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National Aquatic Resource Surveys: Monitoring Our State

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Environmental Institute of Houston
University of Houston – Clear Lake

32nd Annual TCEQ SWQM Workshop
November 12-14, 2018



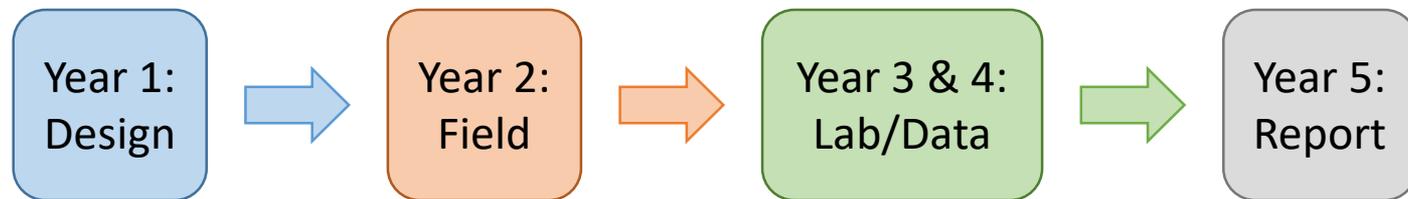


What are the National Aquatic Resource Surveys?

- Series of nationwide statistical surveys designed to assess status and changes in quality of the nation's surface waterbodies.
- Collaboration between EPA, states, tribes, federal agencies, and other organizations.
- Primary questions:
 - What percent of waters support healthy ecosystems and recreation?
 - What are the most common water quality problems?
 - Is water quality improving or getting worse?
 - Are investments in improving water quality focused appropriately?

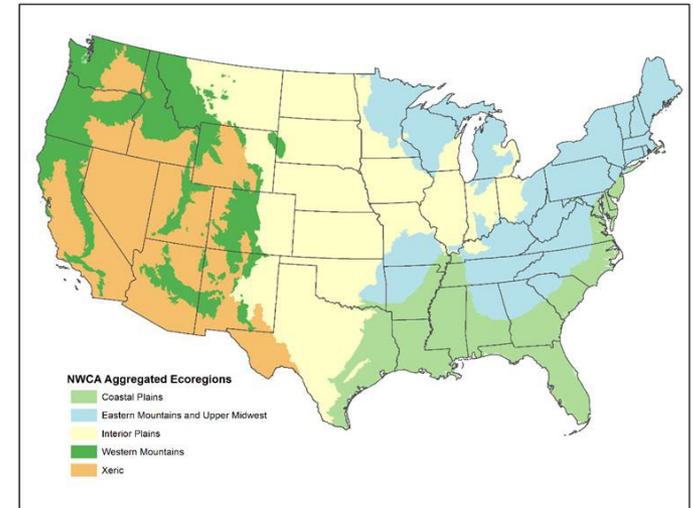


General Timeline for Previous and Current NARS Assessments



NARS Design

- Datasets
 - Omernik Level III Ecoregions
 - National Hydrography Datasets
 - USFWS Status & Trends
- Index period
 - Wetlands: April-September
 - Coastal and Lakes: June-September
 - Rivers and Streams: May*-September





NARS Sampling Indicators

- **Biological**
- Chemical
- Physical
- Recreational



NARS Sampling Indicators

- Biological
- **Chemical**
- Physical
- Recreational





NARS Sampling Indicators

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NARS Sampling Indicators

- Biological
- Chemical
- Physical
- **Recreational**



Primary Components of All NARS Assessments

- Desktop reconnaissance & site evaluation

The screenshot displays the Google Earth Pro interface. The main map shows a satellite view of a wetland area with a green boundary and a yellow pin labeled '4439'. The 'Places' sidebar on the left shows a tree view of 'NWCA 2016' sites, including 'Sampled Sites' and 'Dropped Sites'. The 'Layers' panel at the bottom shows 'Practice EHI Day' and 'PWS Wetlands & Riparian'. A spreadsheet is visible in the bottom-left corner, and a 'Share' dialog is on the right.

Row	State	SITE_ID	Site Name	Coordinates	Base	Method	Access	Notes			
2	TX	NWCA16-4439	NWCA16-4439	-94.61938165	29.72917468	Base11	PF	PRL-f	No	Non-Target	Active crop production during index period (explain)
4		NWCA16-4440	NWCA16-4440	-95.97629679	28.67128759	Base16	E2EM	EH	Yes	Shifted Point Sampleable	EH
5		NWCA16-4441	NWCA16-4441	-95.66162647	29.28570535	Base16	PEM	PRL-EM	No	No Access	Access permission denied by site owner
6		NWCA16-4442	NWCA16-4442	-98.7096026	28.72473463	Base16	PUBPAB	PRL-UBAB	No	Non-Target	Other (describe)

Primary Components of All NARS Assessments

- Access permission
 - Private landowners
 - Permitting



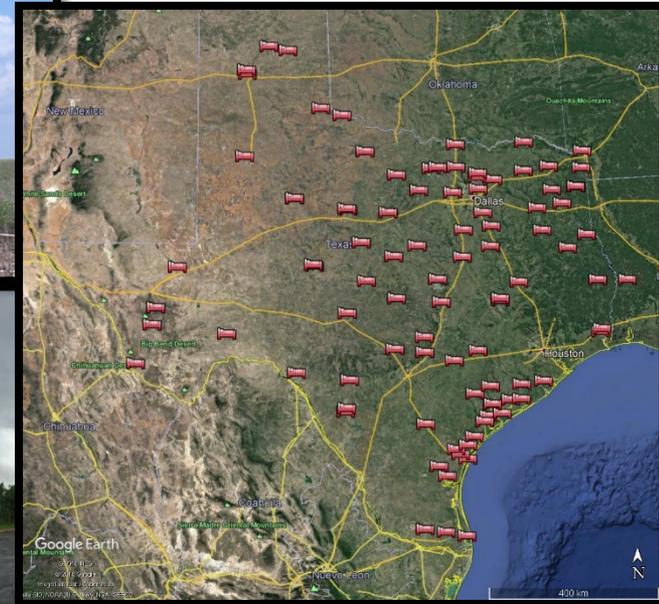
Primary Components of All NARS Assessments

- Training for primary field crew members



Primary Components of All NARS Assessments

- Travel and equipment arrangements



Primary Components of All NARS Assessments

- Field sampling
 - Physical site access
 - Sample processing: filtering, storage, and shipping
 - Sonde pre- and post-calibration



Primary Components of All NARS Assessments

- Equipment decontamination





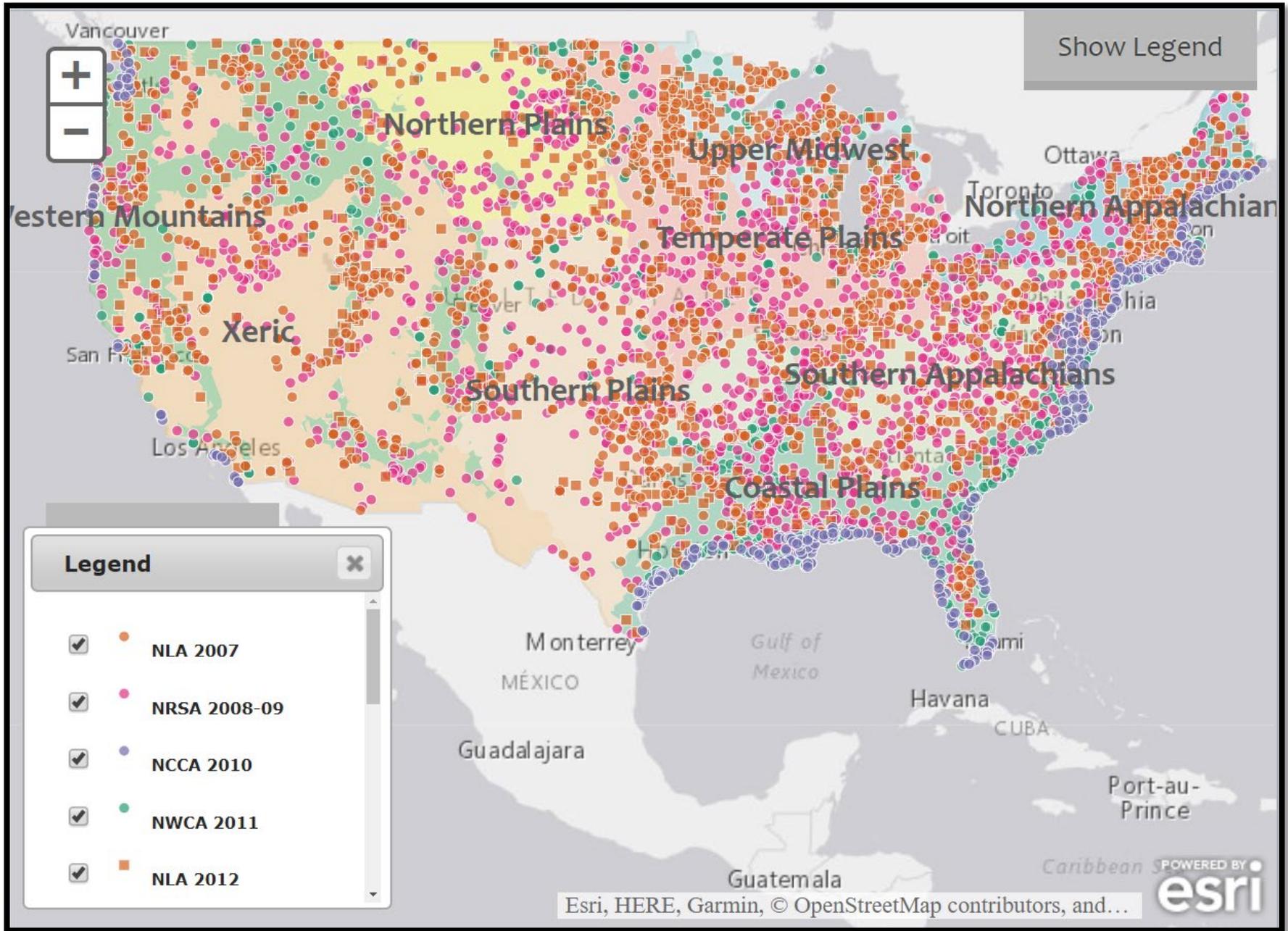
Primary Components of All NARS Assessments

- Final data QC & submission



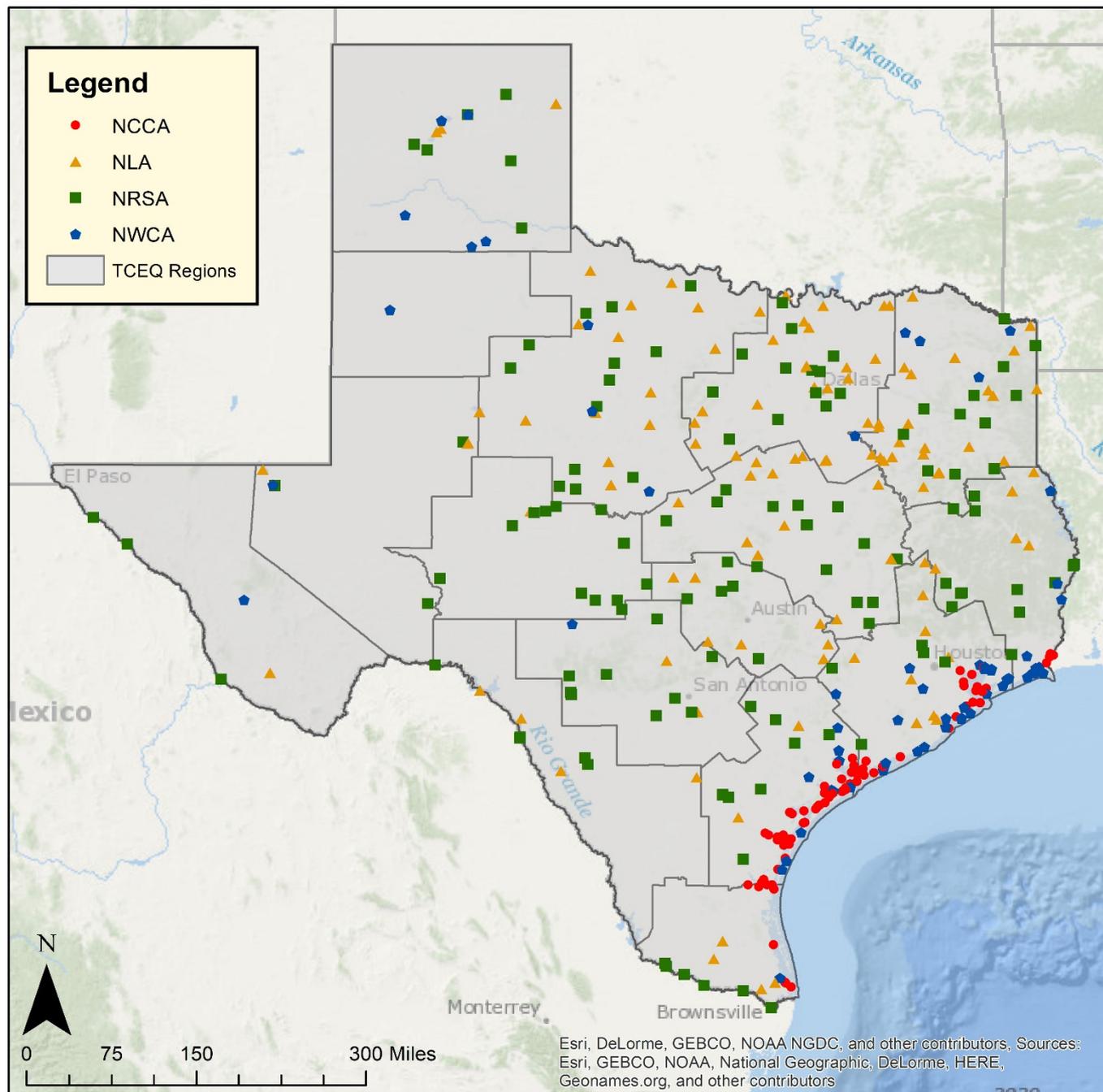
Types of NARS Assessments

- National Lakes Assessment (NLA)
- National Rivers and Streams Assessment (NRSA)
- National Coastal Condition Assessment (NCCA)
- National Wetland Condition Assessment (NWCA)





Survey	# Sites
NCCA	108
NLA	139
NRSA	170
NWCA	80
Total:	497





National Lakes Assessment (NLA)

- Conducted 3 times since inception
 - 2007, 2012, and 2017
- Includes lakes, ponds, and reservoirs
- Primary questions:
 - What is the extent of degradation and is degradation widespread (i.e. national) or localized (i.e. regional)?
 - Is lake condition getting better, worse, or staying consistent?
 - Which environmental stressors are most associated with degraded biological condition?

A day of NLA sampling...

- Site Access
- Index Sampling
- Physical Habitat
- Benthic Macroinverts
- Filtering & Sample Processing





National Rivers & Streams Assessment (NRSA)

- Conducted 3 times since inception
 - 2008-09, 2013-14, and currently in 2018-19
- Two categories: Wadeable and Non-Wadeable
- Goals:
 - Determine extent to which rivers and streams support a healthy biological condition
 - Determine whether rivers and streams are getting cleaner and how to invest resources in protection/restoration

A day of NRSA sampling...

- Site Access & Reach Layout
- X-Site Sampling
- Benthic Macroinverts & Periphyton
- Physical Habitat
- Fish Assemblage
- Filtering & Sample Processing



A day of NRSA sampling...

- Bonus at Wadeable Sites:

- Flow

- Slope

- Sinuosity



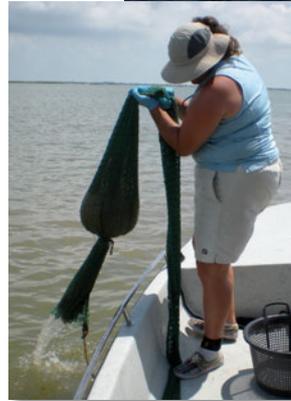


National Coastal Condition Assessment (NCCA)

- Conducted twice since inception
 - 2010 and 2015
- Includes all waters along the marine and Great Lakes coasts
- Primary Questions:
 - What percent of coastal waters are in good, fair, and poor condition for key indicators?
 - What is the relative importance of key stressors?

A day of NCCA sampling...

- Site access
- X-Site Sampling
- Fish Tissue
- Filtering & Sample Processing



National Wetland Condition Assessment (NWCA)

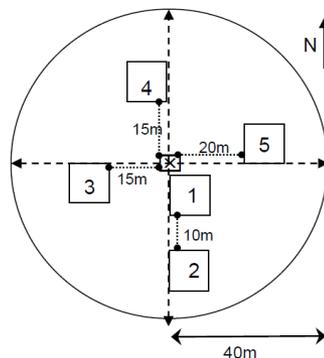
- Conducted twice since inception
 - 2011 and 2016
- Developed in partnership with USFWS Wetlands Status and Trends program
- Goals:
 - Designed to answer basic questions about extent to which wetlands support healthy ecological condition
 - Provide trends in wetland quantity (i.e. area) and quality (i.e. condition)

A day of NWCA sampling...

- Site Access & Assessment Area Layout



Plate 1. Standard Veg Plot Layout –
Circular AA (½ hectare)



Place Veg Plots at specified locations on plot placement lines oriented through the AA CENTER on cardinal directions. Veg Plot 1 is placed 2m from the CENTER.





A day of NWCA sampling...

- Assessment Area & Buffer Characterization



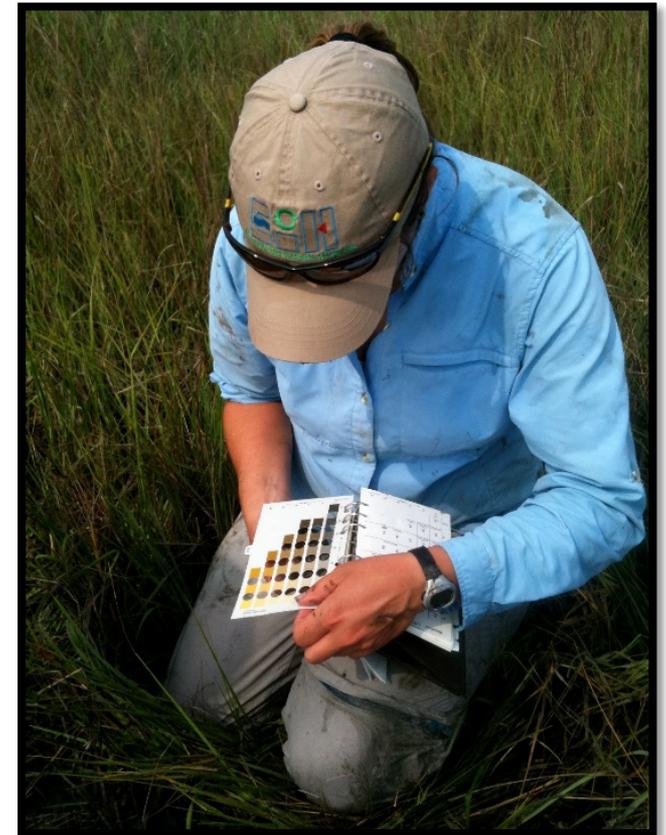
A day of NWCA sampling...

- Vegetation



A day of NWCA sampling...

- Soils





A day of NWCA sampling...

- Hydrology & Water Samples



- Filtering & Sample Processing



Data Download from EPA Website



Environmental Topics

Laws & Regulations

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Background

Indicators

Manuals

Map of Sampled Sites

NARS Data

Journal Articles

Applying the Data

Related Studies and Tools

National Coastal Condition Assessment

National Lakes Assessment

National Rivers and Streams Assessment

National Wetland Condition Assessment

Outreach Materials

Data from the National Aquatic Resource Surveys

To download the data: The following data are available for download as comma separated values (.csv) files. Sort the table below using the pull down menus or headers to more easily locate the data for a specific survey or indicator type. Right click on the file name and select *Save Link As* to save the file to your computer. Make sure to also download the companion metadata file (.txt) for the list of field labels.

Users of the data are encouraged to review the [Technical Reports](#), [Field and Laboratory Manuals](#), and metadata files to understand the types of data available and how they were collected or measured. [Click here to view a summary of the available data for each of the surveys.](#)

More Information

- [Frequent questions about the data](#)
- [Summary of available data](#)
- [How to cite the NARS data](#)
- [Fish tissue contaminant data](#)

Recently added: NLA 2007 and NLA 2012 Water Isotope Variables

Filter data by survey:

All surveys



Filter data by indicator:

All Indicators



Data Download from EPA Website

Filter data by survey:

Lakes 2007

Filter data by indicator:

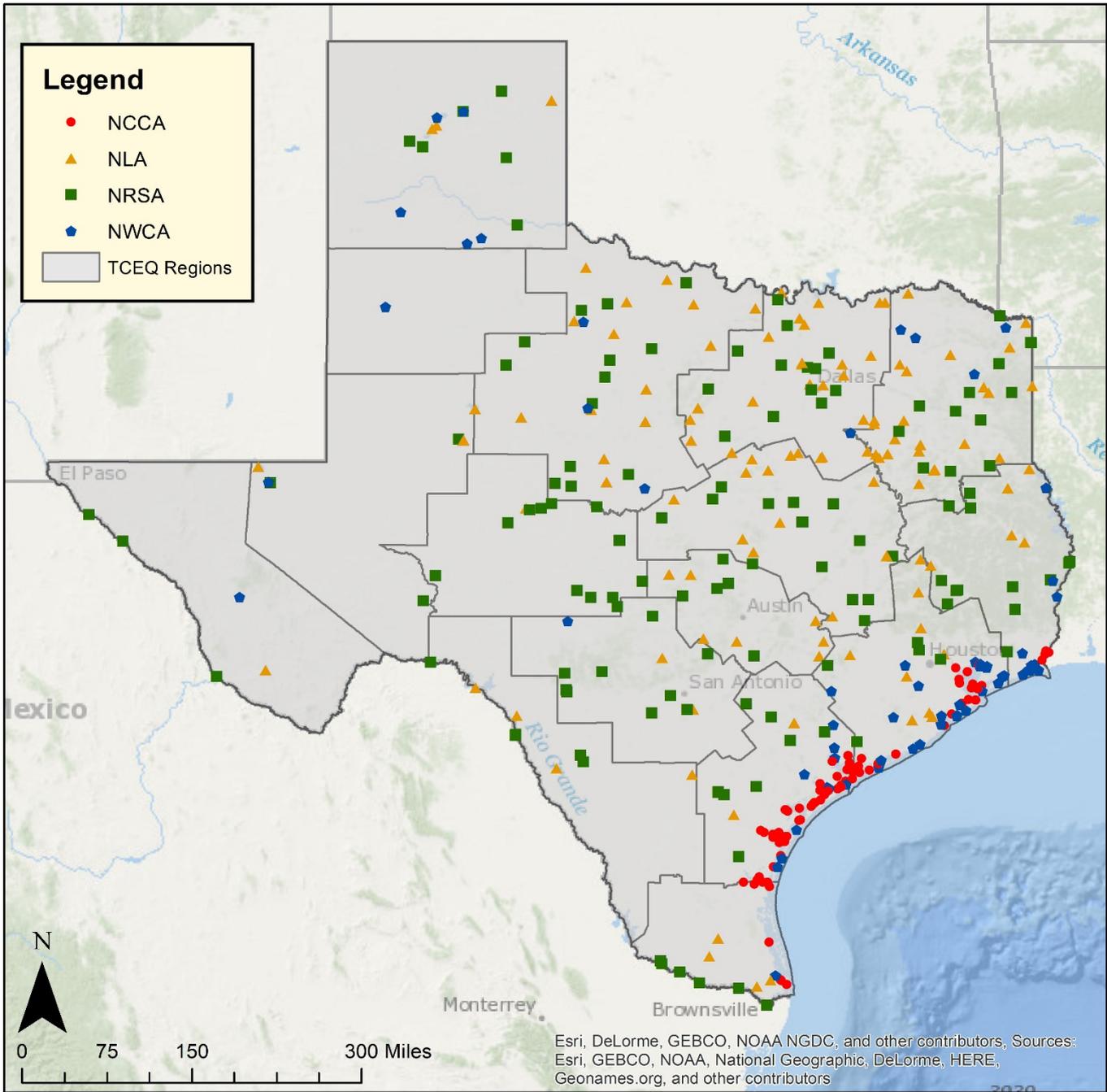
Landscape Data

National Aquatic Resource Surveys Data

Survey	Indicator	Data	Metadata
Lakes 2007	Landscape Data	NLA 2007 Basin Landuse Metrics - Data 20061022 (.CSV), (1 pg, 307 K)	NLA 2007 Basin Landuse Metrics - Metadata 20091022 (.TXT), (1 pg, 4 K)
Lakes 2007	Landscape Data	NLA 2007 Buffer Landuse Metrics - Data 20091022 (.CSV), (1 pg, 273 K)	NLA 2007 Buffer Landuse Metrics - Metadata 20091022 (.TXT), (1 pg, 4 K)
Lakes 2007	Landscape Data	NLA 2007 Lake Polygon Shapefile (.ZIP), (1 pg, 9 MB)	
Lakes 2007	Landscape Data	NLA 2007 Basin Shapefile (.ZIP), (1 pg, 14 MB)	

Legend

- NCCA
- ▲ NLA
- NRSA
- ◆ NWCA
- TCEQ Regions

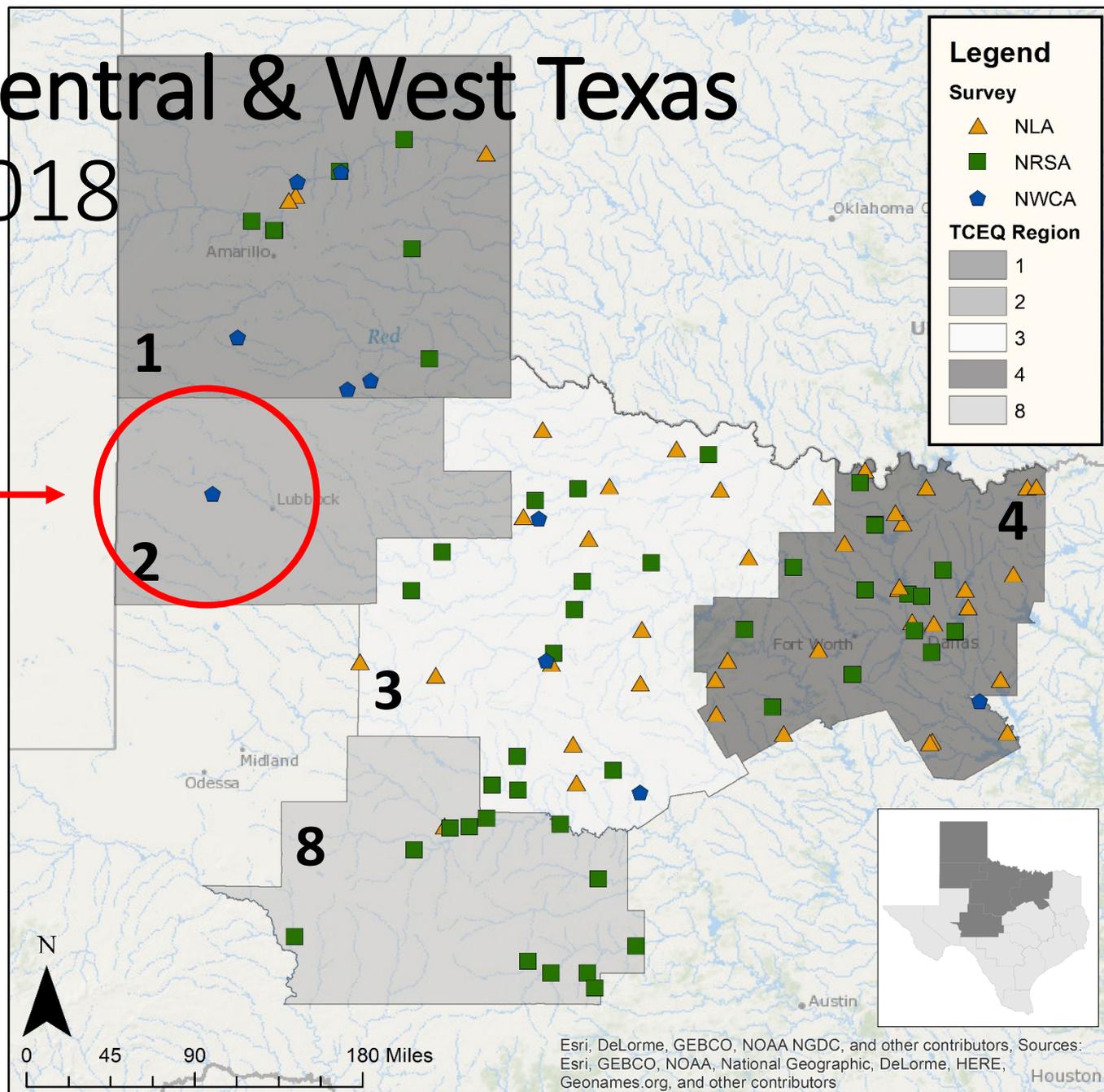


Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors, Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, HERE, Geonames.org, and other contributors

North Central & West Texas 2007-2018

Only assessed
in 2016 NWCA

Survey	# of Sites
NLA	52
NRSA	61
NWCA	9
Total	122

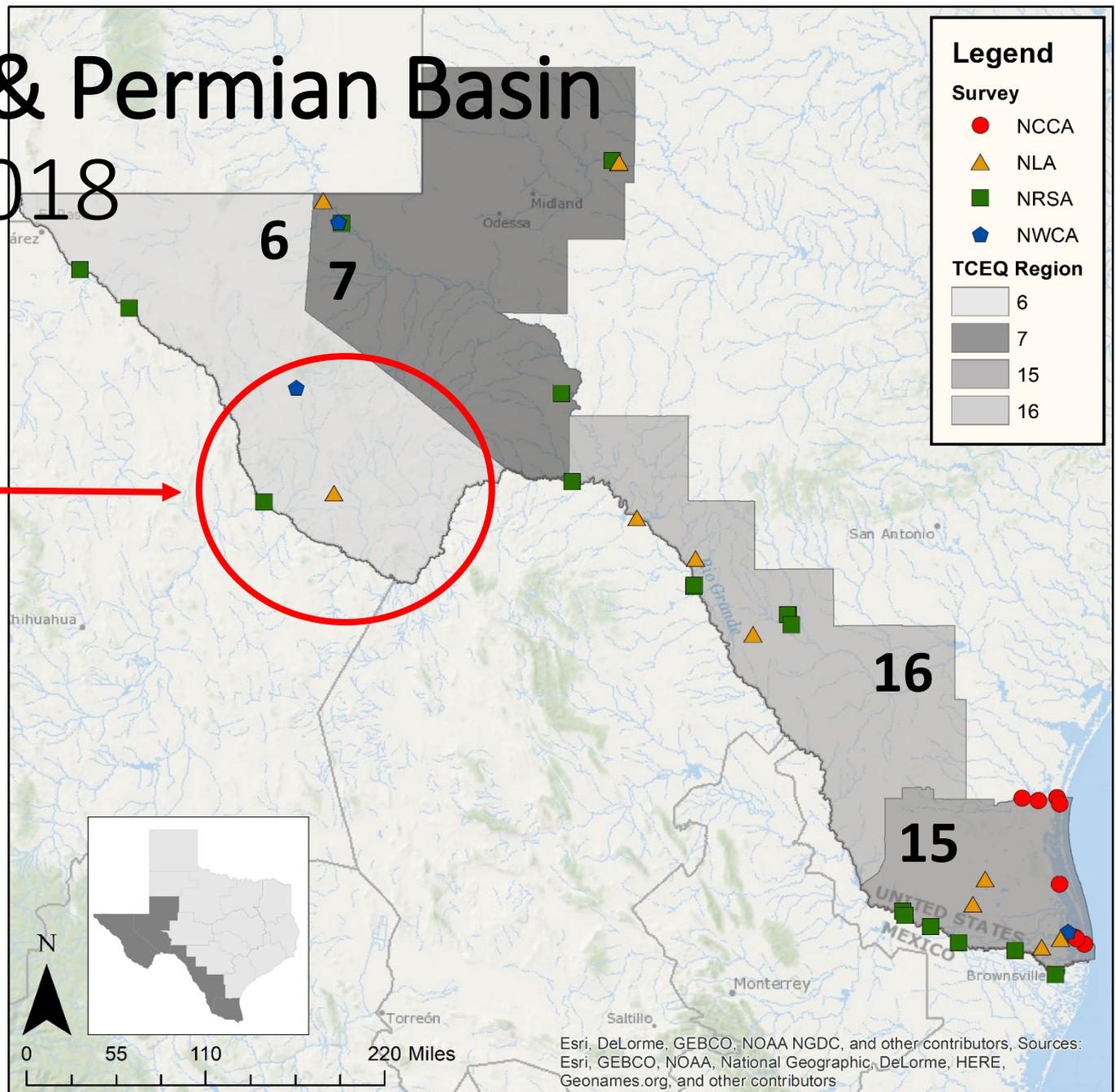


Border & Permian Basin 2007-2018

More sampling
schedule for 2019

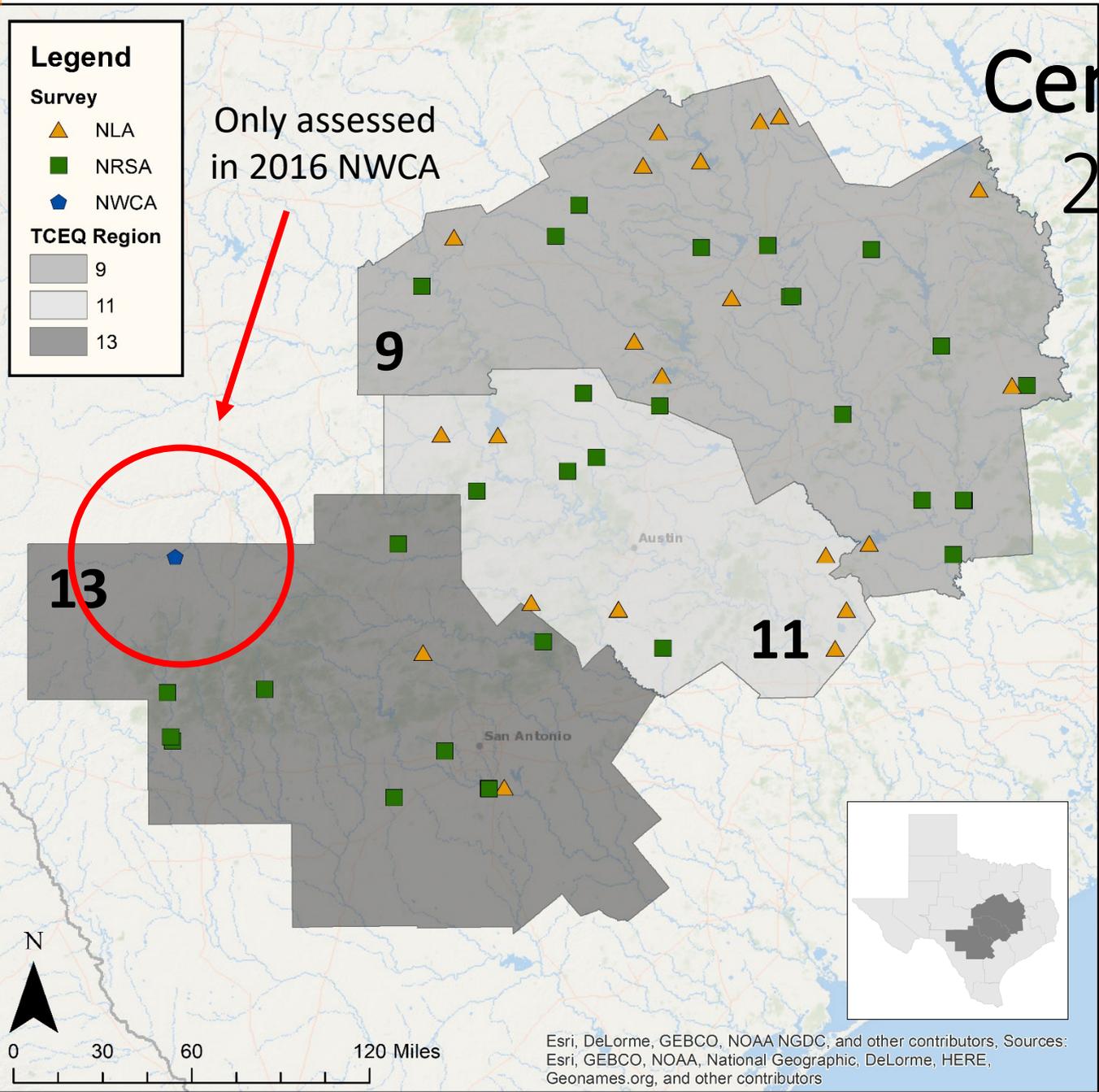


Survey	# of Sites
NCCA	11
NLA	12
NRSA	19
NWCA	6
Total	48





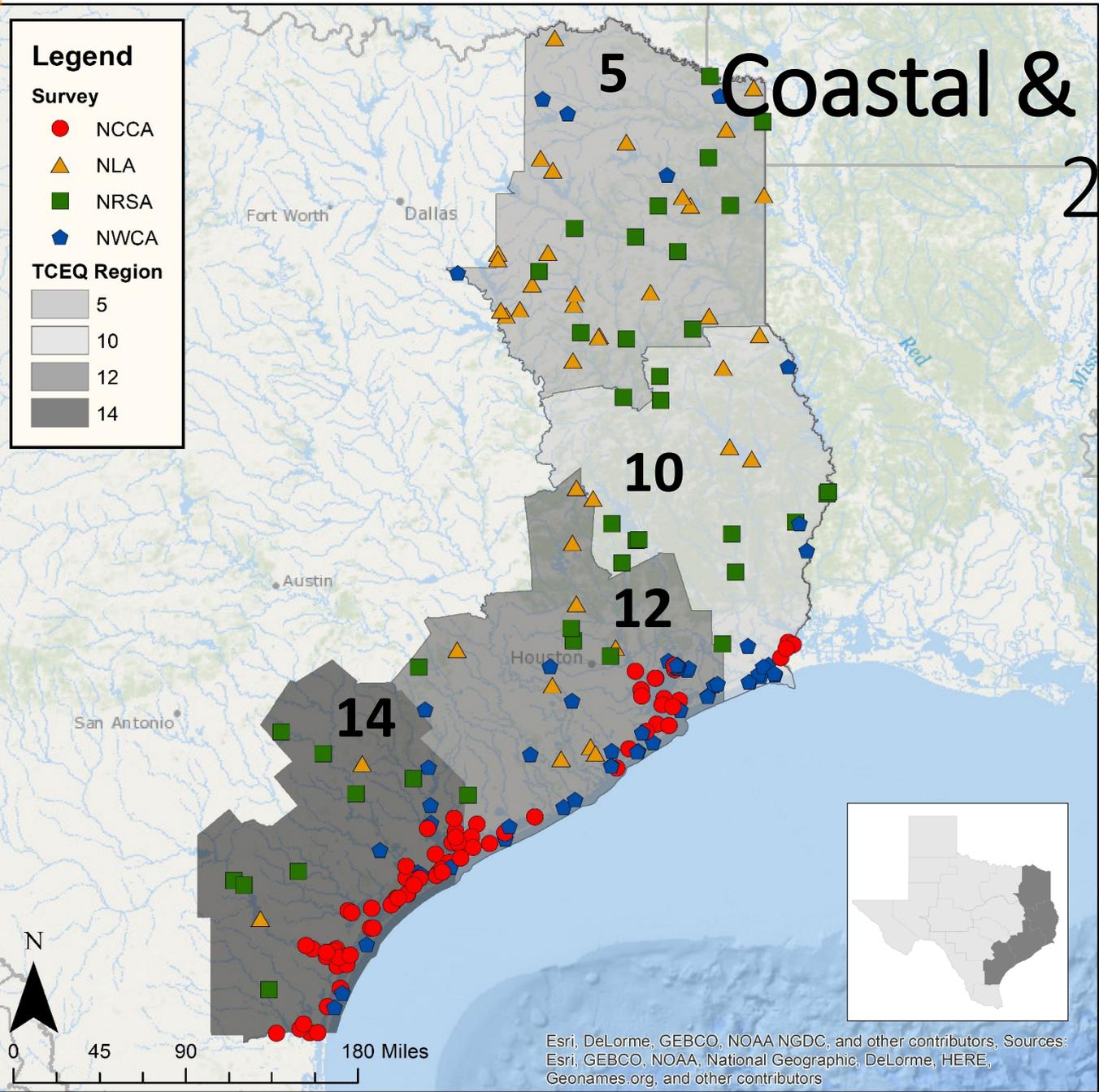
Central Texas 2007-2018



Survey	# of Sites
NLA	27
NRSA	36
NWCA	1
Total	64



Coastal & East Texas 2007-2018



Survey	# of Sites
NCCA	97
NLA	48
NRSA	54
NWCA	64
Total	263

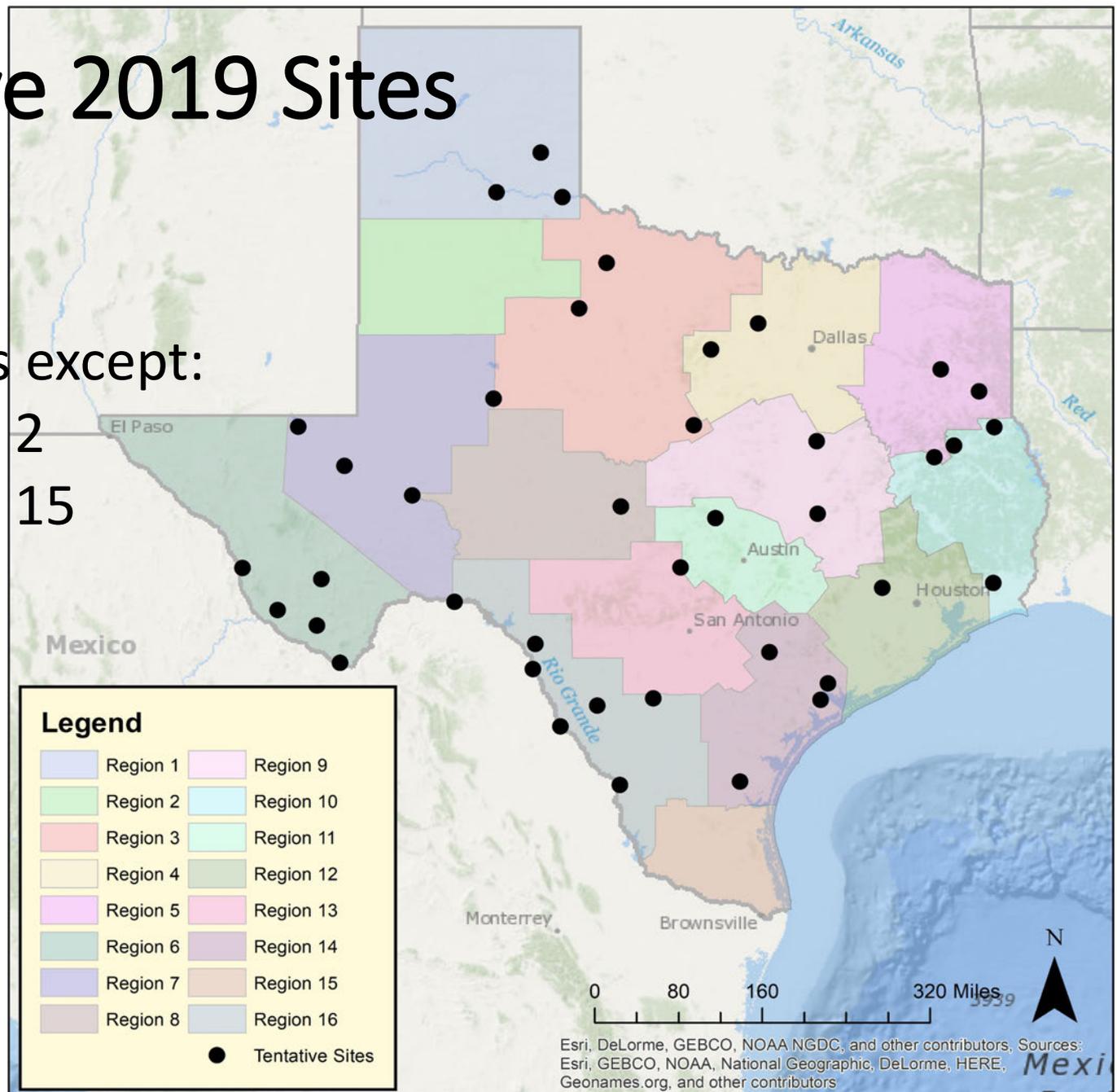
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors. Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, HERE, Geonames.org, and other contributors

Upcoming Assessments

- 2019 NRSA Season
 - Wrapping up 2018-19 season
 - 39 more site visits
- 2020 NCCA
 - Planning phase underway
 - Should be developing list of sites by late 2019

Tentative 2019 Sites

- 40 Sites
- All regions except:
 - Region 2
 - Region 15



Future of NARS: NARS 2.0

- Tentative plan to increase statistical value of NARS
- Goal: to expand spatio-temporal value by sampling each project more often
 - Shift from once every 5 years
 - Include sites from all four assessment types every year
 - Limited number of sites per assessment per state

NARS Crews Over the Years





Alex Miller
Allison Norris
Amy Branom
Anne Rogers
Art Crowe
Bill Harrison
Boyd Guthrie
Brandon Wilcox
Candace Cox
Casey Johnson
Chris Zacry
Clint Robertson
Daniel Reid
Daniel Shelley
David Williams
Dianna Ramirez
Don Warren
Ed Ragsdale
Ellen Hollbrook
Elsa Hull

George Guillen
Glenn Morris
Gordon Linham
Greg Larson
Helen Tufford
James Roundtree
James Yokley
Jason Blackledge
Jennifer Brewton
Jenny Oakley
Jill Csekitz
Joe Martin
John Botros
Josi Robertson
Julie McEntire
Karim Aziz
Keenan Smith
Kevin Kolodjeck
Kris Warner
Laura Hunt

Laura Ryckman
Lauren Pulliam
Linda Broach
Lynn Lindsay
Lythia Metzmeier
Mandi Gordon
Mark Stead
Martin Kelly
Michael Prater
Michele Blair
Michelle Krause
Mike Caldwell
Nakailla Kirkpatrick
Natalie Bell
Nathan Hobbe
Peyton Pearce
Randi Sprouse
Rebecca Pizano
Renee Fields
Richard Baetz

Richard Blackney
Robby Ozment
Robin Cypher
Robin Pugh
Rodney Adams
Rosaleen March
Roy Kleinsasser
Russell Bond
Sam Sugarek
Selena Medrano
Shawna Simpson
Steven Earnest
Tabatha Kirkland
Tabitha Kirkland
Tami Sundquist
Wells Shartle
Wilson Snyder

Contact Us!

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MARCH 18-21, 2019 SURFACE WATER QUALITY MONITORING TRAINING

Course Description

This is a two-part course covering surface water assessments utilizing the Texas Commission on Environmental Quality's Surface Water Quality Monitoring guidelines. Both courses will consist of classroom and field-based instruction designed to explain the theory and methodology of SWQM procedures with a hands-on component in local rivers and streams.

Partial: Water Quality & Hydrological Monitoring (Day 1)

Full: Partial + Biological & Physical Habitat Monitoring (Days 1-4)



Environmental Institute of Houston

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TO REGISTER VISIT:
bit.ly/eihtraining



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of Houston
Clear Lake

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MONITORING

BIOLOGICAL &
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Partial: \$175*/\$200
Full: \$600*/\$700

*Register by February 8th
to receive discounted rate

Registration closes on
March 4th

Partial: March 18
Full: March 18-21

CEUs available
upon request

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*Cancellation policy: Refunds are not made for early dismissal, failure to attend, absences, or sick days. Refunds less an 8 percent fee will be made if your registration is cancelled before March 4, 2018. Refunds after March 4, 2018 will be subject to a 15 percent fee.



Any individual requiring an accommodation in order to participate in this event will need to contact EIH at 281-283-3950 or via e-mail at EIH@uhcl.edu at least two weeks prior to the event.

