RSM-EWN FY15 IPR – Las Conchas Post-Wildfire Sedimentation Impacts

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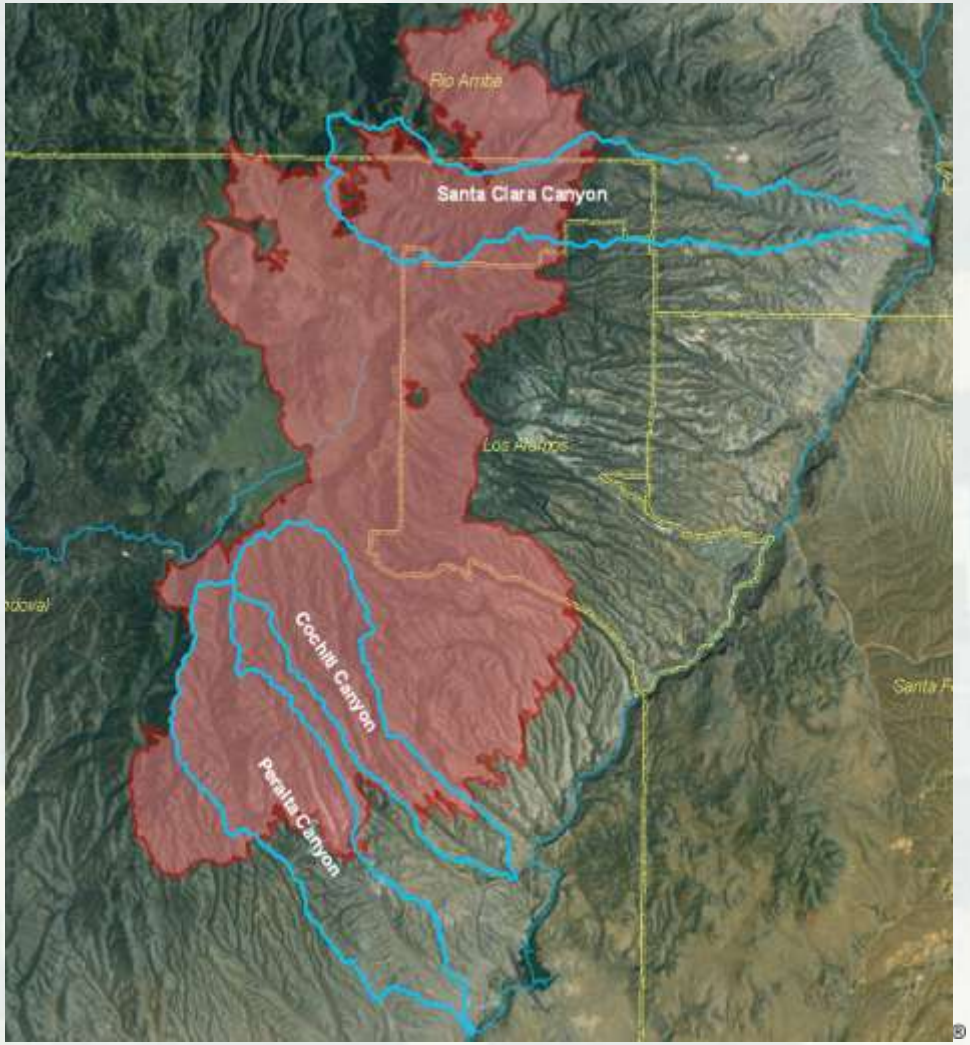
SPA, Post-Wildfire Sedimentation Impact to Cochiti Lake FRM

BLUF: Quantify post-wildfire sedimentation impacts to Cochiti Lake FRM Operations

Las Conchas – Background

- Started: 26 June 2011
- Contained: 03 August 2011
- Burn Area: 631 km^3
- First Day: 162 km^3
- First 2 Days: 243 km^3
- Burn Rate (peak est.): ~4047 m^3/second
- 20 Major Watersheds drain into Rio Grande above Cochiti Reservoir
- Stakeholders: SPA/SPD, FEMA, BLM, BIA, DHS, Local Tribal Nations and Municipalities, New Mexico, NPS, DoE



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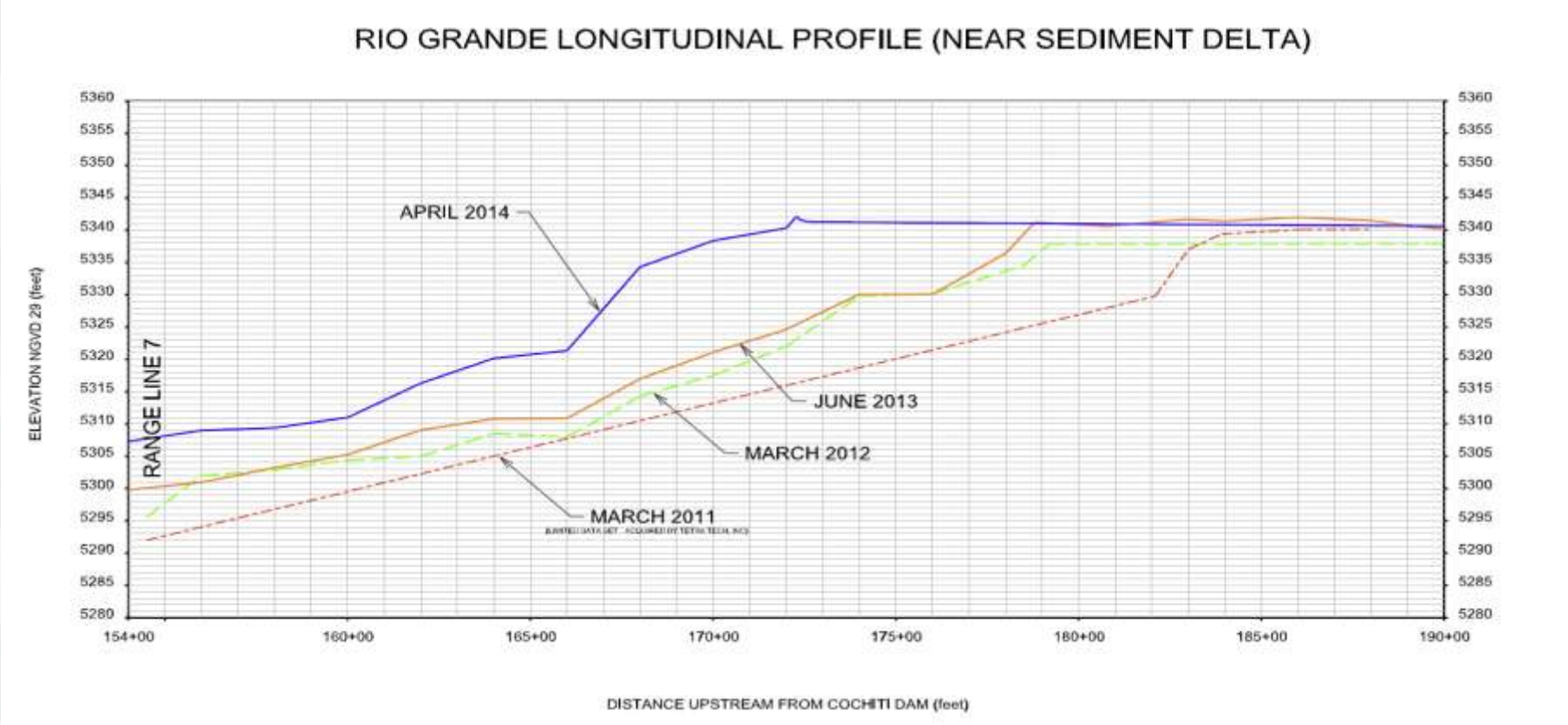

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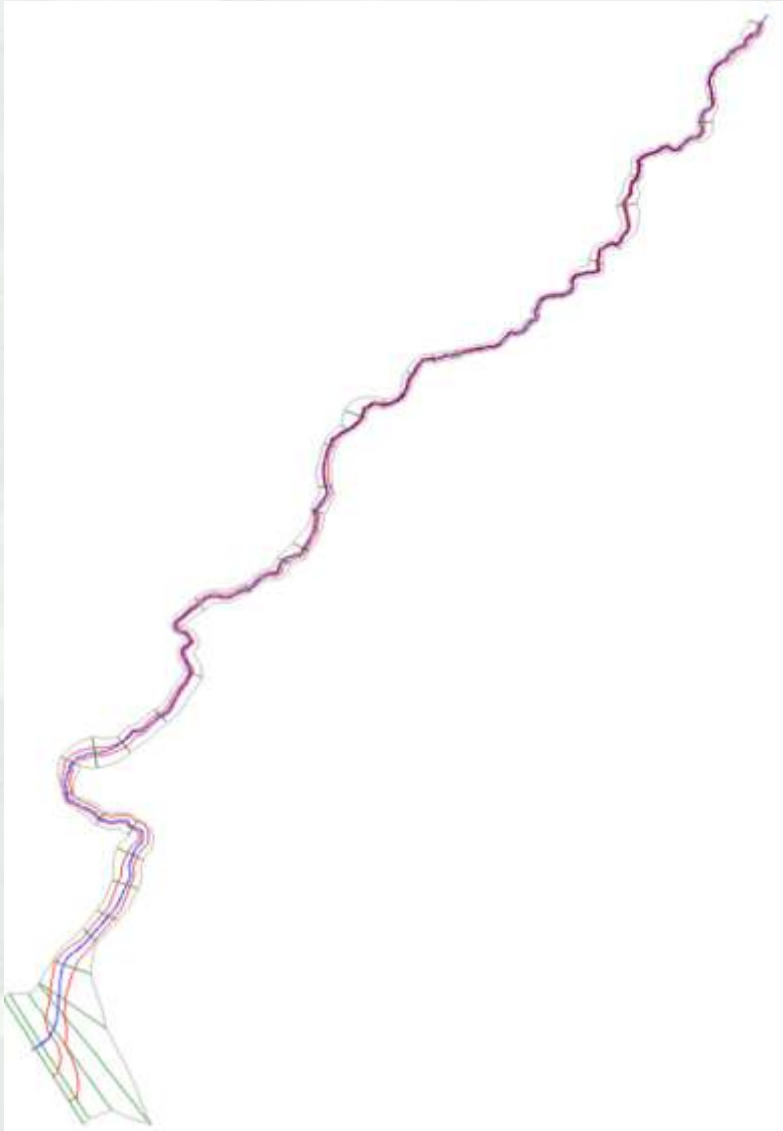
Approach to Address Problem
(non-technical)

- Evaluate current state-of-knowledge
- Develop an integrated hydraulic-hydrologic modeling approach
- Investigate empirical and probability-based methods for estimating magnitude and occurrence of sediment hazard
- Initiate a system-wide geomorphic-based hazard monitoring program and investigate in situ data collection methods

Approach to Address Problem
(Tools, Models, Technologies)

- Background and Sediment Analysis
- HEC-RAS Model Development and Demonstration
- Hydrologic and Hydraulic Model Integration
- Geomorphic and Debris-flow Hazard Analysis
- Documentation, Recommendations and Technology Transfer



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UPs – 3+1 Positives from effort

- Identifying USACE numerical modeling limitations for addressing hyperconcentrated flow events
- Development of proto-type geomorphic data collection systems
- Evaluating debris-flow hazard mitigation on regional scale
- Leveraging for FY16 multi-dimensional numerical modeling and data collection

DOWNs – 3 Negatives from effort

- Data Transfer/Storage
- USACE H&H operational numerical model limitations
- In situ regional data collection methods
  - Issue related to destructive force of debris-flow events

Specific Watersheds and Flooding

Cochiti Canyon/Dixon Orchard:
Post-Fire/Pre-Flood, 07 Aug 11

Debris-flow Event – Cochiti Canyon

Santa Clara Pre-fire Conditions

Santa Clara Post-fire Conditions 6/25/2014

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Debris-flow Event – Santa Clara Canyon

Santa Clara Canyon GeoBrugg Installation

GeoBrugg Post- 1in/15min Precipitation Event

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Value to the Nation (Brainstorming – be creative to identify a value in some way)

- Cost savings
  - Optimizing placement of retaining structures (i.e., GeoBrugg, debris ponds, gabion weirs, etc.)
- Value added
  - Improve FRM and O&M at Cochiti Lake
- Leveraging resources
  - SPA/SPD, FEMA, BLM, BIA, DHS, Local Tribal Nations/Agencies/Municipalities, New Mexico, NPS, DoE, ….
- Environmental benefits
  - Preserving riparian habitat for native species in collaboration w/ Local Tribal Nations
- Improved partnerships, happy stakeholders
  - Isotropic communication with Local Tribal Nations/BIA
- Other?

We dredge too!