



Long Hollow Reservoir – Helping to achieve historical compact obligations while maximizing beneficial uses

- Colorado Water Resources and Power Development Authority
- La Plata Water Conservancy District

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April 2011, CLRMA

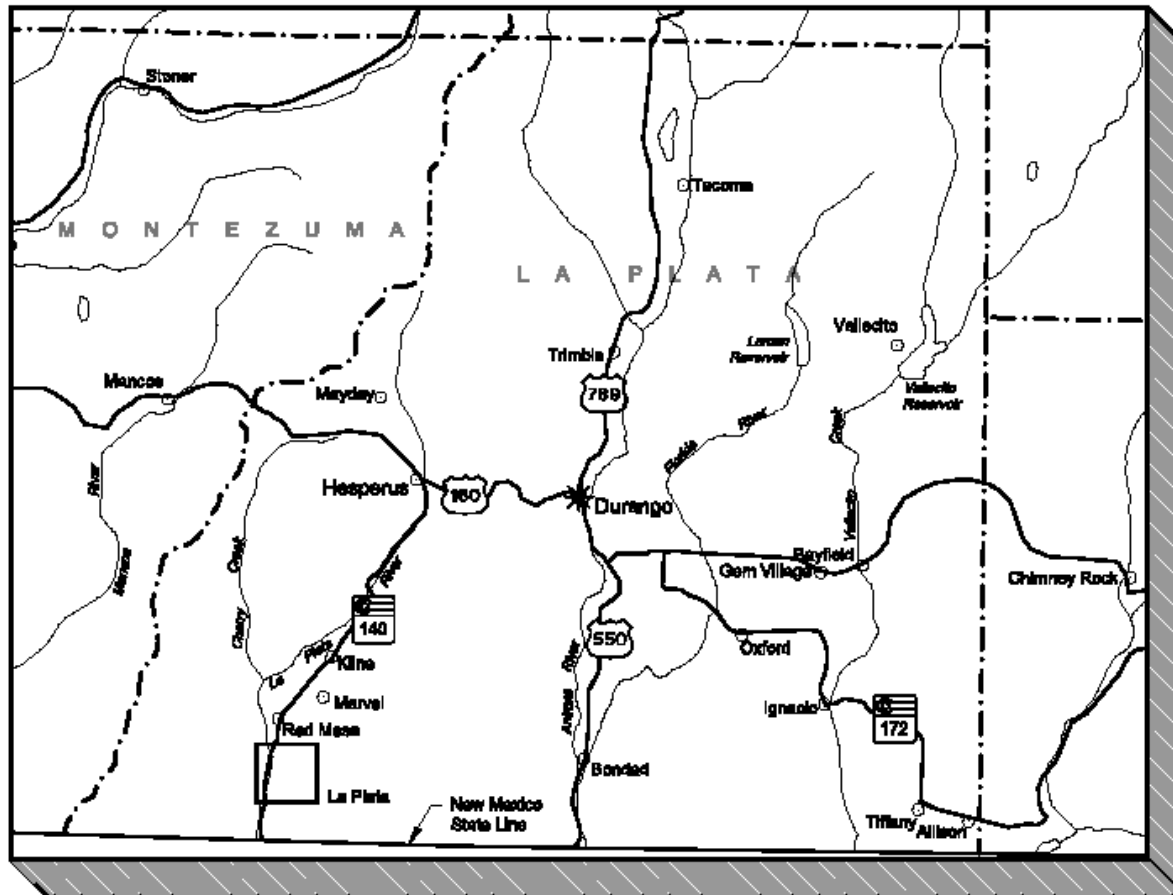


Outline

- Background
- La Plata River Compact, 1922
- Beneficial Uses
 - ▶ Irrigation
 - ▶ Aquatic life
- Ecological Issues
 - ▶ Thermal regime
 - ▶ Native fishery
 - Minimize non-native fish emigration from reservoir
- Fishery Management
- Water Management



Project Location





Mesa Verde – Pueblo Culture





Dam Site Looking Downstream





Long Hollow Reservoir Helps Meet Colorado's Compact Obligations

- 1922 La Plata River Compact between Colorado and New Mexico
 - ▶ Equitable distribution of La Plata River during Compact months
 - ▶ Colorado must deliver half the mean flow at the Hesperus gage (25 miles upstream of State Line) to the State Line, but not more than 100 cfs
- Long Hollow Reservoir (4 miles upstream of State Line) will provide water to meet the Compact Call and help Administer the La Plata River
 - ▶ For example, if flow at Hesperus gage is 100 cfs, the State of Colorado needs to deliver 50 cfs at the State Line. If flow at the State Line is only 30 cfs, then LHR could supply 20 cfs to meet the compact

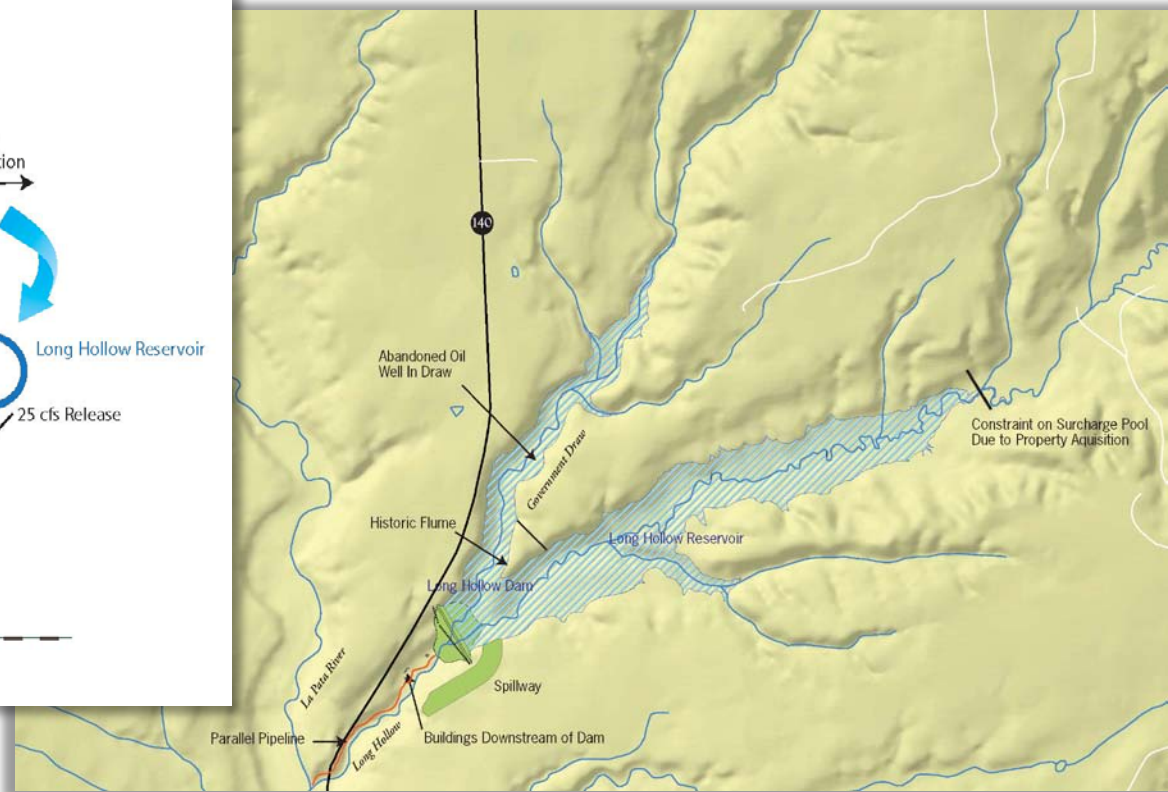
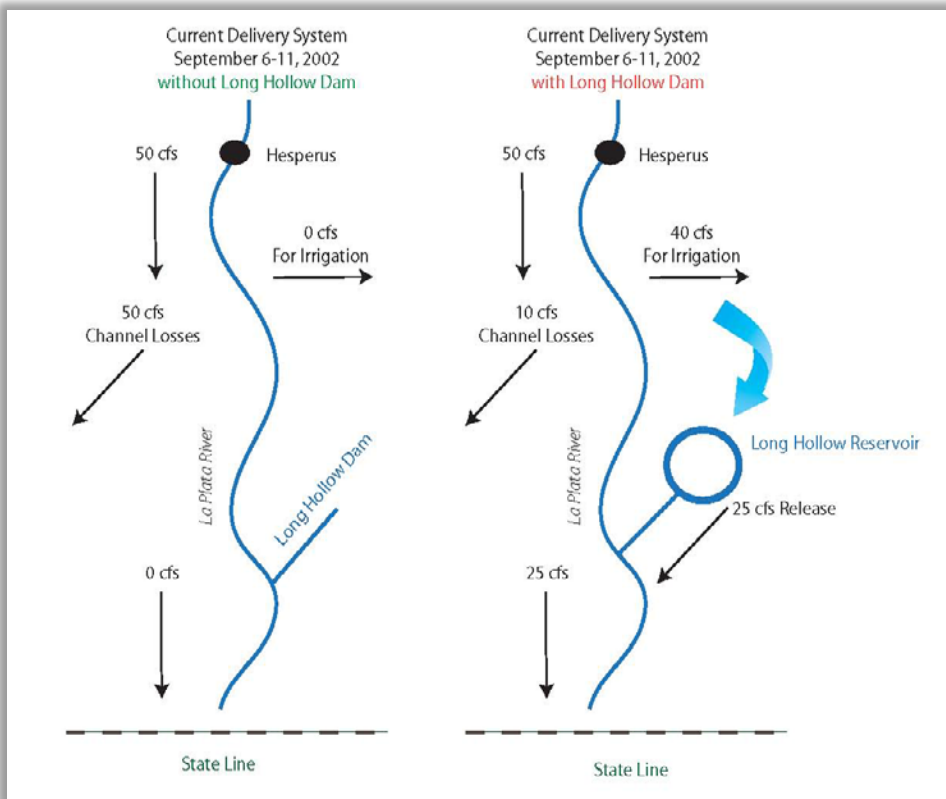


Other Reservoir Benefits

- Provides benefits to non-Tribal interests who would have benefited from the 177,000 ac-ft Animas-La Plata (ALP) Project before ALP was down-sized
- Supplemental water will be available to 18 irrigation ditches serving 20,100 acres of crops
- Increased irrigation return flows will benefit aquatic life in the La Plata River downstream of LHR
- Help native fish recovery objectives in the La Plata River



The Goal: Maximize Beneficial Uses



Storage and delivery to meet La Plata River Compact and enhance irrigation supplies



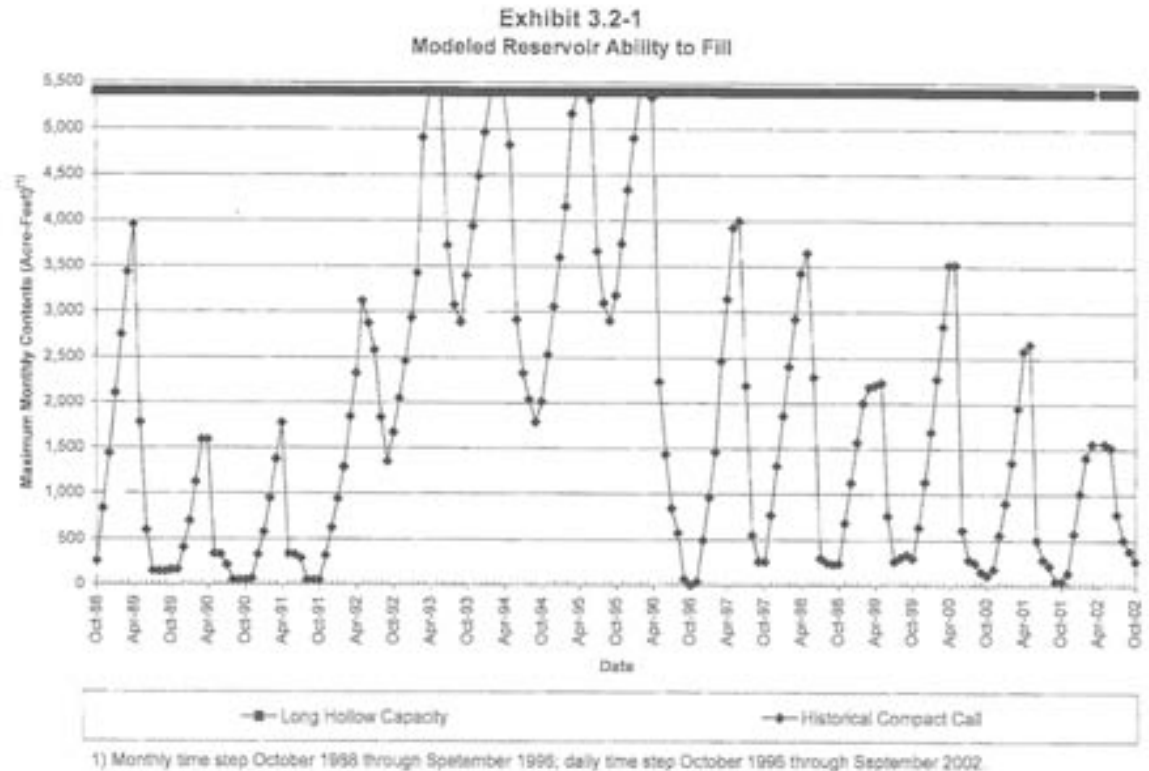
Key Ecological Issues

- Thermal regime of flow downstream of the reservoir
 - ▶ Multi-level tower release versus bottom release
- Satisfy Water Quality Criteria – Important for native fish in LPR
 - ▶ Colorado Species of Special Concern – roundtail chub
 - Other native species include flannelmouth sucker and bluehead sucker
 - ▶ Temperature is primary issue for warm water species, especially during spawning
- Fish screen on outfall for fish management in the reservoir
 - ▶ LHR will not be managed for a fishery
 - ▶ Non-native fish will eventually occupy LHR, via illegal stocking
 - ▶ Fish screen is to protect the downstream native fishery from additional non-native introductions.



Model of Ability to Fill Reservoir

- WWE modeled 14 year period: 1988 to 2002
- Reservoir will fill 4 of 14 years, 5,400 ac-ft; average fill of about 3,500 ac-ft
- Release most storage between April and June when La Plata River temperature is also cool
- Reserve minimum pool 300 ac-ft available to meet Compact needs in warm summer months



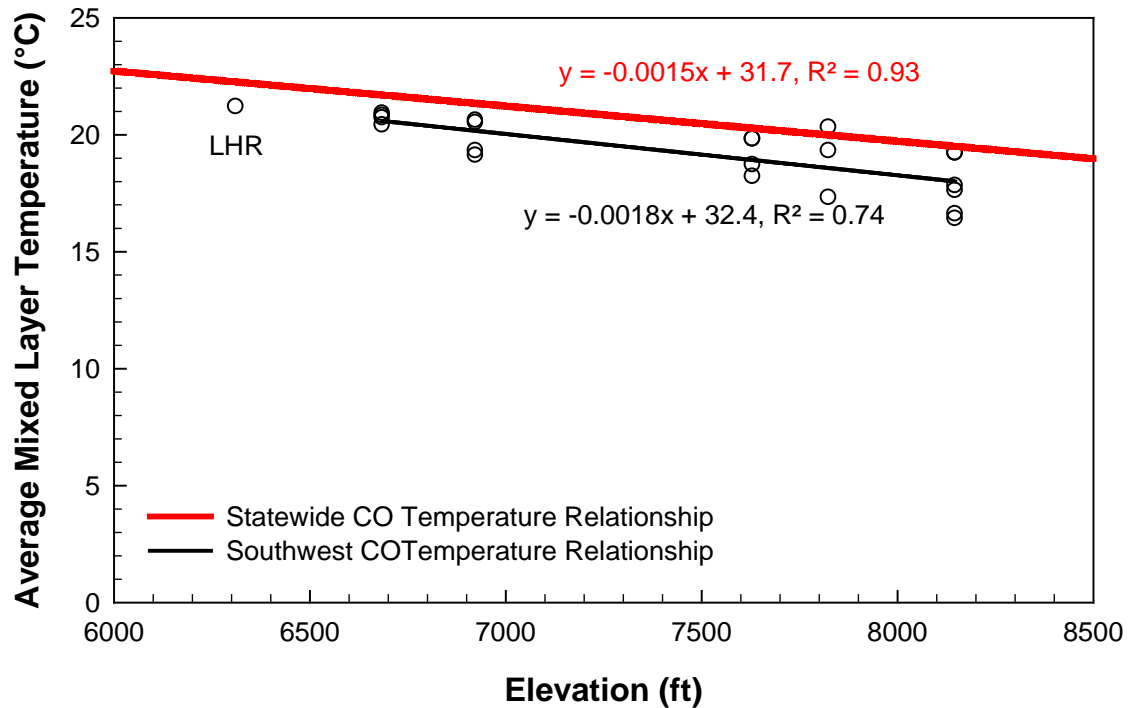
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Wright Water Engineers, Inc.
4/12/05

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Reservoir Temperature Data

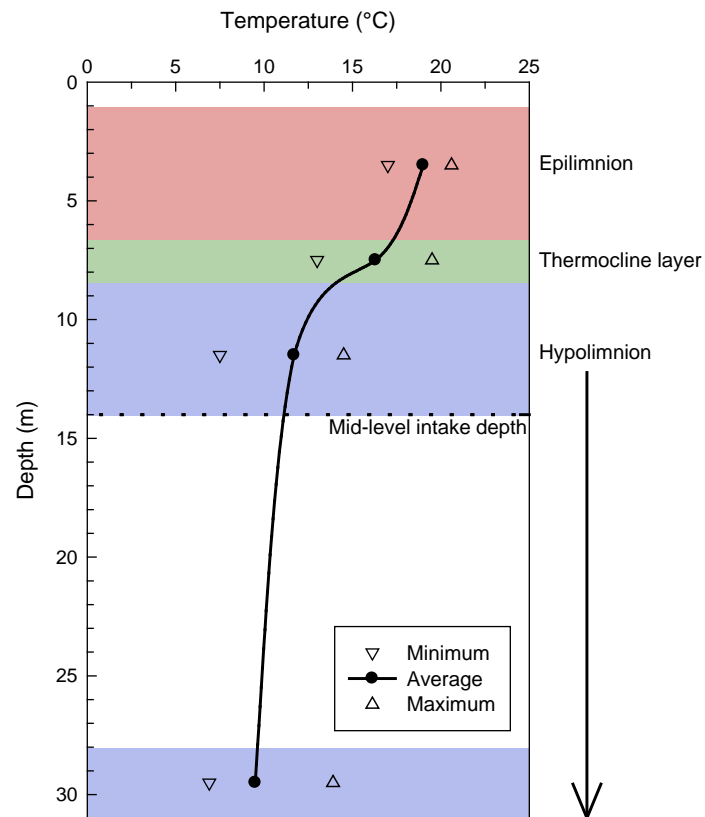


Average mixed-layer temperature

SOURCE: WATER QUALITY CONTROL DIVISION



Summer Temperature Profile For Southwest Colorado Reservoirs

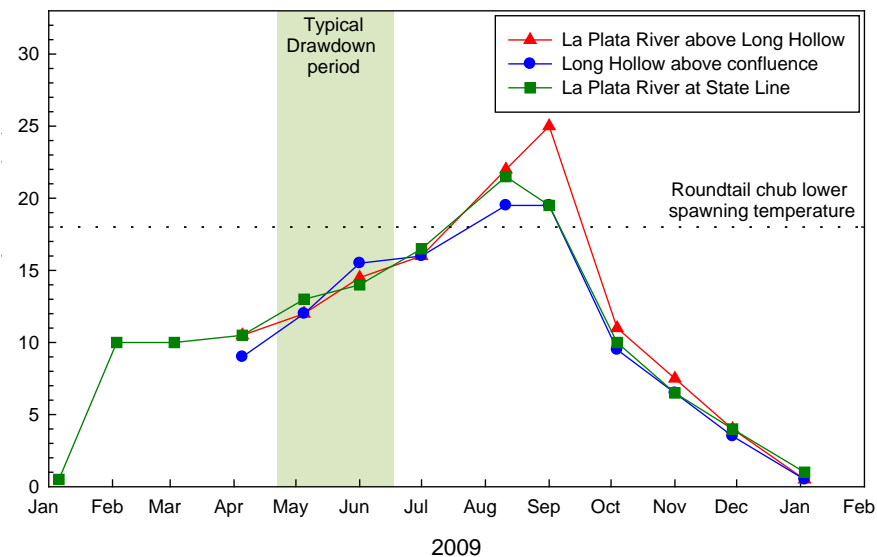
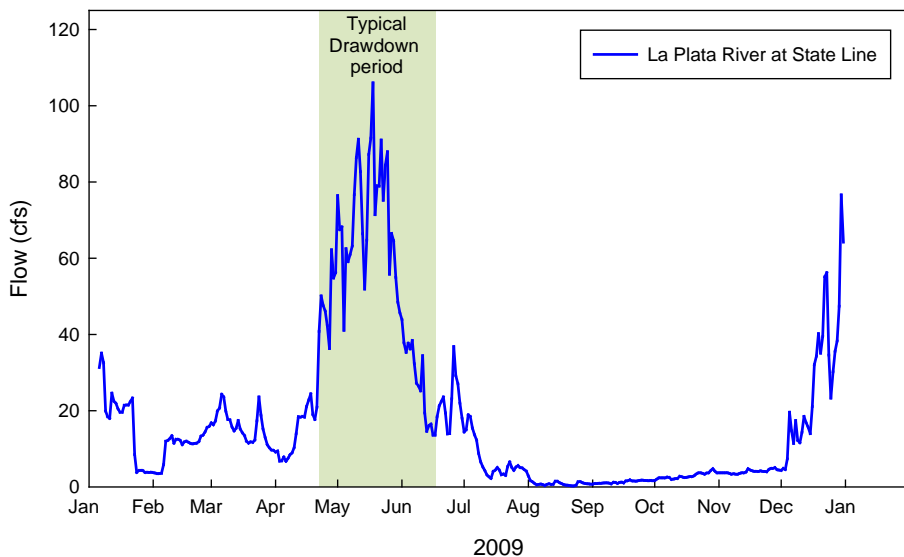


Expected profile for Long Hollow Reservoir is between average and maximum based on elevation



Stream Temperature Data, 2009

- Reservoir release schedule
- Spawning native fish preferences
- Reservoir release temperature will be similar to stream temperature





Reservoir Conditions and Fishery Management Strategies

- Reservoir will be nearly empty during most winters
- Cycled reservoir operations will limit viability of establishing a fishery
- Long Hollow Reservoir will be operated to discourage development of a fishery
- Illegal non-native introduction – low risk of establishment and escapement



Proposed Management to Control Non-native Fish Escapement

- **Downstream Fixed-Cone Valve**
 - ▶ Energy dissipating valve
 - ▶ Reservoir head at valve
 - ▶ Manage discharge to produce a high velocity jet discharge as spray (10 fps to 50 fps range)
 - ▶ High velocity impact against concrete wall in basin
 - ▶ High incidence of fish injury and mortality
- **Periodic non-native fish removal by CDOW**
- **Periodic fish eradication program**
 - ▶ Periodically empty and dry up the reservoir
 - ▶ Periodically dose the low pool with fish toxicant



Water Management Strategy

- During dry and typical water years, reroute water at Hesperus for irrigation and groundwater recharge
 - ▶ Long Hollow is an alluvial groundwater dominated system supplied by irrigation and alluvial recharge in the Red Mesa area
 - ▶ 74% of the return flows to La Plata River enter via Long Hollow (6 mo to 12 yrs)
- During drought conditions, the 300 ac-ft Compact pool will be released during the summer months
 - ▶ La Plata River is often a losing system from Hesperus to confluence with Long Hollow



Management Strategy cont.

- During wet year types the Reservoir would store water in priority for release in following years during compact period (spring-summer-fall)
- During non-compact period (winter), when flow is <4 cfs downstream of Long Hollow, LHR will release up to 2 cfs to help protect the fishery
 - ▶ Never release stored water collected in priority
- Possible storage for other water projects in Southwest Colorado



Summary

Construction and Operation of Long Hollow Dam and Reservoir will:

- Help meet compact obligations with New Mexico
- Enhance irrigation opportunities in the La Plata River Basin
- Increase irrigation return flows to Long Hollow that will benefit aquatic life in the lower reaches of the La Plata River
- Help native fish recovery objectives in the lower La Plata River



Long Hollow Reservoir

**Construction
Summer 2011 – Fall 2012**