Rio Grande/Bravo: Governance and Innovation

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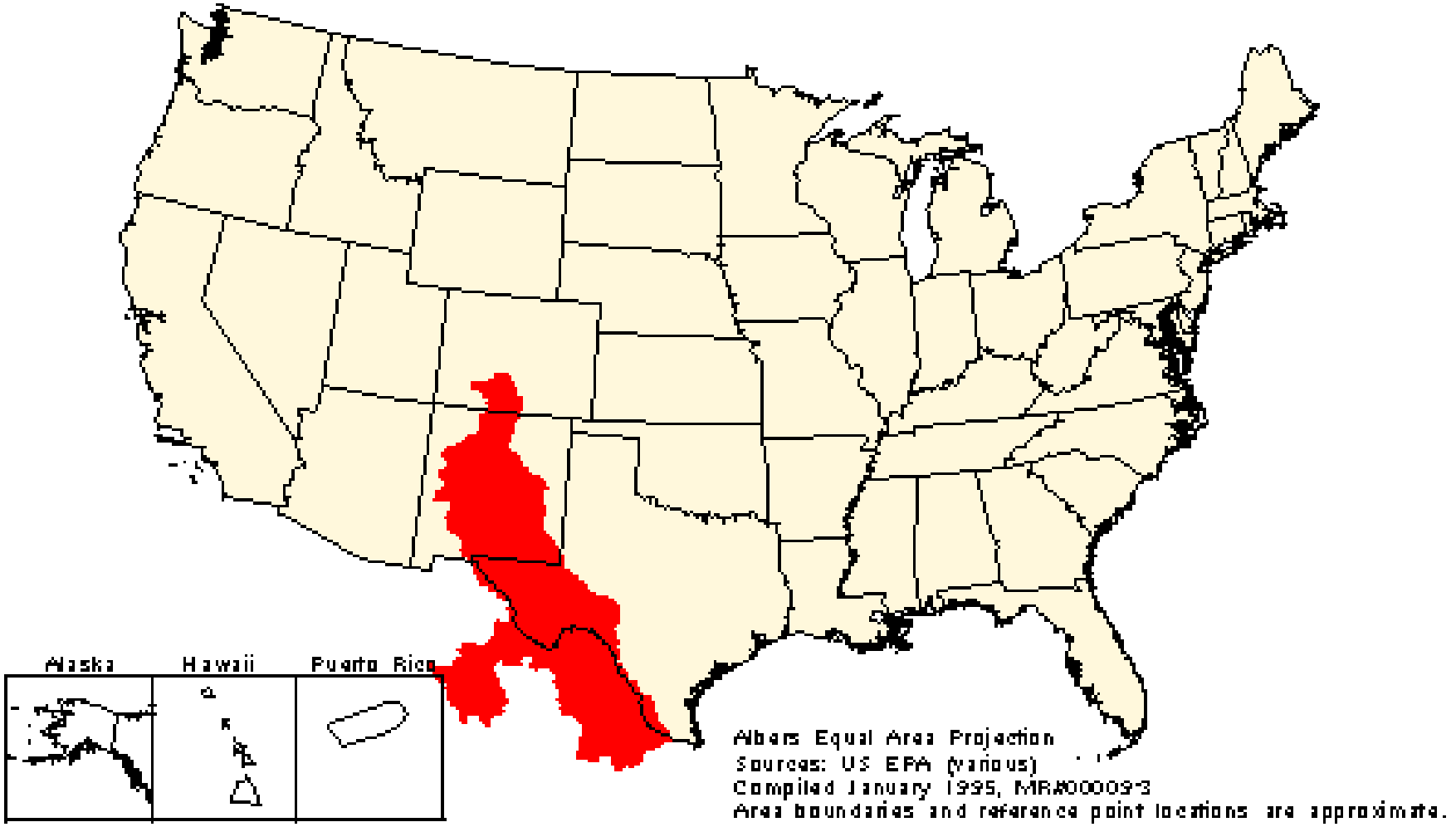
Rio Grande/Rio Bravo Watershed Project



Albers Equal Area Projection
Sources: US EPA (various)
Compiled January 1995, MR#000093
Area boundaries and reference point locations are approximate.


Colorado
Otowi Gauging Station
Cochiti Dam
New Mexico
Elephant Butte
Caballo
I. Paso del Norte
Pecos River
Texas
Fort Quitman
Presidio
Amistad
II. Conchos & Pecos
III. Amistad to Falcon
IV. Lower Rio Grande
Falcon
Rio Conchos
Mexico

River characteristics

Upstream

- Mountain snowpack

Downstream

- Fertile soil from millennia of flooding/sedimentation
- Arid/semi-arid climate

Modern engineering

- Dams, reservoirs, canals, distribution channels
- Flood control, energy production
- Intensive irrigated agriculture


Dams and Diversions
Along the Rio Grande
Colorado
New
Mexico
Texas
Chihuahua
Coahuila
Nuevo
Leon
Closed Basin Project
(early 1990s)
Platoro - 1951
Heron - 1971
El Vado - 1935
Abiquiu - 1963
Galisteo - 1970
Cochiti - 1975
Jemez Canyon - 1953 &
Angostura Diversion - 1938
Isleta Diversion - 1934
San Acacia
Diversion - 1934
Elephant
Butte - 1916
Caballo - 1938
Leasburg - 1919
Pecos River
Rio Grande
American - 1947
Amistad - 1968
Rio Grande
Falcon - 1954
0
90
180
360
Miles
N
W
E
S

Challenges

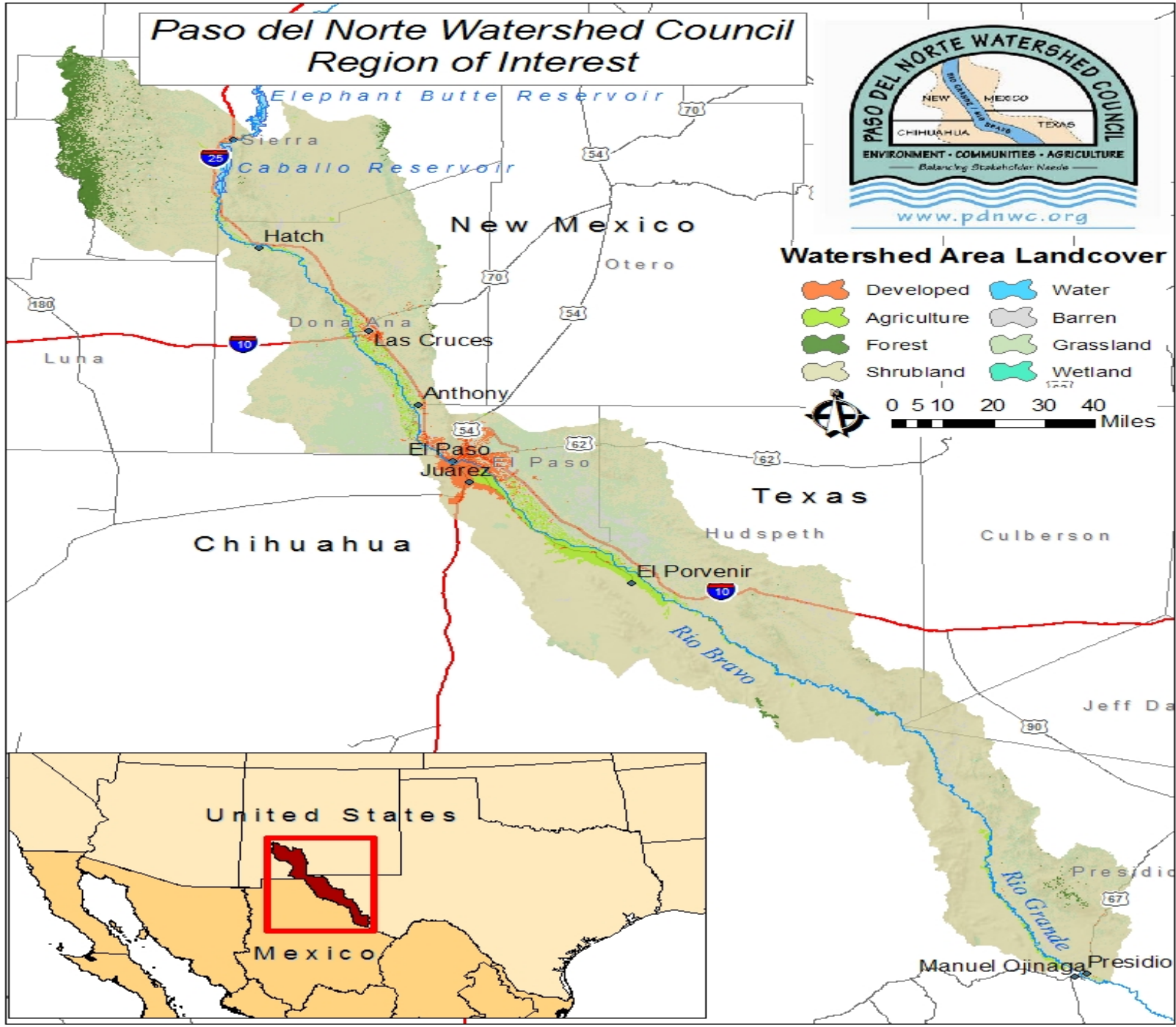
- Climate change
- Climate variation
- Reservoir sedimentation
- Brackish groundwater
- Population growth
- Decreased instream flow

Response options

- New reservoirs?
- Sediment removal
- Efficient irrigation
- Repair leaks in distribution networks
- Crop changes
- Rain harvesting
- Integrated water management
- Stakeholder participation

Lower Rio Grande

Paso del Norte



Paso del Norte

- Sedimentation reduces Elephant Butte storage
- Climate change loss now measurable: less stream flow, more evapotranspiration
- Population growth continues: from 2.6m (2018) to 3.2m (2040)
- >80 percent of surface water used by agriculture
- Drinking water mostly from aquifers
- Brackish groundwater

IBWC/CILA Minutes

- 1944 Treaty
- The Minute process
- Salinity and drought management addressed
- 323 Minutes
- Unique feature in international law

Minute 308 (2002)

Main purpose: Drought management

Calls for:

- Advisory Council
- Basin-wide sustainability plan

No action taken

A Future Sustainability Minute

Based on Bi-national data sharing and research

Current updates on climate change projections

Review of response strategies to date

Step-by-step action agendas

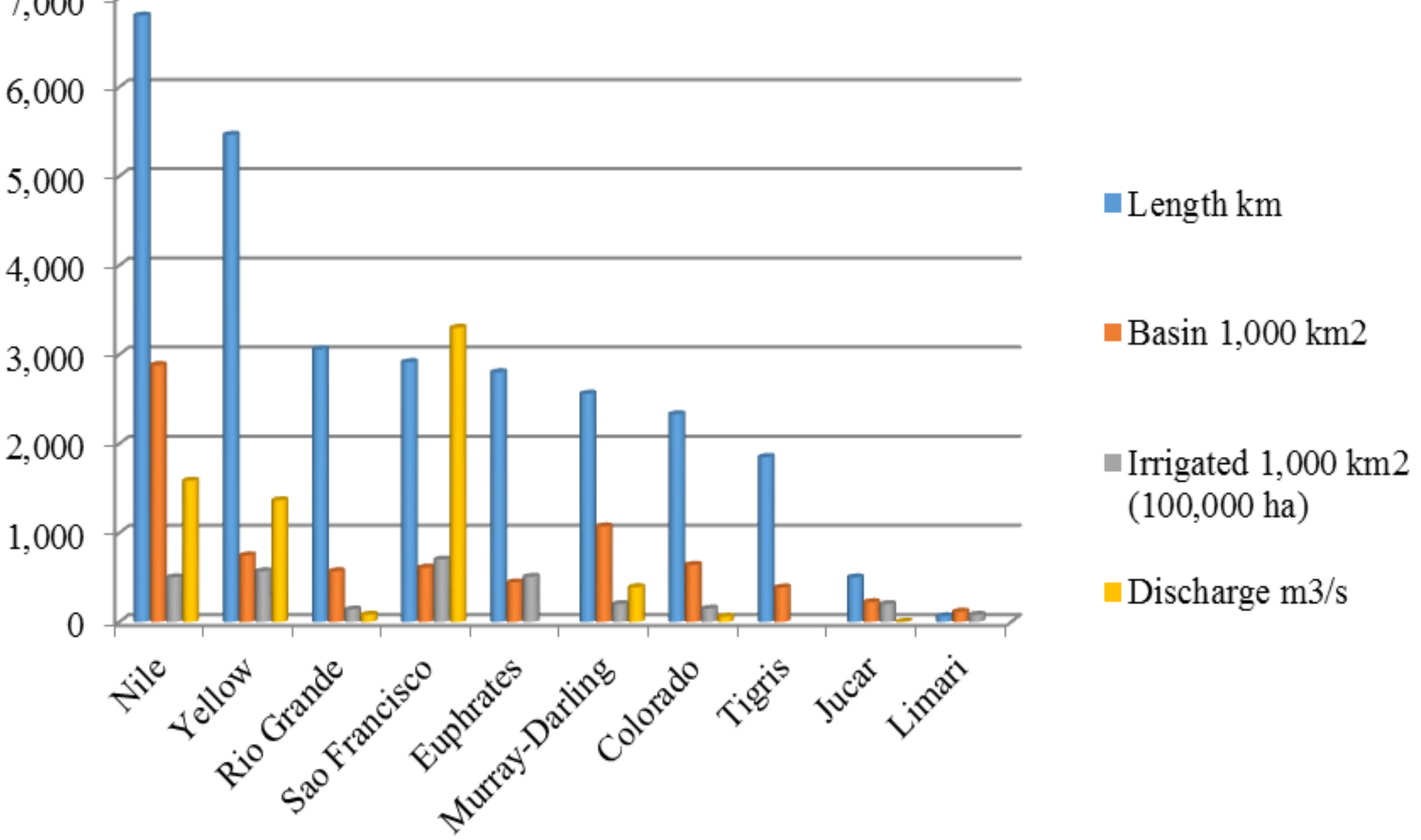
Successive ten-year plans

- Basin-wide—IBWC/CILA
- Sub-basins—stakeholders convened by IBWC/CILA

Rio Grande Bravo Sustainability:

- ***Nature's water supply, averaged over the period of the most severe drought since reservoir construction, delivers a dependable yield sufficient to meet human and ecological needs***
- ***Water managers and stakeholders proactively and jointly implement ways to use water more efficiently***
- ***Whenever natural or social conditions change the dependable yield, water managers, after consultation with stakeholders, adjust existing rules on water allocation and water use to reach a new level of dependable yield***
- ***An ecologically prudent level of instream flow is maintained or restored***


Colorado
Rio Grande
Jucar
Tigris
Euphrates
Yellow
Nile
São Francisco
Limari
Murray-Darling


7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Nile
Yellow
Rio Grande
Sao Francisco
Euphrates
Murray-Darling
Colorado
Tigris
Jucar
Limari
Length km
Basin 1,000 km2
Irrigated 1,000 km2 (100,000 ha)
Discharge m3/s