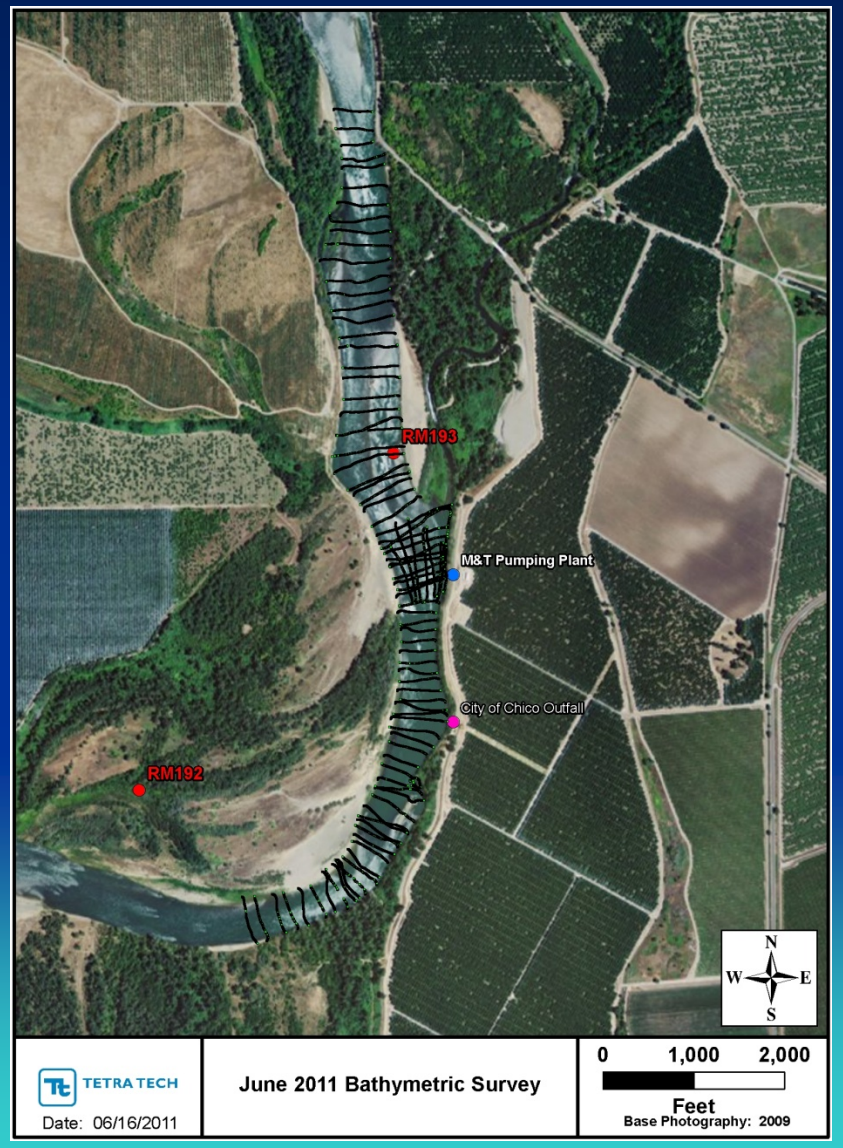
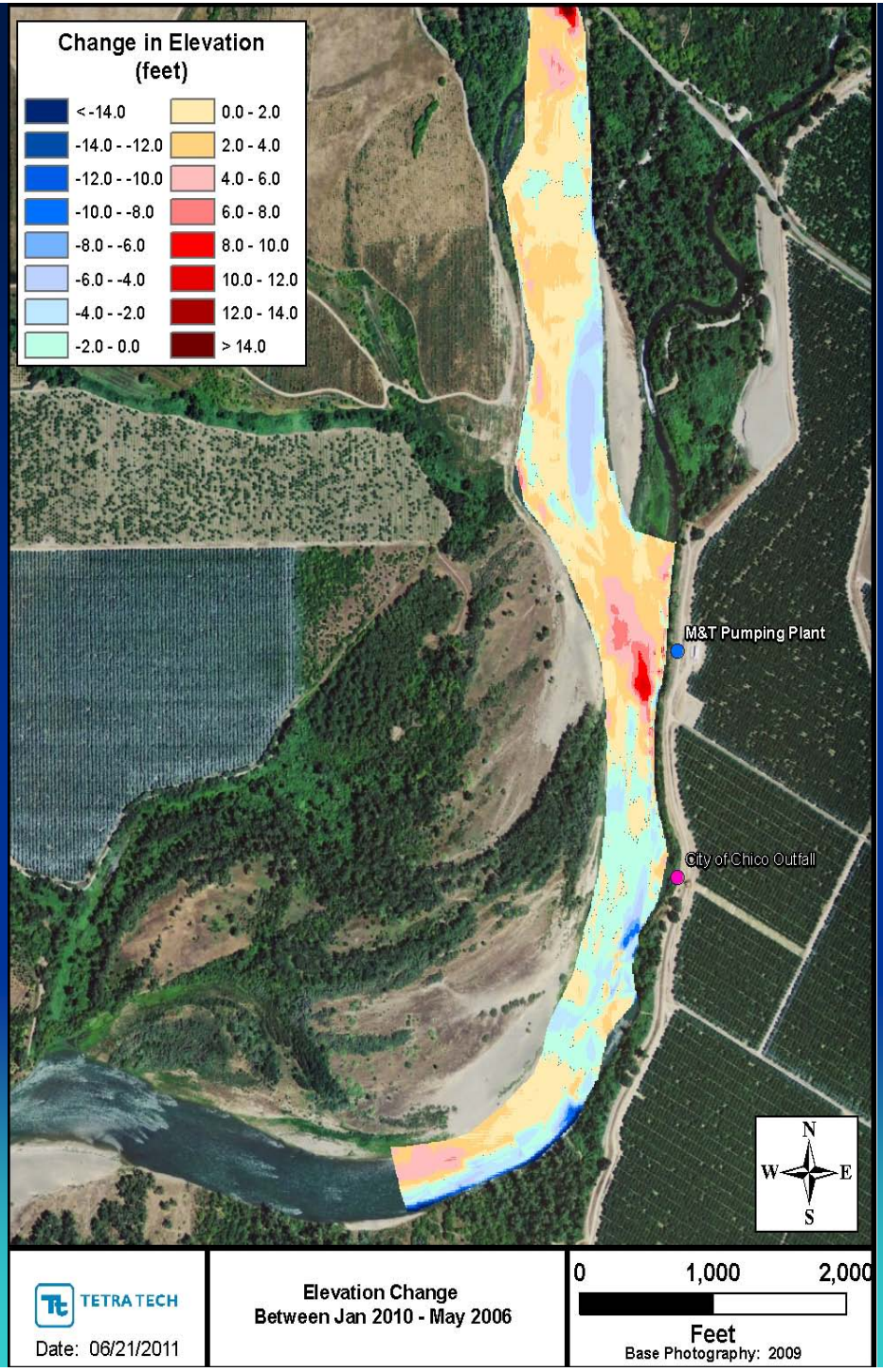
M&T/Llano Seco Fish Screen Short-term/Long-term Project Topographic & Bathymetric Surveys

Mike Harvey

Topographic & Bathymetric Surveys

December 2005
May 2006
January 2010
June 2011





Elevation changes in the M&T/Llano Seco reach between the January 2010 and May 2006 surveys

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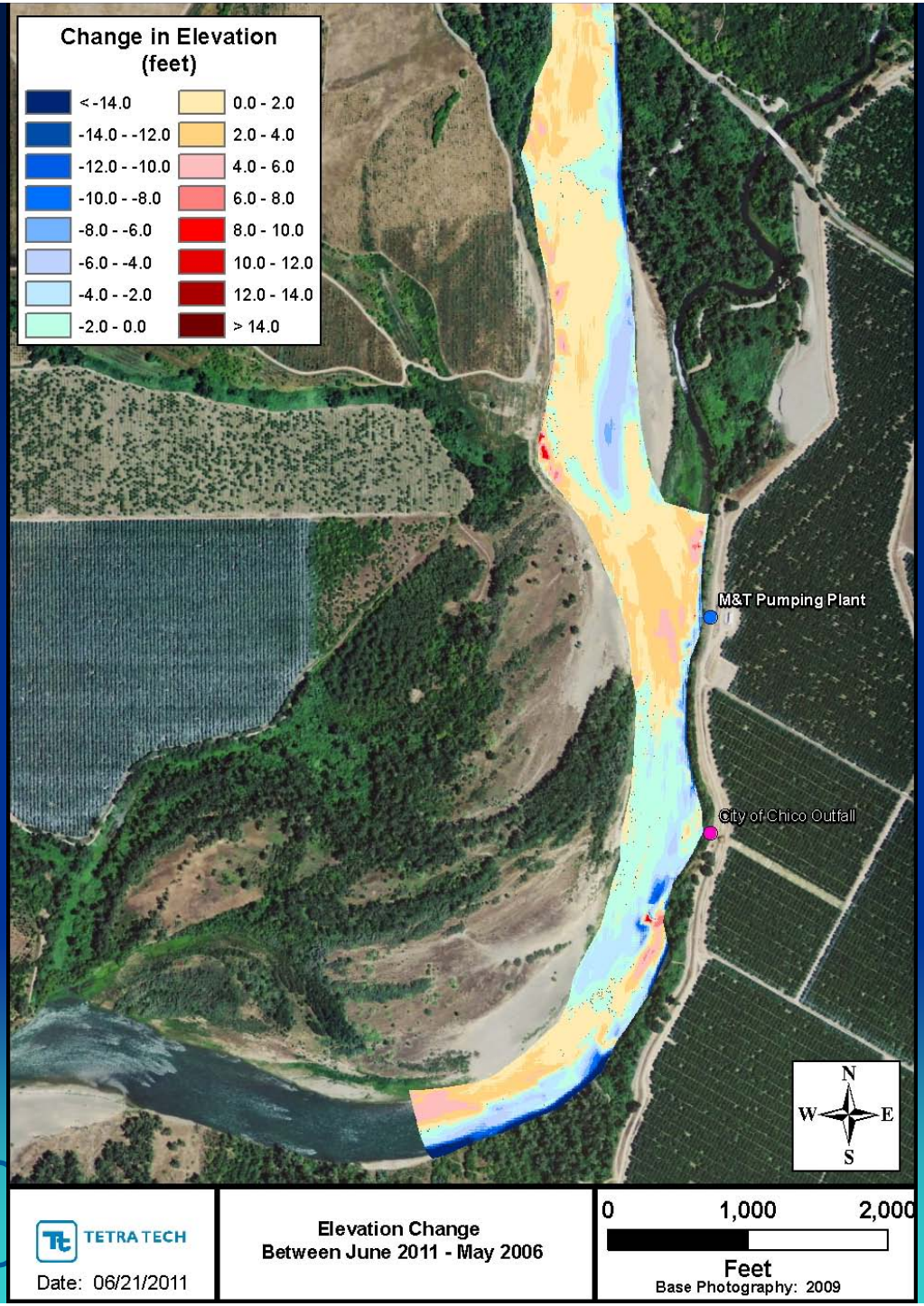

Elevation changes in the M&T/Llano Seco reach between the June 2011 and May 2006 surveys

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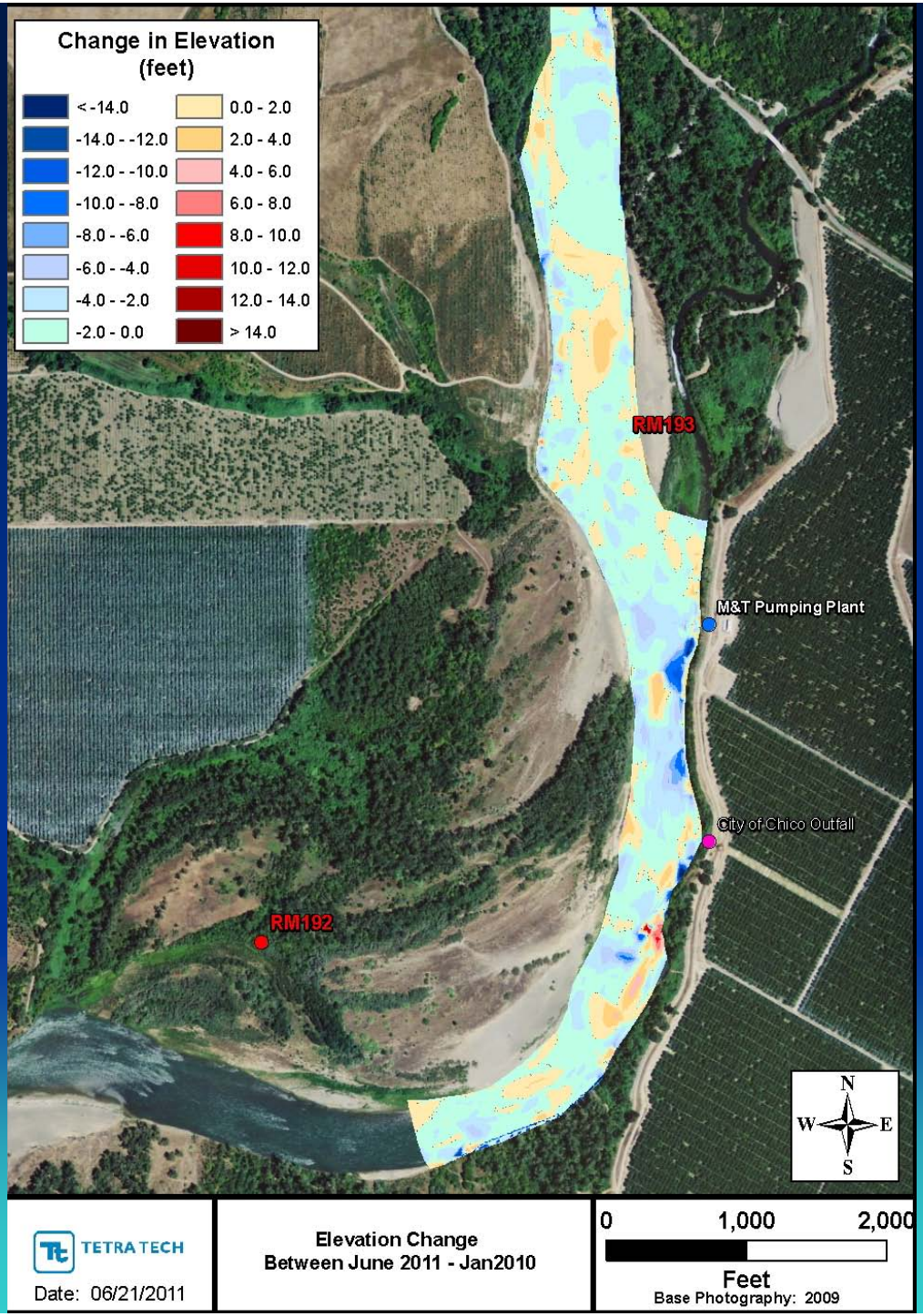

Elevation changes in the M&T/Llano Seco reach between the January 2010 and June 2011 surveys

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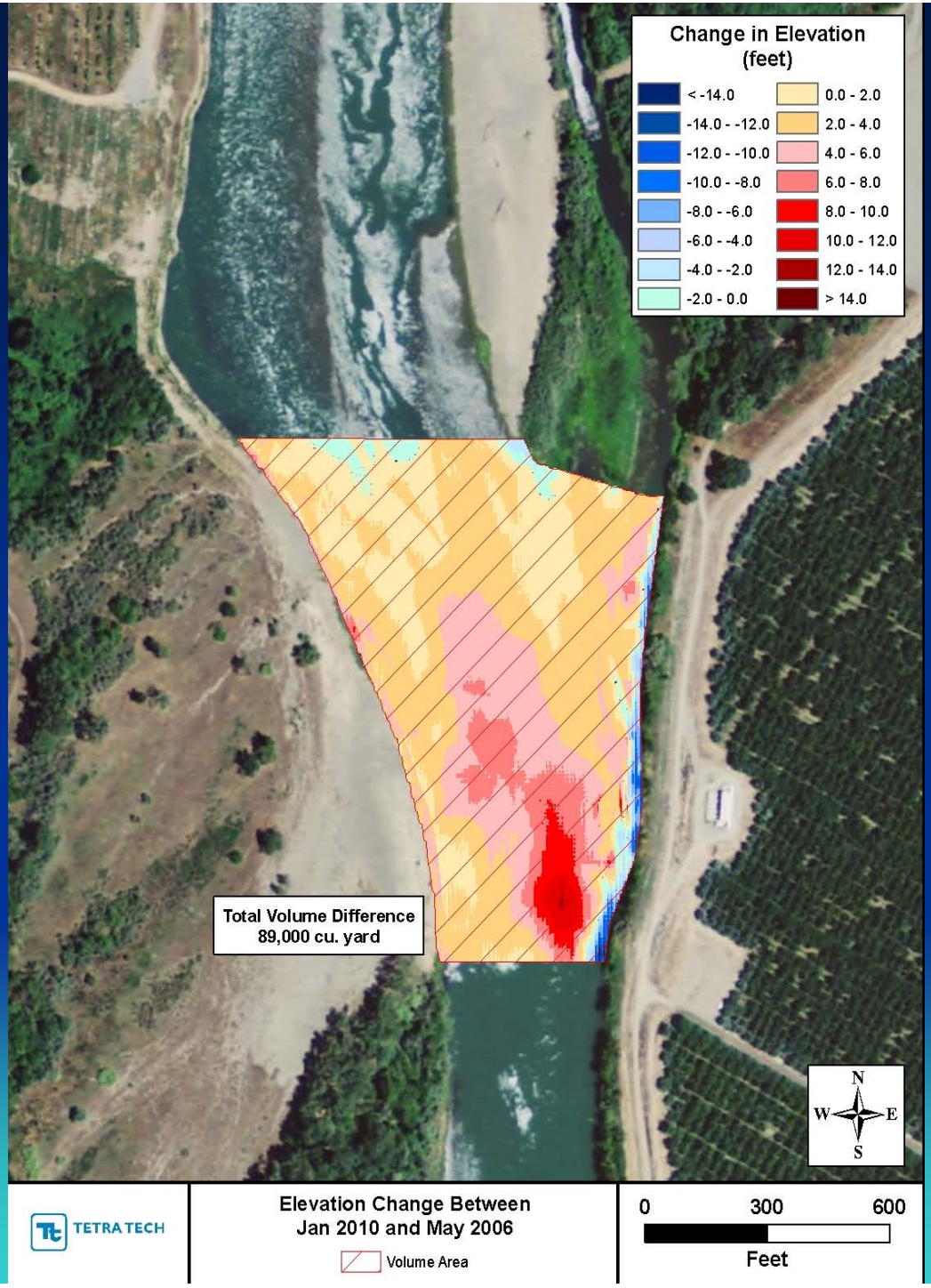
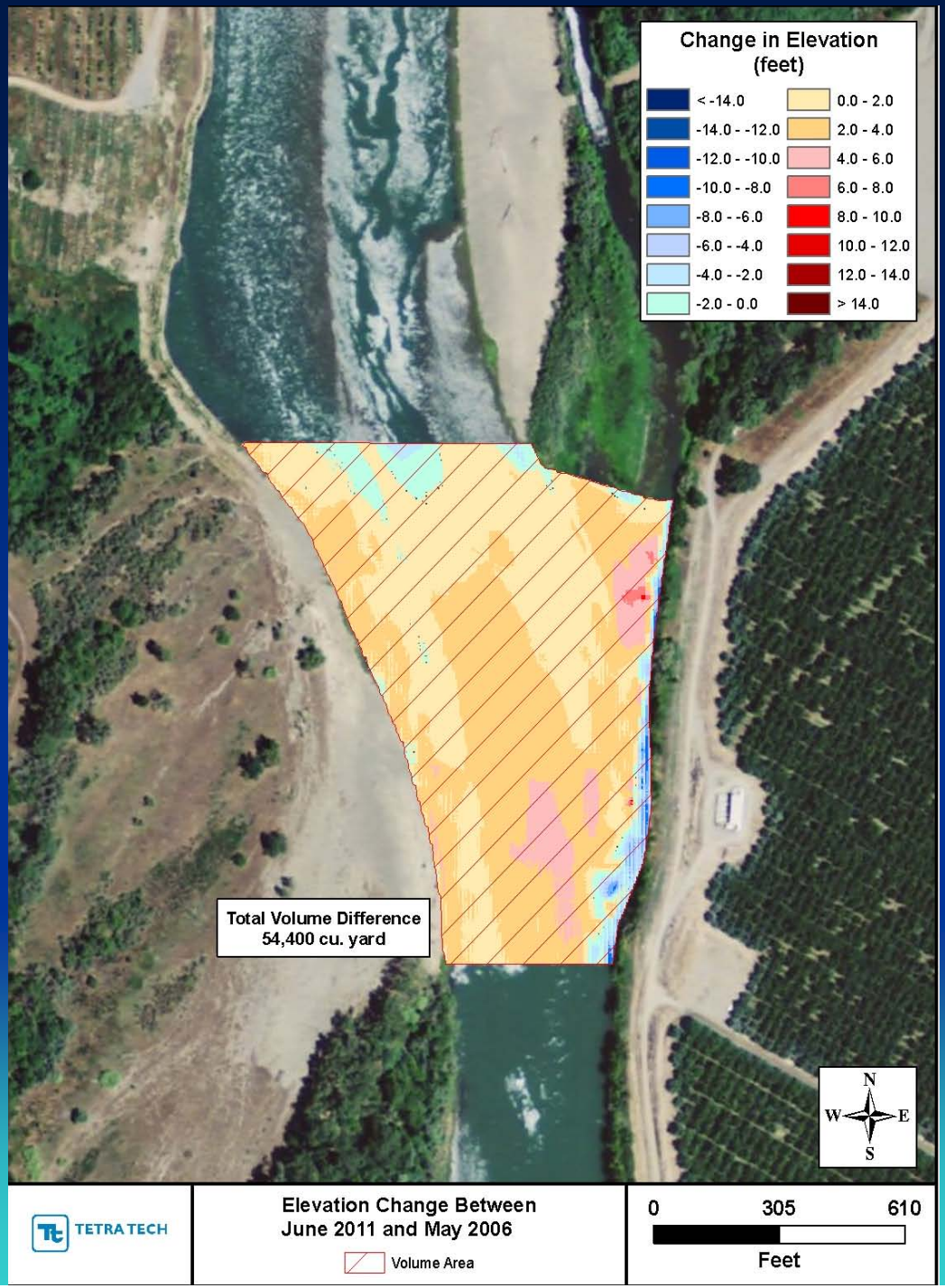


Volumetric calculation of the deposition in the 600 ft by 1200 ft segment in the vicinity of the fish screens and pump inlets between January 2010 and May 2006



Volumetric calculation of the deposition in the 600- by 1,200-foot segment in the vicinity of the fish screens and pump inlets between June 2011 and May 2006

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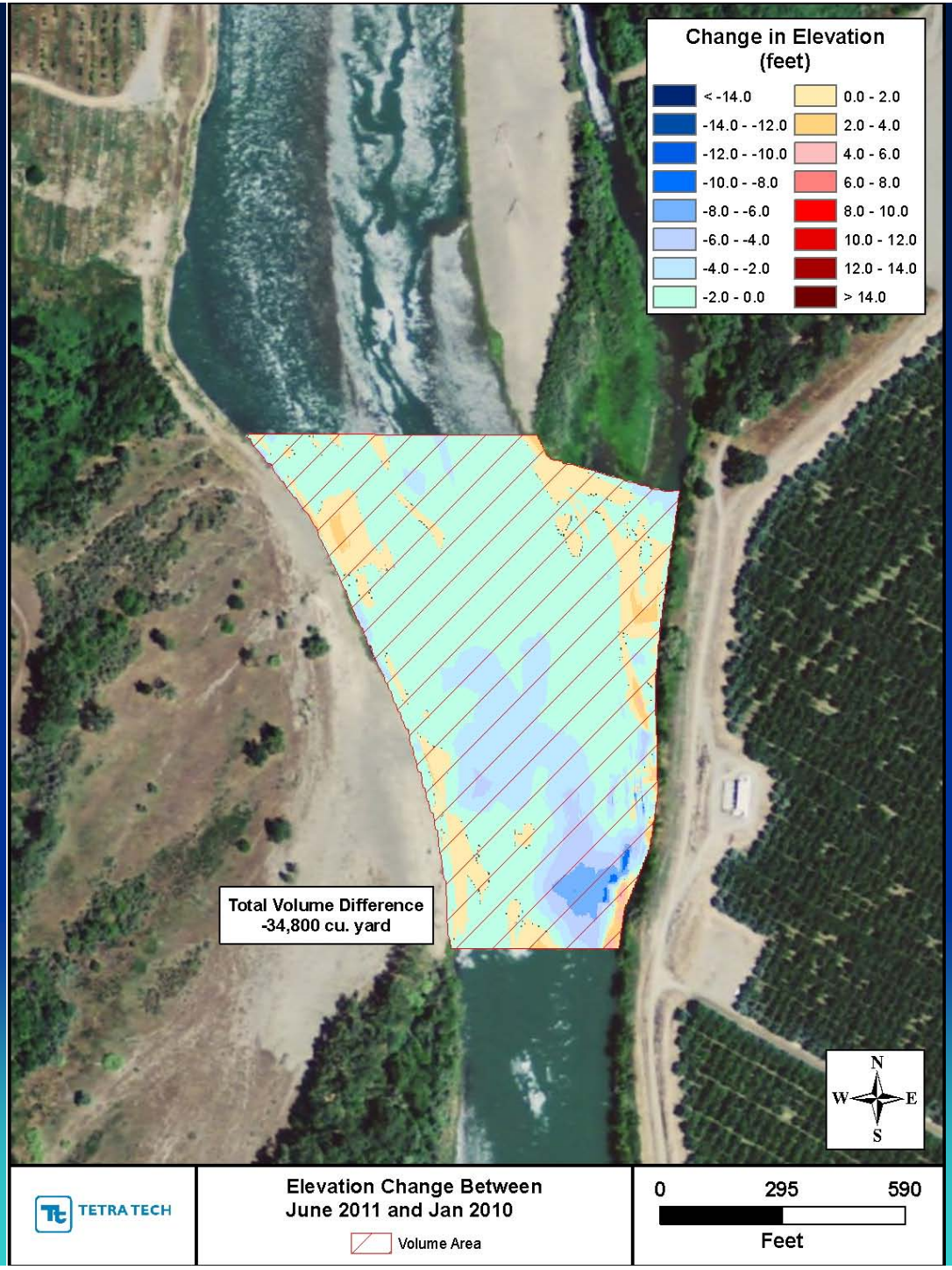


Volumetric calculation of the deposition in the 600- by 1,200-foot segment in the vicinity of the fish screens and pump inlets between January 2010 and June 2011

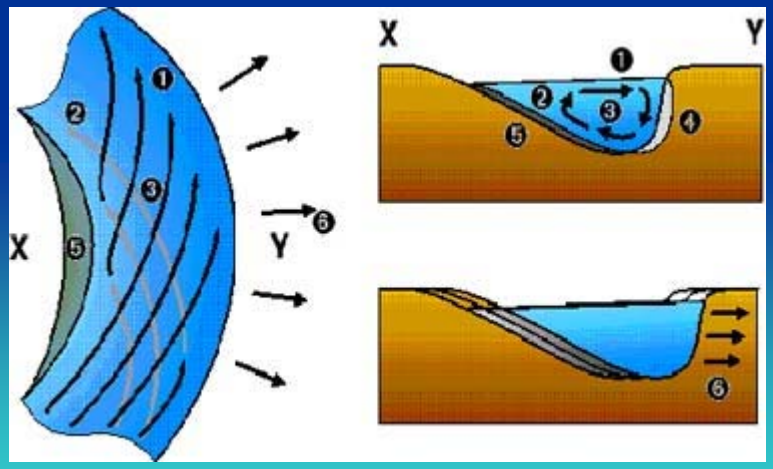
Potential "WET" Dredge Volumes

PERIOD	VOLUME (cu.yd)	TONNAGE (tons)
2010 - 2006	89,000	123,000
2011 - 2006	54,400	75,000
2011 - 2010	-34,600	-48,000

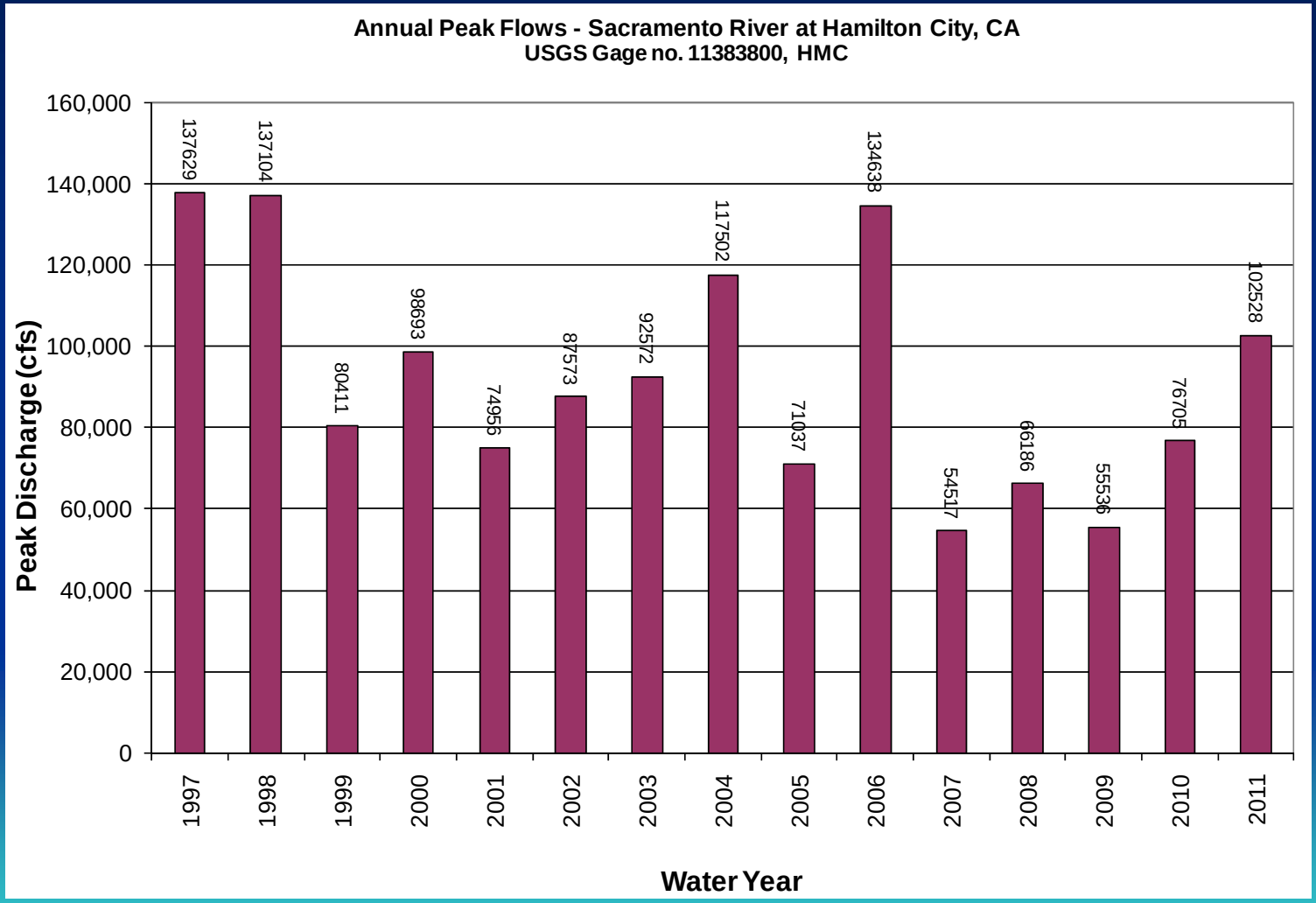
HYPOTHESIS

Cyclic behavior of the reach: During years with less than bankful peak flows the bar builds towards the fish screens and pump inlets. During years with greater than bankful flows the bar edge scours in the vicinity of the fish screens and pump inlets due to the development of a strong helical flow cell along the riprapped east bank.

Caveat: The existing channel geometry is required to maintain the oblique flow approach angle to the east bank.



Peak annual flows at the Hamilton City gage between WY1997 and WY2011



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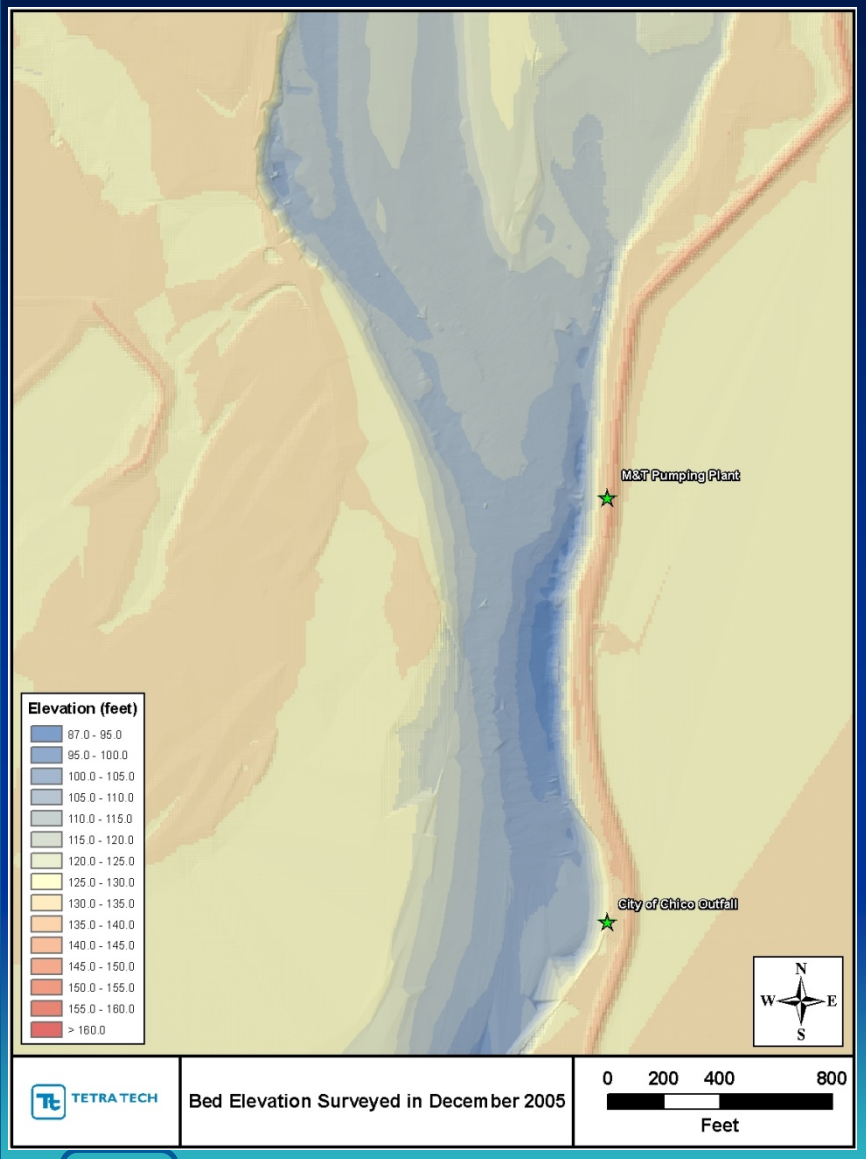
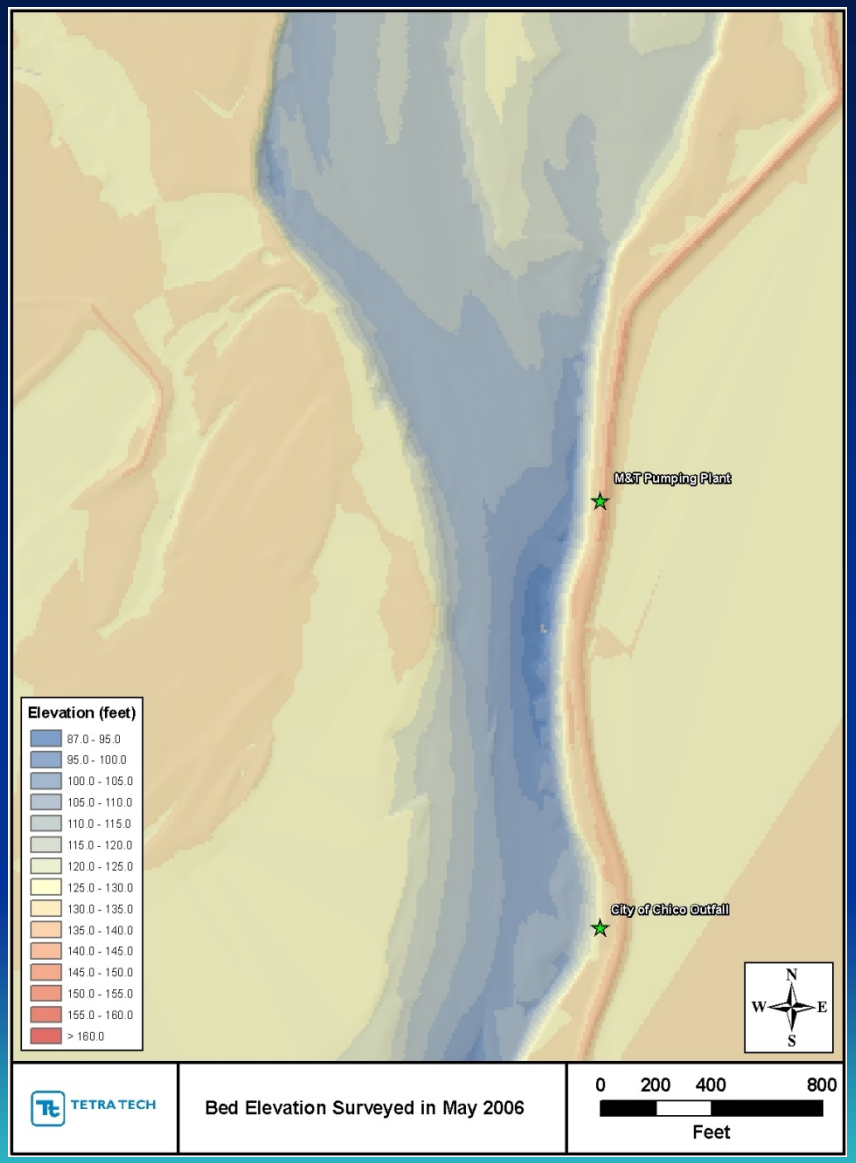
2005



2006



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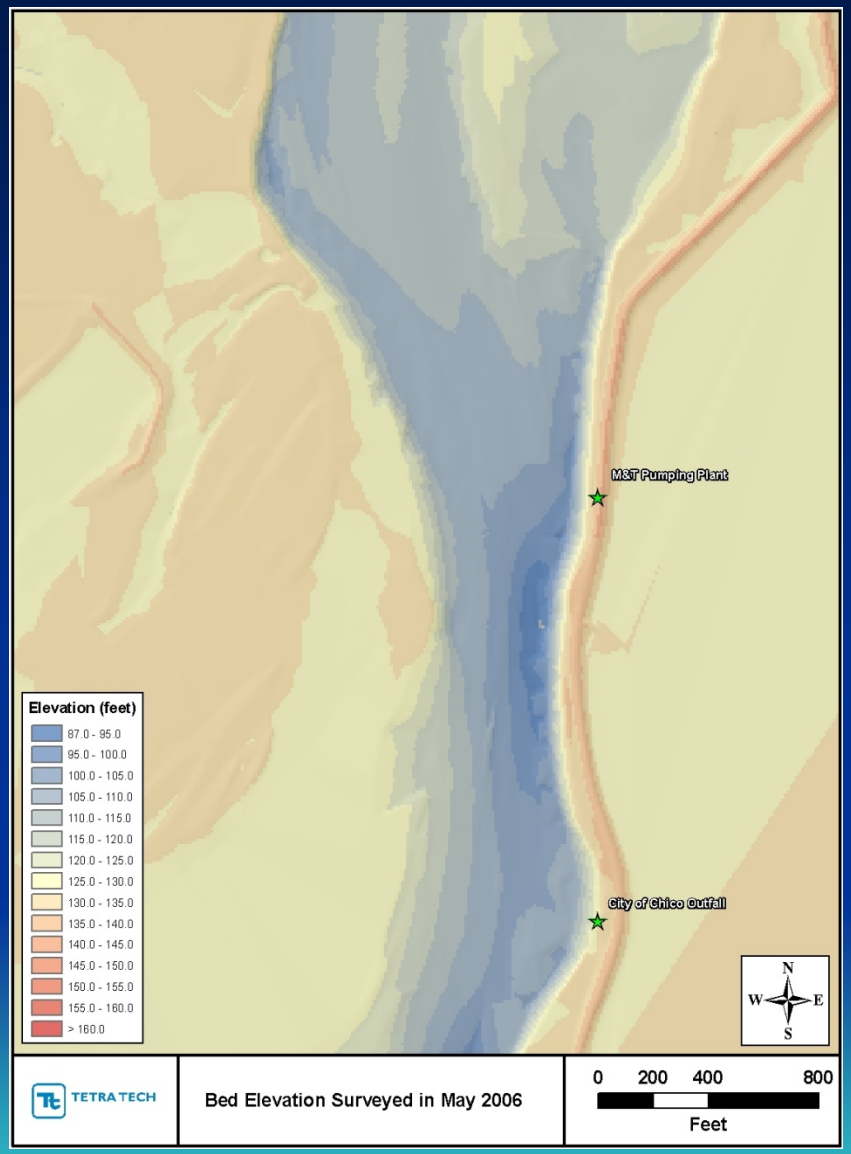
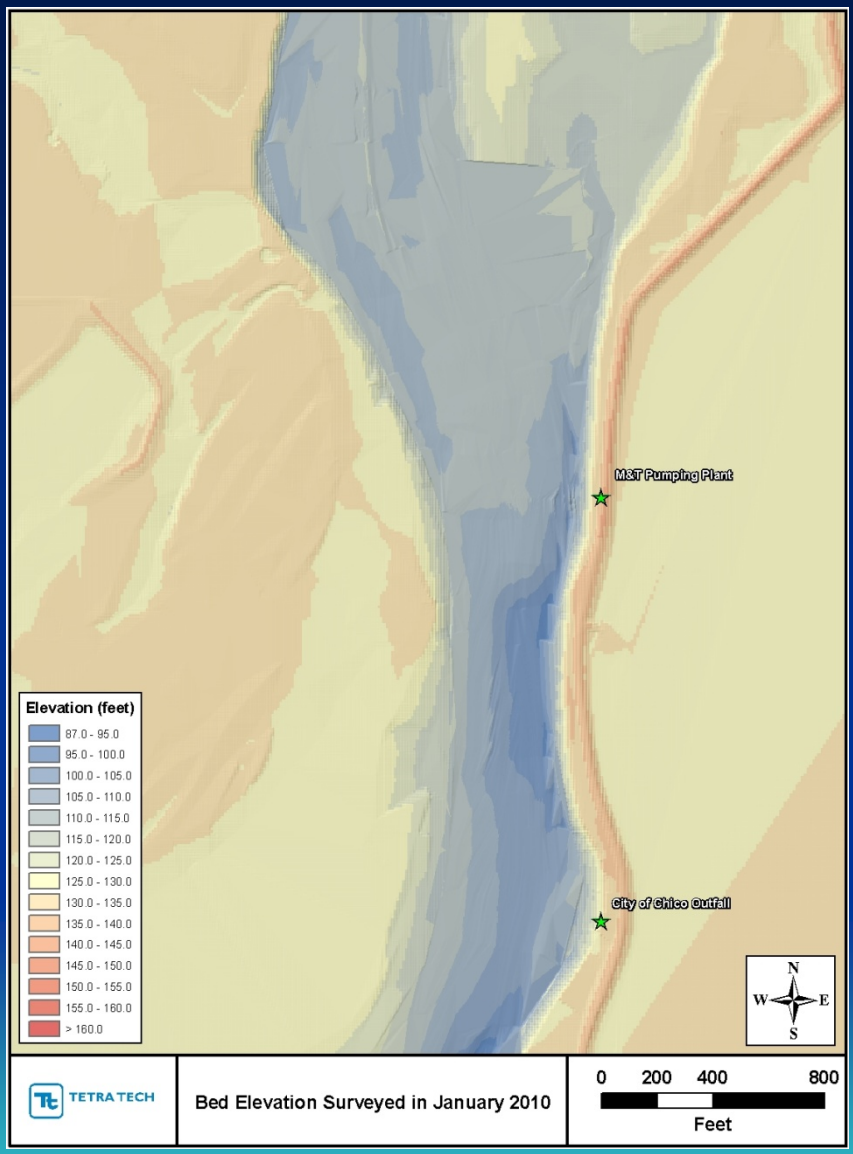
2006



2010



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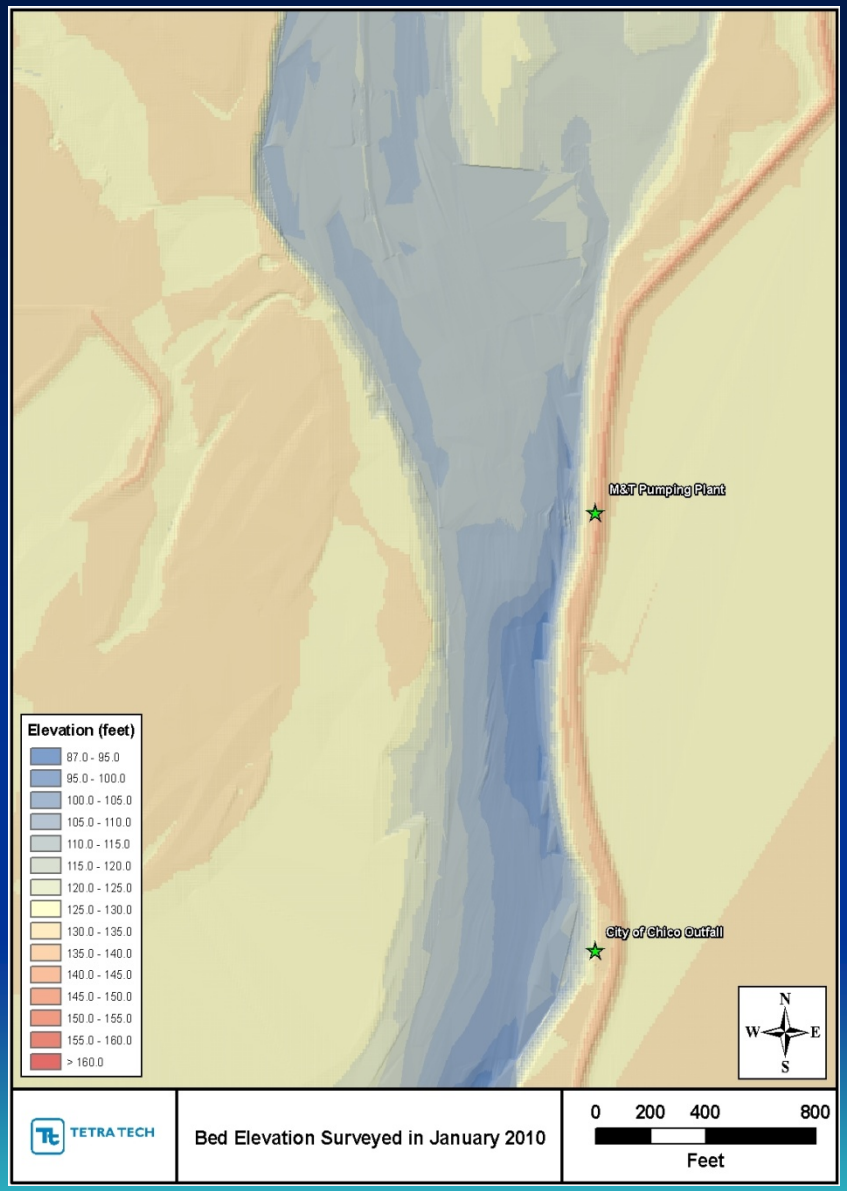
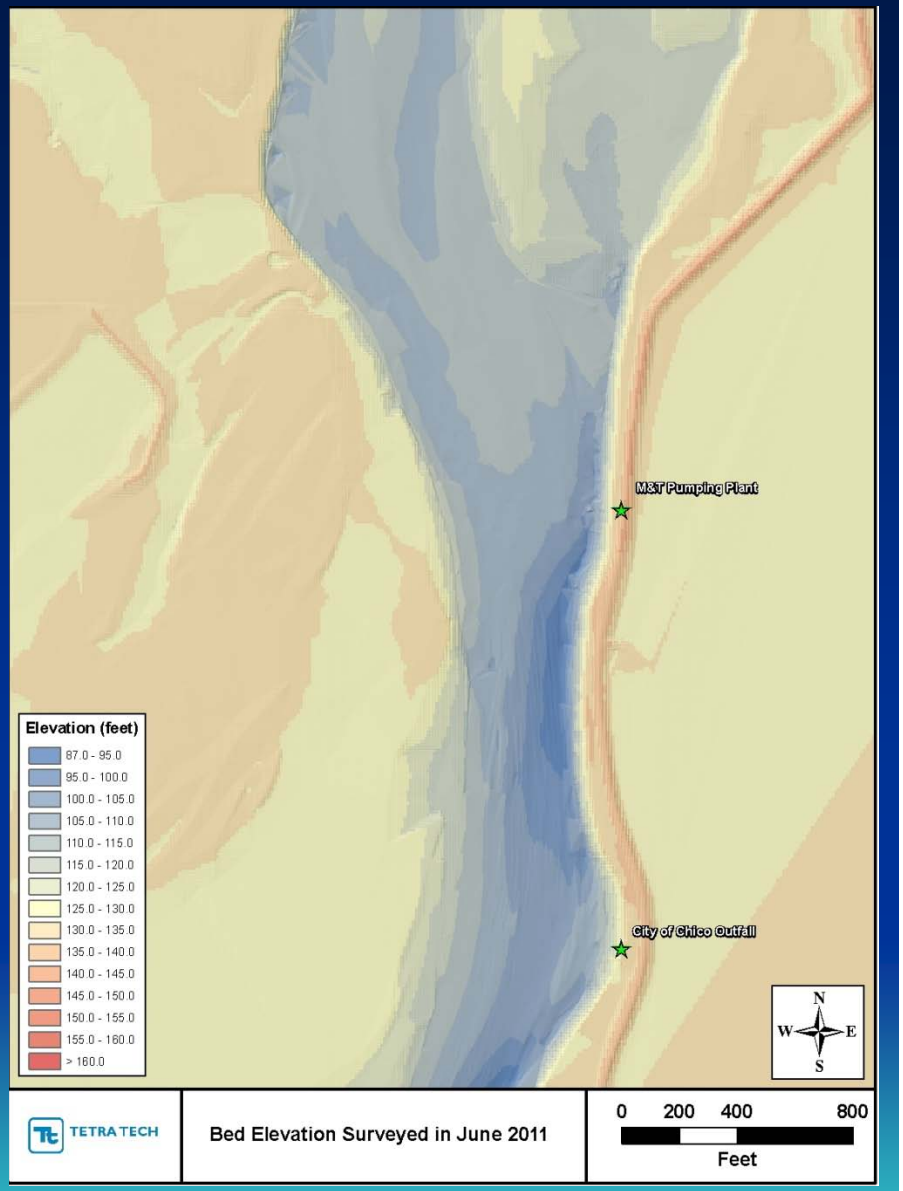
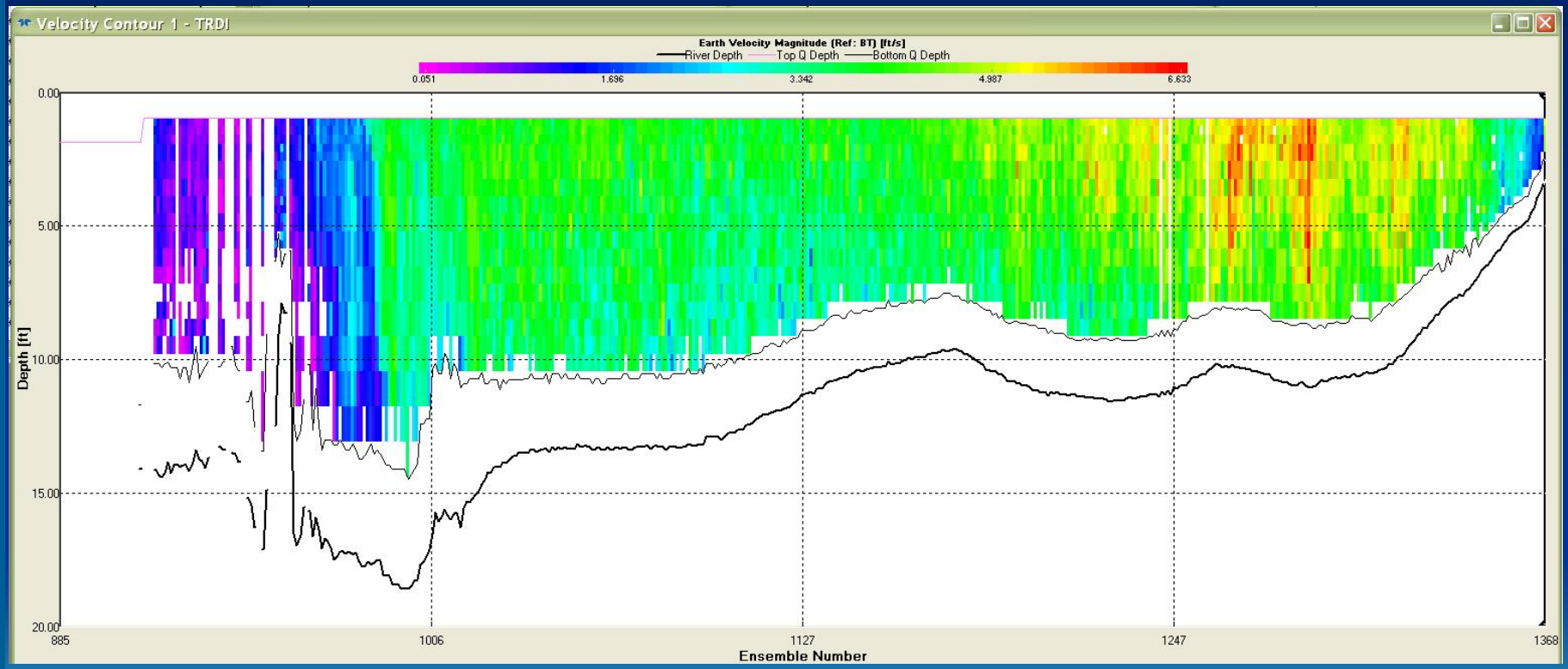
2010



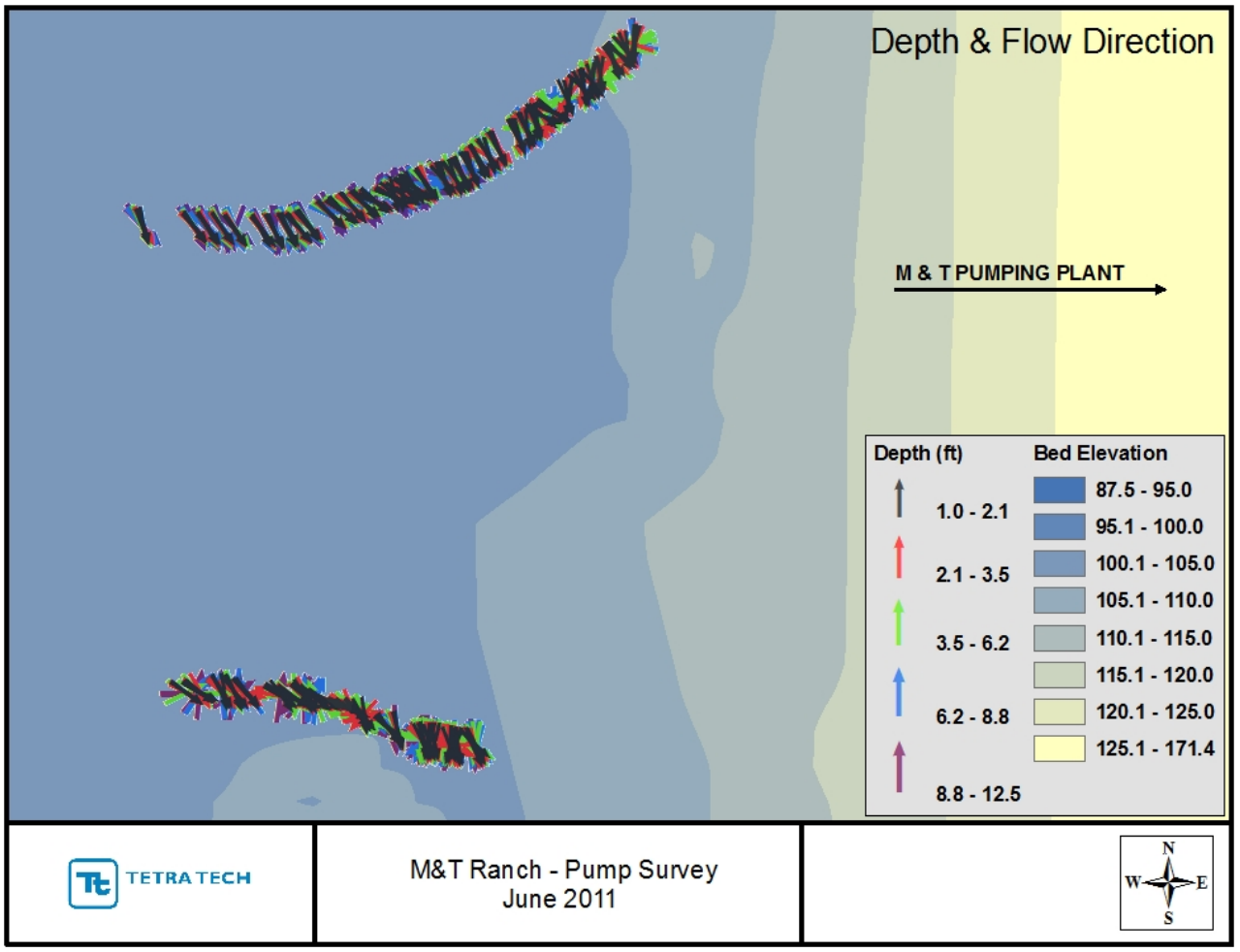
2011



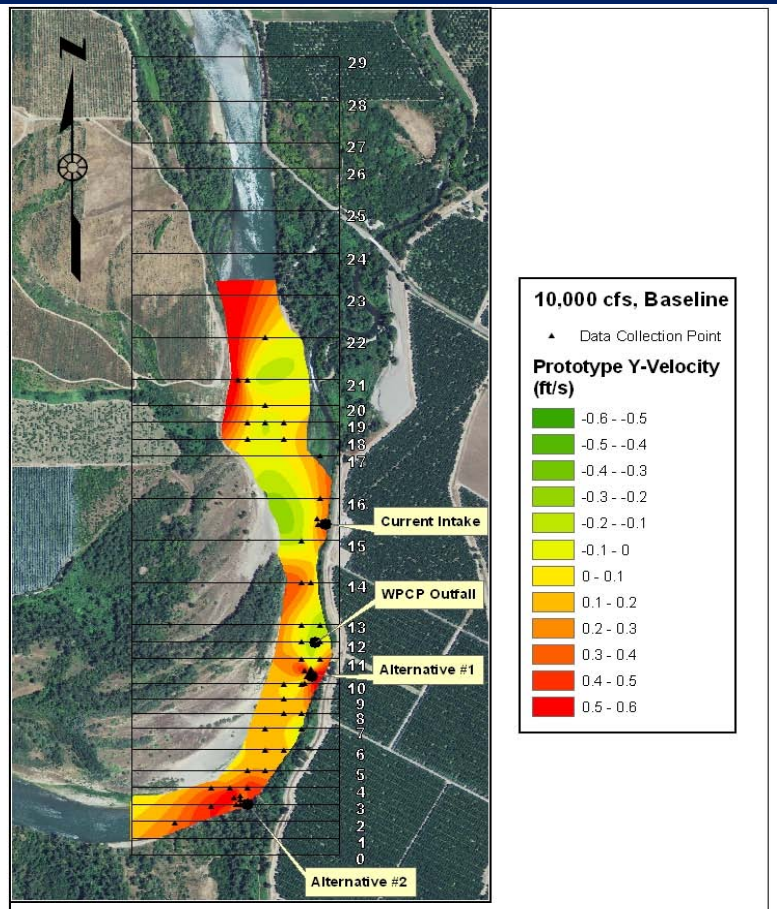
Velocity Profiles at ~ 18,000 cfs

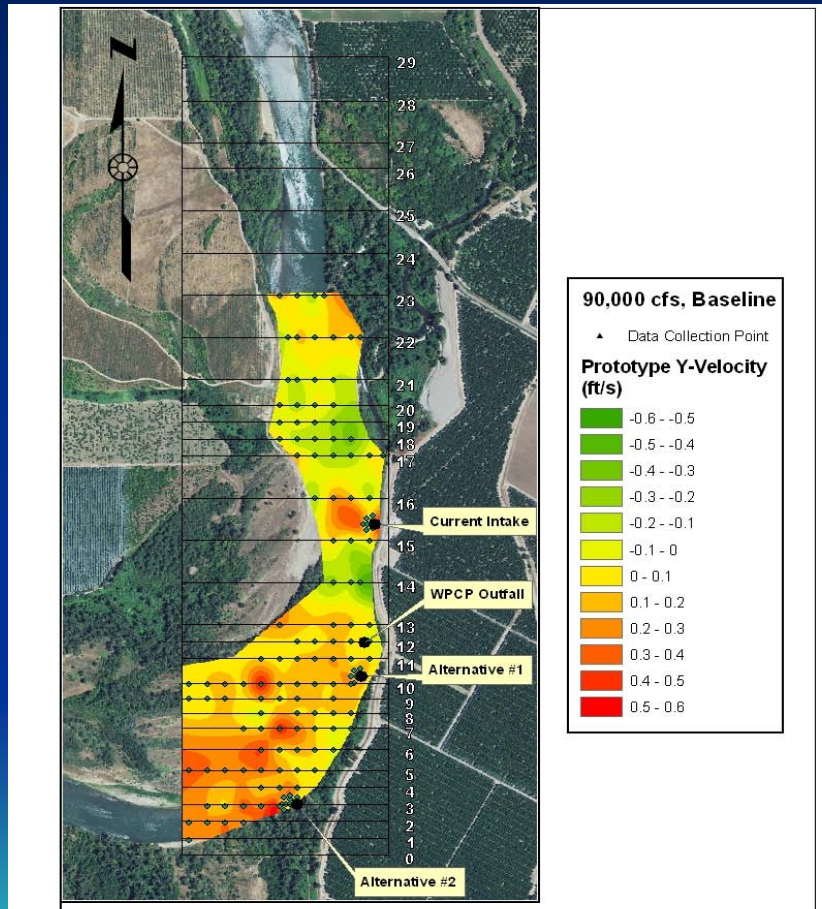


Resolved Velocity Vectors @ ~ 18,000 cfs



CSU Physical Model





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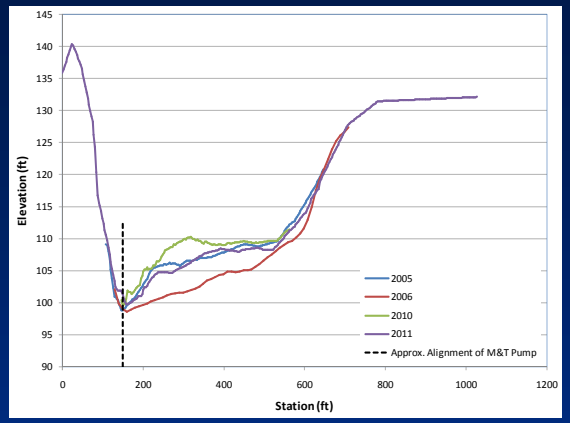
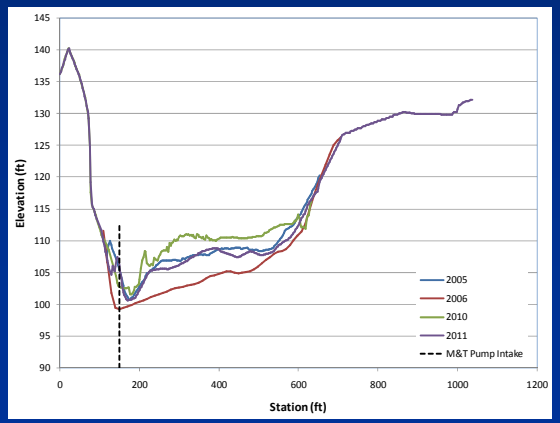
Comparative Cross Sections

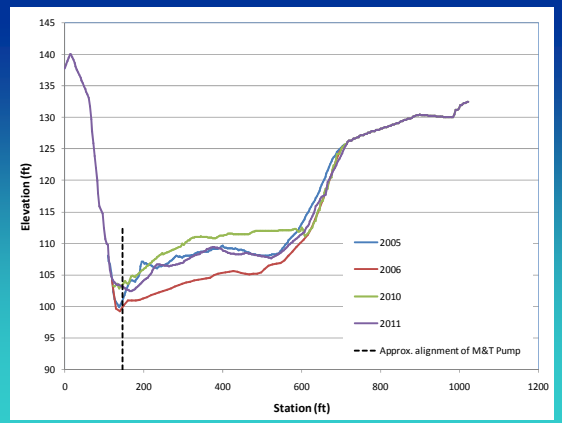
XS 3

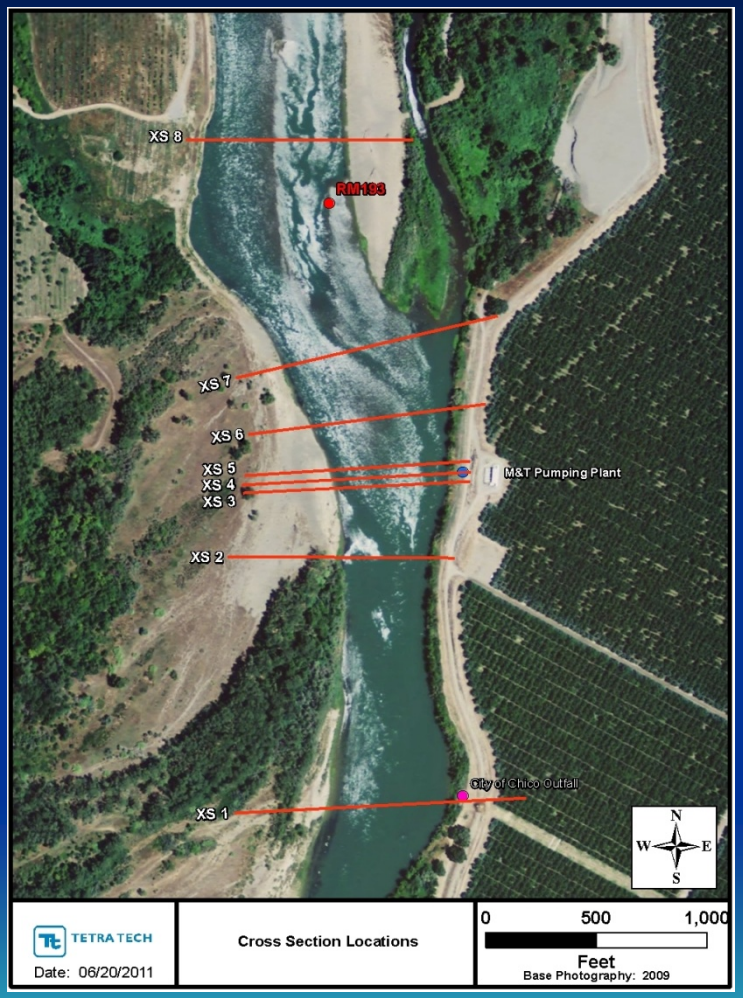


XS 4



XS 5





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Potential Alternative