Assessing source contributions to air quality and noise in unconventional oil shale plays `

Research Team

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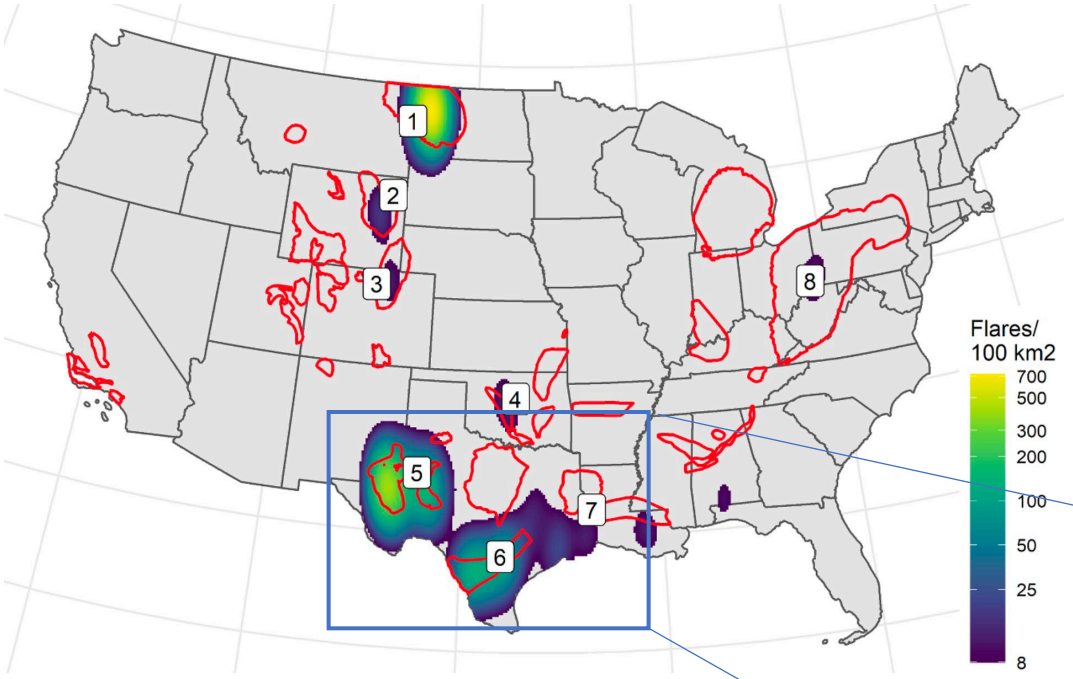
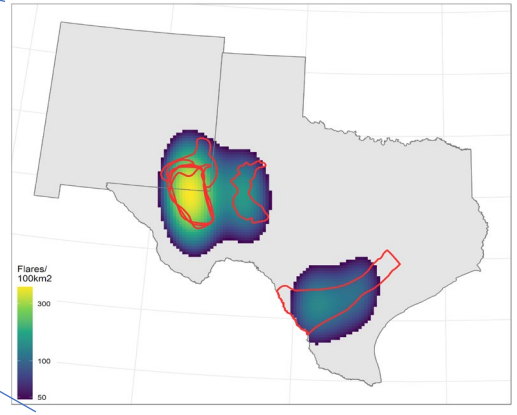
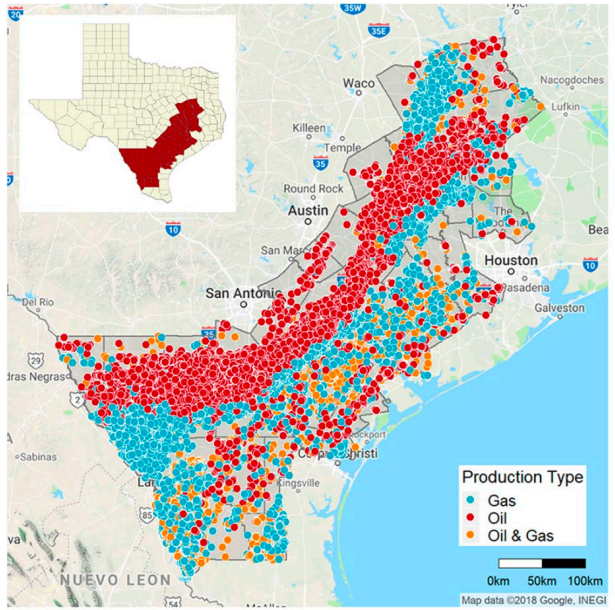
Study Motivation

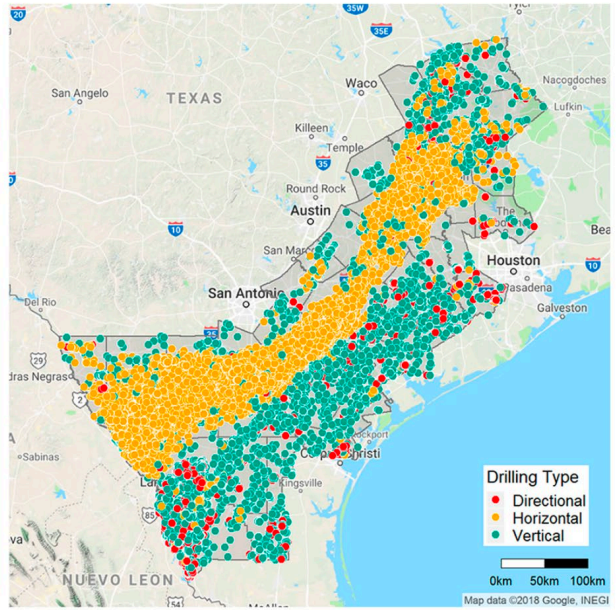


UOGD flaring density



UOGD flaring Permian and Eagle Ford





UOGD well locations in Eagle Ford

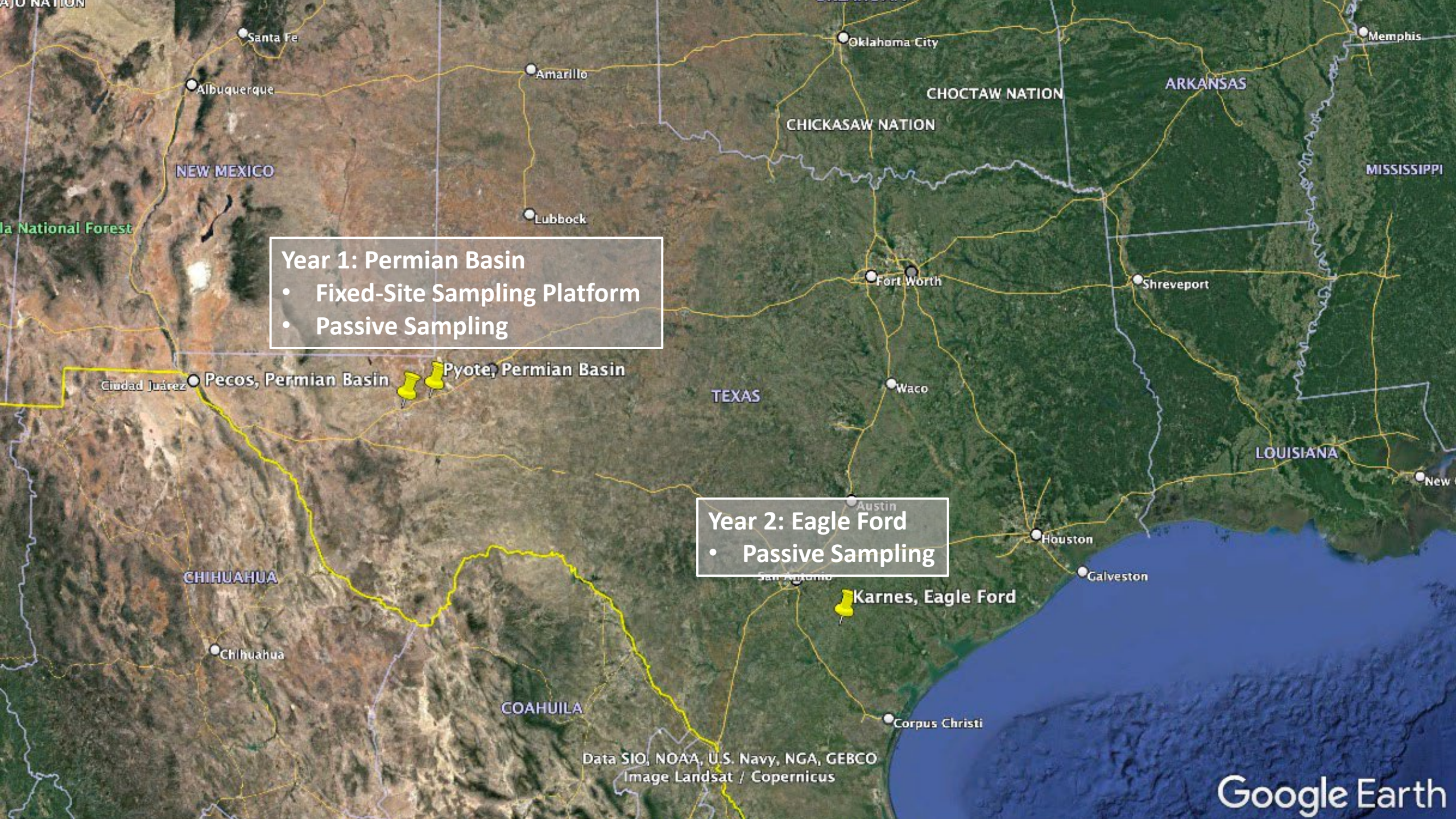
Study Objectives

- Our study is designed to better understand emissions and population exposure to air pollutants and noise coming from Unconventional Oil and Gas Development (UOGD)

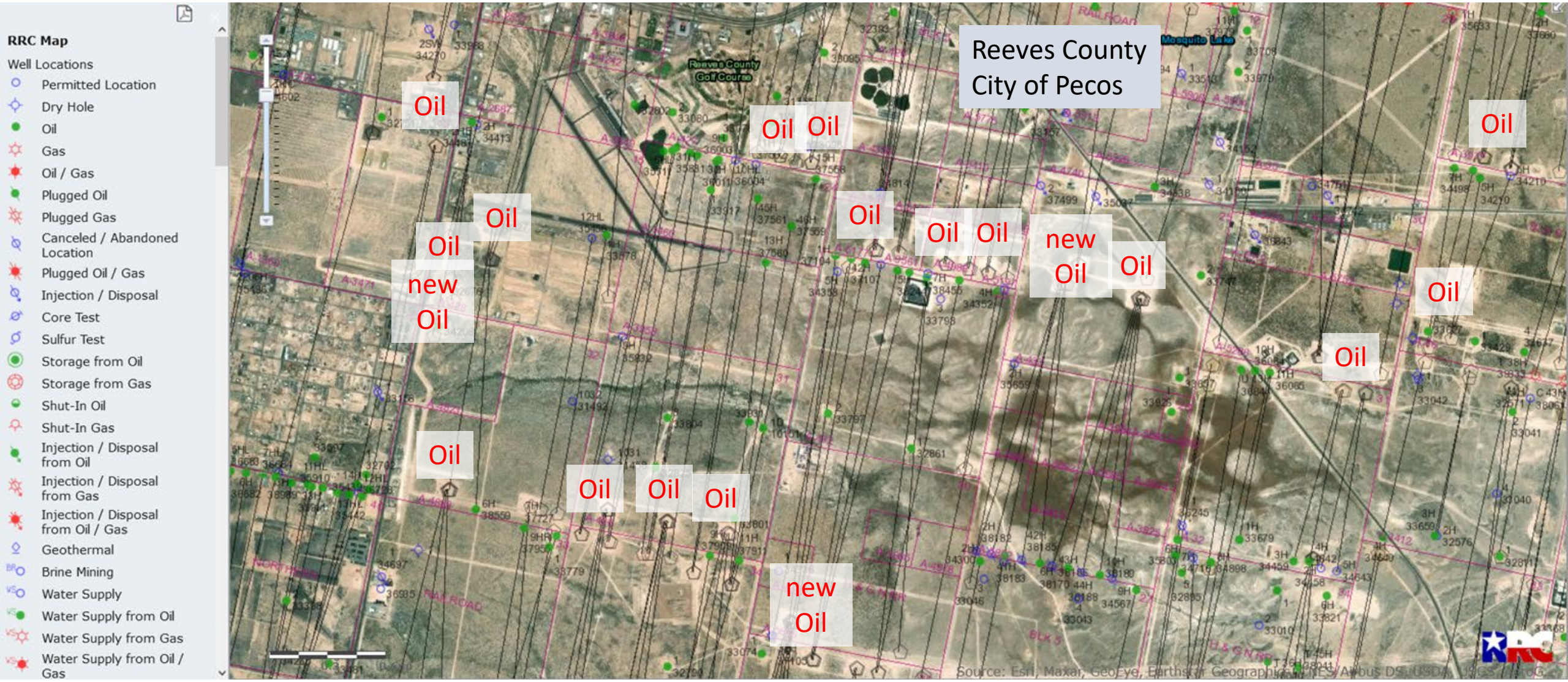
  1) Use fixed-placed, active air quality monitoring to characterize the emissions and impacts from UOGD

  2) Use distributed, passive sampling to understand the potentially uneven distribution of selected toxic air pollutants

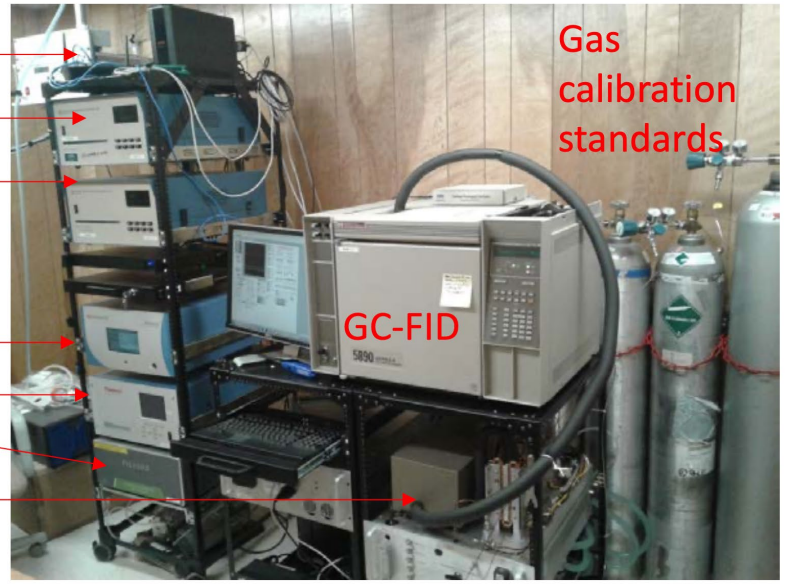
  3) Focus on UOGD related flaring by combining our measured data with satellite observations


Year 1: Permian Basin
• Fixed-Site Sampling Platform
• Passive Sampling
Year 2: Eagle Ford
• Passive Sampling
Pecos, Permian Basin
Pyote, Permian Basin
Karnes, Eagle Ford
Santa Fe
Albuquerque
Amarillo
Lubbock
Oklahoma City
Memphis
CHOCTAW NATION
CHICKASAW NATION
ARKANSAS
MISSISSIPPI
NEW MEXICO
TEXAS
LOUISIANA
Fort Worth
Shreveport
Waco
Austin
Houston
Galveston
Corpus Christi
Ciudad Juárez
CHIHUAHUA
Chihuahua
COAHUILA
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
Google Earth

Possible fixed location Sampling near City of Pecos, Permian Basin



Fixed Location Sampling Platform



One-year deployment in Permian – <u>continuous</u> 24/7 monitoring

- Air pollutants (ozone, methane, CO_2, carbon monoxide, nitrogen oxides, hydrogen sulfide, sulfur dioxide, volatile organic compounds, $PM_{2.5}$, black carbon
- Noise
- Radioactivity
- Meteorology

Distributed Sampling – Permian and Eagle Ford

6-8 months in each Permian Basin (2022-23) and Eagle Ford (2023)

- Air pollutants: selected (toxic) hydrocarbons
- Temperature

Distributed Sampling Volunteer Recruitment

- We are actively looking to recruit volunteers for distributed, passive sampler placement
  - work with local, community-based organizations and residents
  - land-owners
- Selected volunteers will be trained individually or in a group and a video will be circulated
- Communication between volunteers and research team will be key
  - social media usage
- Volunteers will receive a $50 gift card upon completion of the sampling period