

Authorities - *Briefly*

- Conducting Tech Assistance, Design, or Construction
- Authorities:
 - ▶ Emergency Flood Protection
 - Advanced Measures
 - ▶ Flood Risk Evaluation
 - PAS, FPMS
 - ▶ Regulatory Authorities
 - 404 Permitting
 - ▶ Permanent Flood Protection – *(fast track)*
 - Section 205



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SPA Site Assessment Teams

- Lessons learned from Cerro Grande Fire (2000)
- Pre-positioned multi-disciplinary team:
 - ▶ Project Manager
 - ▶ Emergency Management
 - ▶ Planning/Engineering – Hydrologists/Hydraulics
 - ▶ Reservoir Control
 - ▶ Tribal Liaison
 - ▶ Contracting
- Multi-disciplinary teams now include:
 - ▶ Economists
 - ▶ Plan Formulation



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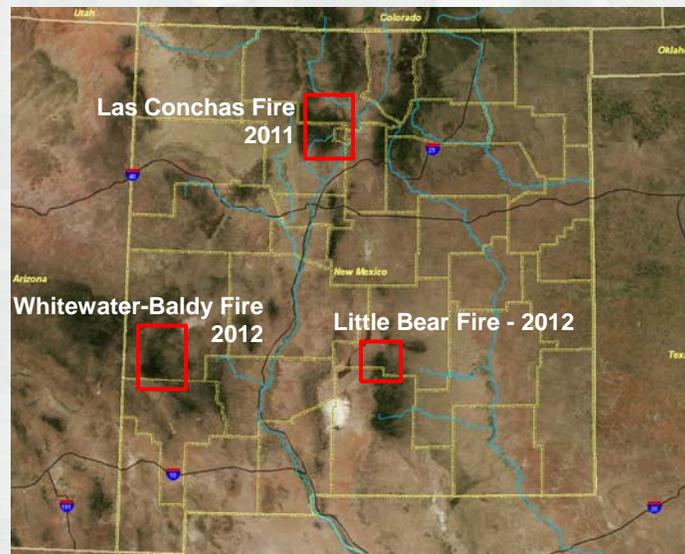
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Multi Agency Teaming

- Silver Jackets
- Lessons learned from Recent Fires (*Partnerships*)
 - ▶ US Forest Service – *Burn Severity Mapping*
 - ▶ FEMA – *National Disaster Recovery Framework*
 - ▶ USGS – *Debris Hazard and Potential Mapping*
 - ▶ NWS – *Precipitation Monitoring/Forecasting*
 - ▶ BLM
 - ▶ BIA – *Dam Safety*
 - ▶ Tribal Entities
 - ▶ County Entities
 - ▶ DHSEM – *State Homeland Security (requests for assistance)*



Fire Background



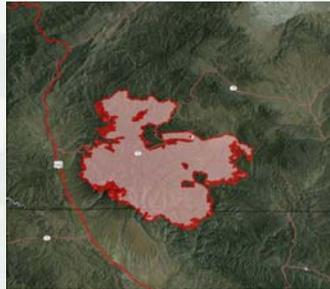
Fire Background



Las Conchas
~ 156,600 acres
High – 33,000 ac.
Mod. – 54,000 ac.
Low – 48,000 ac.



Little Bear
~ 45,000 acres
High – 12,500 ac.
Mod. – 11,000 ac.
Low – 13,200 ac.



Whitewater – Baldy
~ 297,000 acres
High – 39,000 ac.
Mod. – 38,000 ac.
Low – 66,000 ac.



Fire Background



- Aerial Assessments:**
- 2 During Las Conchas Fire
 - 2 Post-Fire in SC Canyon
 - 1 During Tres Lagunas Fire
 - 1 During Silver Fire
 - 1 During Thompson Ridge Fire

Provide training and sandbags to multiple communities:
~300,000 for 2011 & 2012 alone

Provide site assessments or on the **ground technical assistance** responding to increased flood threat



Provide Technical Assistance **documenting potential for flooding and post floods**



Altered Hydrology

- Vegetation
- Organic layer
- Water repellent soil layers
- Altered runoff characteristics
 - ▶ HEC-HMS used to model runoff
 - ▶ Very Large Areas
 - ▶ Burn Severity mapping
 - ▶ Severe Slopes
 - ▶ Infiltration Adjustments:
 - Severe – infiltration set to zero
 - Moderate – infiltration reduced by 50%
 - Low – infiltration reduced by 20%

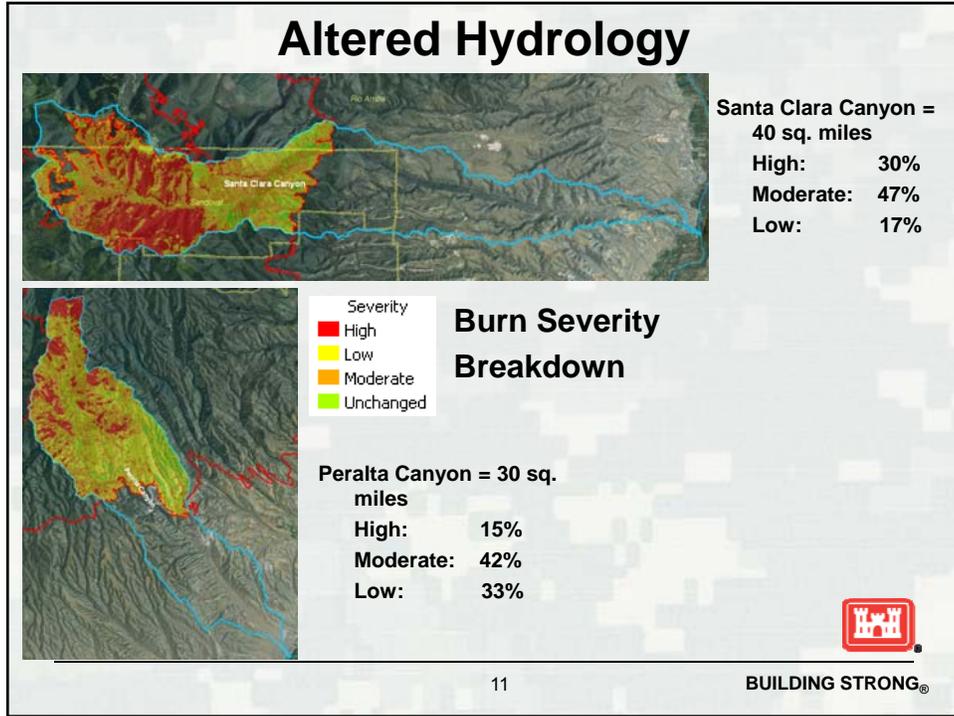


Altered Hydrology

Table 1—Burn severity classification based on postfire appearances of litter and soil and soil temperature profiles (Hungerford 1996, DeBano et al. 1998).

Soil and Litter Parameter	Burn Severity		
	Low	Moderate	High
Litter	Scorched, Charred, Consumed	Consumed	Consumed
Duff	Intact, Surface Char	Deep Char, Consumed	Consumed
Woody Debris - Small	Partly Consumed, Charred	Consumed	Consumed
Woody Debris - Logs	Charred	Charred	Consumed, Deeply Charred
Ash Color	Black	Light Colored	Reddish, Orange
Mineral Soil	Not Changed	Not Changed	Altered Structure, Porosity, etc
Soil Temp. at 0.4 in (10 mm)	<120 °F (<50 °C)	210-390 °F (100-200 °C)	>480 °F (>250 °C)
Soil Organism Lethal Temp.	To 0.4 in (10 mm)	To 2 in (50 mm)	To 6 in (160 mm)





Altered Hydrology

Location	Pre-fire (cfs)	Post-fire (cfs)	Increase (%)
Santa Clara Canyon (<i>North NM</i>)	5,000	20,300	406%
Frijoles Canyon (<i>North NM</i>)	2,700	18,200	674%
Elk Creek, near Ruidoso (<i>South NM</i>)	1,100	2,700	245%
Flow Into Bonito Lake (<i>South NM</i>)	1,300	7,900	608%

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Flooding Event from a Small Rainfall Event
Santa Clara Canyon September 2013 – 2 years later



<http://www.youtube.com/user/spausace>



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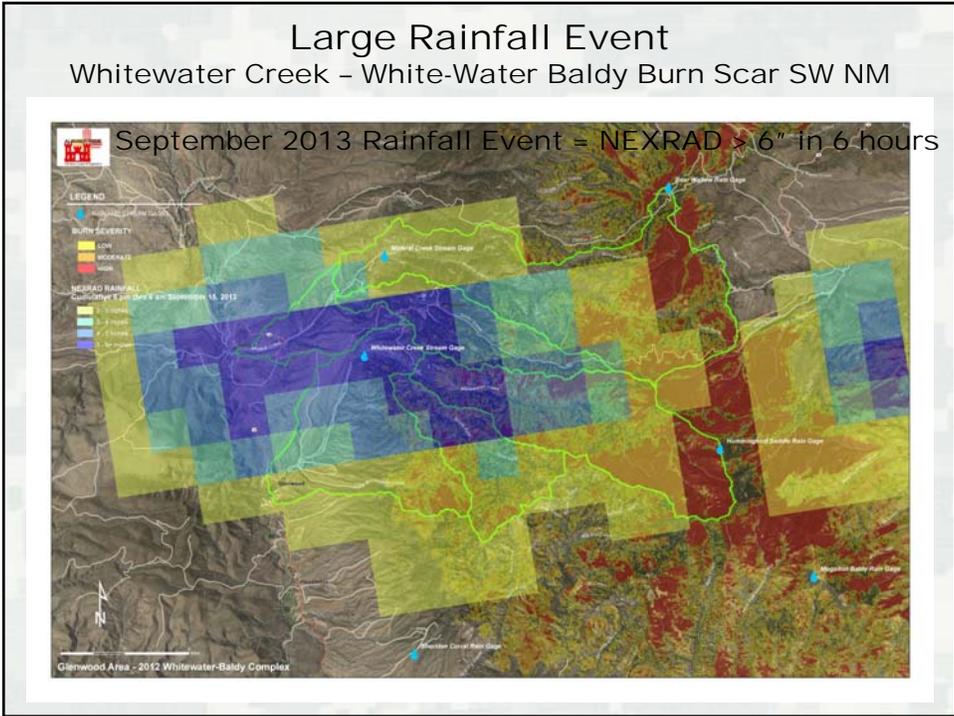
Flooding Event from small Rainfall Event
Cochiti Canyon August 22, 2011



<http://www.youtube.com/user/spausace>



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Watershed Response Geomorphology



**Cochiti Canyon
Post-Flood
August 25, 2011**



Watershed Response Geomorphology



Peralta Creek, Culvert Crossing, July 21, 2011



Watershed Response Geomorphology



Peralta Creek, Culvert Crossing, August 21, 2011



Watershed Response Geomorphology



Peralta Creek, Culvert Crossing, March 6, 2012



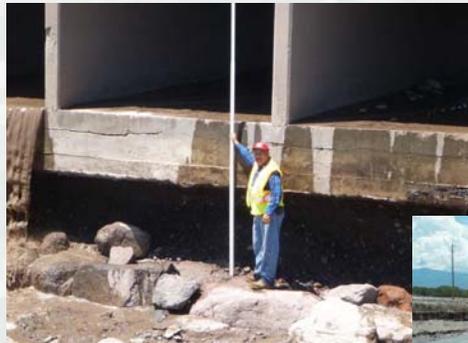
Watershed Response Geomorphology



Peralta Creek, SP-85 Culvert Crossing, 2013



Watershed Response Geomorphology



Culvert Crossing Kee St. –
Santa Clara Creek
July 26, 2013



Village Reach -
Santa Clara Creek
July 26, 2013

Watershed Response Geomorphology



**Pond 4 – Santa Clara Canyon
July 26, 2013**



**Pond 3 – Santa Clara Canyon
July 26, 2013**

Watershed Response Geomorphology



Pond 1 – Santa Clara Canyon – July 26 2013



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Watershed Response Geomorphology



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Watershed Response Geomorphology



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Watershed Response Geomorphology



Peralta Canyon Confluence with the Rio Grande
Pre-fire and Pre-Flooding



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Watershed Response Geomorphology



Peralta Canyon Confluence with the Rio Grande
October 2011



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Northern Watersheds and Flooding



Dixon Conference Center
Pre-Fire



Dixon Conference Center
Post-Fire & Post-Flood



Northern Watersheds and Flooding

Peralta Creek Culvert Crossing



Northern Watersheds and Flooding

Peralta Creek Culvert Crossing
One Monsoon Season Later



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Impacts to Bonito Reservoir



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Impacts to Bonito Reservoir



- One source of the Drinking water supply to City of Alamogordo, and Holloman AFB
- Bonito Lake Watershed
~ 21,000 acres
High – 7,700 ac.
Mod. – 3,100 ac.
Low – 7,400 ac.



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Impacts to Bonito Reservoir



Impacts to Bonito Reservoir



Total of 5 pumps:
4 - 12" and 1 - 8"
Max pump rate: 3,800 GPM ea.

8,000 feet of aluminum pipe

Drawdown rate:
• ~ 1 feet/day to 2 feet/day



Impacts to Cochiti Reservoir



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Debris Impacts

Approximately 100 tons of woody debris were removed from the surface of the lake.



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Debris Impacts

Debris Containment Boom

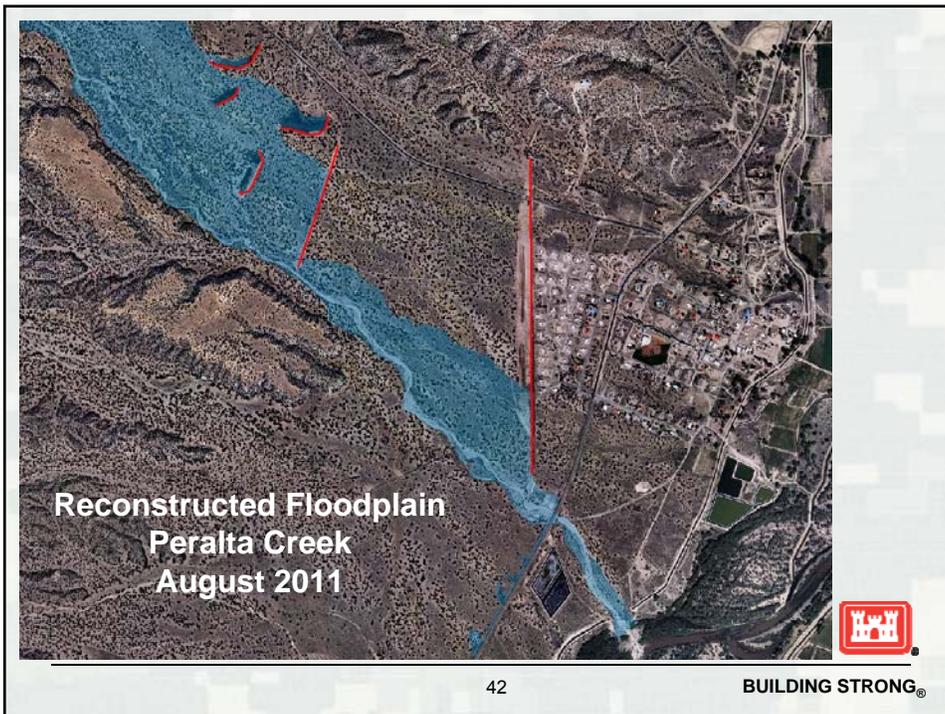


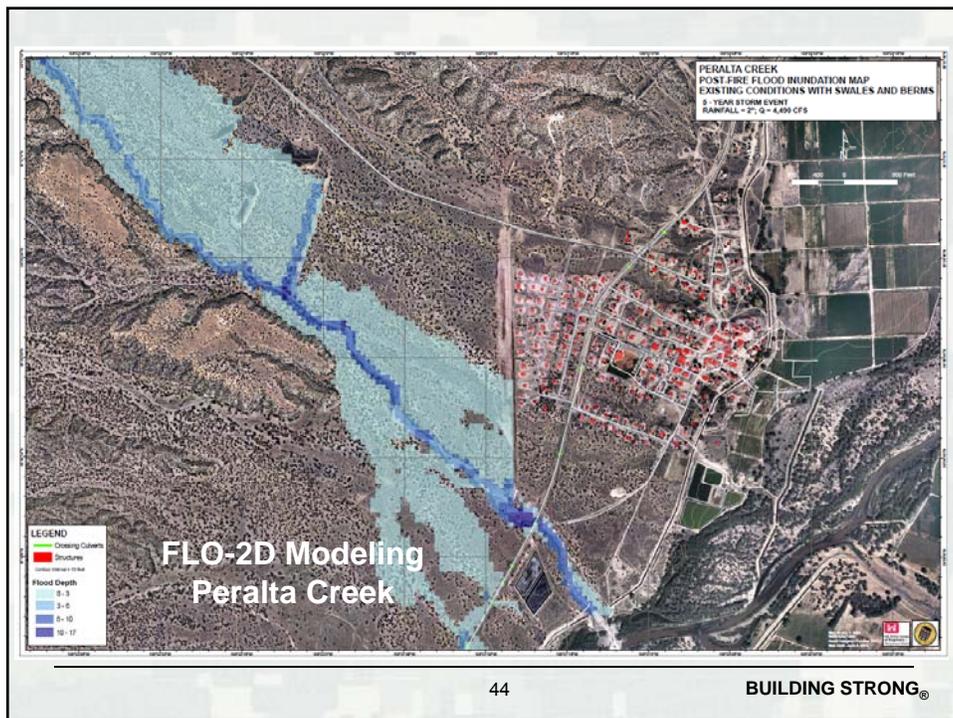
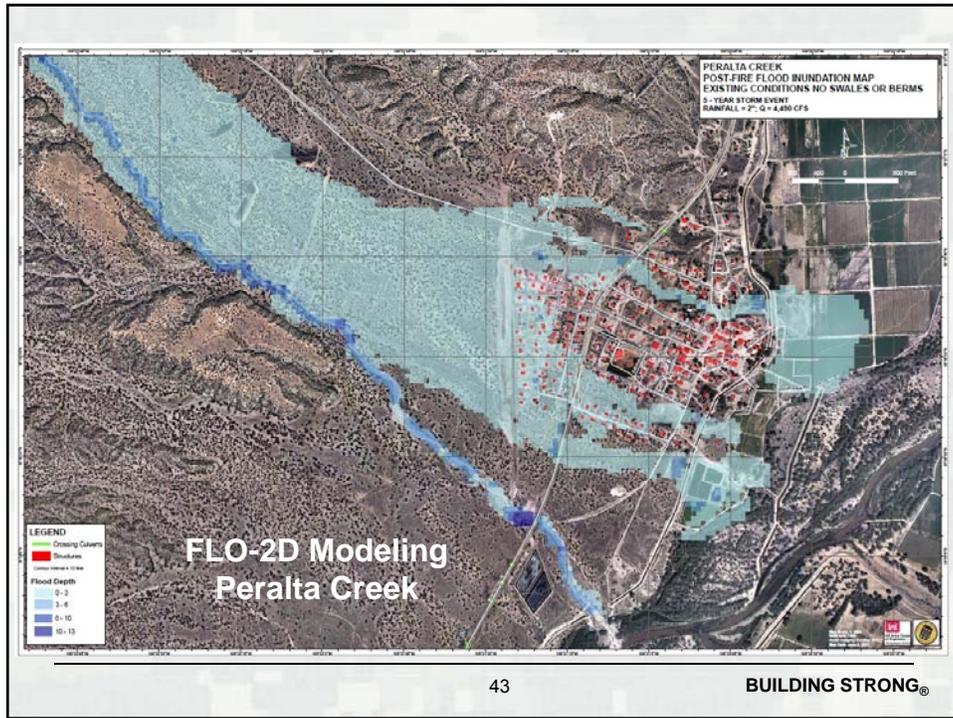
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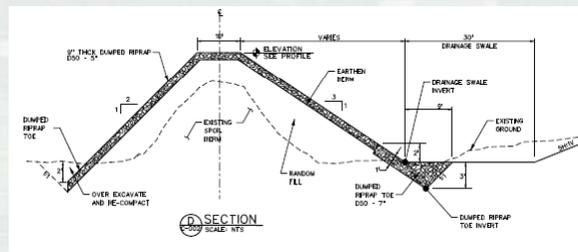
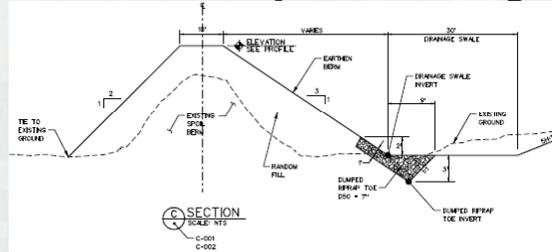
Technical Assistance Reports

- Authority: PL 84-99 Category 520 Funding
- Allows the USACE to provide assistance for repair or maintenance of an active project
- Modified to allow USACE to provide technical assistance in the form of:
 - ▶ Conceptual designs (*includes supporting H&H*)
 - ▶ Performing an economic analysis (BCR)
 - ▶ Recommending cost effective flood control measures
- Hydrology Modeling – HMS
- Hydraulics Modeling – RAS, FLO-2D





Technical Assistance Reports Conceptual Design



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Data Needs

- LiDAR / Orthophotography
 - ▶ Quick but Expensive, offers a snapshot, Multi Discipline Efforts
 - ▶ Used in H&H Analysis (HMS modeling, RAS/FLO-2D Modeling)
- Ground Surveying - In-Stream Cross-Sections
- Existing Floodplains - Look at existing FEMA Data or other data that is readily available
- Economic Data - Values at Risk, start documenting what has the potential to be damaged -> helps with BCR Computations
- Sediment Surveys - Is there an increased potential for large sediment flows?

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Questions

Steve Boberg, PE
Hydraulic Engineer
USACE – Albuquerque District
4101 Jefferson Plaza NE
Albuquerque, NM 87109
Direct: 505.342.3336
steve.a.boberg@usace.army.mil

