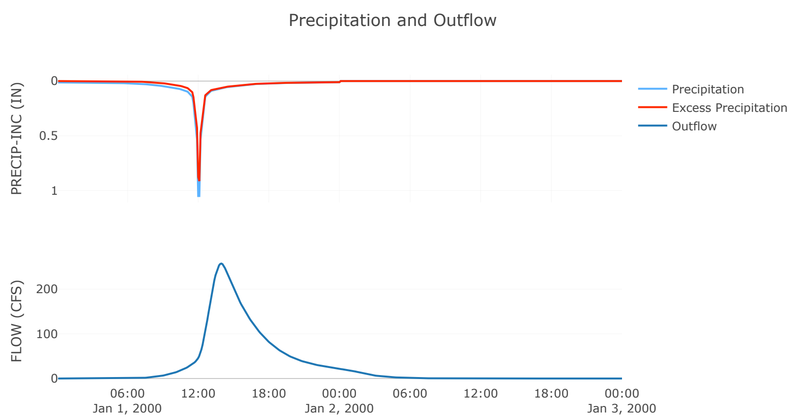
Percent Impervious Area	0
Curve Number	74.47

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.87
Snyder Cp	0.6

Results: Town Street

Peak Discharge (CFS)	257.32
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	9.16
Precipitation Volume (AC - FT)	150.2
Loss Volume (AC - FT)	40.18
Excess Volume (AC - FT)	110.02
Direct Runoff Volume (AC - FT)	110.02
Baseflow Volume (AC - FT)	0

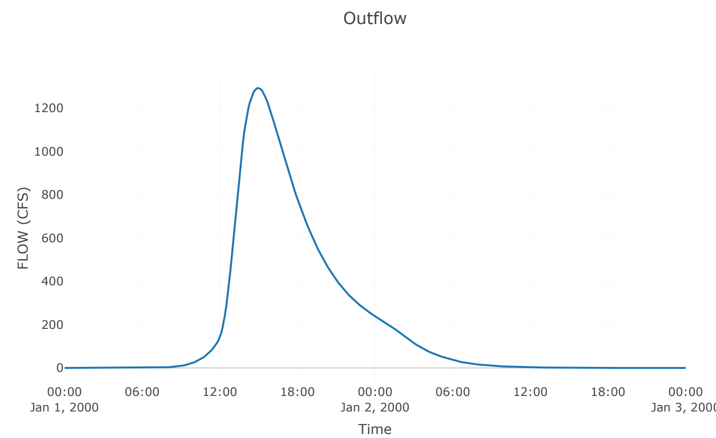


Junction: J2

Downstream : Shagbark to Town St

Results: J2

Peak Discharge (CFS)	1293.07
Time of Peak Discharge	01Jan2000, 15:00
Volume (IN)	7.6



Reach: Shagbark to Town St

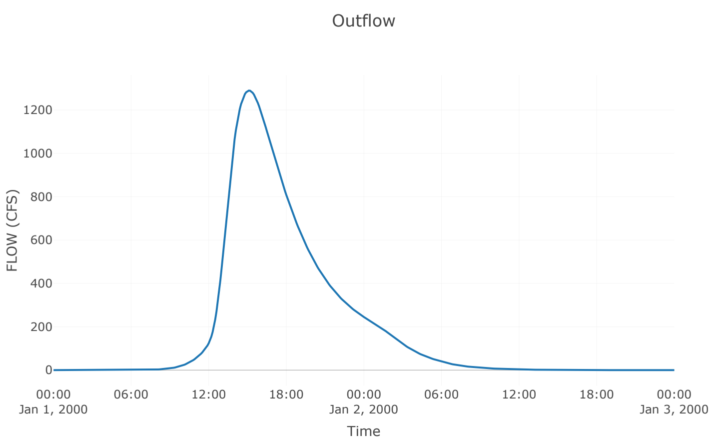
Downstream : J1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.16
Muskingum x	0
Muskingum Steps	1

Results: Shagbark to Town St

Peak Discharge (CFS)	1289.4
Time of Peak Discharge	01Jan2000, 15:06
Volume (IN)	7.6
Peak Inflow (CFS)	1293.07
Inflow Volume (AC - FT)	765



Subbasin: Mt Parnassus Road

Area (MI2) : 0.33
Latitude Degrees : 41.46
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

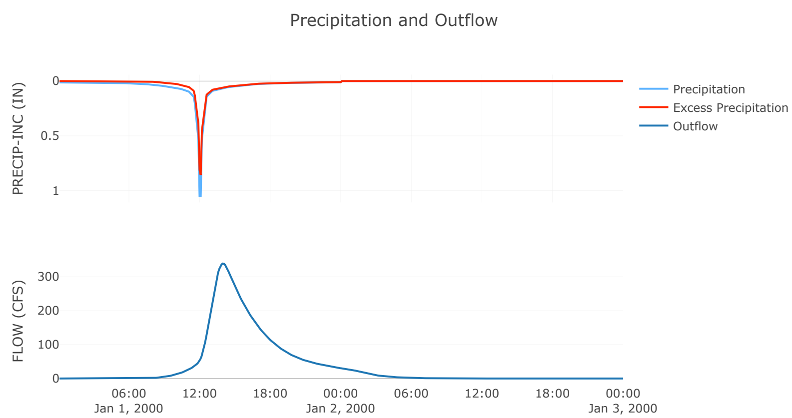
Percent Impervious Area	0
Curve Number	69.48

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.89
Snyder Cp	0.6

Results: Mt Parnassus Road

Peak Discharge (CFS)	339.02
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	8.43
Precipitation Volume (AC - FT)	216.93
Loss Volume (AC - FT)	70.57
Excess Volume (AC - FT)	146.37
Direct Runoff Volume (AC - FT)	146.37
Baseflow Volume (AC - FT)	0



Subbasin: Shagbark

Area (MI2) : 0.08
Latitude Degrees : 41.47
Longitude Degrees : -72.44
Downstream : J1

Loss Rate: Scs

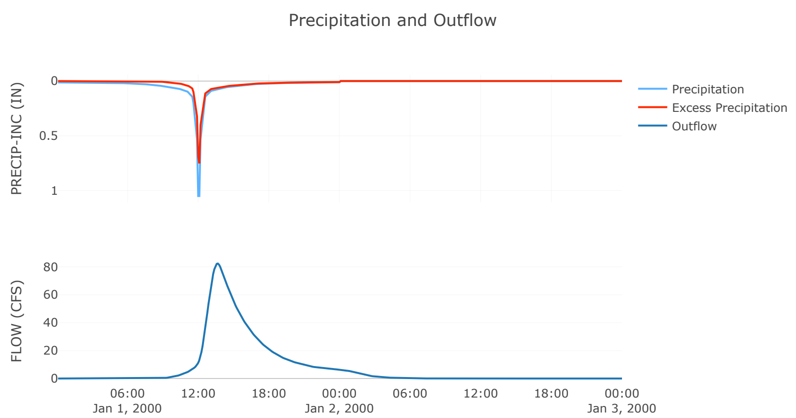
Percent Impervious Area	0
Curve Number	61.43

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.51
Snyder Cp	0.6

Results: Shagbark

Peak Discharge (CFS)	82.38
Time of Peak Discharge	01Jan2000, 13:36
Volume (IN)	7.21
Precipitation Volume (AC - FT)	53.24
Loss Volume (AC - FT)	22.51
Excess Volume (AC - FT)	30.73
Direct Runoff Volume (AC - FT)	30.73
Baseflow Volume (AC - FT)	0

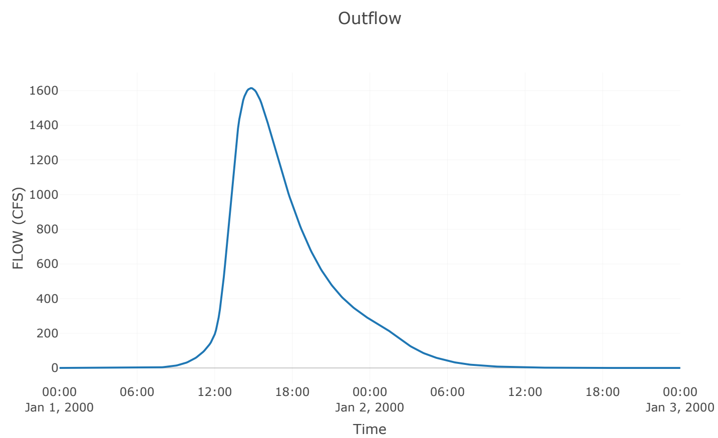


Junction: J1

Downstream : Town St to Boardman Rd

Results: J1

Peak Discharge (CFS)	1614.36
Time of Peak Discharge	01Jan2000, 14:48
Volume (IN)	7.71



Reach: Town St to Boardman Rd

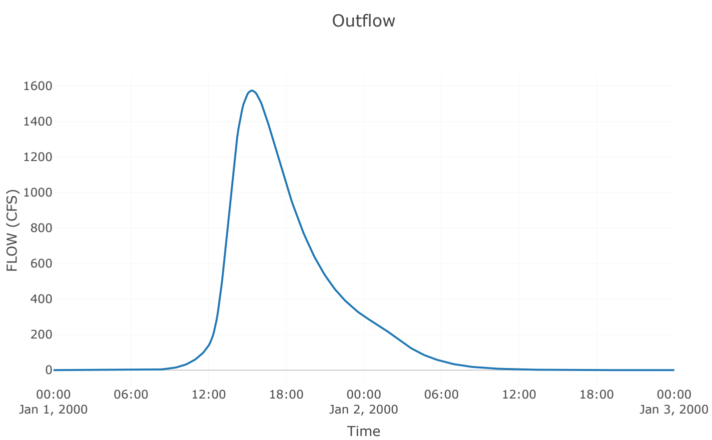
Downstream : J5

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.45
Muskingum x	0
Muskingum Steps	1

Results: Town St to Boardman Rd

Peak Discharge (CFS)	1574.35
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	7.71
Peak Inflow (CFS)	1614.36
Inflow Volume (AC - FT)	942.09



Subbasin: North of Boardman Road

Area (MI2) : 0.25
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

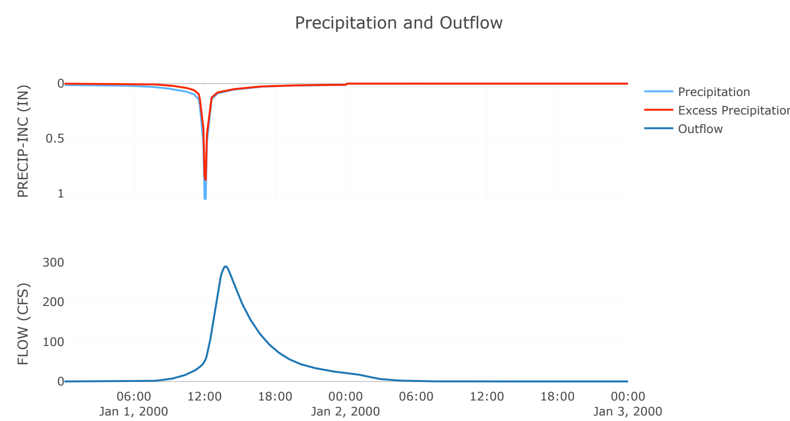
Percent Impervious Area	0
Curve Number	71.66

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.68
Snyder Cp	0.6

Results: North of Boardman Road

Peak Discharge (CFS)	290.25
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	8.75
Precipitation Volume (AC - FT)	164.73
Loss Volume (AC - FT)	49.38
Excess Volume (AC - FT)	115.36
Direct Runoff Volume (AC - FT)	115.36
Baseflow Volume (AC - FT)	0



Subbasin: Norwich Road and Boardman Ro

Area (MI2) : 0.21
Latitude Degrees : 41.47
Longitude Degrees : -72.45
Downstream : J5

Loss Rate: Scs

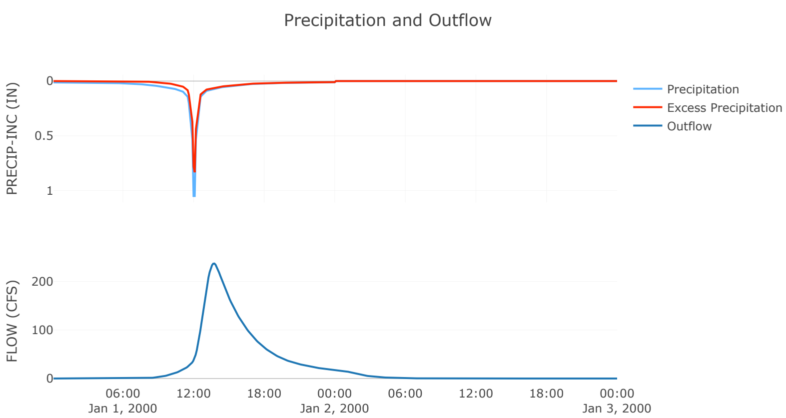
Percent Impervious Area	0
Curve Number	67.46

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.62
Snyder Cp	0.6

Results: Norwich Road and Boardman Ro

Peak Discharge (CFS)	236.86
Time of Peak Discharge	01Jan2000, 13:42
Volume (IN)	8.13
Precipitation Volume (AC - FT)	141.73
Loss Volume (AC - FT)	49.51
Excess Volume (AC - FT)	92.23
Direct Runoff Volume (AC - FT)	92.23
Baseflow Volume (AC - FT)	0

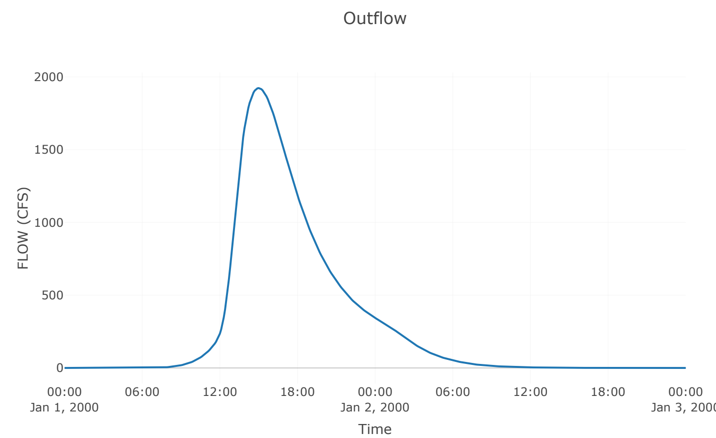


Junction: J5

Downstream : Boardman Rd to Trouble Pond

Results: J5

Peak Discharge (CFS)	1923.35
Time of Peak Discharge	01Jan2000, 15:00
Volume (IN)	7.84



Reach: Boardman Rd to Trouble Pond

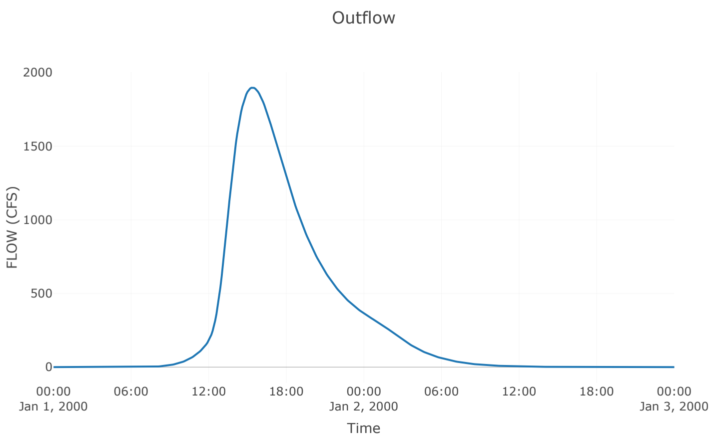
Downstream : J6

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.35
Muskingum x	0
Muskingum Steps	1

Results: Boardman Rd to Trouble Pond

Peak Discharge (CFS)	1898.26
Time of Peak Discharge	01Jan2000, 15:24
Volume (IN)	7.84
Peak Inflow (CFS)	1923.35
Inflow Volume (AC - FT)	1149.68



Subbasin: Upstream of Trouble Pond

Area (MI2) : 0.5
Latitude Degrees : 41.46
Longitude Degrees : -72.45
Downstream : J6

Loss Rate: Scs

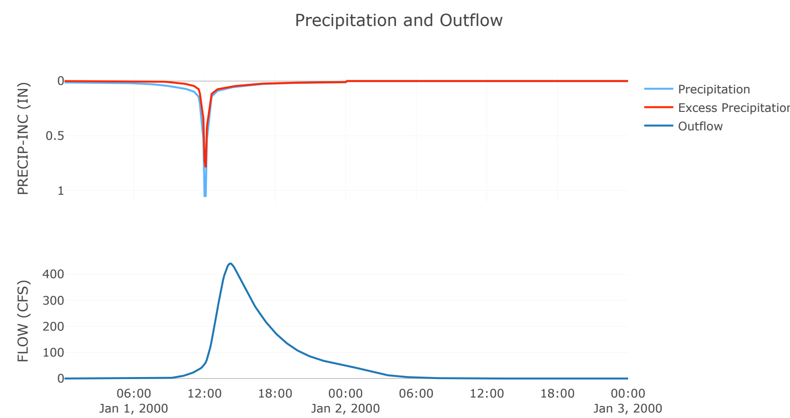
Percent Impervious Area	0
Curve Number	63.97

Transform: Snyder

Snyder Method	Standard
Snyder Tp	2.07
Snyder Cp	0.6

Results: Upstream of Trouble Pond

Peak Discharge (CFS)	441.23
Time of Peak Discharge	01Jan2000, 14:06
Volume (IN)	7.61
Precipitation Volume (AC - FT)	335
Loss Volume (AC - FT)	131.15
Excess Volume (AC - FT)	203.85
Direct Runoff Volume (AC - FT)	203.85
Baseflow Volume (AC - FT)	0

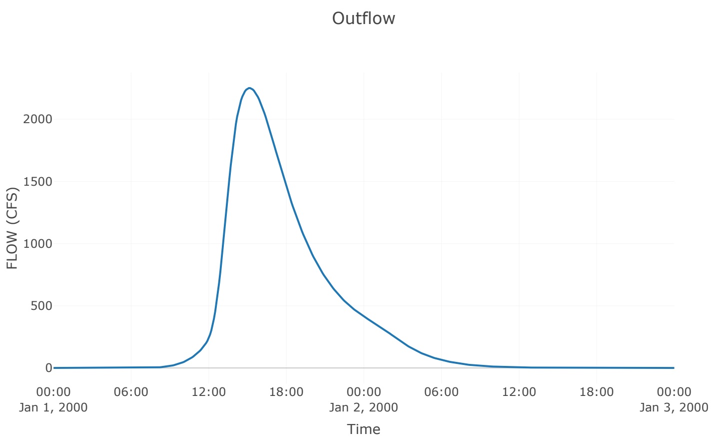


Junction: J6

Downstream : Trouble Pond to CT River

Results: J6

Peak Discharge (CFS)	2250.87
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	7.8



Reach: Trouble Pond to CT River

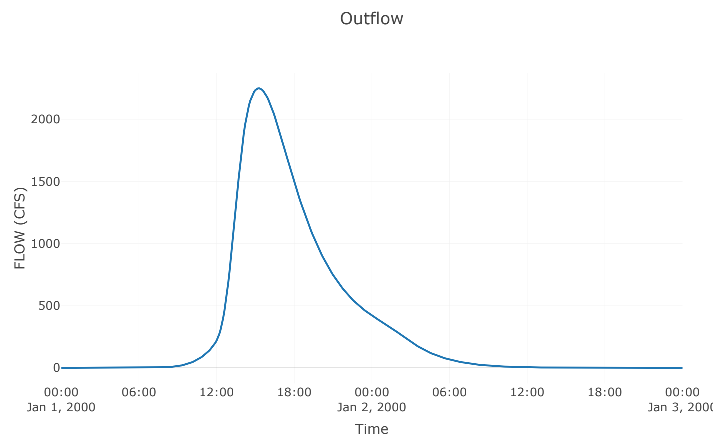
Downstream : Sink - 1

Route: Muskingum

Method	Muskingum
Initial Variable	Combined Inflow
Muskingum K	0.1
Muskingum x	0
Muskingum Steps	1

Results: Trouble Pond to CT River

Peak Discharge (CFS)	2248.9
Time of Peak Discharge	01Jan2000, 15:18
Volume (IN)	7.8
Peak Inflow (CFS)	2250.87
Inflow Volume (AC - FT)	1353.53



Subbasin: Goodspeed Landing

Area (MI2) : 0.17
Latitude Degrees : 41.45
Longitude Degrees : -72.46
Downstream : Sink - 1

Loss Rate: Scs

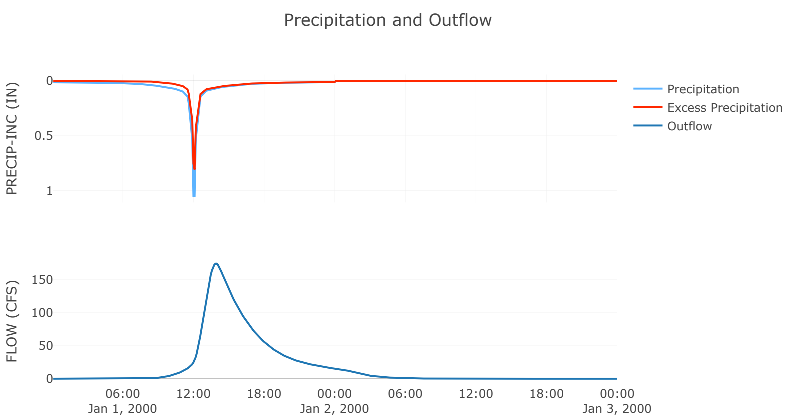
Percent Impervious Area	0
Curve Number	65.5

Transform: Snyder

Snyder Method	Standard
Snyder Tp	1.79
Snyder Cp	0.6

Results: Goodspeed Landing

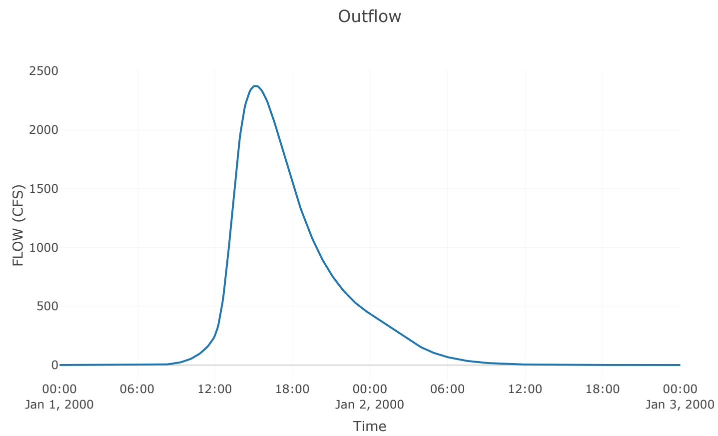
Peak Discharge (CFS)	174.29
Time of Peak Discharge	01Jan2000, 13:54
Volume (IN)	7.84
Precipitation Volume (AC - FT)	116.2
Loss Volume (AC - FT)	43.32
Excess Volume (AC - FT)	72.88
Direct Runoff Volume (AC - FT)	72.88
Baseflow Volume (AC - FT)	0



Sink: Sink-1

Results: Sink-1

Peak Discharge (CFS)	2374.1
Time of Peak Discharge	01Jan2000, 15:12
Volume (IN)	7.8

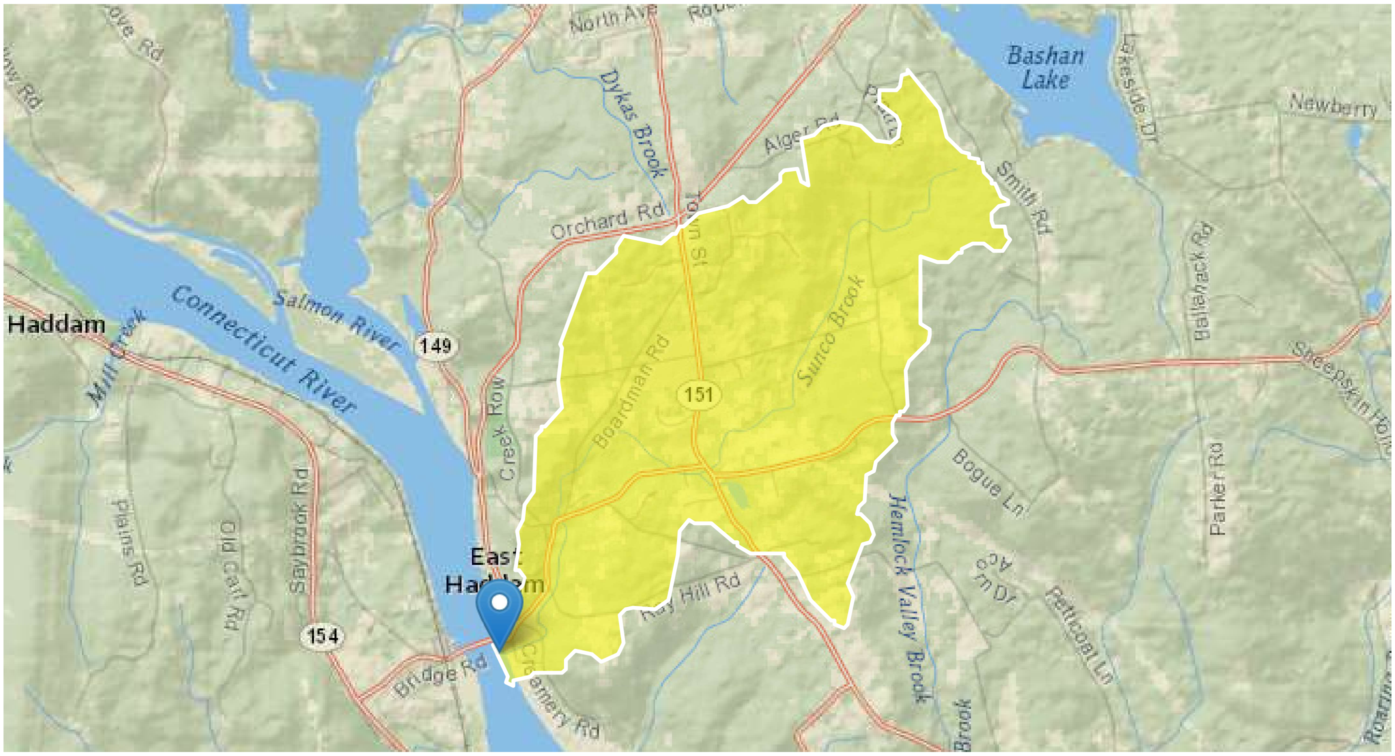


APPENDIX C

KLEINFELDER 400 Capital Blvd., Suite 104, Rocky Hill, CT 06067 p | 860.563.7775 f | 860.563.6744

StreamStats Report - Succor Brook, East Haddam, CT

Region ID: CT
Workspace ID: CT20240223214241859000
Clicked Point (Latitude, Longitude): 41.45096, -72.46263
Time: 2024-02-23 16:43:03 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CRSDFT	Percentage of area of coarse-grained stratified drift	1.96	percent
DRNAREA	Area that drains to a point on a stream	3.47	square miles
ELEV	Mean Basin Elevation	321	feet
I24H100Y	Maximum 24-hour precipitation that occurs on average once in 100 years	8.02	inches
I24H10Y	Maximum 24-hour precipitation that occurs on average once in 10 years	5.15	inches
I24H200Y	Maximum 24-hour precipitation that occurs on average once in 200 years	9.23	inches

Parameter Code	Parameter Description	Value	Unit
I24H25Y	Maximum 24-hour precipitation that occurs on average once in 25 years	6.29	inches
I24H2Y	Maximum 24-hour precipitation that occurs on average once in 2 years - Equivalent to precipitation intensity index	3.14	inches
I24H500Y	Maximum 24-hour precipitation that occurs on average once in 500 years	10.83	inches
I24H50Y	Maximum 24-hour precipitation that occurs on average once in 50 years	7.15	inches
I24H5Y	Maximum 24-hour precipitation that occurs on average once in 5 years	4.28	inches
NOVAVPRE	Mean November Precipitation	5	inches
PRCWINTER	Mean annual precipitation for December through February	4.3	inches
SSURGOCCDD	Percentage of area with hydrologic soil types C, D, or C/D from SSURGO	0.3408	percent
WETLAND	Percentage of Wetlands	2.1	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Statewide DA only SIR 2020 5054]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.47	square miles	0.69	325

Peak-Flow Statistics Parameters [Statewide Multiparameter SIR 2020 5054]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.47	square miles	0.69	325
I24H2Y	24 Hour 2 Year Precipitation	3.14	inches	2.77	3.32
SSURGOCCDD	Percent soil type C or D from SSURGO	0.3408	percent	0.118	0.945
I24H5Y	24 Hour 5 Year Precipitation	4.28	inches	4	4.7
I24H10Y	24 Hour 10 Year Precipitation	5.15	inches	4.86	5.79
I24H25Y	24 Hour 25 Year Precipitation	6.29	inches	5.99	7.22
I24H50Y	24 Hour 50 Year Precipitation	7.15	inches	6.81	8.3

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
I24H100Y	24 Hour 100 Year Precipitation	8.02	inches	7.62	9.38
I24H200Y	24 Hour 200 YearPrecipitation	9.23	inches	8.7	11.22
I24H500Y	24 Hour 500 Year Precipitation	10.83	inches	10.1	13.64

Peak-Flow Statistics Flow Report [Statewide DA only SIR 2020 5054]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	ASEp
Drainage Area Only 50-percent AEP flood	169	ft^3/s	35
Drainage Area Only 20-percent AEP flood	294	ft^3/s	35
Drainage Area Only 10-percent AEP flood	398	ft^3/s	36.3
Drainage Area Only 4-percent AEP flood	553	ft^3/s	37.8
Drainage Area Only 2-percent AEP flood	684	ft^3/s	39.8
Drainage Area Only 1-percent AEP flood	831	ft^3/s	42.4
Drainage Area Only 0.5-percent AEP flood	996	ft^3/s	44.4
Drainage Area Only 0.2-percent AEP flood	1240	ft^3/s	48

Peak-Flow Statistics Flow Report [Statewide Multiparameter SIR 2020 5054]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIL	PIU	ASEp
50-percent AEP flood	142	ft^3/s	34.6	582	26.5
20-percent AEP flood	230	ft^3/s	51.1	1030	26.3
10-percent AEP flood	301	ft^3/s	61.8	1470	28.4
4-percent AEP flood	410	ft^3/s	76.1	2210	31.5
2-percent AEP flood	503	ft^3/s	85	2980	34.3
1-percent AEP flood	609	ft^3/s	93.6	3960	37.1
0.5-percent AEP flood	725	ft^3/s	126	4160	40.6
0.2-percent AEP flood	911	ft^3/s	169	4910	45

Peak-Flow Statistics Flow Report [Area-Averaged]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	ASEp		
Drainage Area Only 50-percent AEP flood	169	ft^3/s	35		
Drainage Area Only 20-percent AEP flood	294	ft^3/s	35		
Drainage Area Only 10-percent AEP flood	398	ft^3/s	36.3		
Drainage Area Only 4-percent AEP flood	553	ft^3/s	37.8		
Drainage Area Only 2-percent AEP flood	684	ft^3/s	39.8		
Drainage Area Only 1-percent AEP flood	831	ft^3/s	42.4		
Drainage Area Only 0.5-percent AEP flood	996	ft^3/s	44.4		
Drainage Area Only 0.2-percent AEP flood	1240	ft^3/s	48		
50-percent AEP flood	142	ft^3/s	34.6	582	26.5
20-percent AEP flood	230	ft^3/s	51.1	1030	26.3
10-percent AEP flood	301	ft^3/s	61.8	1470	28.4
4-percent AEP flood	410	ft^3/s	76.1	2210	31.5
2-percent AEP flood	503	ft^3/s	85	2980	34.3
1-percent AEP flood	609	ft^3/s	93.6	3960	37.1
0.5-percent AEP flood	725	ft^3/s	126	4160	40.6
0.2-percent AEP flood	911	ft^3/s	169	4910	45

Peak-Flow Statistics Citations

Ahearn, E.A., and Hodgkins, G.A.,2020, Estimating flood magnitude and frequency on streams and rivers in Connecticut, based on data through water year 2015: U.S. Geological Survey Scientific Investigations Report 2020–5054, 42 p. (https://doi.org/10.3133/sir20205054)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Duration Flow 2010 5052]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.47	square miles	0.92	150
ELEV	Mean Basin Elevation	321	feet	168	1287
CRSDFT	Percent Coarse Stratified Drift	1.96	percent	0.1	55.1

Flow-Duration Statistics Flow Report [Duration Flow 2010 5052]

Statistic	Value	Unit
25 Percent Duration	8.75	ft^3/s

Statistic	Value	Unit
99 Percent Duration	0.0558	ft^3/s

Flow-Duration Statistics Citations

Ahearn, E.A.,2010, Regional regression equations to estimate flow-duration statistics in Connecticut: U. S. Geological Survey Scientific Investigations Report 2010-5052, 45 p. (http://pubs.usgs.gov/sir/2010/5052/)

Seasonal Flow Statistics

Seasonal Flow Statistics Parameters [Duration Flow 2010 5052]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.47	square miles	0.92	150
PRCWINTER	Mean Annual Winter Precipitation	4.3	inches	3.19	4.4
CRSDFT	Percent Coarse Stratified Drift	1.96	percent	0.1	55.1

Seasonal Flow Statistics Flow Report [Duration Flow 2010 5052]

Statistic	Value	Unit
25 Percent Duration December to February	10.5	ft^3/s
50 Percent Duration December to February	6.41	ft^3/s
75 Percent Duration December to February	3.94	ft^3/s
95 Percent Duration DEC FEB	1.88	ft^3/s
99 Percent Duration December to February	1.13	ft^3/s
25 Percent Duration March to April	14.6	ft^3/s
50 Percent Duration March to April	9.26	ft^3/s
75 Percent Duration March to April	5.79	ft^3/s
95 Percent Duration March to April	3.25	ft^3/s
99 Percent Duration March to April	2.27	ft^3/s
25 Percent Duration July to October	1.93	ft^3/s
50 Percent Duration July to October	0.716	ft^3/s
75 Percent Duration July to October	0.296	ft^3/s
80 Percent Duration July to October	0.24	ft^3/s
99 Percent Duration July to October	0.027	ft^3/s

Seasonal Flow Statistics Citations

Ahearn, E.A.,2010, Regional regression equations to estimate flow-duration statistics in Connecticut: U. S. Geological Survey Scientific Investigations Report 2010-5052, 45 p. (http://pubs.usgs.gov/sir/2010/5052/)

May Flow-Duration Statistics

May Flow-Duration Statistics Parameters [Duration Flow 2010 5052]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.47	square miles	0.92	150
CRSDFT	Percent Coarse Stratified Drift	1.96	percent	0.1	55.1

May Flow-Duration Statistics Flow Report [Duration Flow 2010 5052]

Statistic	Value	Unit
May 25 Percent Duration	9.04	ft^3/s
May 50 Percent Duration	5.5	ft^3/s
May 75 Percent Duration	3.56	ft^3/s
May 95 Percent Duration	1.71	ft^3/s
May 99 Percent Duration	1.04	ft^3/s

May Flow-Duration Statistics Citations

Ahearn, E.A.,2010, Regional regression equations to estimate flow-duration statistics in Connecticut: U. S. Geological Survey Scientific Investigations Report 2010-5052, 45 p. (http://pubs.usgs.gov/sir/2010/5052/)

June Flow-Duration Statistics

June Flow-Duration Statistics Parameters [Duration Flow 2010 5052]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.47	square miles	0.92	150
CRSDFT	Percent Coarse Stratified Drift	1.96	percent	0.1	55.1
WETLAND	Percent Wetlands	2.1	percent	0.3	18.1

June Flow-Duration Statistics Flow Report [Duration Flow 2010 5052]

Statistic	Value	Unit
June 25 Percent Duration	5.3	ft^3/s
June 50 Percent Duration	2.5	ft^3/s
June 75 Percent Duration	1.28	ft^3/s
June 90 Percent Duration	0.642	ft^3/s
June 99 Percent Duration	0.25	ft^3/s

June Flow-Duration Statistics Citations

Ahearn, E.A.,2010, Regional regression equations to estimate flow-duration statistics in Connecticut: U. S. Geological Survey Scientific Investigations Report 2010-5052, 45 p. (http://pubs.usgs.gov/sir/2010/5052/)

November Flow-Duration Statistics

November Flow-Duration Statistics Parameters [Duration Flow 2010 5052]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.47	square miles	0.92	150
NOVAVPRE	Mean November Precipitation	5	inches	3.48	4.93
CRSDFT	Percent Coarse Stratified Drift	1.96	percent	0.1	55.1

November Flow-Duration Statistics Disclaimers [Duration Flow 2010 5052]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

November Flow-Duration Statistics Flow Report [Duration Flow 2010 5052]

Statistic	Value	Unit
November 25 Percent Duration	8.14	ft^3/s
November 50 Percent Duration	4.55	ft^3/s
November 75 Percent Duration	2.32	ft^3/s
November 90 Percent Duration	1.08	ft^3/s
November 99 Percent Duration	0.409	ft^3/s

November Flow-Duration Statistics Citations

Ahearn, E.A.,2010, Regional regression equations to estimate flow-duration statistics in Connecticut: U. S. Geological Survey Scientific Investigations Report 2010-5052, 45 p. (http://pubs.usgs.gov/sir/2010/5052/)

Bankfull Statistics

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.47	square miles	0.07722	940.1535

Bankfull Statistics Parameters [New England P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.47	square miles	3.799224	138.999861

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.47	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	25.5	ft
Bieger_D_channel_depth	1.6	ft
Bieger_D_channel_cross_sectional_area	41.4	ft^2

Bankfull Statistics Disclaimers [New England P Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [New England P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	35.8	ft
Bieger_P_channel_depth	1.81	ft
Bieger_P_channel_cross_sectional_area	65.3	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	19.2	ft
Bieger_USA_channel_depth	1.57	ft
Bieger_USA_channel_cross_sectional_area	33.5	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	25.5	ft
Bieger_D_channel_depth	1.6	ft
Bieger_D_channel_cross_sectional_area	41.4	ft^2
Bieger_P_channel_width	35.8	ft
Bieger_P_channel_depth	1.81	ft
Bieger_P_channel_cross_sectional_area	65.3	ft^2
Bieger_USA_channel_width	19.2	ft
Bieger_USA_channel_depth	1.57	ft
Bieger_USA_channel_cross_sectional_area	33.5	ft^2

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campai

> Maximum Probable Flood Statistics

Maximum Probable Flood Statistics Parameters [Crippen Bue Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.47	square miles	0.1	3000

Maximum Probable Flood Statistics Flow Report [Crippen Bue Region 2]

Statistic	Value	Unit
Maximum Flood Crippen Bue Regional	13000	ft^3/s

Maximum Probable Flood Statistics Citations

Crippen, J.R. and Bue, Conrad D.1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (https://pubs.usgs.gov/wsp/1887/report.pdf)

Application Version: 4.19.4
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Worksheet for computing annual exceedance probability flood discharges and prediction intervals at stream sites in Connecticut

[from: Ahearn, E.A., and Hodgkins, G.A., 2020, Estimating flood magnitude and frequency on streams and rivers in Connecticut, based on data through water year 2015: U.S. Geological Survey Scientific Investigations Report 2020–5054, https://doi.org/10.3133/sir20205054.

About:

This file is designed as a worksheet for computing regional-regression-based flood discharges and associated prediction intervals for basins in Connecticut based on the methods determined in U.S. Geological Survey (USGS) Scientific Investigations Report 2020-5054, available for download at https://doi.org/10.3133/sir20205054.

Description of Worksheet tabs:

Inputs and Results: Users can enter indicated information within the yellow shaded cells. The flood-frequency results and associated prediction intervals are shaded in light gray cells.

Table 1a. Enter explanatory variable data

Table 1b. Flood discharge estimates and prediction intervals for selected annual exceedance probabilities

Table 1c. Regional regression equations for estimating flood discharges at stream sites in Connecticut

CoVariance: Contains the covariance matrix and other pertinent data needed to compute the flood-frequency estimates, associated prediction intervals, and display a figure showing the estimated flood discharges and the lower and upper x-percent prediction intervals for the selected annual exceedance probabilities. The worksheet is protected to avoid inadvertent user modification of formulas. If needed, the worksheet may be unprotected.

Table 2a. Covariance matrix used to compute annual exceedance probability flood discharges and x-percent prediction interval flows reported in Inputs and Results worksheet

Table 2b. Student's T computation

Table 2c. Generalized-least squares regression model performance metrics from U.S. Geological Survey Weighted-multiple-linear Regression (WREG) Program

Read.me about intervals: Contains documentation on prediction interval calculations

References

U.S. Geological Survey, 2014, Weighted-multiple-linear REGression program, WREG version 2.02, at https://github.com/USGS-R/WREG.

Worksheet for computing annual exceedance probability flood discharges and prediction intervals for stream sites in Connecticut

This spreadsheet computes the regression estimate of the 50-, 20-, 10-, 4-, 2-, 1-, 0.5-, and 0.2-percent annual exceedance probabilities for an unregulated stream in Connecticut. The spreadsheet also computes the 70-, 80-, 90-, 95-, and 99-percent prediction intervals and the standard error of prediction of the regressions estimates. Note: The prediction interval provides upper and lower limits of the estimated flood discharge with a certain probability, or level of confidence in the accuracy of the estimate. The prediction interval is a range of discharges that is likely to contain the true discharge given specified settings of the predictors ranging from 70- to 99-percent. For example, for a 70-percent prediction interval, you can be 70% confident that the discharge for the site of interest from the regression is within the range of discharge defined by the lower and upper 70-percent prediction intervals. The standard error of prediction (SEP) indicates the overall prediction error for the regression estimate based on the data used to develop the regression equation.]

To use the spreadsheet, enter requested information in the yellow cells below.

Enter a site name:	Succor Brook, East Haddam, CT
Enter a prediction interval, in percent (70, 80, 90, 95, or 99):	90

Table 1a: Enter explanatory variable data:

[DRNAREA, drainage area, in mi^2; SOILCorD, area of hydrologic soil type C or D, in decimal percent; I24HRXYR, 24 hour rainfall that occurs in x year, in inches; mi^2, square miles]

Explanatory Variable		Value	Units	Applicable range
DRNAREA		3.47	mi^2	0.69 to 325
SOILCorD		0.3408	decimal (percent of basin)	0.1176 to 0.9446
I24HRXYR	P2	3.14	inches	2.77 to 3.32
	P5	4.28	inches	4.0 to 4.70
	P10	5.15	inches	4.86 to 5.79
	P25	6.29	inches	5.99 to 7.22
	P50	7.15	inches	6.81 to 8.30
	P100	8.02	inches	7.62 to 9.38
	P200	9.23	inches	8.70 to 11.22
	P500	10.83	inches	10.10 to 13.64

Table 1b. Flood discharge estimates and prediction intervals for selected annual exceedance probabilities.

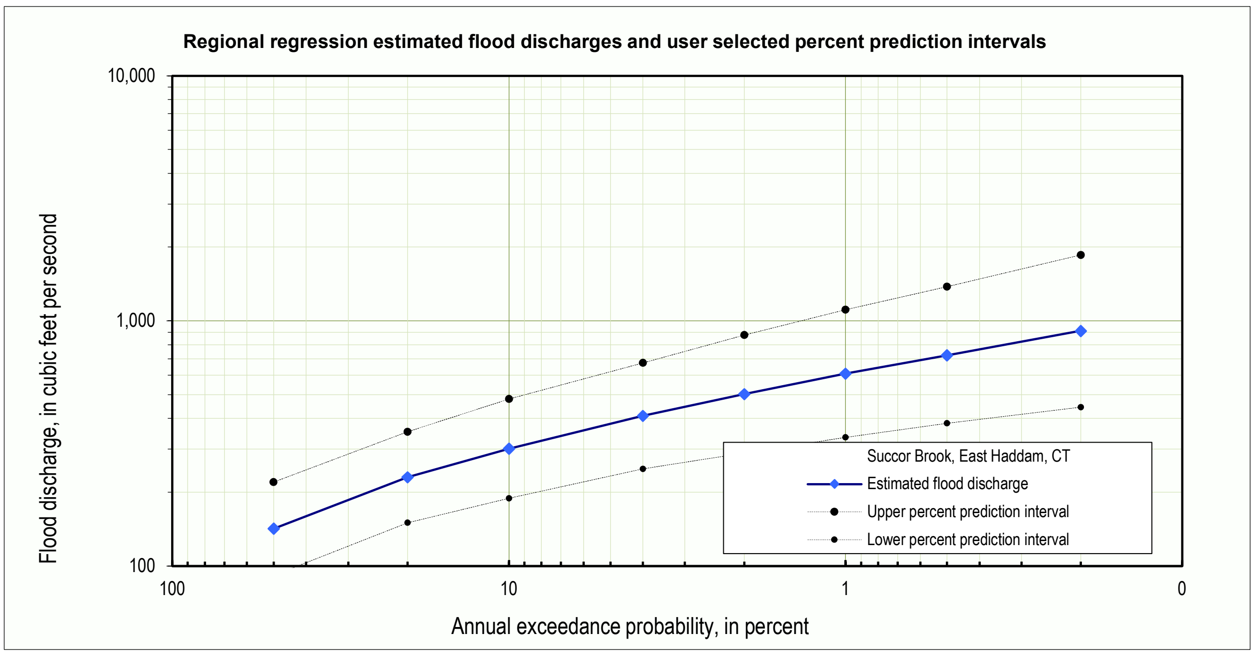
[$SEP_{p,i}$, standard error of prediction of the regression equation, reported as minus and positive units of percent and cubic feet per second; Average $SEP_{p,i}$, average standard error of prediction of the regression equation; ft^3/s, cubic feet per second. Note: The average SEP indicates the overall average prediction error for any estimated discharge based on the data used to develop the regression equation. See "Read.me about intervals" worksheet for documentation on converting the average SEPp,i to a confidence level for the estimate, reported as -SEPp,i and +SEPp,i]

Annual exceedance probability (percent)	Estimated flood discharge (ft^3/s)	Lower percent prediction interval (ft^3/s)	Upper percent prediction interval (ft^3/s)	$-SEP_{P,i}$ (percent)	$+SEP_{P,i}$ (percent)	Average $SEP_{P,i}$ (percent)	$-SEP_{P,i}$ (ft^3/s)	$+SEP_{P,i}$ (ft^3/s)
50	142	92	220	-23.2	30.3	26.9	109	185
20	230	150	353	-22.7	29.3	26.1	178	297
10	301	189	480	-24.4	32.4	28.6	227	398
4	410	249	674	-25.8	34.8	30.5	304	553
2	503	289	875	-28.3	39.5	34.2	361	702
1	609	335	1,110	-30.2	43.3	37.2	425	873
0.5	725	382	1,380	-32.0	47.1	40.0	493	1,070
0.2	911	445	1,860	-35.0	53.7	45.1	593	1,400

Table 1c. Regional regression equations for estimating flood discharges at stream sites in Connecticut.

[Q_x, flood discharge for x annual exceedance probability, in cubic feet per second; DRNAREA, drainage area; mi^2; I24HxxY, 24 hour rainfall that occurs in x years in, inches; SOILCorD, area of hydrologic soil group C or D, in decimal percent]

Annual exceedance probability (percent)	Recurrence interval (years)	Regression models
50	2	$Q_{50} = 10^{\wedge -1.015} * ((DRNAREA)^{\wedge 0.819}) * 10^{\wedge (0.618*I24H2Y)} * 10^{\wedge (0.586*(SOILCorD+1))})$
20	5	$Q_{20} = 10^{\wedge -1.064} * ((DRNAREA)^{\wedge 0.803}) * 10^{\wedge (0.541*I24H5Y)} * 10^{\wedge (0.505*(SOILCorD+1))})$
10	10	$Q_{10} = 10^{\wedge -0.775} * ((DRNAREA)^{\wedge 0.795}) * 10^{\wedge (0.426*I24H10Y)} * 10^{\wedge (0.470*(SOILCorD+1))})$
4	25	$Q_{4} = 10^{\wedge -0.432} * ((DRNAREA)^{\wedge 0.790}) * 10^{\wedge (0.322*I24H25Y)} * 10^{\wedge (0.442*(SOILCorD+1))})$
2	50	$Q_{2} = 10^{\wedge -0.255} * ((DRNAREA)^{\wedge 0.789}) * 10^{\wedge (0.274*I24H50Y)} * 10^{\wedge (0.426*(SOILCorD+1))})$
1	100	$Q_{1} = 10^{\wedge -0.104} * ((DRNAREA)^{\wedge 0.789}) * 10^{\wedge (0.238*I24H100Y)} * 10^{\wedge (0.413*(SOILCorD+1))})$
0.5	200	$Q_{0.5} = 10^{\wedge 0.372} * ((DRNAREA)^{\wedge 0.785}) * 10^{\wedge (0.167*I24H200Y)} * 10^{\wedge (0.390*(SOILCorD+1))})$
0.2	500	$Q_{0.2} = 10^{\wedge 0.740} * ((DRNAREA)^{\wedge 0.784}) * 10^{\wedge (0.120*I24H500Y)} * 10^{\wedge (0.370*(SOILCorD+1))})$



APPENDIX D

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Connecticut State Plane (FIPSZONE 0600). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by the Connecticut Department of Environmental Protection. This information was derived from digital orthophotos produced at a scale of 1:12,000 from aerial photography flown in 2004 supplemented with aerial photography from 2000.

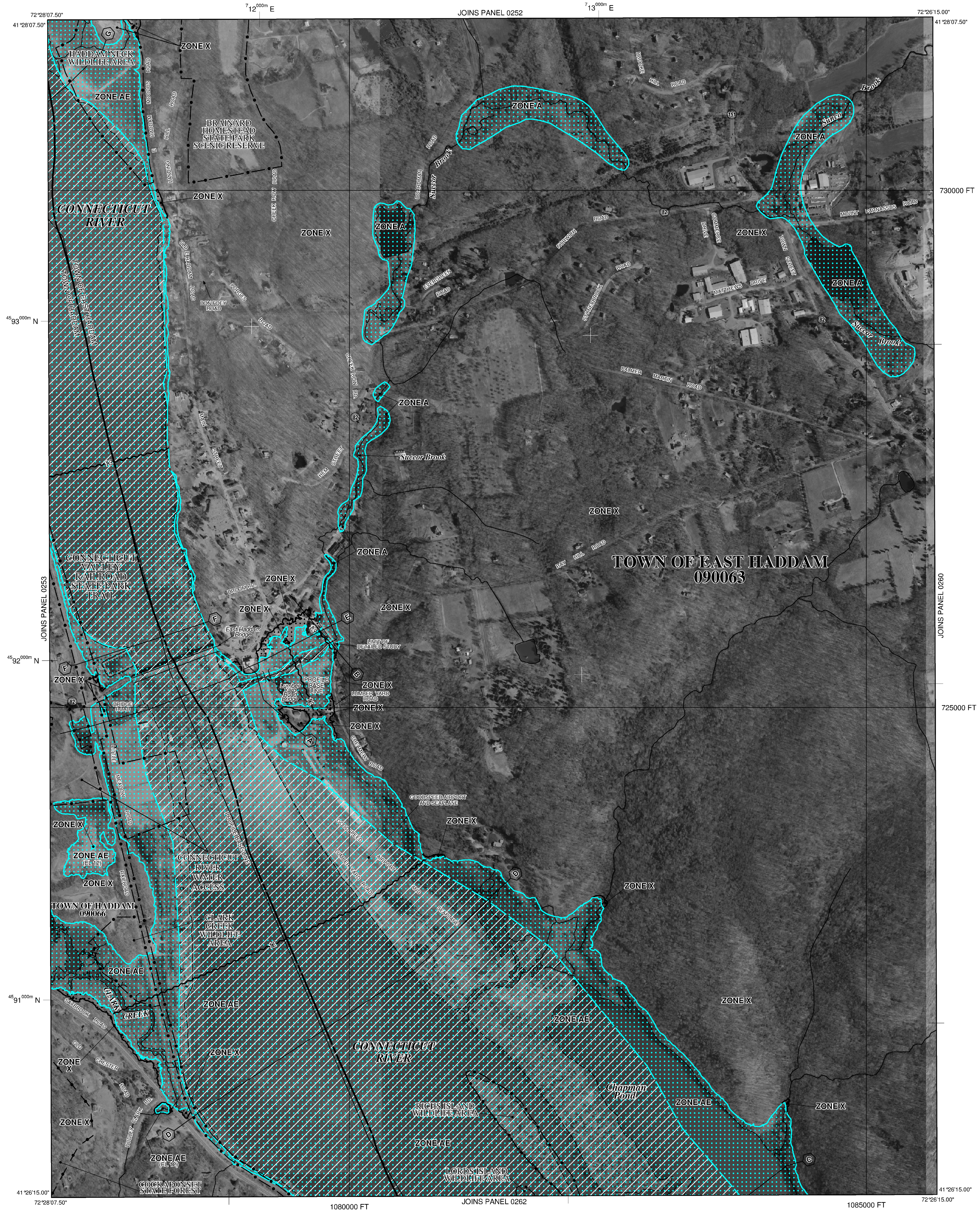
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data*) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A	Cross section line
23 - - - 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
$^{42}75^{000m}$N	1000-meter Universal Transverse Mercator grid, zone 18
6000000 FT	5000-foot grid : Connecticut State Plane coordinate system, (FIPSZONE 0600), Lambert Conformal Conic
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
August 28, 2008
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0254G

FIRM
FLOOD INSURANCE RATE MAP
MIDDLESEX COUNTY, CONNECTICUT
(ALL JURISDICTIONS)

PANEL 254 OF 450
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EAST HADDAM, TOWN OF	090063	0254	G
HADDAM, TOWN OF	090066	0254	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
09007C0254G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

APPENDIX E

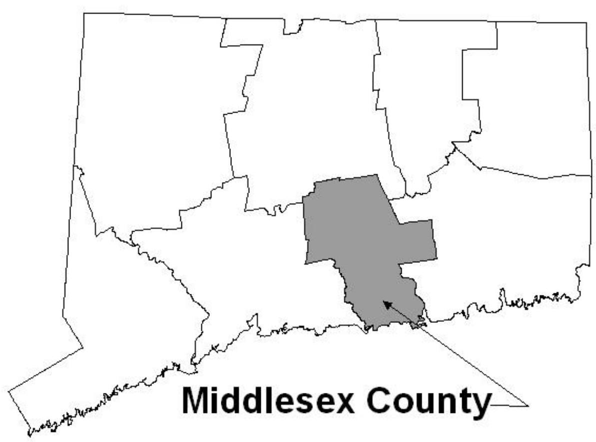
www.kleinfelder.com
KLEINFELDER 400 Capital Blvd., Suite 104, Rocky Hill, CT 06067 p | 860.563.7775 f | 860.563.6744

FLOOD INSURANCE STUDY

MIDDLESEX COUNTY, CONNECTICUT
(ALL JURISDICTIONS)

VOLUME 1 OF 3

Community Name	Community Number
CHESTER, TOWN OF	090060
CLINTON, TOWN OF	090061
CROMWELL, TOWN OF	090123
DEEP RIVER, TOWN OF	090062
DURHAM, TOWN OF	090185
EAST HADDAM, TOWN OF	090063
EAST HAMPTON, TOWN OF	090064
ESSEX, TOWN OF	090065
FENWICK, BOROUGH OF	090187
HADDAM, TOWN OF	090066
KILLINGWORTH, TOWN OF	090174
MIDDLEFIELD, TOWN OF	090067
MIDDLETOWN, CITY OF	090068
OLD SAYBROOK, TOWN OF	090069
PORTLAND, TOWN OF	090130
WESTBROOK, TOWN OF	090070



Revised:
February 6, 2013

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
09007CV001B

routings accounted for the moderating influence of the available lake storage on the storm flood out of Moodus Reservoir. Independent routings were first performed on Bashan Lake and Pickerel Lake, which empty into Moodus Reservoir. The outflows from Bashan and Pickerel Lakes were then input as inflows in the routing of Moodus Reservoir. In each routing, it was assumed that the lake was full to the top of the spillway before the storm runoff began entering the lake. This assumption was made because none of the lakes are regulated to control floods and it was desired to start with the worst possible conditions. Calculations were made to determine a lake storage curve, a rating curve for the spillway, and an inflow hydrograph. From these working curves, discharges for the 10-, 2-, 1-, or 0.2-percent-annual-chance floods were developed. The peak values taken from each of the four flood hydrographs represented the moderation of the storm flood due to lake storage.

Flows for Succor Brook and incremental flows for Moodus River below the reservoir spillway were developed using a regional equation. The regional equation is based on a regression analysis of stream flow records from 105 gaging stations in Connecticut and from precipitation records obtained at 28 gaging stations of the National Weather Service. The regression analysis relates stream flow to rainfall data and topographic parameters (Reference 10).

The 10-, 2-, 1-, or 0.2-percent-annual-chance peak discharges for the Eightmile River and the Salmon River were derived from stream gage data. The published gages used and the years of record for each are as follows: The Salmon River near East Hampton (No. 01193500) with 49 years of record, and the Eightmile River at North Plain (No. 01194000) with 39 years of record; at the time of analysis. A Log-Pearson Type III frequency analysis of the gage data was employed to develop the 10-, 2-, 1-, or 0.2-percent-annual-chance peak flows for the gage sites (Reference 20). The frequency analysis included the use of a regional skew. Peak discharges for the individual stream stations were calculated by transposing the gage-based peak flows according to the discharge-drainage area ratio formula (Reference 17).

For the ungaged Pocotopaug Creek, values of the 10-, 2-, 1-, or 0.2-percent-annual-chance peak discharges below the Pocotopaug Lake spillway were developed using a regional equation based on a regression analysis of streamflow records from 105 gaging stations in Connecticut and 28 precipitation gaging stations of the National Weather Service (Reference 10). This regional equation is based on the parameters of drainage area, rainfall, main channel length, main channel slope, and extent of storm sewers. At the spillway of Pocotopaug Lake, the peak discharges were determined by hydrologic routing methods. The routing accounted for the moderating influence of the available lake storage on the storm flood out of Pocotopaug Lake. Calculations were made to determine a lake storage curve, a rating curve for the- spillway, and an inflow hydrograph. From these working curves, outflow discharges for the 10-, 2-, 1-, or 0.2-percent-annual-chance floods were developed (Reference 14).

In the Town of Killingworth 1981 FIS, the flood-flow frequency analyses for Pond Meadow Brook and Lane District Brook followed the standard Log-Pearson Type III method as outlined by the Water Resources Council (Reference 20). The 10-, 2-, 1-, or 0.2-percent-annual-chance peak discharges were determined by a regression analysis. Discharges were related to basin characteristics such as drainage area, stream length, streambed slope, and rainfall parameters as described in a statewide flood-flow formula determination (Reference 10). Discharges for the Hammonasset River were adopted from the Flood Insurance Study for the Town of Madison (Reference 13). The Soil

7. The Middletown Press, 14 buildings in Middletown deemed unsafe, evacuated (video), retrieved from http://www.middletownpress.com/articles/2011/02/04/news/doc4d4b5283a5d29020146314.txt, February 04, 2011.

8. The Middletown Press, Bridge, culvert repairs to cost $40K in East Hampton, retrieved from http://www.middletownpress.com/articles/2011/05/09/news/doc4dc72938a67ff322632247.txt, May 09, 2011.

9. U.S. Department of the Interior, Geological Survey Water Supply Paper 1580-B, Factors Influencing the Occurrence of Floods in a Humid Region of Diverse Terrain, by Manual A. Benson, Washington, D. C., 1962

10. American Society of Civil Engineers, Watershed Management Symposium, Irrigation and Drainage Division, Flood Flow Formulas for Urbanized and Nonurbanized Areas of Connecticut by L.A. Weiss, Logan, Utah, 1975, revised December 1977.

11. U.S. Department of Agriculture, Soil Conservation Service, Technical Paper 149, A Method for Estimating Volume and Rate of Runoff in Small Watersheds, Washington, D.C., January 1968, revised April 1973.

12. U.S. Department of Agriculture, Soil Conservation Service, Technical Release No. 55, Urban Hydrology for Small Watersheds, Washington, D.C., January 1975.

13. Federal Emergency Management Agency, Flood Insurance Study, Town of Madison, New Haven County, Connecticut, Washington, D.C., July 5, 1984, revised November 4, 1992.

14. U.S. Department of Agriculture, Soil Conservation Service, National Engineering Handbook. Section 4 - Hydrology, Washington, D.C., August 1972.

15. Connecticut Department of Environmental Protection in cooperation with the U.S. Geological Survey, Connecticut Water Resources, Bulletin No. 36, Evaluation and Design of a Streamflow Network for Connecticut by L.A. Weiss, 1983.

16. U.S. Department of the Interior, Geological Survey, Office of Water Data Coordination, Interagency Advisory Committee on Water Data, Hydrology Subcommittee, Guidelines for Determining Flood Flow Frequency, Bulletin 17B, Reston, Virginia, Revised September 1981.

17. Johnstone, Don and W.P. Cross, Elements of Applied Hydrology, New York: Ronald Press Co., 1949.

18. U.S. Department of the Interior, Geological Survey, Discharge Frequency Analysis of Mattabesset River Gauging Station in East Berlin, Hartford, Connecticut.

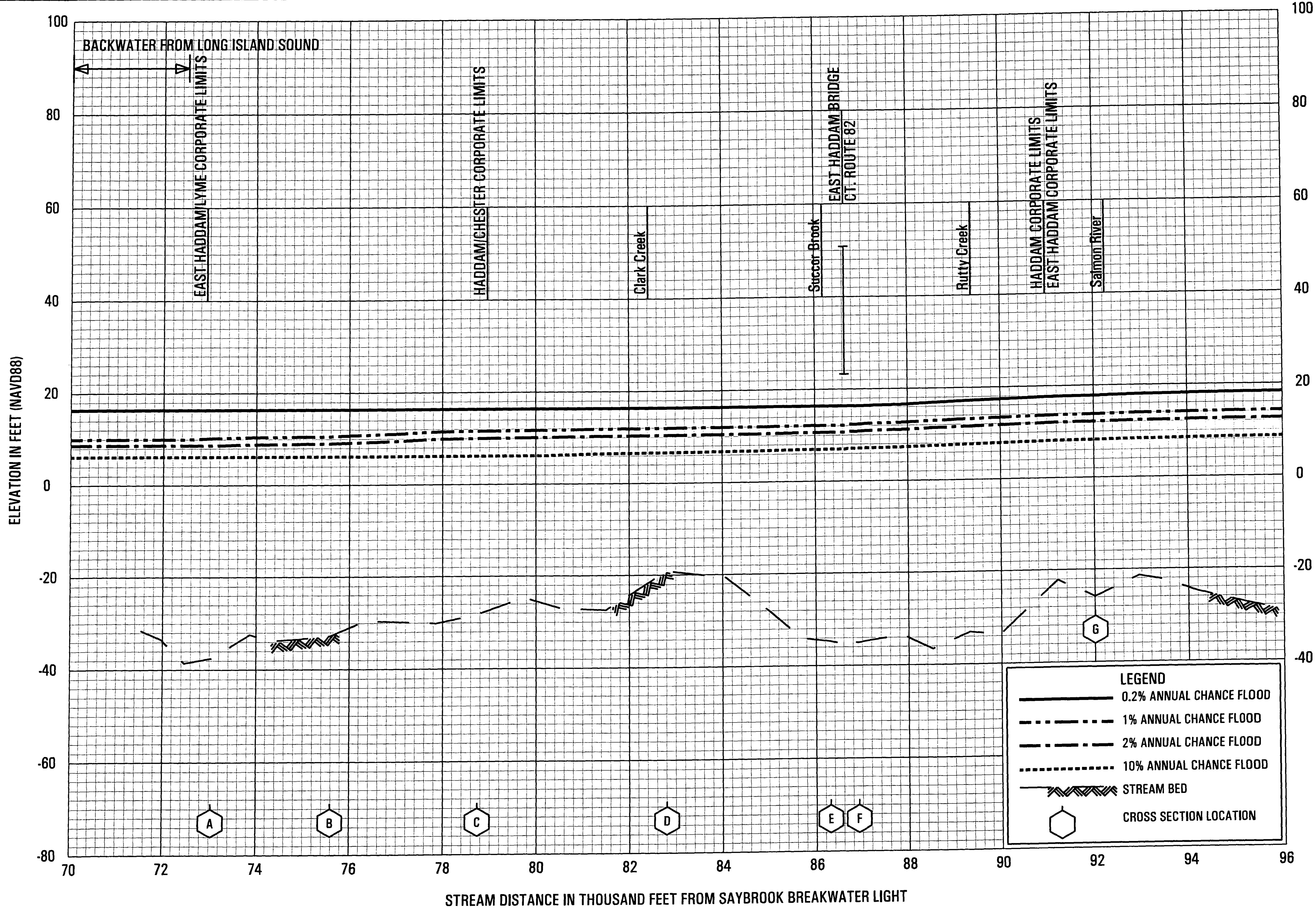
19. Connecticut Department of Environmental Protection, Gazetteer of Natural Drainage Areas of Streams and Water Bodies Within the State of Connecticut, Bulletin No. 1, 1972.

<u>TABLE 6 - SUMMARY OF DISCHARGES</u> - (continued)

Flooding Source and Location	Drainage Area (sq. miles)	Peak Discharges (cfs) 10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
RESERVOIR BROOK					
At junction with Connecticut River	6.5	736	1,427	1,805	2,871
At Portland Reservoir	3.6	521	1,032	1,331	2,206
ROUNDHILL BROOK					
At confluence with Longhill Brook	1.5	*	*	865	*
SALMON RIVER					
Confluence with Connecticut River	150	7,450	13,100	16,300	24,600
2220 ft upstream from Moodus River (Sect. B)	130	6,690	11,800	14,600	22,100
2650 ft upstream from Pine Brook (Sect. C)	114	6,060	10,700	13,300	20,000
Downstream of Leesville Road (Sect. D)	108	5,820	10,300	12,700	19,200
SAWMILL BROOK					
At confluence with Mattabesset River	6.5	*	*	3,380	*
SHUNPIKE CREEK					
At confluence with Mattabesset River	0.7	140	247	314	399
SOUTH BRANCH GREAT BROOK					
Upstream of confluence with Great Brook	†	240	380	525	850
SPENCER HILL BROOK					
At confluence with Hammonasset River	0.30	*	*	92	*
SUCCOR BROOK					
At confluence with Connecticut River	3.36	330	550	650	940
SUMNER BROOK					
At confluence with Connecticut River	12.3	*	*	7,400	*

** Data not available*

† Drainage area not listed in existing report



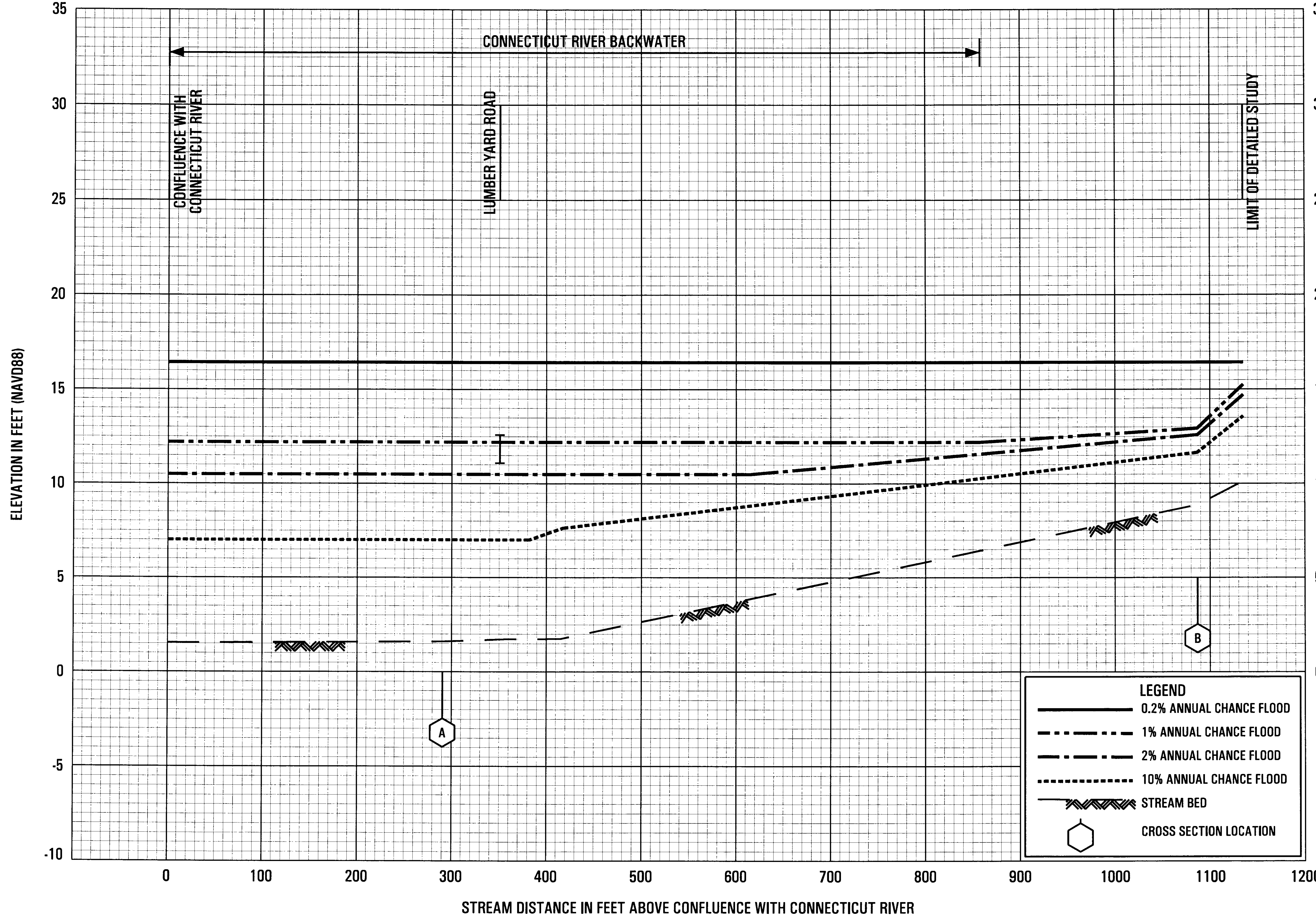
FLOOD PROFILES

CONNECTICUT RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MIDDLESEX COUNTY, CT

(ALL JURISDICTIONS)



FLOOD PROFILES

SUCCOR BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MIDDLESEX COUNTY, CT
(ALL JURISDICTIONS)

APPENDIX F

KLEINFELDER 400 Capital Blvd., Suite 104, Rocky Hill, CT 06067 p | 860.563.7775 f | 860.563.6744

TOWN OF EAST HADDAM, CONNECTICUT
WATER POLLUTION CONTROL PLANT

SHEET INDEX

GENERAL

G-1	SHEET INDEX, DESIGN CRITERIA, LEGEND AND GENERAL NOTES
G-2	PLOT PLAN
G-3	SITE, GRADING AND YARD PIPING PLAN
G-4	ACCESS ROAD AND OUTFALL PROFILE, AND DETAILS
G-5	HYDRAULIC PROFILE AND PLANT PROCESS SCHEMATIC
G-6	MISCELLANEOUS DETAILS

ARCHITECTURAL

A-1	CONTROL AND PROCESS BUILDING FLOOR PLAN AND BUILDING SECTION
A-2	CONTROL AND PROCESS BUILDING ELEVATION
A-3	CONTROL AND PROCESS BUILDING FINISH, LOUVER, WINDOW AND DOOR SCHEDULES AND DETAILS

STRUCTURAL

S-1	PROCESS AND CONTROL BUILDING PLANS
S-2	PROCESS AND CONTROL BUILDING SECTIONS AND DETAILS
S-3	STRUCTURAL DETAILS

MECHANICAL

M-1	PROCESS BUILDING PLAN, SECTIONS AND DETAILS
M-2	CONTROL BUILDING PLAN, SECTION AND DETAILS

HVAC/PLUMBING

H-1	CONTROL AND PROCESS BUILDING PLAN AND SECTION
H-2	BIOFILTER SECTIONS

ELECTRICAL

E-1	ELECTRICAL SYMBOL LIST AND LEGEND
E-2	ELECTRICAL SITE PLAN
E-3	SINGLE LINE DIAGRAMS AND WIRING DIAGRAMS
E-4	PROCESS BUILDING POWER AND LIGHTING PLANS
E-5	CONTROL BUILDING POWER AND LIGHTING PLANS
E-6	DETAILS AND SCHEDULES

RECORD DRAWING

DESIGN CRITERIA

FLOW CONDITIONS

AVERAGE DAILY FLOW	55,000	gpd
MAX DAILY FLOW	125,000	gpd
PEAK HOURLY FLOW	250,000	gpd

LOADING CONDITIONS

BOD 5	350	mg/l
TSS	320	mg/l
Tot-N	68	mg/l
Alkalinity	85	mg/l
pH	6-8	
Temp (min)	8	deg C
Temp (max)	23	deg C
Site Elevation	13	ft NGVD

EFFLUENT REQUIREMENTS

	Monthly Average	Daily Maximum
BOD_5	20 mg/l	35 mg/l
TSS	20 mg/l	35 mg/l
Tot-N	8 mg/l (12 mo. moving average)	
Min D.O.		2 mg/l

Fecal Coliform <200 colonies per 100 ml
(max 7 day geometric mean <400 colonies per 100 ml)

GENERAL NOTES

1. BASE PLANS AND TOPOGRAPHY WERE OBTAINED FROM SURVEY MADE BY DIVERSIFIED TECHNOLOGIES CORPORATION, NORTH HAVEN, CONNECTICUT BETWEEN APRIL AND SEPTEMBER 1994.
2. ALL ELEVATIONS REFER TO NATIONAL GEODETIC VERTICAL DATUM OF 1929.
3. LOCATIONS OF ALL EXISTING UNDERGROUND UTILITIES WERE OBTAINED FROM SURVEY MADE BY DIVERSIFIED TECHNOLOGIES CORPORATION, NORTH HAVEN, CONNECTICUT BETWEEN APRIL AND SEPTEMBER 1994.
4. THE LOCATION OF EXISTING UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE NOT WARRANTED TO BE EXACT NOR IS IT WARRANTED THAT ALL UNDERGROUND UTILITIES ARE SHOWN.
5. THE CONTRACTOR SHALL VERIFY THE SITE, LOCATION AND MATERIAL OF ALL EXISTING UNDERGROUND UTILITIES INCLUDING INDIVIDUAL SEPTIC SYSTEMS, WELLS, WATER LINES AND LAWN SPRINKLERS PRIOR TO CONSTRUCTION.
6. THE EXACT LOCATION OF PROPOSED PIPES, GRINDER PUMPS, VALVES AND ALARM BOXES SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
7. BORINGS WERE TAKEN BY CONNECTICUT TEST BORINGS, SEYMOUR, CONNECTICUT BETWEEN APRIL AND DECEMBER 1994. APPROXIMATE LOCATIONS OF THE BORINGS ARE SHOWN ON THE PLANS. BORING LOGS ARE APPENDED TO THIS SPECIFICATION.
8. GROUND PENETRATING RADAR WAS PERFORMED BY SUB-SURFACE INFORMATIONAL SURVEYS, INC., SOMERS, CONNECTICUT IN APRIL 1994. APPROXIMATE RESULTS OF THE SURVEY ARE SHOWN ON THE PLANS. THE GROUND PENETRATING RADAR REPORT IS APPENDED TO THIS SPECIFICATION.
9. STATE AND FEDERAL WETLANDS WERE FLAGGED BY HALEY AND ALDRICH, GLASTONBURY, CONNECTICUT IN APRIL 1994. APPROXIMATE WETLAND FLAG LOCATIONS ARE SHOWN ON THE PLANS.
10. THE EAST HADDAM INLAND WETLANDS AND WATERCOURSES COMMISSION APPROVED AN INLAND WETLANDS AND WATERCOURSES PERMIT ON NOVEMBER 22, 1994, SUBJECT TO THE FOLLOWING STIPULATIONS.
    A. NOTIFICATION BEFORE CONSTRUCTION IN THE STREAMS FOR SCHEDULING AN ON-SITE MEETING FOR THE SEQUENCE OF CONSTRUCTION AND EROSION CONTROL APPLICATION.
    B. EROSION AND SEDIMENTATION CONTROLS SHALL BE INSTALLED AROUND THE SITE BEFORE CONSTRUCTION AND NOTIFICATION TO THE ZONING ADMINISTRATOR FOR REVIEW BEFORE COMMENCEMENT AND COMPLETION OF CONSTRUCTION.
11. THE EAST HADDAM PLANNING AND ZONING COMMISSION APPROVED CONSTRUCTION OF THE PROJECT ON DECEMBER 12, 1994, SUBJECT TO THE FOLLOWING STIPULATIONS.
    A. THIS SPECIAL EXCEPTION IS GRANTED AND RESTRICTED TO CONSTRUCTION AND USE BY THE TOWN OF EAST HADDAM, OR ITS DESIGNATED CONTRACTOR(S), ONLY. SUCH DESIGNATION SHALL BE BY WRITTEN APPROVAL FROM THE FIRST SELECTMAN OR CHAIRMAN OF THE WATER POLLUTION CONTROL AUTHORITY.
    B. STIPULATIONS OF THE EAST HADDAM INLAND/WETLANDS AND WATERCOURSES COMMISSION SHALL BE INCORPORATED INTO THE FINAL MYLARS.
    C. TRAFFIC CONTROL PLANS/PROCEDURES SHALL BE SUBMITTED TO AND APPROVED BY THE RESIDENT STATE TROOPER PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
    D. COPIES OF ALL OTHER LOCAL, STATE AND FEDERAL APPROVALS REQUIRED AND/OR ASSOCIATED WITH THIS FACILITY SHALL BE SUBMITTED TO THE PLANNING AND ZONING OFFICE PRIOR TO ISSUANCE OF A ZONING PERMIT.
    ~~E. A KNOX BOX SHALL BE INSTALLED ON ONE OF THE BUILDINGS FOR ACCESS DURING (IN CASE OF) AN EMERGENCY.~~ (NOT USED)
    F. ARCHITECTURAL PLANS SHALL BE SUBMITTED TO AND APPROVED BY THE FIRE MARSHAL PRIOR TO ISSUANCE OF A ZONING PERMIT.
    G. BUILDINGS SHALL BE FLOODPROOFED SO THAT THE BELOW BASE FLOOD LEVEL AREA OF THE STRUCTURES ARE WATERTIGHT WITH WALLS SUBSTANTIALLY IMPERMEABLE TO PASSAGE OF WATER.
    H. THE BUILDINGS SHALL BE CONSTRUCTED IN SUCH A MANNER AS TO PROPERLY ANCHOR THEM TO PREVENT FLOTATION, COLLAPSE OR LATERAL MOVEMENT.
    I. COST ESTIMATES OF EROSION AND SEDIMENTATION CONTROLS SHALL BE PROVIDED TO AND APPROVED BY THE ZONING ADMINISTRATOR. A BOND SHALL BE SET AND IN PLACE PRIOR TO ISSUANCE OF A ZONING PERMIT.
    J. ALL CONDITIONS OF APPROVAL SHALL BE SHOWN ON THE FINAL MYLARS AND INCORPORATED INTO APPROPRIATE CONTRACTS OR DOCUMENTS ASSOCIATED WITH THIS FACILITY.
    K. THIS APPROVAL IS CONDITIONED UPON ACQUISITION OF THE PROPERTY TO ENSURE FULL MUNICIPAL CONTROL.

LEGEND

- Property Line
- Fence Line
- Guard Rail
- Combined State and Federal Wetlands Line
- State Wetlands Line
- Federal Wetlands Line
- Water Line
- Stone Wall
- Cedar Stockade Fence
- 25.0 Proposed Contour
- 25.0 Existing Contour
- x 25.0 Existing Spot Elevation
- x 25.0 Proposed Spot Elevation
- Tree
- Shrub
- Tree Line
- GV Gas Valve
- WV Water Valve
- Manhole
- Catch Basin
- Post
- IP (fd) Iron Pipe (found)
- Electric Box
- Marsh
- Sign
- Utility Pole
- Light Pole
- Guy Wire
- Boring
- G Grinder Pump
- B Ball Valve for Low Pressure Service Lateral
- A Alarm Box for Grinder Pump

PVC	Polyvinyl Chloride
TYP	Typical
CONC	Concrete
BIT	Bituminous
GAR	Garage
ELEV	Elevation
VCP	Vitrified Clay Pipe
SNET	Southern New England Telephone
CL&P	Connecticut Light & Power Co.
GPR	Ground Penetrating Radar
CMP	Corrugated Metal Pipe
FLG ST	Flag Stone
HSE	House
F.F.	First Floor
MH	Manhole
FR GAR	Frame Garage
CB	Catch Basin
OMH	Outfall Manhole
INF	Influent
EFF	Effluent

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	5/22/95	DRM	BJK	INCORPORATE REVIEW COMMENTS
2	9/18/95	DRM	BJK	REVISED FOR REBID
3	5/22/98	DPR	NJH	RECORD DRAWING

DESIGNED BY: TPH
DRAWN BY: TPH
SHEET CHK'D BY: TPH
CROSS CHK'D BY: BJK
APPROVED BY: BJK
DATE: JANUARY 12, 1995

CAMP DRESSER & McKEE INC.
241 Main Street
Hartford, Connecticut 06106
environmental engineers, scientists, planners, & management consultants
CDM

TOWN OF EAST HADDAM, CONNECTICUT

WATER POLLUTION CONTROL PLANT

SHEET INDEX, DESIGN CRITERIA, LEGEND AND GENERAL NOTES

PROJECT NO. 2885-002

SHEET NO. G-1

C:\2885-002\WPCP\CIV\ G-1 01/17/95 2/07/01 Camp Dresser & McKee, Camp Drs

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	3/22/95	DRM	BJK	INCORPORATE REVIEW COMMENTS
2	9/18/95	DRM	BJK	REVISED FOR REBID
3	5/06/98	DPR	NJH	RECORD DRAWING

DESIGNED BY: TPH
DRAWN BY: TPH
SHEET CHK'D BY: TPH
CROSS CHK'D BY: BJK
APPROVED BY: BJK
DATE: JANUARY 12, 1995

CAMP DRESSER & McKEE INC.
241 Main Street
Hartford, Connecticut 06106
environmental engineers, scientists, planners, & management consultants

TOWN OF EAST HADDAM, CONNECTICUT

WATER POLLUTION CONTROL PLANT

PLOT PLAN

PROJECT NO. 2885-002

SHEET NO. G-2

DRAWING NUMBER 3202

GENERAL NOTES:

1. ALL SOIL AND SEDIMENTATION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, 1988 REVISION.
2. INSTALL SILT AND SEDIMENTATION CONTROL MEASURES PRIOR TO DISTURBING LAND FOR CONSTRUCTION.
3. HAYBALE/SILT FENCE BARRIER SHALL BE INSPECTED BY THE CONTRACTOR AFTER EACH STORM EVENT, AND SHALL BE RPAIRED OR REPLACED AS IS DEEMED NECESSARY BY THE ENGINEER.
4. MINIMIZE DISTURBED AREAS TO THE GREATEST EXTENT POSSIBLE.
5. PROVIDE TEMPORARY ANNUAL GRASS SEEDING FOR AREAS TO BE LEFT EXPOSED FOR AN EXTENDED PERIOD OF TIME.
6. ALL PERMANENT SEEDING SHALL BE PERFORMED BETWEEN APRIL 1 – JUNE 1 AND AUGUST 15 – SEPTEMBER 15
7. FERTILIZER, LIME AND MULCH SHALL BE USED TO ESTABLISH PERMANENT SOD COVER
8. ALL SHRUB BEDS TO RECEIVE 3" LAYER OF WOOD CHIPS FOR FINAL LANDSCAPING.
9. ALL DISTURBED AREAS NOT OTHERWISE INDICATED TO RECEIVE PERMANENT VEGETATIVE COVER.
10. REMOVE SOIL AND SEDIMENTATION CONTROLS AT THE COMPLETION OF THE JOB AND AFTER PERMANENT SOD OR GROUND COVER IS ESTABLISHED.
11. PARKING CALCULATIONS: 1 PARKING SPACE REQUIRED PER 500 SQUARE FOOT FLOOR AREA. 1320 SQ FT/500 SQ FT/PARK SPACE = 2.64 PARK SPACES => 3 SPACES.
12. CLEARED/GRUBBED MATERIAL SHALL HAULED OF SITE AND PROPERLY DISPOSED OF. BURNING OF MATERIALS IS PROHIBITED
13. ALL EXCAVATED TOP SOIL SHALL BE STOCKPILED IN THE DESIGNATED AREA, AND MAINTAINED TO MINIMIZE EROSION.

(IN FEET)
1 inch = 10 ft.

RECORD DRAWING

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	5/22/95	DRM	BJK	INCORPORATE REVIEW COMMENTS
2	9/18/95	DRM	BJK	REVISED FOR REBID
3	5/06/98	DPR	NJH	RECORD DRAWING

DESIGNED BY: TPH
DRAWN BY: TPH
SHEET CHK'D BY: TPH
CROSS CHK'D BY: BJK
APPROVED BY: BJK
DATE: JANUARY 12, 1995

CAMP DRESSER & McKEE INC.
241 Main Street
Hartford, Connecticut 06106
CDM
environmental engineers, scientists, planners, & management consultants

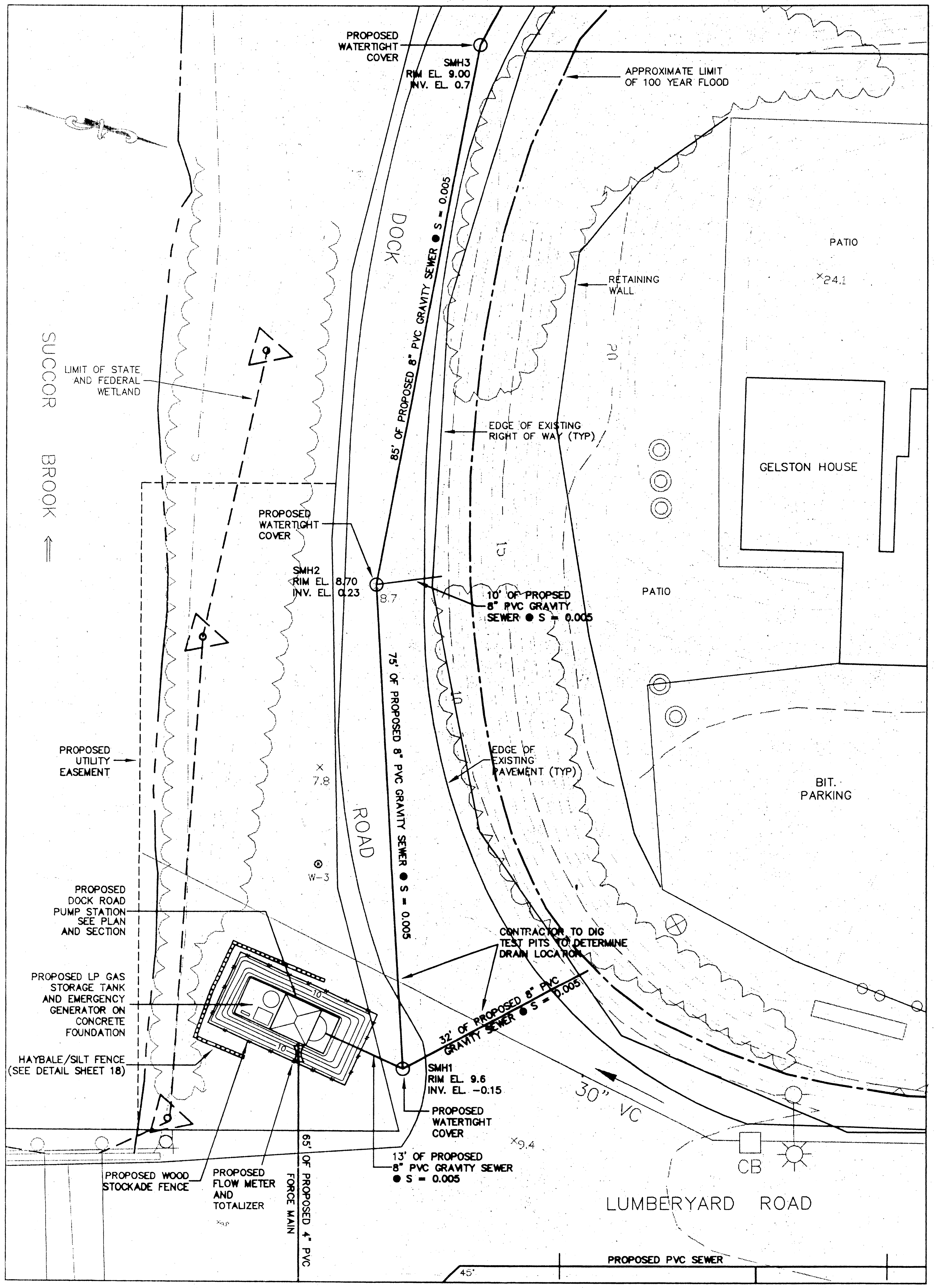
TOWN OF EAST HADDAM, CONNECTICUT
WATER POLLUTION CONTROL PLANT

SITE, GRADING AND YARD PIPING PLAN

PROJECT NO. 2885-002

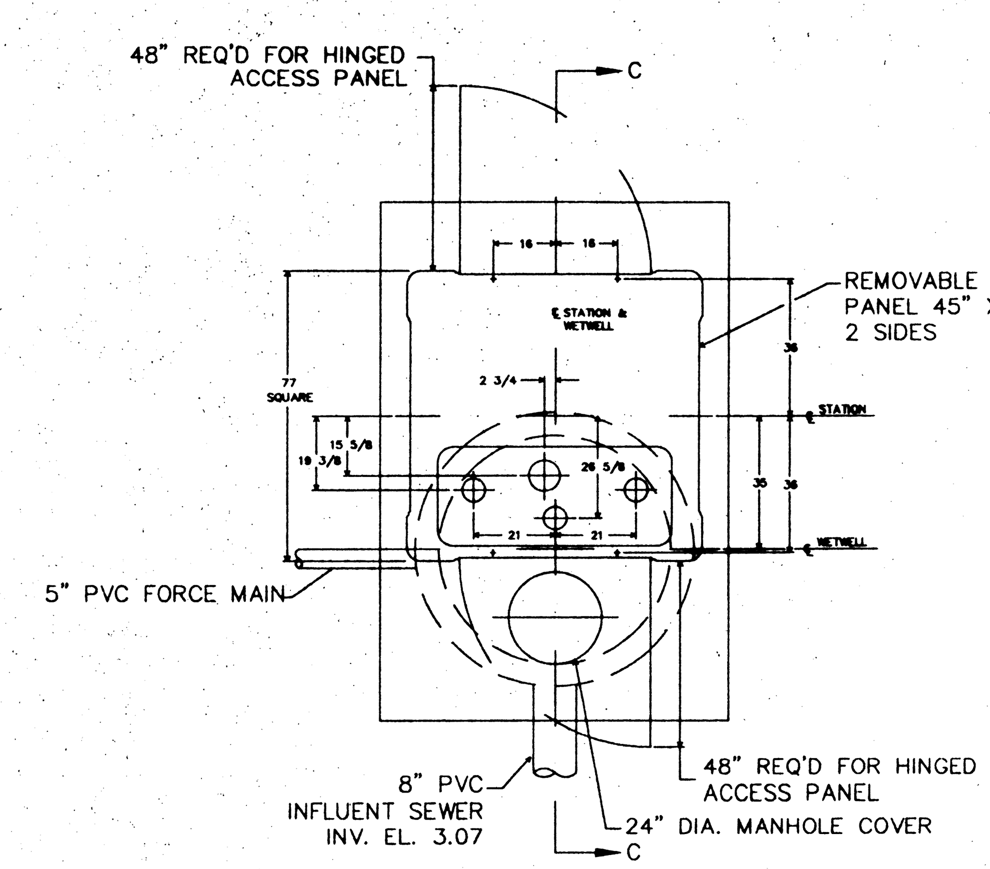
G-3

3203

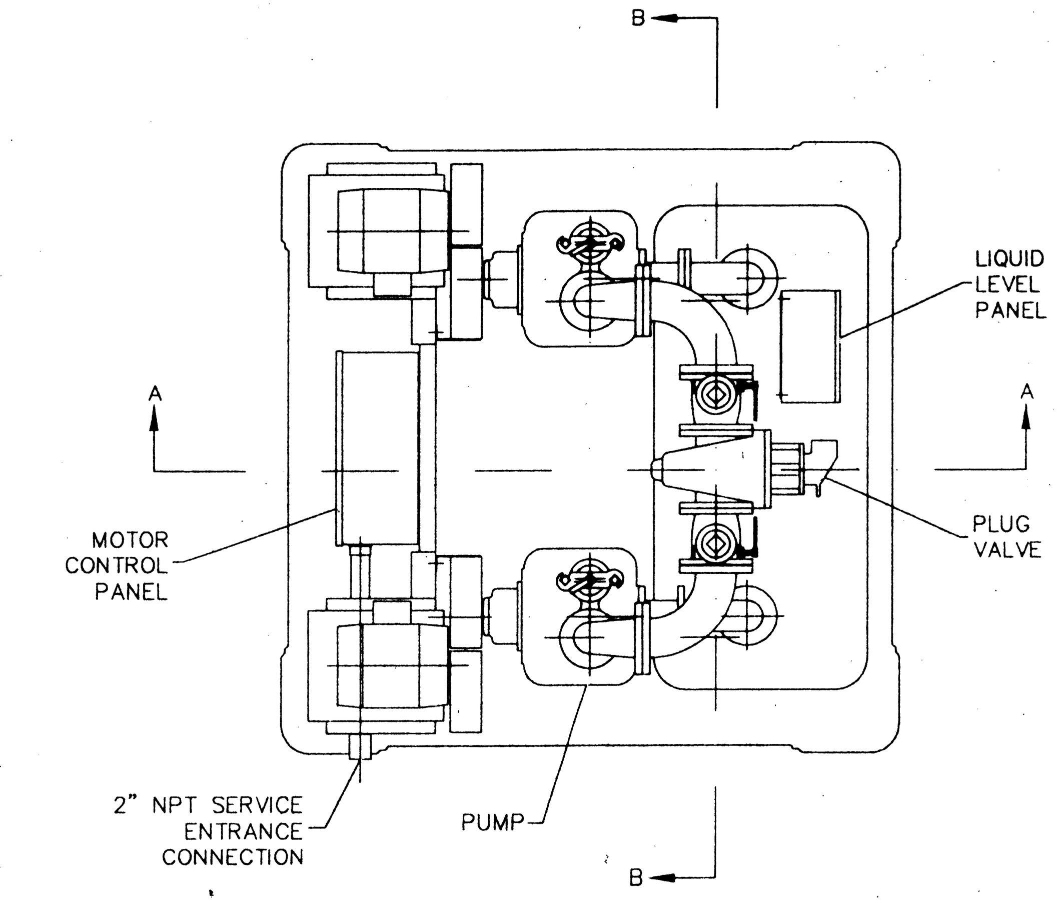


DOCK ROAD PUMP STATION SITE PLAN
SCALE 1" = 10'

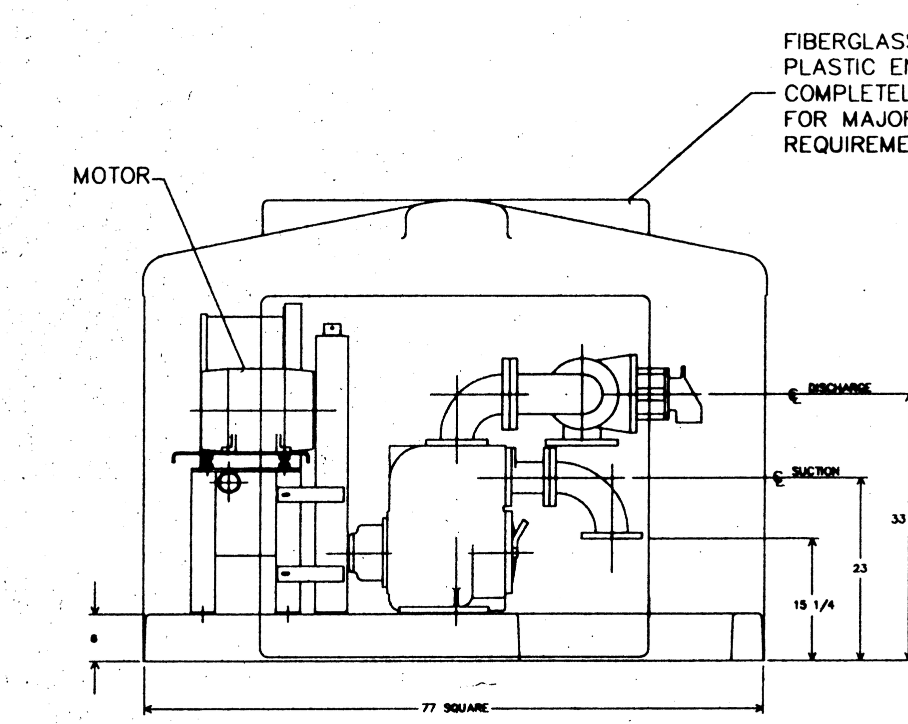
RECORD DRAWING



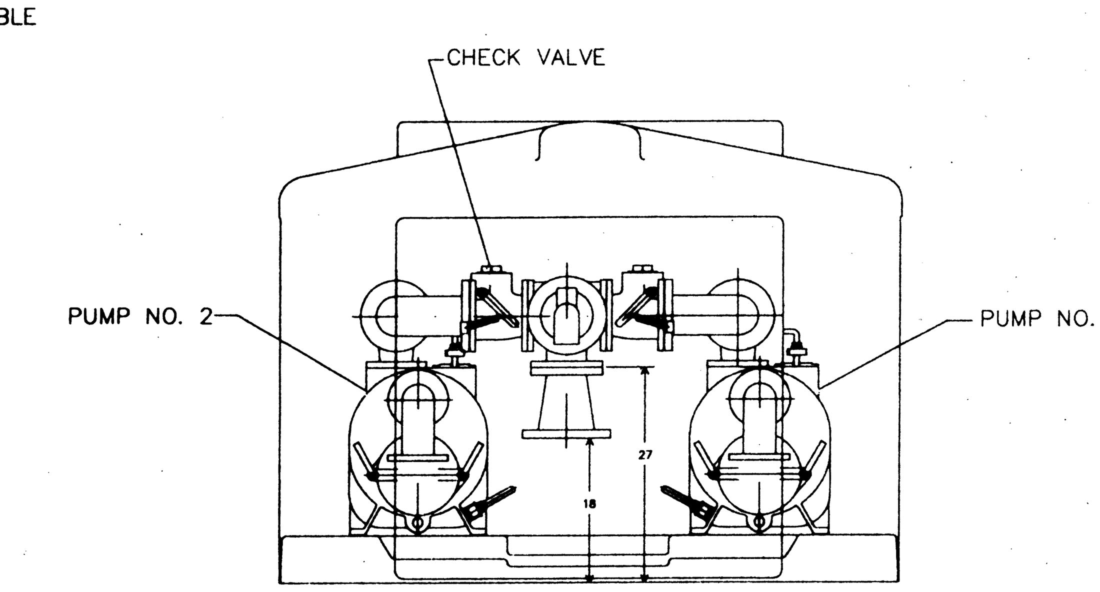
PLAN VIEW
NTS



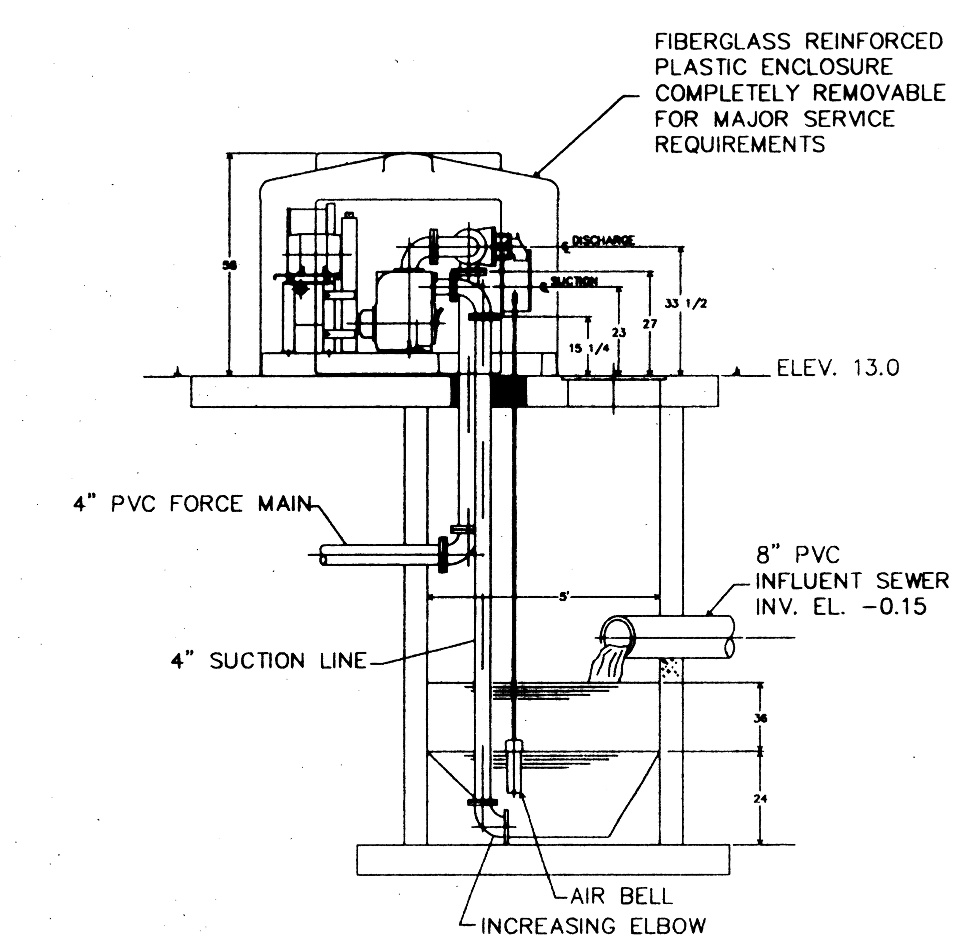
PLAN
NTS



SECTION A–A
NTS



SECTION B–B
NTS



SECTION C–C
NTS

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	5/22/95	DRM	BJK	INCORPORATE REVIEW COMMENTS
2	9/18/95	DRM	BJK	REVISED FOR REBID

DESIGNED BY:	DRM
DRAWN BY:	DRM
SHEET CHK'D BY:	TPH
CROSS CHK'D BY:	BJK
APPROVED BY:	BJK
DATE:	JANUARY 12, 1995

CAMP DRESSER & McKEE INC.
241 Main Street
Hartford, Connecticut 06106
environmental engineers, scientists, planners, & management consultants
CDM

TOWN OF EAST HADDAM, CONNECTICUT

WASTEWATER COLLECTION SYSTEM

DETAILS

PROJECT NO. 2885-001

SHEET NO. 19