

Use of Structures to Aid in the Creation of Emergent Sandbar Habitat

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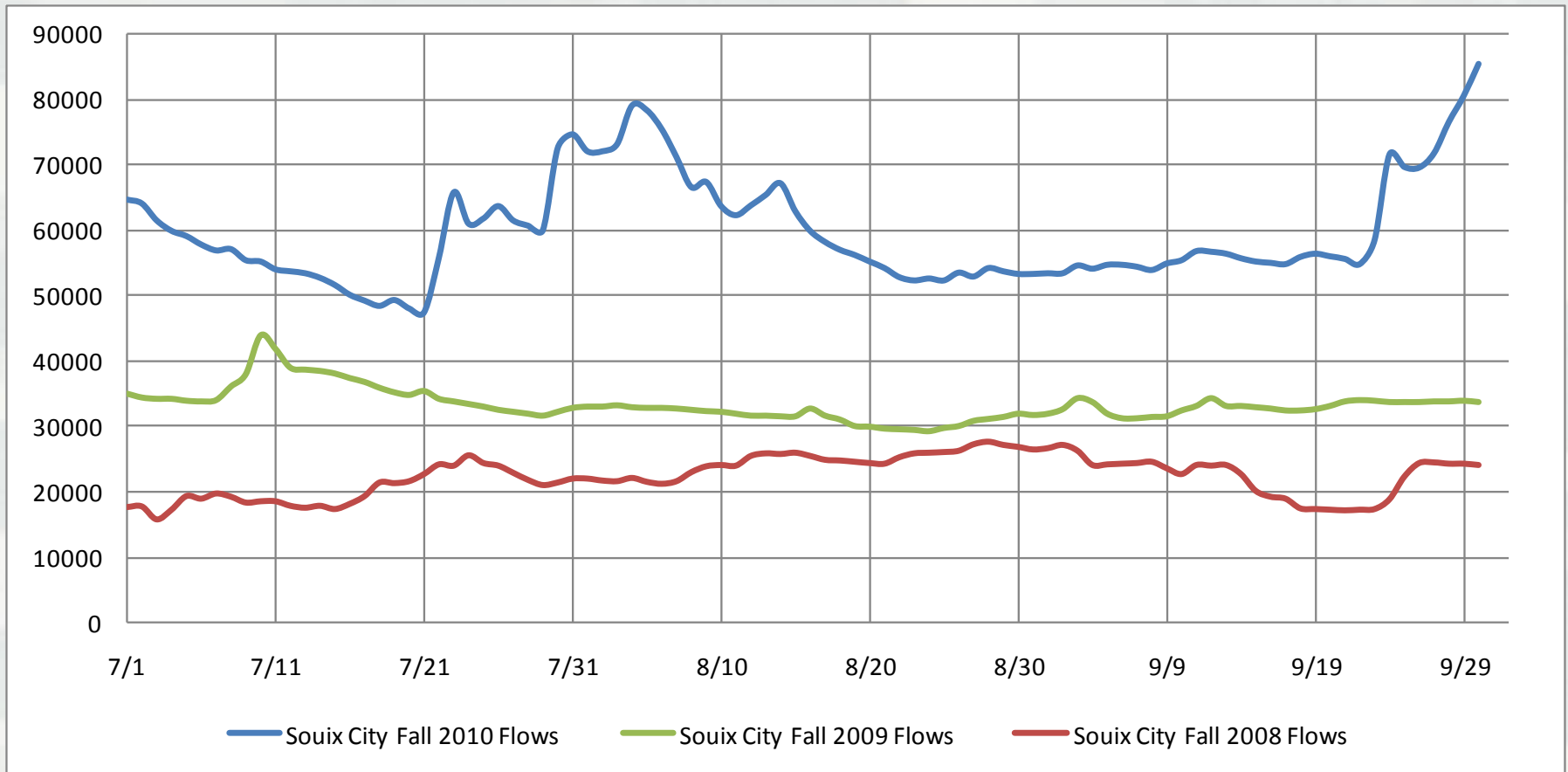
Timeline Overview

- *Spring 2010*: Plans developed for mechanical ESH construction at three sites below Gavins Point
- *June 2010*: Forecasts were pointing towards Fall 2010 flows being much higher than average
- *July 2010*: With flows prohibiting construction, Flow Obstruction Methods (FOM's) would be used to induce deposition and create sandbars using the high flows that would be experienced during the normal construction season
- *Late July – Aug 2010*: Plans and Specs advertised for 3 projects using selected method. Completion date of October 30, 2010 to take advantage of flows.



Missouri River Flows @ Souix City

Jun-Oct 2008-2010

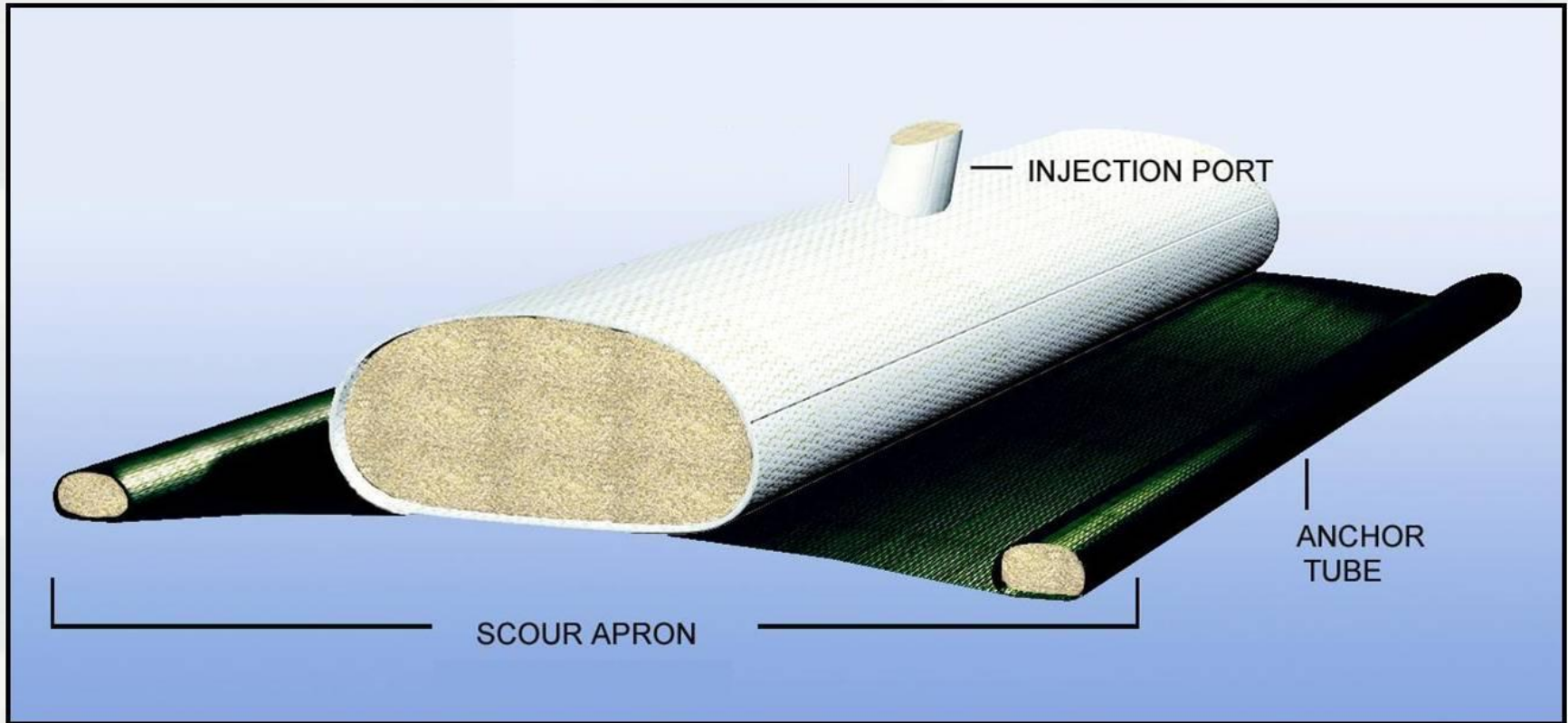


Alternatives Considered

- July 2010 development and design.
 - ▶ Goal: Develop quickly deployable, removable options within no expansion of impacts, present during high flows for minimum of 60 days.
- All alternatives use chevron/sill structures similar to those used to create SWH in nav channel
 - ▶ Sheetpile
 - *Issues with construction time, public safety, aesthetics, cost, structure stability in river*
 - ▶ Engineered Log Jams, Other Biodegradable Materials
 - *Issues with permitting, timeframe available for design*
 - ▶ Geotextile Tube Structures
 - *Unique application, constructability limitations*



Geotextile Tube Structures Overview



Typical Applications: Shoreline Jetties, Beach Protection/Rehabilitation, Soils Dewatering, Wetlands Protection/Rehabilitation.



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Overview Continued...

- 40' circumference tube supported by underlying scour mattress.
- Fillable by dredge through evenly spaced fill ports.
- Fill heights variable from 3 to 8 feet.
- Variable lengths (150' – 250' per tube for this project)





**Courtesy of Dakota Aerials*





Deployment at RM 789.6

Construction Experience

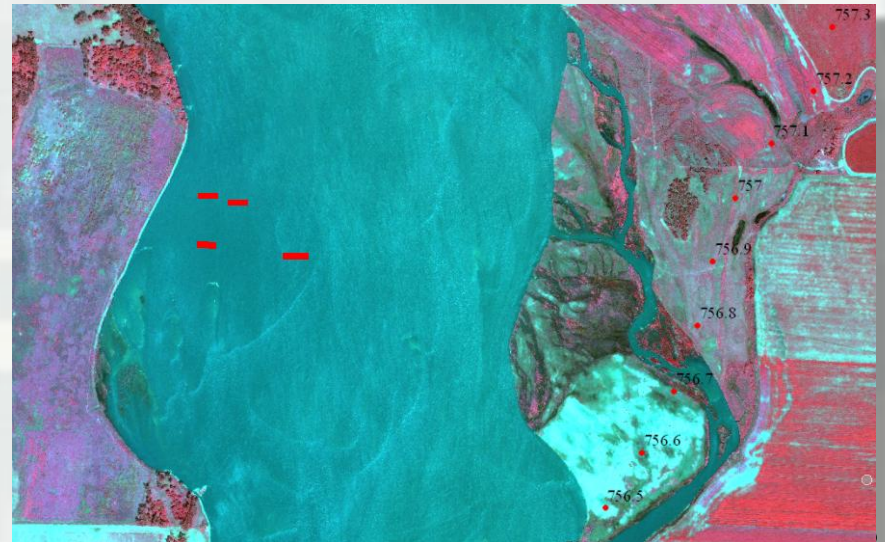
- Depths at time of construction had changed since pre-construction surveys.
- Construction equipment could not operate freely in depths <3.5'.
- Straps on tubes were subject to failure in depths generally >5'.
- Scour around installed tubes prohibited installation tubes in adjacent configurations.
- Two 200' tubes installed before contractor was instructed to proceed to next site.
- Mid September thru Early October



Deployment at RM 757.7

Construction Experience

- Insufficient Depths and Vegetation required relocation of tubes
- Depths and Velocities ideal for placement after experiences at 789.6
- With ideal conditions, still experienced failure of tubes during installation.
- High winds and inclement weather delayed deployment
- Construction halted after installation of four tubes due to safety and schedule concerns. (October 21, 2010)
- Project at RM 759 modified to dredging, which resulted in 5 to 10 acres of habitat created.



Future Activities

- Removal
 - ▶ Scheduled for Fall 2011
 - ▶ Removal will be difficult if high flows persist thru 2011
- Evaluation of Performance
 - ▶ Sites will be surveyed in Spring 2011
 - ▶ Evaluation will look at acres created, habitat elevations, and cost effectiveness.
- Further Study of Flow Obstruction Methods (Fall 2011)
 - ▶ Further Evaluation of alternative structures
 - Engineered Log Jams, Hay Bale Structures, Geotextile Tubes, Steel Sheetpile, other temporary structures
 - Evaluating effectiveness, constructability, public safety, removal success, and other risks
 - 2D hydraulic model to identify appropriate flow levels with which to use methods



Questions?

