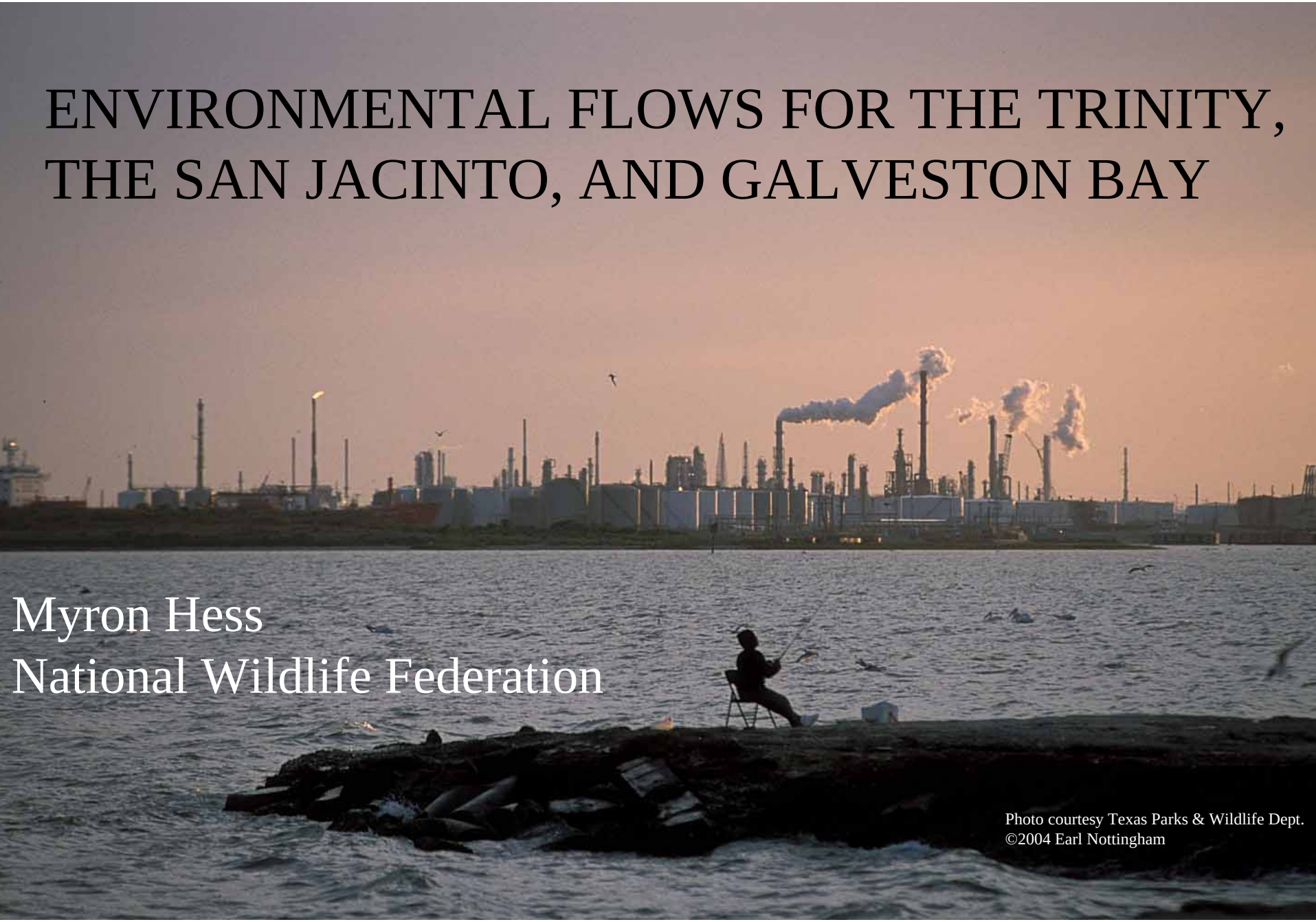
ENVIRONMENTAL FLOWS FOR THE TRINITY, THE SAN JACINTO, AND GALVESTON BAY



Myron Hess
National Wildlife Federation

Photo courtesy Texas Parks & Wildlife Dept.
©2004 Earl Nottingham

ROLE OF INSTREAM FLOWS

Water quality
Fish and wildlife
Livestock
River recreation
Bottomland forests
Tourism

ROLE OF FRESHWATER INFLOWS

- Supply nutrients
- Supply sediments
- Maintain salinity balance

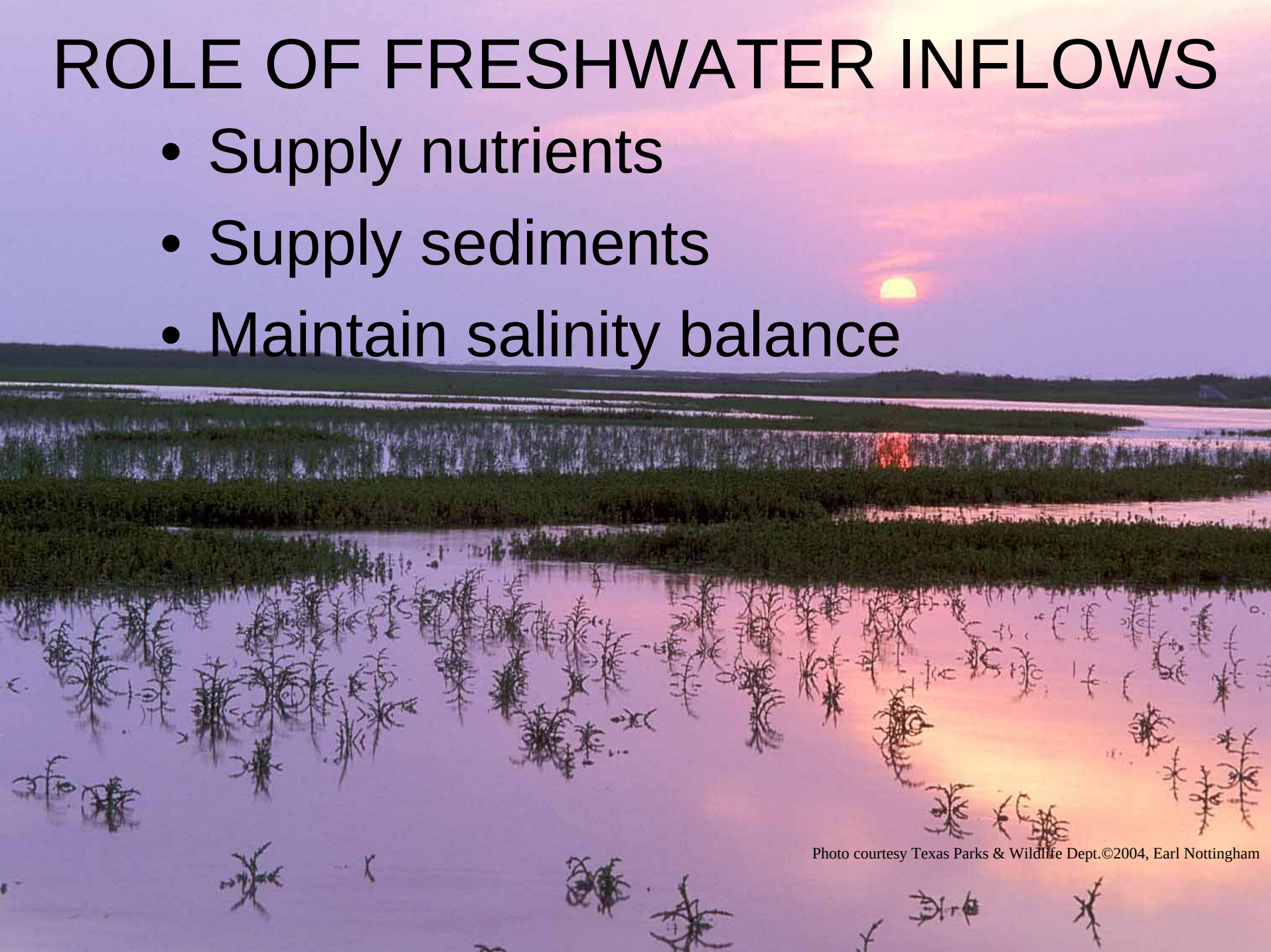
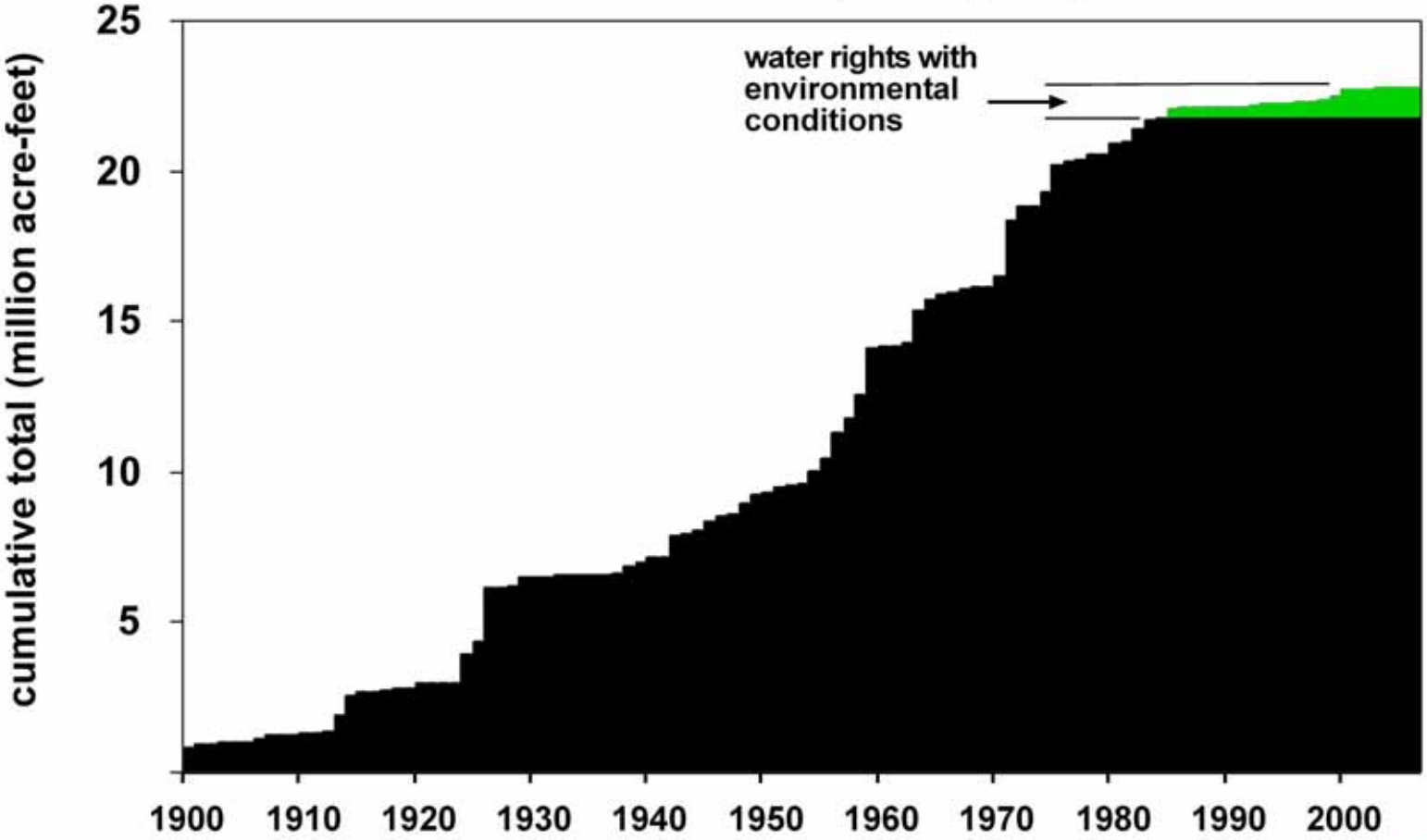


Photo courtesy Texas Parks & Wildlife Dept.©2004, Earl Nottingham

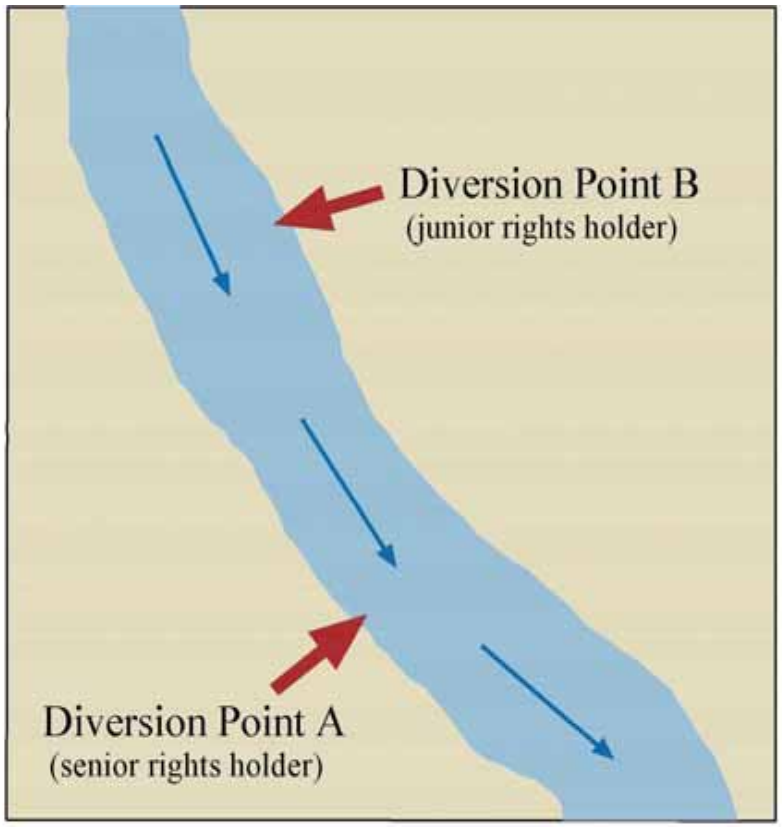
Texas Water Rights -
Timeline of all consumptive rights granted



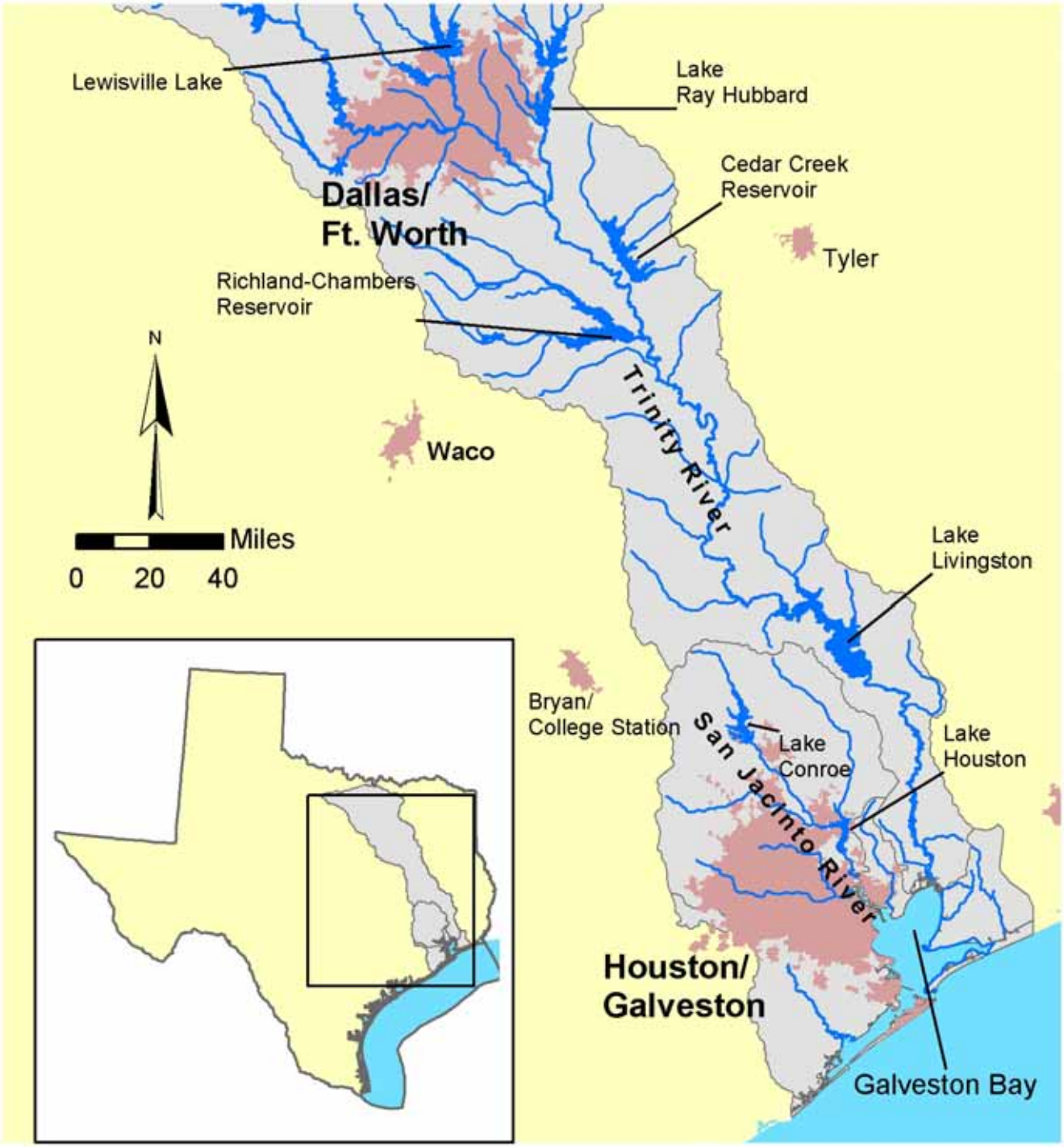
Source: data from Texas Commission on Environmental Quality.

NATIONAL WILDLIFE FEDERATION

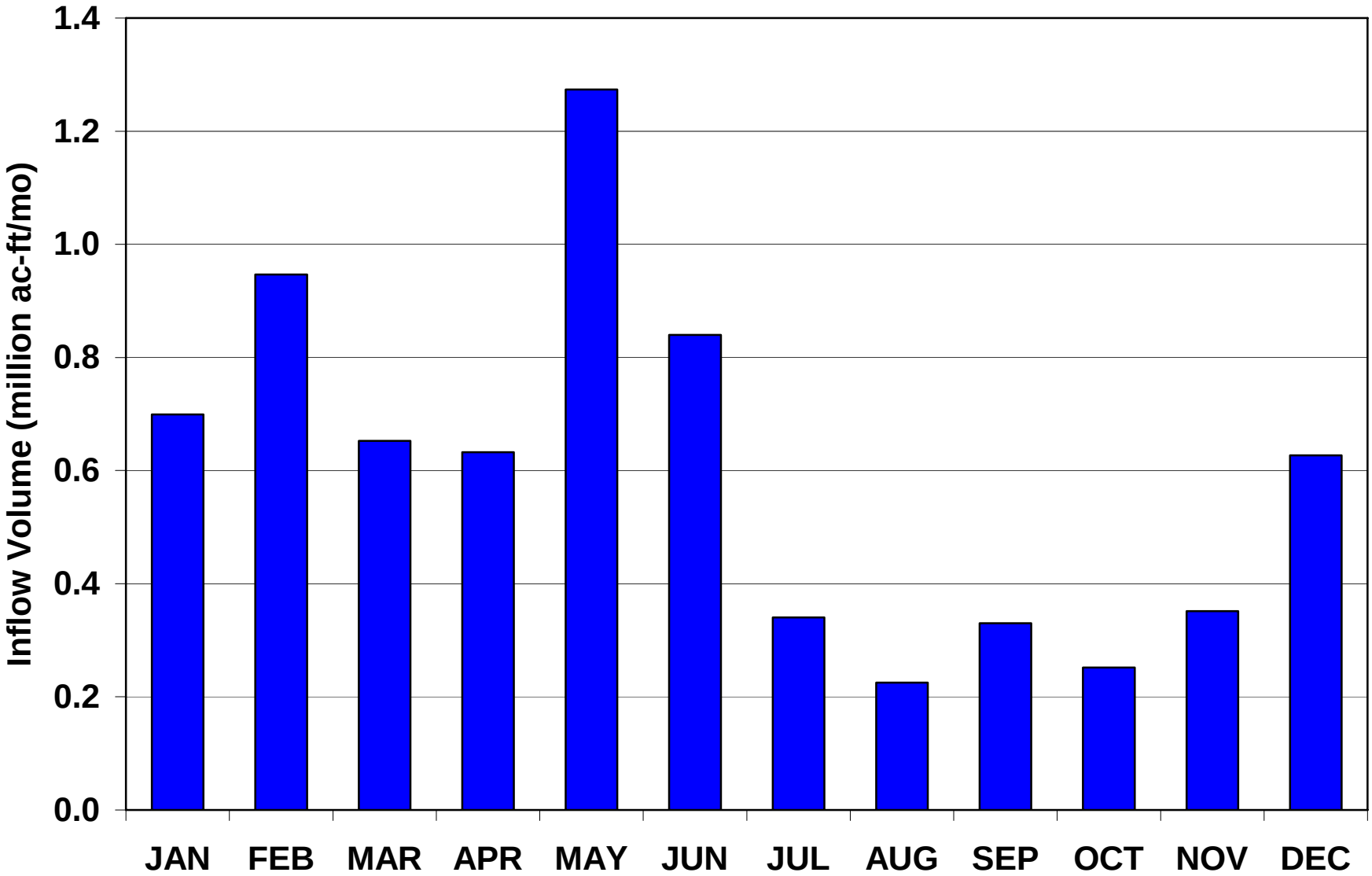
Older Is Better



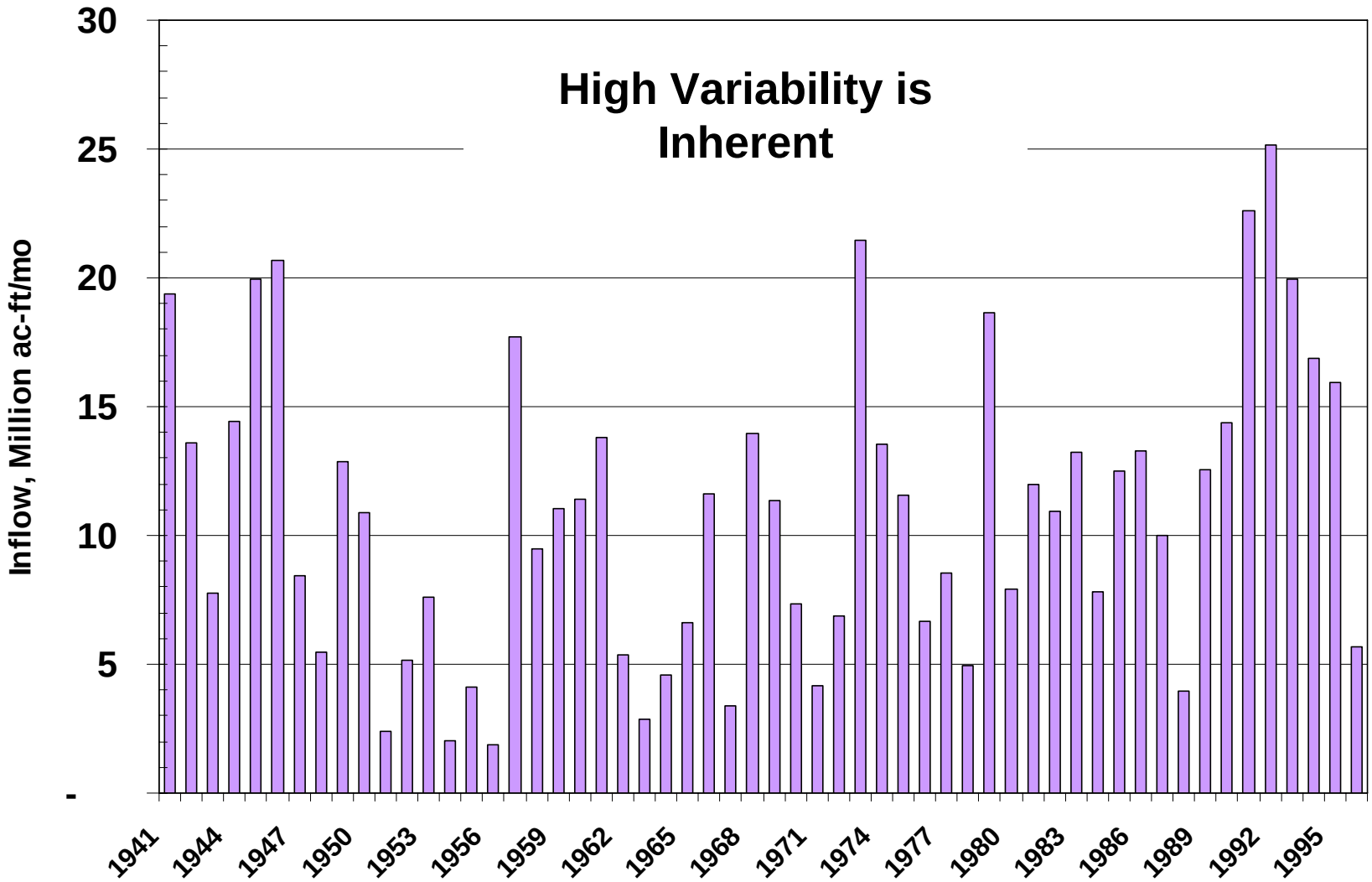
During dry periods, Diverter B may not be able to take water in order that Diverter A, who has senior rights, can get as much of his/her authorized water as possible.


Lewisville Lake
Lake
Ray Hubbard
Cedar Creek
Reservoir
Dallas/
Ft. Worth
Tyler
Richland-Chambers
Reservoir
N
Trinity River
Waco
Miles
0 20 40
Lake
Livingston
Bryan/
College Station
San Jacinto River
Lake
Conroe
Lake
Houston
Houston/
Galveston
Galveston Bay

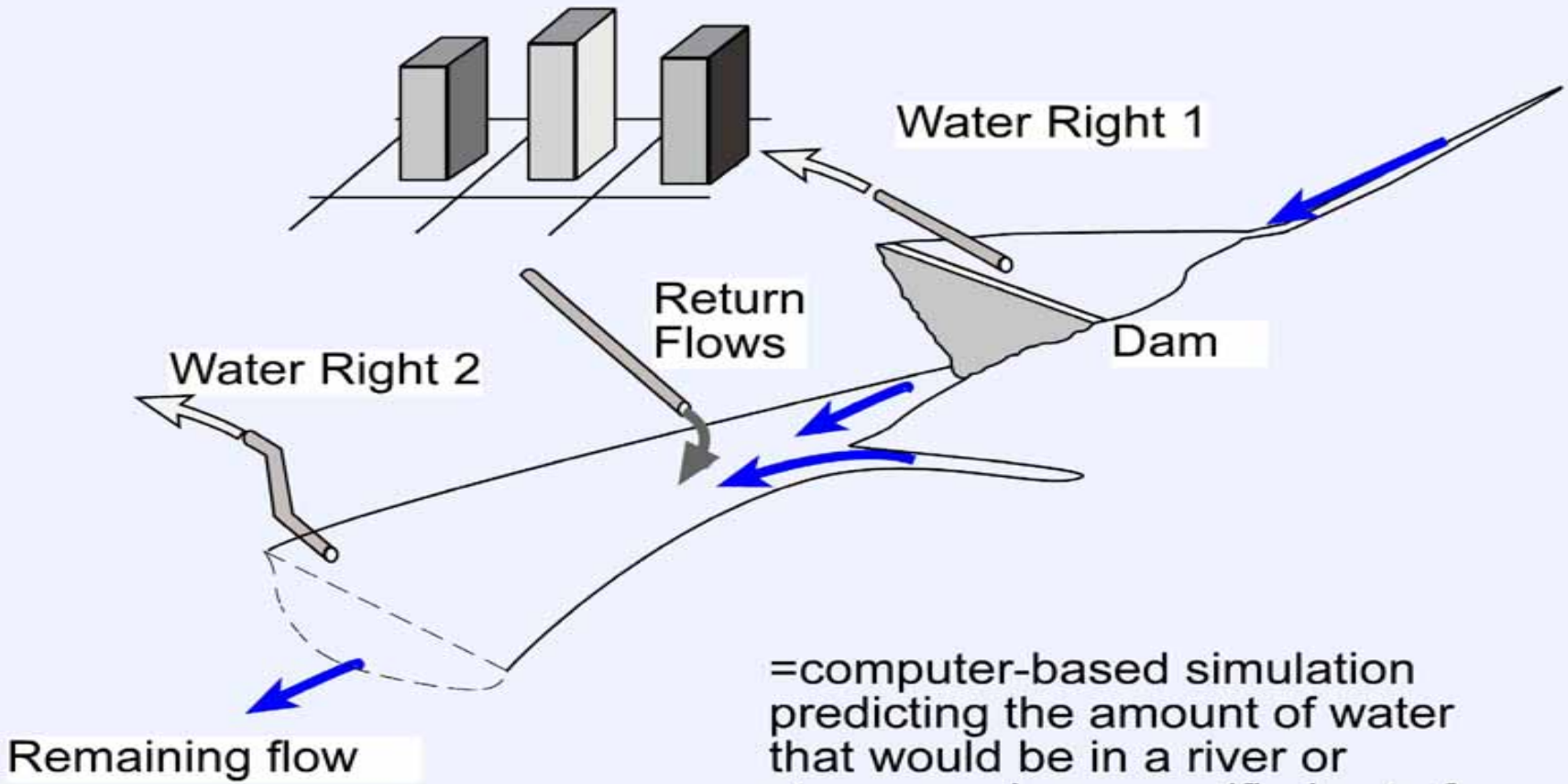
Galveston Bay - Median Historical Freshwater Inflow



Galveston Bay Measured Freshwater Inflows

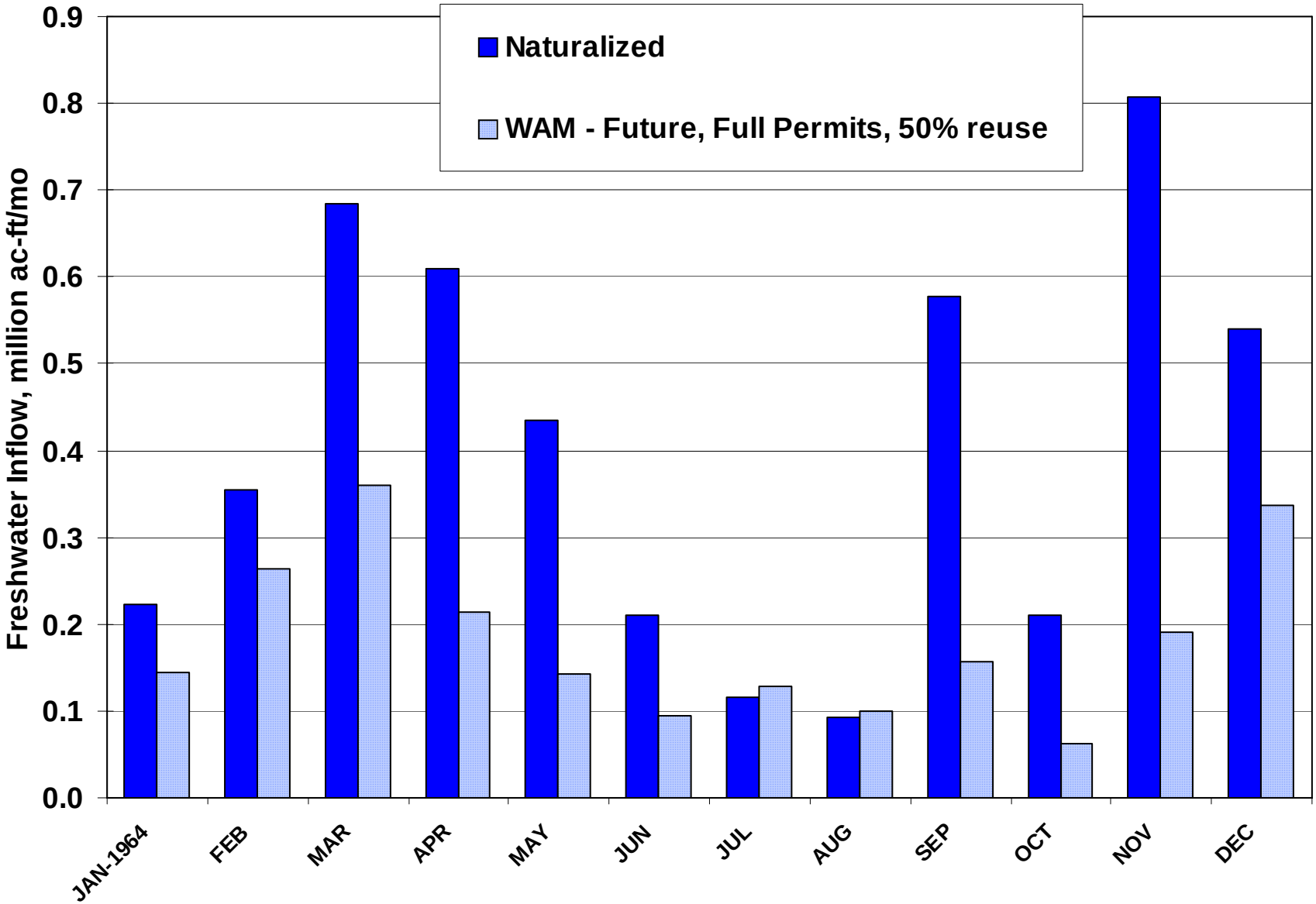


Water Availability Model (WAM)

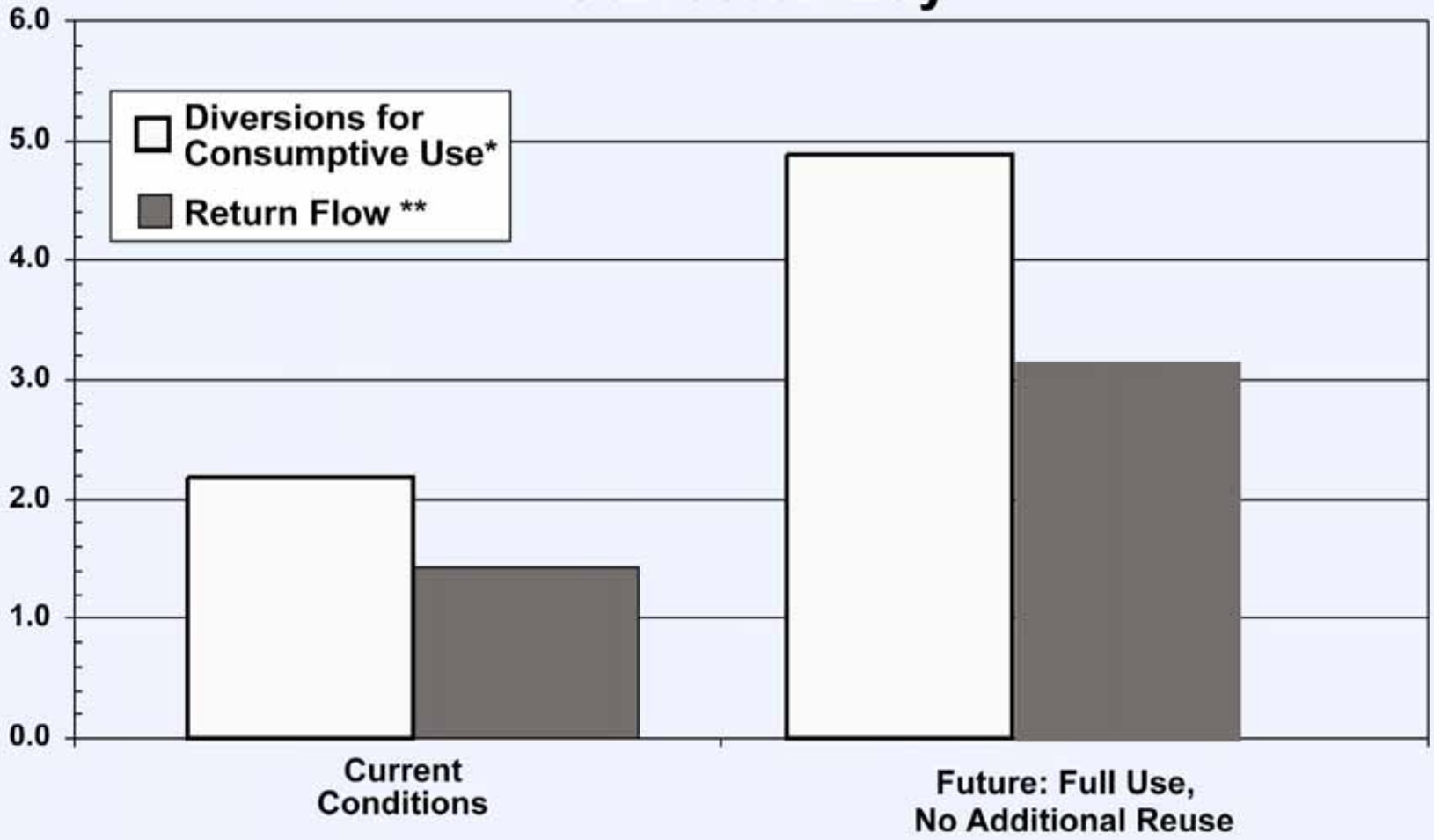


=computer-based simulation predicting the amount of water that would be in a river or stream under a specified set of conditions

Galveston Bay, WAM-Predicted Freshwater Inflows

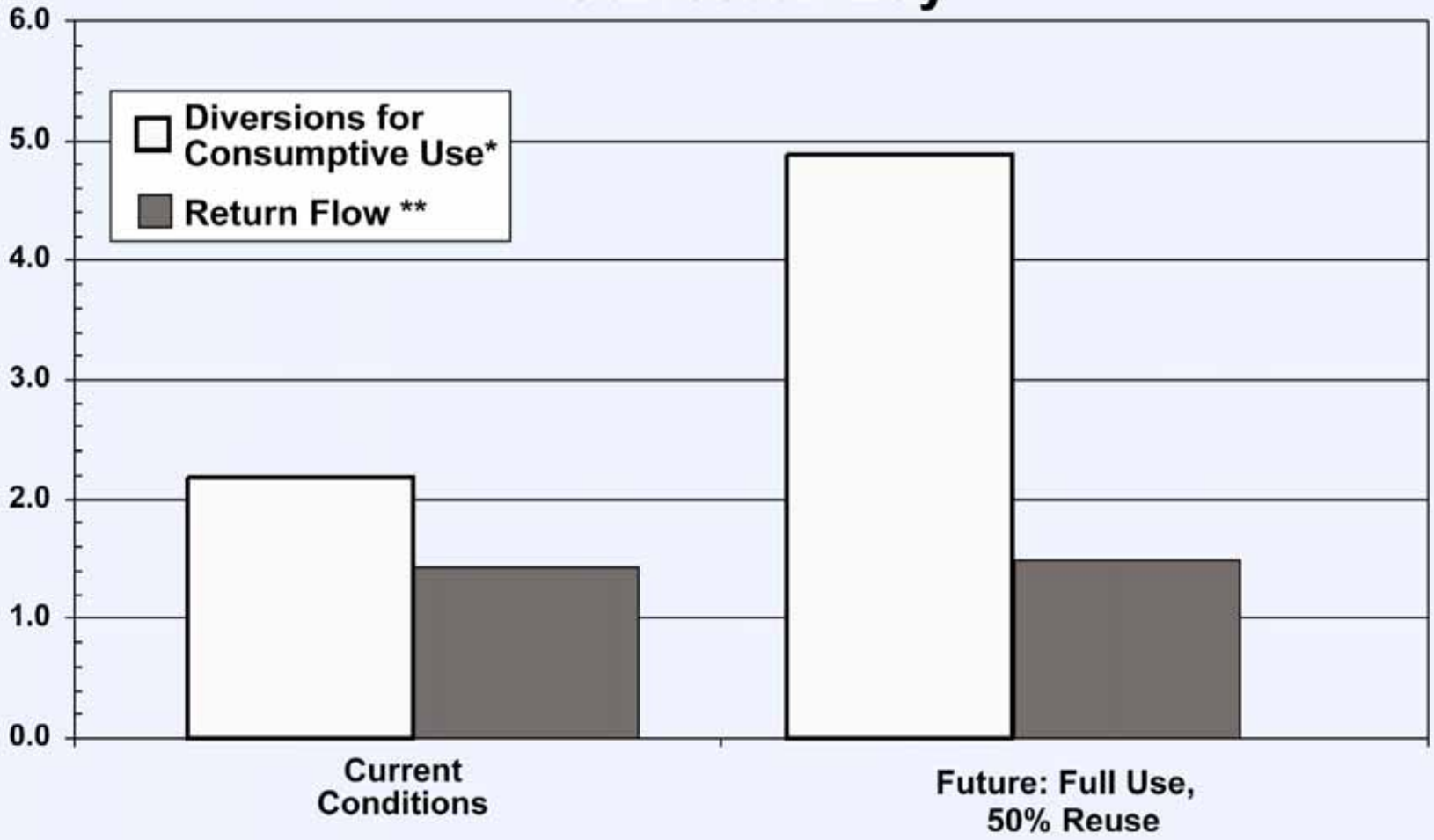


Water Use Characteristics for Rivers Draining to Galveston Bay



notes: * excludes hydropower and pass through cooling.
**includes groundwater based return flows

Water Use Characteristics for Rivers Draining to Galveston Bay



notes: * excludes hydropower and pass through cooling.
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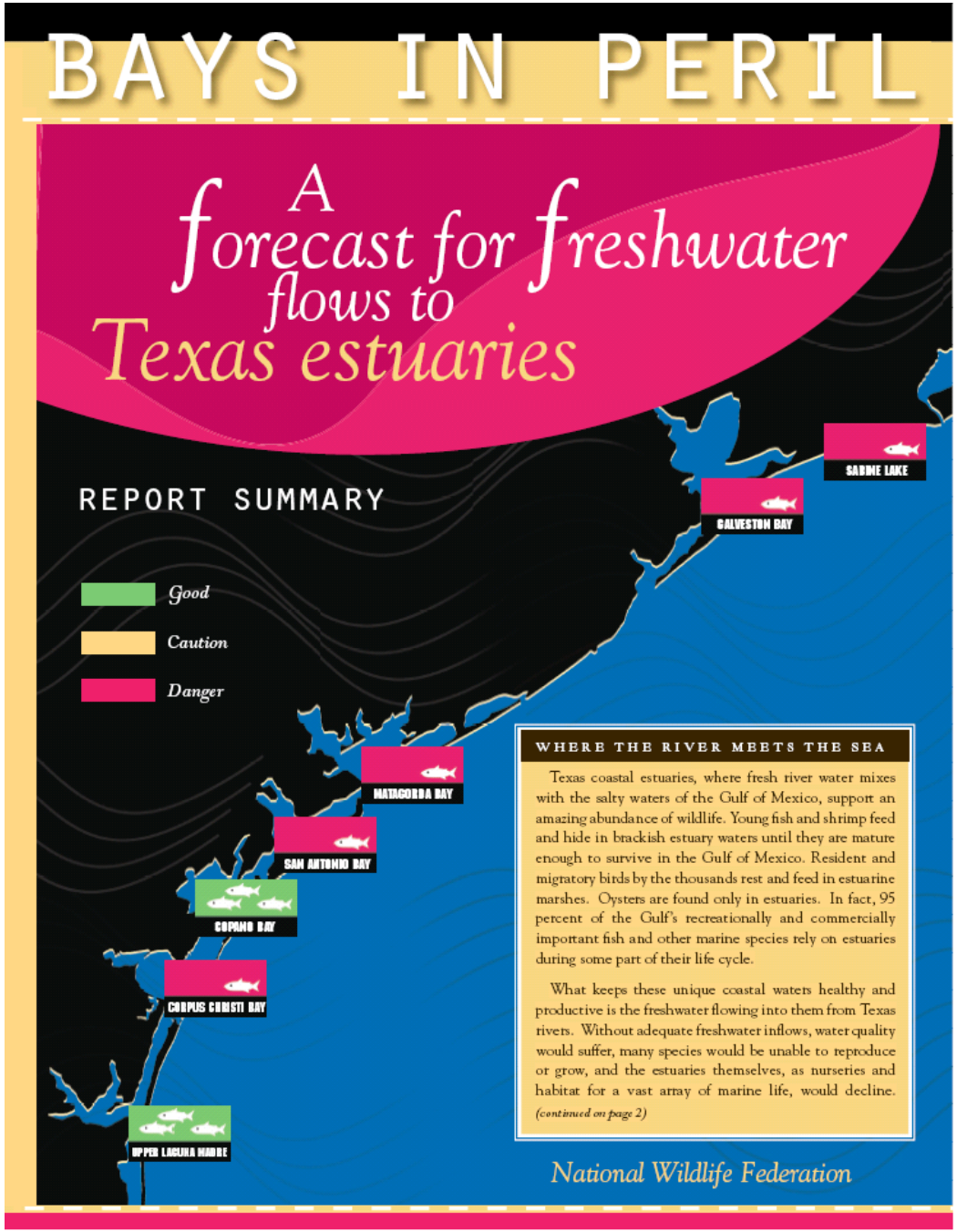
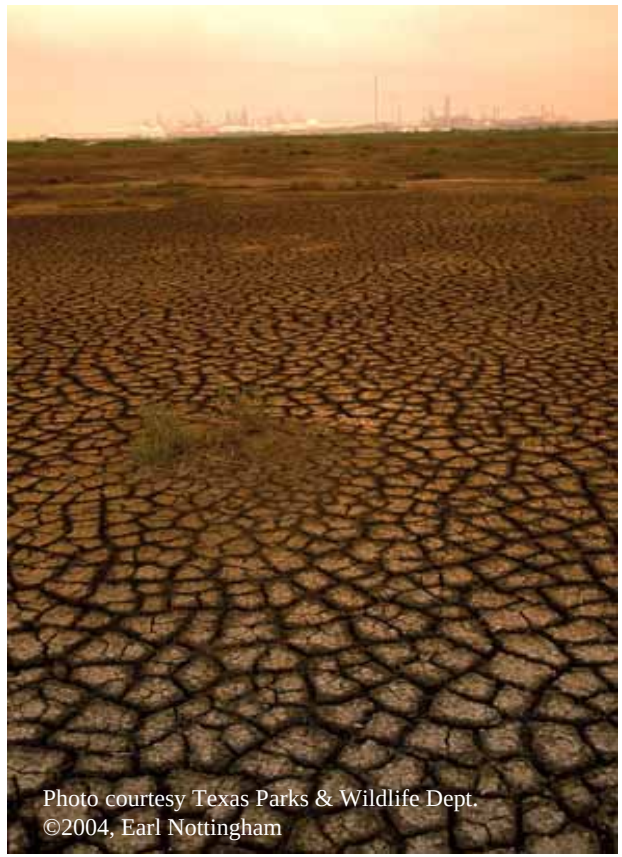


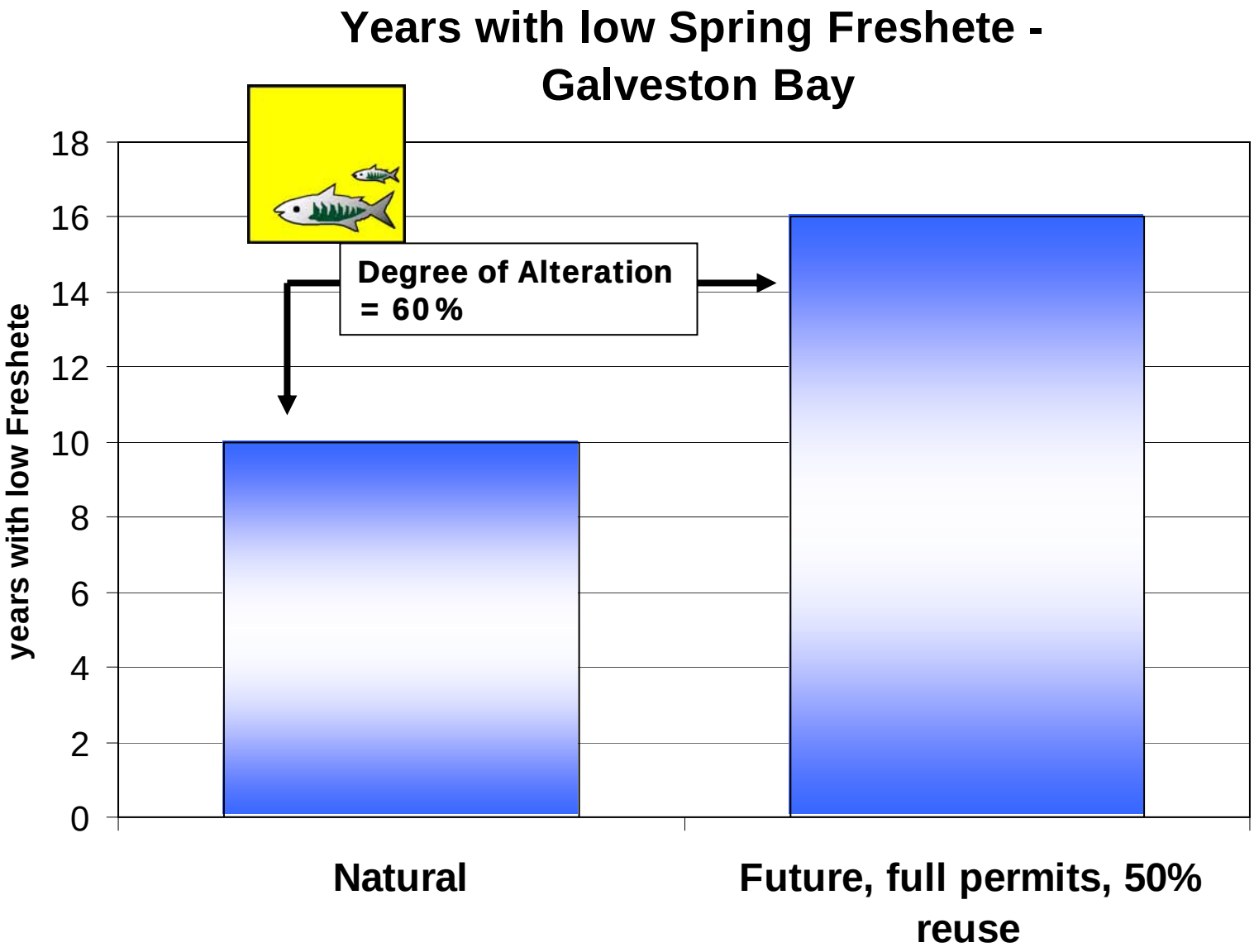
- What if all existing water permits were fully used and wastewater reuse increased to 50%?
- A likely scenario in the not-too-distant future?

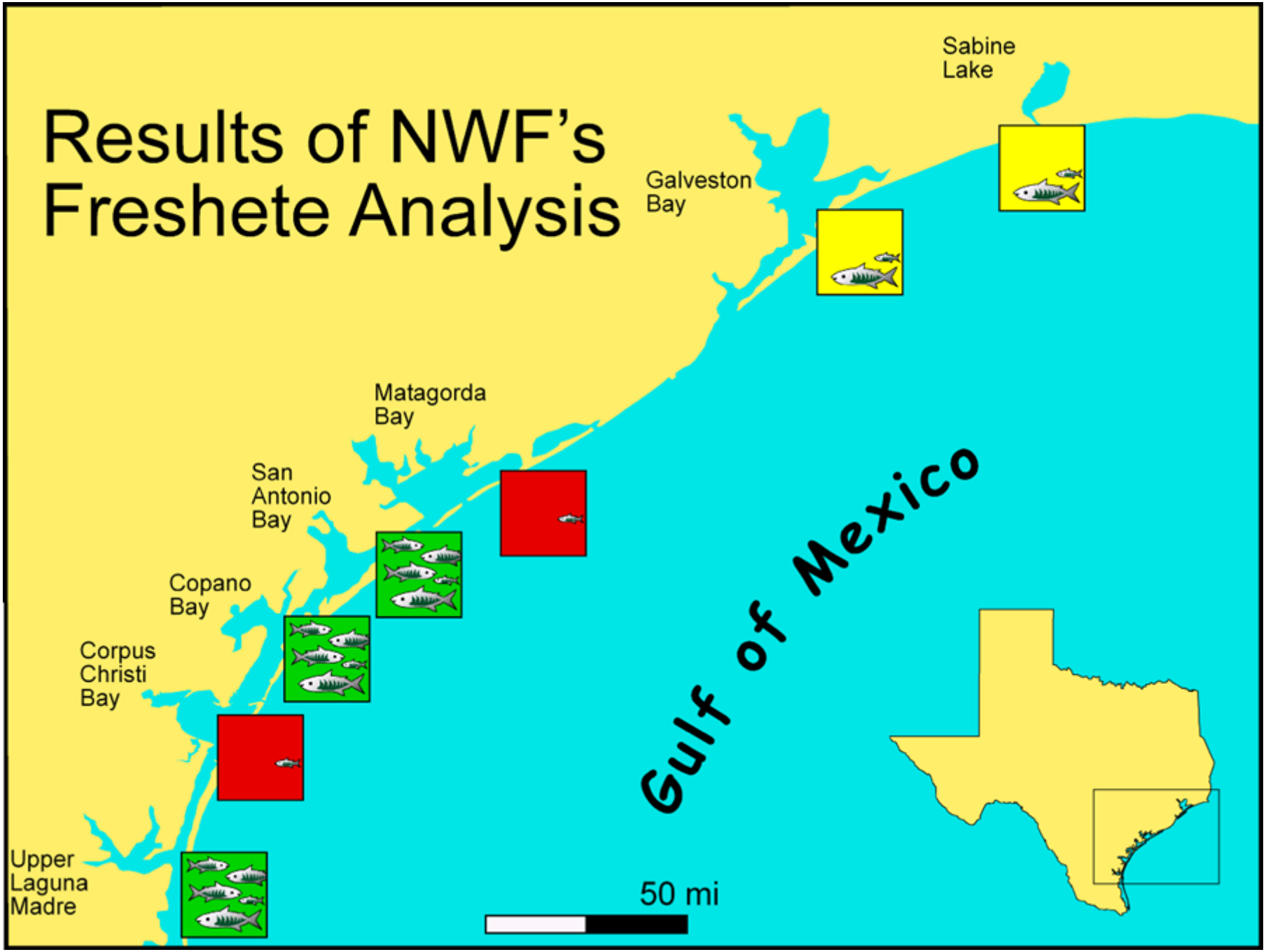
Two Inflow Criteria Critical to Bay Health:

In the Best of Times...
Freshwater Pulses



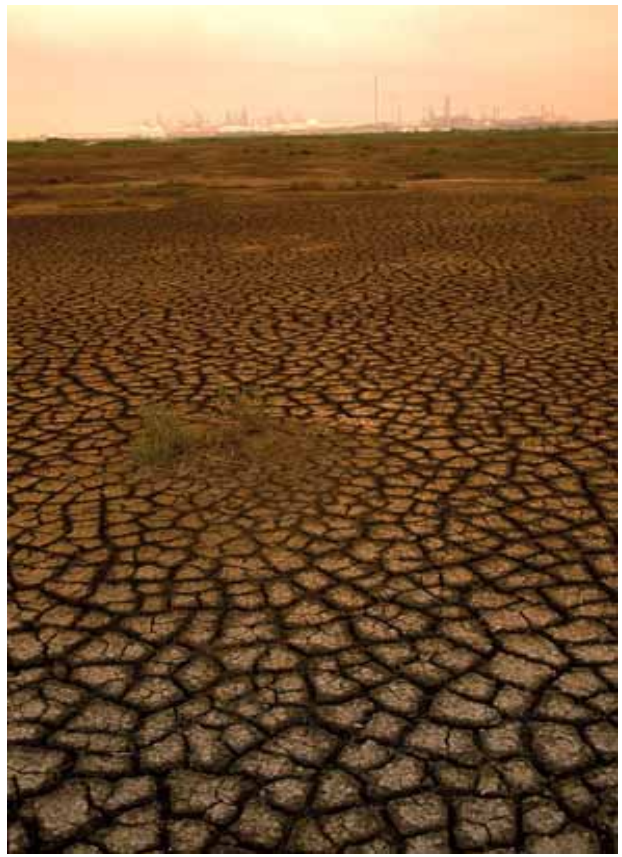
In the Worst of Times...
Drought Tolerance


Years with low Spring Freshete - Galveston Bay
years with low Freshete
18
16
14
12
10
8
6
4
2
0
Degree of Alteration = 60%
Natural
Future, full permits, 50% reuse

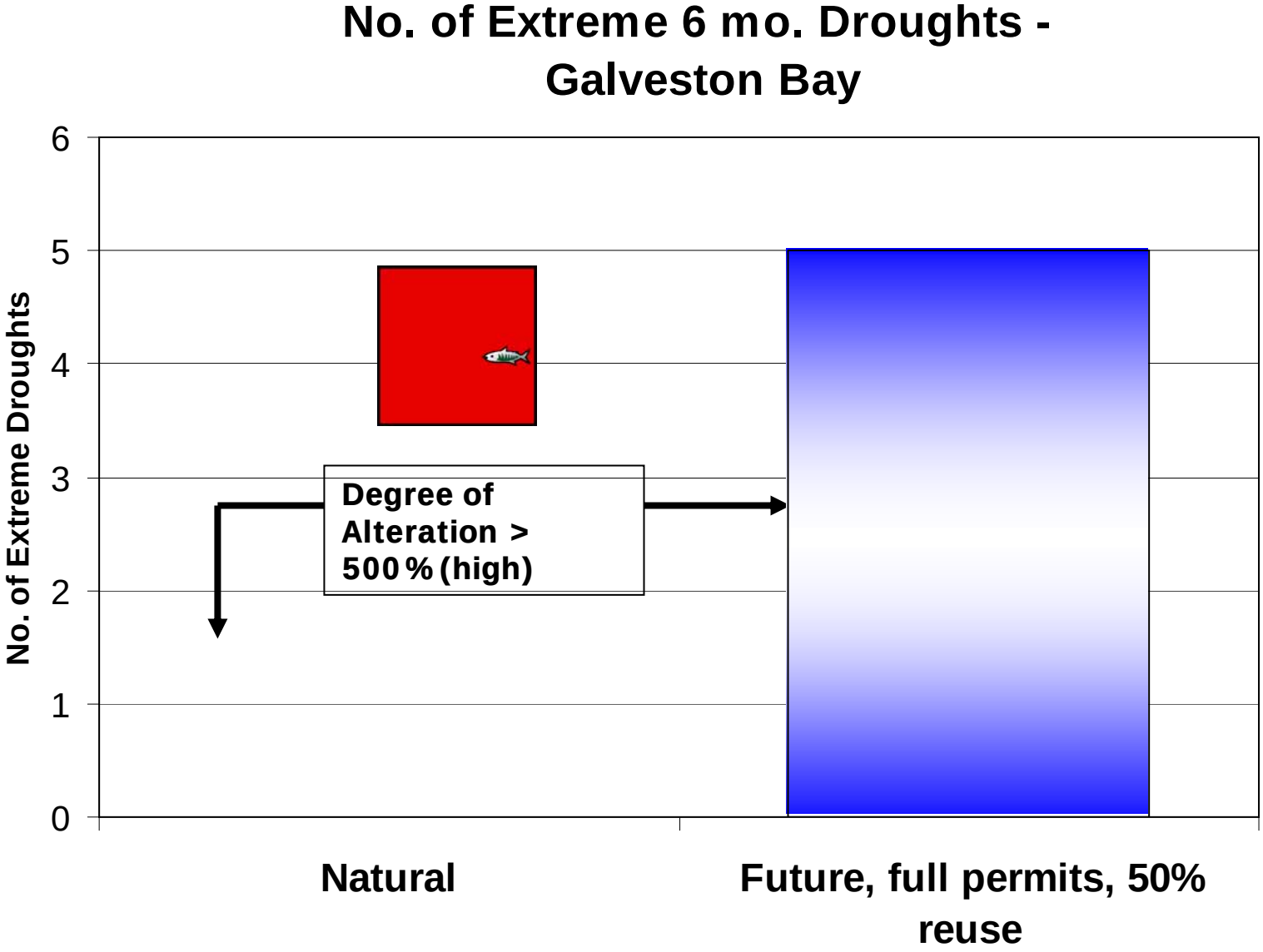

Results of NWF's Freshete Analysis
Sabine Lake
Galveston Bay
Matagorda Bay
San Antonio Bay
Copano Bay
Corpus Christi Bay
Upper Laguna Madre
Gulf of Mexico
50 mi

Two Inflow Criteria Critical to Bay Health:

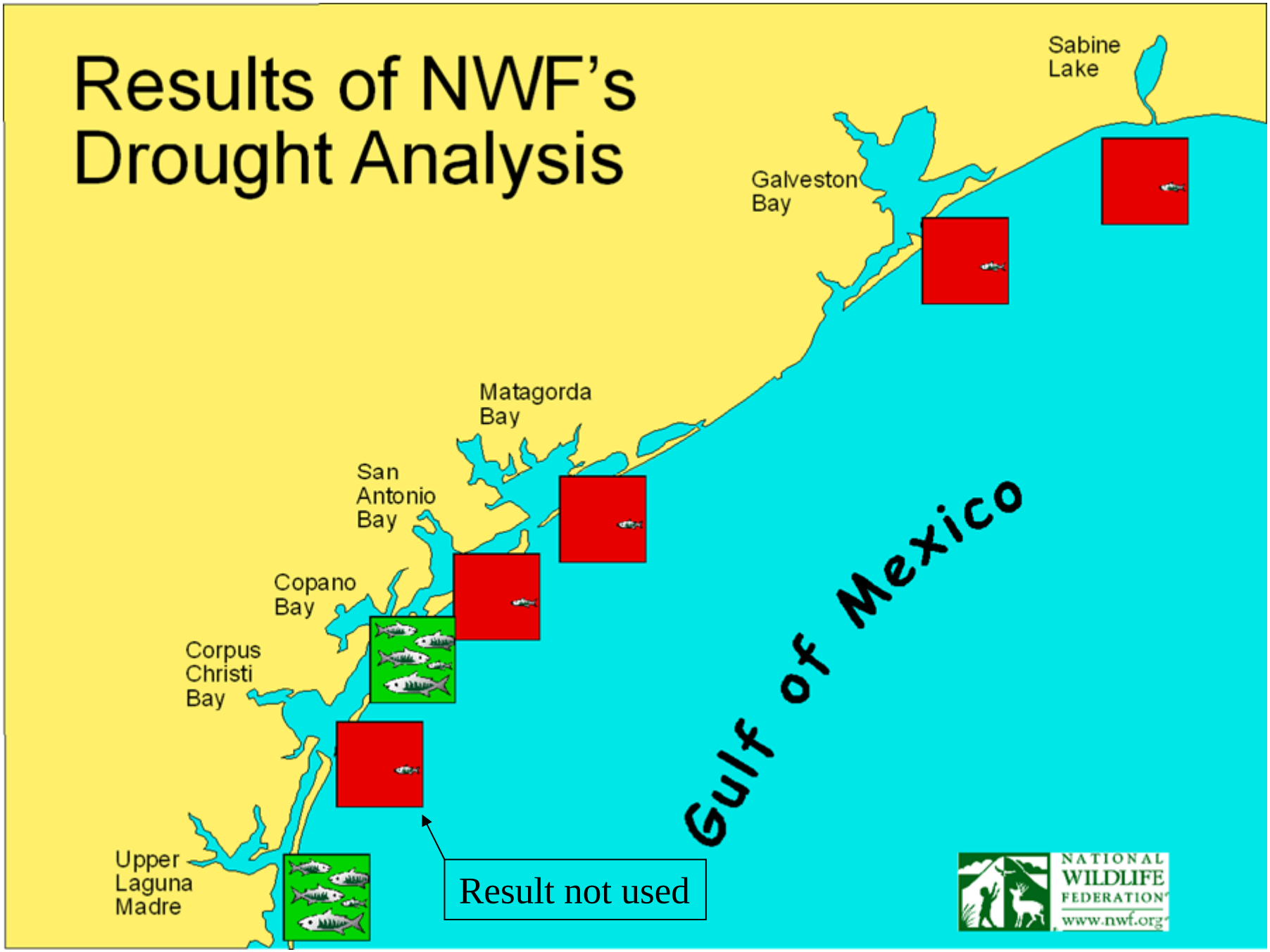
In the Best of Times...
Freshwater Pulses



In the Worst of Times...
Drought Tolerance


No. of Extreme 6 mo. Droughts - Galveston Bay
No. of Extreme Droughts
6
5
4
3
2
1
0
Degree of Alteration > 500% (high)
Natural
Future, full permits, 50% reuse

Results of NWF's Drought Analysis



WHAT NATURAL HERITAGE WILL WE LEAVE FOR OUR CHILDREN AND GRANDCHILDREN?

NEW OR PENDING APPLICATIONS GALVESTON BAY WATERSHEDS

- SJRA/City of Houston – 30,000 new
- SJRA/City of Houston – 80,000 new
- City of Houston - 160,000 new

250,000 new

- City of Houston - 580,000 reuse
- Dallas area - 750,000 reuse
- 1,330,000 reuse

PROTECTION OPTIONS

- CONDITIONS ON NEW PERMITS
- INSTREAM FLOW WATER RIGHTS
- RESERVATIONS OF WATER
- CANCELLATION OF UNUSED RIGHTS
- PURCHASE/DONATION
- LIMITATIONS ON TRANSFERS
- CONSERVATION/DEDICATION
- DEDICATION OF PORTION OF RETURN FLOWS