BUREAU OF RECLAMATION

Binational Collaboration in response to a 120-day Bypass Canal maintenance outage

Presented by: Nathan Lenon, General Biologist

January 29, 2020

Co-Authors

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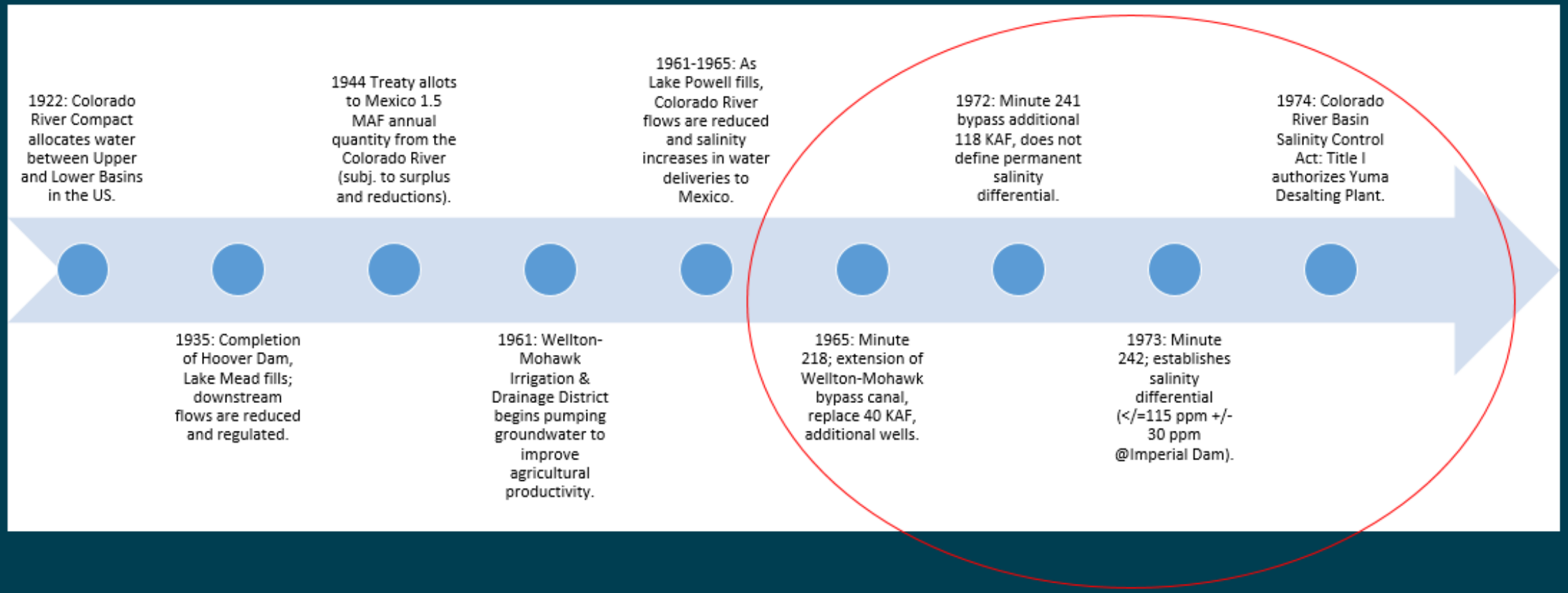
- Amy Witherall (Reclamation)
- Jennifer Pitt (National Audubon Society)
- Nathan Lenon (Reclamation)

Emergence of the Salinity Issue



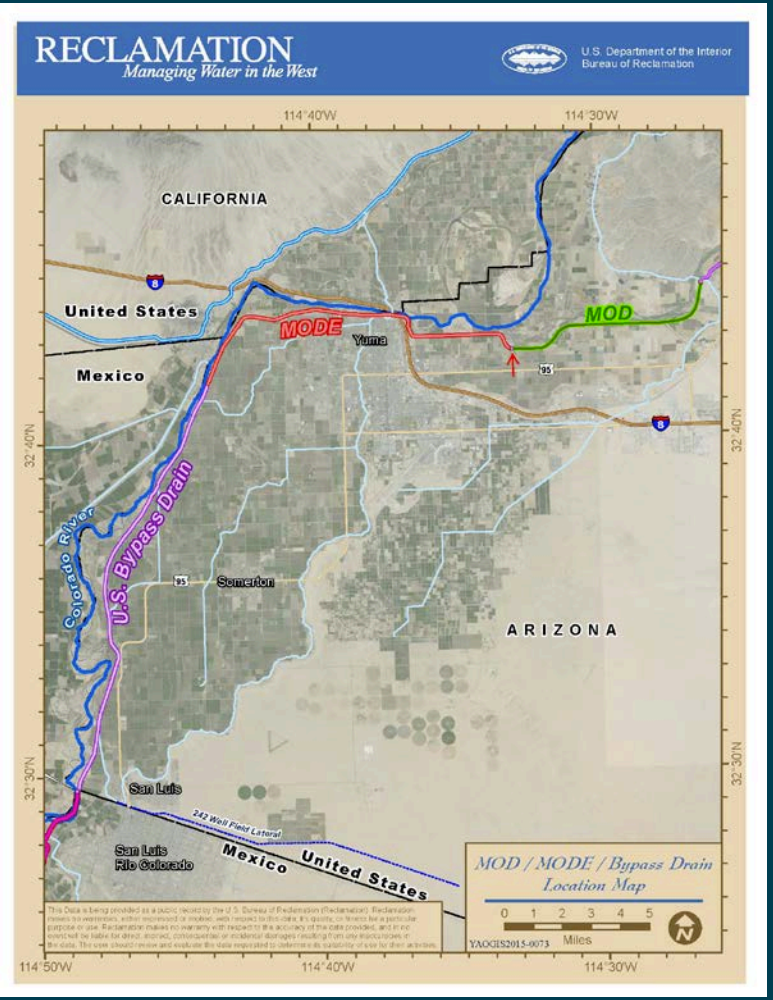
Bypass Canal Maintenance

- Existing system in operation 20+ years, with moderate to severe concrete deterioration in concrete panels and other structures.

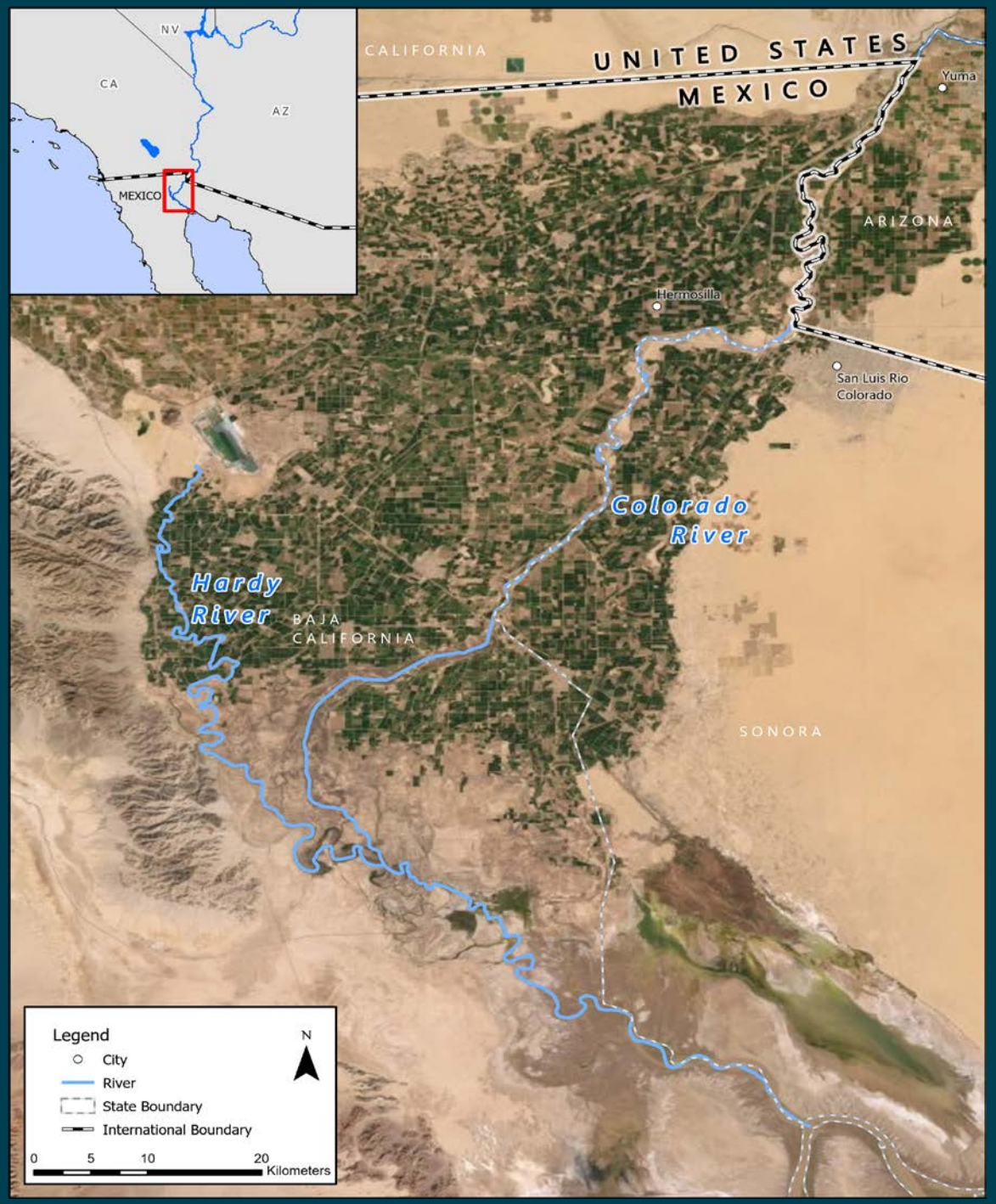
- While Reclamation's contractor completed structural repairs, the Bypass Canal was down from September 5th, 2019 to January 6, 2020. The work consisted of concrete panel replacement, bridge abutment work, etc.

- Multi-year canal maintenance program included bridge replacements and other concrete-repair projects completed starting in 2017.

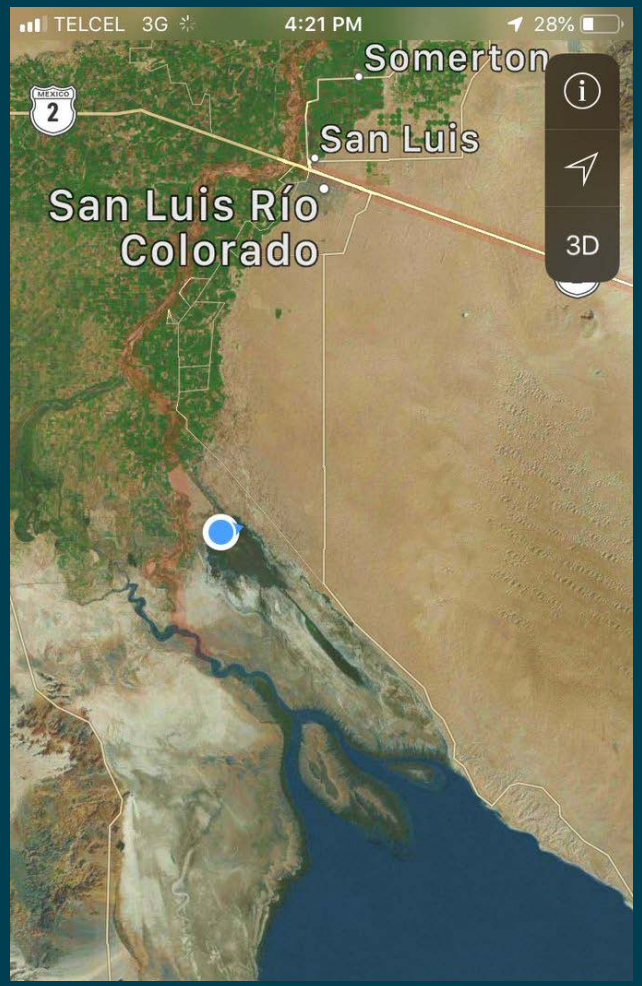
- Canal flows were diverted at MODE III during this period. NIB river water deliveries not affected: this was MODE water and it was diverted below Morelos Dam.

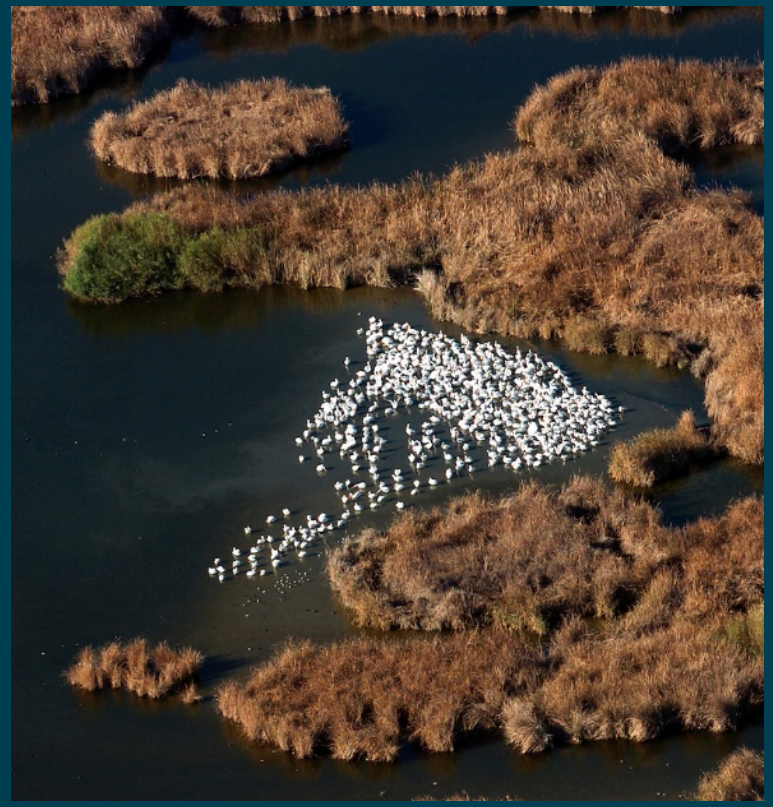


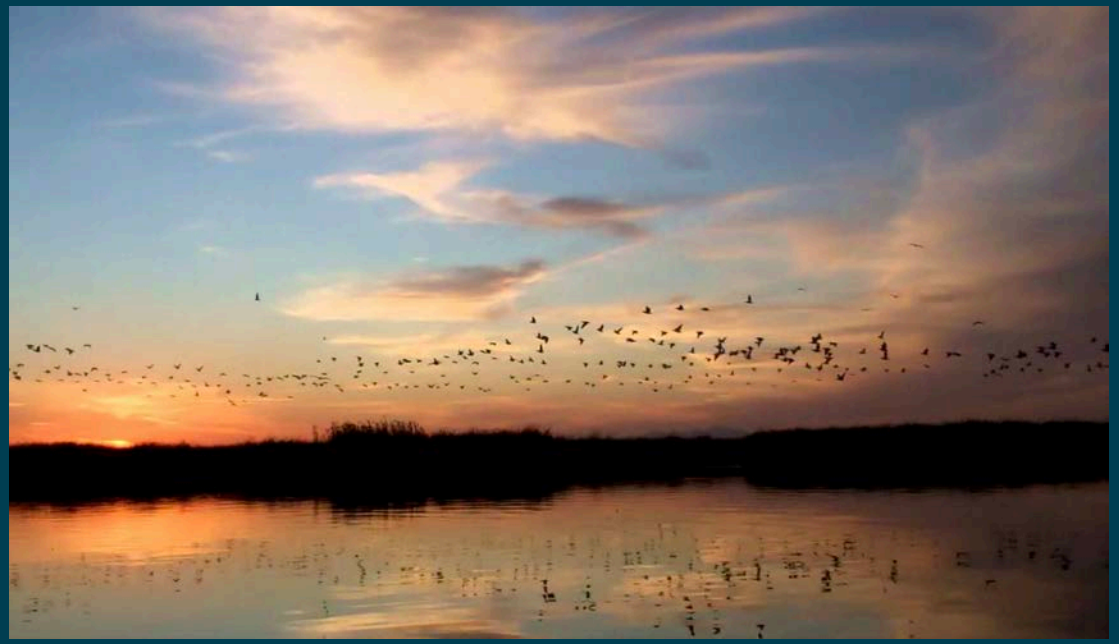
Lower Colorado River Limitrophe and Delta



95% reduction in water for the Ciénega de Santa Clara for 3-4 months







Binational Collaboration

Federal Team

- International Boundary and Water Commission, U.S. Section (USIBWC)
- International Boundary and Water Commission, Mexican Section (CILA)
- Bureau of Reclamation
- Comision Nacional del Agua (CONAGUA)
- U.S. Geological Survey

Monitoring Team

- U.S. Lead - University of Arizona (UA)
- Mexico Lead - Universidad Autónoma de Baja California Sur (UABC)
- Sonoran Institute
- Pronatura Noroeste
- Audubon Society
- The Nature Conservancy

Environmental Monitoring Plan: Limitrophe

- Groundwater Monitoring US (USGS)
- Surface/Groundwater Monitoring MX (UABC)
- Surface Water Extent (UA)
- Vegetation Health (UA & USGS)
- Soil Salinity (Sonoran Institute)

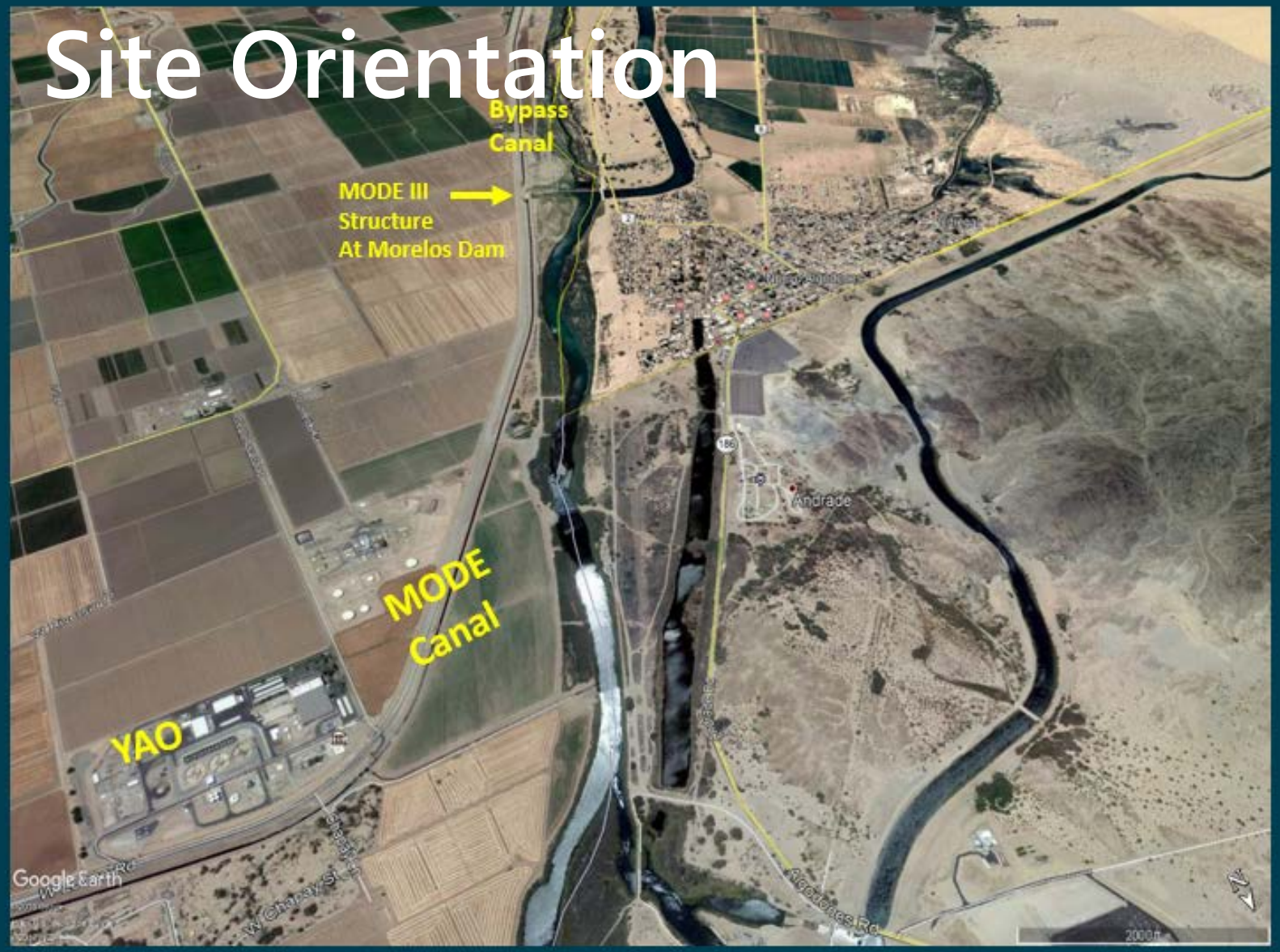
Environmental Monitoring Plan:
Cienega de Santa Clara

- Surface Water Depth & Quality (UABC)
- Surface Water Extent (UA)
- Vegetation Health/NVDI (UA)
- Drone Imagery (UA)
- Yuma Ridgway Rail Movement (Audubon and Pronatura)

Public Outreach

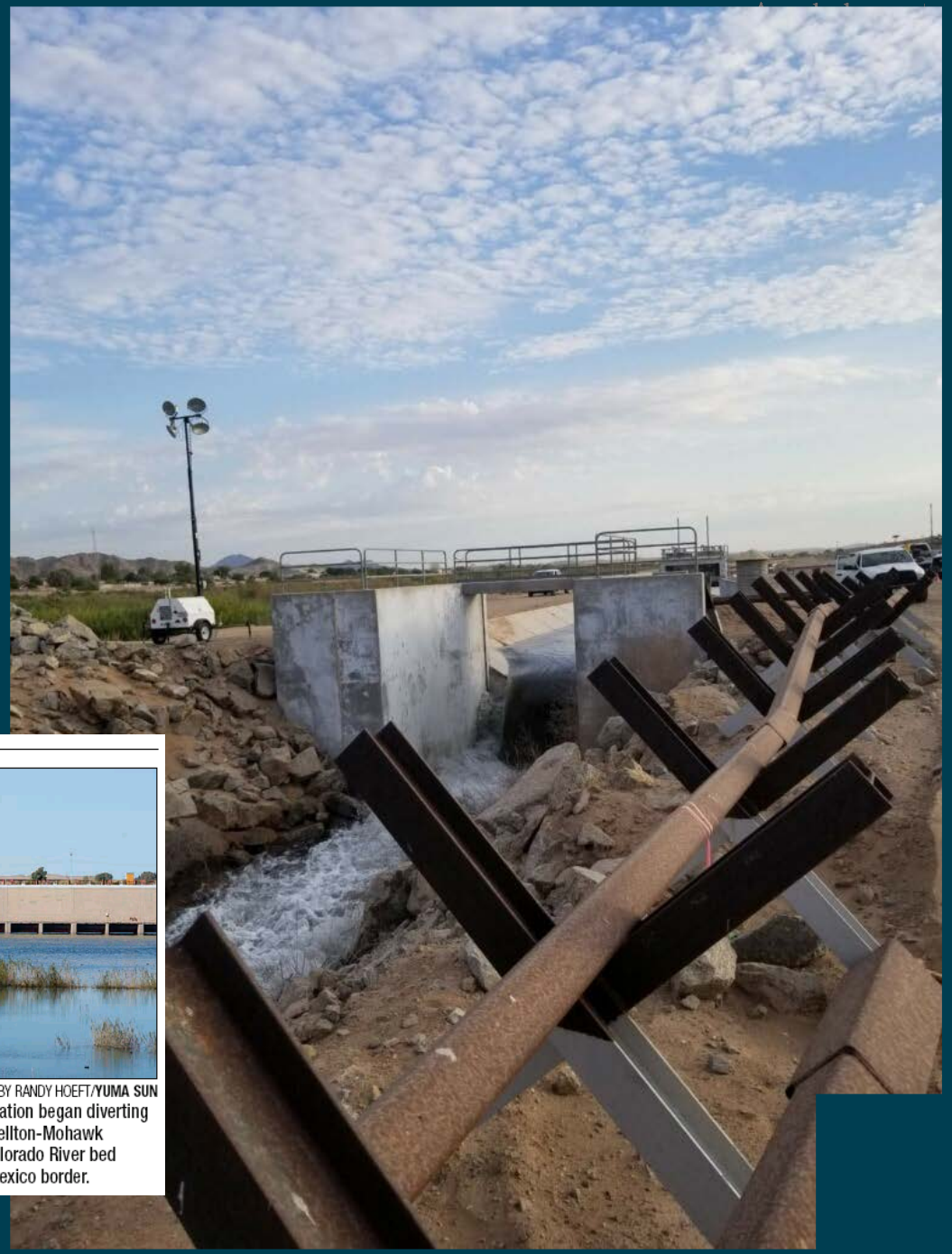
- Reclamation issued press release in US September 3, 2019
- CILA issued press release in Mexico September 3, 2019
- Signage installed at San Luis Bridge and along Limitrophe notifying the public not to drink the water or swim in it.

Site Orientation



Site Orientation

First day of deliveries into Limitriophe



THANK YOU FOR READING YUMA'S COMMUNITY NEWSPAPER

Yuma Sun

MONDAY, SEPTEMBER 9, 2019 123rd YEAR, 142nd ISSUE

Repairs started on Bypass Drain

BY BLAKE HERZOG
@BLAKEHERZOG

Repairs began this week on the U.S. Bypass Drain, the canal which carries irrigation drainage water from eastern Yuma County to the Cienega de Golfo de Santa Clara on the Gulf of California.

The concrete-lined channel has been taking the discharge water from the Wellton-Mohawk Irrigation and Drainage District, as well as some from the Gila Valley, to the Gulf of California since the 1970s, and the section which crosses the border needs maintenance, said Doug Hendrix, spokesman for the U.S. Bureau of Reclamation.

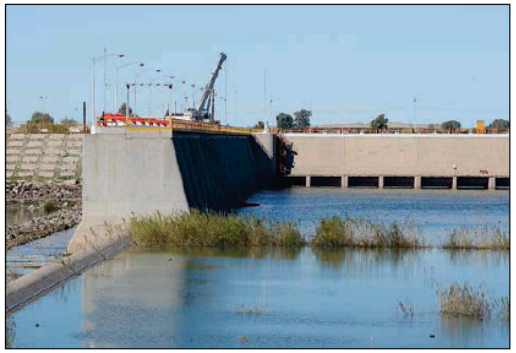
"What's going to happen is they're going to clean the existing sediment out of the channel, and they're going to look for damaged sections, areas which are cracked or rotored away and replace those, and then work on the headwalls and sidewalls, those types of things," he said.

The repairs, expected to take three to four months, will affect the Colorado River both at the base of Morelos Dam and at the wetlands on the gulf, as one location gets the water the other is accustomed to having.

"Because Reclamation is doing these repairs on the bypass canal, they have no place else to put the water, so they have a turnout from that bypass canal into the river, just below the dam, and they can leave it there because it doesn't mix with the water Mexico is taking for its farmers," said Jennifer Pitt, Colorado River program director for Audubon.

The irrigation discharge water's high salt content is the reason it's transported separately instead of allowed to flow back into the river, and it is not suitable for humans to drink or swim in. Warning signs will be posted in the area south of Morelos

SEE DRAIN/A5



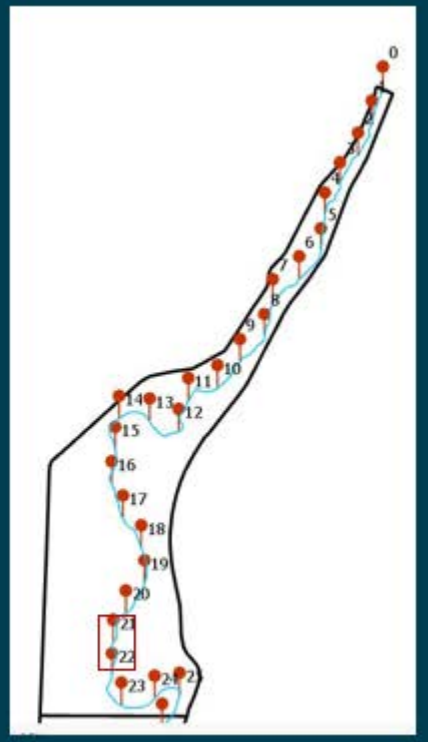
BUY THIS PHOTO AT YUMASUN.COM PHOTO BY RANDY HOEFT/YUMA SUN

ON THURSDAY the U.S. Bureau of Reclamation began diverting salty irrigation drainage water from the Wellton-Mohawk Irrigation and Drainage District into the Colorado River bed below Morelos Dam (above) on the U.S.-Mexico border.

September 8, km 21

September 10, km 22

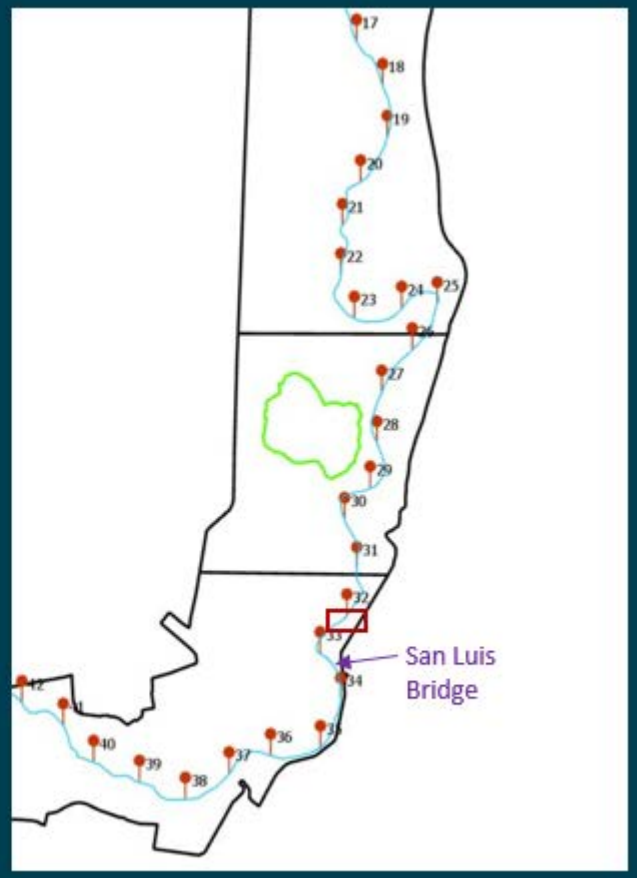
Reach 1



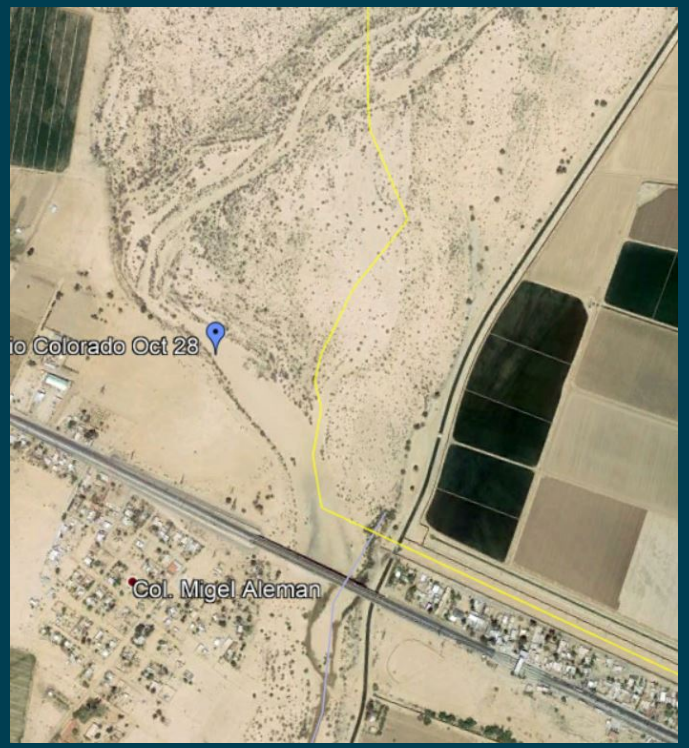
October 18, km 32

October 20, km 32

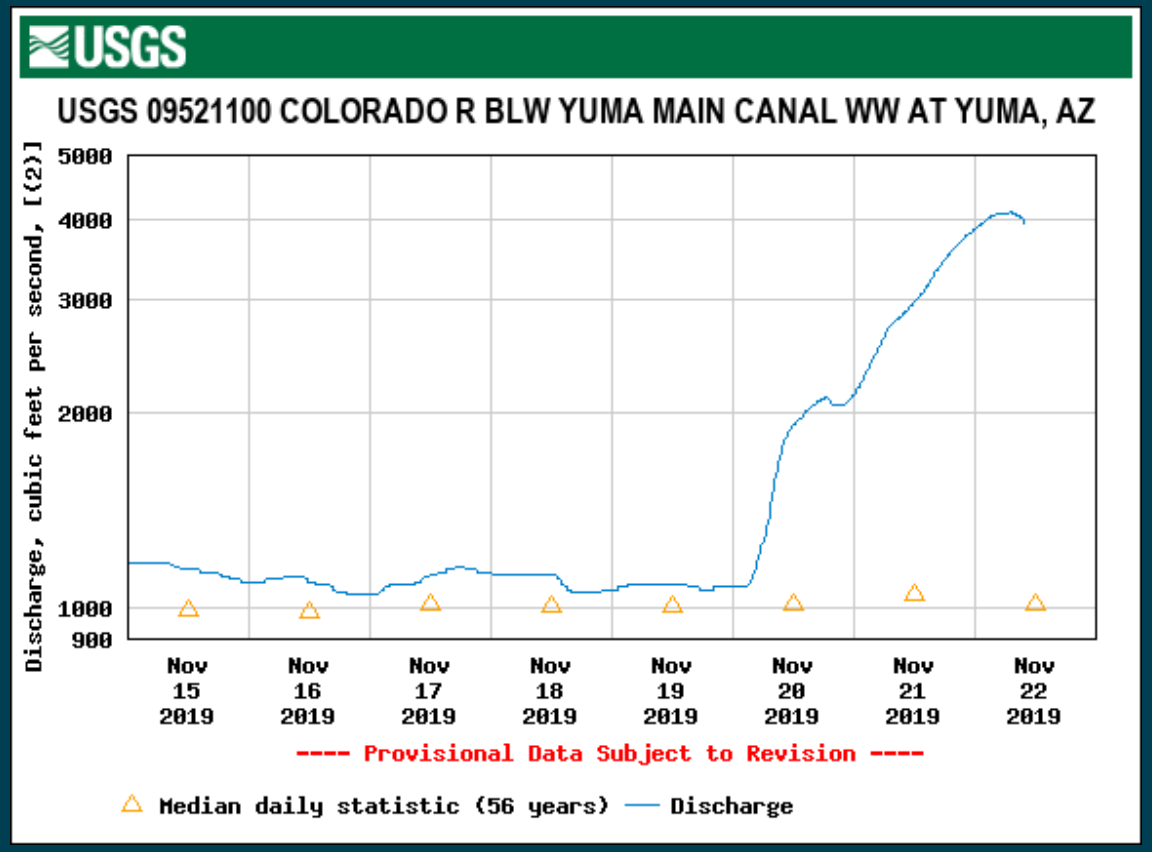
Reach 3



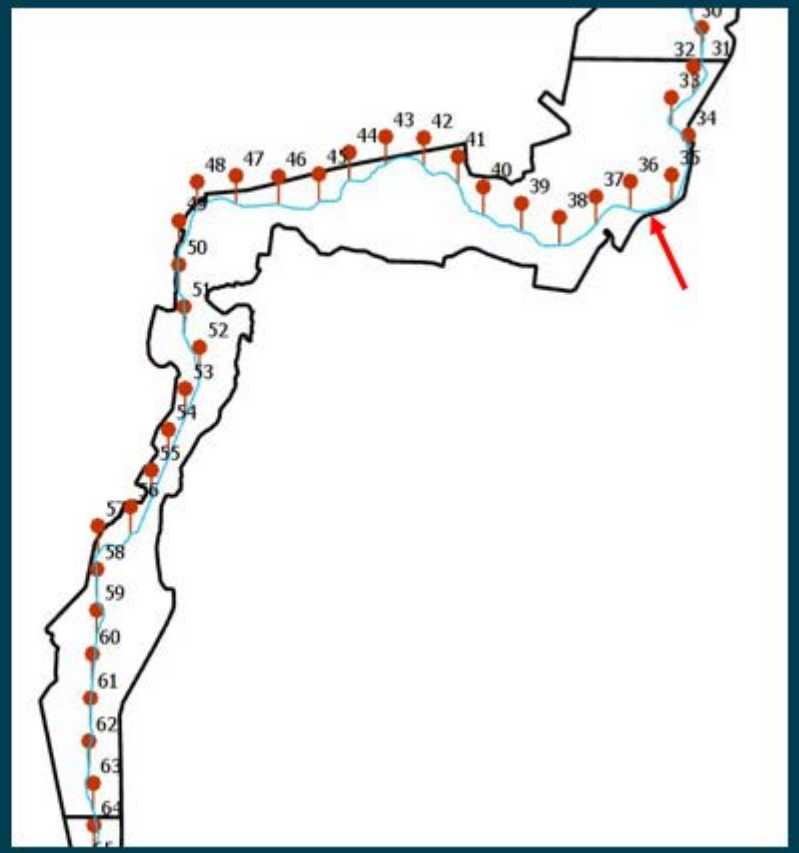
Limitrophe flow was 580 meters from the San Luis Bridge on October 28 at 11:00 AM



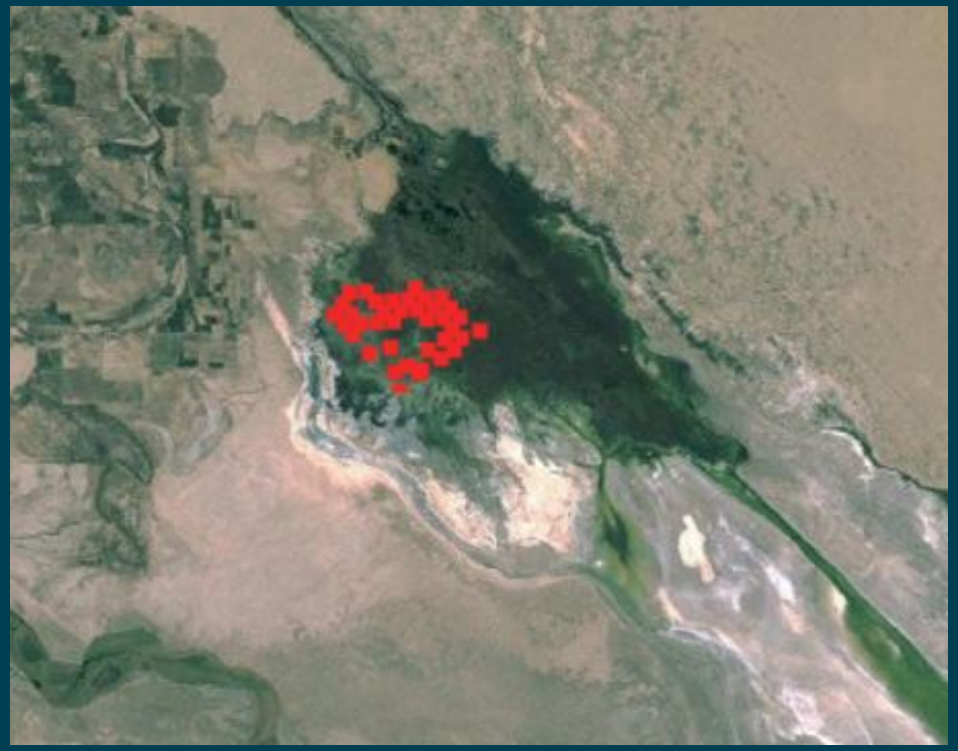
Large rain event contributed additional runoff (Nov 20-22, 2019)



December 9, 2019, km 36, most of the water on Reach 3 infiltrated.



Cienega fire on October 25

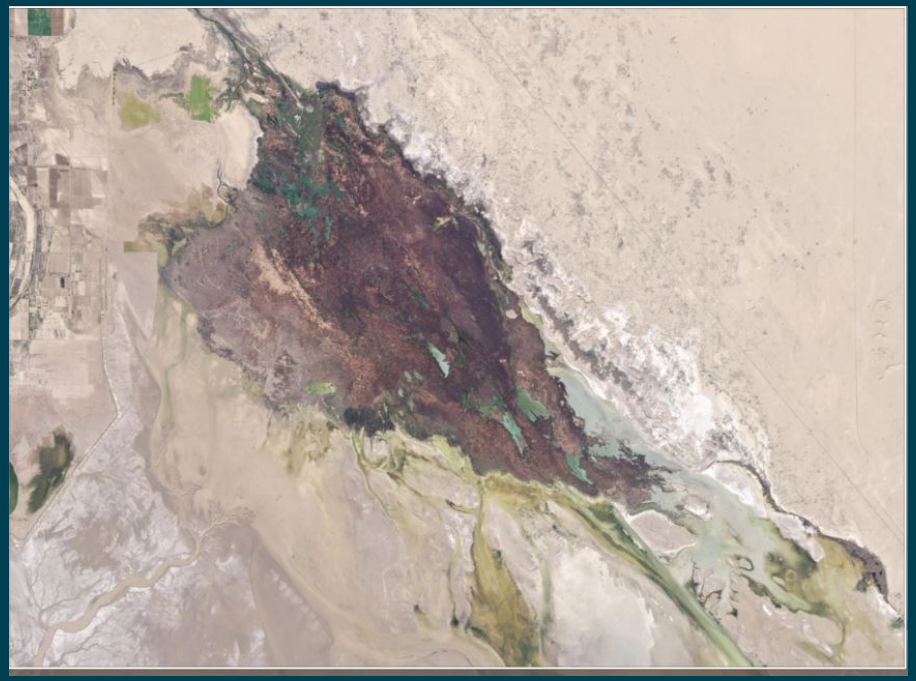


Planetscope image (3 m pixel size) on October 26

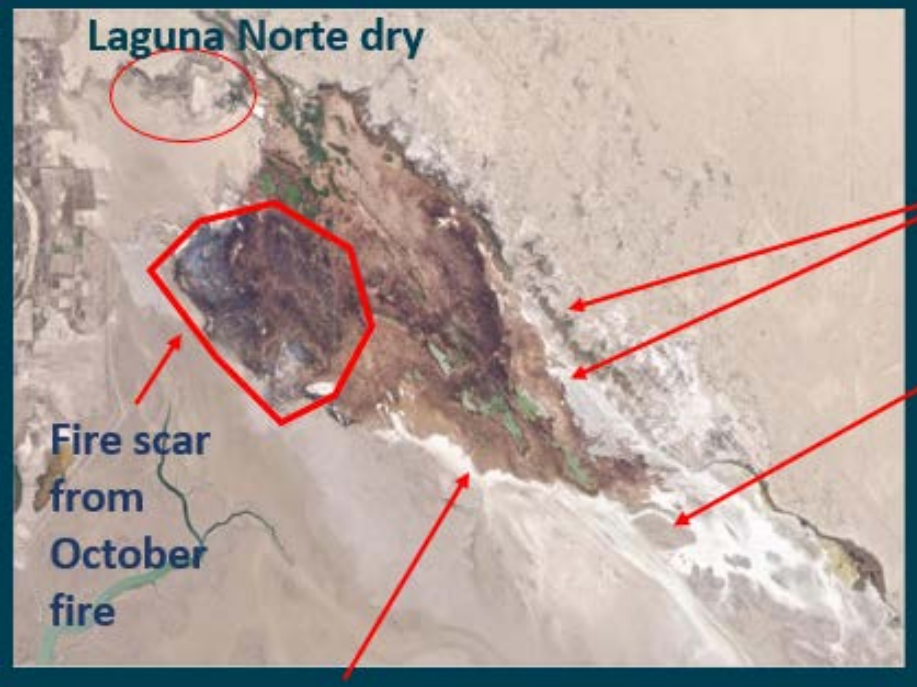
Fire detection on VIIRS (375 m pixel size) image from FIRMS NASA

Cienega de Santa Clara on RapidEye images comparing January 3, 2019 vs January 2, 2020.

January 3, 2019



January 2, 2020



Playa areas dry

No Surface water on the ouflow zone

Western margin dry

- Surface water
- Surface water
- Dry vegetation
- Dry vegetation
- Dry vegetation

Lagoons with surface water show green colors and dormant vegetation is observed in light yellow to dark brown color in both images.

Preliminary Observations

- Limitrophe flow reached San Luis Bridge approximately October 28, 2019
- Cienega became very dry around outer edges, inflow/outflow areas
- Salinity increased in Cienega
- Fire burned large area of Cienega (likely human caused)
- Bypass Canal outage ended on January 7, 2020.
- Limitrophe flow is currently around km 22 (Reach 1) and Cienega water levels are starting to recover.

Monitoring Timeline

- Data Collection: 8/2019-8/2020
- Final Report Completion: 12/2020

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