

New Water for Texas? Seawater Desalination Permitting in the Texas Gulf

Anne Rogers
Water Quality Program
Texas Parks and Wildlife Department

TCEQ SWQM Workshop
Bandera, TX
November 2, 2016

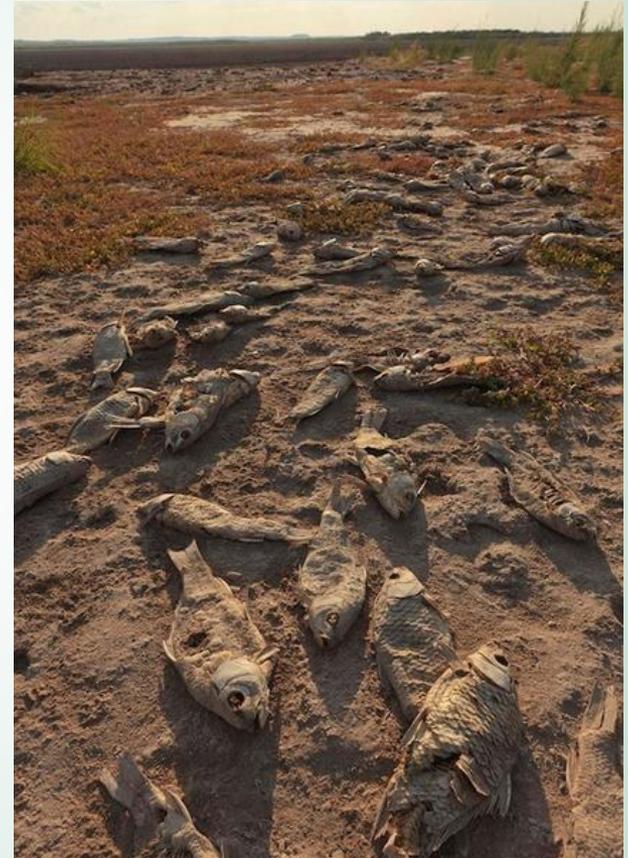
The desalination rules as described in this presentation are currently pending approval by the TCEQ Commission on November 2, 2016 and are subject to change per recommendations by staff based on public comment.



Desalination in Texas

2015 - 84th Texas Legislative Session

“With this state facing an ongoing drought, continuing population growth, and the need to remain economically competitive, every effort must be made to secure and develop plentiful and cost-effective water supplies to meet the ever-increasing demand for water.” – HB 2031



Desalination in Texas

2015 - 84th Texas Legislative Session

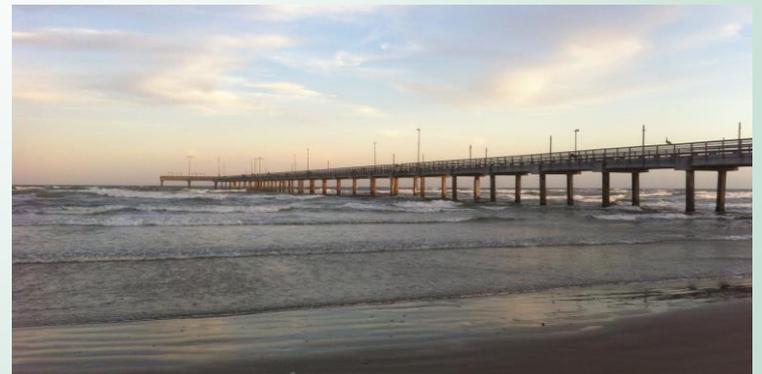
“The purpose of this Act is not to hinder efforts to conserve or develop other surface water supplies but rather to more fully explore and expedite the development of all this state’s water resources in order to balance this state’s supply and demand for water, which is one of the most precious resources of this state.” - HB 2031



Desalination in Texas

2015 - 84th Texas Legislative Session

“In this state, marine seawater is a potential new source of water for drinking and other beneficial uses. This state has access to vast quantities of marine seawater from the Gulf of Mexico. The purpose of this Act is to streamline the regulatory process for and reduce the time required for and cost of marine seawater desalination.” - HB 2031



Environmental Considerations

- At diversion:
 - Impingement and entrainment
 - Hydrological changes
 - Habitat impacts due to infrastructure

- At discharge:
 - TDS concentrations relative to background
 - Other water quality considerations
 - Hydrological changes
 - Habitat impacts
 - Transport of desalinated seawater in freshwater systems



Impingement and Entrainment

Impingement: When organisms sufficiently large to avoid going through intake screens are trapped against them by the force of the flowing source water (i.e., algae, plankton and bacteria are not exposed to impingement)



Entrainment: When marine organisms, small or soft enough to enter the intake screens, are drawn into the intake system, and pass through to the treatment plant



Desal Definitions*

Marine Seawater: Water that is derived from the Gulf of Mexico for desalination.

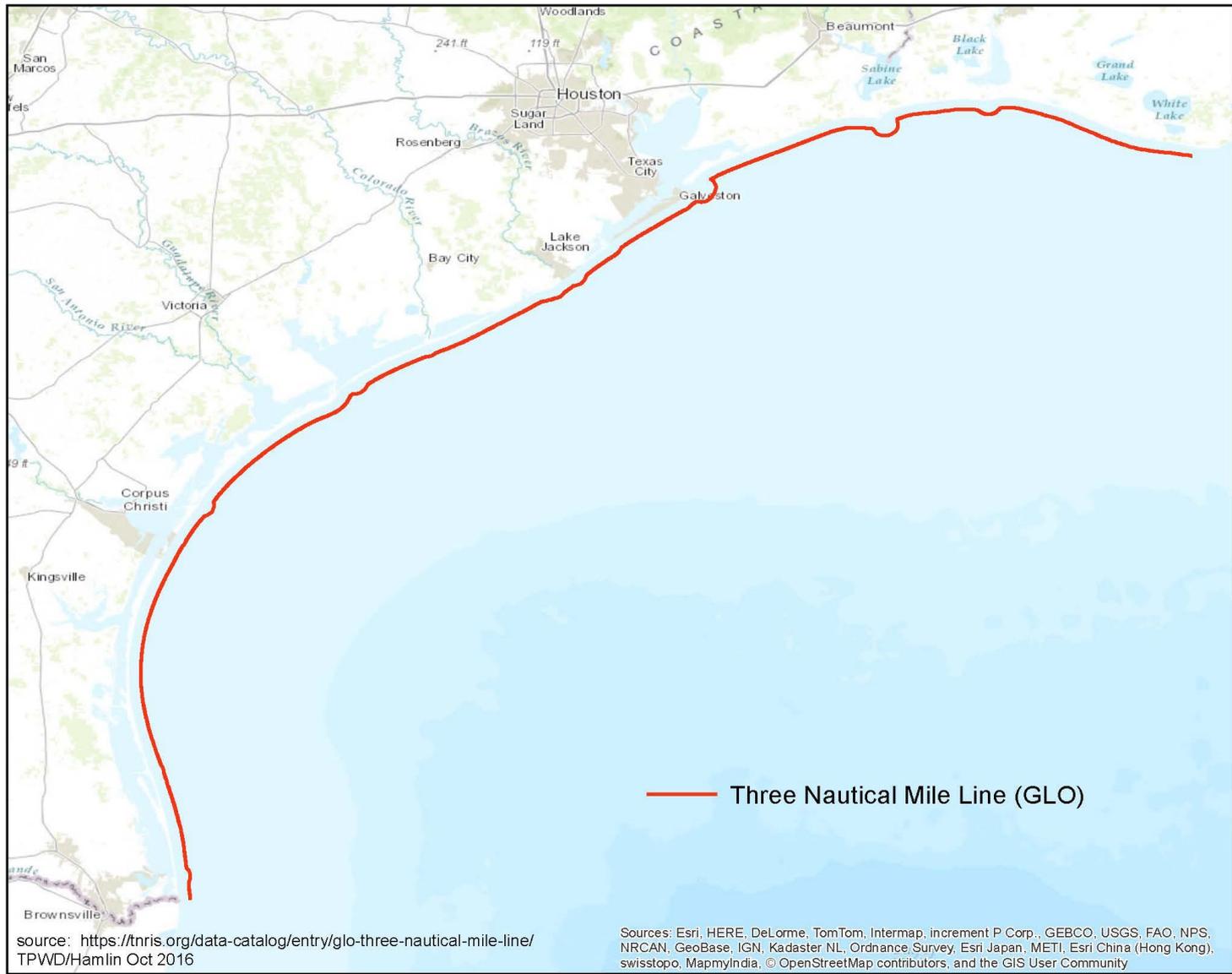
Seawater: Water that is derived from a bay or arm of the Gulf of Mexico for desalination and use solely for industrial purposes.

Near-shore discharges: Marine seawater desalination wastewater discharge location into the Gulf located **less than three miles** seaward from any point located on the coast of Texas.

Off-shore discharges: Marine seawater desalination wastewater discharge location into the Gulf located **three or more miles** seaward from any point located on the coast of Texas.

Treated Marine Seawater: Marine seawater treated to reduce salinity so as to meet standards that are at least as stringent as the water quality standards of the receiving stream or impoundment. More stringent treatment may be required if the TCEQ determines it is necessary to protect water quality. **Treated marine seawater is not a pollutant discharge.**

*Pending TCEQ Commission adoption on 11/2/2016.



Based on the GLO “Dispersant Use Pre-Approval Zone” map or based on a site-specific determination made by the executive director of the TCEQ.

HB 2031

Purpose: Diversion, treatment, and use of marine seawater and the discharge of treated marine seawater and waste resulting from the desalination of marine seawater

Conditions:

- Expedited permitting process for both diversion and waste discharges
- Streamlined applications, reduced review periods and response times and shorter public comment periods
- Proposed exemption from permitting to divert and use marine seawater if the point of diversion is >3 miles seaward or if TDS >20,000 mg/l
- Requires a TPDES permit for the discharge of waste resulting from the desalination of marine seawater into a bay or estuary
- TCEQ must establish reasonable measures to minimize impingement and entrainment



Bed and Banks Transport Provision

In addition, HB 2031:

- Directs TCEQ to issue a bed and banks permit to convey treated marine seawater in any flowing natural stream or lake, reservoir, or other impoundment
- Requires a TPDES permit for the discharge of treated marine seawater into a flowing natural stream or impoundment for conveyance purposes
- The public may request public meetings and/or contested hearings



HB 4097

Purpose: Relates to nearshore seawater desalination projects for industrial purposes

Conditions:

- Creates an expedited permitting process for both diversion and discharges for seawater desalination projects for industrial purposes
- Permit exemption to divert and use seawater if the point of diversion is >3 miles seaward or if seawater contains average TDS >20,000 mg/l
- When diversion permit applications are required, a finding of water availability is not necessary but environmental flow standards must be met
- Near shore discharge permits for seawater desal waste follow standard TPDES application process, although TCEQ can expedite process
- Includes other provisions for disposal of desal wastes such as deep well injection



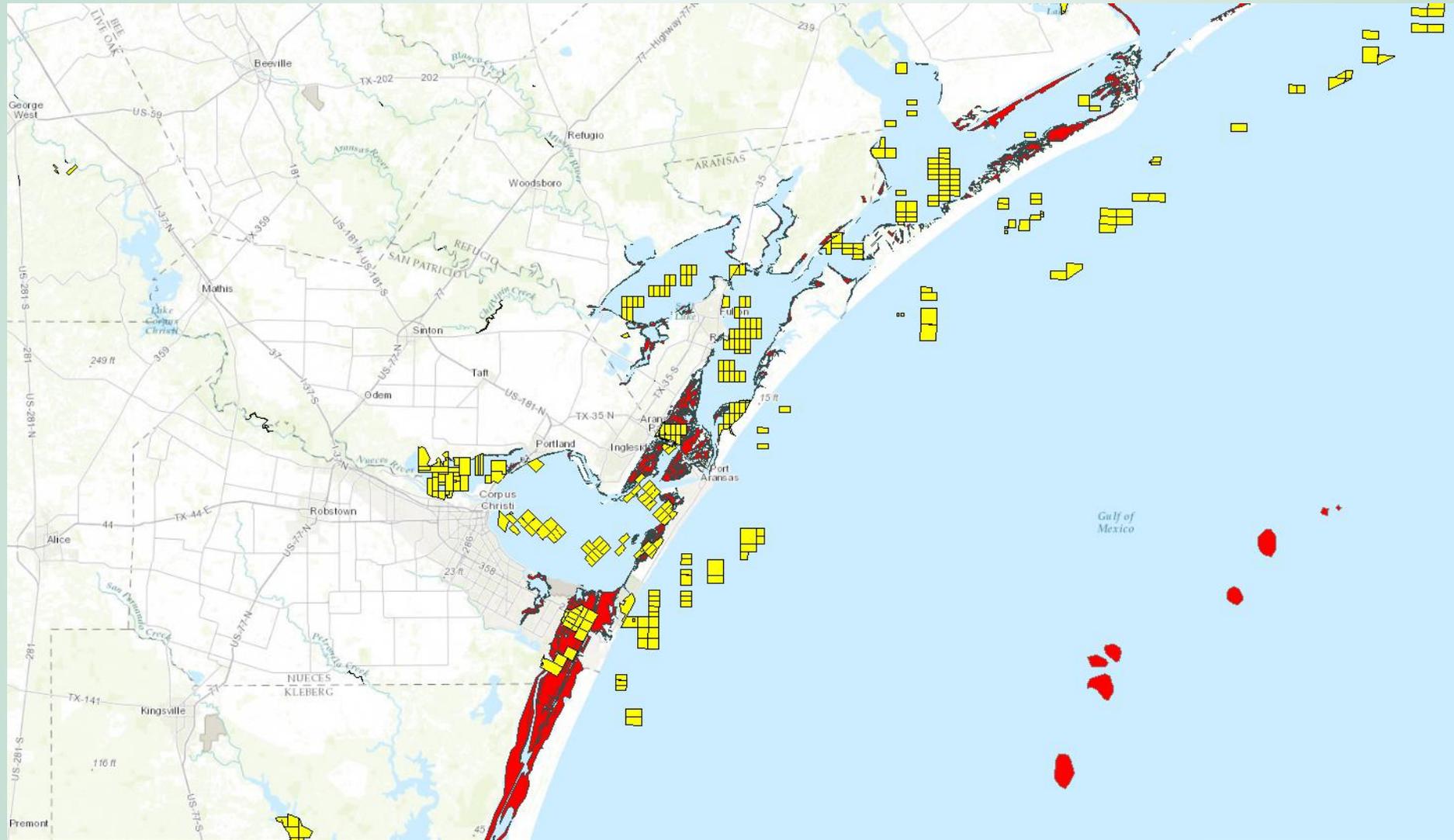
TPWD and GLO Joint Study

- GLO and TPWD are directed to conduct a joint study to identify “zones in the Gulf of Mexico that are appropriate for the diversion of marine seawater and for the discharge of waste resulting from the desalination of marine seawater, taking into account the need to protect marine organisms.”
- Report and maps to be submitted to TCEQ by end of FY 18 (9/1/2018)



Example of Desalination Zone Map

(This map is only an example and should not imply any resemblance to a final map)



Prohibited due to seagrass and sensitive fish habitat



Caution due to oil and gas leases

TPWD/GLO Consultation Requirement

- TCEQ is required to adopt rules by 9/1/20 designating diversion and discharge zones based on TPWD/GLO desalination zone mapping project
- Applicant must consult with TPWD and GLO regarding the point(s) of diversion or discharge until TCEQ adopts rules designating these zones
- Applications for all desalination discharges must contain documentation of TPWD/GLO consultation
 - New applications
 - Amendments that propose a new outfall
 - New location for an existing outfall

TPWD/GLO Consultation Process

Applicant should provide:

- Plans or reports containing:
 - Physical location and names of source and discharge locations;
 - Total annual amount and maximum rate of source water to be diverted for each diversion point;
 - Planned diversion and discharge schedule;
 - Management plans for post-treatment of water intended for discharge to the environment;
 - Plans and dilution strategies for managing salinity levels at discharge locations;
 - Measures to be used to reduce impingement and entrainment of aquatic organisms;
 - Water quality constituent profiles for source water, receiving water, treated water and effluent;
 - Environmental and hydrologic impact assessments of the project;
 - Project timeline including construction start and completion dates, major milestones, and anticipated start of operation.
- Contact information for the applicant or designated representative including name, phone number, email address, physical and postal mailing addresses. TPWD will contact this person as soon as possible after receipt of the above information.

Questions?

Contact: Anne Rogers, Water Quality Program,
Texas Parks and Wildlife Department
(512) 389-8687
anne.rogers@tpwd.texas.gov

For more information on TCEQ's new desalination rules:

https://www.tceq.texas.gov/assets/public/legal/rules/rule_lib/adoptions/15029295_aex.pdf