# Assessment of seagrass habitat quality and plant physiological condition in Texas coastal waters: Summer 2012 and 2013

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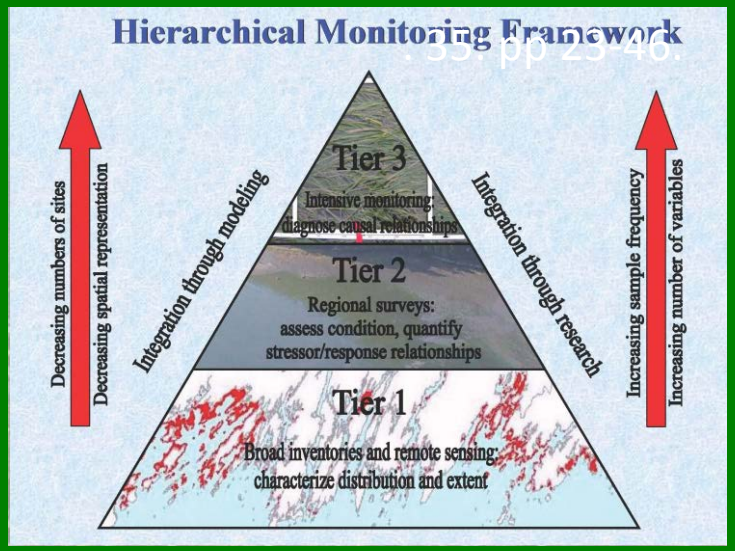
Report to SMWG, 8 May 2013

# Overall Goal:

Provide a State-wide assessment of seagrass condition on both temporal and spatial scales to better evaluate anthropogenic threats to seagrass resources to fulfill seagrass conservation objectives.

# Established Methods and Protocols, Data Sharing, and Reporting

Graphics, data, and protocols used in this sampling effort are posted on:
**www.TexasSeagrass.org**

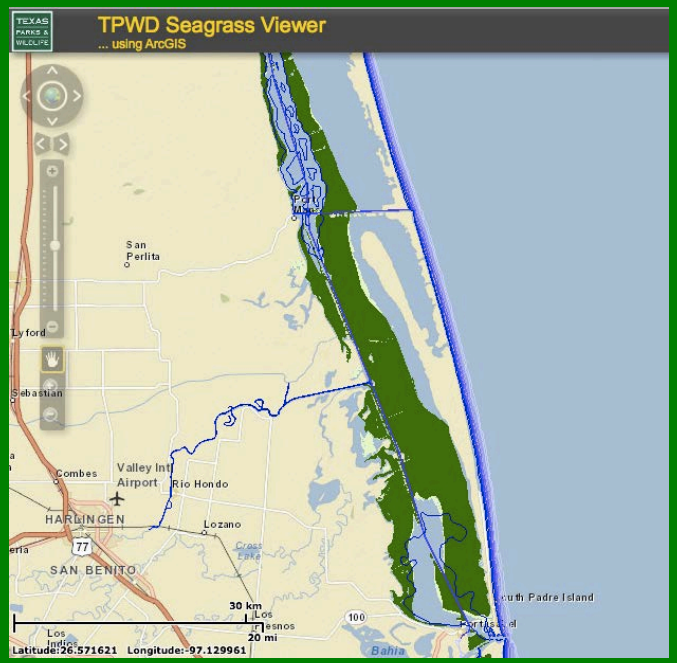


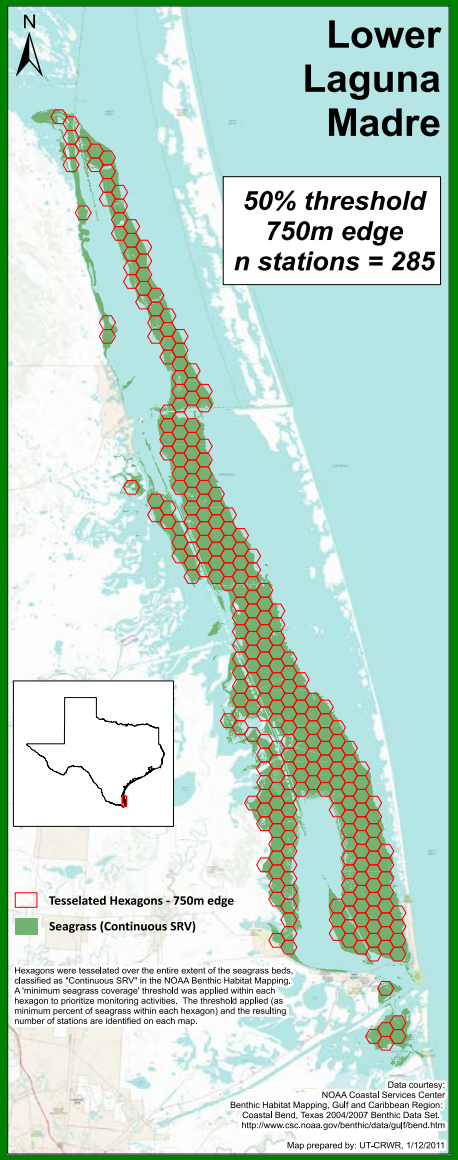


www.TexasSeagrass.org

Neckles, HA, BS Kopp, BJ Peterson and PS Pooler. 2012. Integrating Scales of Seagrass Monitoring to Meet Conservation Needs. Estuaries and Coasts. Vol. 35: pp 23-46.

# Tier 2 Methods: Site Selection


1. Previously delineated seagrass meadows were used to identify specific regions of interest (NOAA Benthic Habitat Mapping, Texas 2004/2007 Benthic Data Set)*
2. Polygons were used to create a tessellated map overlying these regions of interest
3. Random site locations (567 total) were then identified within each polygon
4. For mapping purposes, the data was interpolated using an inverse distance weighting squared method

*TPWD Seagrass Viewer: http://www.tpwd.state.tx.us/gis/seagrass/

# Tier 2 Methods: *Rapid* Sampling

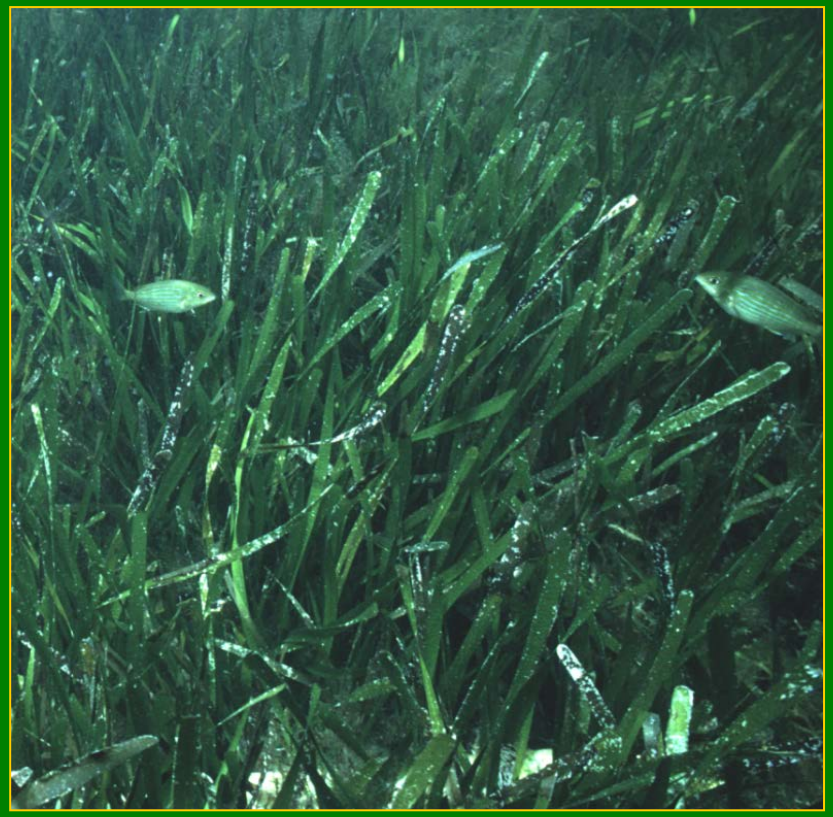
Potential Stressors:

- Light Attenuation
- Total Suspended Solids
- Depth and Secchi Depth
- Temperature, Salinity, pH, DO and Water Column Chlorophyll*

**Measured with YSI Datasonde*

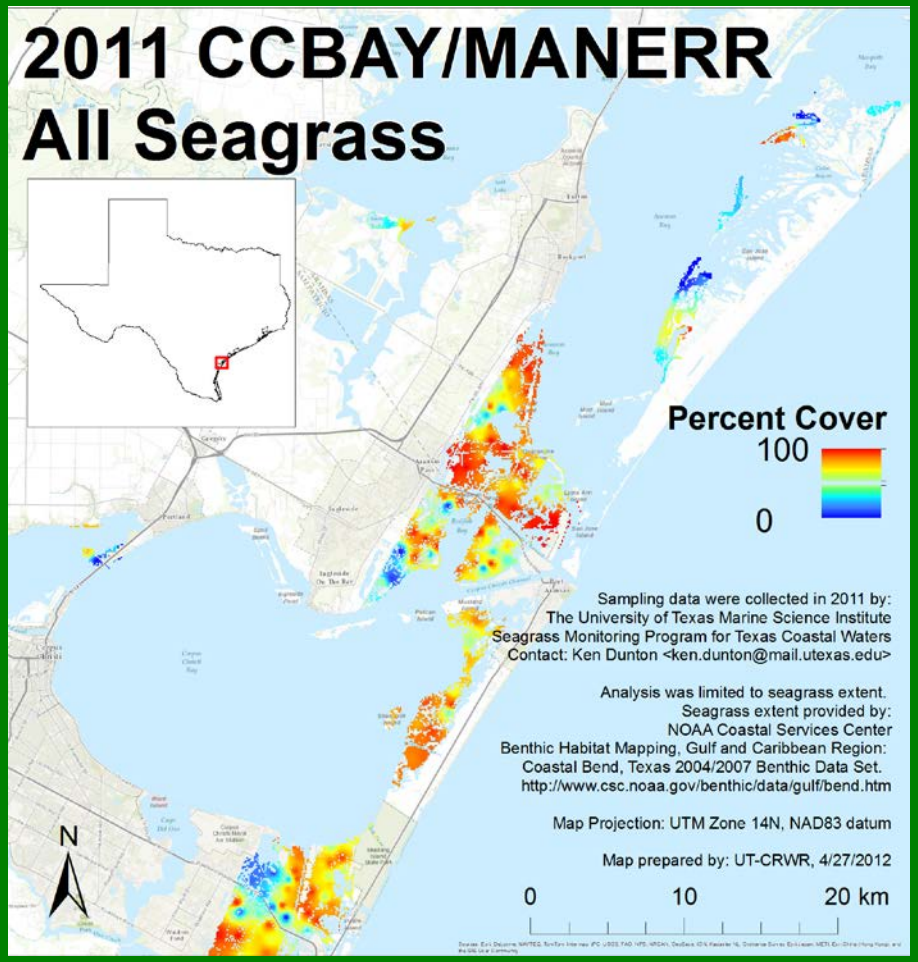
Plant Condition Indicators:

- Percent Coverage
- Species Composition
- Canopy Height
- Tissue C:N:P, $\delta N^{15}$ and $\delta C^{13}$

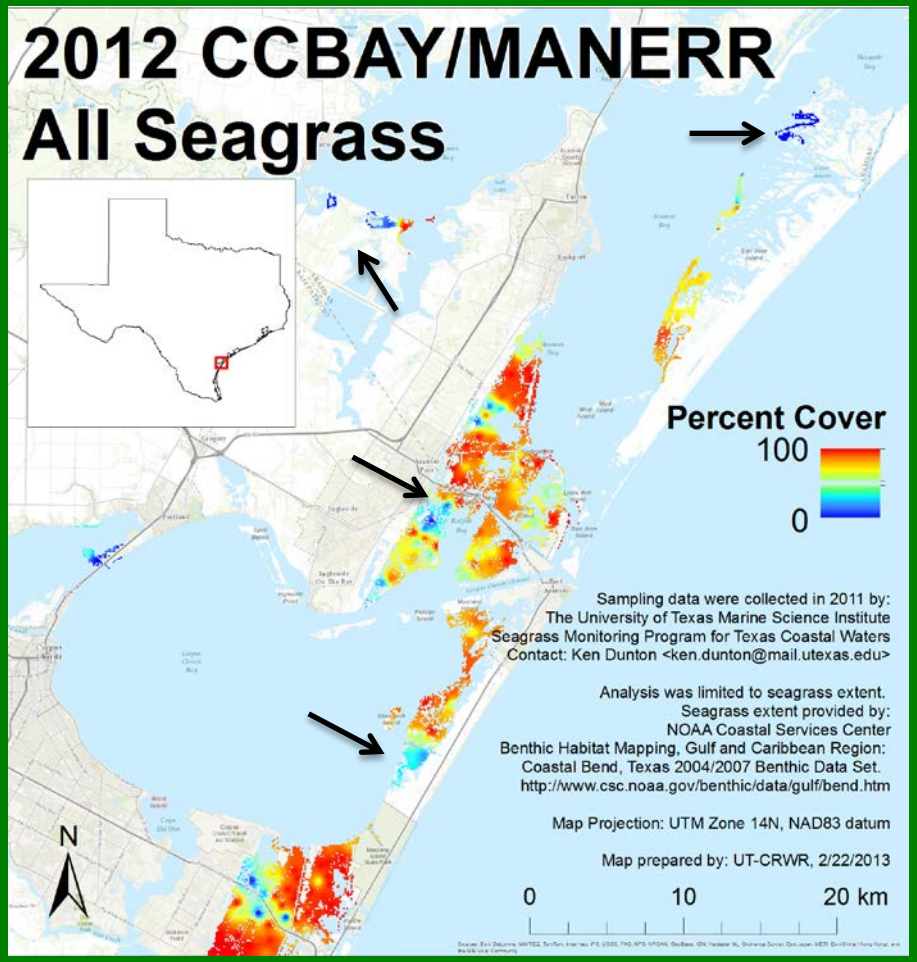


# Tier 2 Results: CCBAY/MANERR

## All seagrass



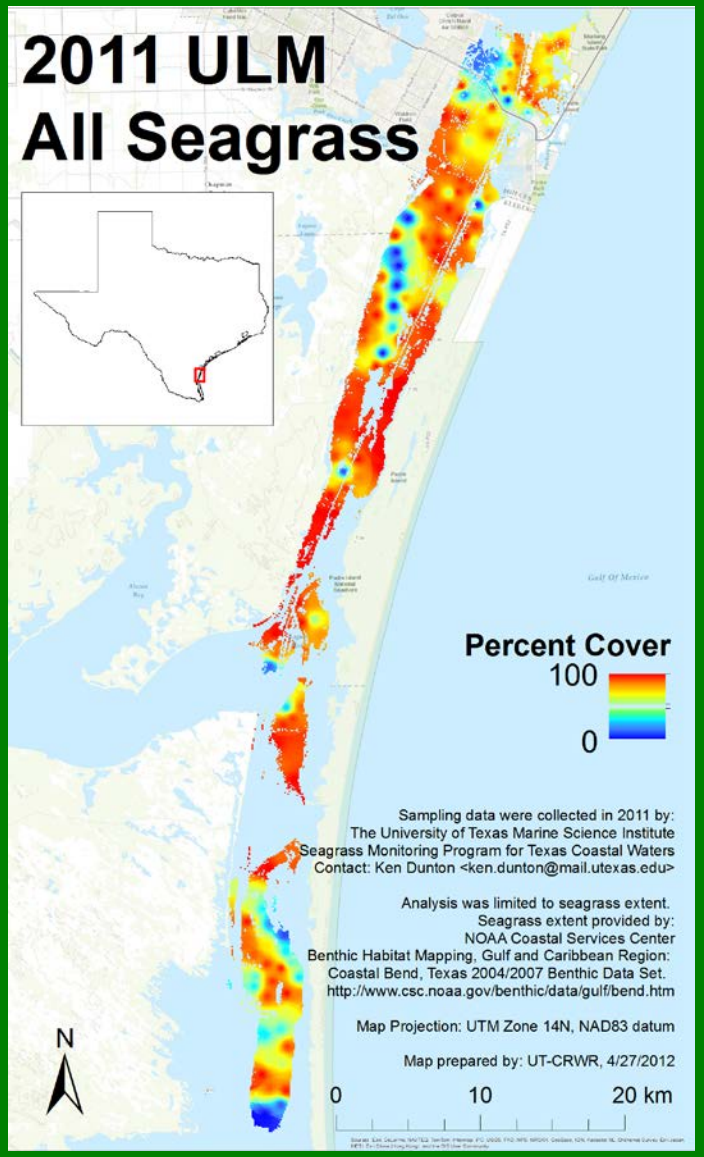

2011



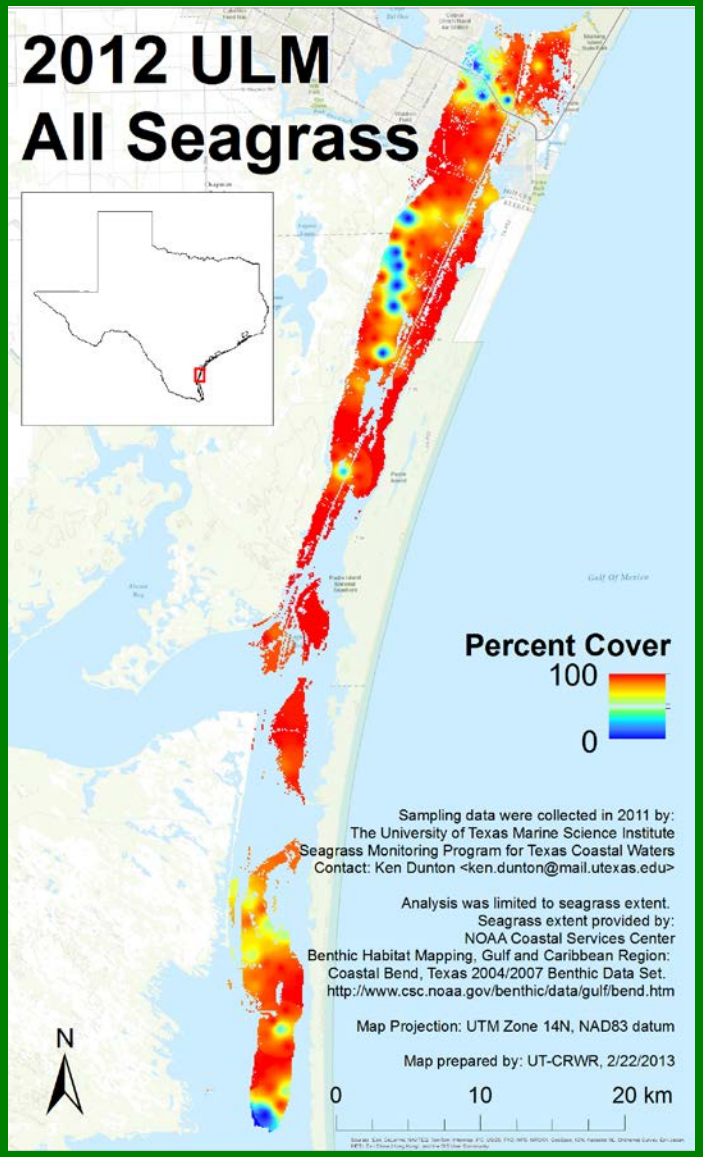

2012

# Tier 2 Results: ULM

## All seagrass



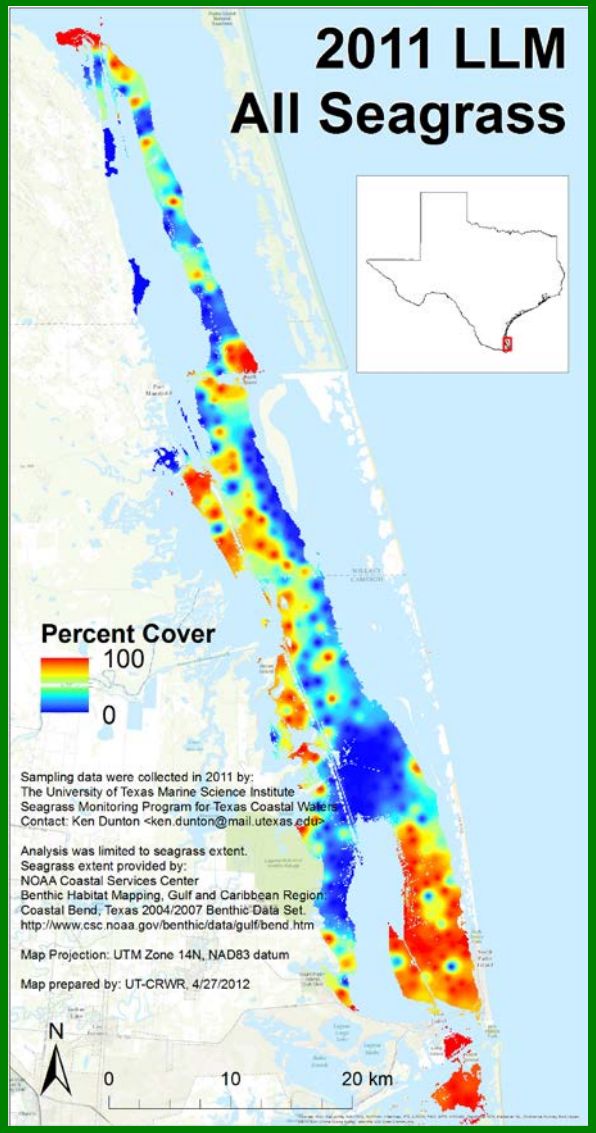

2011



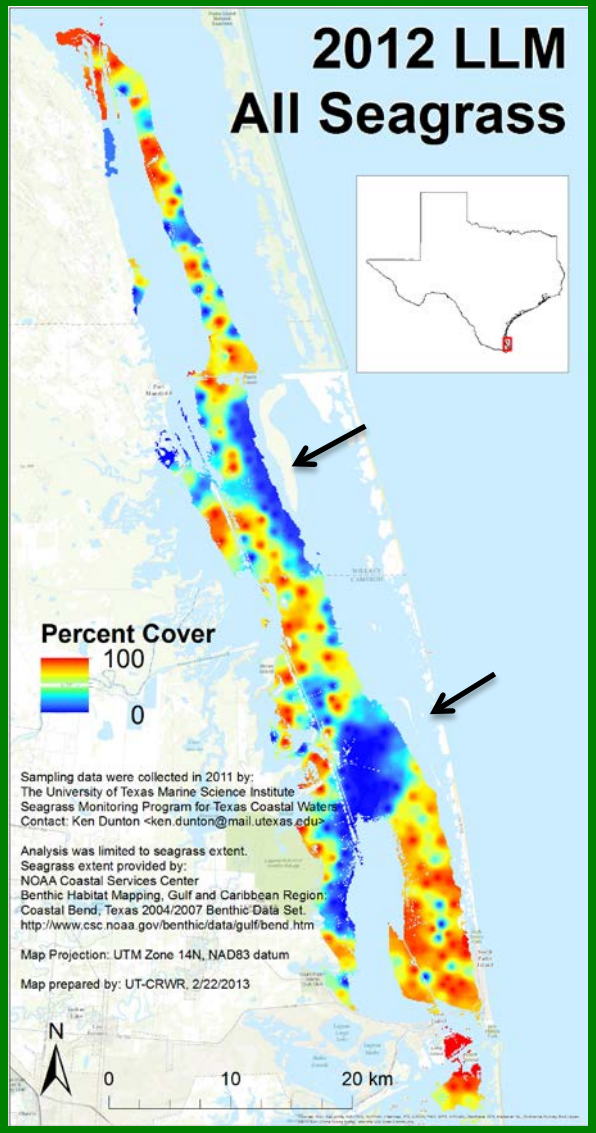

2012

# Tier 2 Results: LLM

## All seagrass




2011

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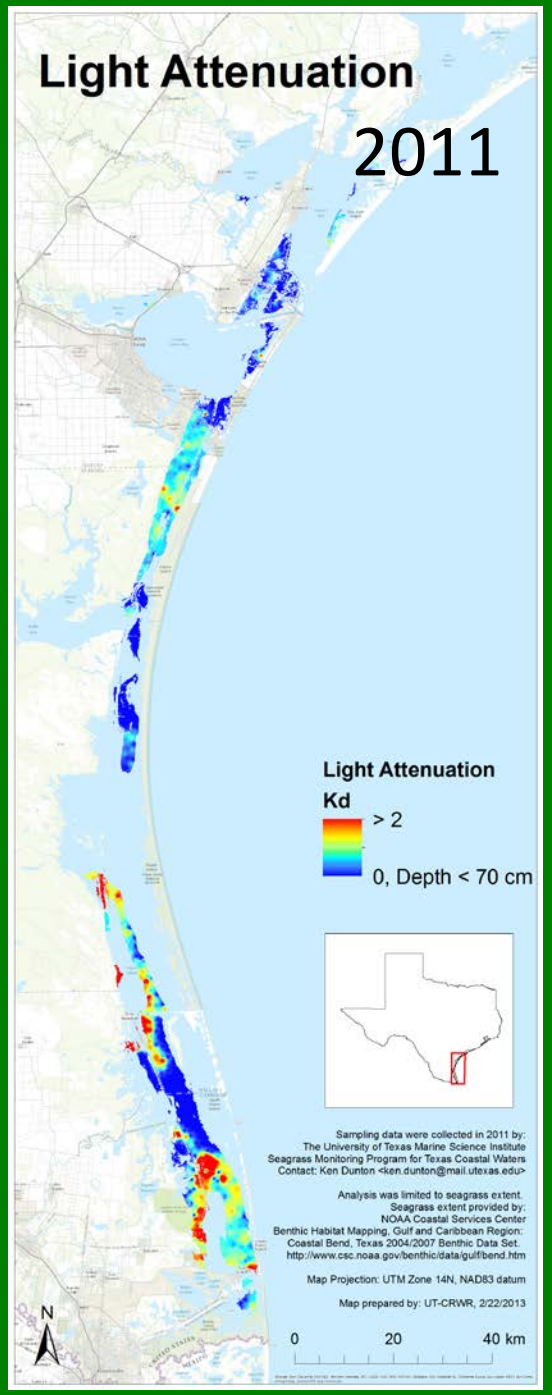
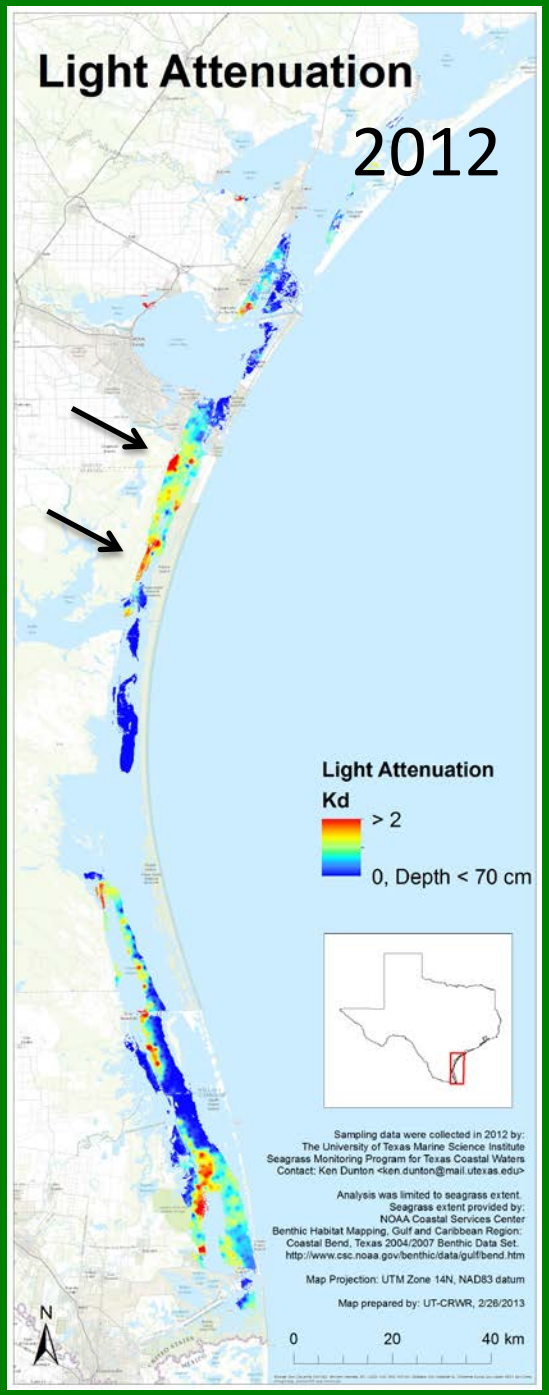
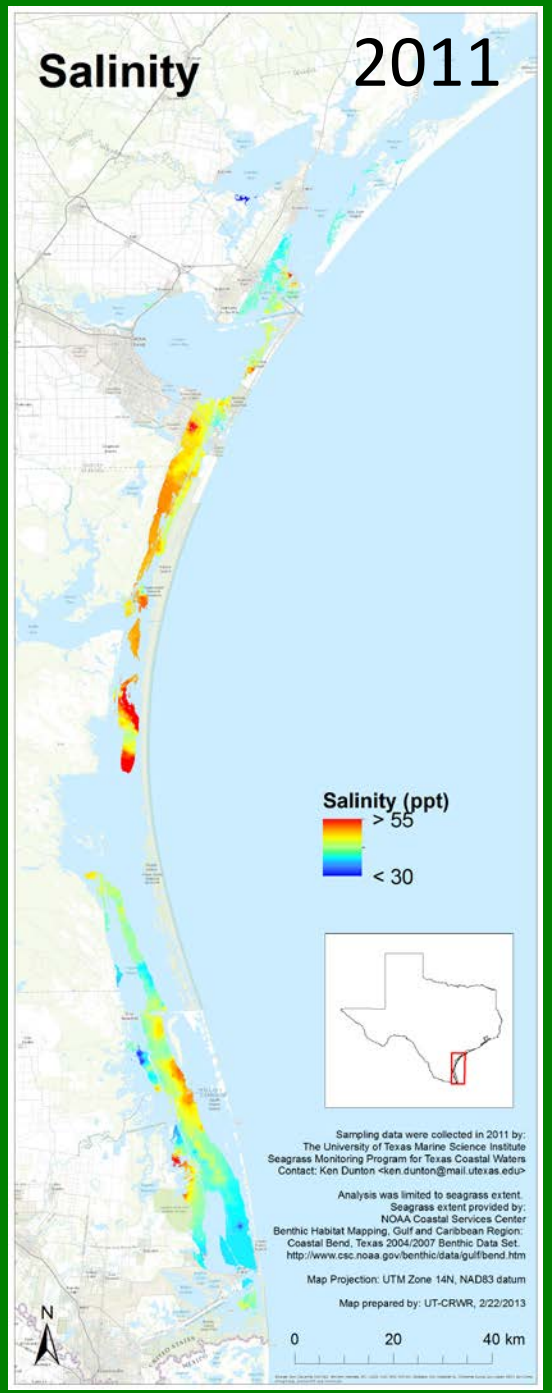
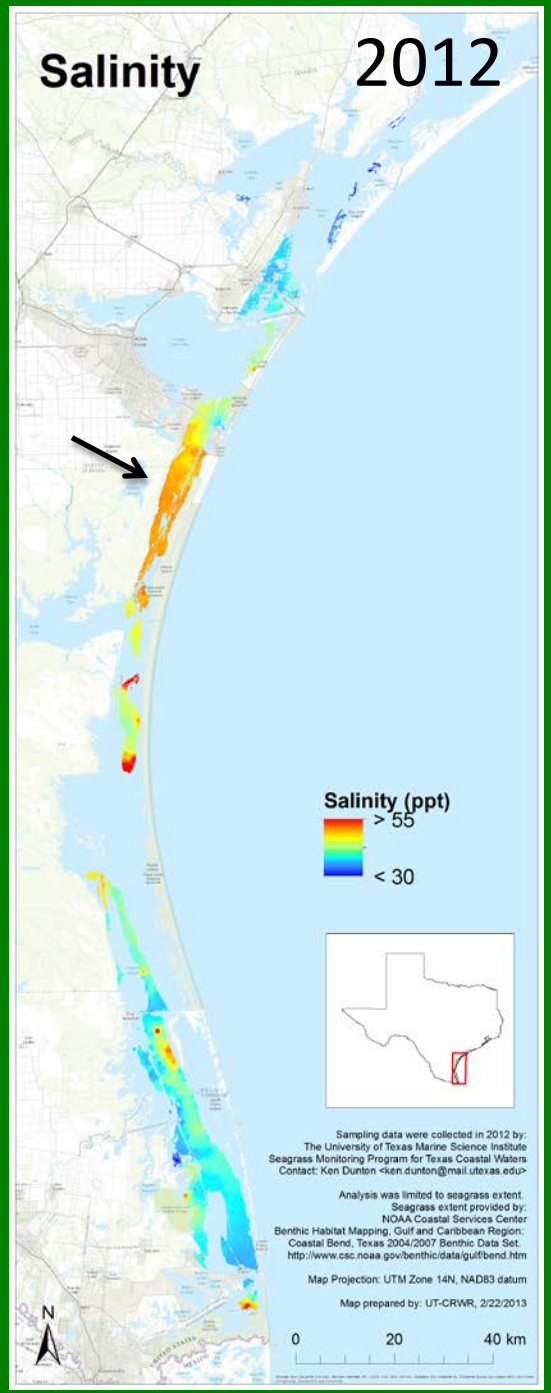



# Tier 2 Results: Entire Study Area

Light Attenuation



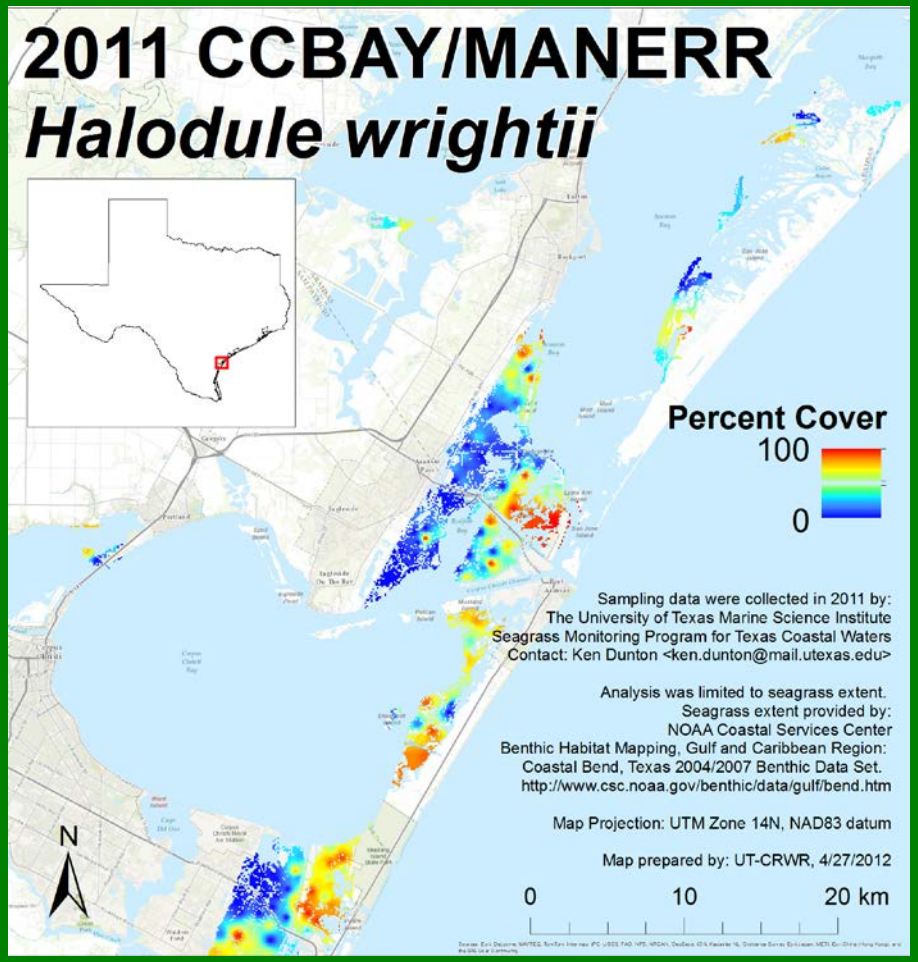




# Tier 2 Results: Entire Study Area

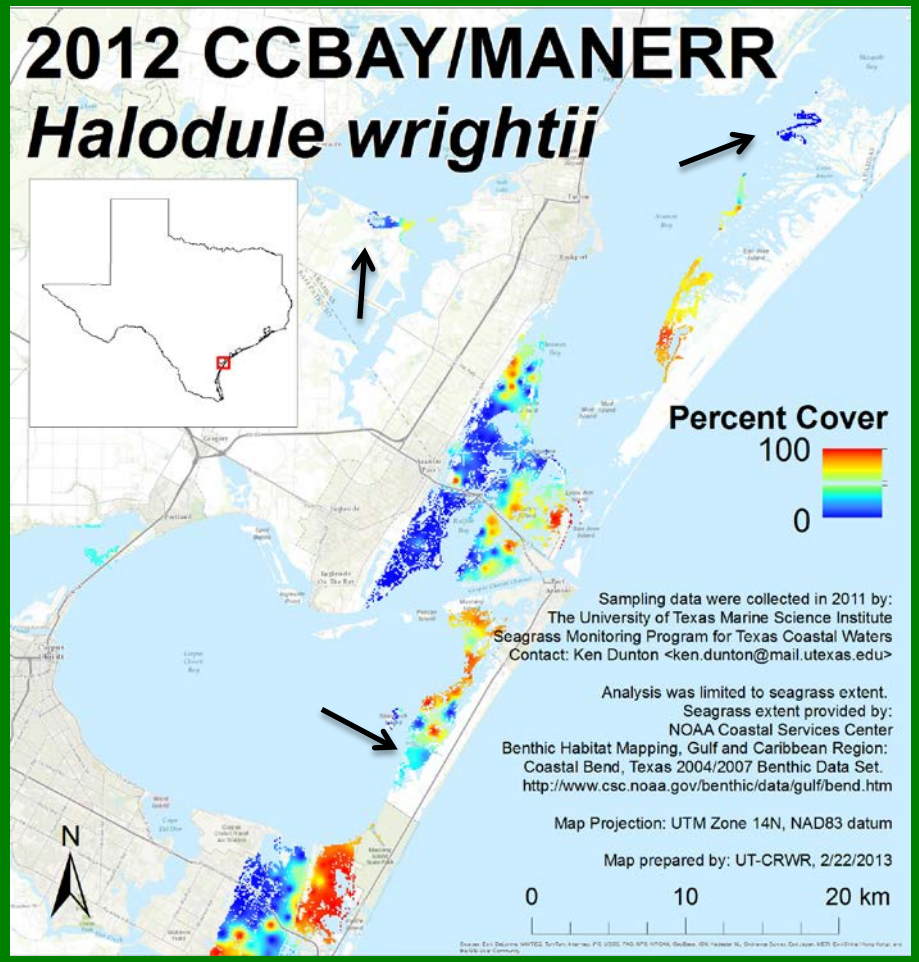
Salinity

# Tier 2 Results: CCBAY/MANERR

*Halodule wrightii*



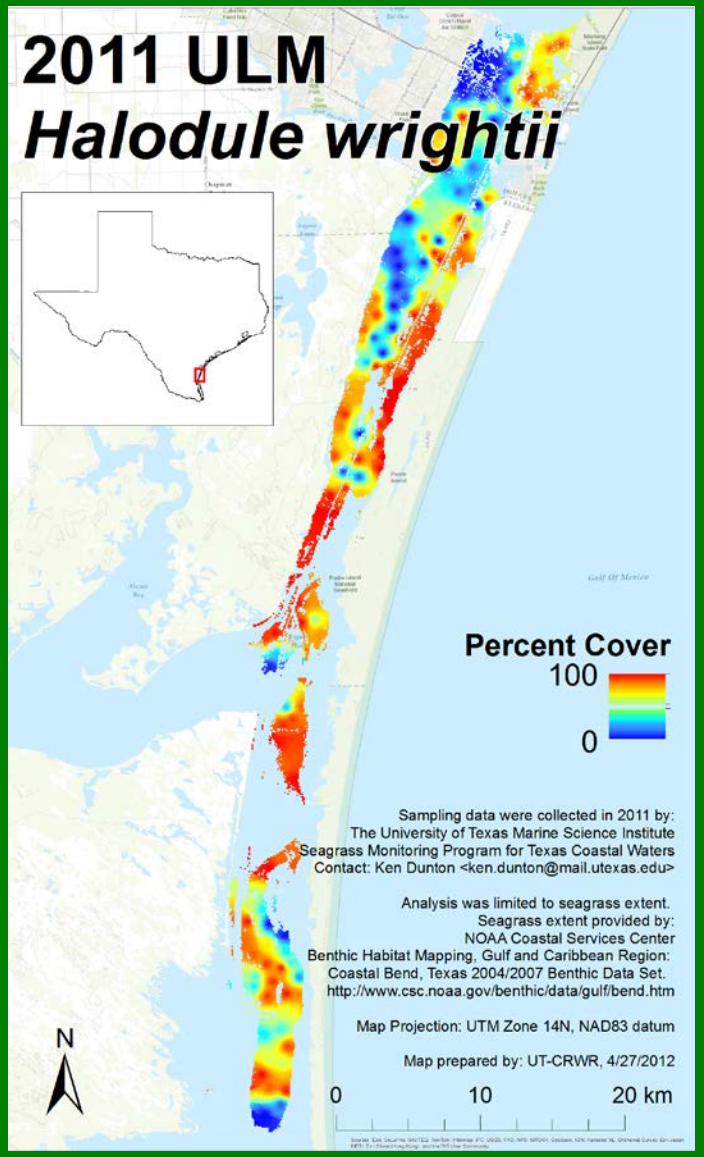

2011



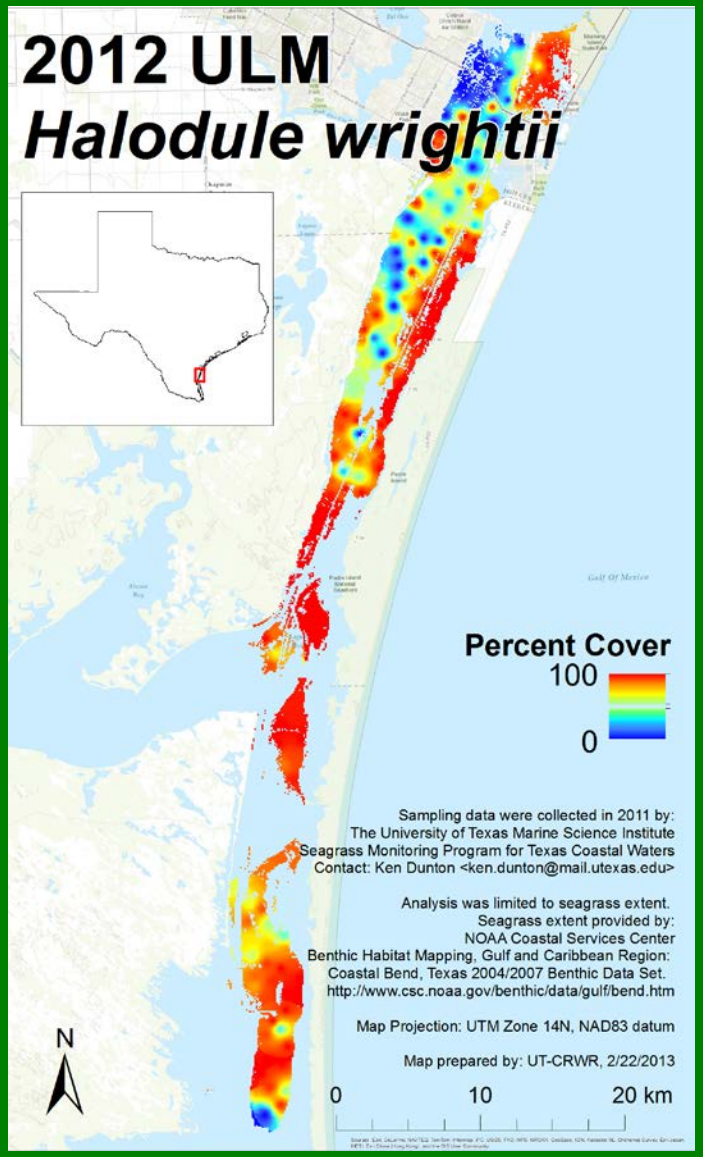

2012

# Tier 2 Results: ULM

*Halodule wrightii*



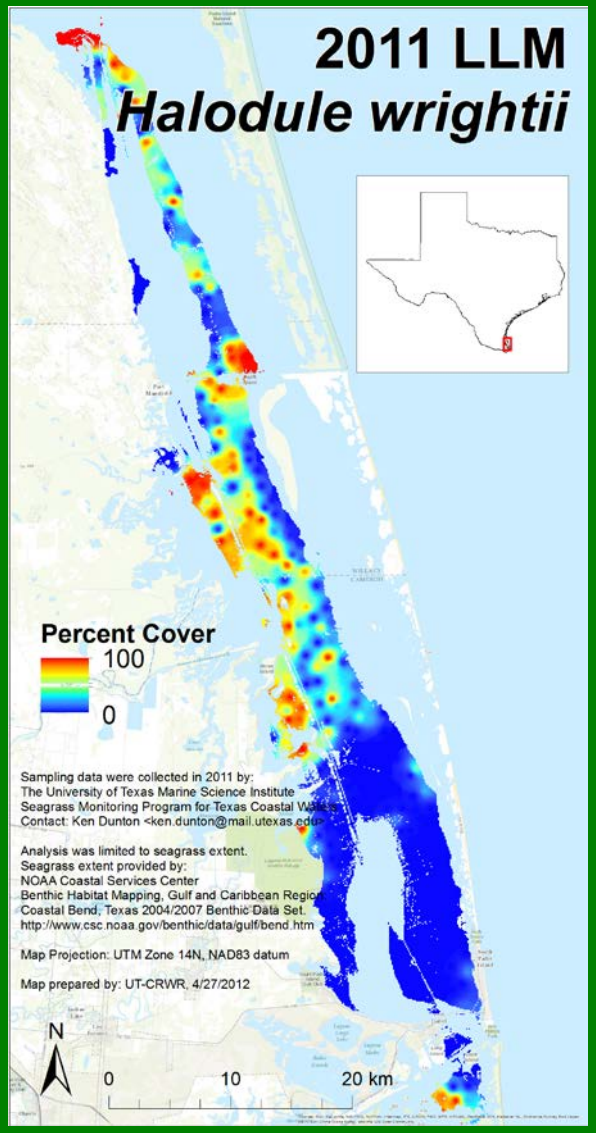

2011

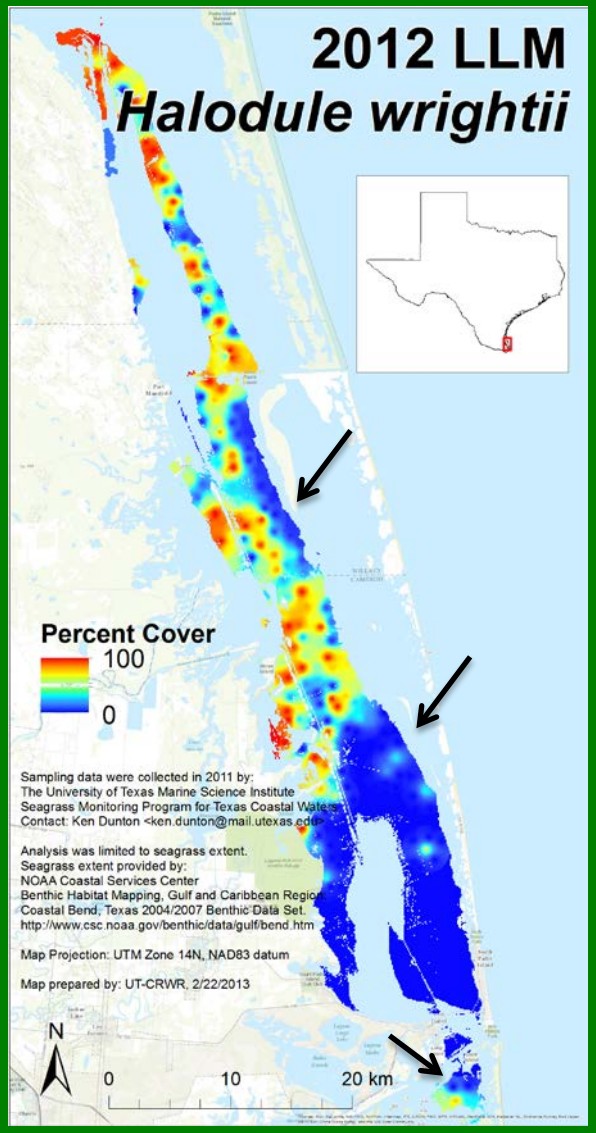



2012

# Tier 2 Results: LLM

*Halodule wrightii*



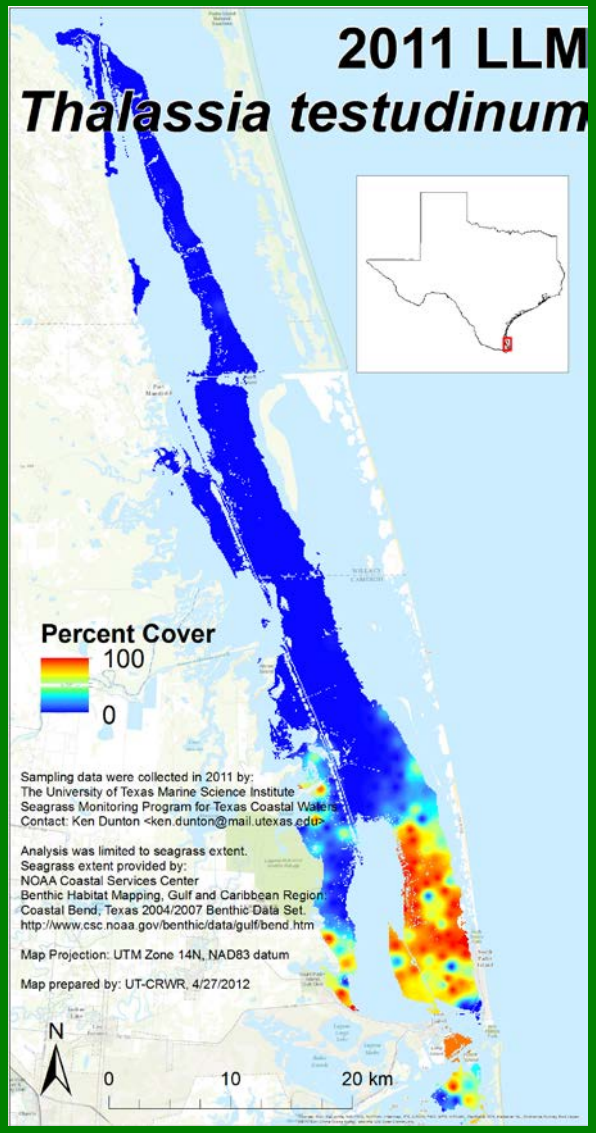



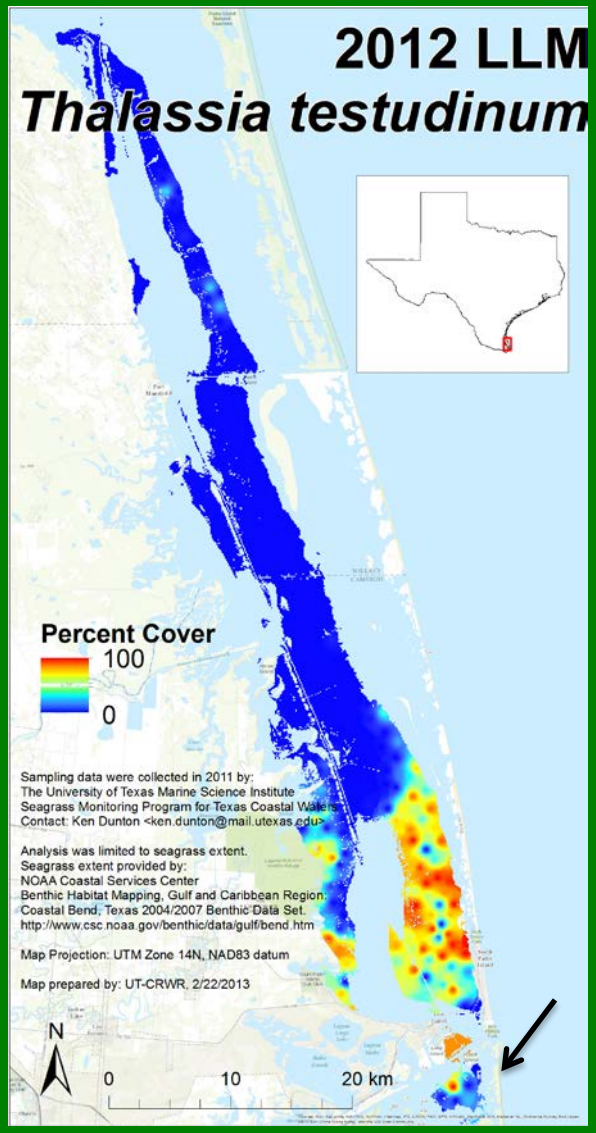

2011

2012

# Tier 2 Results: LLM

*Thalassia testudinum*



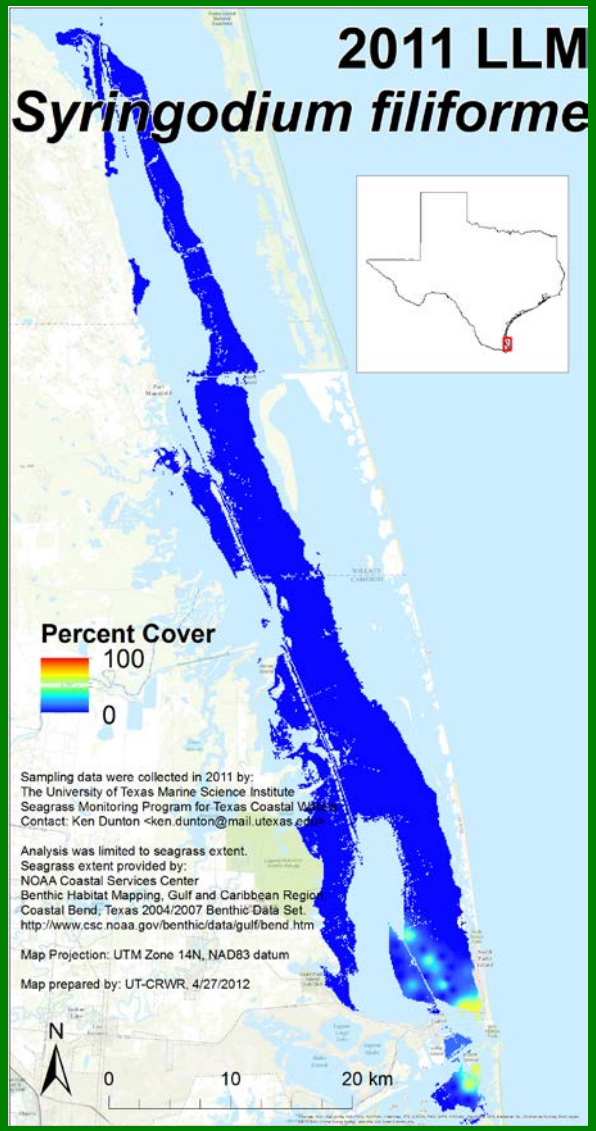



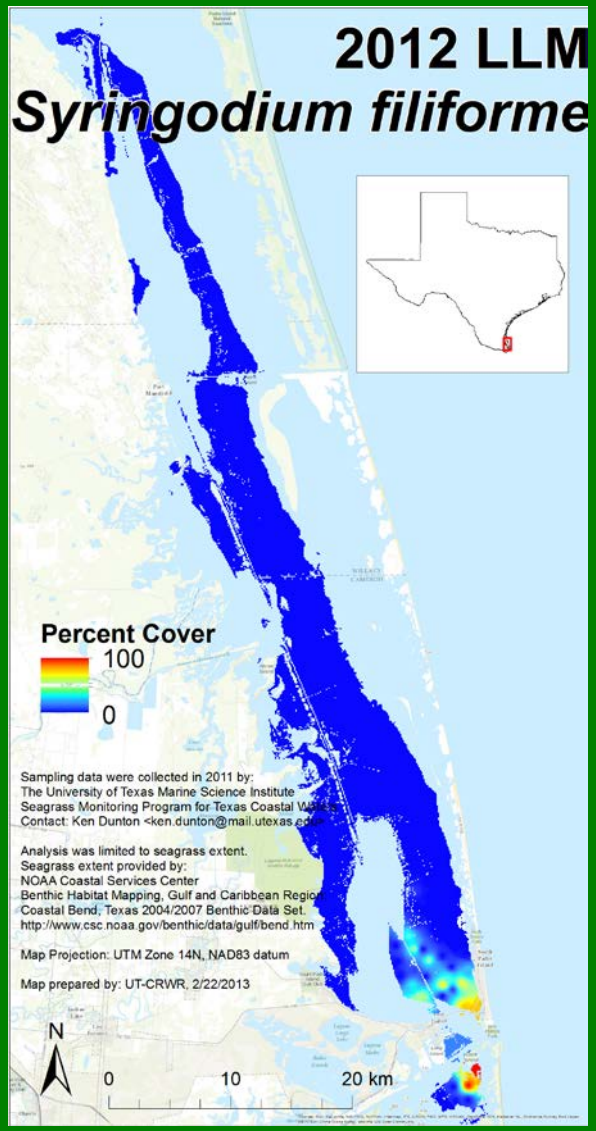

2011

2012

# Tier 2 Results: LLM

*Syringodium filiforme*




2011

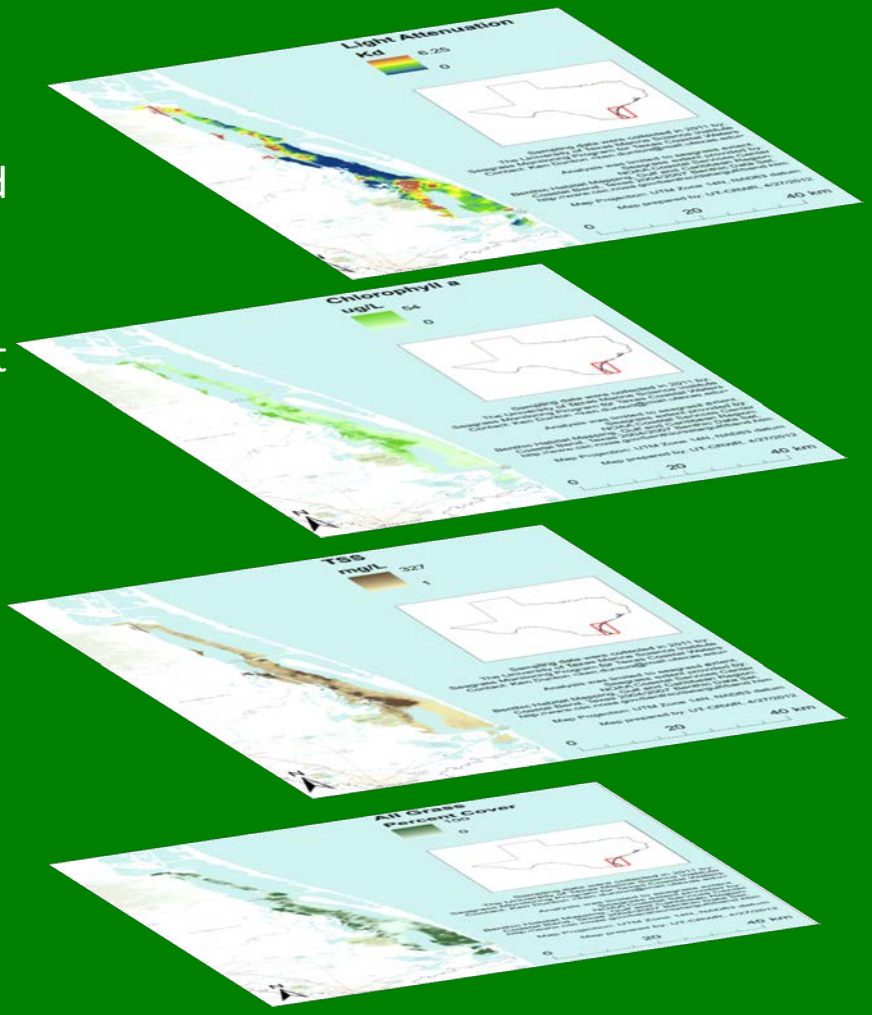
2012

# Future Applications of the Tier 2 Data

The Tier 2 sampling effort provides a quantitative description of both plant condition indicators and habitat quality parameters.

This information can be utilized to develop report cards for specific regions and species-specific habitat suitability indices (HSI) for Texas seagrasses to:

1. Monitor available habitat acreage
2. Identify areas of promise for restoration efforts
3. Predict future impact of climate change, sea level rise and coastal development



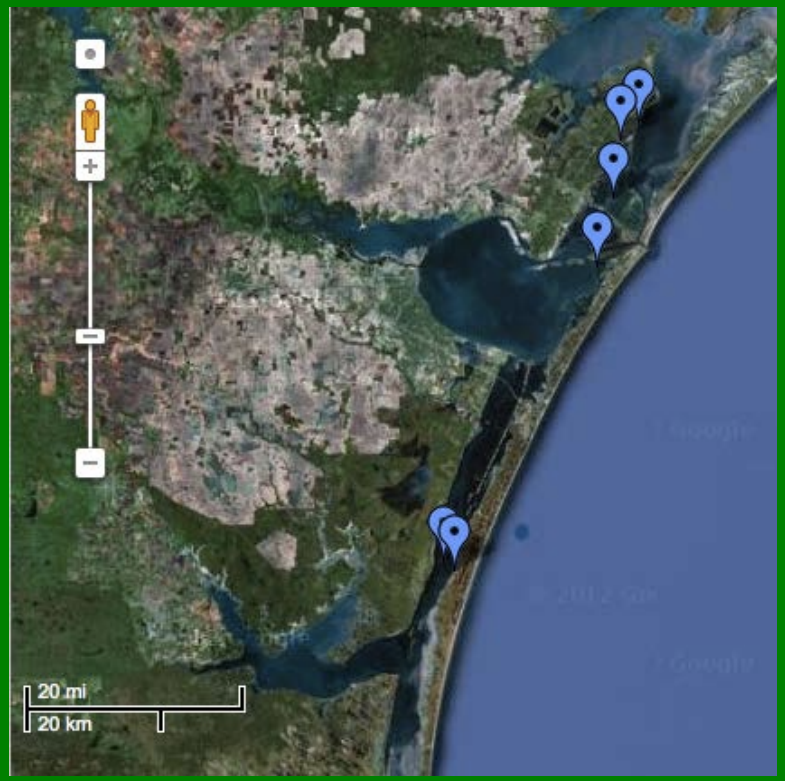
# Tier 3 Established Sampling Locations

<u>Permanent Transects (North : South)</u>

- Trayler Island[1]
- Hog Island[1]
- Mud Island[1]
- East Flats[1]
- Padre Island National Seashore[1]
- LM 151[1,2]

[1] Transect locations are visited annually to document: % cover, seagrass biomass, light availability, water quality, sediment characteristics and epiphyte/macroalgal cover

[2] LM151 is a long-term monitoring site utilized for continuous measurements of underwater irradiance, monthly water quality surveys and quarterly assessments of plant condition



# Texas Seagrass Monitoring Program: Summary

## Program Status: Tier 2

- A total of 567 individual monitoring sites were identified within the NERR, CCB, ULM and LLM
- These sites were all sampled between August and September 2011 and 2012
- The georeferenced data has been checked for Q/A and mapped for all regions
- Preparations are currently underway for the 2013 sampling season
- 14 stations were added in Little Bay in 2012

## Program Status: Tier 3

- A total of 6 permanent transects were identified within the NERR, CCB and ULM
- These transects were all surveyed between August and September 2011, 2012
- The data is currently under review for Q/A

## Overall State of the Texas Seagrass Monitoring Program

- We plan to repeat monitoring through most of the study area pending funding through 2013
- All of the raw data currently resides within a professionally developed central database
- A central website has been created to house all of the protocols, sample data, and GIS information
- We are currently completing an updated data report for both years

# Acknowledgements


## Funding Agencies

- Sally Morehead and Ed Buskey, *Mission-Aransas NERR*
- Martha Segura and Joe Meiman, *National Park Service*
- Ray Allen and Jace Tunnell, *Coastal Bend Bays and Estuaries Program*
- Melissa Porter, *Texas General Land Office*

## GIS and Website

- UT-Austin Center for Water Resources (David Maidment)
- Eric Hersh and Tim Whiteaker

## Field Support

- Kim Jackson
- Travis Bartholomew
- Kelly Darnell
- Nathan McTigue
- Geoff Hensgen
- Joe Stachelek
- Beau Hardegree
- Karen Bishop
- Dana Sjostrom
- Jace Tunnell
- Joe Meiman

## Technical Guidance

- Hilary Neckles
- Bill Dennison
- Jim Fourqurean