WIN 22603.00 Frank J. Wood Bridge

Hydraulics Summary

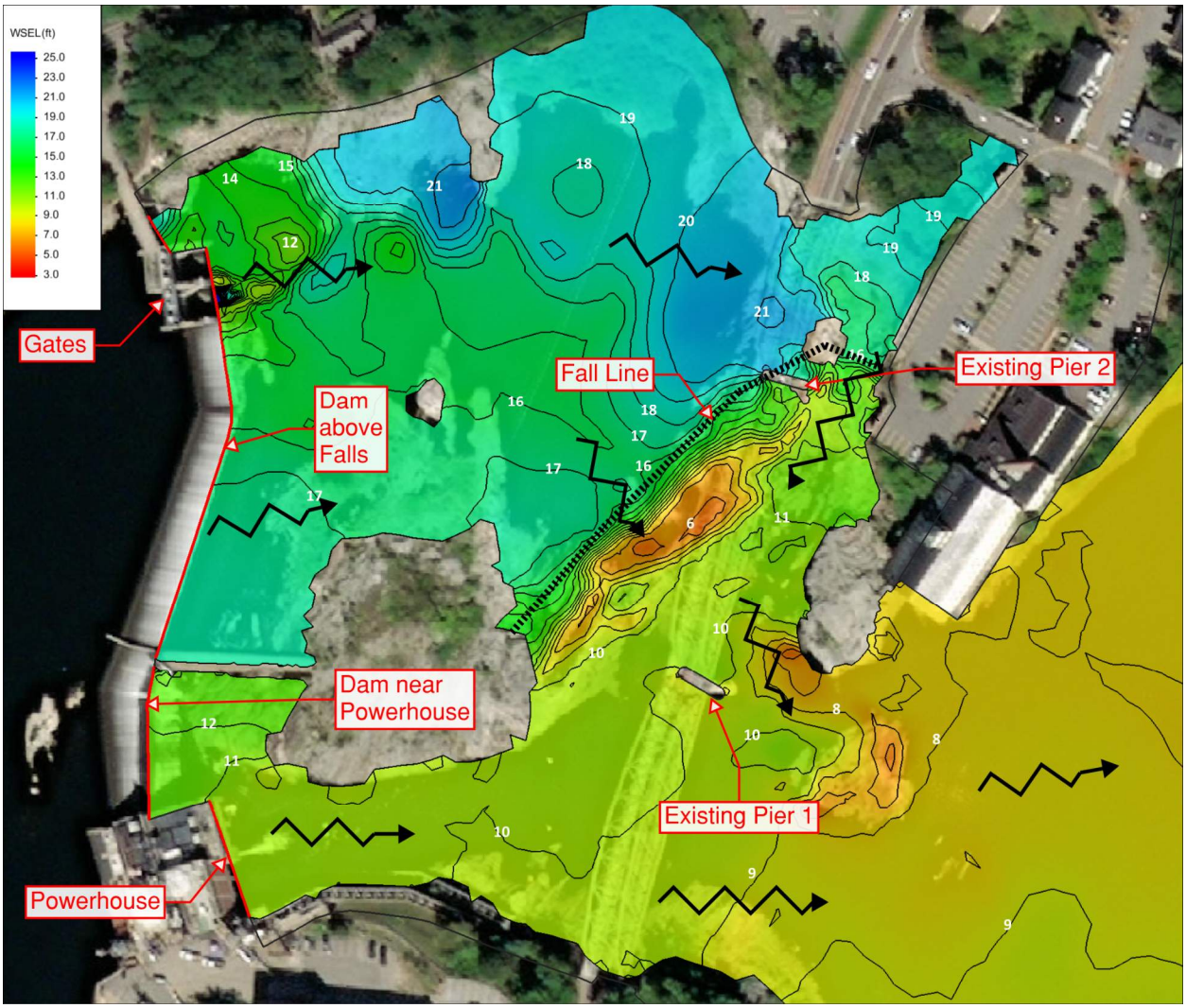
Background

The Frank J. Wood Bridge hydraulics analysis was done with a 2D hydraulics approach due to the significant complexity of the site. SRH-2D was used for the analysis.

Water enters the site from 3 primary sources: through the Powerhouse outfall channel, through the Gates, and over the top of the dam itself. At typical low flows, the water is released exclusively through the Powerhouse outfall channel. At moderate to higher flows the Gates are used to release water also and at high flows (flood events) a significant portion of the flow comes over the dam.

Information from the dam owners was used to estimate the amount of water entering the 2D hydraulics modelling domain from each of these sources for each flow analyzed. A summary of these flows is here:

Flow	Powerhouse (cfs)	Gates (cfs)	Dam near Powerhouse (cfs)	Dam above Falls (cfs)	Total Flow (cfs)
July	4,050				4,050
May	7,900	5,850			13,750
Q1.1	7,900	15,650	3,690	7,250	34,490
Q2	7,900	18,280	5,700	11,200	43,080
Q5	7,900	20,480	9,400	18,460	56,240
Q10	7,900	22,360	12,120	23,820	66,200
Q25	7,900	25,000	15,670	30,790	79,360
Q50	7,900	27,620	18,150	35,650	89,320
Q100	7,900	29,970	20,850	40,950	99,670
Q500	7,900	30,350	29,370	57,690	125,310
Flood of Record (1936)	7,900	31,130	35,070	68,900	143,000



The illustration above illustrates some of the key features of the site. The flow shown is the Q1.1 flow through the existing site.

2D Hydraulics Model Results

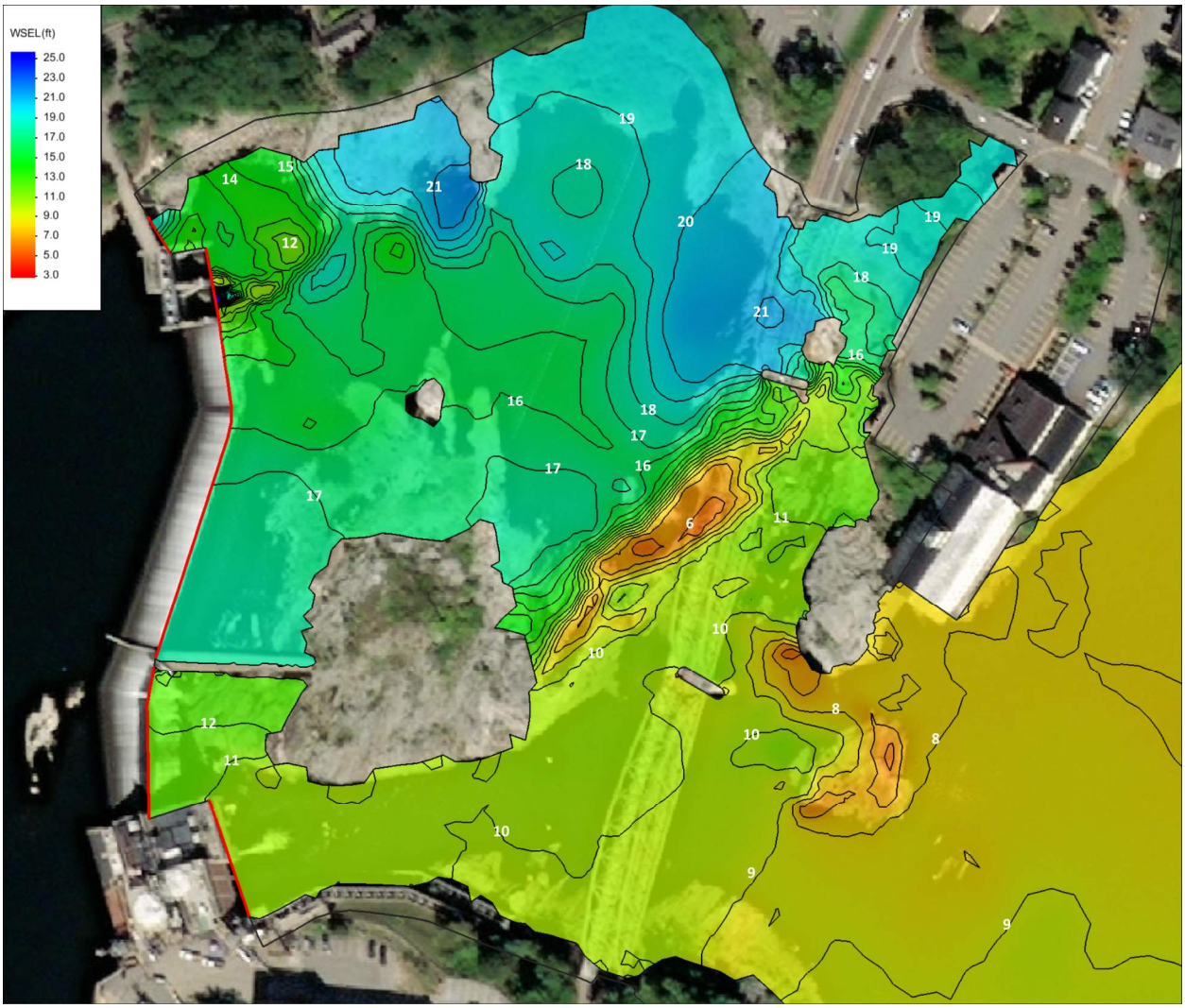
The following pages show the model results for a variety of storm events for the proposed final condition at the site. Each storm event has two output plots: a water surface elevation plot and a velocity vector plot.

Due to the way the geometry was constructed for the modeling, the plan extents of inundation shown in the graphics will not exactly match inundation extents in the field, but the water elevations and velocities should match fairly closely.

Attached at the end of this document is a full sheet showing the surveyed contours for the site.

Q1.1 Event: Water Surface Elevations, Existing Conditions

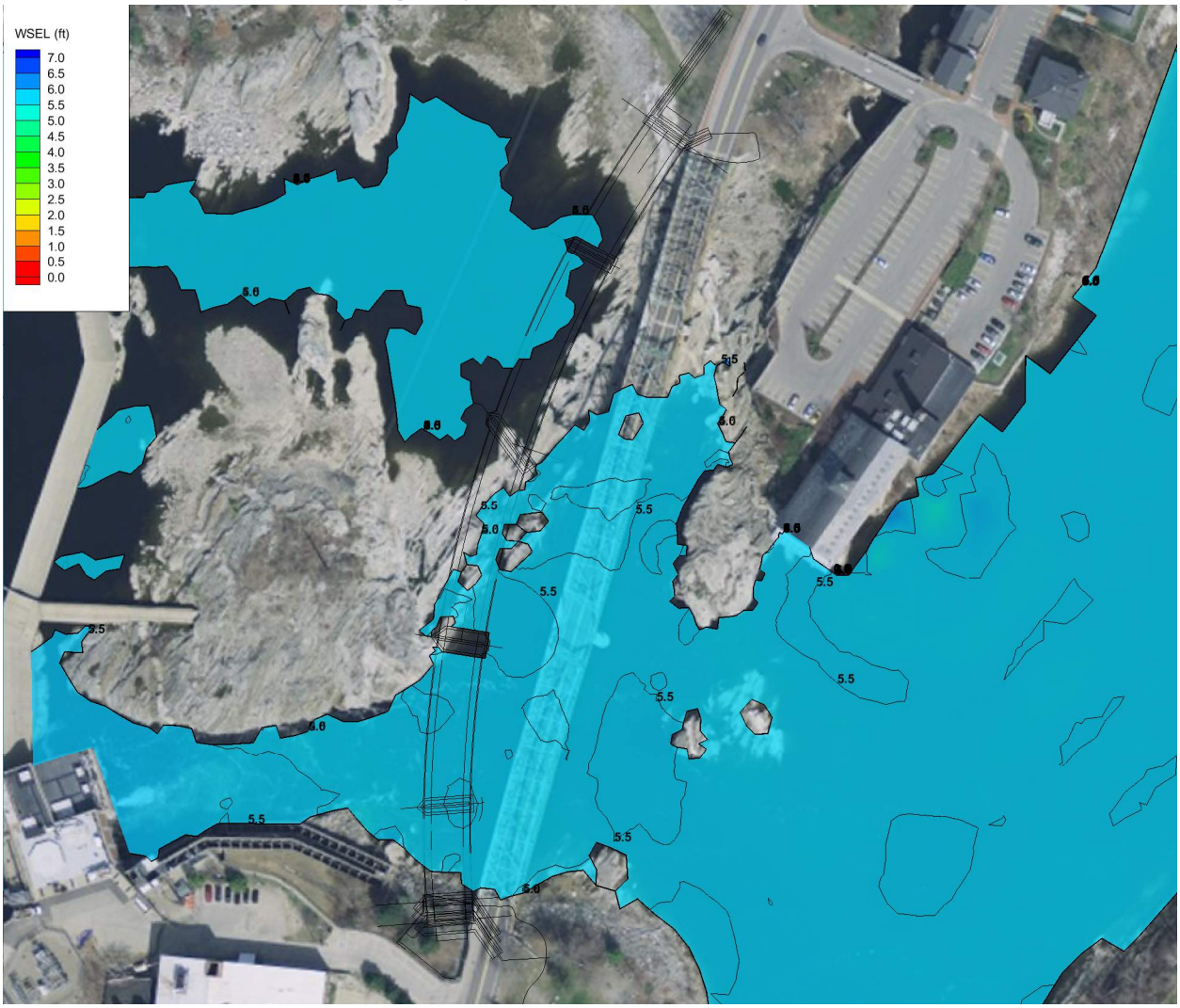
This flow was used to develop the Ordinary High Water extents for environmental purposes. The Ordinary High Water outline is shown on the contours sheet on the last page of this document.



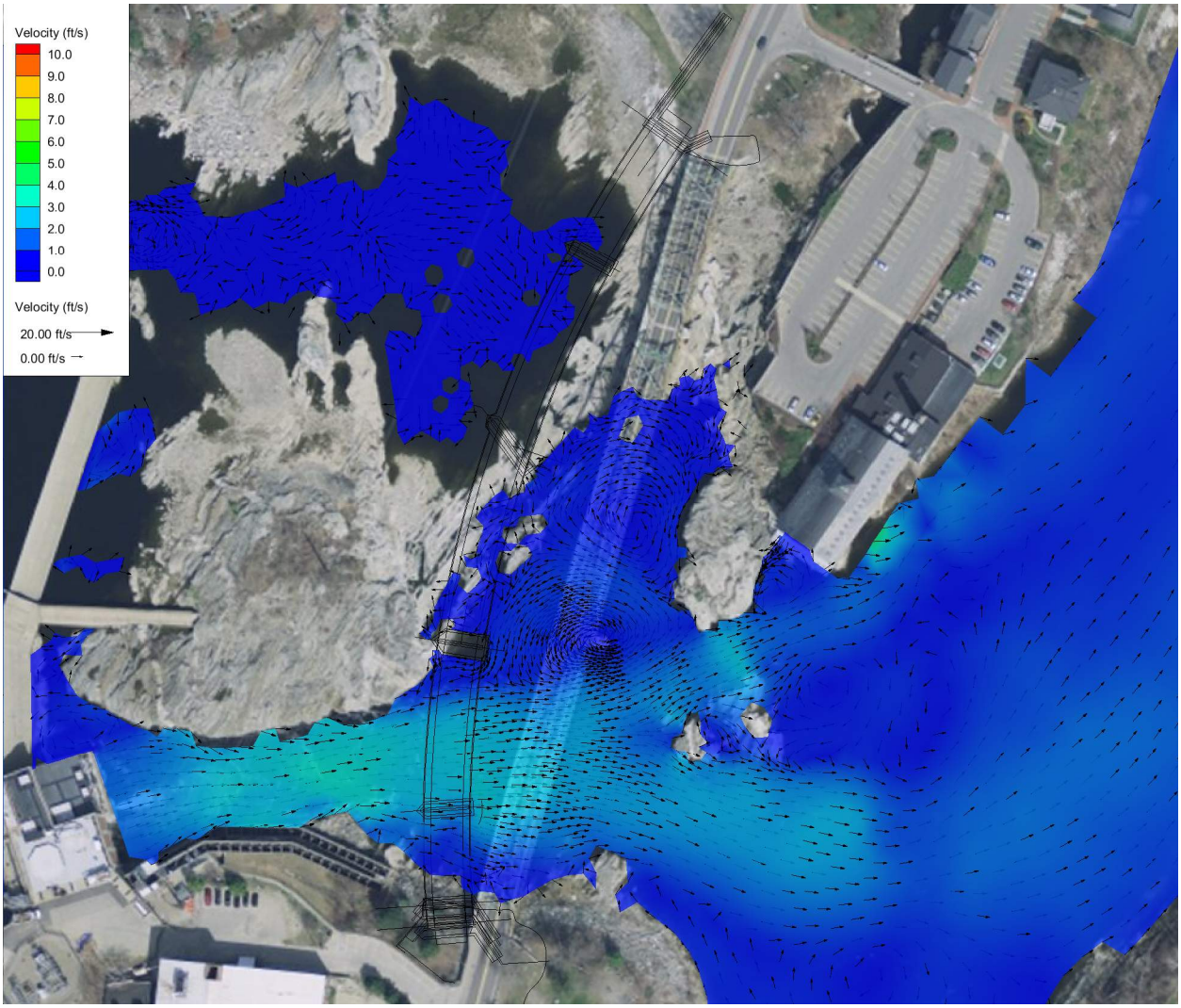
Hydraulic Model Results, Proposed Final Conditions

In general, the existing conditions and proposed final conditions showed very similar results, so only the proposed final condition model results are included in this document for most flows.

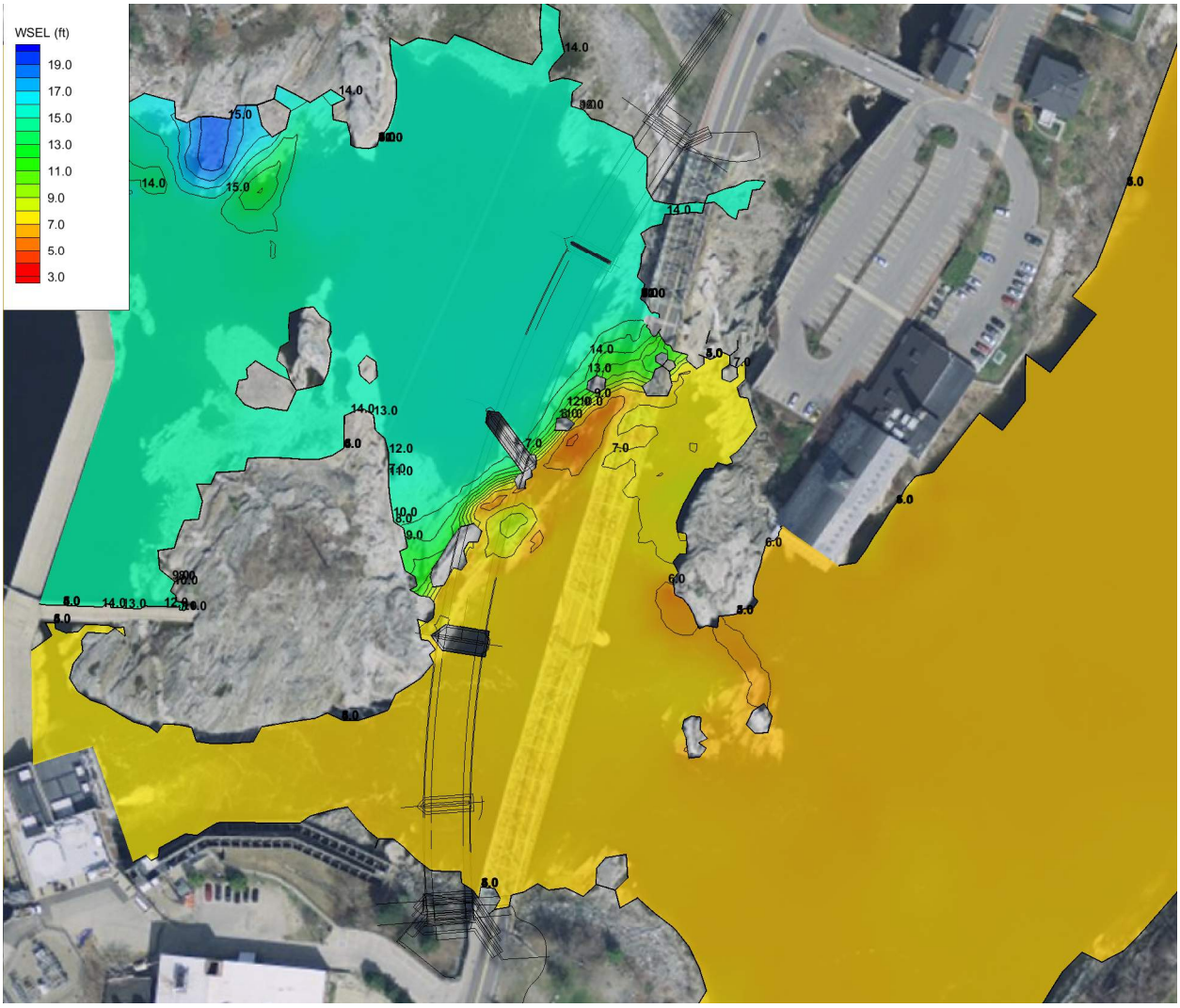
Average July Flow: Water Surface Elevations



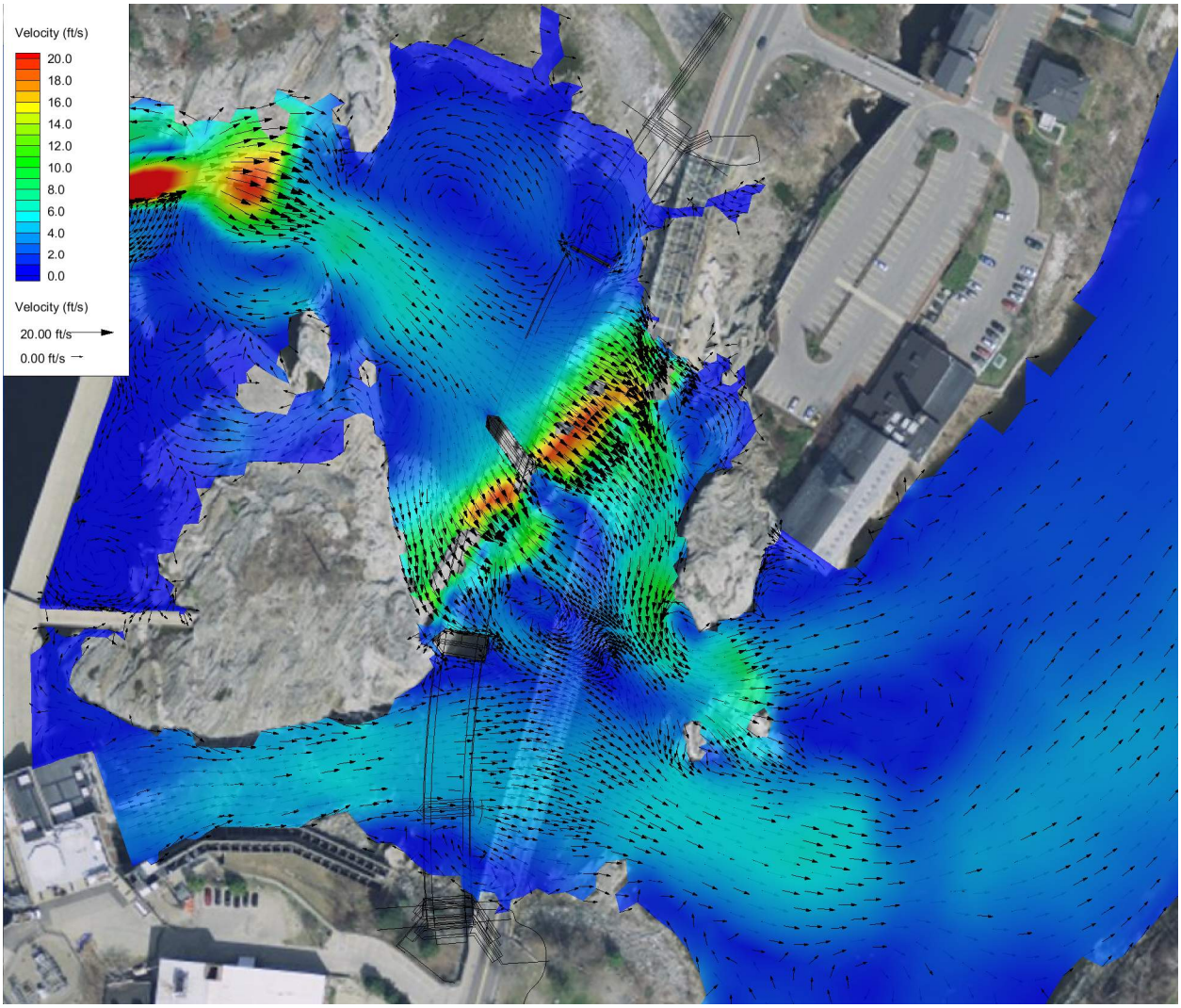
Average July Flow: Velocities



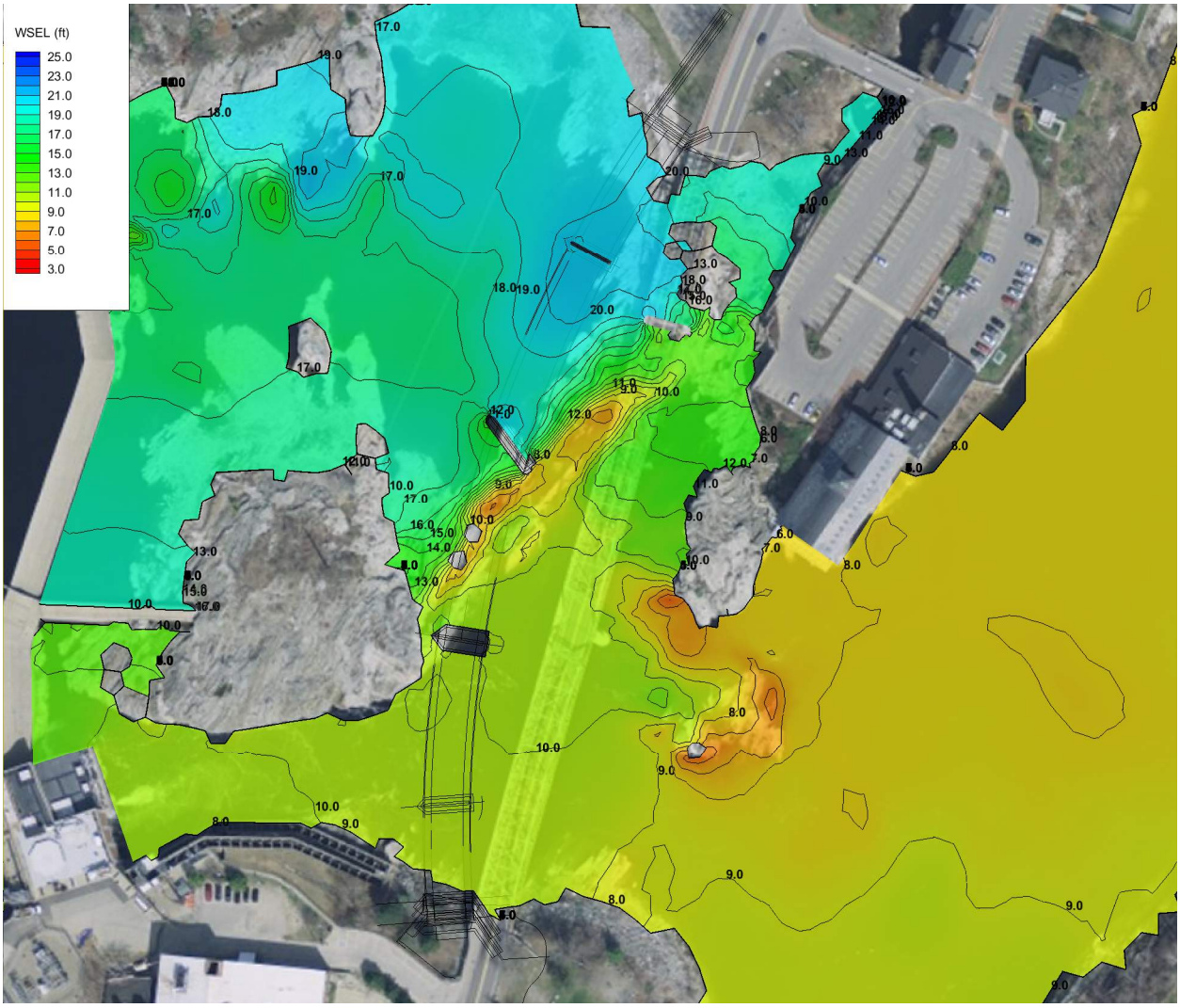
Average May Flow: Water Surface Elevations



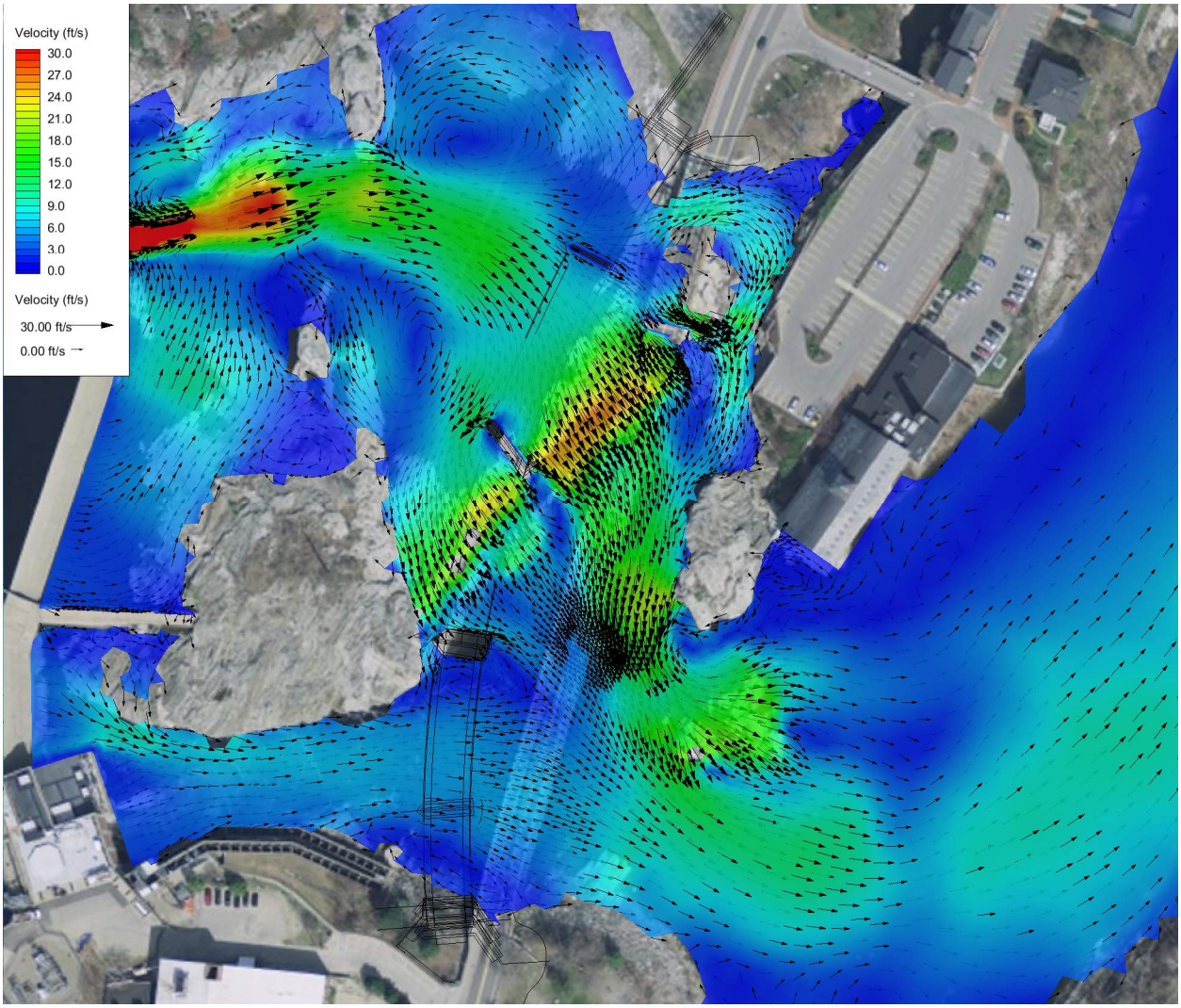
Average May Flow: Velocities



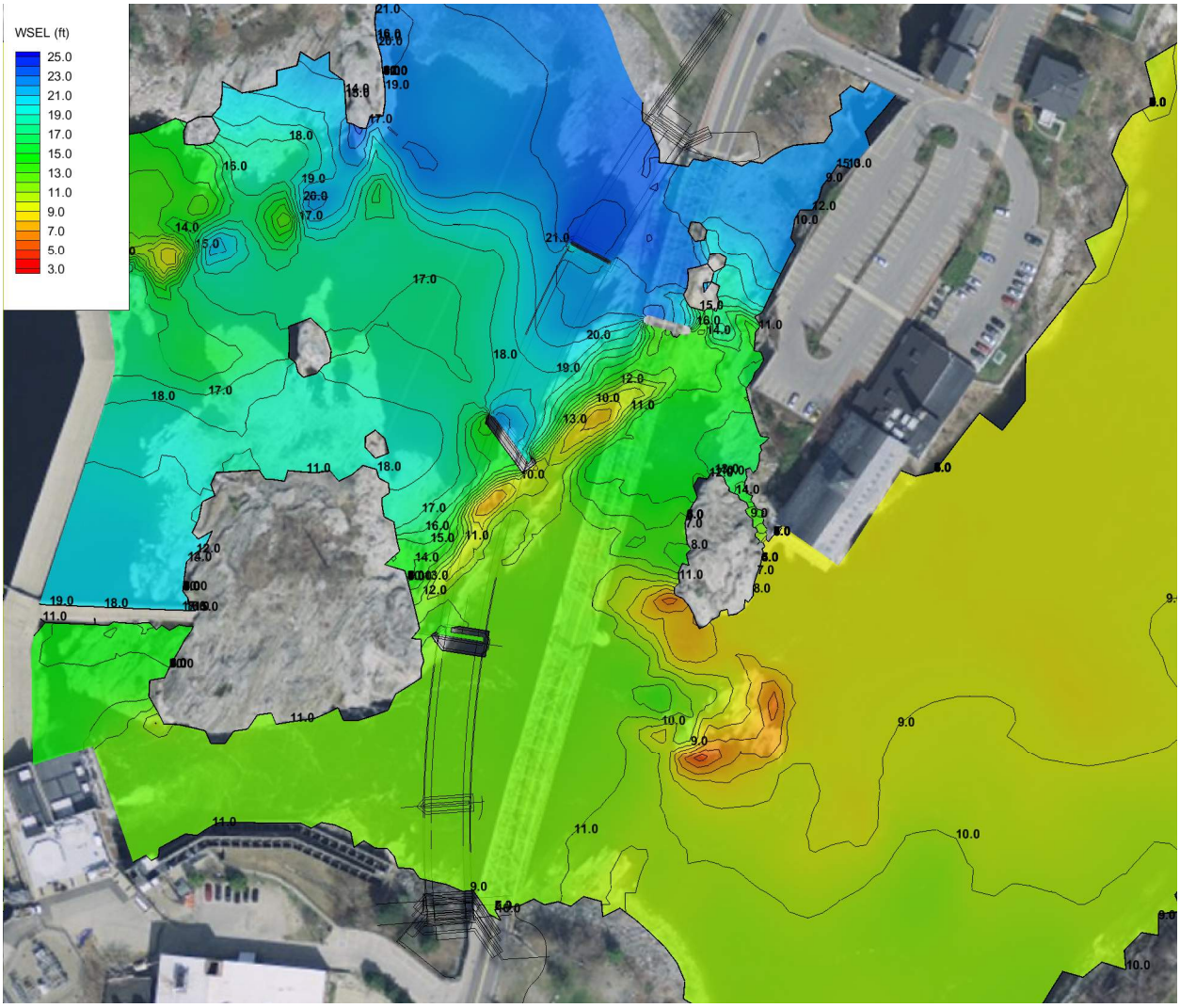
Q1.1 Event: Water Surface Elevations



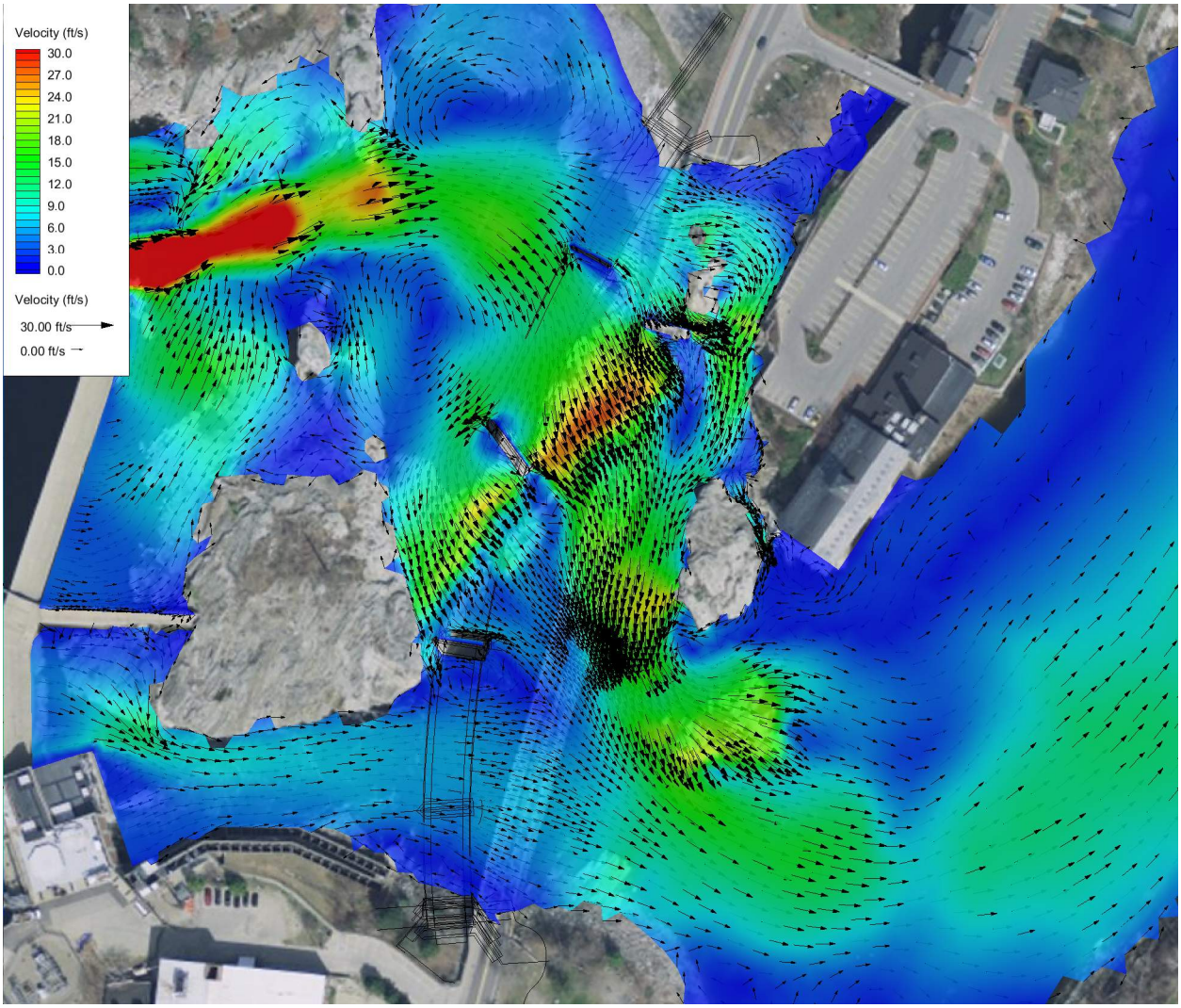
Q1.1 Event: Velocities



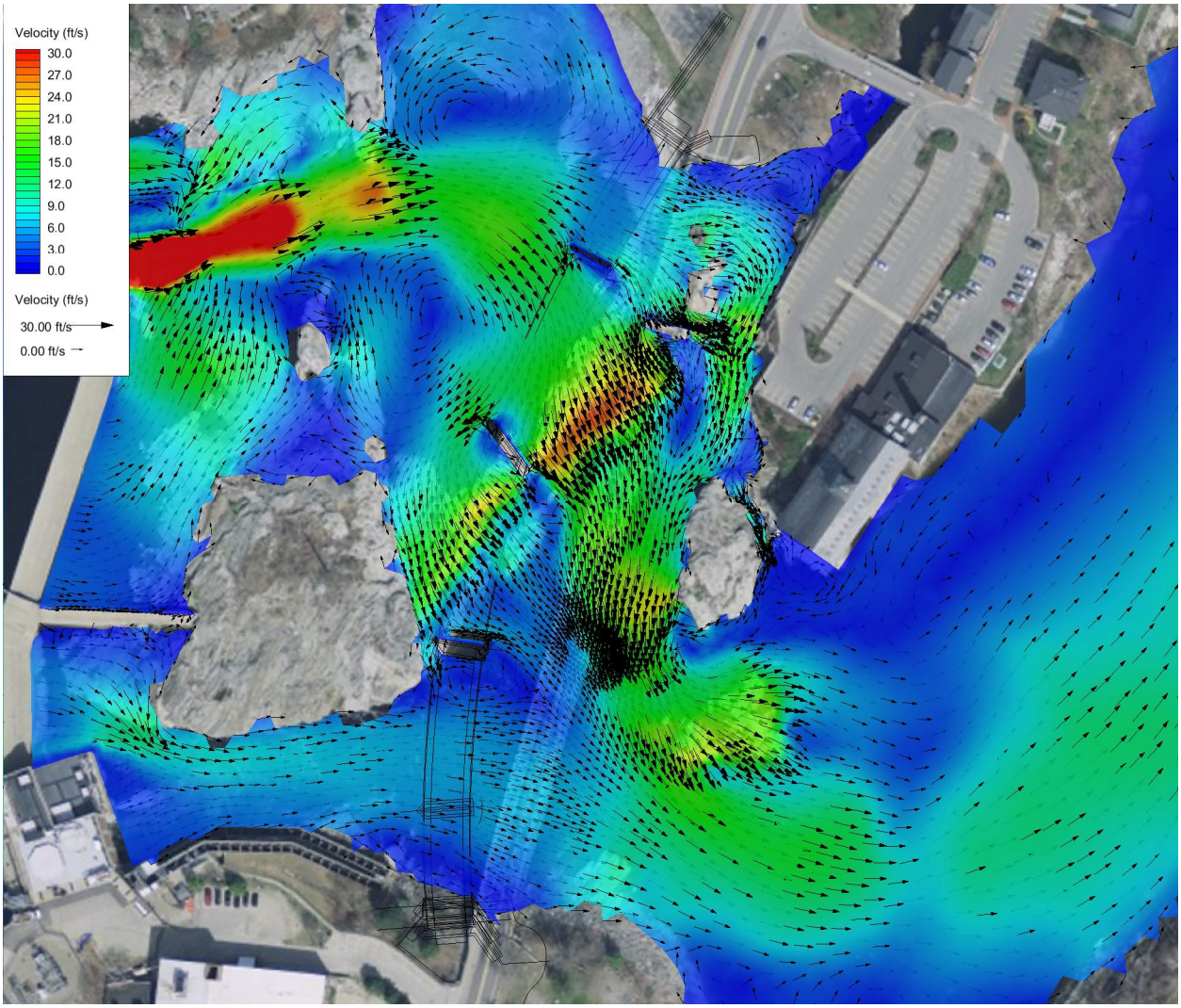
Q2.0 Event: Water Surface Elevations



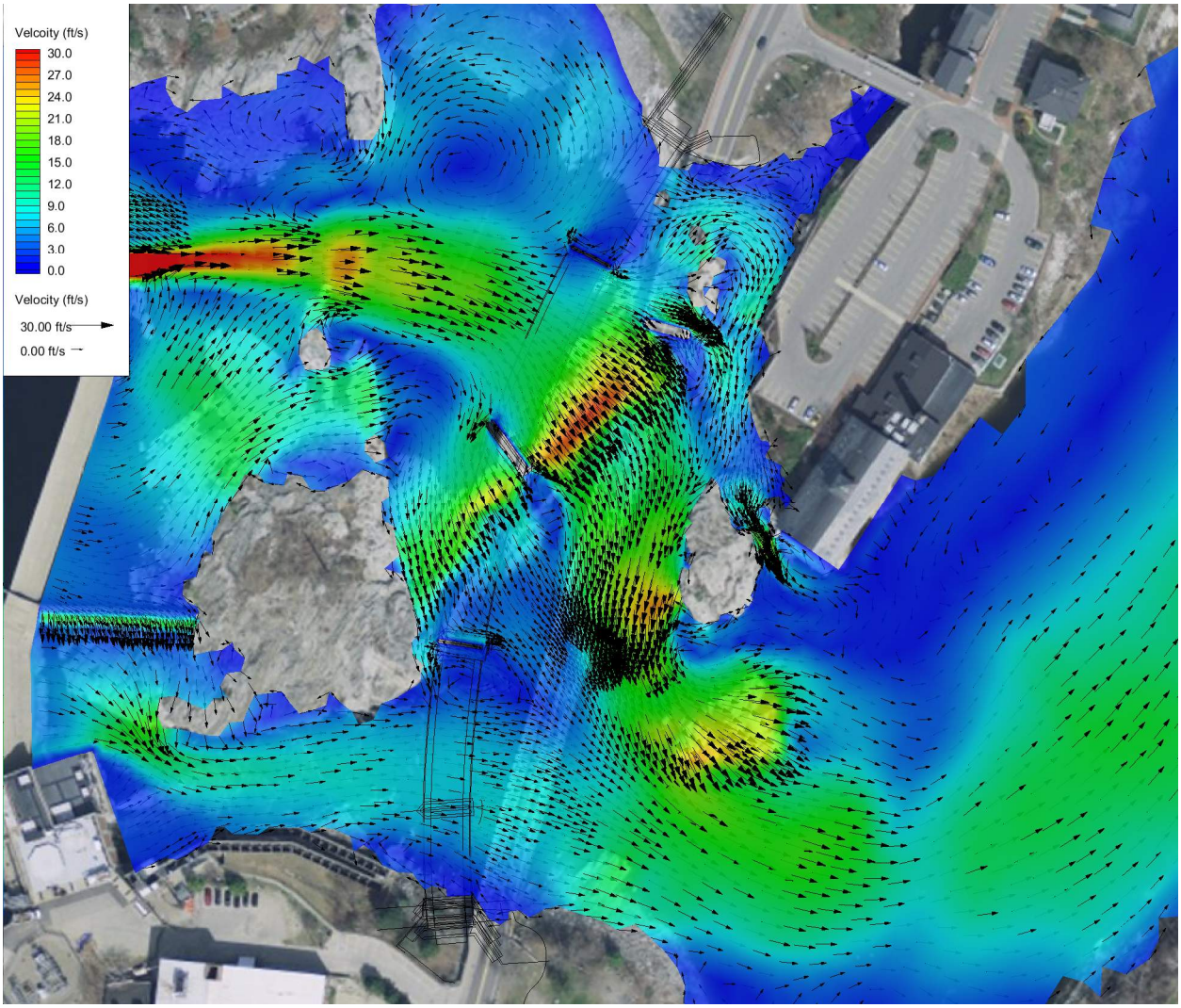
Q2.0 Event: Velocities



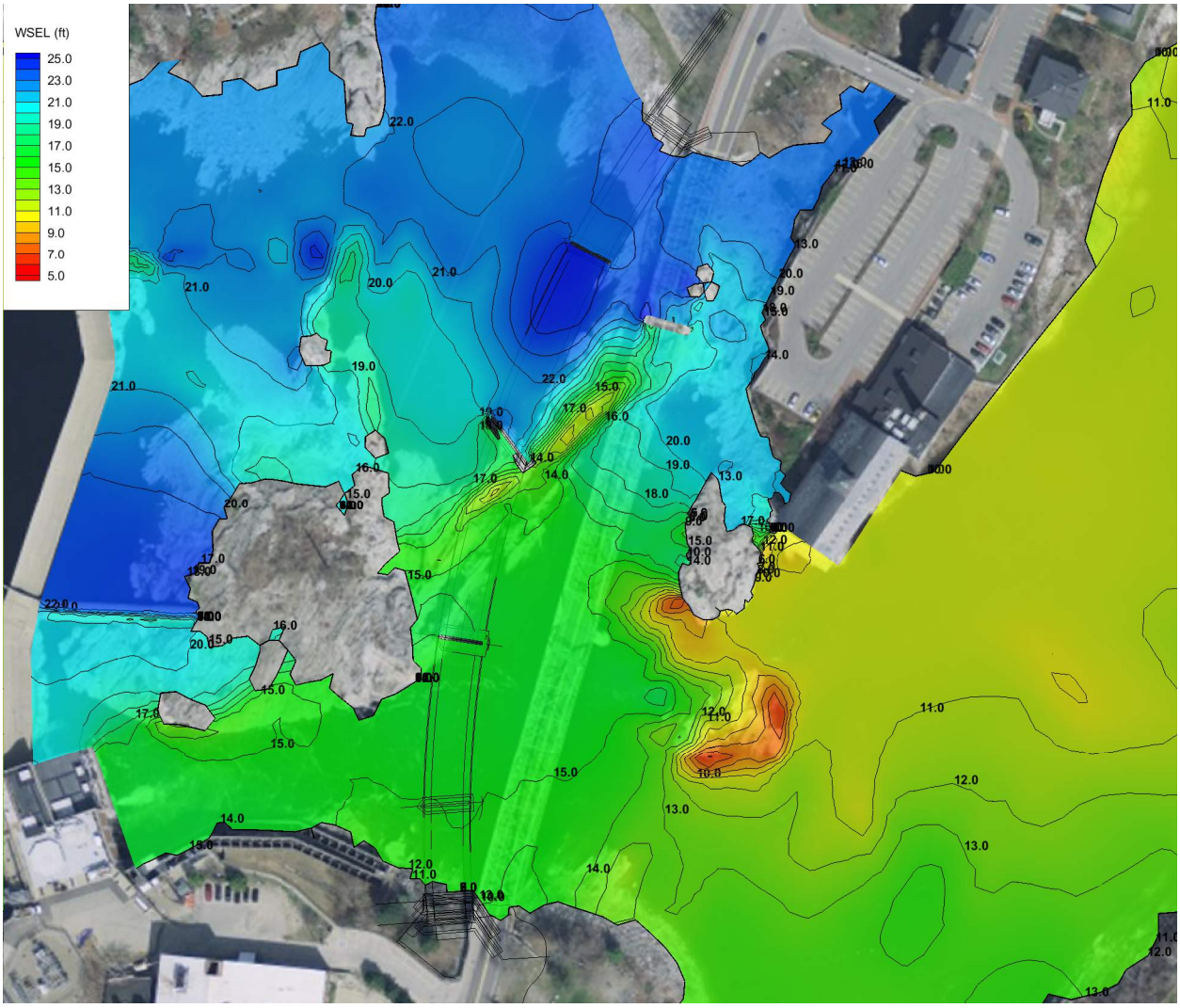
Q5 Event: Water Surface Elevations



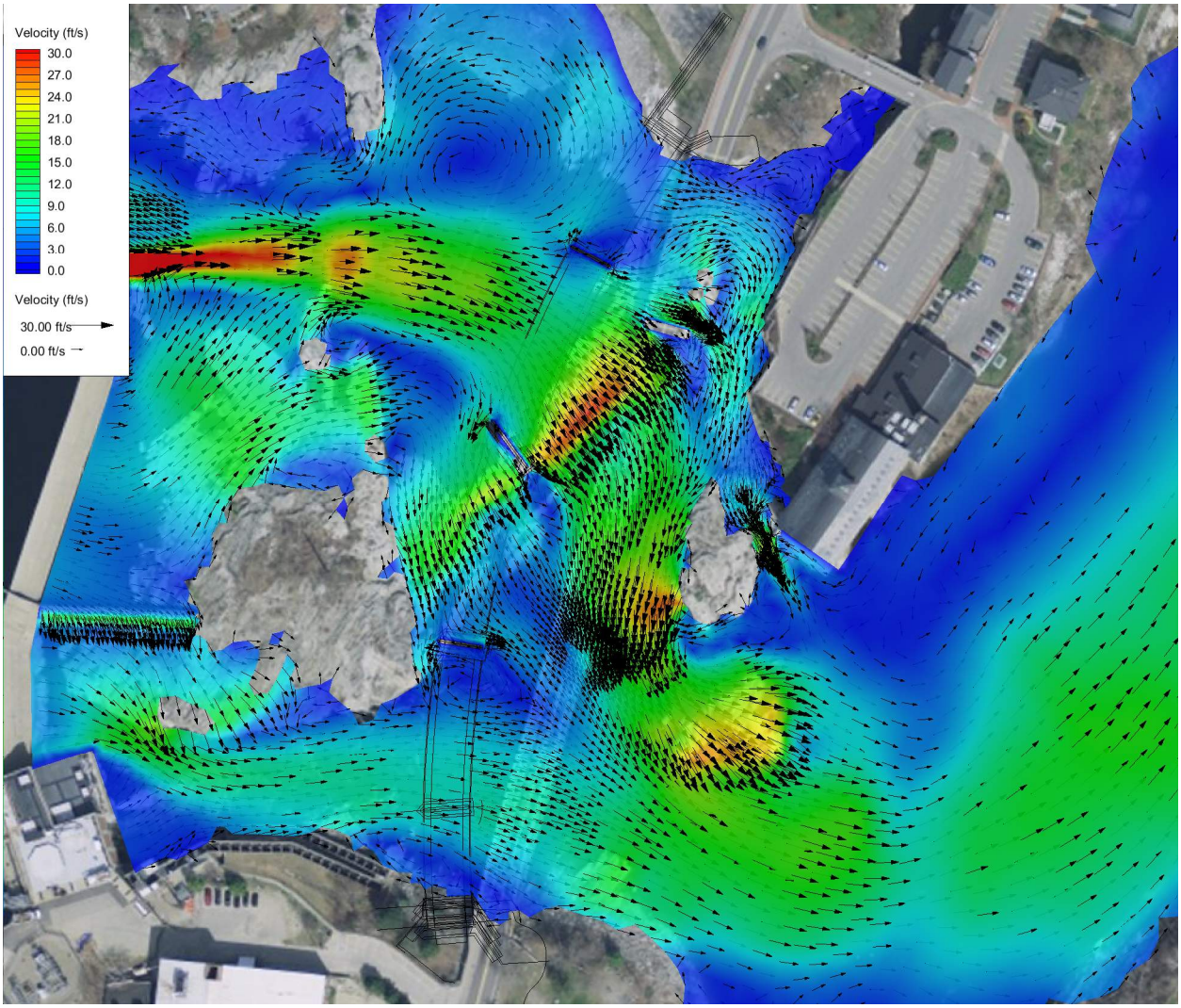
Q5 Event: Velocities



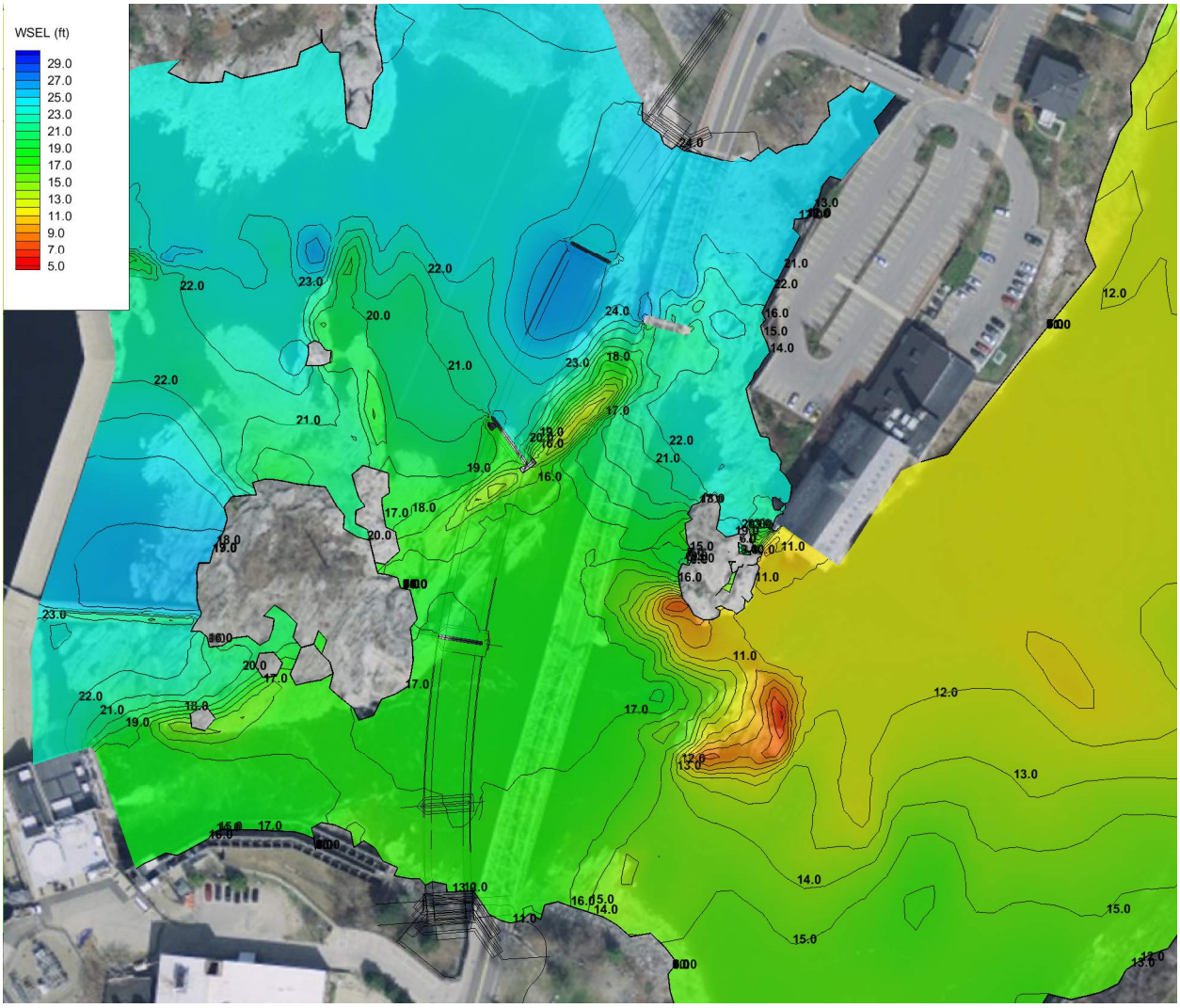
Q10 Event: Water Surface Elevations



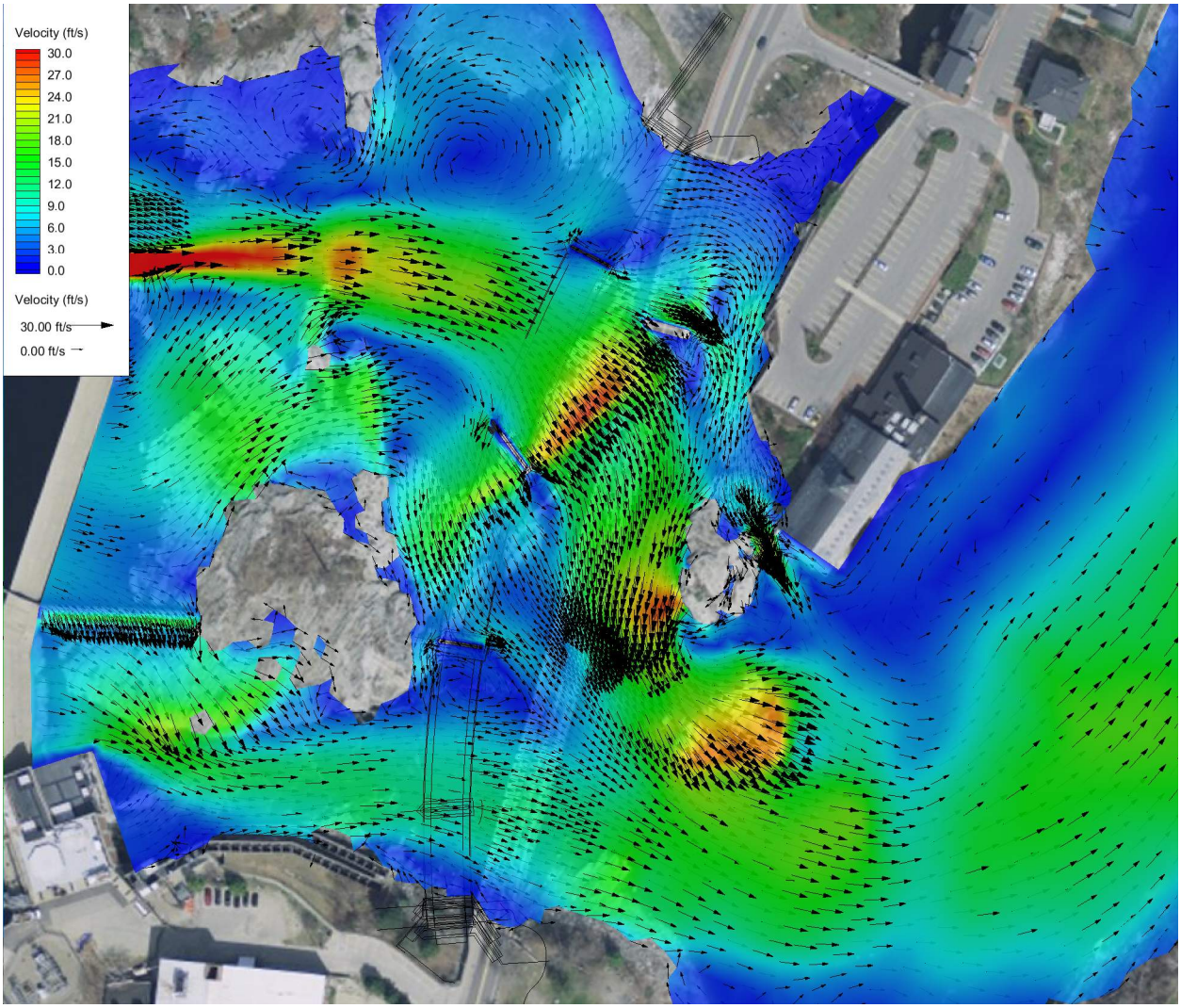
Q10 Event: Velocities



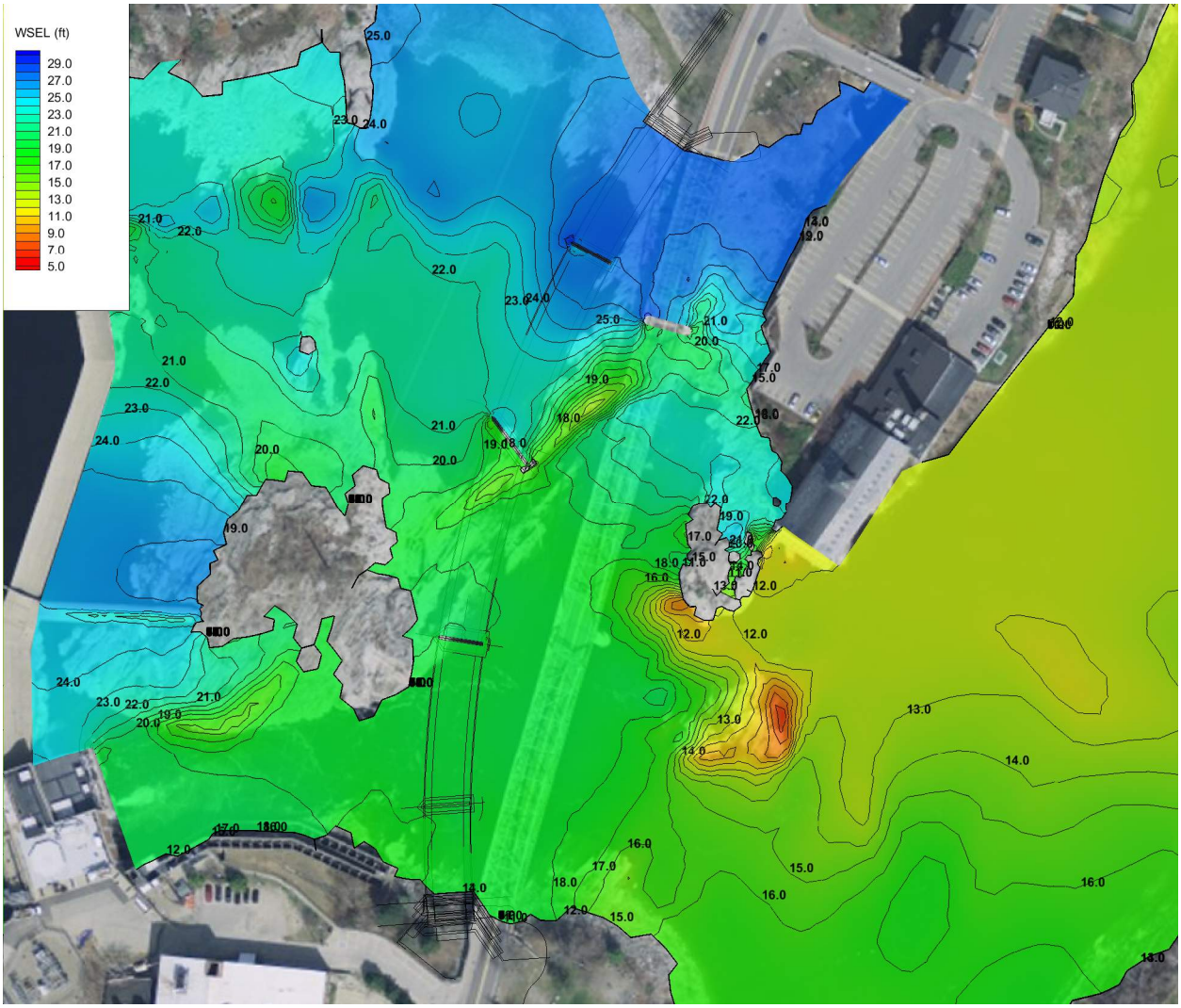
Q25 Event: Water Surface Elevations



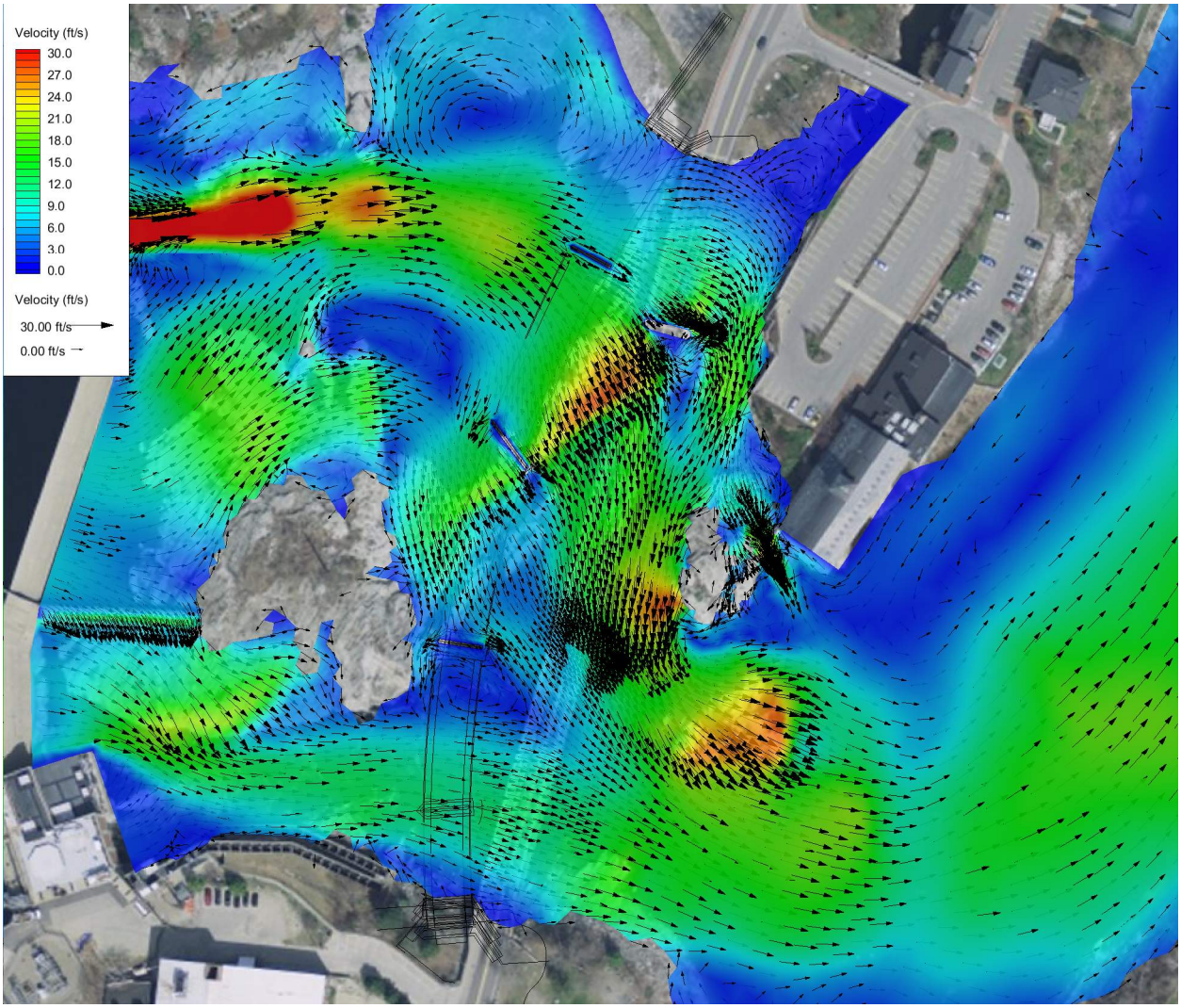
Q25 Event: Velocities



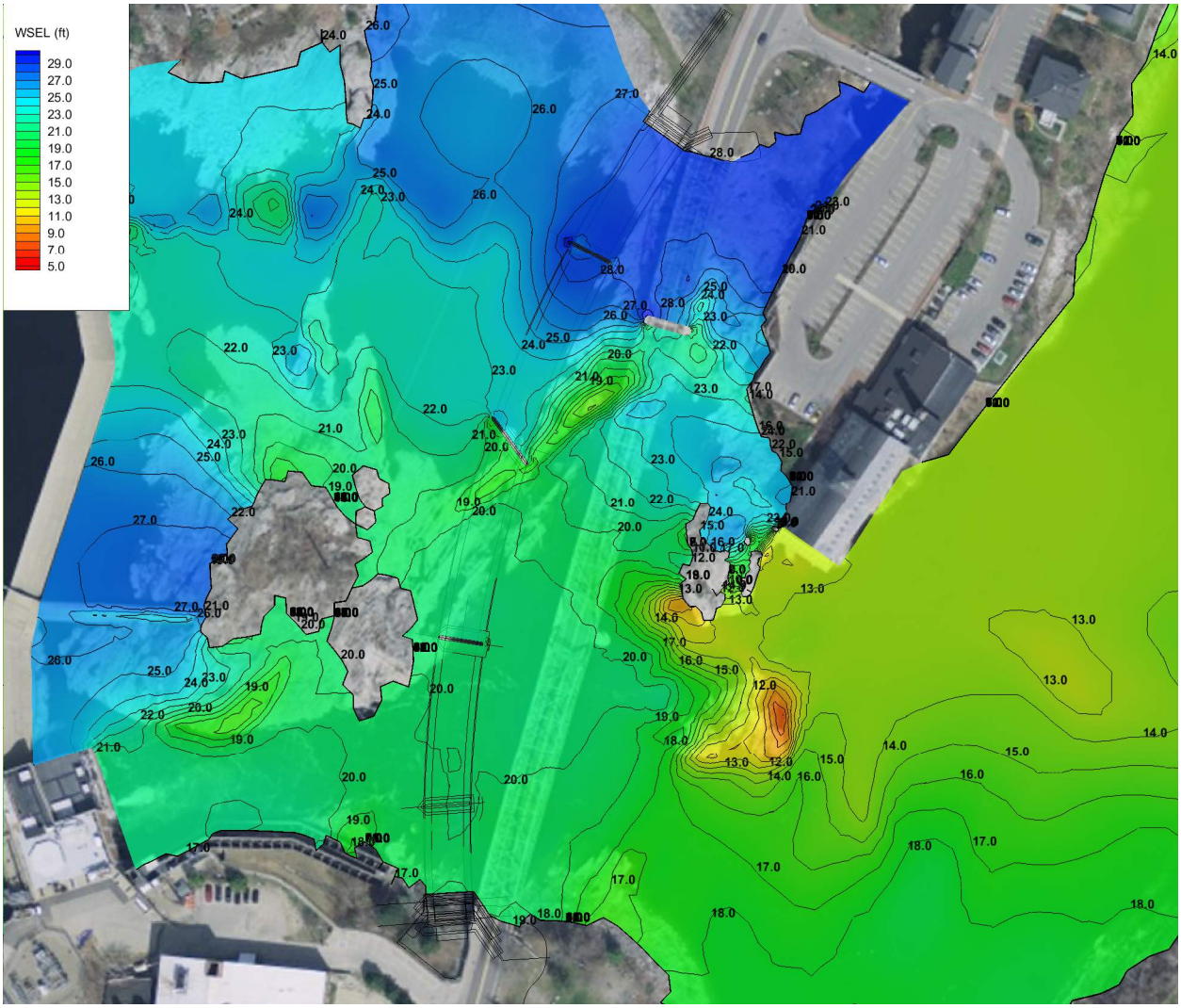
Q50 Event: Water Surface Elevations



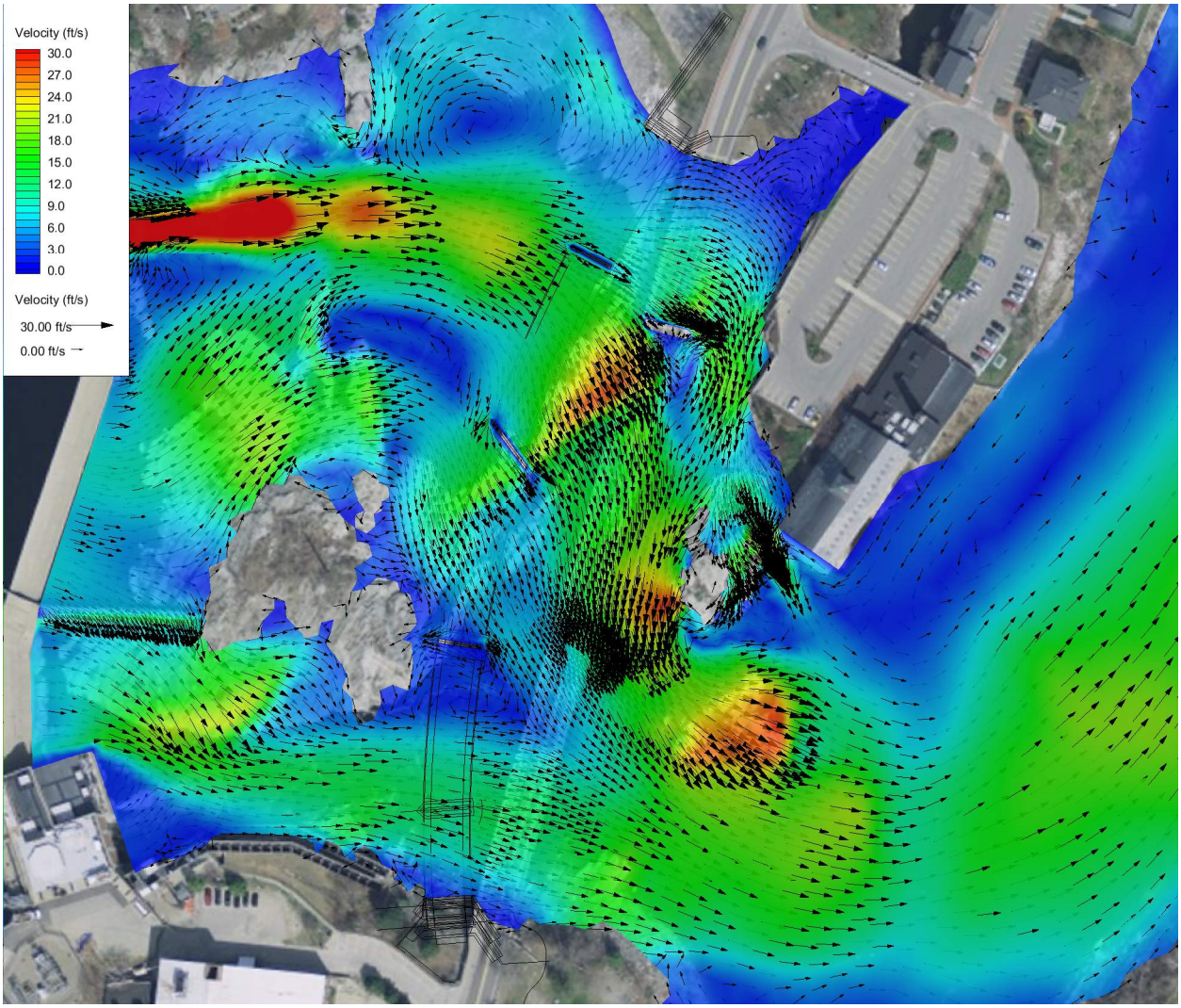
Q50 Event: Velocities



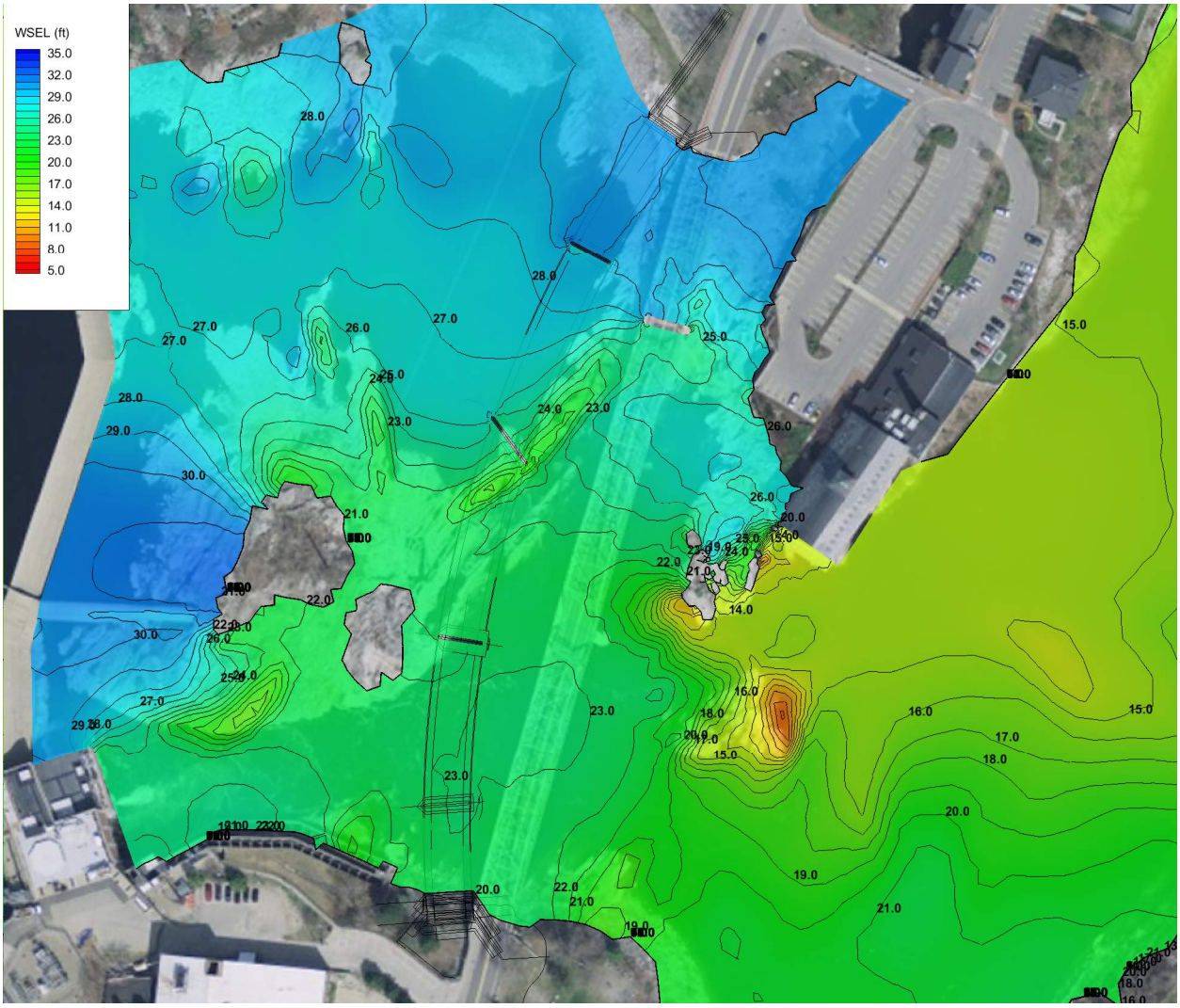
Q100 Event: Water Surface Elevations



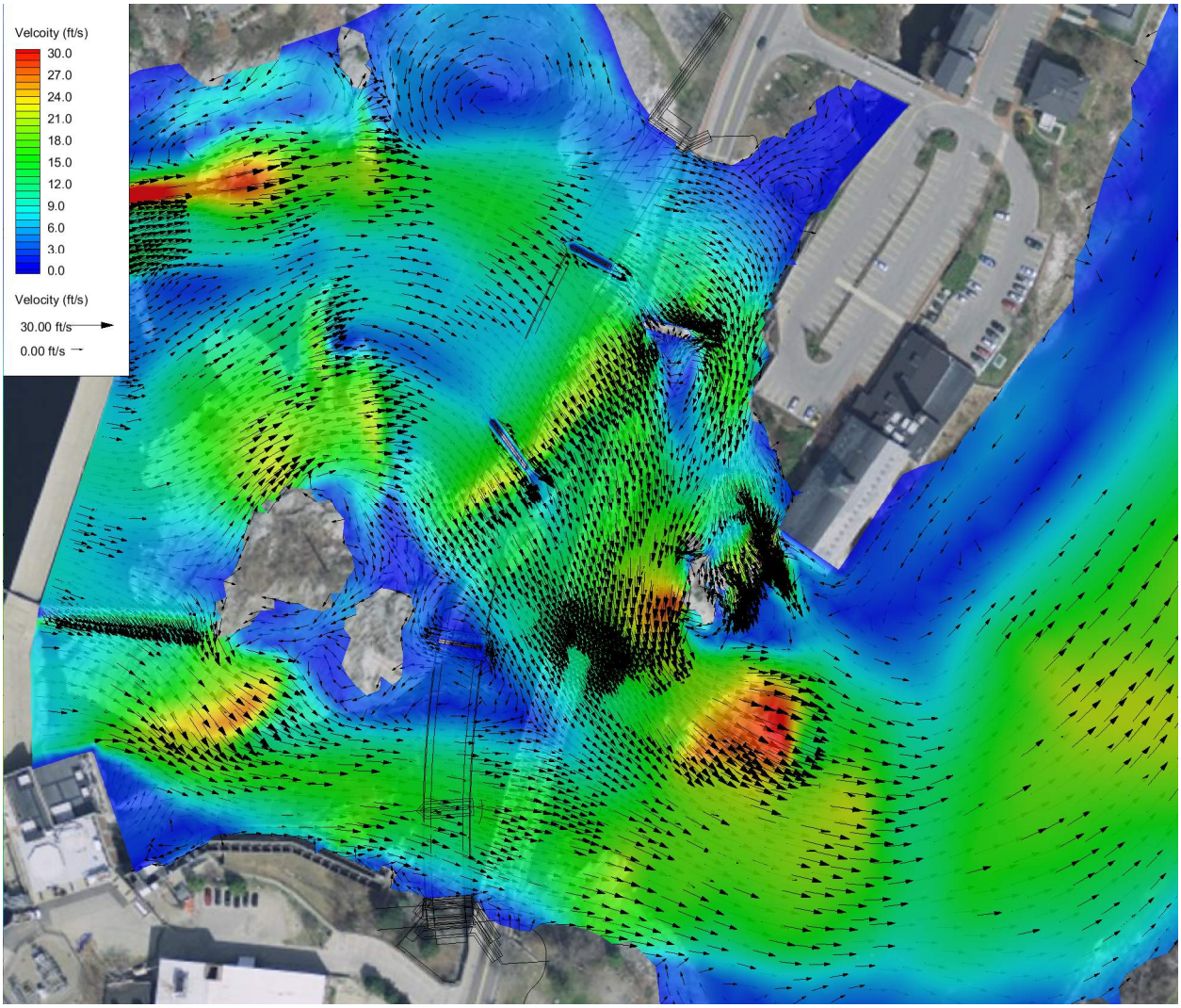
Q100 Event: Velocities



Q500 Event: Water Surface Elevations



Q500 Event: Velocities



Ordinary High Water

Ordinary High Water

Ordinary High Water

Ordinary High Water

Fish Ladder

Ordinary High Water

Ordinary High Water

Ordinary High Water

Ordinary High Water

Corner of Pejepscot Paper Company Mill

4+00

5+00

6+00

7+00

8+00

9+00

10+00

11+00

12+00

13+00

14+00