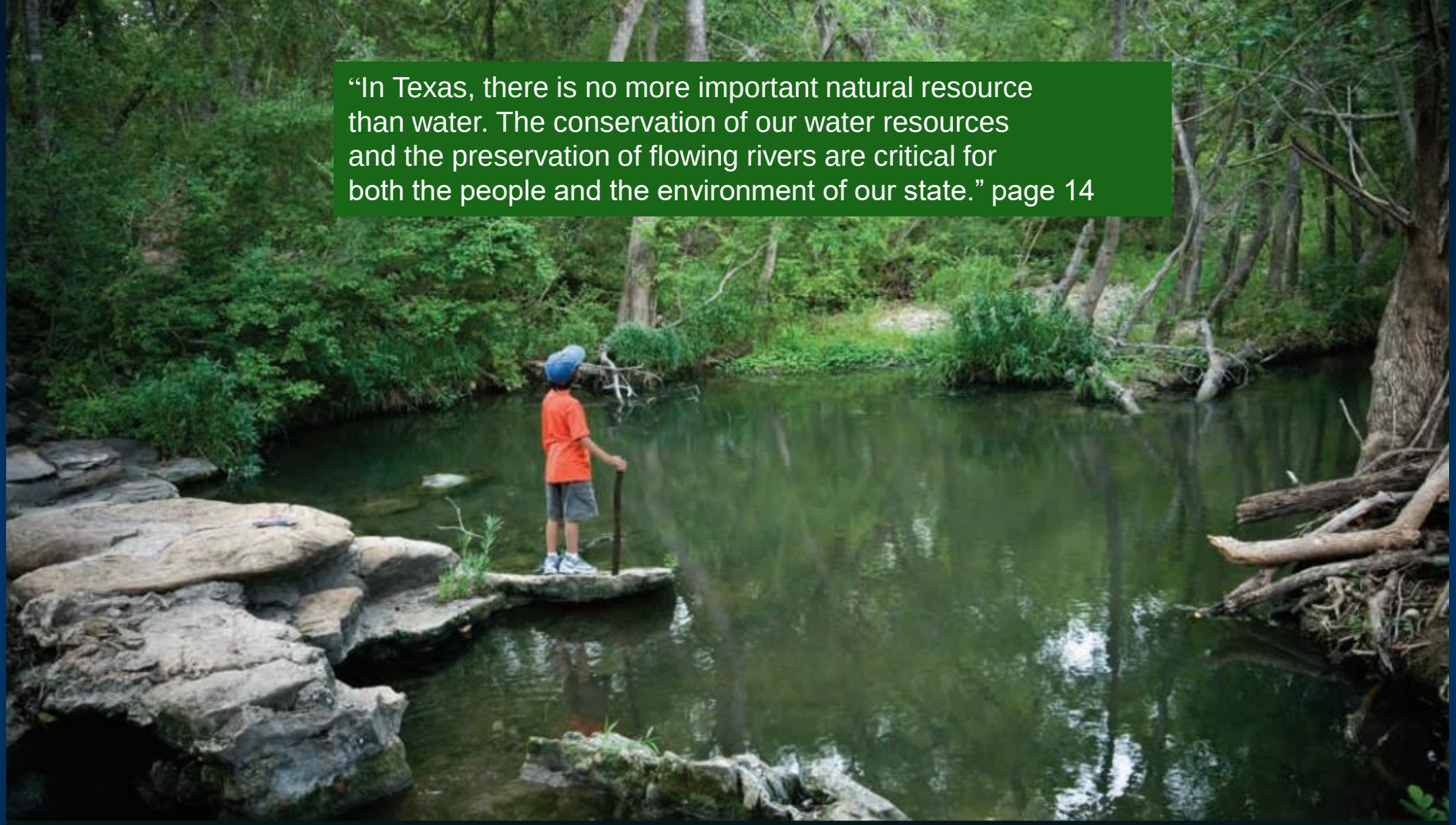
2020 TPWD Texas Water Speakers

One Water: Managing Water Resources to Sustain Healthy Aquatic Ecosystems

Cindy Loeffler, PE

Water Resources Branch Chief

Cindy.Loeffler@TPWD.Texas.gov



"In Texas, there is no more important natural resource than water. The conservation of our water resources and the preservation of flowing rivers are critical for both the people and the environment of our state." page 14

TEXAS PARKS & WILDLIFE

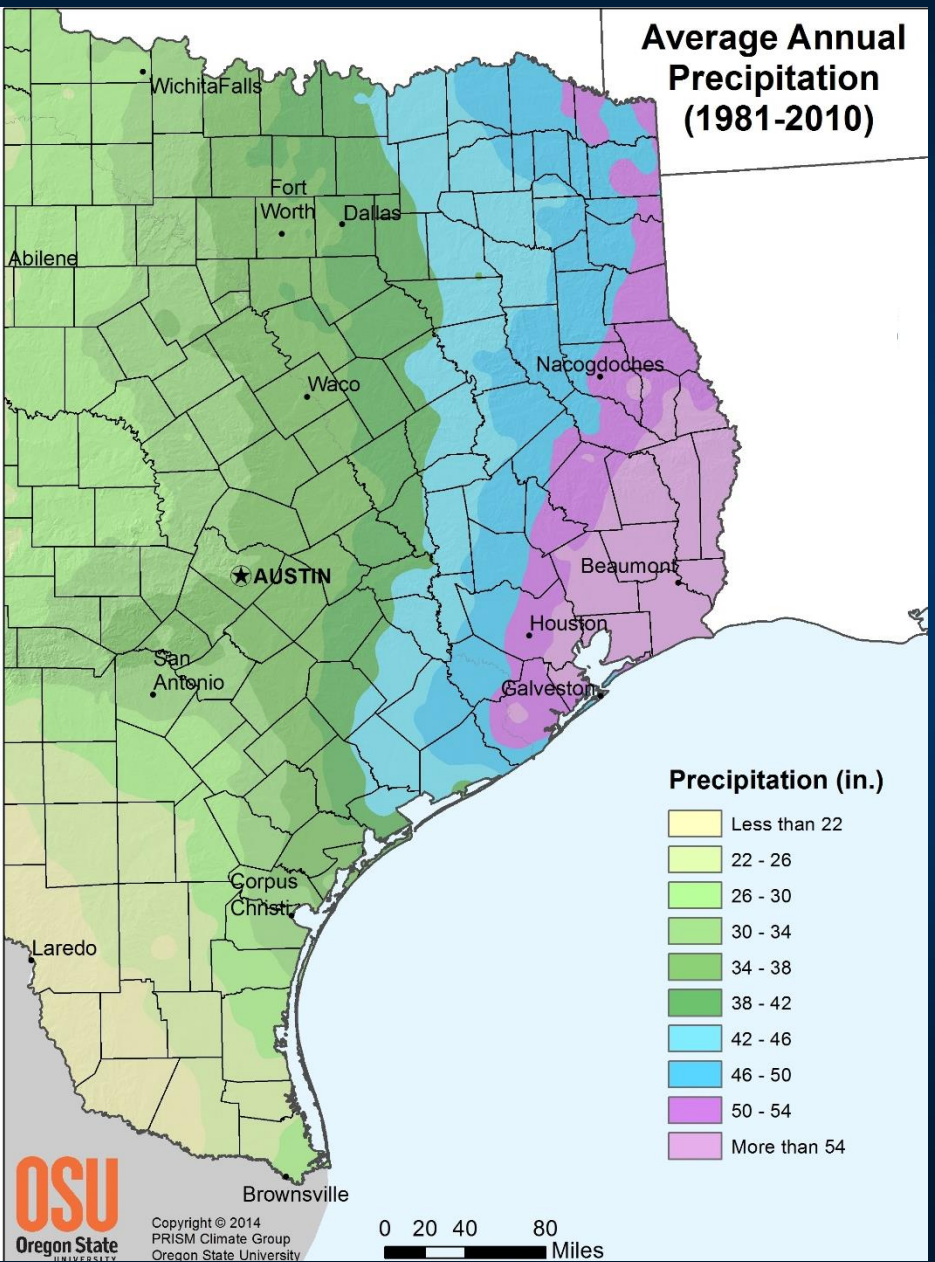
2015

Land and Water

RESOURCES CONSERVATION AND RECREATION PLAN

Texas' climate gradient

…creates a diverse system of springs, streams, rivers, lakes and estuaries.



TEXAS PARKS & WILDLIFE

Groundwater: Source of Springs and River Baseflows

- Springs
  - Support unique aquatic environments, including rare species
  - Serve as a barometer of local aquifer conditions
  - Relatively inexpensive means of monitoring groundwater
  - Provide important baseflows to rivers

- River Baseflows
  - Dependent on aquifer discharge
  - Important component of environmental flow regime, including inflows to bays and estuaries
  - Support habitats during dry periods

Environmental Flows:

Flows that remain in the stream and provide for aquatic and riparian habitat; water quality protection; recreation; navigation; and freshwater inflows to bays and estuaries.

Ecosystem Services

Biodiversity

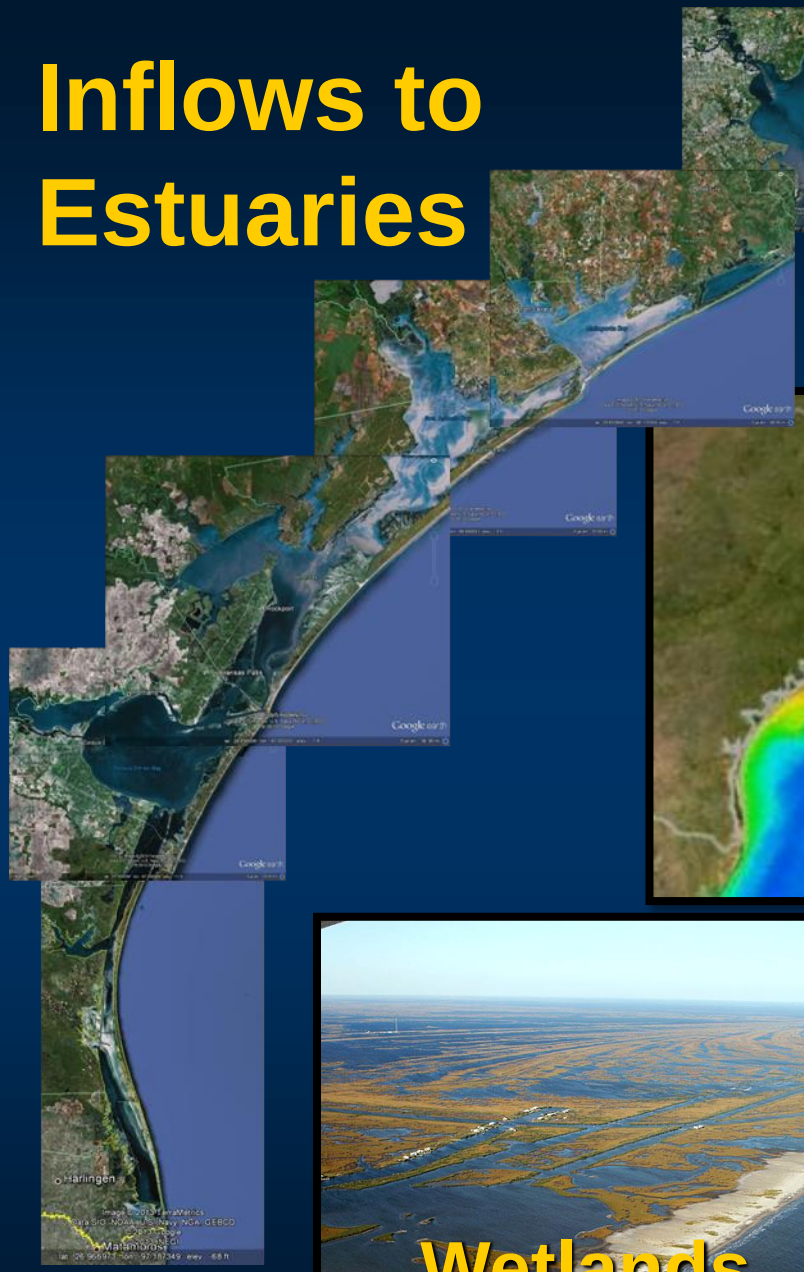
Commercial and Sport Fisheries

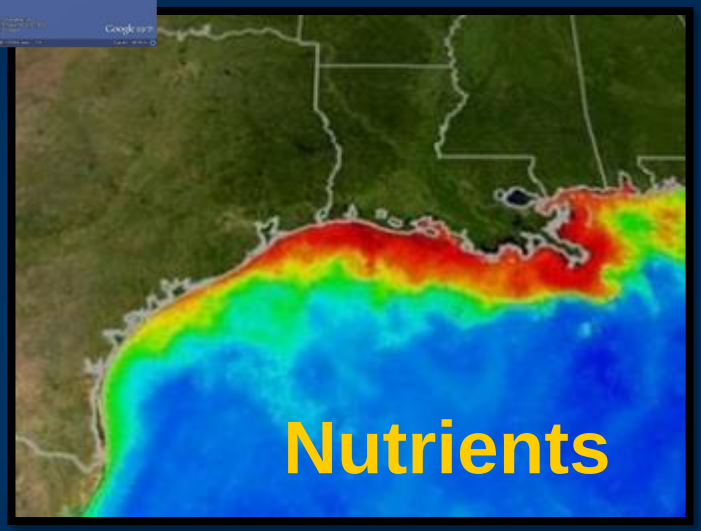
Water quality and assimilative capacity

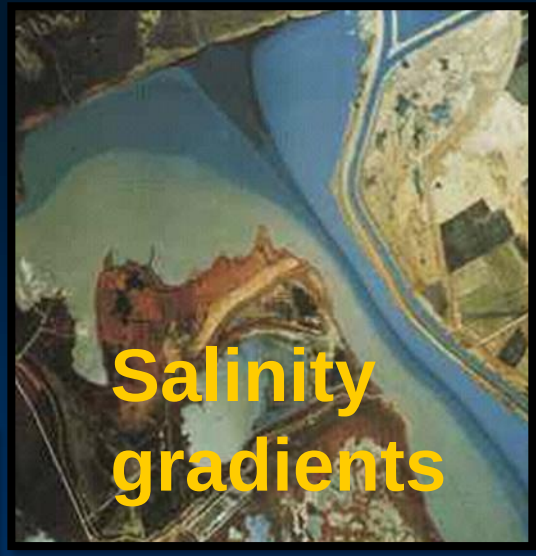
Stream and Riparian Habitat for Fish and Wildlife

Recreation

Inflows to Estuaries



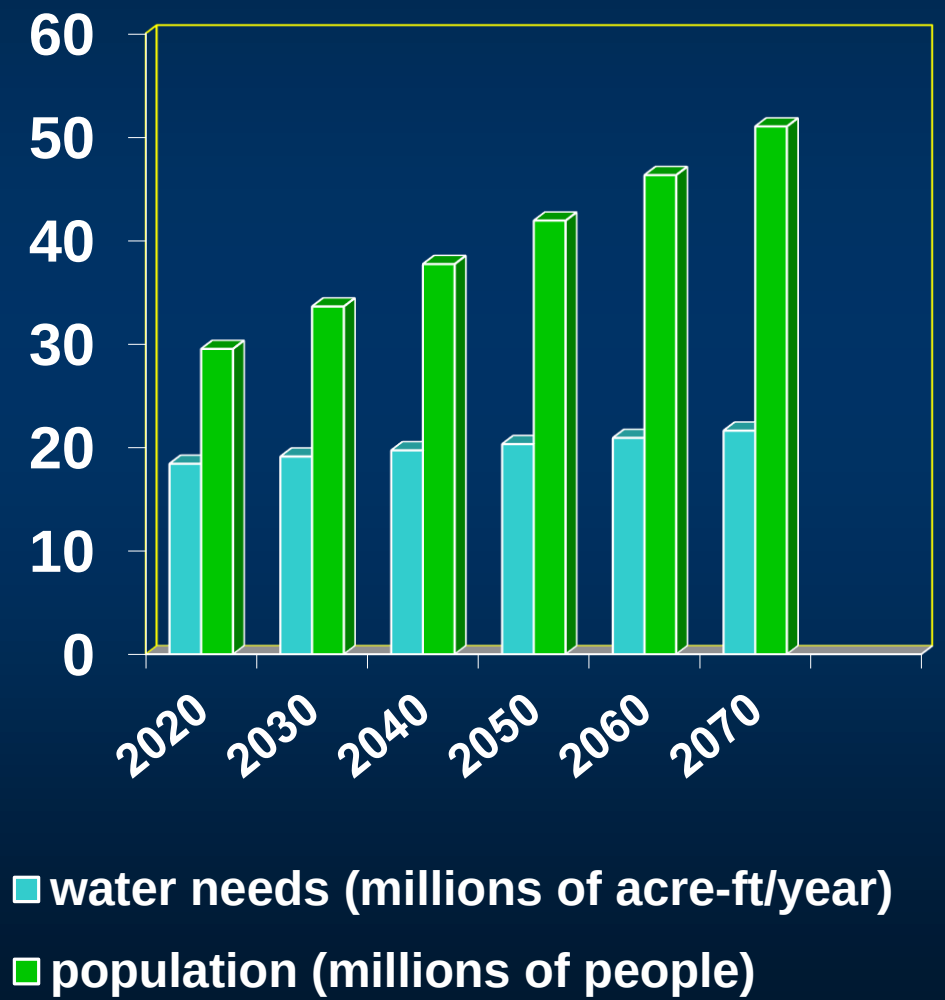




….create and sustain estuaries.

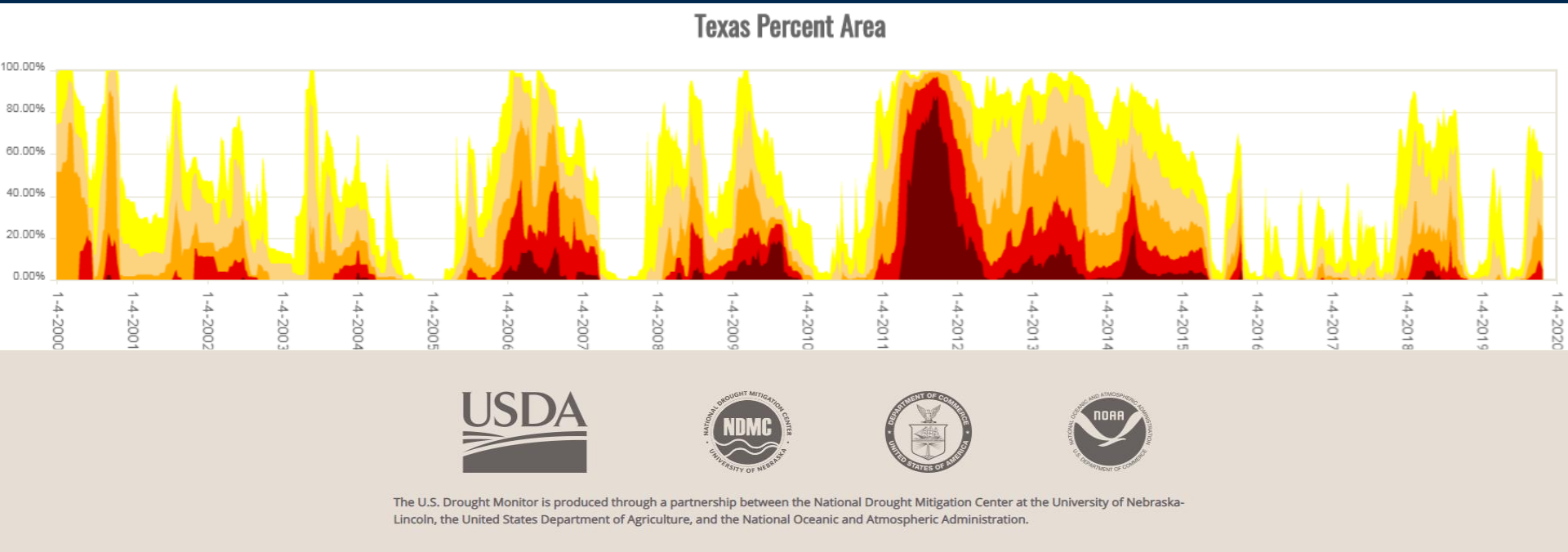
TEXAS PARKS & WILDLIFE

Texas Population Growth and Water Demands



- The population of Texas is expected to nearly double in 50 years.
- Urban/Suburban areas will continue to grow most rapidly.
- Human water needs are also increasing.

Drought Severity in Texas 2000-Present



http://droughtmonitor.unl.edu/DataArchive.aspx

Severe Drought

Extreme Drought

Exceptional Drought

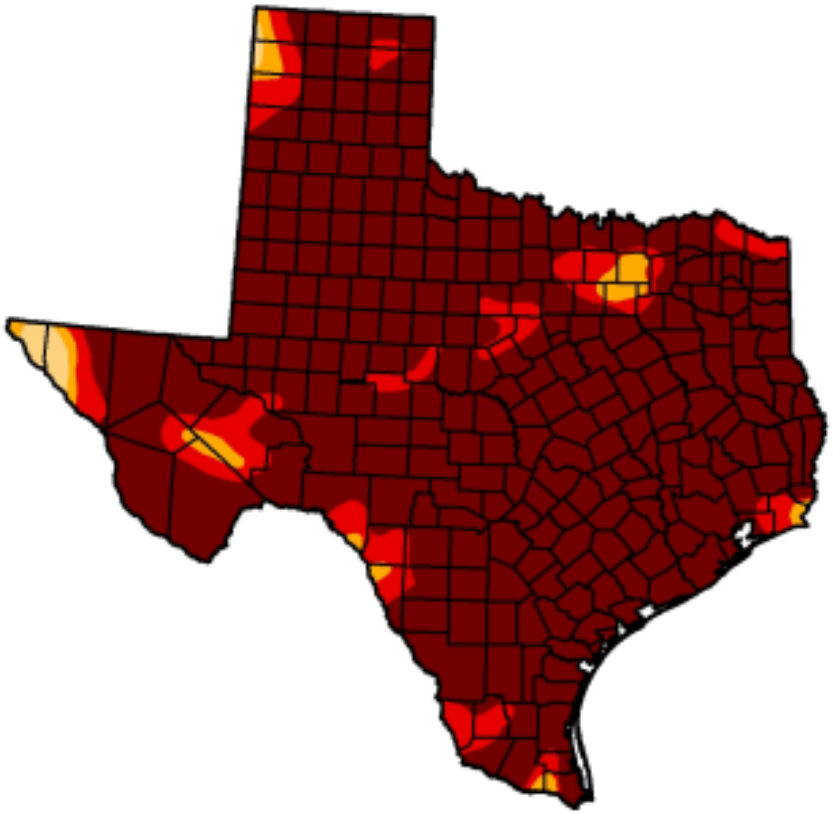
U.S. Drought Monitor

October 4, 2011
Valid 7 a.m. EST

Texas

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	99.16	96.99	87.99
Last Week (09/27/2011 map)	0.00	100.00	100.00	99.16	96.65	85.75
3 Months Ago (07/05/2011 map)	2.41	97.59	95.73	94.39	90.21	71.30
Start of Calendar Year (12/28/2010 map)	7.89	92.11	69.43	37.46	9.59	0.00
Start of Water Year (09/27/2011 map)	0.00	100.00	100.00	99.16	96.65	85.75
One Year Ago (09/28/2010 map)	75.57	24.43	2.43	0.99	0.00	0.00



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

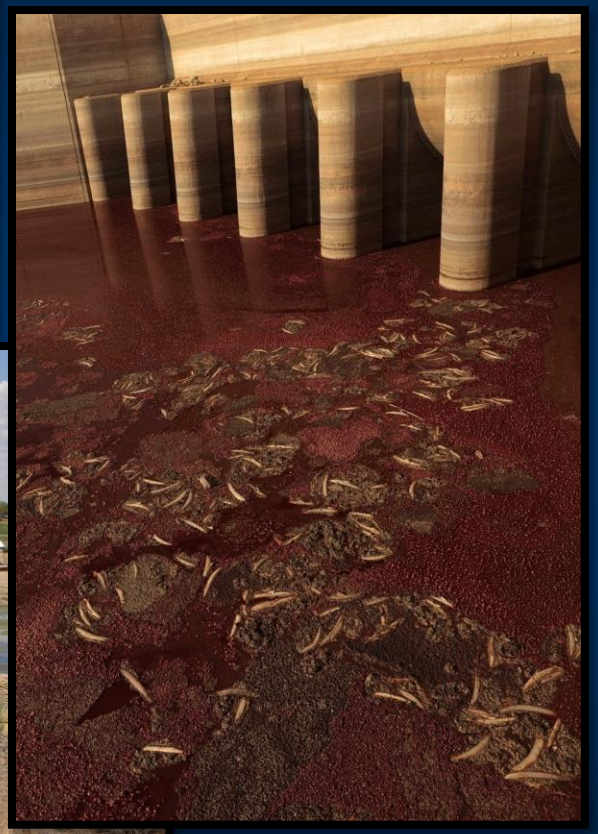
http://droughtmonitor.unl.edu

USDA National Drought Mitigation Center

Released Thursday, October 6, 2011

Drying Rivers threatened rare fish

Critically Low Lake Levels impacted fisheries and recreation



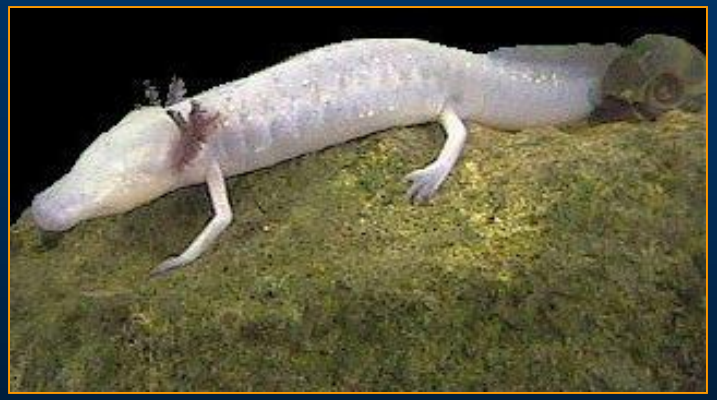
Reduced Freshwater Inflows to Bays and Estuaries Impacted Commercial Fishing

- Bay and estuary salinities are higher than normal due to low freshwater inflows and high temperatures

- Red tides commonly occur during drought years – current bloom started in September

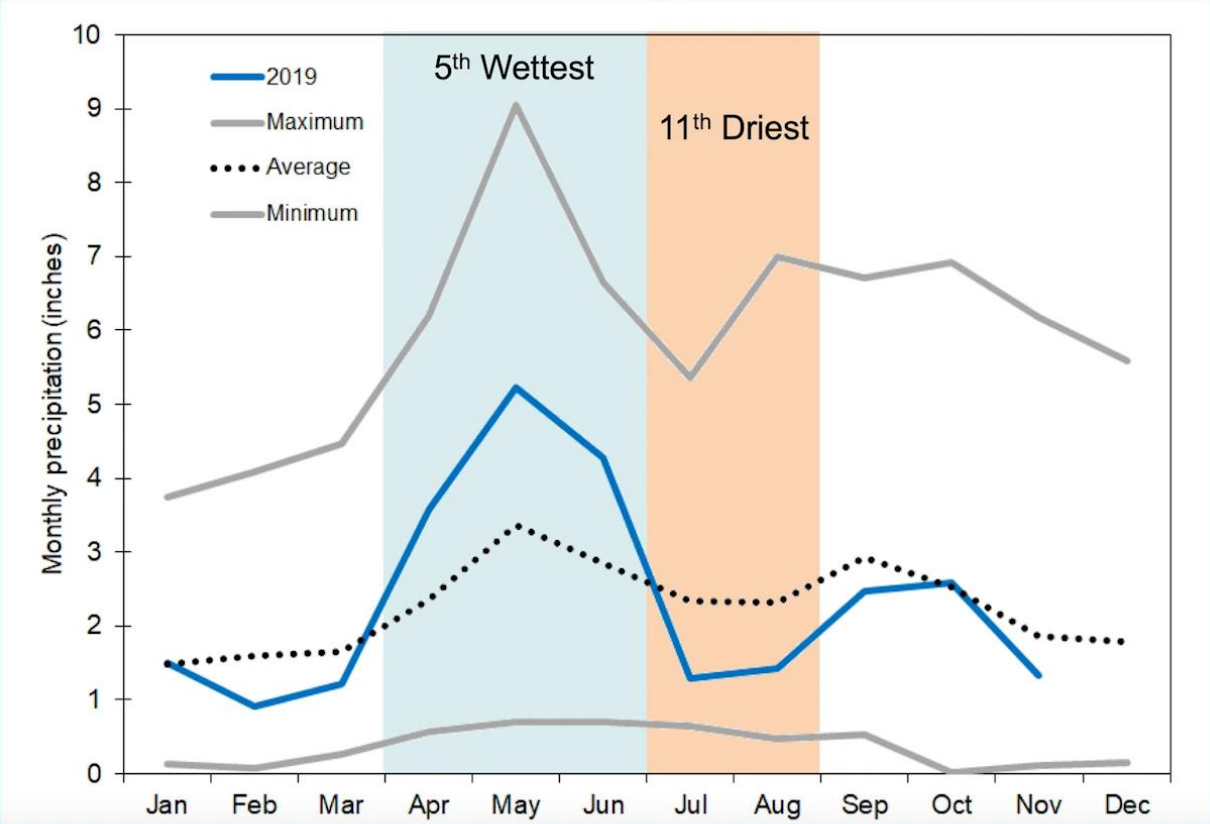
- Oysters have been impacted by parasites and diseases – commercial oyster season closed

Declining groundwater levels threatened spring flow-dependent species



TWDB Water + Weather 2019 Year in Review

2019 Precipitation

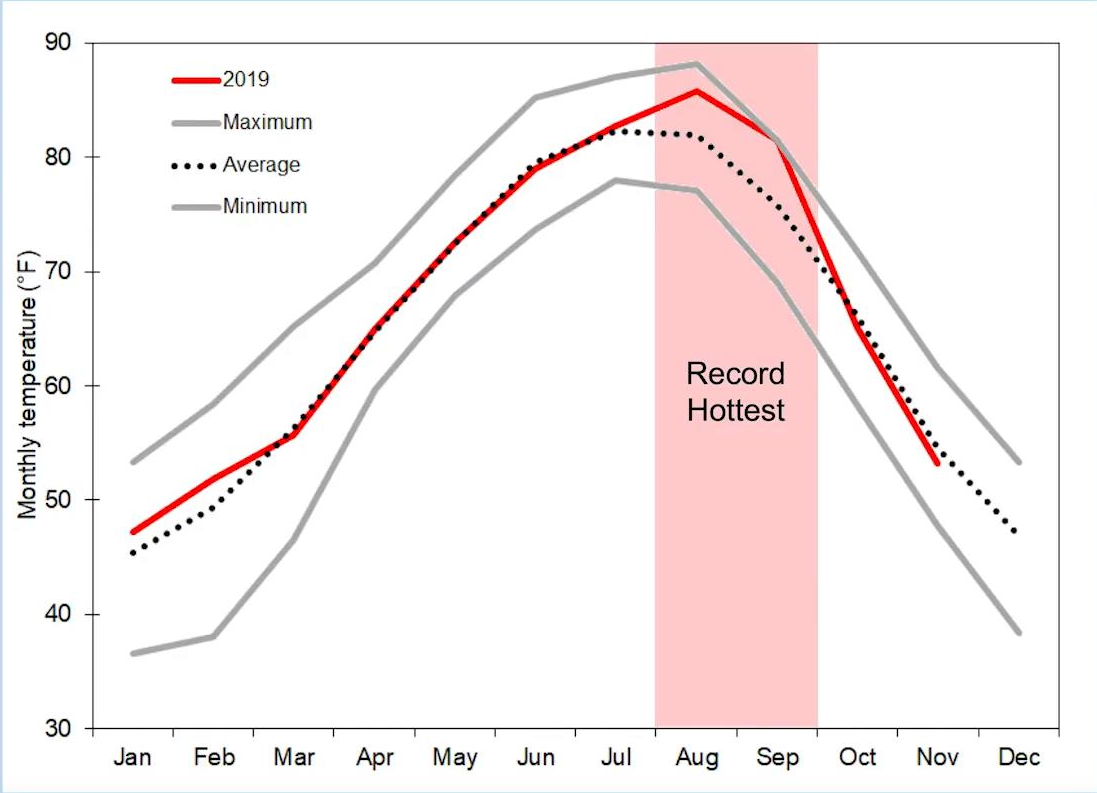


Texas Water Development Board

Play (k)

TWDB Water + Weather 2019 Year in Review

2019 Temperature

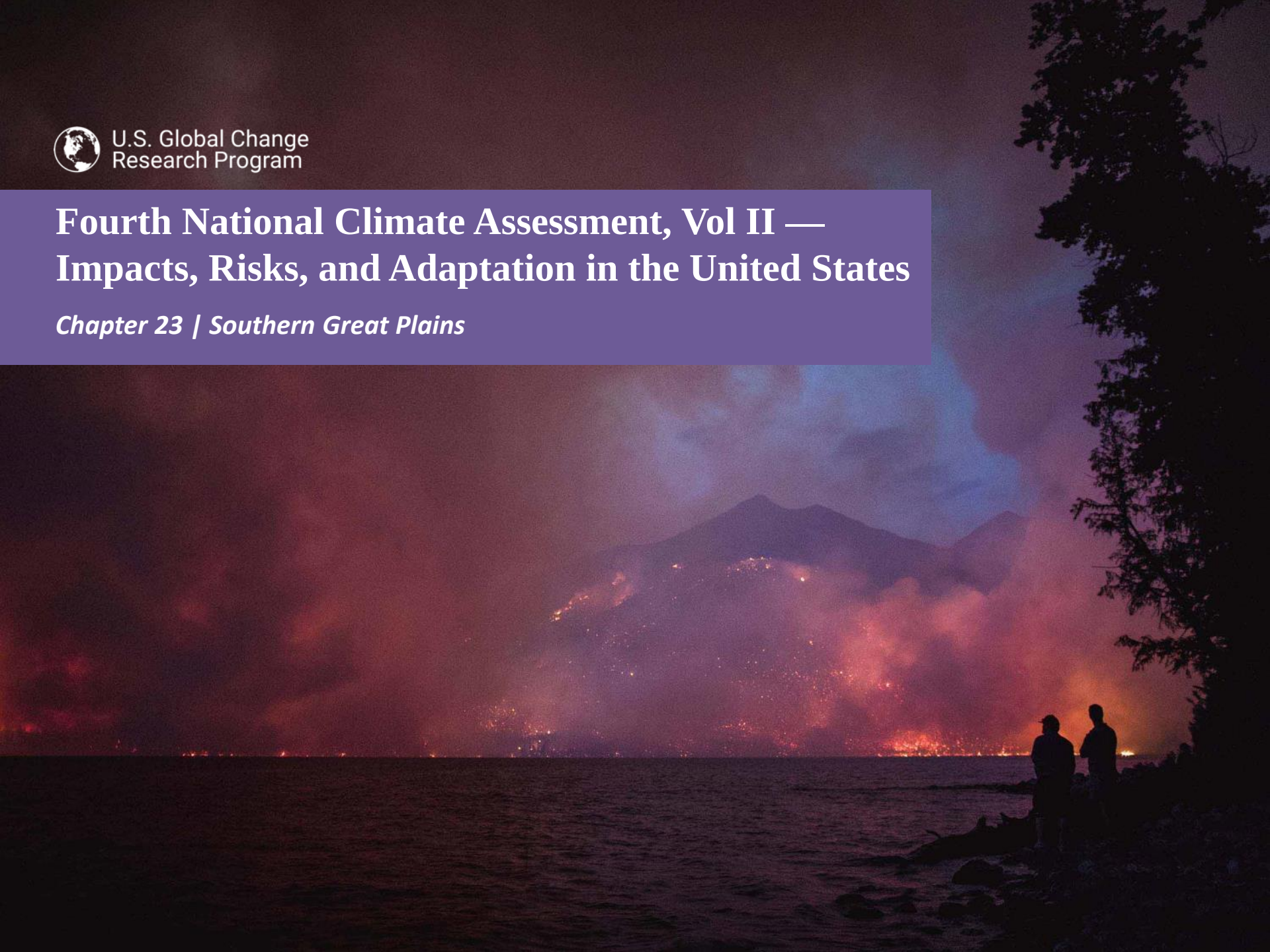


Texas Water Development Board

U.S. Global Change Research Program

Fourth National Climate Assessment, Vol II — Impacts, Risks, and Adaptation in the United States

Chapter 23 | Southern Great Plains



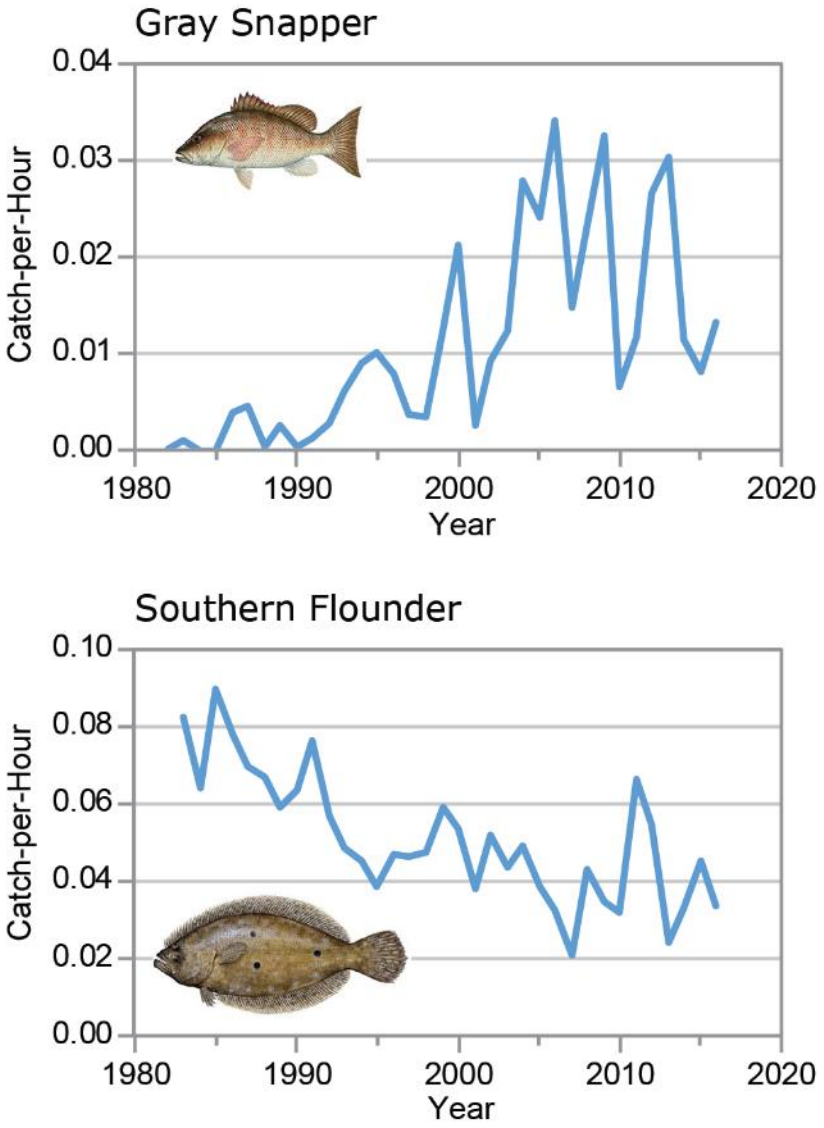
23 Key Message #3

Ecosystems and Ecosystem Services

Terrestrial and aquatic ecosystems are being directly and indirectly altered by climate change. Some species can adapt to extreme droughts, unprecedented floods, and wildfires from a changing climate, while others cannot, resulting in significant impacts to both services and people living in these ecosystems. Landscape-scale ecological services will increase the resilience of the most vulnerable species.

Fig. 23.9: Climate Winners and Losers (Gray Snapper and Southern Flounder)

The graphs show trends in annual abundance of (top) gray snapper and (bottom) southern flounder as the number of fish caught per hour along the Gulf Coast of Texas between 1982 (snapper)/1983 (flounder) and 2016. As water temperatures increase along the Texas Gulf Coast, gray snapper are expanding northward along the Texas coast, while southern flounder, a popular sport fish, are becoming less abundant, impacting the recreational and commercial fishing industries. *Source: Texas Parks and Wildlife Department.*



Texas Water Future?

- Increased water demands
- Climate extremes
- Hydrologic alteration
- Hypoxic zones
- Harmful algal blooms
- Fish kills
- Invasive species
- Habitat fragmentation
- Loss of coastal wetlands
- Species declines

Photo courtesy Randy Blankinship

Question 1:
By 2070 Texas population is expected to increase

A. 0%

B. 70%

C. 25%

D. 100%

Time for a Change: One Water

It's Time to Look at America's Water in a Different Light.

Challenges to our nation's ability to provide clean and safe water for future generations abound. The need to consider approaches that encourage watershed planning, focus on sustainability, and embrace the concept of green cities is critical to our clean water future. Clearly, the silo thinking of the past has kept clean water, drinking water, stormwater and water reuse interests segregated – and while it has driven progress, it has not encouraged comprehensive thinking, planning and management of our waters on the transformational scale now necessary.

An integrated national water policy – that balances our commitment to social, environmental, and economic needs – is essential to guide the development of our Nation's environmental statutes and inform water-related decision-making. Both policy makers and the public must grow to understand that water is a finite resource that must be managed in a sustainable way to allow for continued and unrestricted access. Environmental sustainability must be advanced, water use must be efficient, and clean water must be available for human and ecosystem needs.

Clean Water America Alliance
www.CleanWaterAmericaAlliance.org

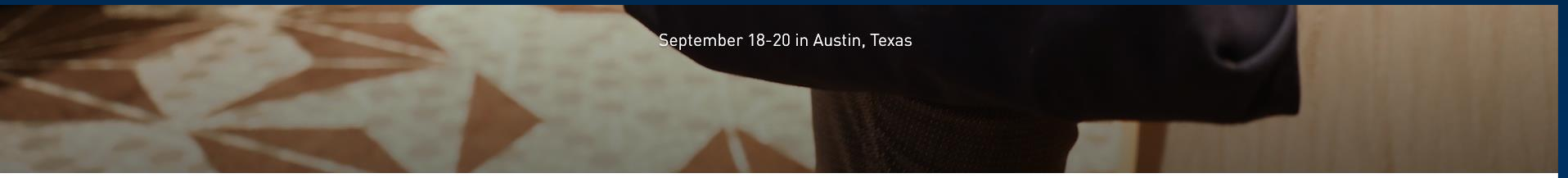
Our Work

Mission
Our Work
Our Members
Become a Member
Board of Directors
Leaders Circle
Staff
Jobs
2019 Year In Review

This is a defining moment for water providers, business leaders, environmental organizations, the agricultural sector, community stewards—in short, for all of us. The importance of sustainable stewardship of our water resources has captured public attention as never before, as the nation deals with epic drought in the West, extreme weather events in the East and Midwest, increased flooding due to climate change and rising sea levels, and unprecedented pressure on water supplies in the face of urbanization and population growth. The US Water Alliance brings together all those that have a stake in sustainable and resilient water systems and resources.

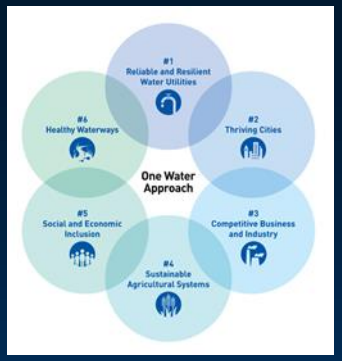
Educate
We educate and inspire people about the value of water and the need for investment.

2019 One Water Summit - Austin



One Water Summit 2019 brought together **1,000 changemakers** to forge partnerships and craft solutions to our nation's most pressing water challenges. Attendees came from over **200 cities and towns** across **40 states**, and as part of **44 Delegations**. **92 percent of attendees** feel better equipped to advance One Water at home after attending the Summit.

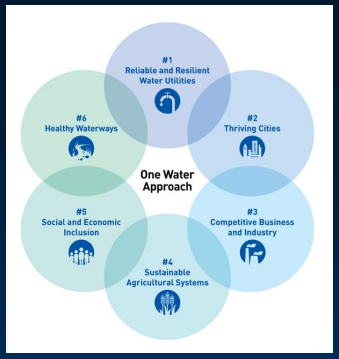
One Water Defined



One Water is an integrated planning and implementation approach to managing finite water resources for long-term resilience and reliability, meeting both community and ecosystem needs.

Source: Water Research Foundation Blueprint for One Water

The One Water Approach:



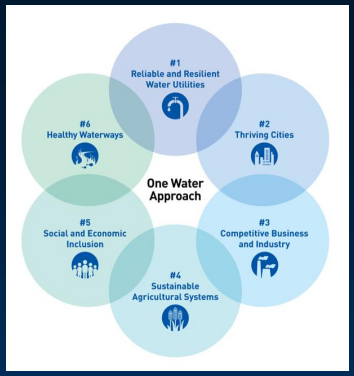
Manage all water in an integrated, inclusive, and sustainable manner to secure a bright, prosperous future for our children, our communities, and our country.

Unifying characteristics:

- The mindset that all water has value—from the water resources in our ecosystems to our drinking water, wastewater, and stormwater.

- Triple Bottom Line - A focus on achieving multiple benefits, meaning that our water-related investments should provide economic, environmental, and societal returns.

The One Water Approach



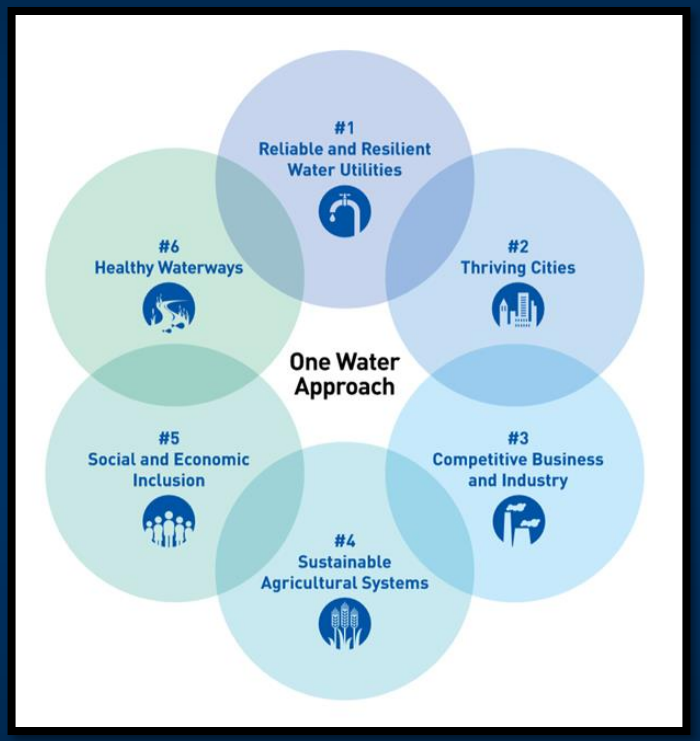
(More) Unifying characteristics:

- Approaching decisions with a systems mindset that encompasses the full water cycle and larger infrastructure systems.

- Utilizing watershed-scale thinking and action that respects and responds to the natural ecosystem, geology, and hydrology of an area.

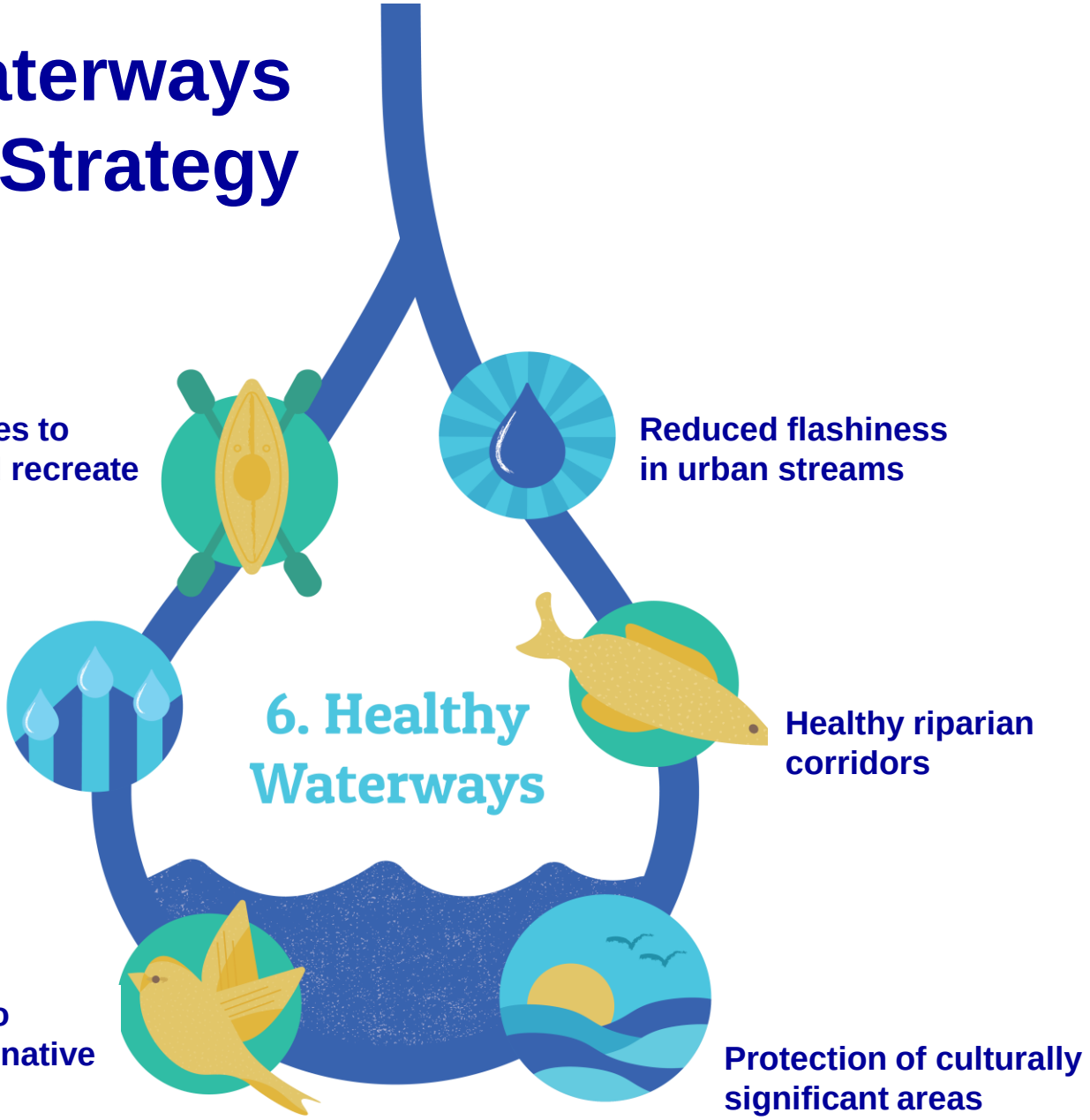
- Relying on partnerships and inclusion, recognizing that real progress will only be made when all stakeholders have a seat at the table.

Arenas and Strategies for Action



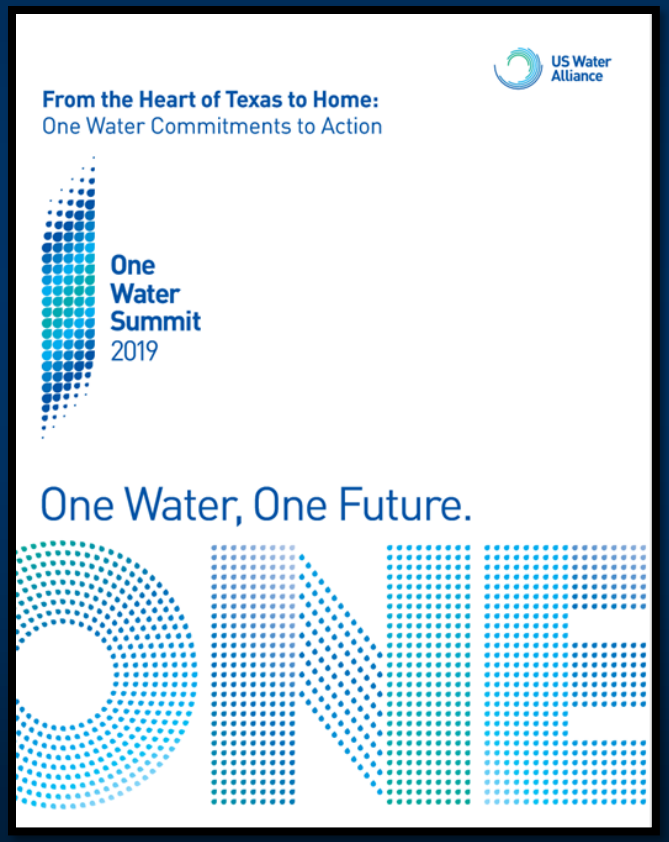
1. Reliable and Resilient Water Utilities (green infrastructure, wastewater reuse)
2. Thriving Cities (integrated planning, climate resiliency)
3. Competitive Business and Industry (partnerships, efficiency)
4. Sustainable Agricultural Systems (water conservation)
5. Social and Economic Inclusion (engagement in planning and governance)
6. Healthy Waterways (natural infrastructure, watershed protection, citizen science)

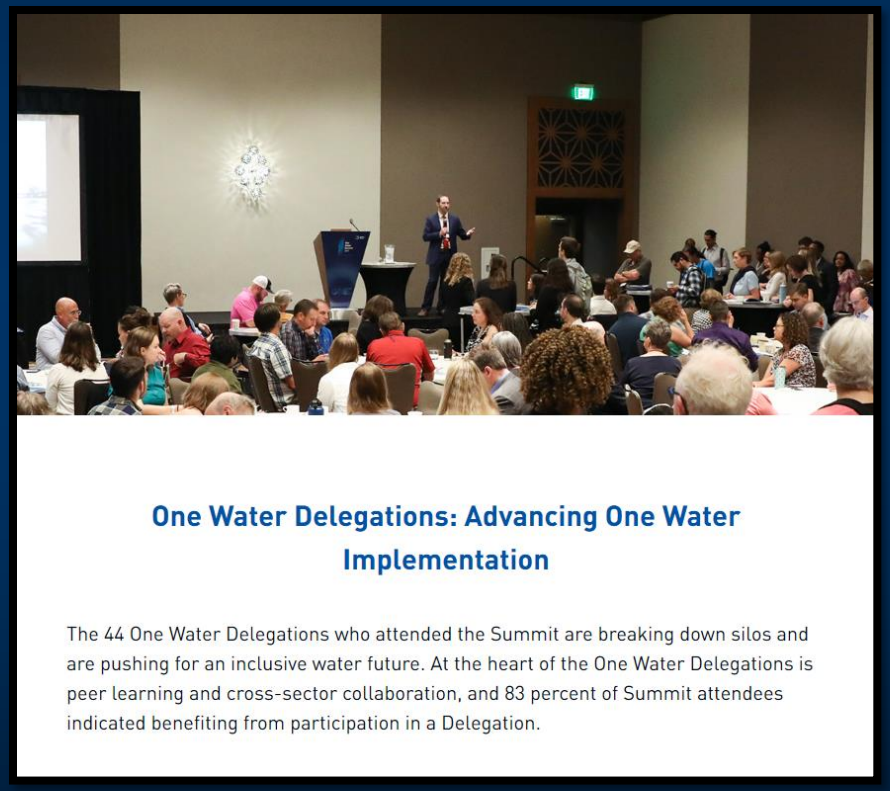
Healthy Waterways Arena and Strategy for Action



Source: Texas Living Waters

One Water Delegations: Commitments to Action





One Water Delegations: Advancing One Water Implementation

The 44 One Water Delegations who attended the Summit are breaking down silos and are pushing for an inclusive water future. At the heart of the One Water Delegations is peer learning and cross-sector collaboration, and 83 percent of Summit attendees indicated benefiting from participation in a Delegation.

Texas Hill Country Delegation

Commitment to Action: Increase One Water practices in the Hill Country

The Texas Hill Country Delegation pledges to build collaboration among the large cities along the I-35 corridor to help the Hill Country, hold information workshops that foster peer-dialogue, create and distribute educational materials so that those outside the sector can understand the need and benefit of One Water practices, and advocate for green infrastructure in the new Texas state flood plan.

Texas Living Waters Project Delegation

Commitment to Action: Advance One Water throughout the Lone Star State

In the coming year, we will advance One Water in Texas, while also improving the One Water paradigm by helping to give meaning and rigor to this national movement's commitment to environment co-benefits. To establish a strong Texas example and to catalyze change, we will support the sound implementation of One Water in Austin and encourage adoption elsewhere in Texas, particularly in the Central Texas Hill Country. To ensure that One Water lives up to its promise as an environmentally responsible way to meet water demands, we will identify and promote strategies and standards needed to secure essential freshwater flows for rivers and bays. We will also operationalize the One Water commitment to equity and fairness, ensuring every community has access to clean, affordable water.

Freese and Nichols Delegation

Commitment to Action: Educate state policymakers and utility partners about the One Water approach

The Freese and Nichols Delegation commits to promoting low-impact development and apply the Institute for Sustainable Infrastructure's (ISI) Envision criteria and performance objectives. The following will be accomplished before the next Summit: assist one utility in earning the Envision rating, encourage four delegation leaders to earn ISI's Environmental Sustainability Program certification, and teach 20 college students how to apply the Envision rating program to their senior design projects.

Freese and Nichols Delegation

Commitment to Action: Educate state policymakers and utility partners about the One Water approach

We will advocate for incorporation of One Water principles into regional water plans and the State Flood Plan process of Texas. By the next Summit, these groups will have submitted plans to Texas, which contain the largest proportion of alternative water supply strategies since the legislature established the bottom-up regional planning approach in 1997.

Finally, we will promote the One Water approach to the hundreds of utilities with which Freese and Nichols partners. Between now and the next Summit, our delegation commits to: facilitate four workshops focusing on One Water and sustainability, expand water reuse in Texas, North Carolina, Georgia, Florida, Oklahoma and Louisiana by 1 million gallons per day, grow its groundwater practice to successfully implement one new desalination project and one new ASR project, design the restoration of 5,000 linear feet of water-way, and continue to engage communities in the development of resiliency plans.

Question 2: What is One Water?

A. A new diet drink
B. A water-based theme park
C. What's left when you drink the other one.
D. A planning approach designed to achieve water sustainability.

Senate Bill 1 (1997-present) Regional Water Planning

- Water supply plan to meet Drought of Record needs
- 50-year planning horizon
- 5-year planning cycle
- Created the Texas Water Trust
- Ecologically Unique Stream Segments
- Must consider environmental water needs

Regional Water Planning: Environmental Issues

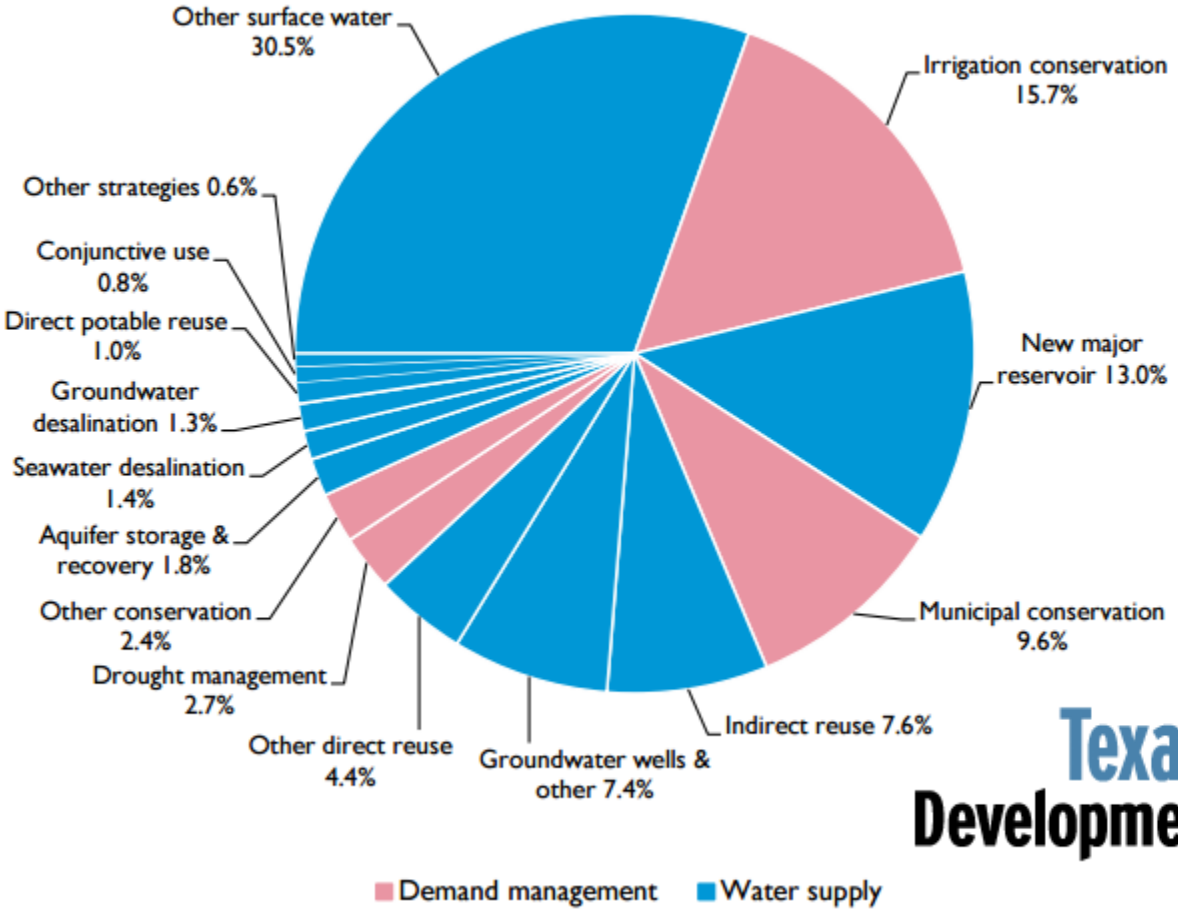
TPWD serves as non-voting members on 16 planning regions.

- 1st cycle: "We don't have the luxury of protecting the environment".
- 2nd cycle: Planning rules amended to require quantitative reporting of environmental factors.
- 3rd cycle: Regional plans begin to address TPW concerns.
- 4th cycle: increased focus on water conservation, reuse and environmental issues.
- 5th cycle: - more interest in innovative water technologies. Draft plans due 3/3/2020.

Link to public meeting schedule:
http://www.twdb.texas.gov/waterplanning/rwp/schedule/IPPhearings.asp

Relative Volume of Recommended Water Management Strategies 2070

Figure ES.7 - Share of recommended water management strategies by strategy type in 2070



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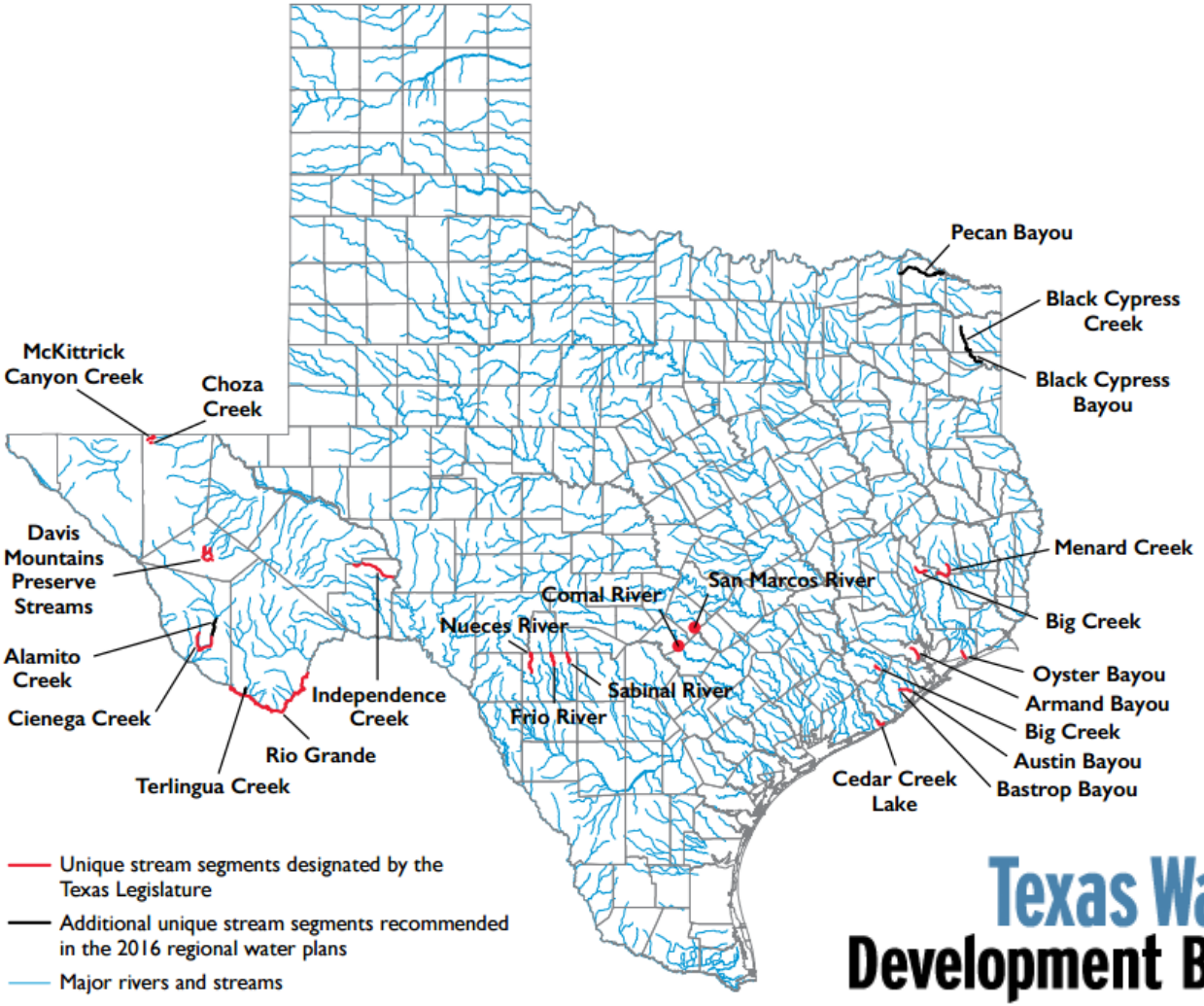
Designated and Additional Recommended Ecologically Unique Stream Segments



Texas Water Development Board

Question 3:

The most environmentally friendly way to meet Texas future water needs is through:

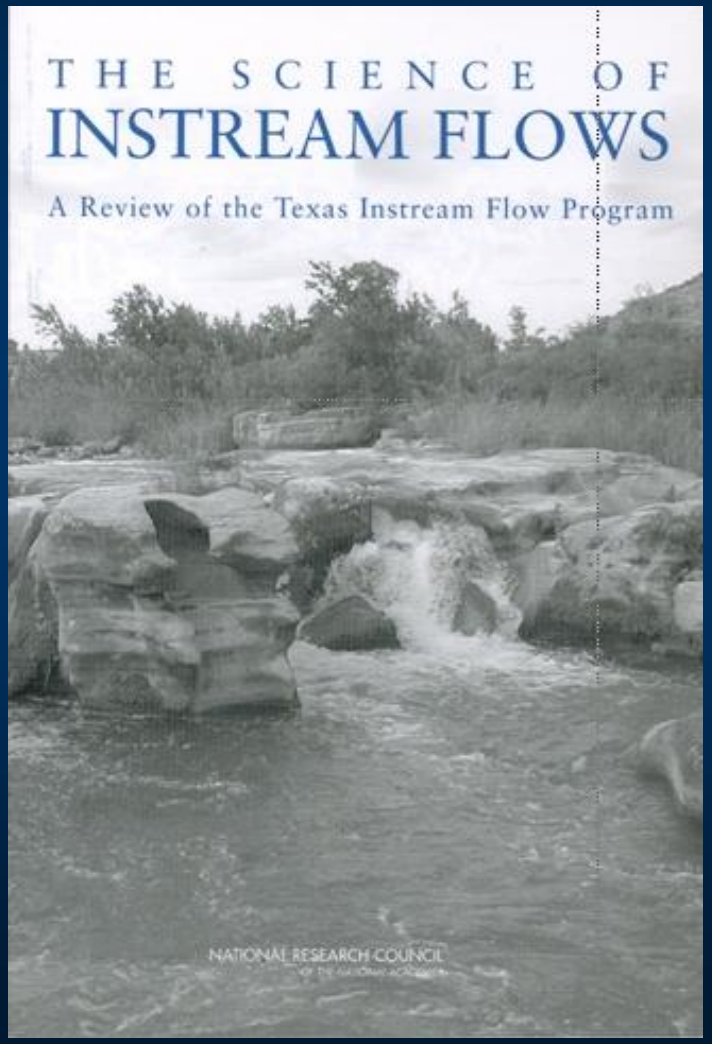
A. Conservation

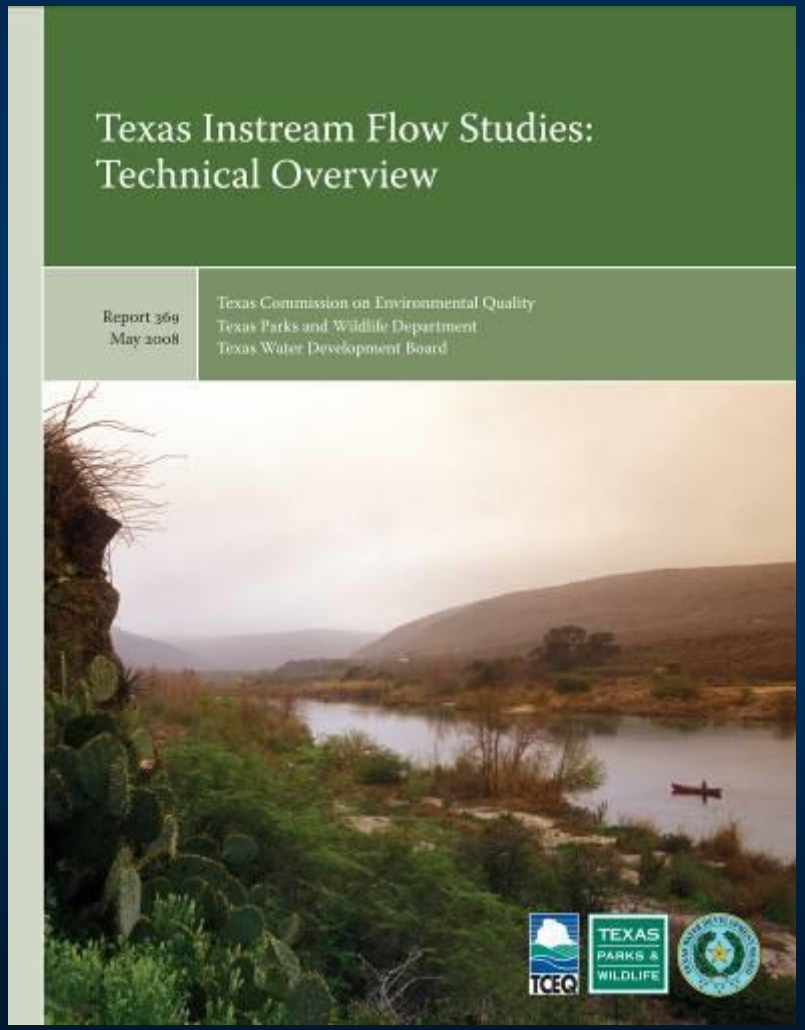
B. Reuse

C. Desalination

D. New reservoir construction

Senate Bill 2 (2001)
Texas Instream Flow Program

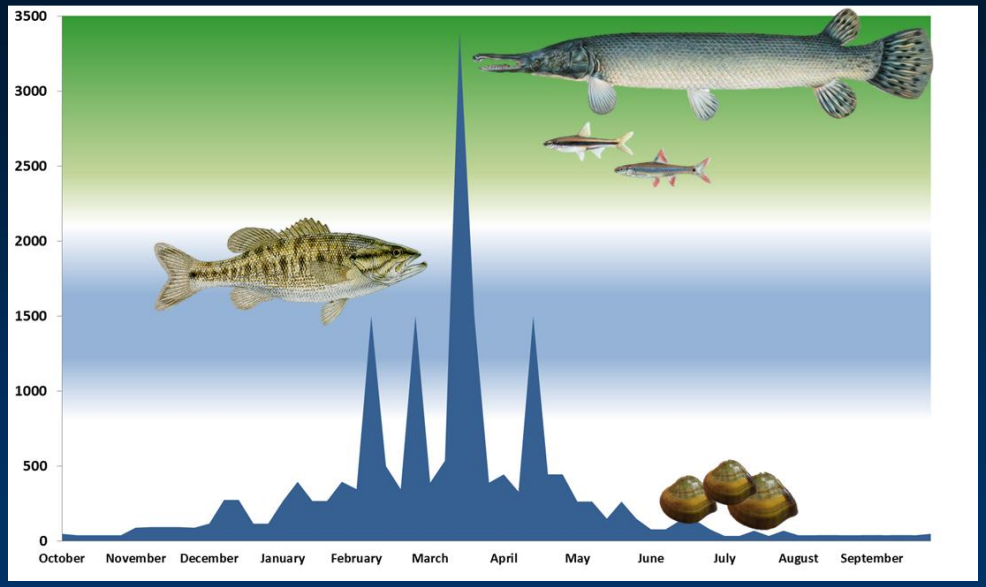




Senate Bill 3 Environmental Flows (2007- present)

Environmental flow regimes are to be developed and recommended by expert science teams working with technical support from state agencies and academic institutions; recommendations shall be based solely on best available science.

Environmental Flow Regime Definition



"A schedule of flow quantities that reflects seasonal and yearly fluctuations that typically would vary geographically, by a specific location in a watershed, and that are shown to be adequate to support a sound ecological environment and to maintain the productivity, extent, and persistence of key aquatic habitats in and along the affected water bodies."

Environmental Flows Process

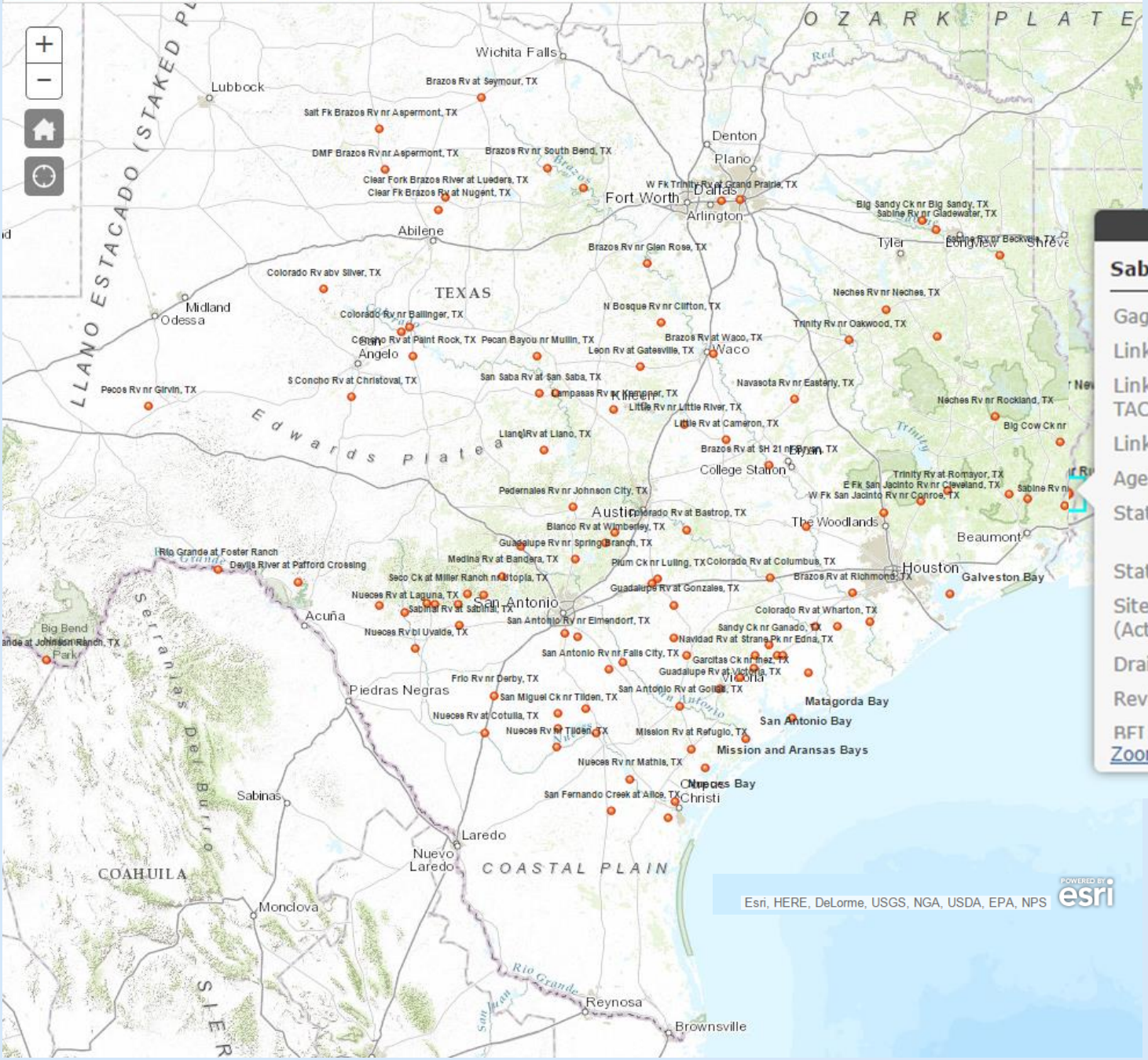
Each Basin/Bay Area Stakeholders Committee reviews findings of Expert Science Team and recommends environmental flow regimes to TCEQ

Through rulemaking, TCEQ adopts environmental flow standards and establishes an environmental flow “set aside” if unappropriated water is available; rulemaking process allows for broad public input

Environmental Flows Management

Environmental flow standards and implementation strategies are subject to “adaptive management,” meaning that the success and/or failure of management measures will be assessed and adjusted as new science and information becomes available. Flow standards will be subject to periodic review and revision.

Texas Environmental Flow Standard Locations



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Sabine Rv nr Ruliff, TX

Gage ID	08030500
Link to eflow table	More info
Link to basin rule TAC298	More info
Link to gage website	More info
Agency	
Station name	Sabine Rv nr Ruliff, TX
State	TX
Site Status (Active/Inactive)	A
Drainage area (sq mi)	9,329
Reviewed	Y
RFI years	80

Zoom to

Environmental Flows Information Toolkit (EFIT)

- Geospatial decision support tool that enables a user to identify areas to align with voluntary strategies for the restoration and protection of environmental flows.
- Pilot project focuses on the Great Plains region of Texas with funding from the Great Plains Landscape Conservation Cooperative (GPLCC) and from the Cynthia and George Mitchell Foundation.
- Texas Nature Conservancy and Texas Conservation Science have partnered as contractors.

TEXAS PARKS & WILDLIFE

The Nature Conservancy
Protecting nature. Preserving life.

Texas Conservation Science
TCS

SB 3: Next Steps

- Adaptive management requires periodic review and possible revision of the standards.
- Develop strategies to meet environmental flow needs.
- Decision Support Tools
- Voluntary Water Market-based approach
- Continue to improve science!

Question 4. Adequate instream flows protect:

A. Aquatic habitat

B. Recreation

C. Ecosystem services

D. All of the above

Texas Water Future!

- The environment is part of the water equation - We must remain engaged!
- Good water decisions require good science.
- New legislative mandate to provide guidance related to seawater desalination.
- Human Dimensions increasingly important.

- Increased emphasis on market-based solutions.
- Partnerships required to tackle complex challenges.
- Education and Outreach are essential!

US Water Alliance

Save the date!

One Water Summit

June 2–4, 2021

Milwaukee, WI

One Water, One Future.


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WILDLIFE