Creating a resilient river report card and scenario model for the Upper Rio Grande

Workshop newsletter

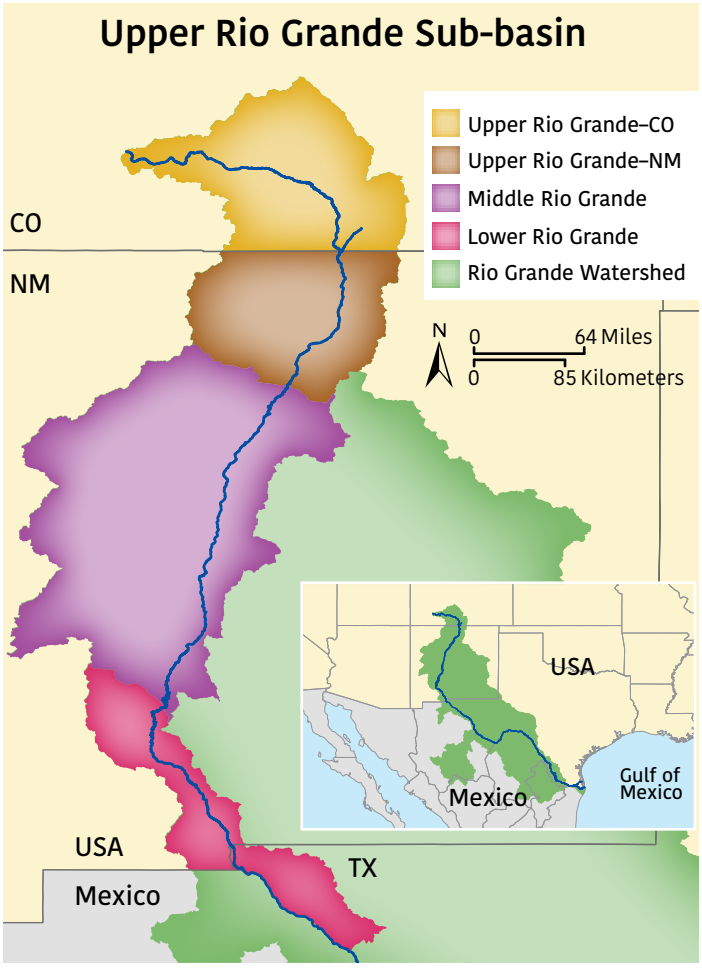
The first stakeholder workshop to develop an eco-health report card and scenario model for the Upper Rio Grande occurred in late 2020. The workshop took place virtually over four 90-minute sessions in October and November 2020. More than 50 diverse stakeholders from government, the private sector, academic institutions, irrigation districts, and indigenous communities participated. The goals of the workshop were to 1) identify shared values, threats, and priorities within the basin; 2) propose indicators; 3) identify data sources and expertise; and 4) discuss potential future management options. For more information on the project, see the project concept newsletter.

This project is a partnership between World Wildlife Fund-US, Audubon New Mexico, University of Massachusetts Amherst, and University of Maryland Center for Environmental Science (UMCES), with generous support from the Arthur Vining Davis Foundations.

Water and culture are vital aspects of the Rio Grande

At the beginning of the workshop, participants were asked, "What does someone need to know about the Upper Rio Grande?" Seven key ideas were identified:

1. The Upper Rio Grande's headwaters begin in the Rocky Mountains of southern Colorado, and the river flows through the Rio Grande Rift, providing a ribbon of green life in an arid landscape.
2. Human societies, including Native American tribes and Spanish acequias, have relied on the Rio Grande for centuries.
3. Water flow is seasonally variable. Snowmelt drives peak flows in the spring, while intermittent flows are common south of Albuquerque.
4. The Upper Rio Grande is managed locally by irrigation districts, state, and federal water management agencies. The Rio Grande Compact is a critical management priority.
5. Water allocation is a major issue; there is not enough water for irrigation and municipal needs.
6. Water deficits due to drought are exacerbated by climate change and population pressure.
7. The Rio Grande is designated as an American Heritage River and a Wild & Scenic River.



The Upper Rio Grande reporting region map.

Creating a shared vision for the Upper Rio Grande

Workshop participants created a shared vision by identifying values and threats to the Rio Grande. The values were ranked and categorized into six groups. This exercise generated over 90 unique values. The most important values were water and culture. The same process occurred for identifying threats to the basin. The biggest threats were water stress, climate change, and pollution.

Potential indicators of basin health

To relate the values and threats to basin condition, stakeholders identified many potential indicators and discussed thresholds for the indicators. Some of the indicators are displayed in the categories below. With continued stakeholder input, the suitability and data availability of these proposed indicators will be investigated in the next stage of this project.

Economy

- Acequia funding
- Crop diversity
- Fishing & hunting
- Cost of water
- Agriculture

Management & governance

- Management funding
- Protected lands
- Basin planning
- Policies supporting tribal nations & Pueblos

Society & culture

- Recreation
- Park access
- Quality of public lands

Landscapes & ecology

- Birds
- River otters
- Beavers
- Wetlands
- Invasive species
- Fish
- Fire

Water quality & quantity

- Flow
- Water supply
- Water Quality Index
- Sedimentation
- Impaired streams

Health & nutrition

- Air quality
- Drinking water access

Modeling to forecast future scenarios

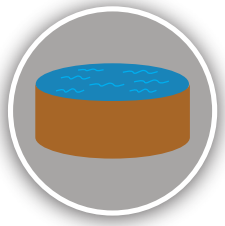
This project also seeks to develop a tool that will relate basin conditions and stakeholder decisions to indicators. The goal is to represent decision-making impacts on the health of the basin. To achieve this, data will be aggregated with water system models of the Upper Rio Grande. The model simulates hydrological processes in the system. It includes land cover changes, infrastructure, and government policy. This model will include a vulnerability assessment that explores the impacts of future social and environmental conditions. A stress test will highlight trade-offs among stakeholder values given alternative management decisions.

The scenario modeling will show options for managing water flow as seen in the example to the right. 2018 (top photo) was a dry year, and the water came from environmental leases secured by Audubon New Mexico. In 2019 (bottom photo), it was wetter and water came from snow melt.

During the workshops, stakeholders outlined management options that address threats to the basin. Creating scenarios that include different management options will allow for recommendations of actions that could best improve conditions and mitigate factors like climate change and population growth. Several potential management options are listed below.

The Rio Grande at Bernardo, NM in early July 2018 (top) and late June 2019 (bottom). (Photo credit: Paul Tashjian)

Infrastructure management



These options address hard infrastructure (investments for adequate water storage, river channelization, switching from well to municipal systems, fencing to manage cattle). They could increase water access and improve water quality.

Infrastructure policies

These options are about infrastructure policies such as recycling, re-operation of infrastructure, and reservoir management. These are aimed at conserving water and increasing the ability to meet prescribed targets/agreements.

Landscape restoration

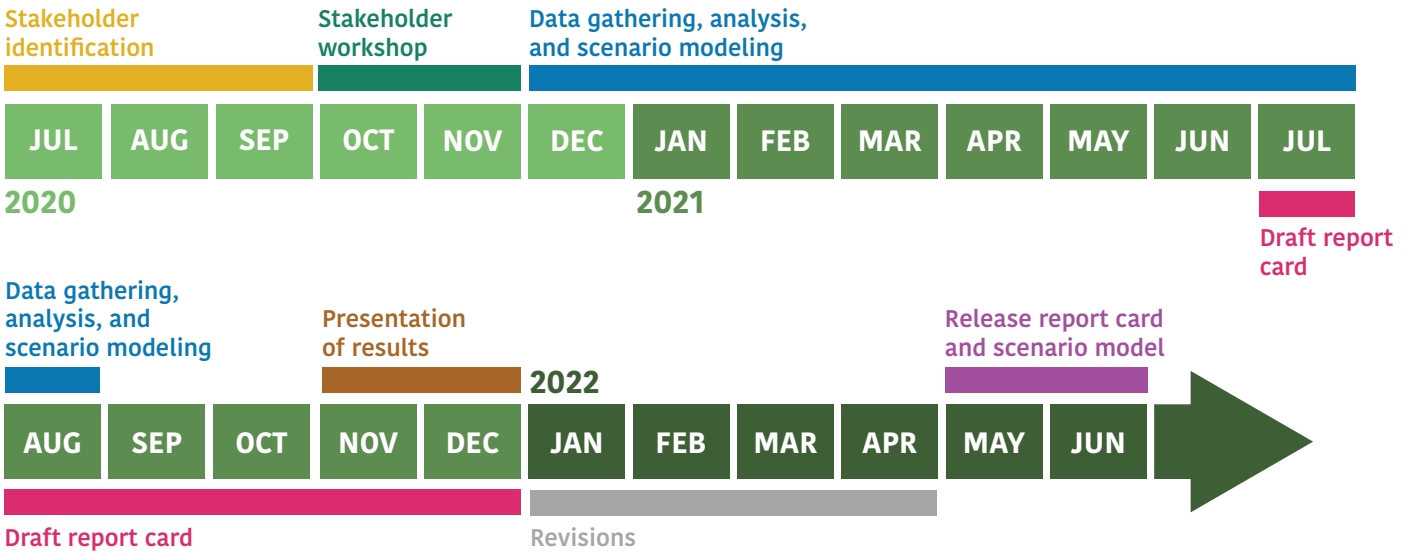
These options cover landscape restoration (riparian and wetland restoration, removal of invasive species, prescribed burns, forest management). They are aimed at increasing the quantity of water that is made available (or saved) for the environment.

Other policy changes

These options include citizen education, financial incentives for environmental consciousness, financial instruments to share water shortages. These non-infrastructure policies are aimed at overall basin health.

Next steps and project timeline

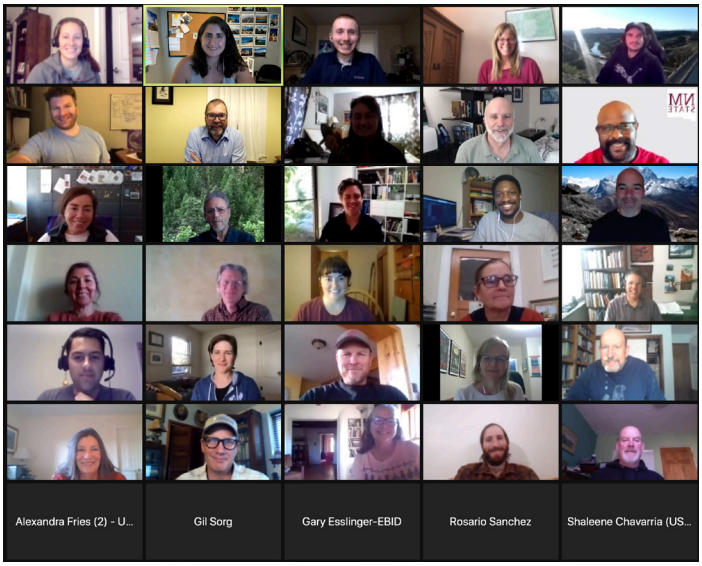
The development and production of the Upper Rio Grande report card and scenario model are estimated to take 2 years, with the release planned for June 2022. Following the initial stakeholder workshop, the next nine months entail data acquisition and analysis of the indicators. This includes small stakeholder working groups that provide guidance and expertise on the indicator thresholds and scoring. A draft report card with preliminary scores will be distributed to stakeholders for review and comment prior to a second workshop in late 2021. Revision and completion of the report card and scenario model will occur in 2022.



Acknowledgments

Thank you to all the participants who attended this workshop over the course of four weeks this past fall: Adrian Oglesby, Aimee Roberson, Alex Mayer, Alex Puglisi, Alex Webster, Alfredo Rodriguez, Bethany Howell, Carolyn Donnelly, Christi Bode, Christine Canaly, Cleave Simpson, Cody Walker, Collin Haffey, Dagmar Llewellyn, Debra Guzman, Elizabeth Verdecchia, Emma Kelly, Esteban Muldavin, Gary Esslinger, Genevieve Johnson, Gill Sorg, Gina Dello Russo, Grace Haggerty, Jason Remshardt, Jeff Bennett, Jeff Hanratty, Jennifer Lindline, Joe Zupan, Jon Radtke, Kim Marotta, Laura Paskus, Luis Garnica, Mark Stone, Maryann McGraw, Michael Porter, Natalie Lau, Paula Garcia, Rachel Conn, Rosario Sanchez, Salim Bawazir, Samual Sandoval Solis, Serafina Lombardi, Sergio Salinas Rodriguez, Shaleene Chavarria, Sharon Vaughn, Stephanie Woodward, Timothy Seaman, Toner Mitchell, Tyler Lystash, William Schneider, and Yasmeen Najmi.

Thanks to the project team who facilitated the workshop sessions: Paul Tashjian, Enrique Prunes, Michele Thieme, Danielle Andrade, Nicole Tanner, Chinedum Eluwa, Casey Brown, Simon Costanzo, Alexandra Fries, Bill Dennison, Heath Kelsey, Nathan Miller, and Joe Edgerton.



Many stakeholders attended the virtual Upper Rio Grande workshop sessions in November 2020.

Cover photo credit: Paul Tashjian.

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