

# UNDERSTANDING THE HYDROLOGY OF THE LOW GRADIENT VERMILION WATERSHED

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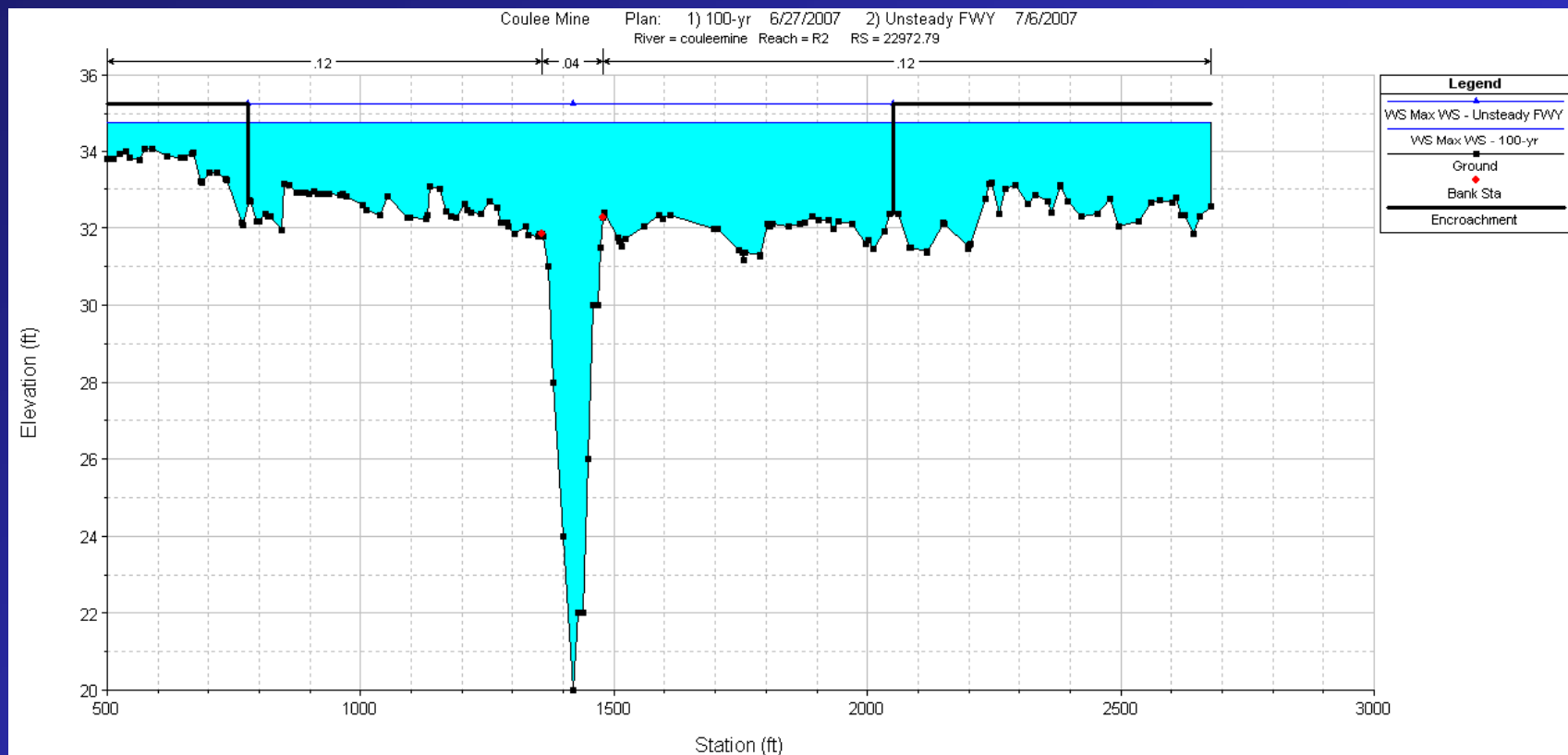
Center for Louisiana Water Studies  
Institute of Coastal Ecology and Engineering  
The University of Louisiana at Lafayette

# CHALLENGES

- **Topographic features**
- **Inter-basin transfer of water**
- **Bi-directional flow**
- **Complex stage-discharge relations**
- **Multi-outlet watersheds**
- **Subsidence**

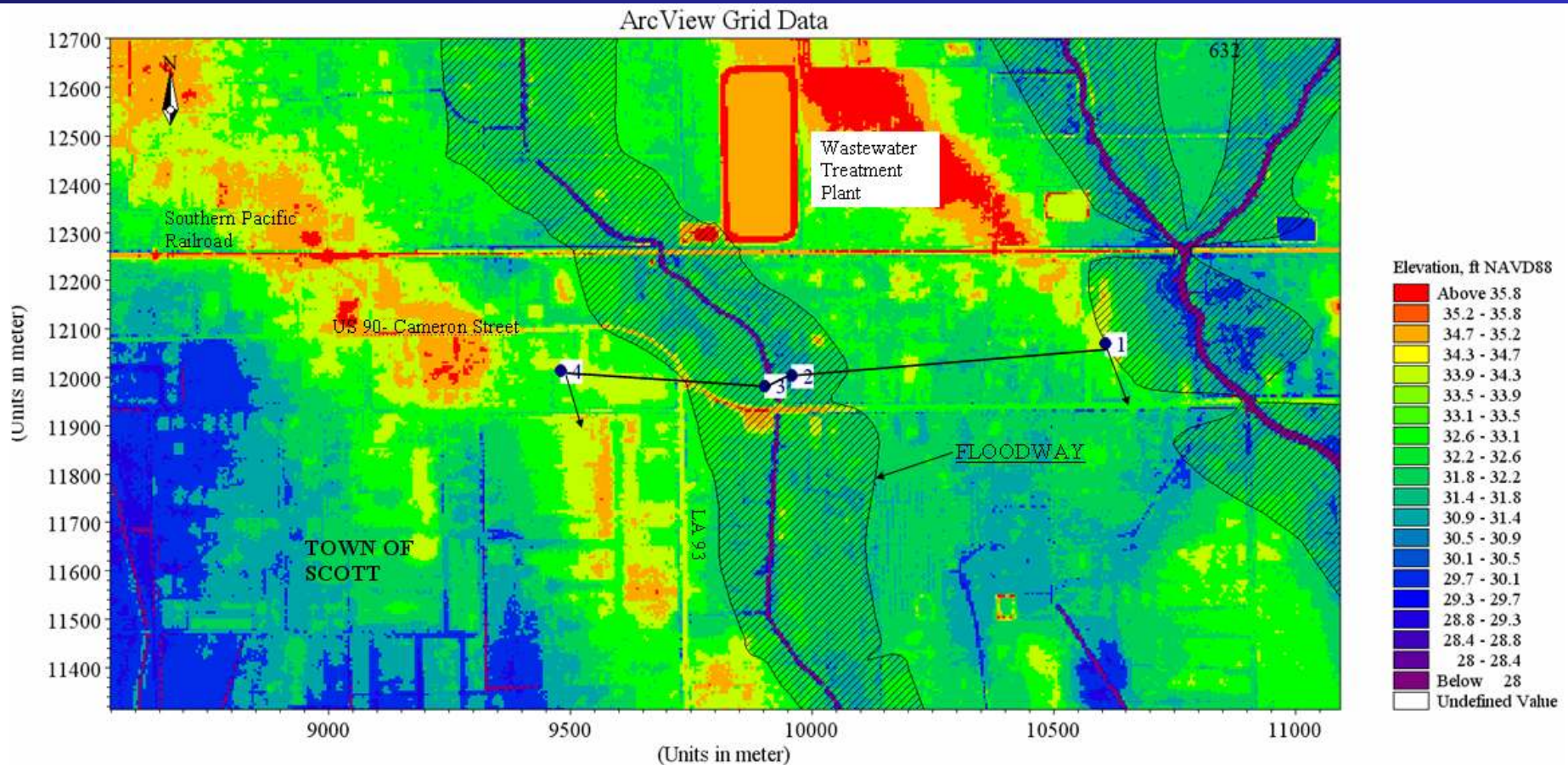
# TOPOGRAPHIC FEATURES

- Limits of flood plain

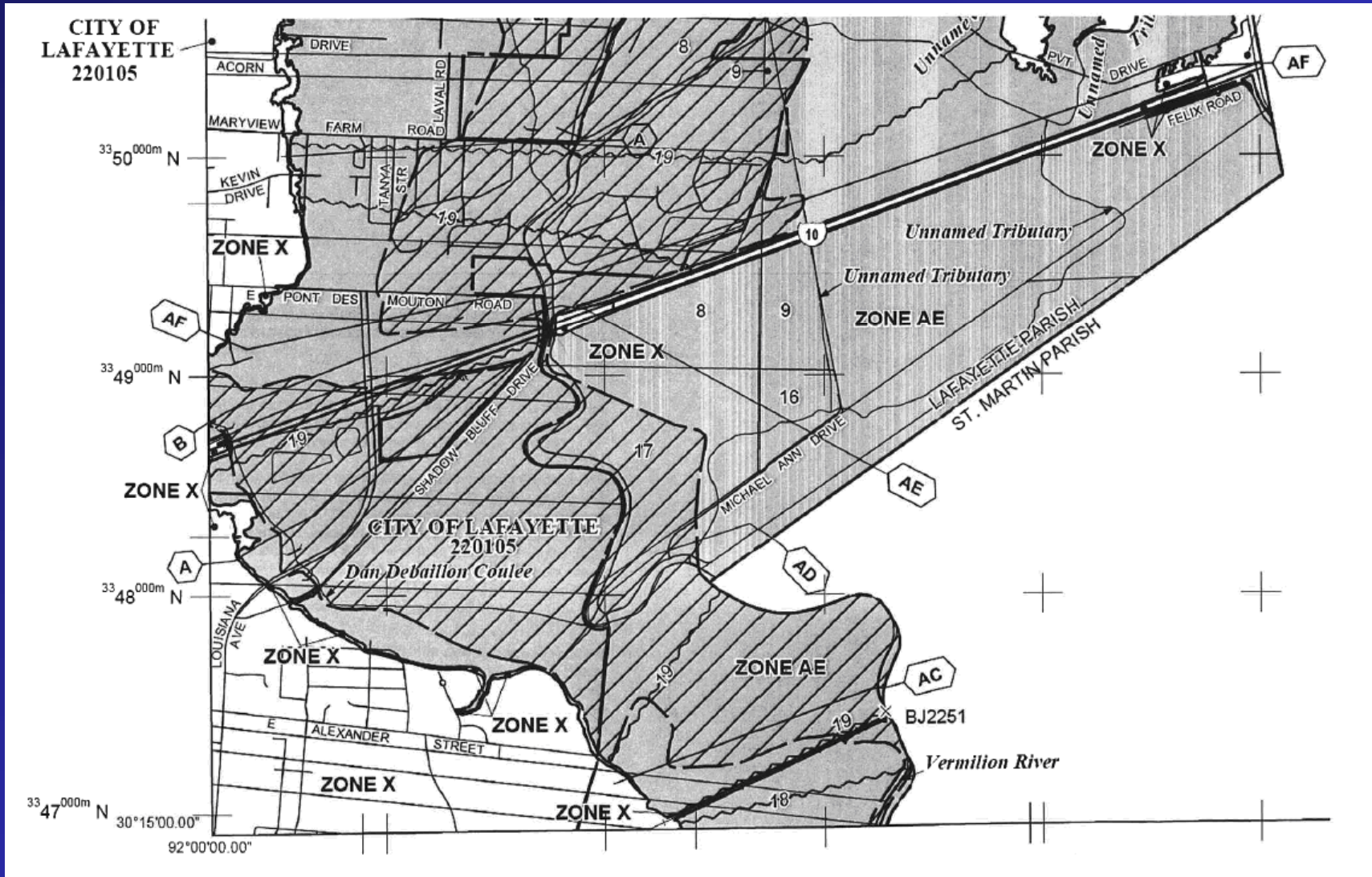


# TOPOGRAPHIC FEATURES

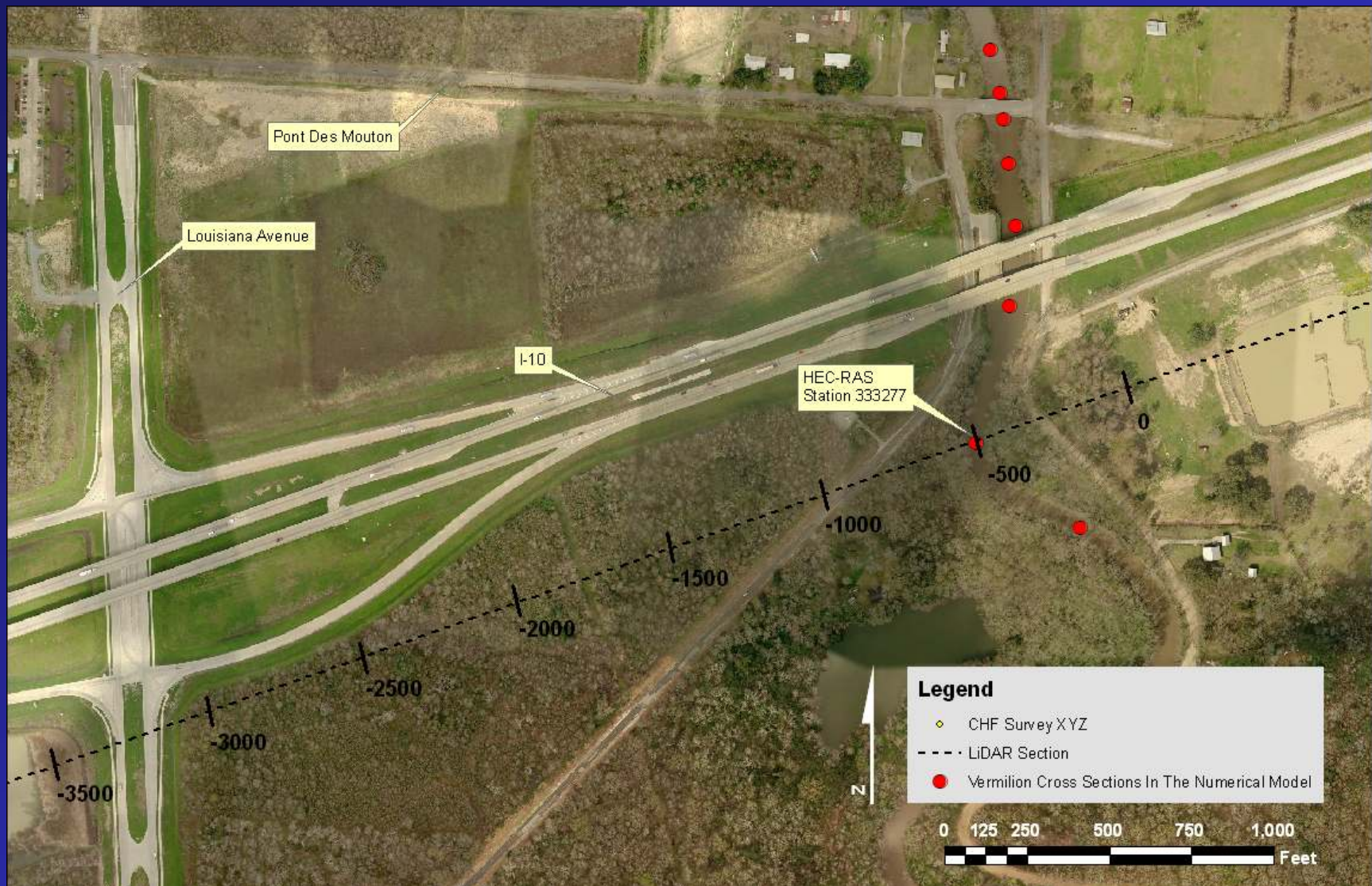
- Limits of flood plain



# TOPOGRAPHIC FEATURES

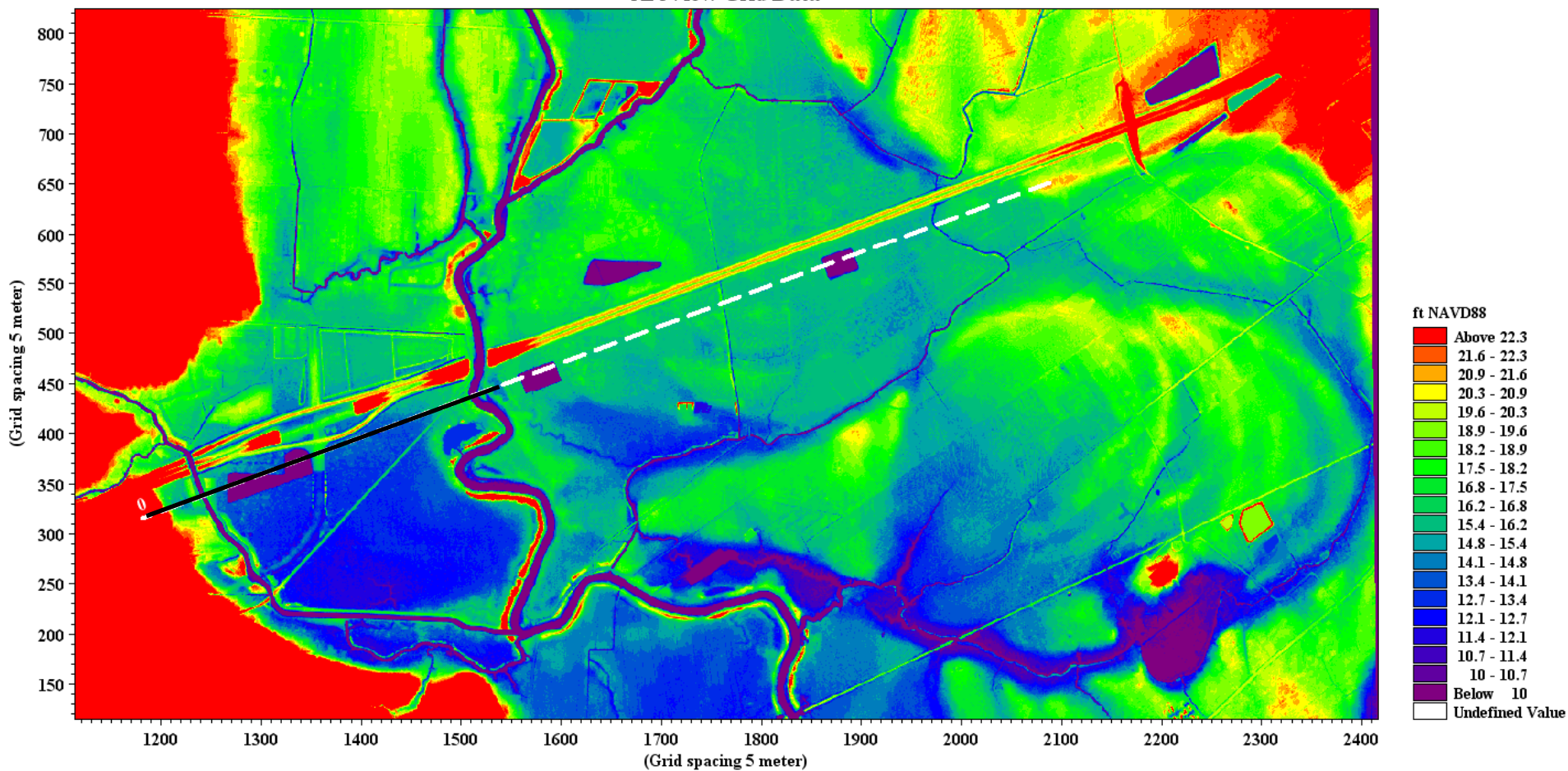


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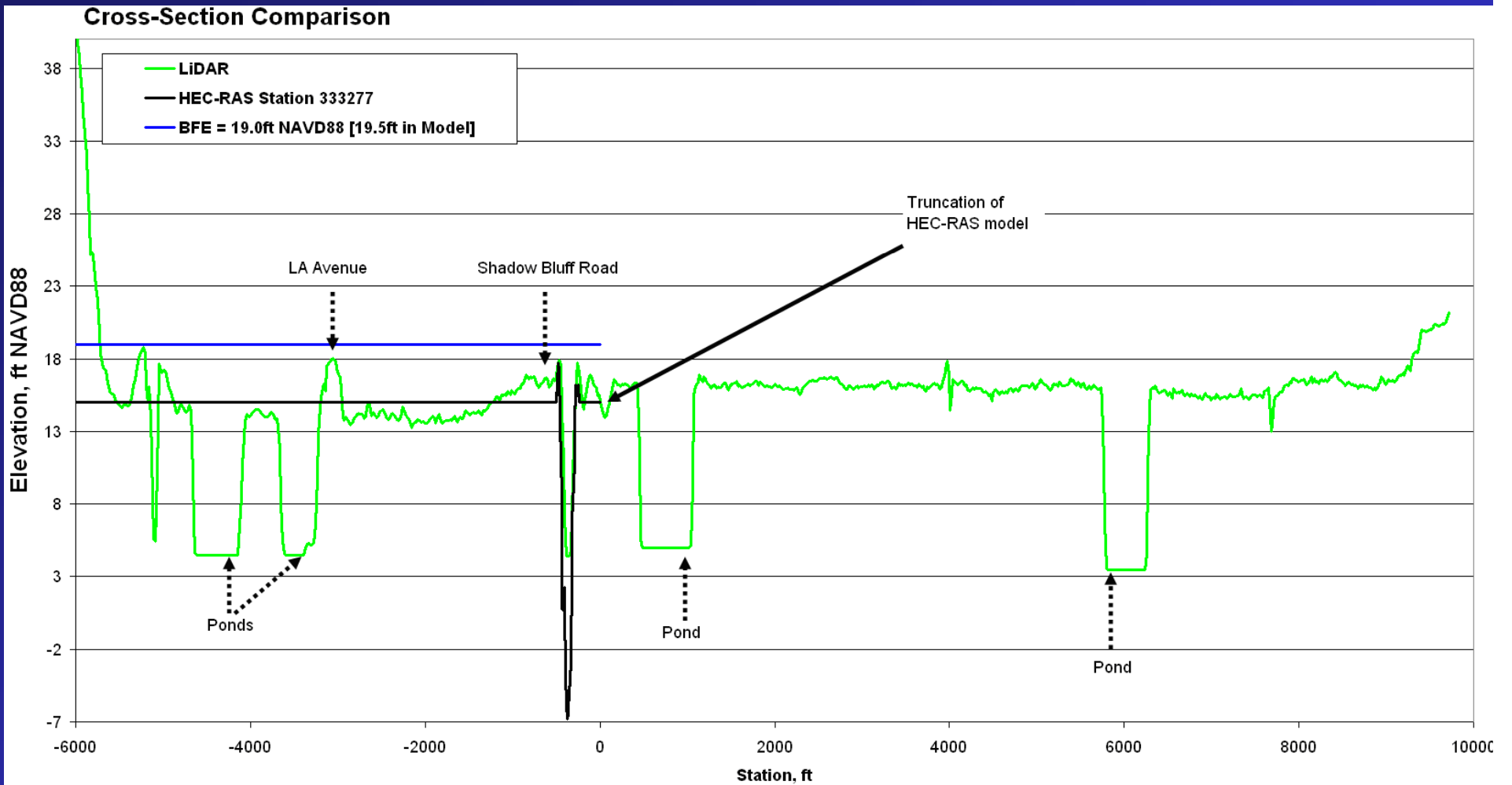


# TOPOGRAPHIC FEATURES

ArcView Grid Data



# TOPOGRAPHIC FEATURES

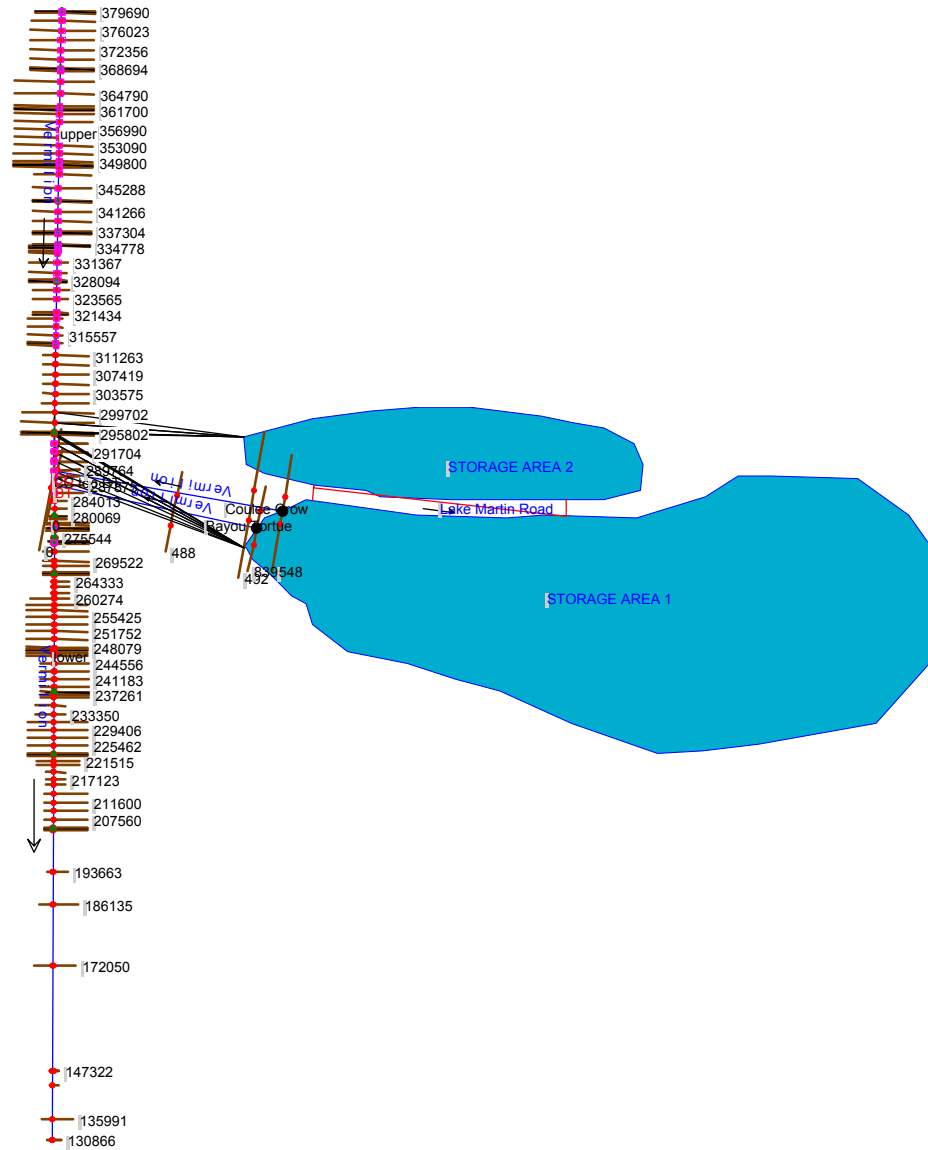




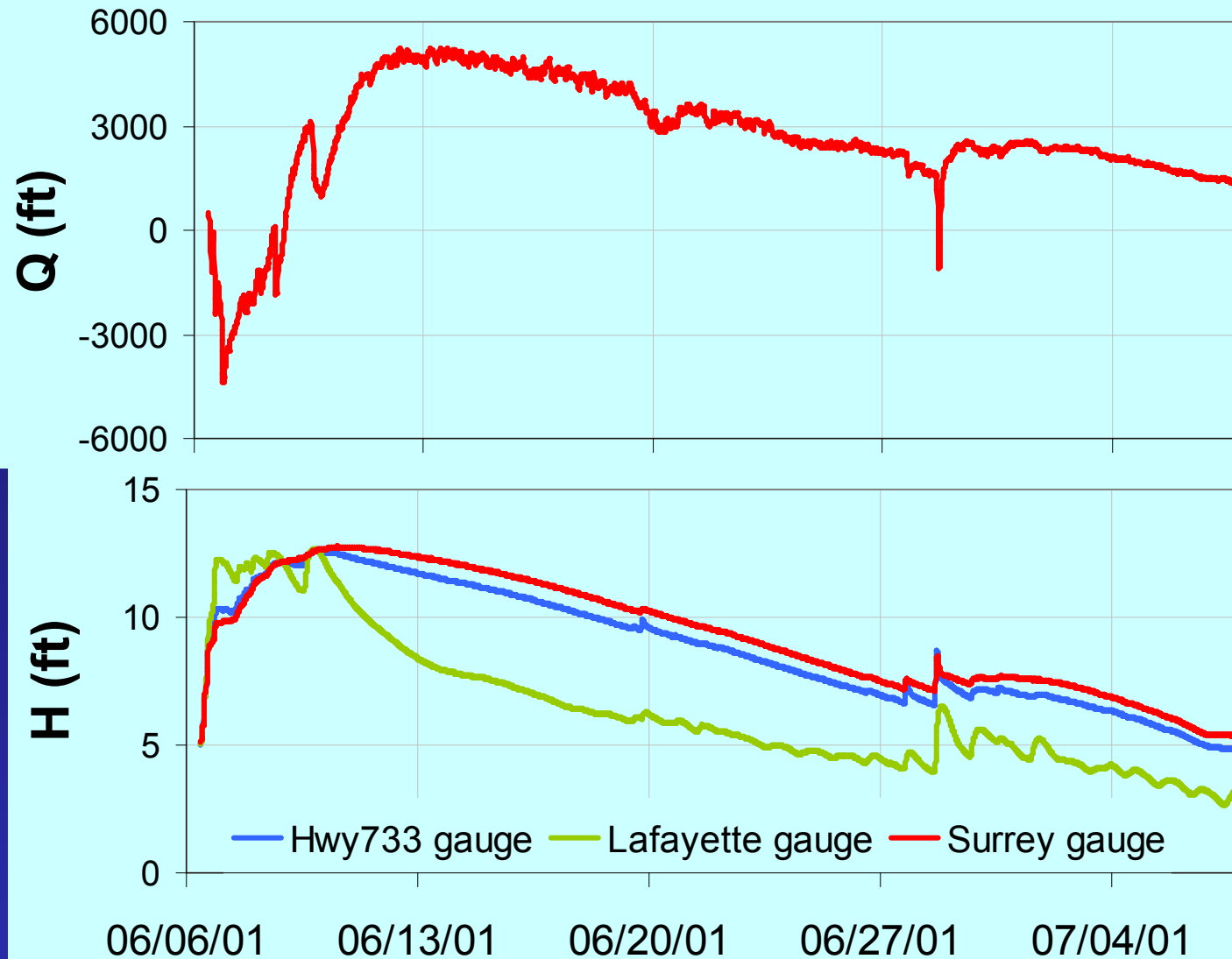
# INTER-BASIN TRANSFER

- Hydrologic boundaries may change with storm size
- Require special tool to replicate numerically

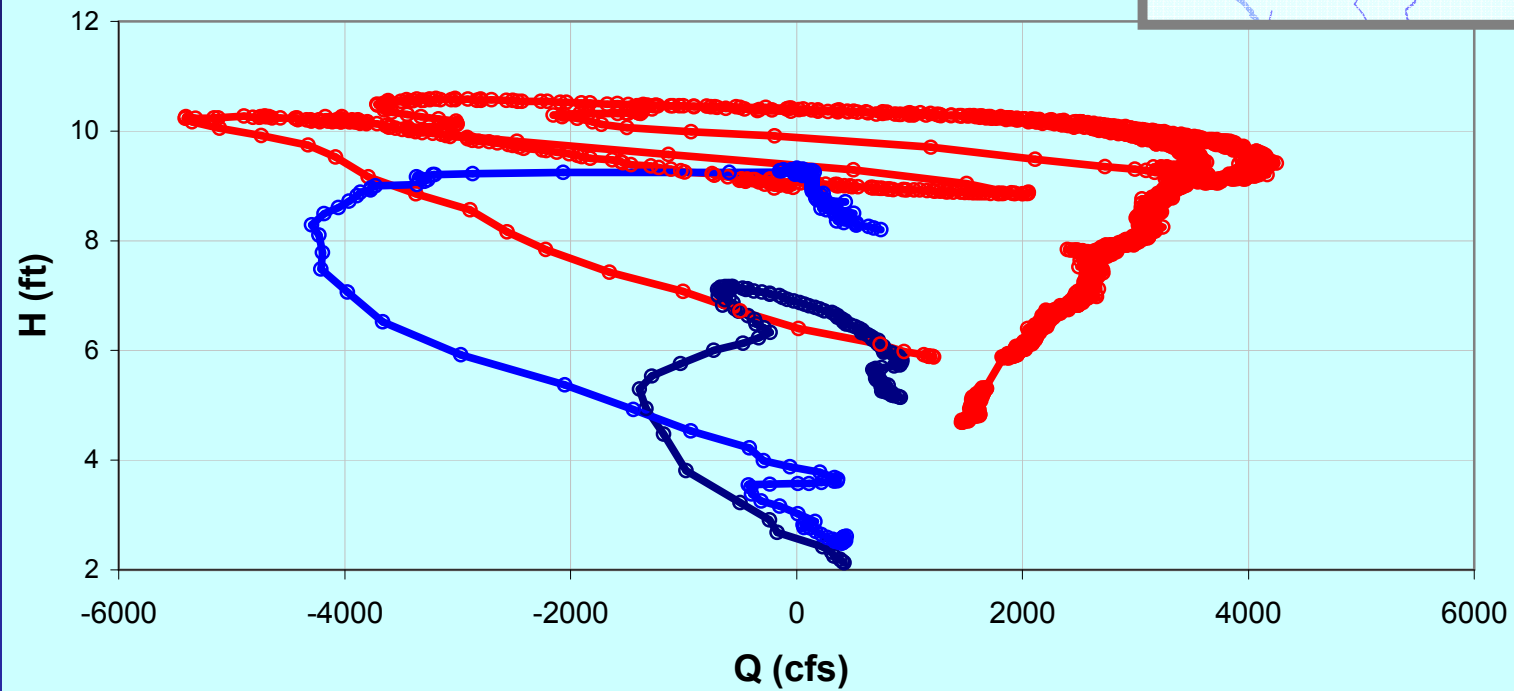
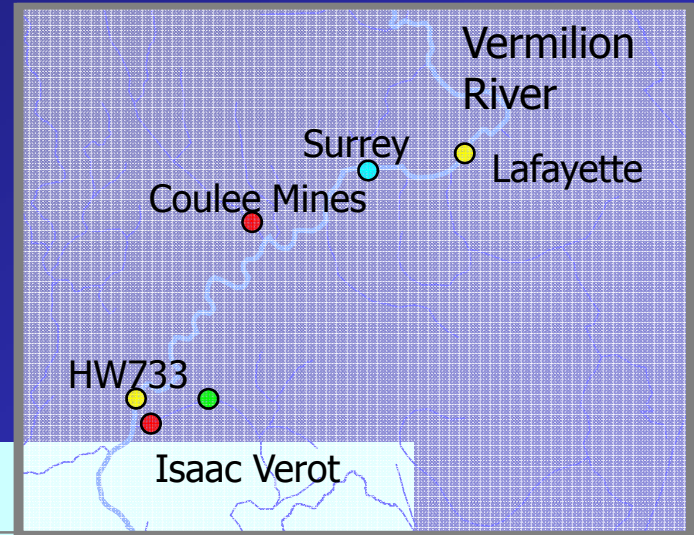
# VERMILION RIVER MODEL



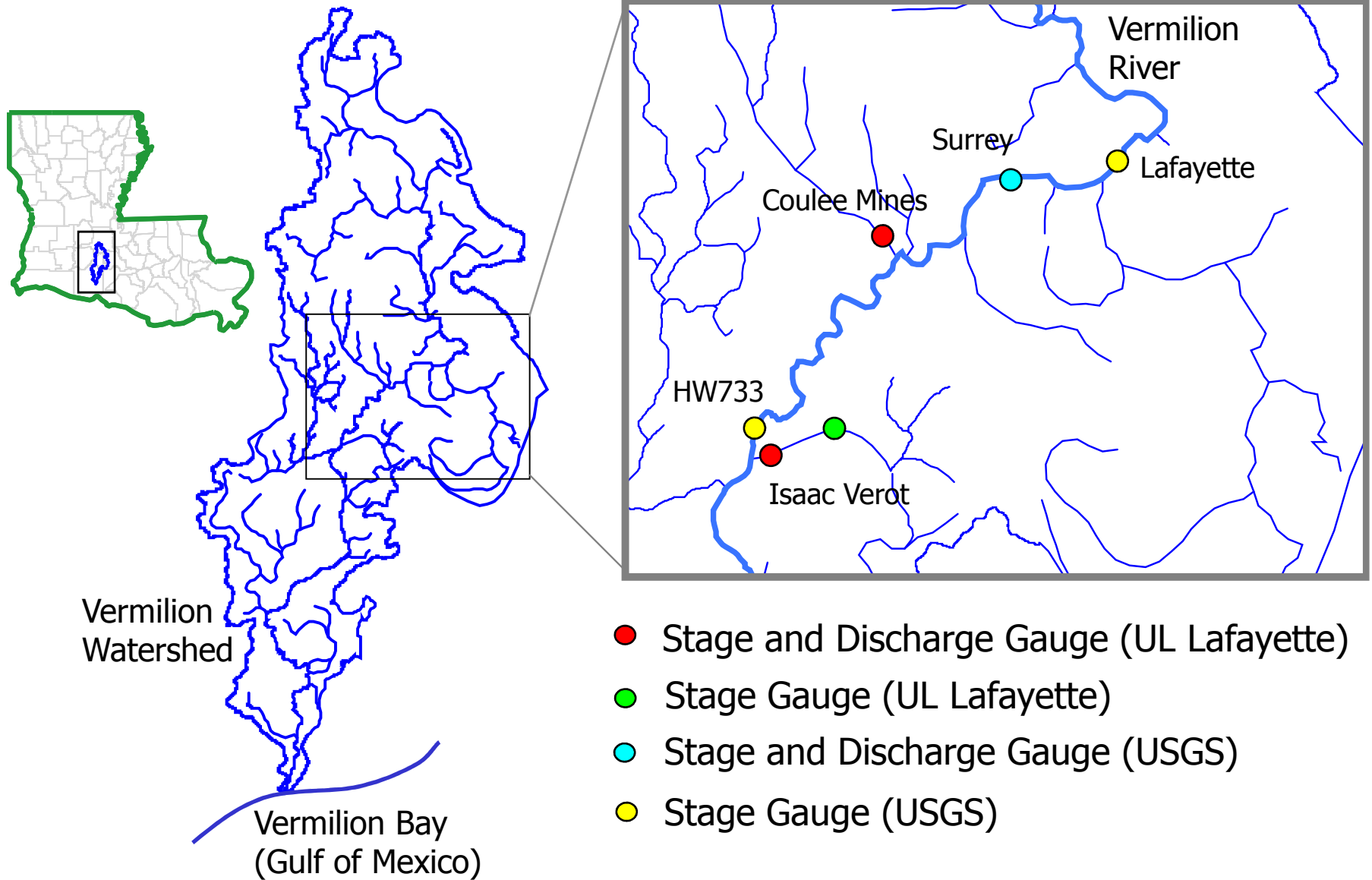
# BI-DIRECTIONAL FLOW



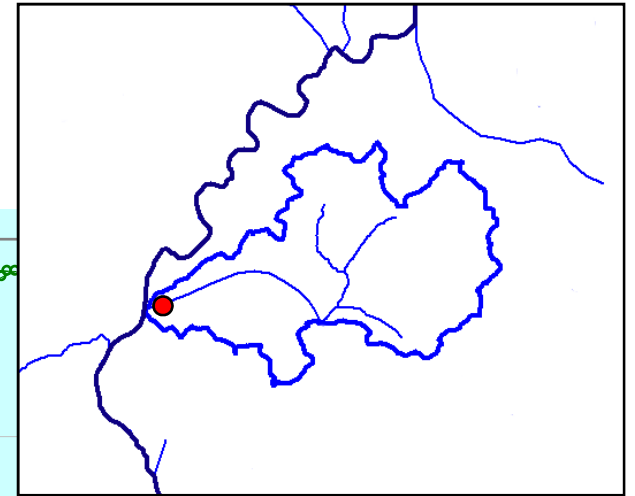
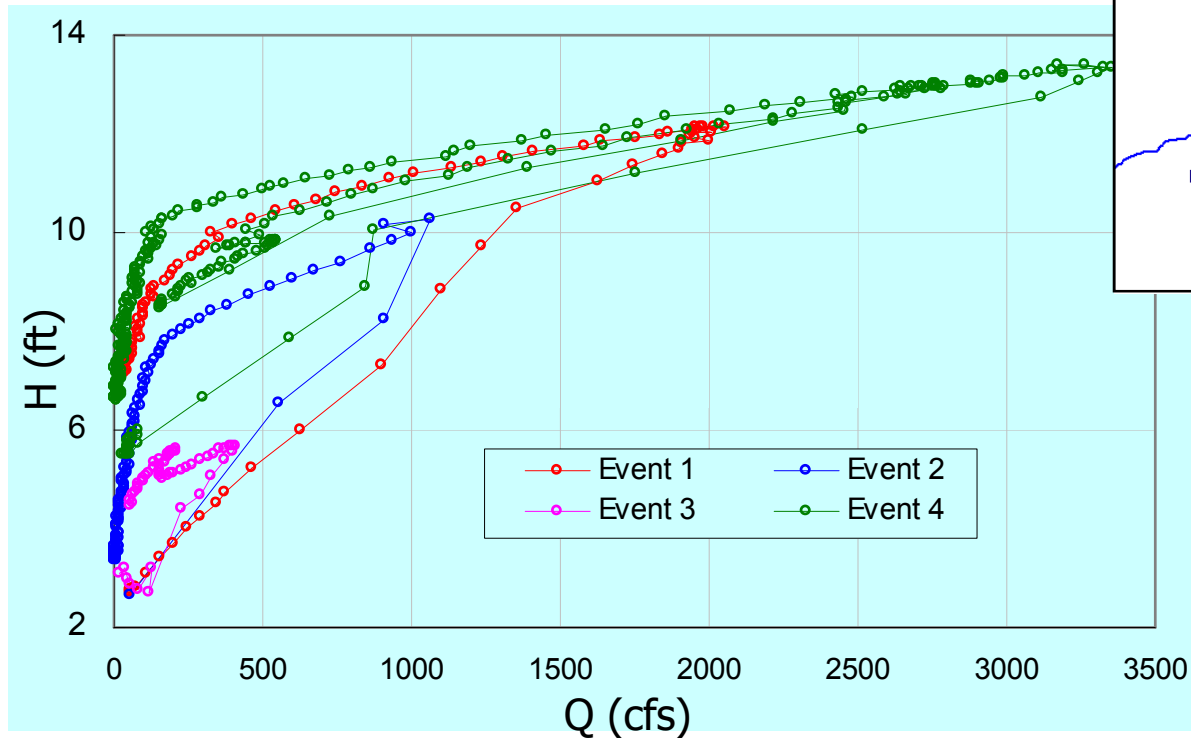
# BI-DIRECTIONAL FLOW



# Stage-Discharge Relationship



$$Q = f(H) ??$$



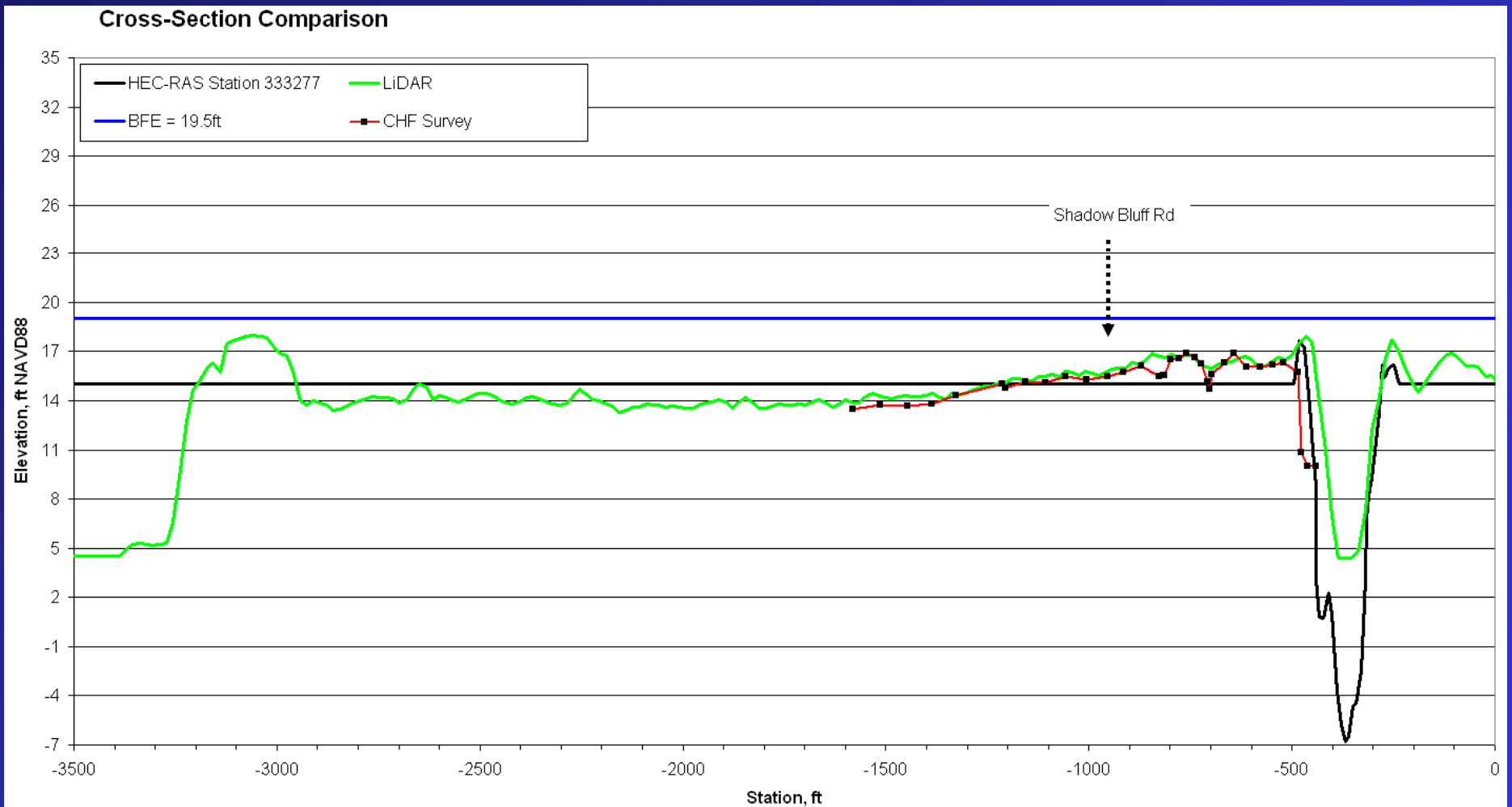
Isaac Verot Watershed

Stage-discharge relationships in low-gradient streams are *nonunique* and have *multiple loops*

# Dual-OUTLET WATERSHEDS

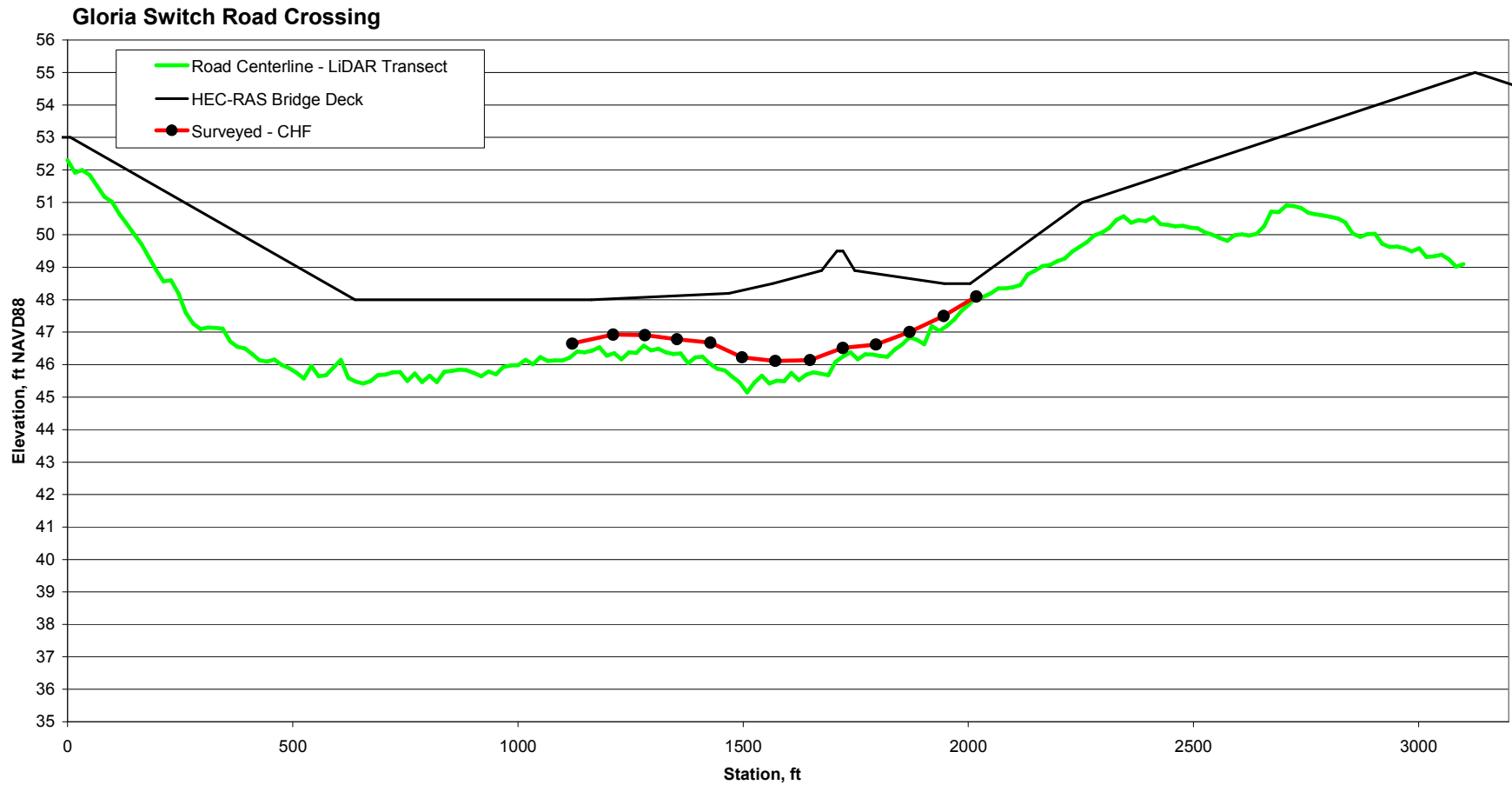


# SUBSIDENCE





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