Aquatic Nuisance Species Electric Dispersal Barriers – Fish Monitoring

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10 Jan 2015

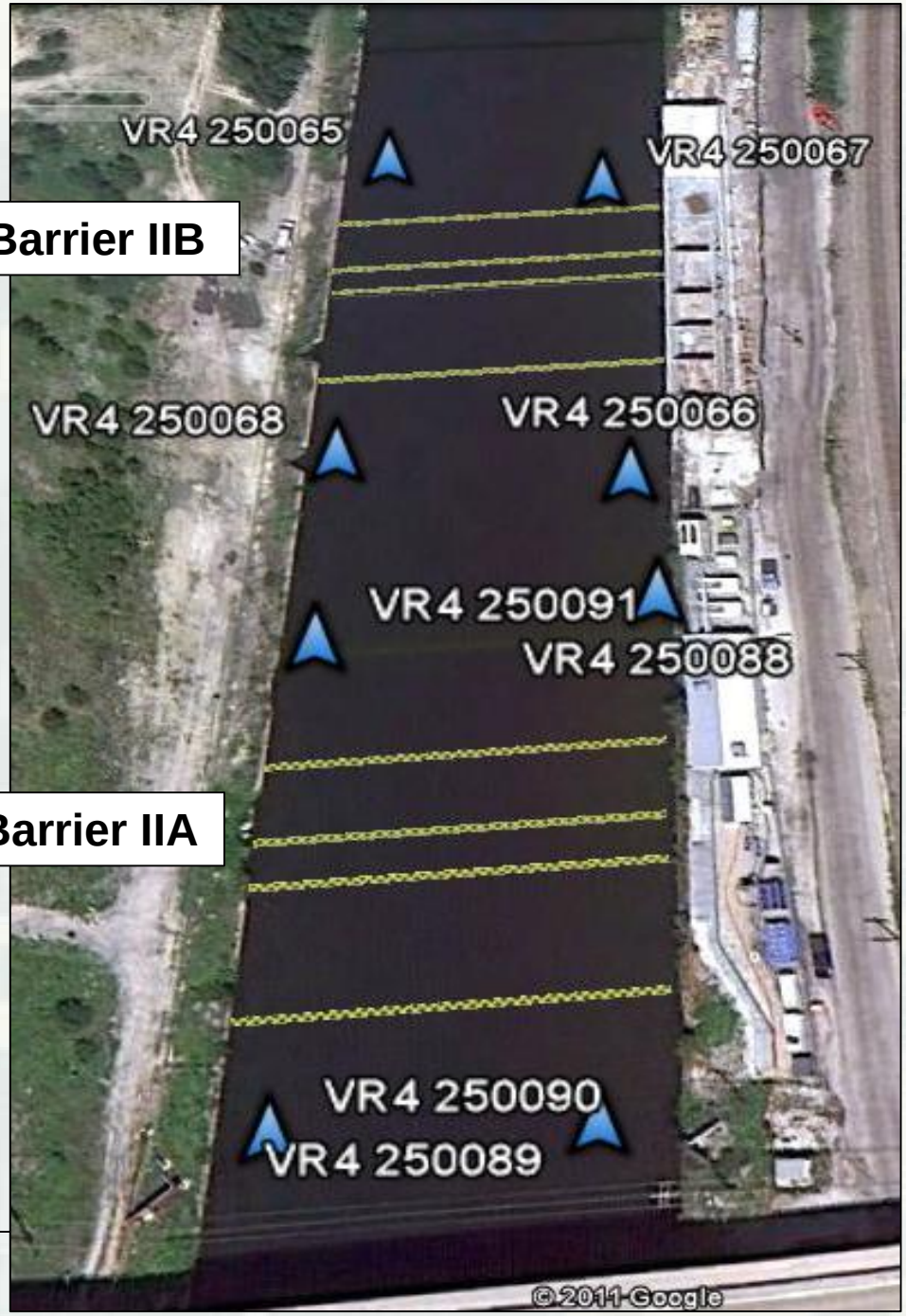
US Army Corps of Engineers
BUILDING STRONG®

Telemetry Monitoring

- 8 submerged receivers compose a Vemco Positioning System
- Tagged fish are detected within the system and positions are calculated
- Pros = 24/7 monitoring at Barriers, 3D data collected, no need to retrieve receiver to collect data (wireless modem)
- Cons = Only track tagged fish, size limitations, Delayed data

Barrier Receiver Array

- 8 VR4 Receivers
- Fish Response near Barrier: Vemco Positioning System (VPS)
  - Triangulates position
  - VR4 downloads from shore; no manual retrieval
- Data Analysis
  - Fish size, # of approaches and proximity to barrier were compared against environmental parameters such as discharge rates, temperature and conductivity



Telemetry Monitoring – Items for improvement

- Existing wireless modem must be submerged introducing electrical exposure hazard and downloads are labor intensive
  - ►Solution – remote downloads of data or automated transfer of data to a database
- May take up to 2 months to receive data
  - ►Solution – automated alarm system for specific tags that cross the barrier

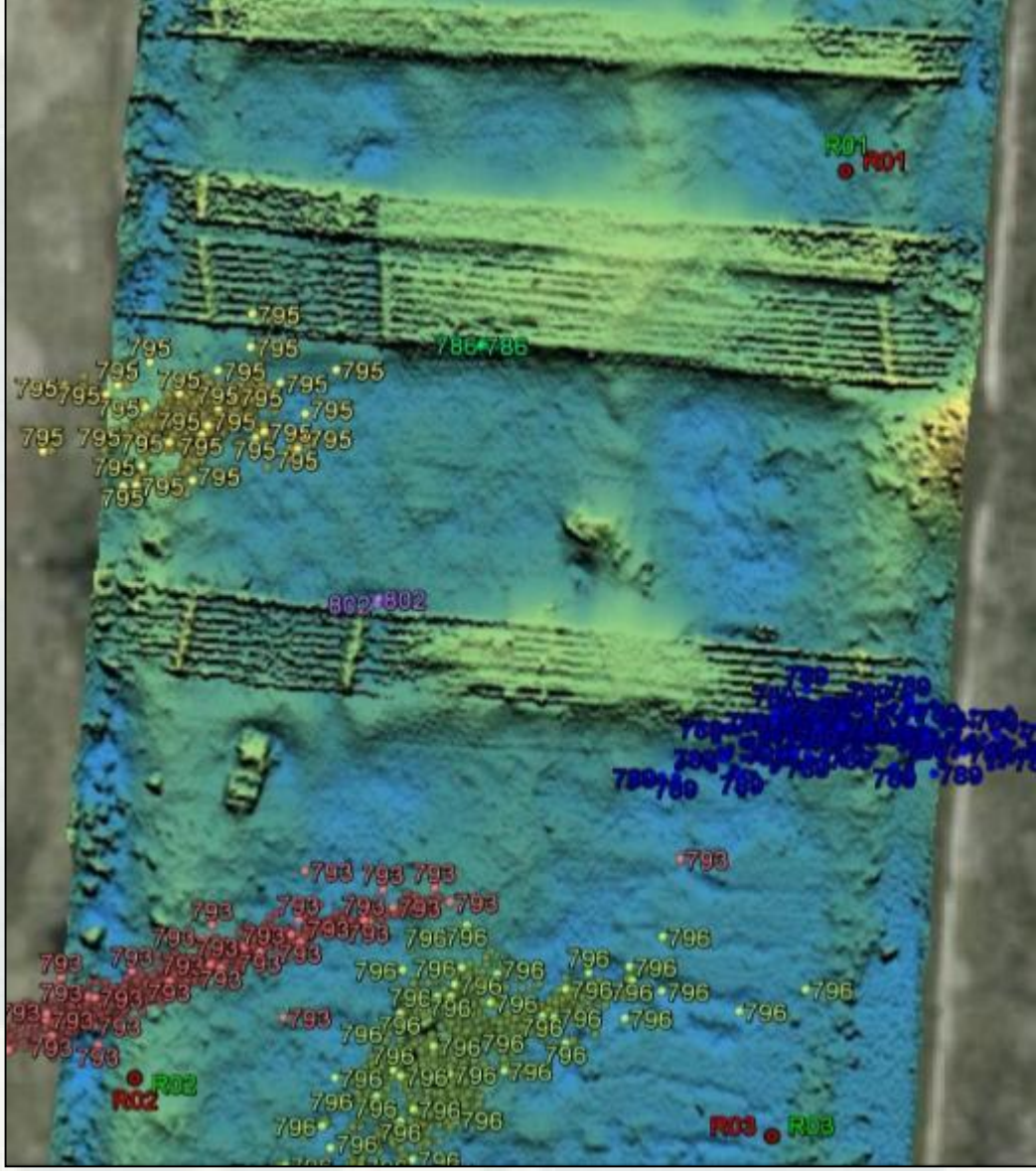
For more information:

Visit:
www.AsianCarp.us

www.lrc.usace.army.mil

You Tube:
“USACE Telemetry”

Email:
telemetry@usace.army.mil



Traditional Physical Sampling

- Electrofishing boats and Nets used to sample fish community at Barriers
- Pros = May be deployed within hours, physical capture and identification of fishes, mark/recapture techniques used, targets all sizes of fish
- Cons = Ineffective at canal floor, uncertainty in missed targets, electrical exposure hazards


Notice
Leaving Electrical Shock
Hazard Area

Physical Sampling – Items for Improvement

- Electrical exposure hazards
  - Solution – Improved safety gear or sampling equipment that limits exposure
- Ineffective sampling at canal floor
  - Solution – Improved sampling methods or equipment that allows physical sampling in the lower half of the canal within the safety zone

Hydroacoustics/Sonar

- Dual Frequency Identification Sonar (DIDSON), Side-scan Sonar, Multi-beam Hydroacoustics have all been implemented at the Barrier
- Pros – Monitor fish activity at barriers and within safety zone in real time, all sizes of fish, low electrical hazard exposure
- Cons – No species identification, labor intensive post processing, temporary deployment to date (barge strikes)

Hydroacoustics/Sonar – Items for Improvement

- Risk of damage to long term equipment
  - Solution – Protection of equipment through improved deployment techniques or protective structure
- Intensive analysis of fish movement data
  - Solution – Automated alarms and data logging for upstream movement

Hydroacoustic/Sonar – Safety

- Man in water scenarios rely on physical monitoring of the waterway and marine radio by onsite engineers could lead to prolonged reaction time for barrier shutdown
  - Solution – Integrated sonar system with Barrier controls to detect man in water and automated shutdown of power in water

Barrier Fish Clearing

- Physical capture or scare methods are employed to clear fishes between the Barriers prior to maintenance shutdowns
- Methods employed are most effective at canal surface and ignore the canal bottom
  - ► Solution – Improve fish clearing methods for physically clearing the canal safety zone


Des Plaines River
Demonstration
Barrier
Control
Bldg
Barrier IIB
Control
Building
Corps Maintenance/Storage Shed
Barrier IIA
Control
Building
135th Street
I & M
Canal
Chicago Sanitary & Ship Canal