Regional Sediment Management (RSM) RPC Experiment

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RSM Talk Overview

- Background
- Objectives
- Basic Methodology
- Validation
- Present Status
Transported sediments and associated erosion in the contiguous U.S. has caused monetary damage of up to $16 B in a year.

Not only erosion but reduction in sediment movements can also have an impact, especially to inland and coastal wetlands.

Sediments heighten water turbidity, impacting watercourse flora and fauna.

Contaminated sediments have been a cause of continuing concern in various U.S. locales – e.g. the Great Lakes, GOM (Gulf of Mexico).

GOM hypoxia incidents have been linked to polluted sediments draining from watercourses into the Gulf.

Sediment character, movements, and volume are both a regional and local scale problem.
Background, cont’d

- RSM is regarded an USACE DST – a GIS-based collection of customized tools that can be linked to numerical models (e.g., ADCIRC, GENESIS, STWAVE).

- Input data layers partially include hydrodynamic, meteorological, bathymetric, topographic, aerial/land imagery, and dredge-related GIS data.

- Potential NASA contribution to USACE RSM would center on remote sensor data and possible use of NASA numerical circulation models (e.g., MITgcm, Wavewatch).

- Contact made with J. Lillycrop as USACE POC.

- NASA next-generation RPC sensor candidates discussed.
Objectives

• Objectives – RSM RPC experiment
  – Identify potential next-generation sensor data useful to RSM DST: VIIRS and LDCM targeted
  – Demonstrate that RPC simulated VIIRS and LDCM would be of value as data input layers to the USACE RSM DST
  – Use simulated imagery to detect, track, and map sediment movements and their impact on regional water clarity
  – Use the imagery to track effects of sediment movements on various ecosystems in the area of study
  – Perform validation of the simulated RMS GIS data layers to show viability of the NASA next-generation sensor data
  – Provide partner agency with results of the experiment
Basic Methodology

• Acquire hyperspectral datasets over target area(s)
• Preprocess the acquired datasets
• Submit to RPC for simulation of VIIRS and LDCM imagery.
• Process the RPC provided imagery to produce salient RSM DST data input layers
• Perform validation of the RPC image-derived data layers by comparing to field data
• Analyze the value of the simulated datasets in RSM GIS DST
• Write and submit wrap-up RPC experiment report
• Provide results to USACE RSM DST through its POC
RSM Status

- RSM RPC experiment is scheduled to begin the last week in July 2007
- Candidate sites are still under discussion with USACE POC; tentative sites include Mobile, AL, and Panama City, FL, areas
Relevant References


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