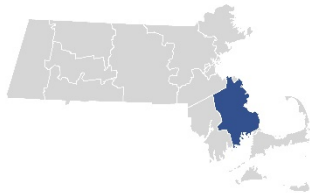# FLOOD INSURANCE STUDY
## FEDERAL EMERGENCY MANAGEMENT AGENCY

**VOLUME 2 OF 5**

# PLYMOUTH COUNTY, MASSACHUSETTS
**(ALL JURISDICTIONS)**

| COMMUNITY NAME | NUMBER | COMMUNITY NAME | NUMBER |
|---|---|---|---|
| ABINGTON, TOWN OF | 250259 | MARSHFIELD, TOWN OF | 250273 |
| BRIDGEWATER, TOWN OF | 250260 | MATTAPOISETT, TOWN OF | 255214 |
| BROCKTON, CITY OF | 250261 | MIDDLEBOROUGH, TOWN OF | 250275 |
| CARVER, TOWN OF | 250262 | NORWELL, TOWN OF | 250276 |
| DUXBURY, TOWN OF | 250263 | PEMBROKE, TOWN OF | 250277 |
| EAST BRIDGEWATER, TOWN OF | 250264 | PLYMOUTH, TOWN OF | 250278 |
| HALIFAX, TOWN OF | 250265 | PLYMPTON, TOWN OF | 250279 |
| HANOVER, TOWN OF | 250266 | ROCHESTER, TOWN OF | 250280 |
| HANSON, TOWN OF | 250267 | ROCKLAND, TOWN OF | 250281 |
| HINGHAM, TOWN OF | 250268 | SCITUATE, TOWN OF | 250282 |
| HULL, TOWN OF | 250269 | WAREHAM, TOWN OF | 255223 |
| KINGSTON, TOWN OF | 250270 | WEST BRIDGEWATER, TOWN OF | 250284 |
| LAKEVILLE, TOWN OF | 250271 | WHITMAN, TOWN OF | 250285 |
| MARION, TOWN OF | 255213 | | |

**REVISED:**

**JULY 22, 2020**

FLOOD INSURANCE STUDY NUMBER
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Version Number 2.6.3.5

FEMA

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Flood Insurance Rate Map (FIRM)

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Indian Head Brook | Outlet of Wampatuck Pond | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Indian Head Brook | Confluence with Indian Head River | Approximately 45 feet upstream of Liberty Street | Regression equations (Wandle 1977) | HEC-2 (USACE 1974) | 6/1/1985 | AE w/Floodway | Starting water-surface elevations were from Indian Head River profiles assuming coincident peaks. |
| Indian Head River | Confluence with North River | Hanson/ Hanover corporate limits | Log-Pearson type III flood frequency analysis (WRC 1977) | HEC-2 (USACE 1974) | 1/1/1978 | AE w/Floodway | Data for analysis were from USGS streamgage 01105730 (Indian Head River in Hanover) (USGS 1976). Discharges agree closely with adjacent studies. Upstream and downstream of streamgage, discharges were transposed based on drainage-area ratios. Starting water-surface elevations for upper reach were from profiles for lower reach. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Iron Mine Brook | Confluence with North River | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Island Creek and Zone A tributaries | Mouth at Kingston Bay | Points of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

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|---|---|---|---|---|---|---|---|
| Jones River | Limit of coastal flooding below Elm Street | Grove Street | Log-Pearson type III flood frequency analysis (IACWD 1982) | HEC-RAS 5.0 | 2/1/2017 | AE w/Floodway | Flood frequency analysis used USGS streamgage 01105870 (Jones River at Kingston) (Zarriello 2017). At-site estimates were weighted by expected moments algorithm (Cohn et al. 1997, 2001; Griffis et al. 2004), considering regression equations and inverse variance. Computations were performed in PeakFQ (Veilleux et al. 2014). Peakflows were transferred upstream of the gage using drainage-area ratios (Johnstone and Cross 1949). The most upstream flow-change location used drainage-area-ratio estimates despite being outside the range of the equations because alternative methods (i.e., regression equations) weren't applicable. Drainage areas calculated for this method included the Silver Lake watershed. This watershed is not usually considered to contribute to Jones River, but Silver Lake water level data from 1996 to 2016 (MADER 2016) indicated that Silver Lake overtopped Forge Pond Dam on 12 of 19 annual peakflow dates. Starting water-surface elevations were from normal depth. Structures and underwater portions of cross sections were surveyed. Overbank portions of cross sections were obtained from lidar topography (USGS 2011, 2014a). Ineffective flow was designated at structures. Hydraulic model assumed steady, subcritical flow; expansion (0.3 to 0.8) and contraction (0.1 to 0.5) coefficients; and no minor losses. Structures were modeled using the same methods for all profiles. Roughness values were selected based on field notes, photographs, and aerial imagery. |
| Jones River | Grove Street | Silver Lake Dam | HEC-1 (USACE 1973) | HEC-2 (USACE 1974) | 5/1/1983 | AE w/Floodway | HEC-1 model was calibrated to March 1968 flood, slightly greater than a 10-percent-annual-chance event at USGS streamgage 01105870. Rainfall hydrographs were from USWB (1961). |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Jones River and Zone A tributaries | Outlet of Silver Lake | Points of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Jones River Brook | Confluence with Jones River | Kingston corporate limits | HEC-1 (USACE 1973) | HEC-2 (USACE 1974) | 5/1/1983 | AE w/Floodway | HEC-1 model was calibrated to March 1968 flood, slightly greater than a 10-percent-annual-chance event at USGS streamgage 01105870. Rainfall hydrographs were from USWB (1961). Starting water-surface elevations were from the slope-area method. |
| Jones River Brook and Zone A tributaries | Kingston corporate limits on Jones River Brook | Points of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Jones River Tributary A | Confluence with Jones River | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Jones River Tributary B | Confluence with Jones River | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Kings Pond | Entire shoreline | Entire shoreline | Rainfall hydrograph | Storage rating curve | 6/1/1983 | AE | |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Little Pudding Brook | Limit of coastal flooding | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Littles Creek | Confluence with South River | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Long Pond | Entire shoreline | Entire shoreline | Regression equations (Zarriello et al. 2012) | HEC-RAS 4.1.0 (Brunner 2010) | 7/1/2014 | AE | Assawompset and Long Ponds were modeled as a continuous river system with Nemasket River. Regression equations were used to calculate peakflows at the outlet of Long Pond, the outlet of Assawompset Pond, and along Nemasket River to the mouth. Water-surface elevations for Long Pond were computed using a step-backwater model for the reach between Assawompset and Long Ponds and using high-water data collected at both ponds to verify the close hydraulic connection between them. |
| Longwater Brook | Confluence with Drinkwater River | Unnamed dam approximately 5,200 feet upstream of confluence with Drinkwater River | Regression equations (Wandle 1977) | HEC-2 (USACE 1974) | 7/1/1980 | AE w/Floodway | Starting water-surface elevations were from Drinkwater River profiles. |
| Longwater Brook and Zone A tributaries | Outlet of Hackett Pond | Points of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Maple Springs Brook and Zone A tributaries | Confluence of Maple Springs Brook with Agawam River | Points of one square mile of drainage area | Drainage-area-to-discharge ratio from USGS streamgage 01105870 (Jones River at Kingston, MA) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Matfield River | Confluence with Taunton River | 275 feet upstream of Bridge Street | Drainage-area ratio | HEC-2 (USACE 1974) | 11/1/1996 | AE w/Floodway | Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. Starting water-surface elevations were from Taunton River profiles. |
| Mattapoisett River | 100 feet downstream of Wolf Island Road | Approximately 6,062 feet upstream of Snipatuit Road | Regression equations | HEC-2 (USACE 1974) | 5/1/1980 | AE w/Floodway | Rating curve was developed for outlet of Snipatuit Pond. Rainfall runoff for 10-, 2-, and 1-percent-annual-chance floods was added to base water-surface elevation, and corresponding outlet floods were determined from rating curve. 0.2-percent-annual-chance flood was extrapolated. Peakflows for remainder of watershed were calculated from regression equations. 1-percent-annual-chance flow from Snipatuit Pond was added to all flows from remainder of watershed to determine final flows. Starting water-surface elevations were from the slope-are method. Cross section data were obtained from field survey and photogrammetric maps. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Mattapoisett River and Zone A tributaries | Limit of coastal flooding on Mattapoisett River | Points of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Meadow Brook (East Bridgewater) | Central Street | East Bridgewater corporate limits | Drainage-area ratio | HEC-2 (USACE 1974) | 11/1/1977 | AE w/Floodway | Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. |
| Meadow Brook (Whitman) | Whitman corporate limits | Approximately 2,658 feet upstream of Auburn Street | Regression equations | HEC-2 (USACE 1974) | 1/1/1980 | AE w/Floodway | Starting water-surface elevations were from adjacent studies. |
| Meadow Brook Tributary | Confluence with Meadow Brook | 4,124 feet upstream of Auburn Street | Regression equations | HEC-2 (USACE 1974) | 1/1/1980 | AE w/Floodway | Starting water-surface elevations were from Meadow Brook profiles. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Mile Brook | Approximately 150 feet south of Kingston corporate limits | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Mile Brook | Confluence with Halls Brook | Approximately 150 feet south of Kingston corporate limits | HEC-1 (USACE 1973) | HEC-2 (USACE 1974) | 5/1/1983 | AE w/Floodway | HEC-1 model was calibrated to March 1968 flood, slightly greater than a 10-percent-annual-chance event at USGS streamgage 01105870. Rainfall hydrographs were from USWB (1961). Starting water-surface elevations were from the slope-area method. |
| Nemasket River | Confluence with Taunton River | Assawompset Pond Dam | Regression equations (Zarriello et al. 2012) | HEC-RAS 4.1.0 (Brunner 2010) | 7/1/2014 | AE w/Floodway | Regression equations were used to calculate peakflows at the outlet of Long Pond, the outlet of Assawompset Pond, and along Nemasket River to the mouth. Most underwater cross-section data and structure elevations were from field surveys in November and December 2012 and April 2013. Underwater cross-section data for selected cross sections were obtained from survey data collected for the previous effective study. Overbank cross-section data were from lidar topography (FEMA 2011, USGS 2011). Starting water-surface elevations were from normal depth, using a slope of 0.00015. |

## Table 12: Summary of Hydrologic and Hydraulic Analyses

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| North River Tributary A | Confluence with North River | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| North Tributary to Shumatuscacant River | Confluence with Shumatuscacant River | Approximately 1,600 feet upstream of Wales Street | Regression equations (Johnson and Tasker 1974) | HEC-2 (USACE 1974) | 9/1/1977 | AE | 0.2-percent-annual-chance peakflows (not available from regression equations) were extrapolated. |
| Northern Branch of Ben Mann Brook | Hingham Street | Approximately 950 feet upstream of Hingham Street | unknown | unknown | 6/16/2008 | AE | |
| Oldham Pond | Entire shoreline | Entire shoreline | Reservoir routing | unknown | 1/1/1978 | AE | 10-, 2-, and 1-percent-annual-chance peakflows into Oldham and Furnace Ponds (CDM 1964) were routed through the ponds. 0.2-percent-annual-chance peakflows were extrapolated. |
| Palmer Mill Brook | Confluence with Winnetuxet River | Approximately 1,660 feet upstream of Hayward Street | Regression equations (Wandle 1977) | HEC-2 (USACE 1974) | 3/1/1980 | AE w/Floodway | Starting water-surface elevations were from Winnetuxet River profiles. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

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|---|---|---|---|---|---|---|---|
| Pine Brook and Zone A tributaries | Confluence of Pine Brook with Jones River | Points of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Plymouth River | Cushing Pond Dam | Approximately 2,068 feet upstream of Old Ward Street | Regression equations (Wandle 1977) | HEC-2 (USACE 1974) | 7/1/1983 | AE w/Floodway | Overbank portions of cross sections and interpolated cross sections were taken from topographic maps (Avis 1979). Structures were field-surveyed. Starting water-surface elevations were from hydraulic analysis of Foundry Pond Dam. Hydraulic model was calibrated to information from local residents and Hingham Flood Plain Maps (Perkins 1975). Recent modifications were taken into account when using historical high-water marks. |
| Pocksha Pond | Entire shoreline | Entire shoreline | Regression equations (Zarriello et al. 2012) | HEC-RAS 4.1.0 (Brunner 2010) | 7/1/2014 | AE | Pocksha Pond was not directly modeled. Elevations were taken from adjacent Assawompset Pond given information on the hydraulic connectivity between the two waterbodies. |
| Poor Meadow Brook | Approximately 8,700 feet downstream of Main Street | Approximately 4,675 feet upstream of West Washington Street | Regression equations (Wandle 1983) | HEC-2 (USACE 1974) | 6/1/1985 | AE w/Floodway | Starting water-surface elevations were from the slope-area method with 0.0006 energy grade line slope. |

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|---|---|---|---|---|---|---|---|
| Pudding Brook and Zone A tributaries | Limit of coastal flooding on Pudding Brook | Points of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Red Brook and Zone A tributaries | Mouth of Red Brook at Buttermilk Bay | Points of one square mile of drainage area | Drainage-area-to-discharge ratio from USGS streamgage 01105870 (Jones River at Kingston, MA) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |

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| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Robinson Creek | Limit of coastal flooding | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Rocky Meadow Brook | Confluence with Weweantic River | Approximately 2,868 feet upstream of France Street | Drainage-area-CFSM curve | HEC-2 (USACE 1974) | 7/1/1980 | AE w/Floodway | Log-Pearson type III flood frequency analysis was performed on all streamgages in vicinity. All results were plotted for drainage area versus CSFM. Envelope curves were drawn around plotted data. Final curve selected by engineering judgment was on the low side of plotted data since characteristics of study reach are different than those of gages used to develop curve. |
| Rose Brook | Confluence with Wankinco River | Point of one square mile of drainage area | Drainage-area-to-discharge ratio from USGS streamgage 01105870 (Jones River at Kingston, MA) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |

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| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Salisbury Brook | Confluence with Salisbury Plain River | Approximately 450 feet upstream of Prospect Street | Flow routing (SCS 1972) | HEC-2 (USACE 1974) | 8/1/1977 | AE w/Floodway | Rainfall runoff method (SCS 1972) was used to determine peakflows for Lovett Brook. Lovett Brook peakflows were routed through Brockton Reservoir, Waldo Lake, ponds in D.W. Field Park (CDM 1968), and Cross Pond, the headwaters for Salisbury Brook. Peakflows downstream were calculated using drainage-area ratios (SCS 1972). Cross sections were field-surveyed. |
| Salisbury Plain River (Brockton) | Brockton corporate limits | Confluence with Salisbury Brook | Flow routing (SCS 1972) | HEC-2 (USACE 1974) | 8/1/1977 | AE w/Floodway | Peakflows were determined by graphically adding peakflows from Salisbury Brook and Trout Brook at confluence. Downstream, peakflows were determined using drainage-area ratios (SCS 1972). Cross sections were field-surveyed. Starting water-surface elevations were from the slope-area method. |
| Salisbury Plain River (West Bridgewater) | West Bridgewater corporate limits | West Bridgewater corporate limits | Drainage-area ratio | HEC-2 (USACE 1974) | 3/1/1979 | AE w/Floodway | Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. Cross sections were field-surveyed. |
| Satucket River | 700 feet downstream of Plymouth Street | 80 feet upstream of Pond Street | Drainage-area ratio | HEC-2 (USACE 1974) | 11/1/1977 | AE w/Floodway | Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. |
| Satuit Brook | 500 feet upstream of Front Street | Approximately 100 feet upstream of abandoned railroad | Rational method | HEC-2 (USACE 1974) | 8/1/1983 | AE w/Floodway | Rational Method computation used assumed hydrograph distributions. Water-surface elevations at road crossings were calculated using the Francis Formula with adopted "C" values for roads and weirs being 3.09 and 3.33, respectively. Starting water-surface elevations were from normal depth. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Sawmill Brook | Confluence with Taunton River | Approximately 4,826 feet upstream of Bedford Street | Regression equations (Jennings et al. 1993) | HEC-2 (USACE 1974) | 11/1/1996 | AE w/Floodway | Starting water-surface elevations were from Taunton River profiles effective at the time. |
| Second Brook | Confluence with Jones River | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Second Herring Brook | Confluence with Black Pond Brook | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Second Herring Brook | Confluence with North River | Confluence with Black Pond Brook | Log-Pearson type III flood frequency analysis, drainage-area ratio, and regression equations (Wandle 1977) | HEC-2 (USACE 1974) | 7/1/1980 | AE w/Floodway | Log-Pearson type III analysis was performed on USGS streamgage 01105870 (Jones River in Kingston). Drainage-area ratios were used to transpose results to study reach. Final peakflows were average of transposed LPIII results and results from regression equations. Cross section data were obtained from field survey and photogrammetric maps (Moore 1974). Starting water-surface elevations were from mean high tide. |
| Shinglemill Brook | Confluence with Longwater Brook | Limit of detailed study | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Shinglemill Brook | Webster Street | Whiting Street | unknown | unknown | 12/26/2007 | AE | |
| Shumatuscacant River (Abington) | Abington corporate limits | Approximately 2,300 feet upstream of Summit Road | Regression equations (Johnson and Tasker 1974) | HEC-2 (USACE 1974) | 9/1/1977 | AE w/Floodway | 0.2-percent-annual-chance peakflows (not available from regression equations) were extrapolated. Because watershed is small, six flow-change locations were used. Cross sections were field-surveyed. Starting water-surface elevations were from hydraulic analysis at the downstream end. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Shumatuscacant River (Whitman) | Confluence with Shumatuscacant Tributary | Whitman corporate limits | Regression equations | HEC-2 (USACE 1974) | 1/1/1980 | AE w/Floodway | Cross sections were field-surveyed. Starting water-surface elevations were from the slope-area method. |
| Shumatuscacant Tributary | Confluence with Shumatuscacant River | 820 feet upstream of Franklin Street | Regression equations | HEC-2 (USACE 1974) | 1/1/1980 | AE w/Floodway | Starting water-surface elevations were from the slope-area method. |
| Sippican River and Zone A tributaries | Limit of coastal flooding on Sippican River | Points of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Sippican River Tributary A | Confluence with Sippican River | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Smelt Brook | State Route 3 | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Smelt Brook | State Route 3A | 60 feet upstream of Cranberry Road | Regression equations (Wandle 1977) | HEC-2 (USACE 1974) | 5/1/1983 | AE w/Floodway | Starting water-surface elevations were from the slope-area method. |
| Snows Brook | Confluence with Taunton River | 50 feet upstream of Forest Street | Drainage-area ratio | HEC-2 (USACE 1974) | 3/1/1978 | AE w/Floodway | Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. |
| South Brook | Confluence with Town River | 25 feet upstream of Bedford Street | Drainage-area ratio | HEC-2 (USACE 1974) | 3/1/1978 | AE w/Floodway | Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| South Meadow Brook | Confluence with Weweantic River | Approximately 1,145 feet upstream of Pond Street | Drainage-area-CFSM curve | HEC-2 (USACE 1974) | 7/1/1980 | AE w/Floodway | Log-Pearson type III flood frequency analysis was performed on all streamgages in vicinity. All results were plotted for drainage area versus CSFM. Envelope curves were drawn around plotted data. Final curve selected by engineering judgment was on the low side of plotted data since characteristics of study reach are different than those of gages used to develop curve. Starting water-surface elevations were from Weweantic River profiles. |
| South River and Zone A tributaries | Limit of coastal flooding on South River | Points of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Stream Channel to Unnamed Tributary to Third Herring Brook | Confluence with Unnamed Tributary to Third Herring Brook | Confluence of Tributaries 1 and 2 to Stream Channel to Unnamed Tributary to Third Herring Brook | unknown | unknown | 9/7/2005 | AE | |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Stream River | Whitman/Abington corporate limits | Approximately 100 feet upstream of Ashland Street | Regression equations (Wandle 1983) | HEC-2 (USACE 1974) | 12/1/1990 | AE w/Floodway | 0.2-percent-annual-chance peakflows (not available from regression equations) were extrapolated. Cross sections were field-surveyed. Starting water-surface elevations were from the slope-are method. |
| Taunton River | County limits | Cherry Street | Regression-weighted log-Pearson type III flood frequency analysis (Cohn et al. 2012) | HEC-RAS 4.1.0 (Brunner 2010) | 7/1/2014 | AE w/Floodway | Log-Pearson type III discharges from USGS streamgage 01108000 (Taunton River near Bridgewater) were from Zariello et al. (2012). Flows were transferred upstream and downstream using a weighted hybrid method (Guimaraes and Bohman 1992). At split-flow reach between County Street and Owen Parkway, flow optimization in HEC-RAS was used to calculate amount of discharge in main channel and side channel. The hydraulic model was calibrated to the high-water marks from the March and April 2010 flood event. Most underwater cross-section data and structure elevations were from field surveys in March and April, 2012. Underwater cross-section data for cross sections in Bridgewater and Middleborough were obtained from survey data collected for the previous effective study. Overbank cross-section data were from lidar topography (FEMA 2011, USGS 2011). Starting water-surface elevations were from normal depth, using a slope of 0.00033. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Third Herring Brook and Zone A tributaries | Confluence of Third Herring Brook with North River | Points of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Torrey Brook and Zone A tributaries | Confluence of Torrey Brook with Drinkwater River | Points of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Town Brook (Hingham) | Hingham Harbor | Approximately 1,100 feet upstream of South Street | Regression equations (Wandle 1977) | HEC-2 (USACE 1974) | 7/1/1983 | AE w/Floodway | Overbank portions of cross sections and interpolated cross sections were taken from topographic maps (Avis 1979). Survey data were obtained from Hingham Highway Department and a previous study (MADPW 1970). Elevations were spot-checked, and some additional sections were surveyed. Starting water-surface elevations were from normal depth. Hydraulic model was calibrated to information from local residents and Hingham Flood Plain Maps (Perkins 1975). Recent modifications were taken into account when using historical high-water marks. |
| Town Brook (Plymouth) | Limit of coastal flooding below Water Street | Headwaters at Billington Sea | Maintenance of Variance Extension, type 1 (Hirsch 1982) | HEC-RAS 5.0 | 2/1/2017 | AE w/Floodway | MOVE.1 record extension was performed on USGS streamgage 01105874 (Town Brook at Plymouth) using index USGS streamgage 01105876 (Eel River at Rt. 3A near Plymouth). Derived peakflow record was analyzed using log-Pearson type III flood-frequency analysis (IACWD 1982) with expected moments algorithm (Cohn et al. 1997, 2001; Griffis et al. 2004) in PeakFQ (Veilluex et al. 2014). Starting water-surface elevations were from mean higher high tide at nearby tide gage. Structures and underwater portions of cross sections were surveyed. Overbank portions of cross sections were obtained from lidar topography (USGS 2011, 2014a). Ineffective flow was designated at structures. Hydraulic model assumed steady, subcritical flow; expansion (0.3 to 0.8) and contraction (0.1 to 0.5) coefficients; and no minor losses. Structures were modeled using the same methods for all profiles. Roughness values were selected based on field notes, photographs, and aerial imagery. |

## Table 12: Summary of Hydrologic and Hydraulic Analyses

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Town River | Confluence with Taunton River | Confluence with Lake Nippenicket Tributary | Drainage-area ratio | HEC-2 (USACE 1974) | 3/1/1979 | AE w/Floodway | Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. Starting water-surface elevations were from Taunton River profiles. |
| Tributary 1 to Stream Channel to Unnamed Tributary to Third Herring Brook | Confluence with Stream Channel to Unnamed Tributary to Third Herring Brook | Approximately 300 feet upstream of confluence with Stream Channel to Unnamed Tributary to Third Herring Brook | unknown | unknown | 9/7/2005 | AE | |
| Tributary 1 to Unnamed Tributary to Iron Mine Brook | Confluence with Unnamed Tributary to Iron Mine Brook | Ponding Area 1 | unknown | unknown | 9/7/2005 | AE | |
| Tributary 2 to Stream Channel to Unnamed Tributary to Third Herring Brook | Confluence with Stream Channel to Unnamed Tributary to Third Herring Brook | Approximately 370 feet upstream of confluence with Stream Channel to Unnamed Tributary to Third Herring Brook | unknown | unknown | 9/7/2005 | AE | |

## Table 12: Summary of Hydrologic and Hydraulic Analyses

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Tributary 2 to Unnamed Tributary to Iron Mine Brook | Confluence with Unnamed Tributary to Iron Mine Brook | Ponding Area 2 | unknown | unknown | 9/7/2005 | AE | |
| Tributary A | Confluence with French Stream | Levin Road | Rational method | HEC-2 (USACE 1974) | 3/1/1980 | AE w/Floodway | In conjunction with Rational Method, flows were routed through Summer Street culvert (Gray 1973). Peakflows at confluence are lower than at Levin Road because Summer Street culvert causes upstream storage. Starting water-surface elevations were from the slope-are method. |
| Tributary A to Sawmill Brook | Confluence with Sawmill Brook | Approximately 80 feet upstream of Colonial Drive | Regression equations (Jennings et al. 1993) | HEC-2 (USACE 1974) | 11/1/1996 | AE | Starting water-surface elevations were from Sawmill Brook profiles. |
| Tributary to Meadow Brook | Confluence with Meadow Brook | 1,340 feet upstream of Whitman/East Bridgewater corporate limits | Drainage-area ratio | HEC-2 (USACE 1974) | 11/1/1977 | AE w/Floodway | Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. Starting water-surface elevations were based on coincident flow with Meadow Brook. |
| Trout Brook | Confluence with Salisbury Brook | Approximately 415 feet upstream of Ames Street | Flow routing (SCS 1972) | HEC-2 (USACE 1974) | 8/1/1977 | AE w/Floodway | Rainfall runoff method (SCS 1972) was used to determine peakflows for Trout Brook. Peakflows downstream were routed through the reach. Cross sections were field-surveyed. Starting water-surface elevations were from Salisbury Plain River profiles. |
| Turkey Hill Run | Confluence with Weir River | Approximately 160 feet upstream of East Street | Regression equations | HEC-2 (USACE 1974) | 8/1/1983 | AE w/Floodway | |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Unnamed Tributary 2 to Shinglemill Brook | Confluence with Shinglemill Brook | Approximately 1,300 feet upstream of confluence with Shinglemill Brook | unknown | unknown | 12/26/2007 | AE | |
| Unnamed Tributary 3 to Shinglemill Brook | Confluence with Shinglemill Brook | Approximately 1,600 feet upstream of confluence with Shinglemill Brook | unknown | unknown | 12/26/2007 | AE | |
| Wankinco River and Zone A tributaries | Limit of coastal flooding on Wankinco River | Points of one square mile of drainage area | Drainage-area-to-discharge ratio from USGS streamgage 01105870 (Jones River at Kingston, MA) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Weir River | Foundry Pond Dam | Free Street | Regression equations (Wandle 1977) | HEC-2 (USACE 1974) | 7/1/1983 | AE w/Floodway | Overbank portions of cross sections and interpolated cross sections were taken from topographic maps (Avis 1979). Structures were field-surveyed. Starting water-surface elevations were from hydraulic analysis of Foundry Pond Dam. Hydraulic model was calibrated to information from local residents and Hingham Flood Plain Maps (Perkins 1975). Recent modifications were taken into account when using historical high-water marks. |
| West Brook | Limit of coastal flooding | Point of one square mile of drainage area | 2017 state regression equations (Zarriello 2017) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| West Meadow Brook | Confluence with Town River | West Bridgewater corporate limits | Drainage-area ratio | HEC-2 (USACE 1974) | 3/1/1979 | AE w/Floodway | Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. |

## Table 12: Summary of Hydrologic and Hydraulic Analyses

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Weweantic River | Wareham/Carver corporate limits | Confluence of Rocky Meadow Brook and South Meadow Brook | Drainage-area-CFSM curve | HEC-2 (USACE 1974) | 7/1/1980 | AE w/Floodway | Log-Pearson type III flood frequency analysis was performed on all streamgages in vicinity. All results were plotted for drainage area versus CSFM. Envelope curves were drawn around plotted data. Final curve selected by engineering judgment was on the low side of plotted data since characteristics of study reach are different than those of gages used to develop curve. Starting water-surface elevations were from the slope-are method. |
| Weweantic River and Zone A tributaries | Limit of coastal flooding on Weweantic River | Points of one square mile of drainage area | Drainage-area-to-discharge ratio from USGS streamgage 01105870 (Jones River at Kingston, MA) | HEC-RAS 4.1.0 (Brunner 2010) | 5/31/2017 | A | Flow-change locations were selected based on 50% change in drainage area. Sub-basin delineation used hydro-conditioned lidar topography (USGS 2011, 2014a). Cross sections were placed at entrances and exits of structures, at flow-change locations, and at significant changes in stream morphology. Overbank geometries were taken from lidar topography; channel geometries were calculated from regional bankfull equations (Bent 2006). Roughness was estimated from drainage area. Starting water-surface elevations were from normal depth using slope of lower end of reach. Ineffective flow was applied where applicable. |
| Willow Brook | Confluence with Town River | Approximately 950 feet upstream of Main Street | Drainage-area ratio | HEC-2 (USACE 1974) | 3/1/1979 | AE w/Floodway | Discharge estimates from regression equations were unreasonably high. Index used for ratio equation was 01108000 (Taunton River at State Farm). Drainage areas were taken from topographic maps (USGS various). Ratio equation used exponent of 0.7. |

**Table 12: Summary of Hydrologic and Hydraulic Analyses**

| Flooding Source | Study Limits Downstream Limit | Study Limits Upstream Limit | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|---|---|---|---|---|---|---|---|
| Winnetuxet River | Confluence with Taunton River | Approximately 4,888 feet upstream of Main Street | Regression equations (Wandle 1977) | HEC-2 (USACE 1974) | 3/1/1980 | AE w/Floodway | Starting water-surface elevations for lower reach were from Taunton River profiles effective at the time. Coincident flow was chosen for these two rivers because topographic and soil characteristics indicate it is probable. Cross section data were obtained from field survey and photogrammetric maps (Col-East various). Starting water-surface elevations for upper reach were from lower reach profiles. |

**Table 13: Roughness Coefficients**

| Flooding Source | Channel "n" | Overbank "n" |
|---|---|---|
| Aaron River and Zone A tributaries | 0.055-0.057 | 0.099-0.106 |
| Accord Brook | 0.010-0.050 | 0.050-0.100 |
| Agawam River and Zone A tributaries | 0.051-0.057 | 0.090-0.105 |
| Agawam River Tributary A | 0.057 | 0.105 |
| Ashley Brook | 0.057 | 0.104-0.106 |
| Aucoot Creek | 0.057 | 0.104 |
| Bares Brook | 0.057 | 0.105-0.106 |
| Beaver Brook | 0.030-0.050 | 0.016-0.080 |
| Beaver Dam Brook (detailed) | 0.025-0.070 | 0.090-0.100 |
| Beaver Dam Brook and Zone A tributaries | 0.057 | 0.104-0.106 |
| Beaver Dam Brook Tributary A | 0.057 | 0.104-0.105 |
| Benson Brook | 0.056-0.057 | 0.102-0.106 |
| Billington Sea Zone A tributaries | 0.056-0.057 | 0.101-0.106 |
| Black Betty Brook | 0.030-0.060 | 0.050-0.100 |
| Black Brook | 0.013-0.050 | 0.016-0.080 |
| Black Pond Brook (approximate) | 0.057 | 0.104-0.105 |
| Black Pond Brook (detailed) | 0.04 | 0.060-0.110 |
| Bluefish River Tributary A | 0.057 | 0.104-0.106 |
| Bound Brook | 0.030-0.065 | 0.050-0.095 |
| Branch of Eel River (detailed) | 0.015-0.060 | 0.090-0.100 |
| Branch of Eel River and Zone A tributaries | 0.055-0.057 | 0.098-0.106 |
| Branch of Eel River Tributary A | 0.057 | 0.104-0.105 |
| Coastal Tributary A and Zone A tributaries | 0.057 | 0.103-0.106 |
| Coastal Tributary C | 0.057 | 0.106 |
| Coastal Tributary D | 0.057 | 0.104 |
| Coastal Tributary E | 0.057 | 0.104-0.106 |
| Coastal Tributary F | 0.057 | 0.103-0.104 |
| Coastal Tributary G | 0.057 | 0.104 |
| Coastal Tributary H | 0.057 | 0.104-0.105 |
| Coastal Tributary I | 0.057 | 0.104-0.105 |
| Coastal Tributary J | 0.057 | 0.103-0.106 |
| Crane Brook | 0.04 | 0.080-0.120 |

**Table 13: Roughness Coefficients**

| Flooding Source | Channel "n" | Overbank "n" |
|---|---|---|
| Crooked Meadow River | 0.014-0.050 | 0.080-0.120 |
| Cushing Brook and Zone A tributaries | 0.055-0.057 | 0.100-0.106 |
| Doggett Brook and Zone A tributaries | 0.053-0.057 | 0.094-0.106 |
| Drinkwater River (approximate) | 0.057 | 0.105-0.106 |
| Drinkwater River (detailed) | 0.035 | 0.060-0.090 |
| Drinkwater River Tributary | 0.035 | 0.08 |
| Drinkwater River Tributary A and Zone A tributaries | 0.056-0.057 | 0.103-0.106 |
| Eel River (Hingham) | 0.015-0.050 | 0.090-0.120 |
| Eel River (Plymouth) | 0.024-0.060 | 0.09 |
| Eel River and Zone A tributaries | 0.054-0.057 | 0.096-0.106 |
| First Herring Brook (approximate) | 0.057 | 0.104-0.105 |
| First Herring Brook (detailed) | 0.023-0.060 | 0.090-0.100 |
| First Herring Brook Tributary A | 0.057 | 0.105 |
| French Stream (Hanover) | 0.035 | 0.08 |
| French Stream (Rockland) | 0.030-0.045 | 0.050-0.100 |
| French Stream Zone A tributaries | 0.056-0.057 | 0.103-0.106 |
| Furnace Brook No. 2 | 0.056-0.057 | 0.102-0.104 |
| Green Harbor Brook and Zone A tributaries | 0.057 | 0.104-0.106 |
| Halls Brook (approximate) | 0.057 | 0.105-0.106 |
| Halls Brook (detailed) | 0.015-0.040 | 0.080-0.100 |
| Harlow Brook No. 2 and Zone A tributaries | 0.55-0.057 | 0.099-0.104 |
| Herring Brook (approximate) | 0.057 | 0.104-0.106 |
| Herring Brook (detailed) | 0.025-0.030 | 0.075-0.080 |
| Herring River | 0.053-0.057 | 0.094-0.104 |
| Hockomock River | 0.030-0.060 | 0.050-0.100 |
| Indian Brook (detailed) | 0.020-0.065 | 0.020-0.100 |
| Indian Brook and Zone A tributaries | 0.055-0.057 | 0.098-0.106 |
| Indian Head Brook (approximate) | 0.057 | 0.104-0.105 |
| Indian Head Brook (detailed) | 0.035-0.040 | 0.070-0.090 |
| Indian Head River (Hanover) | 0.035 | 0.060-0.100 |
| Indian Head River (Hanson) | 0.035 | 0.060-0.100 |
| Iron Mine Brook | 0.057 | 0.104-0.106 |

## Table 13: Roughness Coefficients

| Flooding Source | Channel "n" | Overbank "n" |
|---|---|---|
| Island Creek and Zone A tributaries | 0.056-0.057 | 0.103-0.106 |
| Jones River (detailed) | 0.04-0.055 | 0.08-0.11 |
| Jones River and Zone A tributaries | 0.055-0.057 | 0.100-0.106 |
| Jones River Brook (detailed) | 0.030-0.040 | 0.100-0.110 |
| Jones River Brook and Zone A tributaries | 0.055-0.057 | 0.100-0.106 |
| Jones River Tributary A | 0.057 | 0.106 |
| Jones River Tributary B | 0.057 | 0.105-0.106 |
| Little Pudding Brook | 0.057 | 0.104-0.106 |
| Littles Creek | 0.056-0.057 | 0.103-0.105 |
| Longwater Brook | 0.035 | 0.08 |
| Maple Springs Brook and Zone A tributaries | 0.056-0.057 | 0.101-0.105 |
| Matfield River | 0.035 | 0.100-0.120 |
| Mattapoisett River (detailed) | 0.035-0.040 | 0.060-0.090 |
| Mattapoisett River Zone A tributaries | 0.046-0.057 | 0.077-0.106 |
| Meadow Brook (East Bridgewater) | 0.023-0.030 | 0.016-0.030 |
| Meadow Brook (Whitman) | 0.035 | 0.060-0.080 |
| Meadow Brook Tributary | 0.040-0.045 | 0.060-0.100 |
| Mile Brook (approximate) | 0.057 | 0.105-0.106 |
| Mile Brook (detailed) | 0.015-0.040 | 0.080-0.100 |
| Nemasket River | 0.025-0.065 | 0.06-0.13 |
| North River | 0.025-0.030 | 0.075-0.080 |
| North River Tributary A | 0.057 | 0.103-0.106 |
| Palmer Mill Brook | 0.045 | 0.08 |
| Pine Brook and Zone A tributaries | 0.055-0.057 | 0.100-0.106 |
| Plymouth River | 0.014-0.050 | 0.080-0.120 |
| Poor Meadow Brook | 0.035-0.045 | 0.065-0.105 |
| Pudding Brook and Zone A tributaries | 0.055-0.057 | 0.100-0.106 |
| Red Brook and Zone A tributaries | 0.052-0.057 | 0.093-0.106 |
| Robinson Creek | 0.057 | 0.104-0.106 |
| Rocky Meadow Brook | 0.030-0.035 | 0.060-0.090 |
| Rose Brook | 0.057 | 0.104 |
| Salisbury Brook | 0.025-0.040 | 0.060-0.080 |

## Table 13: Roughness Coefficients

| Flooding Source | Channel "n" | Overbank "n" |
|---|---|---|
| Salisbury Plain River (Brockton) | 0.025-0.040 | 0.060-0.080 |
| Salisbury Plain River (West Bridgewater) | 0.030-0.060 | 0.050-0.100 |
| Satucket River | 0.031-0.050 | 0.016-0.080 |
| Satuit Brook | 0.013-0.060 | 0.1 |
| Sawmill Brook | 0.04 | 0.100-.0120 |
| Second Brook | 0.057 | 0.105 |
| Second Herring Brook | 0.057 | 0.104-0.106 |
| Shinglemill Brook | 0.057 | 0.105 |
| Shumatuscacant River | 0.035-0.040 | 0.080-0.100 |
| Shumatuscacant River – North Tributary | 0.012-0.040 | 0.080-0.100 |
| Shumatuscacant Tributary | 0.030-0.045 | 0.090-0.100 |
| Sippican River and Zone A tributaries | 0.050-0.057 | 0.087-0.106 |
| Sippican River Tributary A | 0.057 | 0.105-0.106 |
| Smelt Brook (approximate) | 0.057 | 0.104-0.106 |
| Smelt Brook (detailed) | 0.015-0.040 | 0.070-0.100 |
| Snows Brook | 0.013-0.060 | 0.016-0.070 |
| South Brook | 0.013-0.060 | 0.016-0.090 |
| South Meadow Brook | 0.033-0.037 | 0.060-0.080 |
| South River and Zone A tributaries | 0.052-0.057 | 0.091-0.106 |
| Stream River | 0.013-0.060 | 0.060-0.180 |
| Taunton River | 0.035-0.060 | 0.080-0.10 |
| Third Herring Brook and Zone A tributaries | 0.052-0.057 | 0.091-0.106 |
| Torrey Brook and Zone A tributaries | 0.057 | 0.104-0.106 |
| Town Brook (Hingham) | 0.017-0.050 | 0.070-0.100 |
| Town Brook (Plymouth) | 0.03-0.05 | 0.07-0.1 |
| Town River | 0.03-0.06 | 0.050-0.100 |
| Tributary A | 0.035-0.040 | 0.08 |
| Tributary A to Sawmill Brook | 0.04 | 0.12 |
| Tributary to Meadow Brook | 0.05 | 0.08 |
| Trout Brook | 0.025-0.040 | 0.060-0.080 |
| Turkey Hill Brook | 0.015-0.070 | 0.090-0.110 |
| Wankinco River and Zone A tributaries | 0.052-0.057 | 0.093-0.106 |

**Table 13: Roughness Coefficients**

| Flooding Source | Channel "n" | Overbank "n" |
|---|---|---|
| Weir River | 0.014-0.050 | 0.080-0.120 |
| West Brook | 0.057 | 0.104-0.106 |
| West Meadow Brook | 0.030-0.060 | 0.050-0.100 |
| Weweantic River (detailed) | 0.025-0.037 | 0.060-0.090 |
| Weweantic River and Zone A tributaries | 0.035-0.057 | 0.052-0.106 |
| Willow Brook | 0.030-0.060 | 0.050-0.100 |
| Winnetuxet River (Halifax) | 0.035-0.045 | 0.050-0.100 |
| Winnetuxet River (Plympton) | 0.030-0.050 | 0.080-0.100 |

### 5.3    Coastal Analyses

For the areas of Plymouth County that are impacted by coastal flooding processes, coastal flood hazard analyses were performed to provide estimates of coastal BFEs. Coastal BFEs reflect the increase in water levels during a flood event due to extreme tides and storm surge as well as overland wave effects.

The following subsections provide summaries of how each coastal process was considered for this FIS Report. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation. Table 14 summarizes the methods and/or models used for the coastal analyses. Refer to Section 2.5.1 for descriptions of the terms used in this section.

**Table 14: Summary of Coastal Analyses**

| Flooding Source | Study Limits From | Study Limits To | Hazard Evaluated | Model or Method Used | Date Analysis was Completed |
|---|---|---|---|---|---|
| Bourne Wharf River, Eel River, Little Wood Island River, North River, Pine Point River | Tidal portions in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate | Tidal portions in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate | Stillwater elevation and storm surge | RIVSRG (HTA 1977) | 3/1/2002 |
| Buzzards Bay | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Extremal analysis | Peaks Over Threshold (POT) | 3/28/2008 |

**Table 14: Summary of Coastal Analyses**

| Flooding Source | Study Limits From | Study Limits To | Hazard Evaluated | Model or Method Used | Date Analysis was Completed |
|---|---|---|---|---|---|
| Buzzards Bay | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Stillwater elevation and storm surge | USACE Tidal Flood Profiles (USACE 1988) with extrapolation | 3/28/2008 |
| Buzzards Bay | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Wave height | WHAFIS 3.0 (FEMA 1988) | 3/28/2008 |
| Buzzards Bay | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Wave runup for sloped structures with slope gentler than 1:8 | RUNUP 2.0 (FEMA 2007b) | 3/28/2008 |
| Buzzards Bay | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Wave runup for sloped structures with slope steeper than 1:8 | TAW | 3/28/2008 |
| Buzzards Bay | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Wave runup for vertical structures | SPM (USACE 1984) | 3/28/2008 |
| Buzzards Bay | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Entire coastline in Towns of Marion, Mattapoisett, and Wareham | Wave setup | DIM (FEMA 2007a) | 3/28/2008 |

**Table 14: Summary of Coastal Analyses**

| Flooding Source | Study Limits From | Study Limits To | Hazard Evaluated | Model or Method Used | Date Analysis was Completed |
|---|---|---|---|---|---|
| Cape Cod Bay | Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate | Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate | Overland wave height | WHAFIS 4.0 (FEMA undated) | 5/1/2013 |
| Cape Cod Bay | Entire coastline in Towns of Duxbury, Marshfield, Plymouth, and Scituate | Entire coastline in Towns of Duxbury, Marshfield, Plymouth, and Scituate | Primary frontal dune | Analysis of dune dimensions | 5/1/2013 |
| Cape Cod Bay | Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate | Entire coastline in Town of Duxbury, Kingston, Marshfield, Plymouth, and Scituate | Stillwater elevation and storm surge | USACE Tidal Flood Profiles (USACE 1988) with extrapolation | 3/1/2002 |
| Cape Cod Bay | Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate | Entire coastline in Towns of Duxbury, Marshfield, Plymouth, and Scituate | Wave height | STWAVE (USACE 2001) | 5/1/2013 |
| Cape Cod Bay | Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate | Entire coastline in Towns of Duxbury, Marshfield, Plymouth, and Scituate | Wave runup for sloped structures with slope steeper than 1:8 | TAW | 5/1/2013 |

**Table 14: Summary of Coastal Analyses**

| Flooding Source | Study Limits From | Study Limits To | Hazard Evaluated | Model or Method Used | Date Analysis was Completed |
|---|---|---|---|---|---|
| Cape Cod Bay | Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate | Entire coastline in Towns of Duxbury, Marshfield, Plymouth, and Scituate | Wave runup for sloped structures with slope gentler than 1:8 | RUNUP 2.0 (FEMA 2007b) | 5/1/2013 |
| Cape Cod Bay | Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate | Entire coastline in Towns of Duxbury, Marshfield, Plymouth, and Scituate | Wave runup for vertical structures | SPM (USACE 1984) | 5/1/2013 |
| Cape Cod Bay | Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate | Entire coastline in Towns of Duxbury, Kingston, Marshfield, Plymouth, and Scituate | Wave setup | DIM (FEMA 2007a) | 5/1/2013 |
| Hingham Bay and Massachusetts Bay | Entire coastline in Towns of Hingham and Hull | Entire coastline in Towns of Hingham and Hull | Extremal analysis | Peaks Over Threshold (POT) | 3/28/2008 |
| Hingham Bay and Massachusetts Bay | Entire coastline in Towns of Hingham and Hull | Entire coastline in Towns of Hingham and Hull | Stillwater elevation and storm surge | USACE Tidal Flood Profiles (USACE 1988) with extrapolation | 3/28/2008 |
| Hingham Bay and Massachusetts Bay | Entire coastline in Towns of Hingham and Hull | Entire coastline in Towns of Hingham and Hull | Wave height | WHAFIS 3.0 (FEMA 1988) | 3/28/2008 |

**Table 14: Summary of Coastal Analyses**

| Flooding Source | Study Limits From | Study Limits To | Hazard Evaluated | Model or Method Used | Date Analysis was Completed |
|---|---|---|---|---|---|
| Hingham Bay and Massachusetts Bay | Entire coastline in Towns of Hingham and Hull | Entire coastline in Towns of Hingham and Hull | Wave runup for sloped structures with slope gentler than 1:8 | RUNUP 2.0 (FEMA 2007b) | 3/28/2008 |
| Hingham Bay and Massachusetts Bay | Entire coastline in Towns of Hingham and Hull | Entire coastline in Towns of Hingham and Hull | Wave runup for sloped structures with slope steeper than 1:8 | TAW | 3/28/2008 |
| Hingham Bay and Massachusetts Bay | Entire coastline in Towns of Hingham and Hull | Entire coastline in Towns of Hingham and Hull | Wave runup for vertical structures | SPM (USACE 1984) | 3/28/2008 |
| Hingham Bay and Massachusetts Bay | Entire coastline in Towns of Hingham and Hull | Entire coastline in Towns of Hingham and Hull | Wave setup | DIM (FEMA 2007a) | 3/28/2008 |

### 5.3.1   Total Stillwater Elevations

The total stillwater elevations (stillwater including storm surge plus wave setup) for the 1% annual chance flood were determined for areas subject to coastal flooding. The models and methods that were used to determine storm surge and wave setup are listed in Table 14. The stillwater elevation that was used for each transect in coastal analyses is shown in Table 16, "Coastal Transect Parameters." Figure 8 shows the total stillwater elevations for the 1% annual chance flood that was determined for this coastal analysis.

**Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas**

[Not Applicable to this Flood Risk Report]

**Astronomical Tide**
Astronomical tidal statistics were generated directly from local tidal constituents by sampling the predicted tide at random times throughout the tidal epoch.

**Storm Surge Statistics**
Storm surge is modeled based on characteristics of actual storms responsible for significant coastal flooding. The characteristics of these storms are typically determined by statistical study of the regional historical record of storms or by statistical study of tidal gages.

When historic records are used to calculate storm surge, characteristics such as the strength, size, track, etc., of storms are identified by site. Storm data was used in conjunction with numerical hydrodynamic models to determine the corresponding storm surge levels. An extreme value analysis was performed on the storm surge modeling results to determine a stillwater elevation for the 1% annual chance event.

Tidal gages can be used instead of historic records of storms when the available tidal gage record for the area represents both the astronomical tide component and the storm surge component. Table 15 provides the gage name, managing agency, gage type, gage identifier, start date, end date, and statistical methodology applied to each gage used to determine the stillwater elevations. For areas between gages, peak stillwater elevations for selected recurrence intervals were estimated by combining interpolation between gages and observed high water marks during major storms. A regionalized statistical approach was applied to the gage data so that stillwater elevations in areas between gages could be identified.

**Table 15: Tide Gage Analysis Specifics**

| Gage Name | Managing Agency of Tide Gage Record | Gage Type | Start Date | End Date | Statistical Methodology |
|---|---|---|---|---|---|
| WIS Station 53 | * | Tide | 1980 | 1999 | POT |

**Combined Riverine and Tidal Effects**
Riverine and surge rates for the lower reaches of the Inundation River were combined by developing curves for rate of occurrence vs. flood level for each flood source.

**Wave Setup Analysis**
Wave setup was computed during the storm surge modeling through the methods and models listed in Table 14 and included in the frequency analysis for the determination of the total stillwater elevations. The oscillating component of wave setup, *dynamic wave setup*, was calculated for areas subject to wave runup hazards.

### 5.3.2 Waves

A coastal wave model was used to calculate the nearshore wave fields required for the addition of wave setup effects. Three nested grids were used to obtain sufficient nearshore resolution to represent the radiation stress gradients required as ADCIRC inputs. Radiation stress fields output from the inner grids are used by ADCIRC to estimate the contribution of breaking waves (wave setup effects) to the total stillwater elevation.

### 5.3.3 Coastal Erosion

A single storm episode can cause extensive erosion in coastal areas. Storm-induced erosion was evaluated to determine the modification to existing topography that is expected to be associated with flooding events. Erosion was evaluated using the methods listed in Table 14. The post-event eroded profile was used for the subsequent transect-based onshore wave hazard analyses.

### 5.3.4 Wave Hazard Analyses

Overland wave hazards were evaluated to determine the combined effects of ground elevation, vegetation, and physical features on overland wave propagation and wave runup. These analyses were performed at representative transects along all shorelines for which waves were expected to be present during the floods of the selected recurrence intervals. The results of these analyses were used to determine elevations for the 1% annual chance flood.

Transect locations were chosen with consideration given to the physical land characteristics as well as development type and density so that they would closely represent conditions in their locality. Additional consideration was given to changes in the total stillwater elevation. Transects were spaced close together in areas of complex topography and dense development or where total stillwater elevations varied. In areas having more uniform characteristics, transects were spaced at larger intervals. Transects shown in Figure 9, "Transect Location Map," are also depicted on the FIRM. Table 16 provides the location, stillwater elevations, and starting wave conditions for each transect evaluated for overland wave hazards. In this table, "starting" indicates the parameter value at the beginning of the transect.

**Wave Height Analysis**
Wave height analyses were performed to determine wave heights and corresponding wave crest elevations for the areas inundated by coastal flooding and subject to overland wave propagation hazards. Refer to Figure 6 for a schematic of a coastal transect evaluated for overland wave propagation hazards.

Wave heights and wave crest elevations were modeled using the methods and models listed in Table 14, "Summary of Coastal Analyses".

**Wave Runup Analysis**
Wave runup analyses were performed to determine the height and extent of runup beyond the limit of stillwater inundation for the 1% annual chance flood. Wave runup elevations were modeled using the methods and models listed in Table 14.

**Table 16: Coastal Transect Parameters**

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
| Weymouth Back River | 1 | 13.76 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Weymouth Back River | 2 | 15.01 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Hingham Bay | 3 | 15.01 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Hingham Bay | 4 | 16.25 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Hingham Bay | 5 | 16.16 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Hingham Harbor | 6 | 14.66 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Hingham Harbor | 7 | 15.29 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Hingham Harbor | 8 | 14.28 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Hingham Harbor | 9 | 16.84 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Hingham Harbor | 10 | 15.22 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Hingham Harbor | 11 | 15.01 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Weir River | 12 | 16.5 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Hull Bay | 13 | 15.49/15.00 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Hull Bay | 14 | 15.55 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Hull Bay | 15 | 16.39 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |

*Not calculated for this Flood Risk Project

**Table 16: Coastal Transect Parameters**

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
|---|---|---|---|---|---|---|---|---|
| Hull Bay | 16 | 16.22 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Massachusetts Bay | 17 | 16.95/15.96 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Massachusetts Bay | 18 | 15.39 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Massachusetts Bay | 19 | 16.87/14.66 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Massachusetts Bay | 20 | 17.57 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Massachusetts Bay | 21 | 23.28 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Massachusetts Bay | 22 | 21.91/16.7 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Massachusetts Bay | 23 | 21.61/14.7 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Massachusetts Bay | 24 | 22.06 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Massachusetts Bay | 25 | 23.43 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Massachusetts Bay | 26 | 22.37 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Massachusetts Bay | 27 | 26.01 | * | 8.4 | * | 9.3 | 9.7 | 10.6 |
| Massachusetts Bay | 28 | 23.73 | * | 8.1 | * | 9.3 | 9.7 | 10.6 |
| Massachusetts Bay | 29 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 30 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |

*Not calculated for this Flood Risk Project

**Table 16: Coastal Transect Parameters**

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
|---|---|---|---|---|---|---|---|---|
| Massachusetts Bay | 31 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 32 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 33 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 34 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 35 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 36 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 37 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 38 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 39 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 40 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 41 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 42 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 43 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 44 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 45 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |

*Not calculated for this Flood Risk Project

**Table 16: Coastal Transect Parameters**

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
|---|---|---|---|---|---|---|---|---|
| Massachusetts Bay | 46 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 47 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 48 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 49 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 50 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 51 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 52 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 53 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 54 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 55 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 56 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 57 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 58 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 59 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Massachusetts Bay | 60 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |

*Not calculated for this Flood Risk Project

**Table 16: Coastal Transect Parameters**

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
|---|---|---|---|---|---|---|---|---|
| Massachusetts Bay | 61 | * | * | 8.3 | * | 9.1 | 9.5 | 10.6 |
| Massachusetts Bay | 62 | * | * | 8.3 | * | 9.1 | 9.5 | 10.6 |
| Massachusetts Bay | 63 | * | * | 8.3 | * | 9.1 | 9.5 | 10.6 |
| Massachusetts Bay | 64 | * | * | 8.3 | * | 9.1 | 9.5 | 10.6 |
| Massachusetts Bay | 65 | * | * | 8.3 | * | 9.1 | 9.5 | 10.6 |
| Massachusetts Bay | 66 | * | * | 8.3 | * | 9.1 | 9.5 | 10.6 |
| Duxbury Bay | 67 | * | * | 8.3 | * | 9.1 | 9.5 | 10.6 |
| Duxbury Bay | 68 | * | * | 8.3 | * | 9.1 | 9.5 | 10.6 |
| Duxbury Bay | 69 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 70 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 71 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 72 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 73 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 74 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 75 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |

*Not calculated for this Flood Risk Project

## Table 16: Coastal Transect Parameters

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
|---|---|---|---|---|---|---|---|---|
| Duxbury Bay | 76 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 77 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 78 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 79 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 80 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 81 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 82 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 83 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 84 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 85 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 86 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 87 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Duxbury Bay | 88 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 89 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 90 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |

*Not calculated for this Flood Risk Project

**Table 16: Coastal Transect Parameters**

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
|---|---|---|---|---|---|---|---|---|
| Kingston Bay | 91 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 92 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 93 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 94 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 95 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 96 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 97 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 98 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 99 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 100 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 101 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 102 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Kingston Bay | 103 | * | * | 8.3 | * | 9.1 | 9.8 | 10.7 |
| Plymouth Harbor | 104 | * | * | 8.6 | * | 9.5 | 9.8 | 10.7 |
| Plymouth Harbor | 105 | * | * | 8.6 | * | 9.5 | 9.8 | 10.7 |

*Not calculated for this Flood Risk Project

## Table 16: Coastal Transect Parameters

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Plymouth Harbor | 106 | * | * | 8.6 | * | 9.5 | 9.8 | 10.7 |
| Massachusetts Bay | 107 | * | * | 8.6 | * | 9.5 | 9.8 | 10.7 |
| Plymouth Harbor | 108 | * | * | 8.6 | * | 9.5 | 9.8 | 10.7 |
| Plymouth Harbor | 109 | * | * | 8.6 | * | 9.5 | 9.8 | 10.7 |
| Plymouth Harbor | 110 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Plymouth Harbor | 111 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Plymouth Harbor | 112 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Plymouth Harbor | 113 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Plymouth Harbor | 114 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Plymouth Harbor | 115 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Plymouth Harbor | 116 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Plymouth Harbor | 117 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Plymouth Harbor | 118 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 119 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 120 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |

*Not calculated for this Flood Risk Project

## Table 16: Coastal Transect Parameters

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cape Cod Bay | 121 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 122 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 123 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 124 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 125 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 126 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 127 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 128 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 129 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 130 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 131 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 132 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 133 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 134 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 135 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |

*Not calculated for this Flood Risk Project

## Table 16: Coastal Transect Parameters

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
| Cape Cod Bay | 136 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 137 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 138 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 139 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 140 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 141 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 142 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 143 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 144 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Cape Cod Bay | 145 | * | * | 8.3 | * | 9.1 | 9.5 | 10.3 |
| Buzzards Bay | 146 | 18.7 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 147 | 21.89 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 148 | 21.04 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 149 | 18.97 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 150 | 20.44 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |

*Not calculated for this Flood Risk Project

## Table 16: Coastal Transect Parameters

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
| Buzzards Bay | 151 | 17.7 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 152 | 17.34 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 153 | 18.11 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 154 | 19.08 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 155 | 21.64 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 156 | 20.24 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 157 | 22.3 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 158 | 21.51 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 159 | 22.3 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 160 | 22.21 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 161 | 19.13 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 162 | 24.93 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 163 | 21.96 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 164 | 21.37 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 165 | 21.37 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |

*Not calculated for this Flood Risk Project

**Table 16: Coastal Transect Parameters**

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
| Buzzards Bay | 166 | 21.37 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 167 | 20.57 | * | 7.8 | * | 11.8 | 13.7 | 17.7 |
| Buzzards Bay | 168 | 20.98 | * | 7.8 | * | 11.7 | 13.6 | 17.6 |
| Buzzards Bay | 169 | 21.34 | * | 7.6 | * | 11.6 | 13.5 | 17.6 |
| Buzzards Bay | 170 | 20.79 | * | 7.6 | * | 11.6 | 13.5 | 17.6 |
| Buzzards Bay | 171 | 20.91 | * | 7.6 | * | 11.6 | 13.5 | 17.6 |
| Buzzards Bay | 172 | 21.06 | * | 7.6 | * | 11.6 | 13.5 | 17.6 |
| Buzzards Bay | 173 | 22.1 | * | 7.6 | * | 11.5 | 13.3 | 17.3 |
| Buzzards Bay | 174 | 23.41 | * | 7.6 | * | 11.5 | 13.3 | 17.3 |
| Buzzards Bay | 175 | 21.53 | * | 7.6 | * | 11.5 | 13.3 | 17.3 |
| Buzzards Bay | 176 | 22.67 | * | 7.6 | * | 11.5 | 13.3 | 17.3 |
| Buzzards Bay | 177 | 21.82 | * | 7.6 | * | 11.5 | 13.3 | 17.3 |
| Buzzards Bay | 178 | 21.09 | * | 7.6 | * | 11.5 | 13.3 | 17.3 |
| Buzzards Bay | 179 | 21.09 | * | 7.6 | * | 11.5 | 13.3 | 17.3 |
| Buzzards Bay | 180 | 20.72 | * | 7.6 | * | 11.5 | 13.3 | 17.3 |

*Not calculated for this Flood Risk Project

**Table 16: Coastal Transect Parameters**

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
|---|---|---|---|---|---|---|---|---|
| Buzzards Bay | 181 | 21.3 | * | 7.6 | * | 11.7 | 13.2 | 17.1 |
| Buzzards Bay | 182 | 21.07 | * | 7.6 | * | 11.7 | 13.2 | 17.1 |
| Buzzards Bay | 183 | 21.05 | * | 7.6 | * | 11.4 | 13.21 | 17.1 |
| Buzzards Bay | 184 | 20.7 | * | 7.6 | * | 11.4 | 13.21 | 17.1 |
| Buzzards Bay | 185 | 20.67 | * | 7.6 | * | 11.4 | 13.21 | 17.1 |
| Buzzards Bay | 186 | 21.79 | * | 7.6 | * | 11.4 | 13.21 | 17.1 |
| Buzzards Bay | 187 | 20.77 | * | 7.5 | * | 11.3 | 13.2 | 17.1 |
| Buzzards Bay | 188 | 20.81 | * | 7.5 | * | 11.3 | 13.2 | 17.1 |
| Buzzards Bay | 189 | 20.95 | * | 7.5 | * | 11.3 | 13.2 | 17.1 |
| Buzzards Bay | 190 | 20.03 | * | 7.4 | * | 11.1 | 12.9 | 16.7 |
| Buzzards Bay | 191 | 20.96 | * | 7.4 | * | 11.1 | 12.9 | 16.7 |
| Buzzards Bay | 192 | 20.79 | * | 7.4 | * | 11.1 | 12.9 | 16.7 |
| Buzzards Bay | 193 | 20.67 | * | 7.4 | * | 11.1 | 12.9 | 16.7 |
| Buzzards Bay | 194 | 20.96 | * | 7.3 | * | 11.1 | 12.8 | 16.7 |
| Buzzards Bay | 195 | 20.39 | * | 7.3 | * | 11.1 | 12.8 | 16.7 |

*Not calculated for this Flood Risk Project

**Table 16: Coastal Transect Parameters**

| Flood Source | Coastal Transect | Starting Wave Conditions for the 1% Annual Chance | | Starting Stillwater Elevations (ft NAVD88) Range of Stillwater Elevations (ft NAVD88) | | | | |
| | | Significant Wave Height $H_s$ (ft) | Peak Wave Period $T_p$ (sec) | 10% Annual Chance | 4% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
|---|---|---|---|---|---|---|---|---|
| Buzzards Bay | 196 | 20.17 | * | 7.1 | * | 10.7 | 12.5 | 16.2 |
| Buzzards Bay | 197 | 20.1 | * | 7.1 | * | 10.7 | 12.5 | 16.2 |
| Buzzards Bay | 198 | 20.1 | * | 7.1 | * | 10.7 | 12.5 | 16.2 |
| Buzzards Bay | 199 | 20.45 | * | 7.1 | * | 10.7 | 12.5 | 16.2 |
| Buzzards Bay | 200 | 18.98 | * | 7.1 | * | 10.7 | 12.5 | 16.2 |

*Not calculated for this Flood Risk Project

**Figure 9: Transect Location Map**



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## 5.4 Alluvial Fan Analyses

This section is not applicable to this Flood Risk Project.

**Table 17: Summary of Alluvial Fan Analyses**

[Not Applicable to this Flood Risk Project]

**Table 18: Results of Alluvial Fan Analyses**

[Not Applicable to this Flood Risk Project]

## SECTION 6.0 – MAPPING METHODS

### 6.1 Vertical and Horizontal Control

All FIS Reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS Reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the completion of the North American Vertical Datum of 1988 (NAVD88), many FIS Reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS Report and on the FIRMs are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between NGVD29 and NAVD88 or other datum conversion, visit the National Geodetic Survey website at www.ngs.noaa.gov.

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the archived project documentation associated with the FIS Report and the FIRMs for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks in the area, please visit the NGS website at www.ngs.noaa.gov.

The datum conversion locations and values that were calculated for Plymouth County in the 2012 FIS are provided in Table 19.

**Table 19: Countywide Vertical Datum Conversion**

| Quadrangle Name | Quadrangle Corner | Latitude | Longitude | Conversion from NGVD29 to NAVD88 (feet) |
|---|---|---|---|---|
| All in Plymouth County | - | - | - | -0.8 |
| Average Conversion from NGVD29 to NAVD88 = -0.8 feet | | | | |

**Table 20: Stream-Based Vertical Datum Conversion**

[Not Applicable to this Flood Risk Project]

## 6.2 Base Map

The FIRMs and FIS Report for this project have been produced in a digital format. The flood hazard information was converted to a Geographic Information System (GIS) format that meets FEMA's FIRM Database specifications and geographic information standards. This information is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community. The FIRM Database includes most of the tabular information contained in the FIS Report in such a way that the data can be associated with pertinent spatial features. For example, the information contained in the Floodway Data table and Flood Profiles can be linked to the cross sections that are shown on the FIRMs. Additional information about the FIRM Database and its contents can be found in FEMA's *Guidelines and Standards for Flood Risk Analysis and Mapping*, www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping.

Base map information shown on the FIRM was derived from the sources described in Table 21.

**Table 21: Base Map Sources**

| Data Type | Data Provider | Data Date | Data Scale | Data Description |
|---|---|---|---|---|
| Digital orthophoto | MassGIS | 2005 | 1:5,000 | Orthoimagery for all FIRMs dated July 17, 2012 (MassGIS 2005) |
| Digital orthophoto | USGS | 2013 | 1:2,400 | Orthoimagery for all FIRMs dated July 16, 2015 |
| Digital orthophoto | MassGIS | 2008 | 30-cm resolution | Orthoimagery for all FIRMs dated November 4, 2016 |
| Digital orthophoto | USGS | 2014 | 0.3-m resolution | Orthoimagery for certain FIRMs dated July 22, 2020 in the southern portion of Plymouth County (USGS 2014b) |

**Table 21: Base Map Sources**

| Data Type | Data Provider | Data Date | Data Scale | Data Description |
|---|---|---|---|---|
| Digital orthophoto | USGS | 2013 | 0.3-m resolution | Orthoimagery for certain FIRMs dated July 22, 2020 in the northern portion of Plymouth County (USGS 2013) |
| Political boundaries | MassGIS | - | - | Municipal and county boundaries |
| Transportation features | MassGIS | - | - | Roads and railroads derived from orthophotography for all FIRMs dated July 17, 2012; July 16, 2015; or November 4, 2016 |
| Transportation features | USCB | 2016 | - | Roads and railroads for all FIRMs dated July 22, 2020 (USCB 2016) |
| Surface water features | MassGIS | - | - | Streams, rivers, and lakes derived from orthophotography for all FIRMs dated July 17, 2012; July 16, 2015; or November 4, 2016 |

### 6.3   Floodplain and Floodway Delineation

The FIRM shows tints, screens, and symbols to indicate floodplains and floodways as well as the locations of selected cross sections used in the hydraulic analyses and floodway computations.

For riverine flooding sources, the mapped floodplain boundaries shown on the FIRM have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 22. For each coastal flooding source studied as part of this FIS Report, the mapped floodplain boundaries on the FIRM have been delineated using the flood and wave elevations determined at each transect; between transects, boundaries were delineated using land use and land cover data, the topographic elevation data described in Table 22, and knowledge of coastal flood processes. In ponding areas, flood elevations were determined at each junction of the model; between junctions, boundaries were interpolated using the topographic elevation data described in Table 22.

In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

The floodway widths presented in this FIS Report and on the FIRM were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. Table 2 indicates the flooding sources for which floodways have been determined. The results of the floodway

computations for those flooding sources have been tabulated for selected cross sections and are shown in Table 23, "Floodway Data."

**Table 22: Summary of Topographic Elevation Data used in Mapping**

| Community | Flooding Source | Source for Topographic Elevation Data | | | |
| --- | --- | --- | --- | --- | --- |
| | | Description | Vertical Accuracy | Horizontal Accuracy | Citation |
| Duxbury, Town of; Kingston, Town of; Marion, Town of; Marshfield, Town of; Mattapoisett, Town of; Norwell, Town of; Plymouth, Town of; Rochester, Town of; Scituate, Town of; Wareham, Town of | All sources in lidar project area (mostly near the coast) studied or redelineated in 2020 Cape Cod Watershed revision | Lidar | 5.0 cm | N/A | USGS 2014a |
| Abington, Town of; Carver, Town of; Duxbury, Town of; Halifax, Town of; Hanover, Town of; Hanson, Town of; Hingham, Town of; Marion, Town of; Marshfield, Town of; Mattapoisett, Town of; Middleborough, Town of; Norwell, Town of; Pembroke, Town of; Plymouth, Town of; Plympton, Town of; Rochester, Town of; Rockland, Town of; Scituate, Town of; Wareham, Town of | All sources in lidar project area (mostly inland) studied or redelineated in 2020 Cape Cod Watershed revision | Lidar | 8.5 cm | N/A | USGS 2011 |
| Bridgewater, Town of; Halifax, Town of; Lakeville, Town of; Middleborough, Town of | Assawompset Pond, Great Quitticas Pond, Long Pond, Nemasket River, Pocksha Pond, Taunton River, and all reaches in lidar project area redelineated in 2015 Narragansett Watershed revision | Lidar | 7.1 cm | N/A | USGS 2011 |

**Table 22: Summary of Topographic Elevation Data used in Mapping**

| Community | Flooding Source | Source for Topographic Elevation Data | | | |
|---|---|---|---|---|---|
| | | Description | Vertical Accuracy | Horizontal Accuracy | Citation |
| Duxbury, Town of; Kingston, Town of; Marshfield, Town of; Plymouth, Town of; Scituate, Town of | All coastal flooding sources | Lidar | 2 ft | N/A | Photo Science 2010 |
| Hingham, Town of; Hull, Town of; Marion, Town of; Mattapoisett, Town of; Wareham, Town of | All coastal flooding sources | Lidar | 2 ft | N/A | Sanborn 2006 |
| Hanson, Town of | Certain flooding sources not revised or redelineated since pre-countywide study | Topographic maps | 10 ft | 1:4,800 | Sewall 1984 |
| Hingham, Town of; Kingston, Town of | Flooding sources studied with detailed methods and not revised or redelineated since pre-countywide study | Topographic maps | 5 ft | 1:4,800 | Avis 1979 |
| Whitman, Town of | Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study | Previous studies | * | * | FEMA 1978 |
| West Bridgewater, Town of | Certain flooding sources not revised or redelineated since pre-countywide study | Previous studies | * | * | FEMA 1976 |
| Whitman, Town of | Flooding sources studied with detailed methods and not revised or redelineated since pre-countywide study | Topographic maps | 5 ft | 1:4,800 | Teledyne 1976 |
| Abington, Town of | Flooding sources studied with detailed methods and not revised or redelineated since pre-countywide study | Topographic maps | 5 ft | 1:2,400 | CDM 1975 |

*Data not available

**Table 22: Summary of Topographic Elevation Data used in Mapping**

| Community | Flooding Source | Source for Topographic Elevation Data | | | |
| --- | --- | --- | --- | --- | --- |
| | | Description | Vertical Accuracy | Horizontal Accuracy | Citation |
| Hingham, Town of | Certain flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study | Topographic maps | 10 ft | 1:7,200 | Perkins 1975 |
| Norwell, Town of | Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study | Previous studies | * | * | FEMA 1975 |
| Halifax, Town of | Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study | Previous studies | * | * | FEMA 1974a |
| Rockland, Town of | Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study | Previous studies | * | * | FEMA 1974b |
| Abington, Town of | Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study | Topographic maps | 10 ft | 1:24,000 | USGS various |
| Bridgewater, Town of | Certain flooding sources not revised or redelineated since pre-countywide study | Topographic maps | 10 ft | 1:25,000 | USGS various |
| Bridgewater, Town of; West Bridgewater, Town of | Certain flooding sources not revised or redelineated since pre-countywide study | Topographic maps | 10 ft | 1:24,000 | USGS various |
| Brockton, City of | Flooding sources not revised or redelineated since pre-countywide study | Topographic maps | 10 ft | 1:24,000 | USGS various |

*Data not available

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**Table 22: Summary of Topographic Elevation Data used in Mapping**

| Community | Flooding Source | Source for Topographic Elevation Data | | | |
|---|---|---|---|---|---|
| | | Description | Vertical Accuracy | Horizontal Accuracy | Citation |
| Carver, Town of | Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study | Topographic maps | 10 ft | 1:25,000 | USGS various |
| East Bridgewater, Town of; Lakeville, Town of; Middleborough, Town of | Flooding sources not revised or redelineated since pre-countywide study | Topographic maps | 10 ft | 1:24,000 | USGS various |
| Halifax, Town of; Plympton, Town of | Flooding sources studied with detailed methods and not revised or redelineated since pre-countywide study | Topographic maps | 5 ft | 1:4,800 | Col-East various |
| Hanson, Town of | Certain flooding sources not revised or redelineated since pre-countywide study | Topographic maps | 5 ft | 1:4,800 | Col-East various |
| Hingham, Town of | Certain flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study | Topographic maps | 10 ft | 1:24,000 | * |
| Plympton, Town of | Flooding sources studied with approximate methods and not revised or redelineated since pre-countywide study | Topographic maps | 10 ft | 1:24,000 | USGS various |

*Data not available

BFEs shown at cross sections on the FIRM represent the 1% annual chance water surface elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations.

**Table 23: Floodway Data**

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 16,178 | 128 | 437 | 0.6 | 107.5 | 107.5 | 108.4 | 0.9 |
| B | 16,284 | 100 | 428 | 0.6 | 107.5 | 107.5 | 108.5 | 1.0 |
| C | 17,234 | 188 | 929 | 0.3 | 107.5 | 107.5 | 108.5 | 1.0 |
| D | 18,290 | 9 | 48 | 5.3 | 112.6 | 112.6 | 112.6 | 0.0 |
| E | 18,396 | 87 | 334 | 0.8 | 113.1 | 113.1 | 113.1 | 0.0 |
| F | 19,314 | 128 | 541 | 0.5 | 113.2 | 113.2 | 113.3 | 0.1 |
| G | 20,164 | 405 | 1,733 | 0.1 | 113.2 | 113.2 | 113.4 | 0.2 |
| H | 21,738 | 206 | 703 | 0.4 | 113.2 | 113.2 | 113.4 | 0.2 |
| I | 22,857 | 39 | 56 | 4.5 | 113.7 | 113.7 | 114.6 | 0.9 |
| J | 23,681 | 128 | 338 | 0.8 | 116.0 | 116.0 | 117.0 | 1.0 |
| K | 24,980 | 16 | 39 | 6.6 | 118.6 | 118.6 | 118.9 | 0.3 |
| L | 26,337 | 92 | 382 | 0.7 | 124.4 | 124.4 | 124.5 | 0.1 |
| M | 26,437 | 56 | 185 | 1.4 | 124.4 | 124.4 | 124.5 | 0.1 |

[1]Feet above confluence with Plymouth River

| | FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
|---|---|---|
| TABLE 23 | **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODING SOURCE: ACCORD BROOK** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 0 | 38 | 326 | 2.4 | 63.9 | 63.9 | 64.9 | 1.0 |
| B | 800 | 33 | 174 | 5.8 | 68.9 | 68.9 | 69.9 | 1.0 |
| C | 3,520 | 200 | 912 | 1.1 | 73.2 | 73.2 | 47.2 | 1.0 |
| D | 4,800 | 34 | 288 | 3.1 | 77.6 | 77.6 | 78.6 | 1.0 |
| E | 6,320 | 40 | 67 | 7.3 | 88.4 | 88.4 | 88.7 | 0.3 |
| F | 8,080 | 71 | 704 | 2.1 | 93.6 | 93.6 | 94.6 | 1.0 |

[1]Feet above Elm Street

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** **FLOODING SOURCE: BEAVER BROOK** |
|---|---|---|

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 2,950 | 240 | 901 | 1.5 | * | 9.9 | 10.9 | 1.0 |
| B | 4,250 | 37 | 185 | 7.2 | 13.4 | 13.4 | 13.4 | 0.0 |
| C | 4,350 | 250 | 1,620 | 0.8 | 15.0 | 15.0 | 15.9 | 0.9 |
| D | 5,000 | 490 | 3,127 | 0.4 | 15.1 | 15.1 | 16.0 | 0.9 |
| E | 5,900 | 21 | 230 | 4.6 | 18.0 | 18.0 | 18.4 | 0.4 |
| F | 6,000 | 72 | 695 | 1.5 | 18.6 | 18.6 | 19.1 | 0.5 |
| G | 7,100 | 162 | 1,328 | 0.8 | 18.9 | 18.9 | 19.5 | 0.6 |
| H | 8,600 | 384 | 3,578 | 0.3 | 18.9 | 18.9 | 19.5 | 0.6 |

[1]Feet above confluence with Cape Cod Bay

*Controlled by coastal flooding – see Flood Insurance Rate Map for regulatory base flood elevation

TABLE 23

| FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
|---|---|
| **PLYMOUTH COUNTY, MASSACHUSETTS** | |
| **(ALL JURISDICTIONS)** | **FLOODING SOURCE: BEAVER DAM BROOK** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 1,400 | 108 | 221 | 0.5 | 90.4 | 88.3[2] | 89.3 | 1.0 |
| B | 2,040 | 38 | 17 | 2.9 | 90.4 | 90.0[2] | 90.1 | 0.1 |
| C | 3,580 | 10 | 25 | 2.0 | 97.8 | 97.8 | 98.0 | 0.2 |
| D | 4,620 | 13 | 22 | 2.3 | 100.5 | 100.5 | 100.6 | 0.1 |

[1]Feet above confluence with West Meadow Brook
[2]Elevation computed without consideration of backwater effects from West Meadow Brook

TABLE 23

**FEDERAL EMERGENCY MANAGEMENT AGENCY**

**PLYMOUTH COUNTY, MASSACHUSETTS**

**(ALL JURISDICTIONS)**

**FLOODWAY DATA**

**FLOODING SOURCE: BLACK BETTY BROOK**

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | -510 | 20 | 119 | 2.3 | 53.6 | 53.6 | 54.6 | 1.0 |
| B | -502 | 18 | 64 | 3.3 | 55.5 | 55.5 | 56.2 | 0.7 |
| C | 1,150 | 70 | 181 | 1.6 | 57.8 | 57.8 | 58.8 | 1.0 |

[1]Feet above Central Street

| | FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
|---|---|---|
| TABLE 23 | **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODING SOURCE: BLACK BROOK** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 50 | 19 | 64 | 4.1 | 37.6 | 37.6 | 38.4 | 0.8 |
| B | 600 | 20 | 48 | 5.5 | 41.2 | 41.2 | 41.2 | 0.0 |
| C | 1,090 | 20 | 55 | 4.7 | 43.8 | 43.8 | 44.4 | 0.6 |
| D | 1,440 | 15 | 38 | 6.9 | 48.2 | 48.2 | 48.6 | 0.4 |
| E | 1,650 | 60 | 128 | 2.0 | 50.9 | 50.9 | 51.9 | 1.0 |
| F | 1,960 | 25 | 57 | 4.6 | 52.7 | 52.7 | 52.8 | 0.1 |
| G | 2,100 | 15 | 37 | 5.7 | 52.9 | 52.9 | 53.2 | 0.3 |
| H | 2,800 | 27 | 67 | 3.1 | 56.3 | 56.3 | 56.7 | 0.4 |
| I | 3,370 | 15 | 39 | 5.3 | 58.3 | 58.3 | 58.9 | 0.6 |
| J | 3,440 | 15 | 27 | 7.7 | 59.9 | 59.9 | 60.1 | 0.2 |
| K | 4,270 | 16 | 55 | 3.8 | 65.4 | 65.4 | 66.3 | 0.9 |
| L | 4,720 | 16 | 49 | 4.3 | 67.1 | 67.1 | 67.9 | 0.8 |
| M | 5,200 | 16 | 59 | 3.6 | 68.6 | 68.6 | 69.6 | 1.0 |
| N | 6,000 | 40 | 80 | 1.9 | 72.1 | 72.1 | 72.5 | 0.4 |
| O | 6,310 | 23 | 28 | 5.3 | 75.3 | 75.3 | 75.3 | 0.0 |

[1]Feet above confluence with Second Herring Brook

TABLE 23

**FEDERAL EMERGENCY MANAGEMENT AGENCY**

**PLYMOUTH COUNTY, MASSACHUSETTS**

**(ALL JURISDICTIONS)**

**FLOODWAY DATA**

**FLOODING SOURCE: BLACK POND BROOK**

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 10 | 95 | 617 | 1.4 | 14.2 | 14.2 | 15.2 | 1.0 |
| B | 110 | 200 | 1,557 | 0.6 | 14.3 | 14.3 | 15.3 | 1.0 |
| C | 710 | 100 | 550 | 1.6 | 14.4 | 14.4 | 15.4 | 1.0 |
| D | 1,410 | 140 | 534 | 1.6 | 16.7 | 16.7 | 17.1 | 0.4 |
| E | 1,500 | 147 | 565 | 1.6 | 18.3 | 18.3 | 18.7 | 0.4 |
| F | 1,850 | 77 | 510 | 1.7 | 18.3 | 18.3 | 18.8 | 0.5 |
| G | 1,950 | 242 | 1,788 | 0.5 | 19.2 | 19.2 | 19.4 | 0.2 |
| H | 2,850 | 90 | 145 | 6.1 | 23.0 | 23.0 | 23.0 | 0.0 |
| I | 4,450 | 273 | 1,436 | 0.5 | 29.4 | 29.4 | 30.1 | 0.7 |
| J | 5,450 | 349 | 898 | 0.7 | 30.2 | 30.2 | 30.2 | 0.0 |
| K | 6,000 | 180 | 347 | 1.9 | 30.6 | 30.6 | 30.8 | 0.2 |

[1]Feet above Mordecai Lincoln Road

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** *FLOODING SOURCE: BOUND BROOK* |
|---|---|---|

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 600 | 116 | 396 | 2.7 | * | 9.2[2] | 10.2 | 1.0 |
| B | 1,265 | 101 | 298 | 3.6 | 16.7 | 16.7 | 16.7 | 0.0 |
| C | 1,380 | 340 | 2,495 | 0.4 | 17.9 | 17.9 | 18.4 | 0.5 |
| D | 1,980 | 506 | 4,642 | 0.2 | 17.9 | 17.9 | 18.4 | 0.5 |
| E | 2,695 | 16 | 134 | 7.9 | 18.5 | 18.5 | 19.4 | 0.9 |
| F | 2,810 | 223 | 1,868 | 0.6 | 19.8 | 19.8 | 20.4 | 0.6 |

[1]Feet above confluence with Eel River
[2]Elevation computed without consideration of backwater effects from Eel River
*Controlled by coastal flooding – see Flood Insurance Rate Map for regulatory base flood elevation

TABLE 23

**FEDERAL EMERGENCY MANAGEMENT AGENCY**

**PLYMOUTH COUNTY, MASSACHUSETTS**

**(ALL JURISDICTIONS)**

**FLOODWAY DATA**

**FLOODING SOURCE: BRANCH OF EEL RIVER**

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 1,515 | 100 | 116 | 4.4 | 66.6 | 64.1[2] | 64.1 | 0.0 |
| B | 4,275 | 40 | 181 | 2.8 | 67.2 | 67.2 | 67.6 | 0.4 |
| C | 6,078 | 85 | 297 | 1.7 | 67.7 | 67.7 | 68.3 | 0.6 |

[1]Feet above confluence with Weweantic River
[2]Elevation computed without consideration of backwater effects from Weweantic River

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
|---|---|---|
| | **PLYMOUTH COUNTY, MASSACHUSETTS** | |
| | **(ALL JURISDICTIONS)** | **FLOODING SOURCE: CRANE BROOK** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 0 | 34 | 235 | 1.9 | 28.4 | 28.4 | 28.8 | 0.4 |
| B | 100 | 44 | 351 | 1.3 | 28.5 | 28.5 | 28.9 | 0.4 |
| C | 1,500 | 35 | 224 | 1.6 | 28.5 | 28.5 | 29.0 | 0.5 |
| D | 2,640 | 9 | 60 | 6.0 | 31.2 | 31.2 | 31.2 | 0.0 |
| E | 2,777 | 16 | 124 | 2.9 | 31.8 | 31.8 | 31.8 | 0.0 |
| F | 3,775 | 13 | 118 | 3.1 | 31.9 | 31.9 | 32.7 | 0.8 |

[1]Feet above Free Street

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** |
|---|---|---|
| | | FLOODING SOURCE: CROOKED MEADOW BROOK |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 5,600 | 38 | 233 | 6.6 | 50.3 | 50.3 | 50.6 | 0.3 |
| B | 6,780 | 155 | 686 | 2.1 | 52.1 | 52.1 | 53.1 | 1.0 |
| C | 7,200 | 40 | 154 | 7.5 | 52.5 | 52.5 | 53.3 | 0.8 |
| D | 8,080 | 35 | 167 | 6.9 | 67.0 | 67.0 | 67.1 | 0.1 |
| E | 8,435 | 200 | 2,169 | 0.7 | 67.7 | 67.7 | 68.4 | 0.7 |
| F | 10,870 | 58 | 358 | 3.8 | 68.1 | 68.1 | 68.4 | 0.3 |
| G | 12,585 | 40 | 354 | 2.5 | 75.1 | 75.1 | 75.6 | 0.5 |
| H | 13,660 | 50 | 464 | 1.9 | 75.1 | 75.1 | 75.8 | 0.7 |
| I | 14,880 | 30 | 248 | 2.3 | 76.2 | 76.2 | 76.3 | 0.1 |
| J | 15,570 | 40 | 284 | 2.3 | 76.2 | 76.2 | 76.5 | 0.3 |
| K | 17,030 | 200 | 783 | 0.7 | 76.2 | 76.2 | 76.9 | 0.7 |
| L | 18,430 | 250 | 1,014 | 0.6 | 76.4 | 76.4 | 77.1 | 0.7 |
| M | 19,430 | 55 | 146 | 2.3 | 76.4 | 76.4 | 77.1 | 0.7 |
| N | 20,540 | 160 | 620 | 0.5 | 79.7 | 79.7 | 80.4 | 0.7 |

[1]Feet above confluence with Indian Head River

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** **FLOODING SOURCE: DRINKWATER RIVER** |
|---|---|---|

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 100 | 27 | 125 | 2.5 | 52.5 | 52.5 | 53.5 | 1.0 |
| B | 430 | 27 | 115 | 2.7 | 53.1 | 53.1 | 53.8 | 0.7 |
| C | 535 | 27 | 119 | 2.7 | 53.2 | 53.2 | 54.0 | 0.8 |
| D | 1,150 | 45 | 260 | 1.2 | 53.6 | 53.6 | 54.3 | 0.7 |
| E | 1,252 | 30 | 112 | 2.8 | 54.2 | 54.2 | 54.6 | 0.4 |
| F | 1,950 | 45 | 277 | 1.1 | 54.3 | 54.3 | 54.7 | 0.4 |
| G | 2,064 | 32 | 210 | 1.5 | 54.4 | 54.4 | 54.8 | 0.4 |
| H | 3,130 | 150 | 118 | 2.7 | 54.5 | 54.5 | 55.2 | 0.7 |
| I | 3,200 | 200 | 214 | 1.5 | 54.7 | 54.7 | 55.3 | 0.6 |
| J | 3,670 | 20 | 123 | 2.6 | 55.2 | 55.2 | 56.0 | 0.8 |
| K | 4,220 | 6 | 26 | 12.3 | 60.0 | 60.0 | 60.0 | 0.0 |
| L | 4,291 | 16 | 112 | 2.8 | 67.7 | 67.6 | 67.6 | 0.0 |

[1]Feet above confluence with Drinkwater River

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** |
|---|---|---|
| | | **FLOODING SOURCE: DRINKWATER RIVER TRIBUTARY** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 201 | 28 | 99 | 1.1 | 48.8 | 48.8 | 49.8 | 1.0 |
| B | 919 | 5 | 14 | 7.8 | 49.8 | 49.8 | 50.0 | 0.2 |
| C | 966 | 49 | 137 | 0.8 | 51.1 | 51.1 | 51.2 | 0.1 |
| D | 1,668 | 78 | 229 | 0.5 | 51.2 | 51.2 | 51.4 | 0.2 |
| E | 2,988 | 5 | 16 | 7.2 | 55.1 | 55.1 | 55.1 | 0.0 |
| F | 3,105 | 26 | 104 | 1.1 | 56.0 | 56.0 | 56.0 | 0.0 |
| G | 3,844 | 76 | 160 | 0.7 | 56.1 | 56.1 | 56.2 | 0.1 |
| H | 4,784 | 6 | 22 | 5.2 | 74.4 | 74.4 | 74.4 | 0.0 |
| I | 4,932 | 9 | 15 | 7.4 | 75.1 | 75.1 | 75.1 | 0.0 |
| J | 5,349 | 49 | 255 | 0.4 | 98.8 | 98.8 | 98.8 | 0.0 |
| K | 5,475 | 23 | 101 | 1.1 | 98.8 | 98.8 | 98.8 | 0.0 |
| L | 5,993 | 77 | 239 | 0.5 | 98.9 | 98.9 | 99.0 | 0.1 |

[1]Feet above confluence with Plymouth River

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** |
|---|---|---|
| | | **FLOODING SOURCE: EEL RIVER (TOWN OF HINGHAM)** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 9,700 | 47 | 160 | 2.9 | * | 8.0[2] | 9.0 | 1.0 |
| B | 9,960 | 30 | 102 | 4.5 | * | 9.6[2] | 10.0 | 0.4 |
| C | 10,060 | 12 | 43 | 10.8 | 10.3 | 10.3 | 10.3 | 0.0 |
| D | 10,160 | 96 | 487 | 1.0 | 12.3 | 12.3 | 12.3 | 0.0 |
| E | 10,400 | 53 | 239 | 1.9 | 12.4 | 12.4 | 12.5 | 0.1 |
| F | 10,700 | 49 | 187 | 2.5 | 12.6 | 12.6 | 12.8 | 0.2 |
| G | 10,830 | 190 | 332 | 1.4 | 24.8 | 24.8 | 24.8 | 0.0 |
| H | 10,940 | 316 | 1,579 | 0.3 | 25.0 | 25.0 | 25.0 | 0.0 |
| I | 11,800 | 330 | 1,631 | 0.3 | 25.0 | 25.0 | 25.0 | 0.0 |
| J | 12,700 | 234 | 492 | 0.9 | 25.0 | 25.0 | 25.0 | 0.0 |
| K | 12,810 | 20 | 82 | 5.7 | 25.0 | 25.0 | 25.1 | 0.1 |
| L | 12,950 | 19 | 96 | 4.8 | 25.8 | 25.8 | 25.9 | 0.1 |
| M | 13,200 | 104 | 377 | 1.2 | 26.4 | 26.4 | 26.6 | 0.2 |
| N | 13,800 | 37 | 62 | 7.5 | 26.9 | 26.9 | 27.2 | 0.3 |
| O | 13,920 | 10 | 41 | 11.4 | 29.2 | 29.2 | 29.2 | 0.0 |
| P | 14,000 | 29 | 57 | 8.1 | 33.6 | 33.6 | 33.6 | 0.0 |
| Q | 14,110 | 7 | 57 | 8.2 | 56.7 | 56.7 | 56.7 | 0.0 |
| R | 14,220 | 366 | 2,061 | 0.2 | 57.4 | 57.4 | 57.4 | 0.0 |

[1]Feet above confluence with Plymouth Harbor
[2]Elevation computed without consideration of backwater effects from Plymouth Harbor
*Controlled by coastal flooding – see Flood Insurance Rate Map for regulatory base flood elevation

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
|---|---|---|
| | **PLYMOUTH COUNTY, MASSACHUSETTS** | |
| | **(ALL JURISDICTIONS)** | **FLOODING SOURCE: EEL RIVER (TOWN OF PLYMOUTH)** |

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| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 575 | 232 | 871 | 0.7 | 17.2 | 17.2 | 17.3 | 0.1 |
| B | 1,420 | 370 | 1,163 | 0.5 | 17.5 | 17.5 | 17.6 | 0.1 |
| C | 2,420 | 123 | 445 | 1.4 | 17.6 | 17.6 | 17.8 | 0.2 |
| D | 3,420 | 50 | 88 | 6.9 | 24.3 | 24.3 | 24.3 | 0.0 |
| E | 4,430 | 41 | 639 | 0.7 | 41.8 | 41.8 | 41.8 | 0.0 |
| F | 5,530 | 770 | 7,845 | 0.1 | 41.8 | 41.8 | 41.8 | 0.0 |
| G | 6,730 | 10 | 80 | 4.5 | 41.8 | 41.8 | 41.8 | 0.0 |
| H | 7,920 | 280 | 821 | 0.4 | 44.0 | 44.0 | 44.0 | 0.0 |
| I | 8,920 | 30 | 49 | 7.3 | 44.0 | 44.0 | 44.5 | 0.5 |
| J | 9,920 | 120 | 311 | 1.2 | 48.8 | 48.8 | 49.5 | 0.7 |
| K | 10,920 | 197 | 409 | 0.9 | 50.0 | 50.0 | 50.8 | 0.8 |
| L | 12,020 | 33 | 126 | 1.9 | 57.3 | 57.3 | 57.9 | 0.6 |
| M | 12,890 | 14 | 57 | 4.3 | 62.7 | 62.7 | 63.6 | 0.9 |
| N | 14,000 | 164 | 470 | 0.5 | 65.2 | 65.2 | 65.8 | 0.6 |
| O | 15,000 | 145 | 407 | 0.6 | 65.4 | 65.4 | 66.2 | 0.8 |
| P | 15,800 | 94 | 261 | 0.9 | 65.7 | 65.7 | 66.7 | 1.0 |

[1]Feet above New Driftway

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
|---|---|---|
| | **PLYMOUTH COUNTY, MASSACHUSETTS** | |
| | **(ALL JURISDICTIONS)** | **FLOODING SOURCE: FIRST HERRING BROOK** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 640 | 80 | 240 | 2.9 | 68.4 | 68.4 | 68.9 | 0.5 |
| B | 1,800 | 90 | 282 | 2.5 | 69.4 | 69.4 | 69.9 | 0.5 |
| C | 2,550 | 90 | 286 | 2.4 | 70.1 | 70.1 | 70.9 | 0.8 |
| D | 4,400 | 430 | 1,370 | 0.5 | 70.8 | 70.8 | 71.8 | 1.0 |
| E | 5,310 | 401 | 1,199 | 0.5 | 70.9 | 70.9 | 71.9 | 1.0 |
| F | 6,750 | 230 | 698 | 0.7 | 71.1 | 71.1 | 72.1 | 1.0 |
| G | 8,420 | * | 137 | 3.8 | 72.8 | 72.8 | 73.4 | 0.6 |
| H | 10,425 | * | 124 | 3.5 | 79.5 | 79.5 | 80.0 | 0.5 |
| I | 12,540 | * | 122 | 3.5 | 84.4 | 84.4 | 84.8 | 0.4 |
| J | 13,760 | * | 101 | 4.3 | 86.2 | 86.2 | 86.9 | 0.7 |
| K | 14,800 | * | 94 | 4.6 | 89.5 | 89.5 | 89.5 | 0.0 |
| L | 17,690 | * | 191 | 1.9 | 101.5 | 101.5 | 101.5 | 0.0 |
| M | 18,420 | * | 212 | 1.7 | 102.5 | 102.5 | 102.6 | 0.1 |
| N | 18,880 | 50 | 154 | 2.3 | 102.5 | 102.5 | 102.7 | 0.2 |
| O | 19,300 | * | 78 | 4.6 | 103.4 | 103.4 | 103.5 | 0.1 |
| P | 21,630 | * | 40 | 9.0 | 108.3 | 108.3 | 108.3 | 0.0 |
| Q | 22,740 | * | 87 | 4.2 | 115.2 | 115.2 | 115.4 | 0.2 |
| R | 23,480 | 100 | 411 | 0.9 | 118.5 | 118.5 | 118.5 | 0.0 |

[1]Feet above confluence with Drinkwater River
*Floodway coincident with channel banks

TABLE 23

| FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
|---|---|
| **PLYMOUTH COUNTY, MASSACHUSETTS** | |
| **(ALL JURISDICTIONS)** | **FLOODING SOURCE: FRENCH STREAM** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 16 | * | 32 | 8.3 | 18.8 | 18.8 | 18.8 | 0.0 |
| B | 100 | 149 | 1,084 | 0.2 | 20.0 | 20.0 | 20.0 | 0.0 |
| C | 301 | 26 | 122 | 2.2 | 21.5 | 21.5 | 21.5 | 0.0 |
| D | 760 | 22 | 101 | 2.6 | 21.7 | 21.7 | 21.9 | 0.2 |
| E | 1,214 | 22 | 75 | 3.5 | 21.9 | 21.9 | 22.5 | 0.6 |
| F | 1,404 | * | 44 | 6.0 | 23.5 | 23.5 | 23.5 | 0.0 |
| G | 1,637 | * | 108 | 2.4 | 24.0 | 24.0 | 24.3 | 0.3 |
| H | 1,837 | 28 | 197 | 1.3 | 24.1 | 24.1 | 24.4 | 0.3 |
| I | 2,397 | 26 | 170 | 1.6 | 24.1 | 24.1 | 24.5 | 0.4 |
| J | 3,918 | 22 | 193 | 1.4 | 24.2 | 24.2 | 24.8 | 0.6 |
| K | 5,776 | 336 | 3,261 | 0.1 | 24.2 | 24.2 | 25.0 | 0.8 |
| L | 7,476 | 80 | 382 | 0.6 | 24.2 | 24.2 | 25.1 | 0.9 |
| M | 8,596 | 184 | 697 | 0.2 | 24.2 | 24.2 | 25.1 | 0.9 |
| N | 9,858 | 50 | 131 | 1.1 | 24.2 | 24.2 | 25.2 | 1.0 |
| O | 10,639 | 50 | 108 | 1.4 | 24.8 | 24.8 | 25.8 | 1.0 |
| P | 11,357 | 22 | 27 | 5.4 | 27.9 | 27.9 | 27.9 | 0.0 |
| Q | 11,558 | * | 19 | 7.8 | 31.5 | 31.5 | 31.5 | 0.0 |
| R | 11,648 | * | 28 | 5.1 | 32.9 | 32.9 | 33.2 | 0.3 |
| S | 12,038 | 400 | 1,695 | 0.1 | 41.4 | 41.4 | 41.4 | 0.0 |
| T | 14,277 | 120 | 145 | 0.9 | 41.4 | 41.4 | 41.4 | 0.0 |
| U | 15,159 | 80 | 119 | 1.1 | 42.6 | 42.6 | 43.6 | 1.0 |

[1]Feet above dam
*Floodway coincident with channel banks

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** |
|---|---|---|
| | | **FLOODING SOURCE: HALLS BROOK** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| V | 15,660 | 40 | 50 | 2.2 | 45.0 | 45.0 | 45.0 | 0.0 |
| W | 15,808 | 23 | 154 | 0.7 | 52.7 | 52.7 | 52.7 | 0.0 |
| X | 16,220 | * | 51 | 2.1 | 52.9 | 52.9 | 53.5 | 0.6 |
| Y | 16,421 | 435 | 1,530 | 0.1 | 52.9 | 52.9 | 53.6 | 0.7 |

[1]Feet above dam
*Floodway coincident with channel banks

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

**PLYMOUTH COUNTY, MASSACHUSETTS**

(ALL JURISDICTIONS)

**FLOODWAY DATA**

**FLOODING SOURCE: HALLS BROOK**

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 4,230 | * | 35 | 6.0 | 46.8 | 46.8 | 47.3 | 0.5 |

[1]Feet above Damons Point Road
*Floodway coincident with channel banks

TABLE 23

| FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** FLOODING SOURCE: HANNAH EAMES BROOK |
|---|---|

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 11,440 | 111 | 64 | 4.3 | 20.8 | 20.8 | 20.8 | 0.0 |
| B | 11,755 | 65 | 272 | 1.0 | 25.1 | 25.1 | 25.1 | 0.0 |
| C | 13,635 | 58 | 51 | 5.4 | 25.7 | 25.7 | 25.7 | 0.0 |
| D | 16,545 | 80 | 130 | 1.7 | 31.9 | 31.9 | 31.9 | 0.0 |
| E | 17,291 | 9 | 38 | 5.7 | 35.6 | 35.6 | 35.6 | 0.0 |
| F | 18,251 | 175 | 479 | 0.5 | 36.3 | 36.3 | 36.3 | 0.0 |
| G | 19,812 | 35 | 37 | 5.9 | 39.4 | 39.4 | 39.4 | 0.0 |

[1]Feet above confluence with North River

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** |
|---|---|---|
| | | **FLOODING SOURCE: HERRING BROOK** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | -3,115 | 1,643 | 9,444 | 0.1 | 62.6 | 62.6 | 63.6 | 1.0 |
| B | -1,765 | 1,383 | 6,072 | 0.2 | 62.6 | 62.6 | 63.6 | 1.0 |
| C | -90 | 1,590 | 5,685 | 0.2 | 62.6 | 62.6 | 63.6 | 1.0 |
| D | 1,490 | 1,500 | 4,804 | 0.2 | 63.3 | 63.3 | 63.7 | 0.4 |
| E | 2,910 | 1,200 | 3,096 | 0.3 | 63.4 | 63.4 | 63.7 | 0.3 |
| F | 4,350 | 900 | 2,389 | 0.4 | 63.5 | 63.5 | 63.8 | 0.3 |
| G | 5,880 | 600 | 1,641 | 0.6 | 63.5 | 63.5 | 63.9 | 0.4 |
| H | 7,306 | 567 | 781 | 1.2 | 63.7 | 63.7 | 64.5 | 0.8 |
| I | 8,170 | 300 | 1,081 | 0.9 | 66.7 | 66.7 | 66.8 | 0.1 |
| J | 10,144 | 100 | 456 | 2.1 | 66.8 | 66.8 | 67.3 | 0.5 |
| K | 11,480 | 100 | 407 | 2.3 | 68.1 | 68.1 | 68.9 | 0.8 |
| L | 15,015 | 100 | 367 | 2.6 | 70.8 | 70.8 | 71.8 | 1.0 |
| M | 17,520 | 100 | 471 | 1.9 | 74.2 | 74.2 | 74.6 | 0.4 |
| N | 19,233 | 100 | 471 | 1.9 | 74.3 | 74.3 | 75.3 | 1.0 |
| O | 22,271 | 100 | 395 | 2.2 | 75.8 | 75.8 | 76.7 | 0.9 |
| P | 24,000 | 100 | 384 | 2.3 | 77.0 | 77.0 | 78.0 | 1.0 |
| Q | 24,732 | 100 | 404 | 2.2 | 78.9 | 78.9 | 79.5 | 0.6 |

[1]Feet above Maple Street in West Bridgewater

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
|---|---|---|
| | **PLYMOUTH COUNTY, MASSACHUSETTS** | |
| | **(ALL JURISDICTIONS)** | **FLOODING SOURCE: HOCKOMOCK RIVER** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 250 | 78 | 252 | 2.5 | 21.2 | 21.2 | 22.0 | 0.8 |
| B | 850 | 75 | 463 | 1.4 | 26.6 | 26.6 | 26.6 | 0.0 |
| C | 950 | 170 | 643 | 1.0 | 26.6 | 26.6 | 26.6 | 0.0 |
| D | 1,310 | 80 | 221 | 2.9 | 26.6 | 26.6 | 26.6 | 0.0 |
| E | 1,870 | 111 | 496 | 1.3 | 28.1 | 28.1 | 28.5 | 0.4 |
| F | 2,430 | 15 | 82 | 7.7 | 28.3 | 28.3 | 28.3 | 0.0 |

[1]Feet above confluence with Cape Cod Bay

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** **FLOODING SOURCE: INDIAN BROOK** |
|---|---|---|

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 250 | 27 | 111 | 2.8 | 39.9 | 38.9[2] | 39.8 | 0.9 |
| B | 1,180 | 36 | 157 | 2.0 | 40.1 | 39.6[2] | 40.5 | 0.9 |
| C | 2,180 | 35 | 48 | 6.6 | 41.9 | 41.9 | 42.0 | 0.1 |
| D | 2,400 | 125 | 372 | 0.8 | 46.4 | 46.4 | 46.4 | 0.0 |
| E | 3,200 | 100 | 408 | 0.8 | 46.5 | 46.5 | 46.5 | 0.0 |
| F | 4,160 | 26 | 45 | 7.0 | 46.7 | 46.7 | 46.9 | 0.2 |
| G | 5,340 | 60 | 217 | 1.3 | 53.3 | 53.3 | 53.6 | 0.3 |
| H | 6,750 | 25 | 127 | 2.2 | 53.5 | 53.5 | 54.1 | 0.6 |
| I | 7,980 | 130 | 273 | 0.7 | 53.8 | 53.8 | 54.7 | 0.9 |
| J | 8,910 | 50 | 102 | 1.9 | 54.2 | 54.2 | 55.2 | 1.0 |
| K | 10,010 | 18 | 68 | 2.9 | 57.7 | 57.7 | 58.0 | 0.3 |
| L | 11,550 | 125 | 274 | 0.7 | 58.0 | 58.0 | 58.9 | 0.9 |
| M | 12,400 | 18 | 43 | 4.5 | 59.3 | 59.3 | 59.3 | 0.0 |

[1]Feet above confluence with Indian Head River
[2]Elevation computed without consideration of backwater effects from Indian Head River

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** FLOODING SOURCE: INDIAN HEAD BROOK |
|---|---|---|

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 5,830 | 100 | 467 | 3.9 | 25.6 | 25.6 | 26.6 | 1.0 |
| B | 6,280 | 60 | 222 | 8.2 | 27.0 | 27.0 | 27.5 | 0.5 |
| C | 7,130 | 50 | 283 | 6.4 | 31.3 | 31.3 | 31.6 | 0.3 |
| D | 7,700 | 179 | 1,002 | 1.8 | 38.5 | 38.5 | 38.5 | 0.0 |
| E | 8,690 | 261 | 1,120 | 1.6 | 38.7 | 38.7 | 38.7 | 0.0 |
| F | 9,800 | 119 | 634 | 2.9 | 39.0 | 39.0 | 39.0 | 0.0 |
| G | 11,100 | 72 | 465 | 3.9 | 39.6 | 39.6 | 39.8 | 0.2 |
| H | 12,650 | 150 | 752 | 2.1 | 40.5 | 40.5 | 41.3 | 0.8 |
| I | 13,660 | 330 | 1,202 | 1.3 | 41.5 | 41.5 | 42.5 | 1.0 |
| J | 14,450 | 50 | 326 | 4.8 | 44.4 | 44.4 | 44.9 | 0.5 |

[1]Feet above Elm Street Dam

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY PLYMOUTH COUNTY, MASSACHUSETTS (ALL JURISDICTIONS) | FLOODWAY DATA |
|---|---|---|
| | | FLOODING SOURCE: INDIAN HEAD RIVER |

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| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 132 | 55 | 192 | 3.0 | * | 7.0[2] | 7.0 | 0.0 |
| B | 192 | 55 | 198 | 2.9 | * | 7.2[2] | 7.2 | 0.0 |
| C | 670 | 94 | 269 | 2.2 | * | 8.0[2] | 8.2 | 0.2 |
| D | 1,555 | 45 | 133 | 4.4 | * | 9.9 | 10.9 | 1.0 |
| E | 1,619 | 70 | 237 | 2.5 | 12.2 | 12.2 | 12.3 | 0.1 |
| F | 1,655 | 44 | 269 | 2.2 | 19.1 | 19.1 | 19.1 | 0.0 |
| G | 1,794 | 290 | 1,870 | 0.3 | 19.2 | 19.2 | 19.2 | 0.0 |
| H | 2,587 | 114 | 553 | 1.0 | 19.2 | 19.2 | 19.2 | 0.0 |
| I | 3,544 | 64 | 332 | 1.7 | 19.3 | 19.3 | 19.3 | 0.0 |
| J | 5,493 | 63 | 260 | 2.0 | 19.5 | 19.5 | 20.0 | 0.5 |
| K | 6,429 | 122 | 376 | 1.4 | 19.6 | 19.6 | 20.5 | 0.9 |
| L | 7,268 | 27 | 61 | 8.6 | 20.8 | 20.8 | 20.8 | 0.0 |
| M | 7,473 | 53 | 100 | 5.2 | 23.0 | 23.0 | 23.1 | 0.1 |
| N | 8,272 | 39 | 175 | 3.0 | 25.1 | 25.1 | 25.5 | 0.4 |
| O | 9,446 | 26 | 139 | 3.8 | 26.3 | 26.3 | 26.9 | 0.6 |
| P | 10,363 | 83 | 301 | 1.7 | 27.0 | 27.0 | 27.9 | 0.9 |
| Q | 11,857 | 60 | 228 | 2.3 | 27.9 | 27.9 | 28.8 | 0.9 |
| R | 12,495 | 32 | 134 | 3.9 | 28.7 | 28.7 | 29.5 | 0.8 |
| S | 14,032 | 34 | 179 | 2.9 | 30.6 | 30.6 | 31.5 | 0.9 |
| T | 15,561 | 91 | 300 | 1.7 | 31.7 | 31.7 | 32.7 | 1.0 |
| U | 16,458 | 154 | 496 | 1.1 | 32.2 | 32.2 | 33.2 | 1.0 |

[1] Feet above confluence with Second Brook
[2] Elevation computed without consideration of backwater effects from Kingston Bay
*Controlled by coastal flooding – see Flood Insurance Rate Map for regulatory base flood elevation

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** **FLOODING SOURCE: JONES RIVER** |
|---|---|---|

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| V | 16,521 | 38 | 179 | 2.9 | 32.2 | 32.2 | 33.2 | 1.0 |
| W | 17,564 | 281 | 829 | 0.6 | 32.7 | 32.7 | 33.7 | 1.0 |
| X | 18,870 | 80 | 284 | 1.8 | 33.1 | 33.1 | 34.0 | 0.9 |
| Y | 19,576 | 130 | 394 | 0.5 | 33.2 | 33.2 | 34.2 | 1.0 |
| Z | 20,558 | 33 | 138 | 1.4 | 33.4 | 33.4 | 34.4 | 1.0 |
| AA | 21,902 | 51 | 143 | 1.4 | 33.9 | 33.9 | 34.8 | 0.9 |
| AB | 22,720 | 39 | 77 | 2.5 | 34.7 | 34.7 | 35.4 | 0.7 |
| AC | 22,821 | 33 | 151 | 1.3 | 36.5 | 36.5 | 36.9 | 0.4 |
| AD | 22,993 | 49 | 245 | 0.8 | 38.2 | 38.2 | 38.6 | 0.4 |
| AE | 23,241 | 45 | 206 | 0.9 | 38.2 | 38.2 | 38.7 | 0.5 |
| AF | 23,798 | 30 | 75 | 0.9 | 38.2 | 35.7[2] | 36.0 | 0.3 |
| AG | 25,358 | 61 | 122 | 0.6 | 38.2 | 35.9[2] | 36.3 | 0.4 |
| AH | 26,658 | * | 12 | 5.8 | 39.7 | 39.7 | 39.9 | 0.2 |
| AI | 26,898 | 49 | 40 | 0.6 | 40.5 | 40.5 | 40.9 | 0.4 |
| AJ | 27,178 | 83 | 310 | 0.1 | 47.1 | 47.1 | 47.1 | 0.0 |

[1]Feet above confluence with Second Brook
[2]Elevation computed without consideration of backwater effects from downstream Jones River model
*Floodway coincident with channel banks

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** |
|---|---|---|
| | | **FLOODING SOURCE: JONES RIVER** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 0 | 53 | 155 | 1.9 | 33.2 | 32.5[2] | 33.5 | 1.0 |
| B | 1,162 | 90 | 309 | 1.0 | 33.7 | 33.7 | 34.6 | 0.9 |
| C | 2,360 | 79 | 245 | 1.2 | 34.5 | 34.5 | 35.3 | 0.8 |
| D | 3,041 | * | 74 | 4.0 | 35.1 | 35.1 | 36.0 | 0.9 |
| E | 3,268 | 40 | 206 | 1.5 | 38.7 | 38.7 | 38.9 | 0.2 |
| F | 4,150 | 61 | 333 | 0.9 | 38.7 | 38.7 | 39.0 | 0.3 |

[1]Feet above confluence with Jones River
[2]Elevation computed without consideration of backwater effects from Jones River
*Floodway coincident with channel banks

TABLE 23

| FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
|---|---|
| **PLYMOUTH COUNTY, MASSACHUSETTS** | |
| **(ALL JURISDICTIONS)** | **FLOODING SOURCE: JONES RIVER BROOK** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 800 | 60 | 315 | 0.9 | 79.8 | 79.8 | 80.5 | 0.7 |
| B | 1,790 | 65 | 320 | 0.8 | 79.8 | 79.8 | 80.8 | 1.0 |
| C | 2,700 | 40 | 112 | 2.4 | 83.2 | 83.2 | 83.8 | 0.6 |
| D | 2,875 | 19 | 69 | 3.9 | 83.7 | 83.7 | 84.2 | 0.5 |
| E | 3,880 | 18 | 58 | 4.7 | 85.2 | 85.2 | 85.7 | 0.5 |
| F | 5,120 | 6 | 33 | 8.2 | 92.9 | 92.9 | 93.2 | 0.3 |

[1]Feet above confluence with Drinkwater River

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY<br>**PLYMOUTH COUNTY, MASSACHUSETTS**<br>(ALL JURISDICTIONS) | **FLOODWAY DATA**<br>FLOODING SOURCE: LONGWATER BROOK |
|---|---|---|

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 2,560 | 129 | 1,412 | 1.7 | 29.4 | 29.4 | 30.3 | 0.9 |
| B | 6,670 | 190 | 1,240 | 2.0 | 31.4 | 31.4 | 32.1 | 0.7 |
| C | 7,200 | 268 | 2,316 | 1.1 | 33.2 | 33.2 | 33.9 | 0.7 |

[1]Feet above confluence with Taunton River

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
|---|---|---|
| | **PLYMOUTH COUNTY, MASSACHUSETTS** | |
| | **(ALL JURISDICTIONS)** | **FLOODING SOURCE: MATFIELD RIVER** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | -95 | * | 125 | 3.9 | 21.2 | 21.2 | 22.2 | 1.0 |
| B | 95 | 23 | 111 | 4.4 | 22.0 | 22.0 | 22.9 | 0.9 |
| C | 1,895 | 130 | 334 | 1.4 | 23.7 | 23.7 | 24.6 | 0.9 |
| D | 3,345 | 25 | 70 | 7.0 | 25.2 | 25.2 | 25.4 | 0.2 |
| E | 5,445 | 30 | 162 | 3.0 | 26.9 | 26.9 | 27.8 | 0.9 |
| F | 6,705 | 80 | 321 | 1.5 | 27.6 | 27.6 | 28.6 | 1.0 |
| G | 8,515 | 50 | 220 | 2.2 | 28.5 | 28.5 | 29.4 | 0.9 |
| H | 10,655 | 120 | 468 | 1.0 | 29.2 | 29.2 | 30.1 | 0.9 |
| I | 11,685 | 30 | 123 | 3.9 | 30.6 | 30.6 | 31.0 | 0.4 |
| J | 13,025 | 90 | 434 | 1.1 | 32.6 | 32.6 | 33.3 | 0.7 |
| K | 15,005 | 115 | 544 | 0.9 | 32.8 | 32.8 | 33.7 | 0.9 |
| L | 16,195 | 150 | 549 | 0.9 | 32.9 | 32.9 | 33.8 | 0.9 |
| M | 17,445 | 130 | 427 | 1.1 | 33.0 | 33.0 | 34.0 | 1.0 |
| N | 19,035 | 160 | 413 | 1.2 | 33.5 | 33.5 | 34.5 | 1.0 |
| O | 20,195 | * | 120 | 4.0 | 34.5 | 34.5 | 35.1 | 0.6 |
| P | 22,025 | 150 | 416 | 1.2 | 38.3 | 38.3 | 39.1 | 0.8 |
| Q | 22,895 | 135 | 314 | 1.5 | 38.8 | 38.8 | 39.8 | 1.0 |
| R | 24,065 | 30 | 71 | 1.9 | 41.5 | 41.5 | 42.4 | 0.9 |
| S | 25,055 | 36 | 57 | 2.4 | 44.6 | 44.6 | 44.6 | 0.0 |
| T | 28,105 | * | 662 | 0.2 | 51.8 | 51.8 | 51.8 | 0.0 |
| U | 28,995 | * | 31 | 4.3 | 51.8 | 51.8 | 51.8 | 0.0 |

[1]Feet above Wolf Island Road
*Floodway coincident with channel banks

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
|---|---|---|
| | **PLYMOUTH COUNTY, MASSACHUSETTS** | |
| | **(ALL JURISDICTIONS)** | **FLOODING SOURCE: MATTAPOISETT RIVER** |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| V | 29,985 | * | 58 | 2.3 | 53.1 | 53.1 | 53.8 | 0.7 |
| W | 30,805 | * | 99 | 0.7 | 53.4 | 53.4 | 54.2 | 0.8 |
| X | 32,645 | * | 39 | 1.6 | 53.7 | 53.7 | 54.5 | 0.8 |
| Y | 33,735 | * | 29 | 2.2 | 54.5 | 54.5 | 55.0 | 0.5 |

[1]Feet above Wolf Island Road bridge in Rochester
*Floodway coincident with channel banks

TABLE 23

| FEDERAL EMERGENCY MANAGEMENT AGENCY **PLYMOUTH COUNTY, MASSACHUSETTS** (ALL JURISDICTIONS) | **FLOODWAY DATA** FLOODING SOURCE: MATTAPOISETT RIVER |
|---|---|

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 0 | 28 | 141 | 3.4 | 39.8 | 39.8 | 40.8 | 1.0 |
| B | 1,040 | 56 | 161 | 3.0 | 42.2 | 42.2 | 42.6 | 0.4 |
| C | 2,160 | 41 | 127 | 3.7 | 47.5 | 47.5 | 47.5 | 0.0 |
| D | 2,812 | 15 | 239 | 2.7 | 49.0 | 49.0 | 49.1 | 0.1 |
| E | 3,229 | 26 | 389 | 2.2 | 50.4 | 50.4 | 50.6 | 0.2 |
| F | 4,509 | 56 | 203 | 3.7 | 55.9 | 55.9 | 56.9 | 1.0 |
| G | 6,389 | 64 | 209 | 2.6 | 59.4 | 59.4 | 59.9 | 0.5 |
| H | 8,069 | 19 | 182 | 4.1 | 66.8 | 66.8 | 67.5 | 0.7 |
| I | 9,269 | 87 | 360 | 2.0 | 69.5 | 69.5 | 70.5 | 1.0 |
| J | 10,789 | 50 | 350 | 2.2 | 70.6 | 70.6 | 71.6 | 1.0 |
| K | 12,269 | 12 | 160 | 3.0 | 72.6 | 72.6 | 73.4 | 0.8 |
| L | 13,989 | 57 | 1,848 | 0.4 | 74.6 | 74.6 | 75.5 | 0.9 |
| M | 15,069 | 345 | 1,715 | 0.4 | 74.6 | 74.6 | 75.6 | 1.0 |
| N | 16,429 | 50 | 234 | 1.2 | 77.7 | 77.7 | 77.8 | 0.1 |
| O | 17,489 | 25 | 117 | 2.3 | 77.8 | 77.8 | 78.0 | 0.2 |
| P | 17,939 | 25 | 118 | 2.3 | 77.8 | 77.8 | 78.2 | 0.4 |
| Q | 18,189 | 30 | 113 | 1.9 | 77.9 | 77.9 | 78.4 | 0.5 |
| R | 19,279 | 50 | 152 | 1.4 | 78.7 | 78.7 | 79.6 | 0.9 |
| S | 20,029 | 20 | 51 | 4.4 | 80.0 | 80.0 | 80.5 | 0.5 |
| T | 20,560 | 50 | 182 | 1.2 | 84.4 | 84.4 | 84.4 | 0.0 |
| U | 21,269 | 45 | 100 | 2.2 | 86.1 | 86.1 | 87.0 | 0.9 |

[1]Feet above Central Street

| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
|---|---|---|
| | **PLYMOUTH COUNTY, MASSACHUSETTS** | |
| | **(ALL JURISDICTIONS)** | **FLOODING SOURCE: MEADOW BROOK** |