DISCUSSION PANEL:

GROUNDWATER DEPLETION AND WATER SECURITY IN THE RIO GRANDE BASIN VS COLORADO RIVER BASIN

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October 2020

GOBIERNO DE MÉXICO | MEDIO AMBIENTE
SECRETARÍA DE MEDIO AMBIENTE Y RECURSOS NATURALES | IMTA
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How does climate variability impact groundwater availability (Rio Bravo/Grande river basin vs Rio Colorado basin)?

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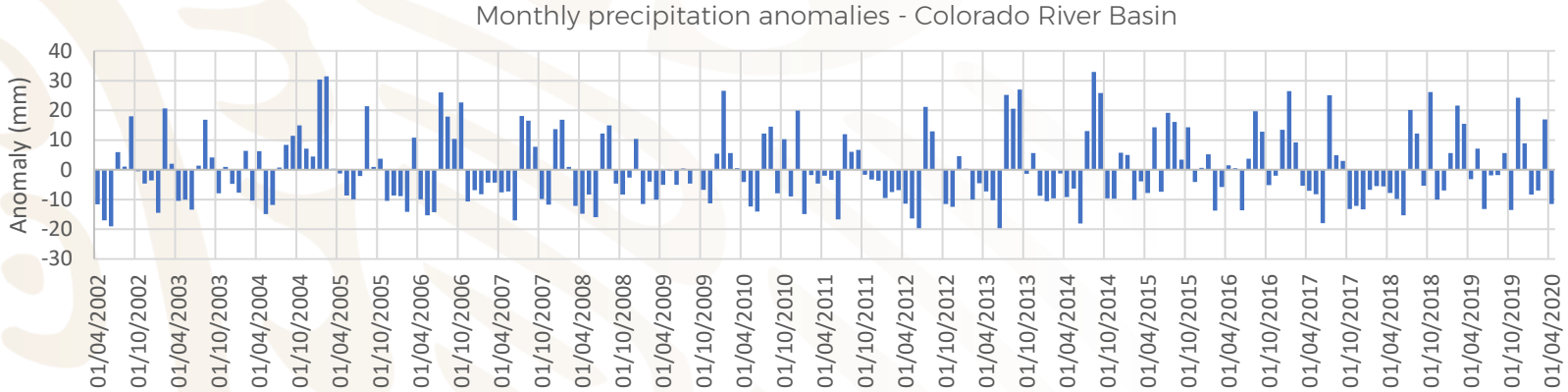

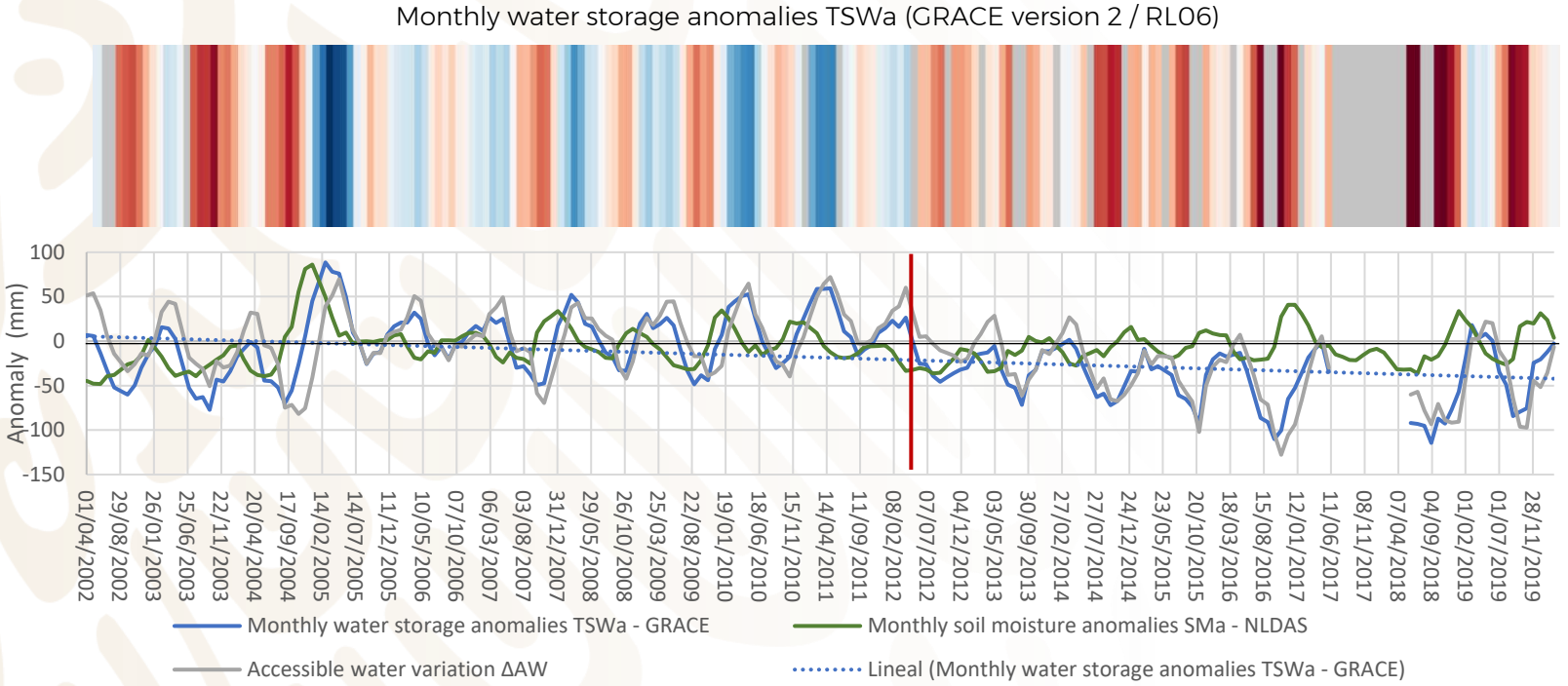

DATA:
Monthly precipitation anomalies (CHRIPS V2.0)
Monthly water storage anomalies TSWa (GRACE version 2 / RL06)
Monthly soil moisture anomalies Sma (NLDAS L4 v2.0)

Colorado River Basin

Variable	Trend since 1980's	Likely causes, in order of importance
Temperature	Increasing*	Anthropogenic, climate change, natural variability
Precipitation	Decreasing	Natural variability, anthropogenic climate change
Snowpack wáter volume	Decreasing*	Decreasing precipitation, warming temperatures
Timing of snowmelt and runoff	Earlier*	Warming temperatures, dust-on-snow, decreasing precipitation
Annual streamflow	Decreasing	Decreasing precipitation, warming temperatures

Groundwater depletion

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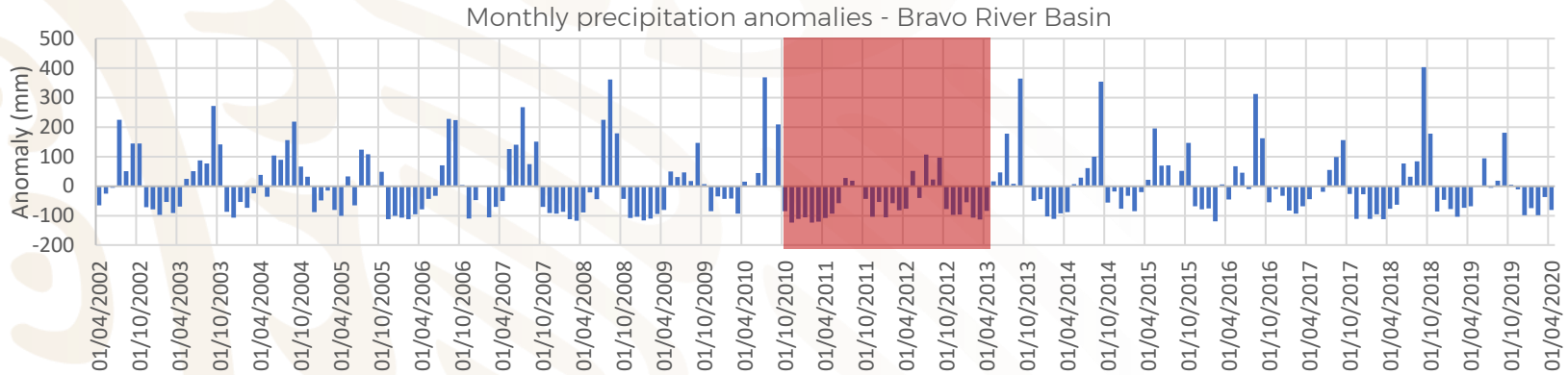

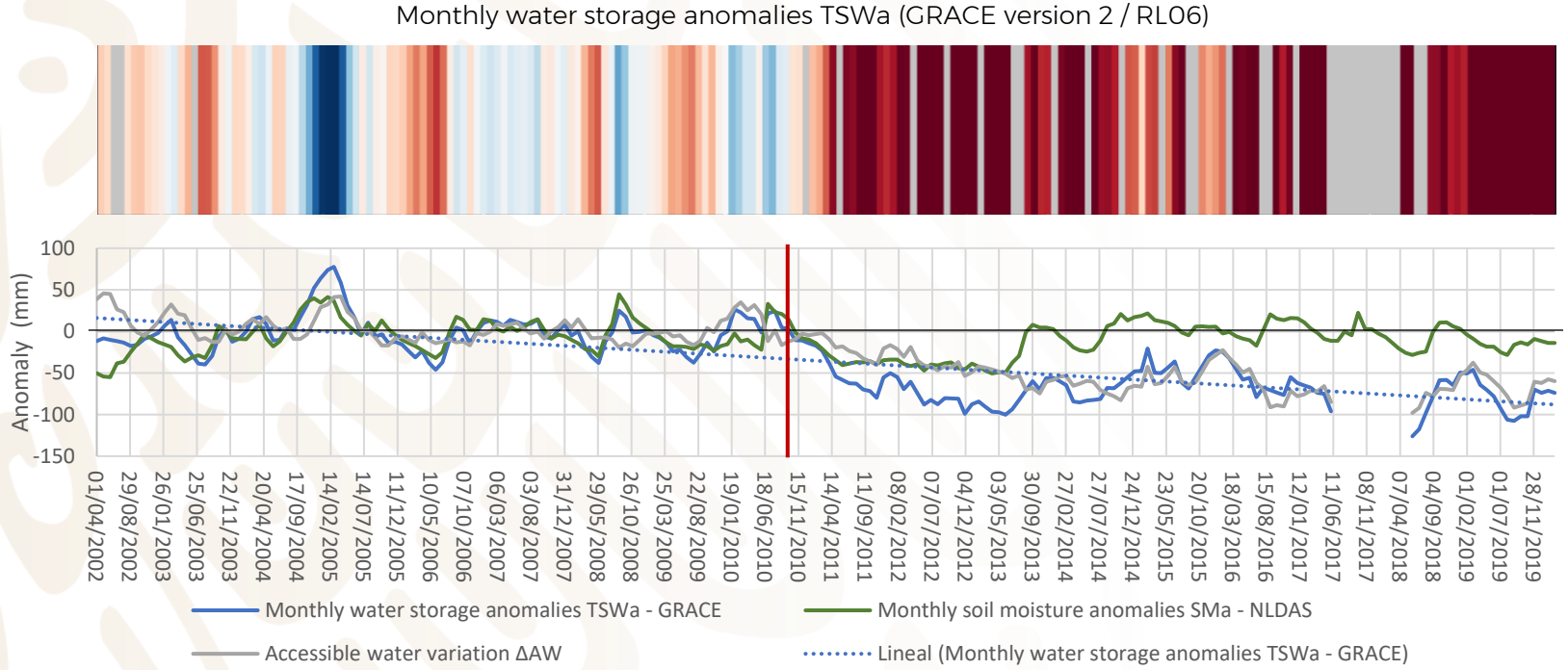

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Groundwater depletion

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Does the US and Mexico need novel hydro-diplomacy and governance tools under the expected climate change scenarios (any differences between basins Colorado / Rio Grande)?

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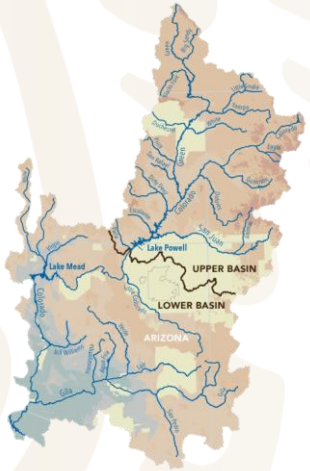
Colorado River Basin



Total area: 637,137.1 km^2
(EU: 97.9%, MX: 2.1%)

Basin characteristics :

Storage: 74,000 hm^3 in US
No reserviors in Mexico

Annual average runoff:
Around 19,735 hm^3
Water allocation:
Around 21,586 hm^3
(7 states in EU & 2 in MX)

Grande / Bravo River Basin

Total area: 868,945 km^2
Drainage área: 471,928km^2
(EU: 51.7%, MX: 48.3%)

Basin characteristics :

Storage: 2 international reservoirs, 7,305 hm^3
Annual average runoff:
10467.64hm3, MX: 5,762 hm^3
Water allocation in MX:
7,076 hm^3
(3 states in EU & 5 in MX)

Water Treaty Between Mexico and United States

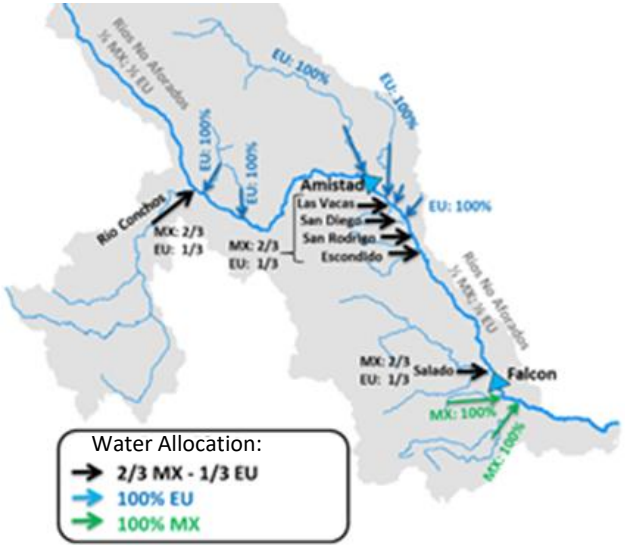
Colorado River Basin

- Guaranted volume of **1,850.2 hm^3** to Mexico.
- Any other volumen that reaches MX derivation points, not exceeding **2096.9 hm^3**

Grande / Bravo River Basin

Convention of 1906:
Allots **74 hm^3** to MX

1944 Treaty:



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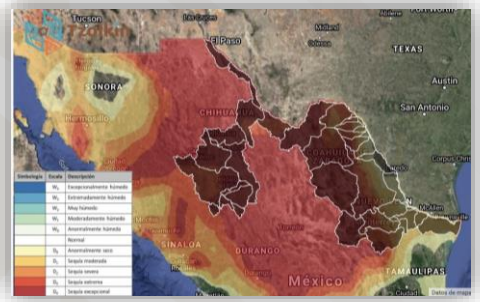
Issues to address

Lack of an allocation of water flows for environmental purposes.

Prolonged periods of severe droughts since early 1990's



Increased water demand for irrigation and due to population growth

Changes in land use: deforestation

to mention a few...

Novel hydro-diplomacy and governance tools

1. All stakeholders must be involved in the cooperation process
2. Joint work of monitoring, evaluation and follow-up of water uses and water cycle variables.
3. value creation: efficient use of water to satisfy priorities
4. collaborative adaptive stakeholder management
5. Implement mutual benefits approach.
6. Decisions based on scientific and technical solutions

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What is the role of the water-energy-food nexus in transboundary waters?

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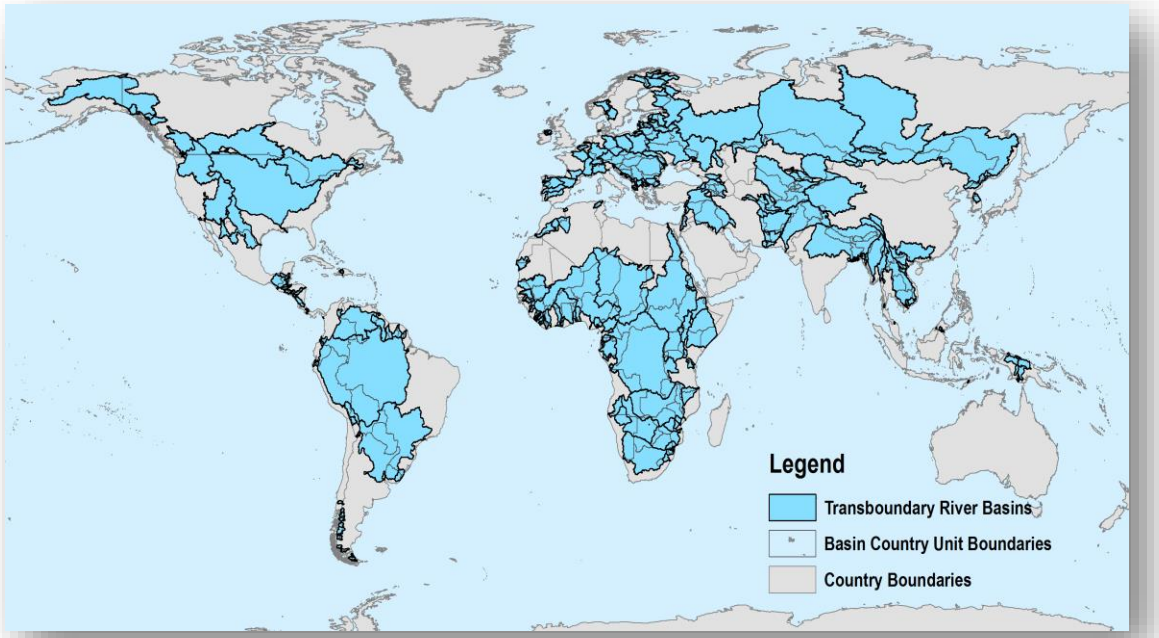
About

There are 263 transboundary river basins worldwide, approximately 300 transboundary aquifers

More than 90% of the world's population lives in countries that share basins and aquifers

About 40% of the world's population lives in transboundary basins and aquifers

Since 1948, there have been 37 incidents of acute conflict over water



It is relevant to include the interests of the multiple dimensions

Describes the complex and inter-related nature of our global resources systems

In this way

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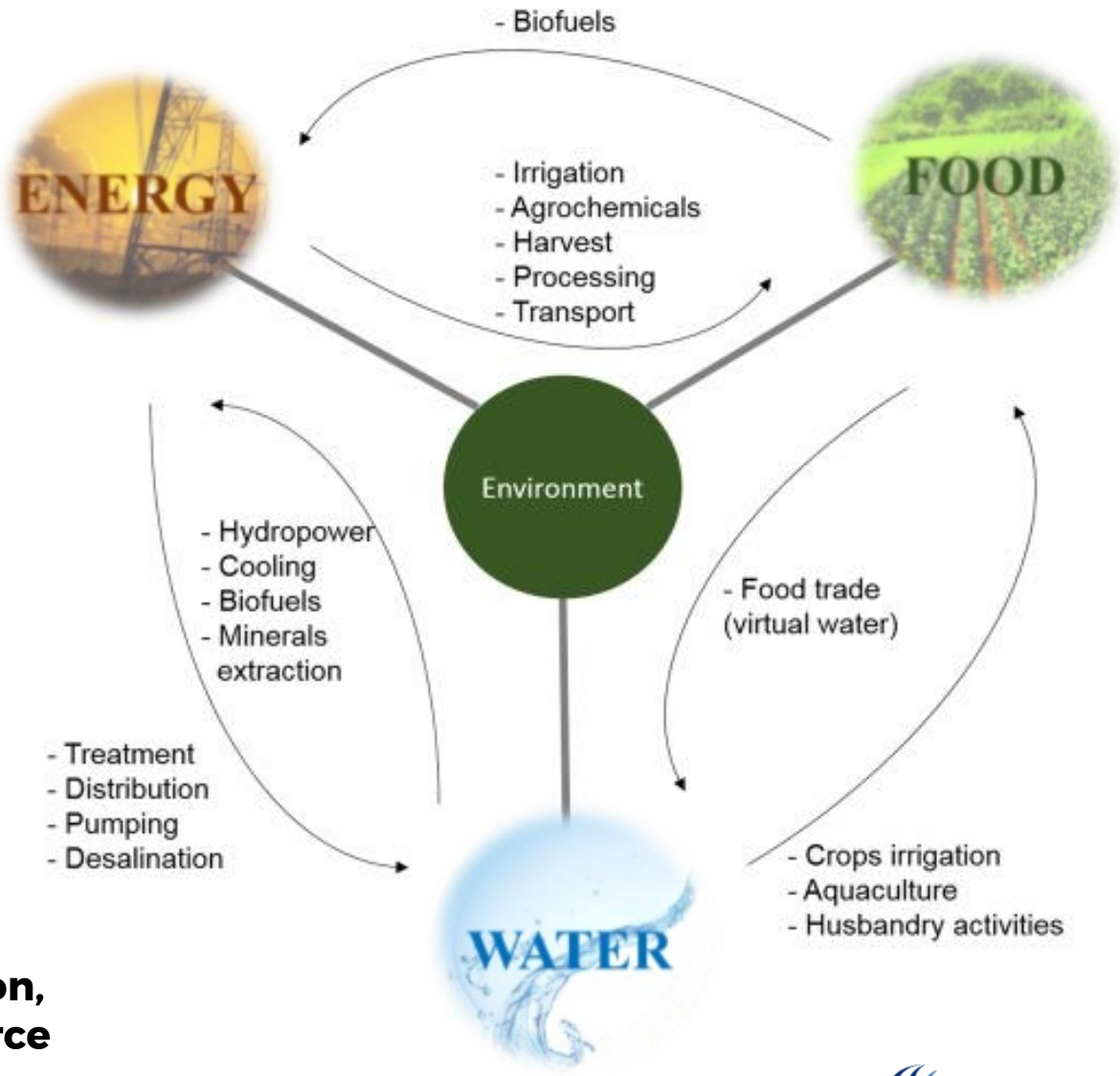
What is the role of the water-energy-food nexus in transboundary waters?

Roles:

- **WEF Nexus** is a systematic process for both analysis and policy-making to unpack the interdependencies between water, energy, food and other linked systems. e.g. land, climate, environment and ecosystem
- **Nexus approach** engages a greater diversity of stakeholders and can help achieve more balanced agreements across sectors
- Achieve more coherent and integrated **water management**, mitigating deficiencies and the lack of cross-border agreements.

Final aim: **Promoting cross-sectoral integration, sustainability, synergies, and resource use efficiency.**

WEF Nexus



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What would you say are the key challenges when it comes to water security in the border region as a whole?

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Satisfaction, at the household level, all the needs of water supply inadequate quantity and quality.

Guarantee the capacity of water bodies to maintain their environmental services.

Risk management as adaptation to global changes

Promoting management of transboundary aquifers

Improving governance, planning, management, allocation, and efficient use of water resources

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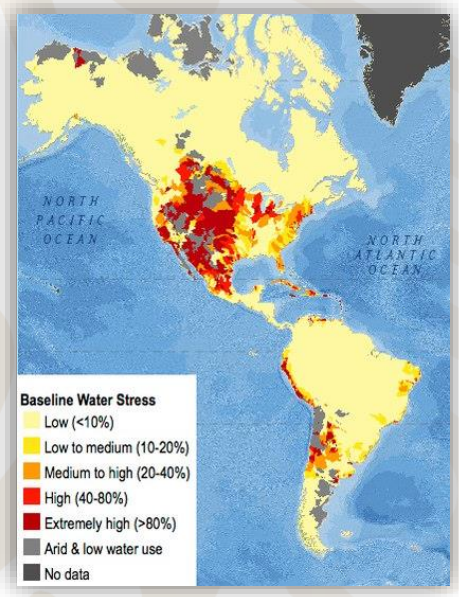
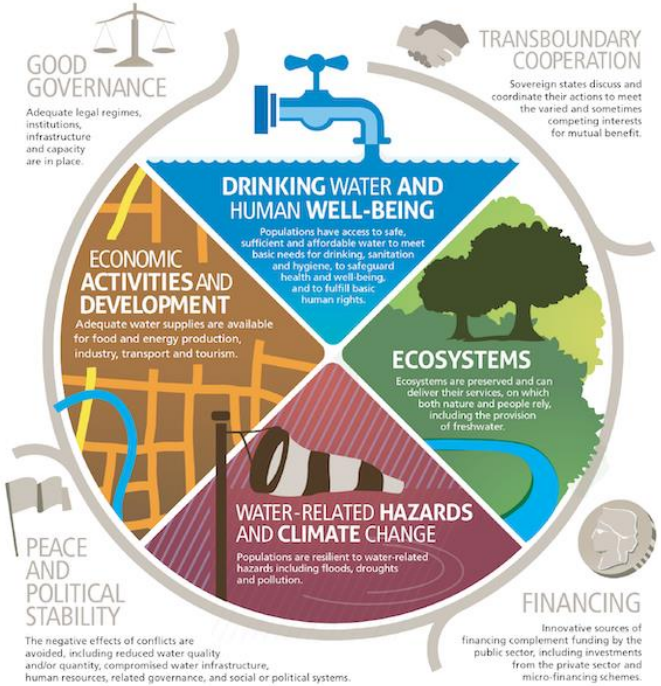


Promoting tools for stakeholder involvement, awareness, and conflict resolution

Dealing with present water scarcity and developing foresight to prevent undesirable trends

Promoting innovative tools for water supply safety and pollution control

Education for transboundary water cooperation and governance



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Thank you

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