North American Climate Service Partnership: Rio Grande/Bravo (RGB) Basin Regional Pilot on Drought and Climate Services

Technical Scoping Workshop Summary
August 15-16, 2012
El Paso , TX

Purpose

There is a pronounced need for timely, relevant, and regional-scale information to support climate services within the Rio Grande/Bravo (RGB) basin. A primary issue in this basin is drought, which affects a range of constituents across a variety of economic and environmental sectors. Bilateral coordination in the RGB is essential in order to identify and prioritize mutual needs for drought-related data, products, and services, including in the areas of monitoring, reporting, research, and forecasting.

An initial technical scoping workshop hosted by the International Boundary Water Commission was held in El Paso TX on August 15-16 2012. This workshop was organized under the auspices of the North American Climate Services Partnership (NACSP) and brought together a core group of Mexican, U.S. and Canadian participants to assess opportunities for collaboration in the RGB for the development and delivery of drought-based climate services. This emerging regional collaboration will support water resource managers, agricultural interests, and other constituents within the basin as they respond to future drought events and build capacity to respond to other climate extremes. Actions undertaken in this pilot study could contribute to existing regional and global initiatives including the Global Framework for Climate Services, the U.S. National Integrated Drought Information System (NIDIS), and NOAA Memorandums of Understanding with the U.S. Western Governors Association (WGA) and the National Water Commission of Mexico (CONAGUA). The workshop was structured around four primary themes of bilateral or trilateral collaboration for drought services in the RGB basin:

- Observations and monitoring
- North American Drought Monitor
- Outlooks and forecasts
- Drought impacts

Within each of these themes, a number of key objectives were addressed through a combination of plenary presentations and discussion:

- Highlight current areas of bilateral or trilateral climate services collaboration
- Assess opportunities for new or enhanced collaboration, including improvements to or expansion of existing products and services
- Begin to plan near- and long-term activities to enhance existing efforts and/or develop new collaborations within the basin
- Identify partners to engage in priority workshop outcomes

Outcomes: Observations and Monitoring

What we are currently doing

The U.S. and Mexico are both engaged in a wide variety of observational and monitoring activities in the RGB in support of climate- and drought-services delivery. Climate and weather stations relevant to the RGB are sited and managed through a variety of networks in both the U.S. and Mexico (e.g., WRCC, COOP, SNOTEL, RAWS, CoCoRaHS, US CRN and USRCRN), but significant gaps in spatial coverage do exist in the basin. At the scale of the RGB, most efforts to date have been centered on hydrological monitoring and in stakeholder outreach at the community level. For example, NOAA has developed transboundary flood inundation maps for the Rio Grande that incorporate Spanish and metric translation. Hydrological data is being used for streamflow modeling on the Rio Grande around the El Paso area and to develop daily river forecasts that have been useful to government planners during extreme events such as Hurricane Alex. It is unclear how this flood information can be utilized for drought events. Examples of national-level integration on water resources with benefits at regional scales such as the RGB include NOAA's Integrated Water Resources Science and Services (IWRSS) consortium, which is a partnership of U.S. federal agencies with complementary operational missions in water science, observation, prediction and management. Examples of bilateral coordination include activities under the Bi-national Technical Work Group of the U.S.-Mexico Environmental Program.

For drought-focused observational and monitoring products and activities at the North American scale, existing trilateral cooperation includes the North American Drought Monitor and the North American GEO bilateral drought indices and definitions study, as well as additional activities being undertaken by the NACSP Drought team. At this technical workshop, U.S. participants presented several examples of products designed to increase awareness in the broad RGB region regarding current drought conditions, drought impacts and climate forecasts (CLIMAS La Nina Drought Tracker, bilingual quarterly newsletters, regional climate outlooks, workshops, etc.), many of which include an explicit or implicit focus on observations and monitoring. Several of these efforts became operational following an experimental period and could provide a framework for future bilateral collaboration efforts.

Potential areas of collaboration

- Assess the extent, quality, and capacity of observational climate networks in RGB, to include an inventory of existing networks, identification of gaps in coverage and quality control issues, and facilitation of improved bilateral data sharing
- Explore development of real-time North American reporting systems for key drought variables such as temperature, precipitation, and soil moisture
- Assess the availability and quality of existing climate- and drought-specific products in the RGB, at both regional and national scales
- Clarify technical descriptors of climate and drought, such as defining "persistence", "flash drought" and other phenomena using criteria specific to the RGB
- Expand the Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS) into Mexico and the RGB

- Improve transborder communications regarding observations of climate and drought conditions in the RGB, utilizing lessons learned on outreach and messaging from previous activities (e.g., NWS El Paso WFO, SMN activities)

Outcomes: North American Drought Monitor

What we are currently doing:

The NADM is well recognized as an effective multilateral coordination effort. The U.S., Mexico and Canada produce their own national Drought Monitor products, which are collectively used to develop the monthly North American Drought Monitor. Nearly 300 individuals participate in this iterative decision-making process, allowing for a diverse group of backgrounds and skill sets to be brought to bear on the project's creation. There has been discussion among current collaborators about producing the NADM more frequently than monthly, but it is not clear if the user community needs this or if all three countries have the resources to make it operational. Other areas of potential improvement to the NADM include defining 'flash drought', understanding how the product is being utilized by decision makers, and incorporating drought impacts into the monitor.

Potential areas of collaboration

- Conduct a user assessment of the NADM with the RGB as a "ground truth" location, addressing issues such as the product's use, benefits, and areas for improvement through local community feedback
- Explore ways in which drought impact assessment in the RGB region can be utilized to enhance the North American Drought Monitor
- Conduct selected cross-border analyses (e.g., indices development in the RGB) to inform country-level Drought Monitors and subsequently the NADM
- Identify methodological consistency in cross-border analysis and input to the NADM using the RGB as a "ground truth" location

Outcomes: Outlooks and Forecasts

What we are currently doing:

The NWS CPC Seasonal Drought Outlook provides a biweekly national picture of where droughts will improve, persist or develop, but improvements to the Outlook are needed to improve verification, incorporate user community and peer-reviewed input, better engage the drought monitoring community, and align with drought alert systems. CPC also produces monthly and seasonal climate outlooks for precipitation and temperature, with briefings conducted monthly to assess the performance of the previous month's products and discuss the updated outlooks. Mexico has been participating in these briefings and is interested in expanding their involvement, perhaps by co-leading the effort with the U.S and expanding the drought outlook coverage to include parts of Mexico. Other entities such as CLIMAS are developing experimental outlooks at regional scales that overlap with the RGB.

Efforts to increase coordination on North American scale forecast systems (e.g., ensemble, seasonal) are being discussed among other NACSP teams. Another successful example of integrating climate information into decision making at North American scales includes the development of monthly pre-season fire outlooks through the annual National Seasonal Assessment Workshop for Fire Potential. This outlook was expanded to include Canada and Mexico in 2006, but it is not fully clear how the information is being used in these countries. Finally, both the U.S. and Mexico are experimenting with media outreach tools (television, websites, newsletters, webinars, social media, surveys, etc.) to share information on weather and climate forecasts, and Mexico's SMN has established their own media room for this purpose.

Potential areas of collaboration

- Enhance bilateral collaboration on operational climate outlook products (precipitation, temperature, drought)
- Discuss the current capacity for seasonal and long-lead climate outlooks and identify opportunities for potential enhancements through monitoring, research, and services
- Assess user needs in the RGB for climate forecasts, including priority variables and spatial and temporal forecast scales
- Expand the prototype U.S. Southern Great Plains (TX-NM-OK) quarterly outlook to include Mexican border states and/or the RGB
- Link the National Climate Predictions and Projections Platform (NCPPP) to the RGB via the development of new pilot downscaling efforts

Outcomes: Drought Impacts

What we are currently doing:

Current drought impact reporting efforts are varied among the U.S., Canada, and Mexico, and there is an understanding that improvements are needed in this area to better understand vulnerability and increase responsiveness as part of an integrated drought early warning system. The U.S. Drought Impact Reporter is one type of impact reporting mechanism, which allows the public to contribute reports of all types of drought impacts at the local scale. Canada has also developed a database on drought impacts, with a primary focus on the agriculture sector. Impact reporting efforts within the RGB include the Arizona Drought Impact Reporting System, which was developed as a mechanism to keep citizens engaged in drought preparedness and is part of the Arizona Drought Preparedness Plan, and regional climate services engagement in the RGB to better identify the impacts of drought on ecosystems and human vulnerability on a transboundary basis. It was acknowledged at the technical workshop that the building blocks to start a North American database are likely in place, but it was suggested that an initial focus on the border states might be most useful in the near-term.

Potential areas of collaboration

- Develop a prototype regional drought impact reporting system for the RGB, one that includes a focus on training observers, corroborating impacts information with other sources and monitoring resources, and improving understanding of ecosystem services with respect to drought impacts
- Use constituents in the RGB to "ground truth" and prototype a North American Drought Impact Reporting System

Key cross-cutting themes to help guide next steps in the RGB collaboration

- There is a need to be more proactive in responding to drought
- Users of climate information want very specific targeted information
- There is a need to better integrate monitoring and prediction efforts
- A sustained process requires that we understand and articulate the real benefits of our work
- There is a poor distribution of climate observation stations in the RGB, and a need for validation and verification on this existing system.
- We have a poor understanding of how the NADM is being utilized and valued by the user community
- Better definitions are needed to classify 'flash drought'
- Data formats are highly variable, which restricts the ability of both countries to share and access networked datasets
- Enhanced communication between research and operational communities is needed, such as in identifying what the next generation of drought forecasting and prediction can be
- This pilot effort is ideal to test out new approaches that could eventually be incorporated into operational processes, and we need to remain flexible in our approach

Next Steps

- Establish regular coordination calls among US, Mexican, and Canadian representatives to ensure overall strategic guidance and communication for the pilot project and linkages back to the broader NACSP effort
  - US: David Brown, Meredith Muth
  - Canada: Al Howard
  - Mexico: Horacio Rubio, Martin Montero
- Establish small leadership teams to move forward with next steps in each outcome area. Suggested team leads identified during the workshop are:
  - Observations and monitoring: Greg Shelton, Kelly Redmond, Dave Dubois, Horacio Rubio
  - North American Drought Monitor: Richard Heim, Rene Lobato, Al Howard
  - Outlooks and forecasts: Wayne Higgins, Rene Lobato
  - Drought impacts: Gregg Garfin, Mark Svoboda, Oscar Gutierrez

Participants in the RGB Technical Scoping Workshop

U.S. participants

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