

Public Tools for Produced Water Disposal and Seismicity

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Acknowledgments: Alexandros Savvaidis, PhD, Manager of TexNet; Peter Sarkis, Web Tools Developer, BEG

Public Tools for Produced Water Disposal and Seismicity

1. There is a lot of operations and monitoring in the Permian Basin
2. Information is improving
3. Tools can connect information to operational decisions

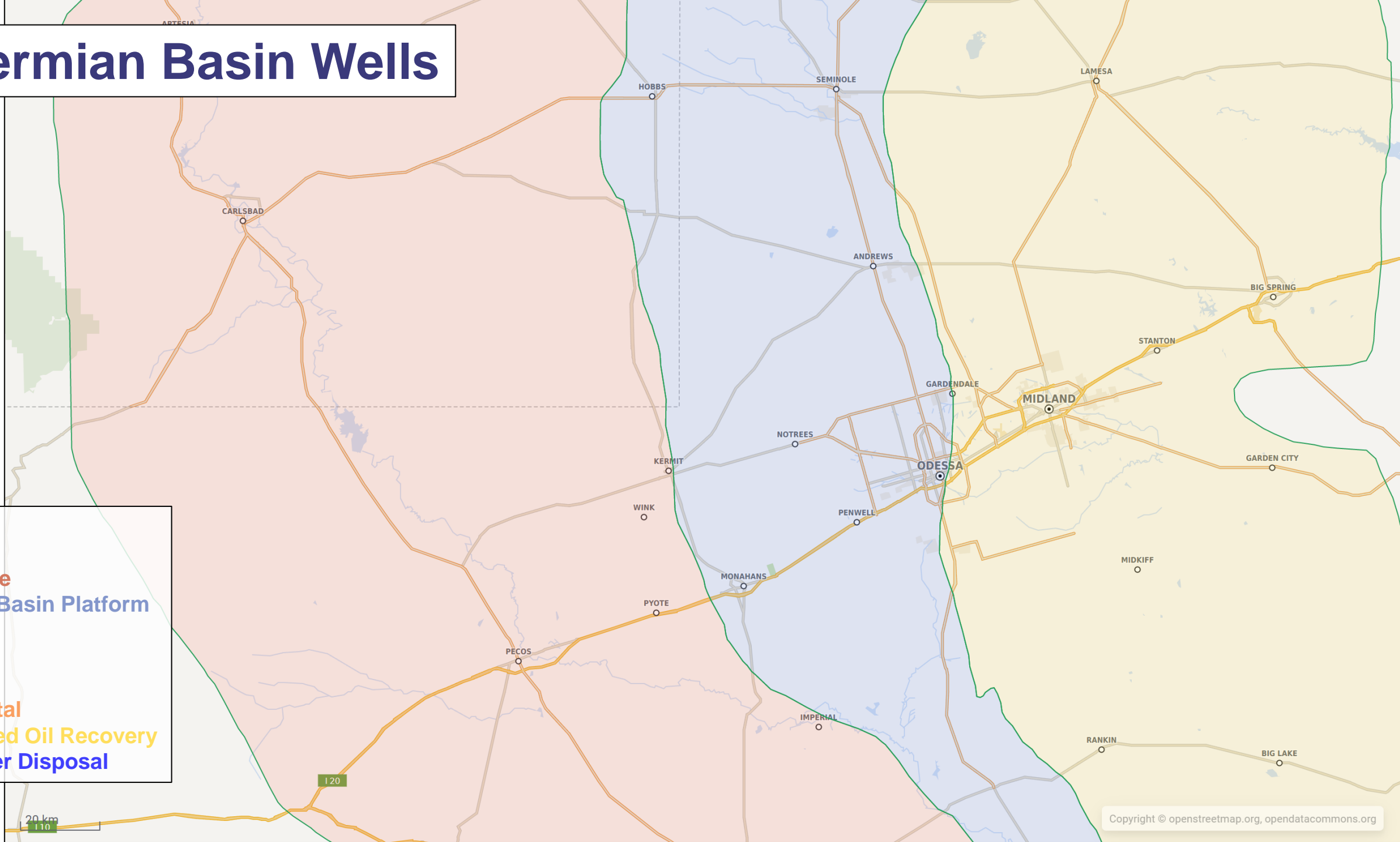


The Permian Basin is busy

Permian Basin Wells

Areas:
Midland
Delaware
Central Basin Platform

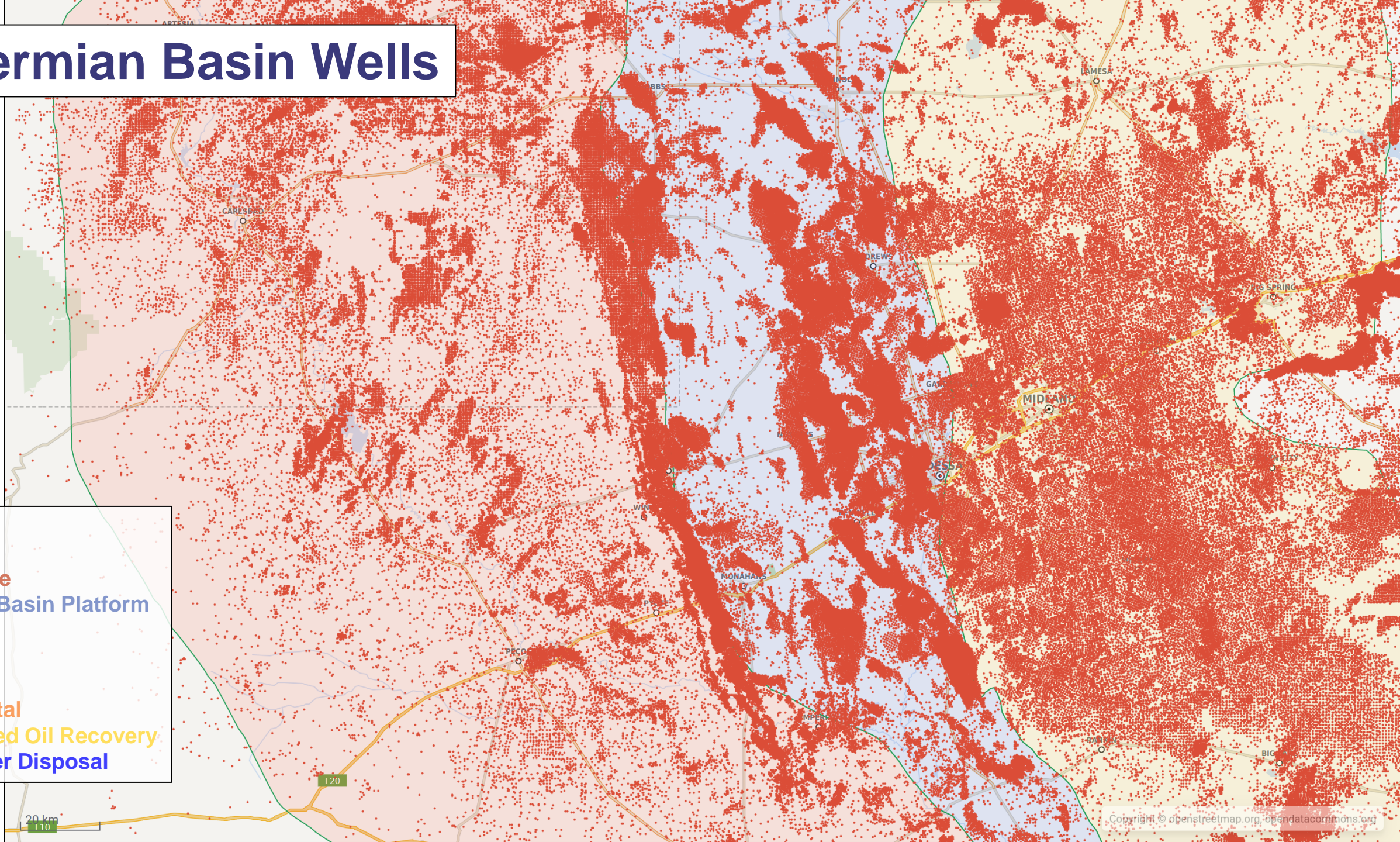
Wells:
Vertical
Horizontal
Enhanced Oil Recovery
Saltwater Disposal



Permian Basin Wells

Areas:
Midland
Delaware
Central Basin Platform

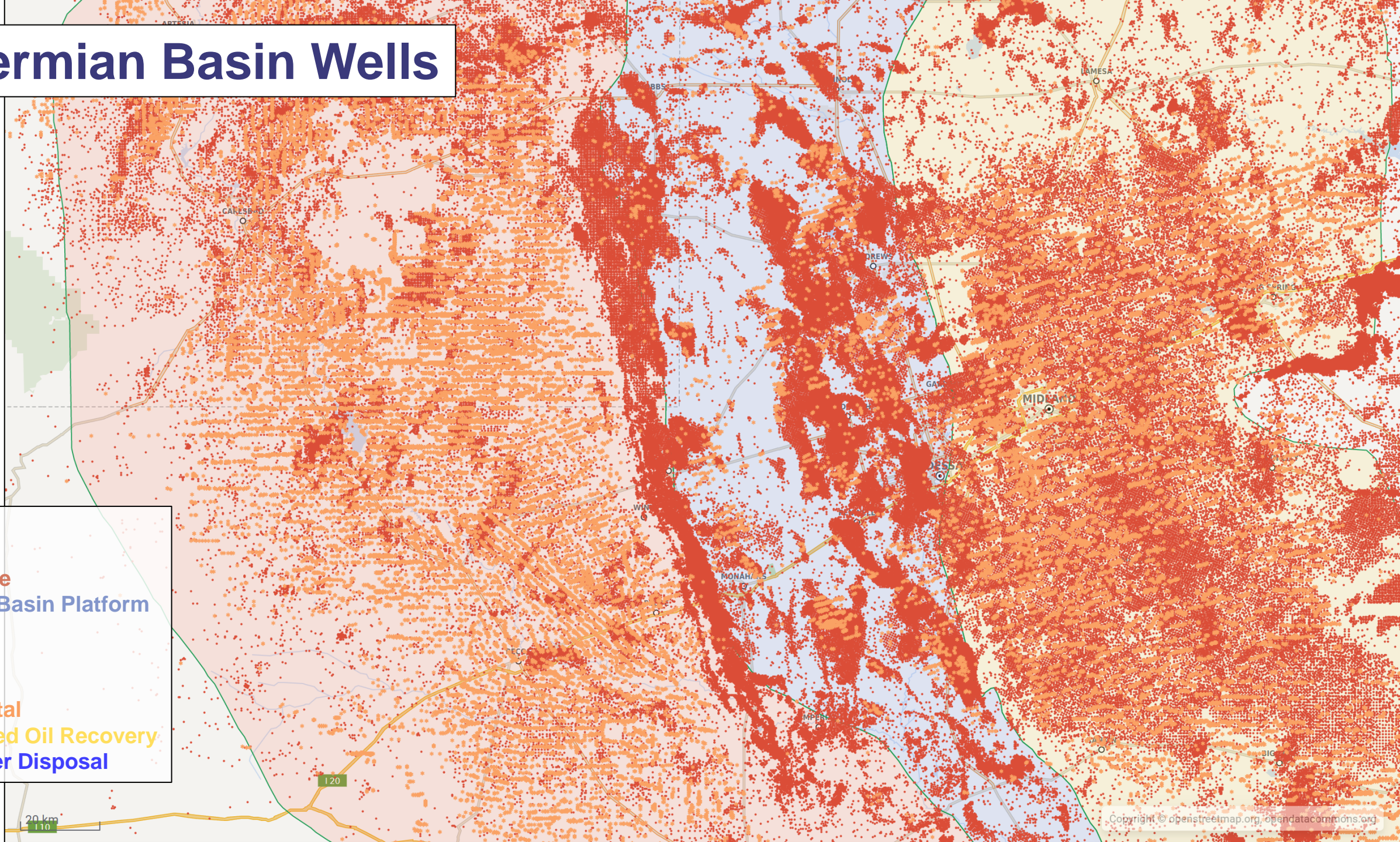
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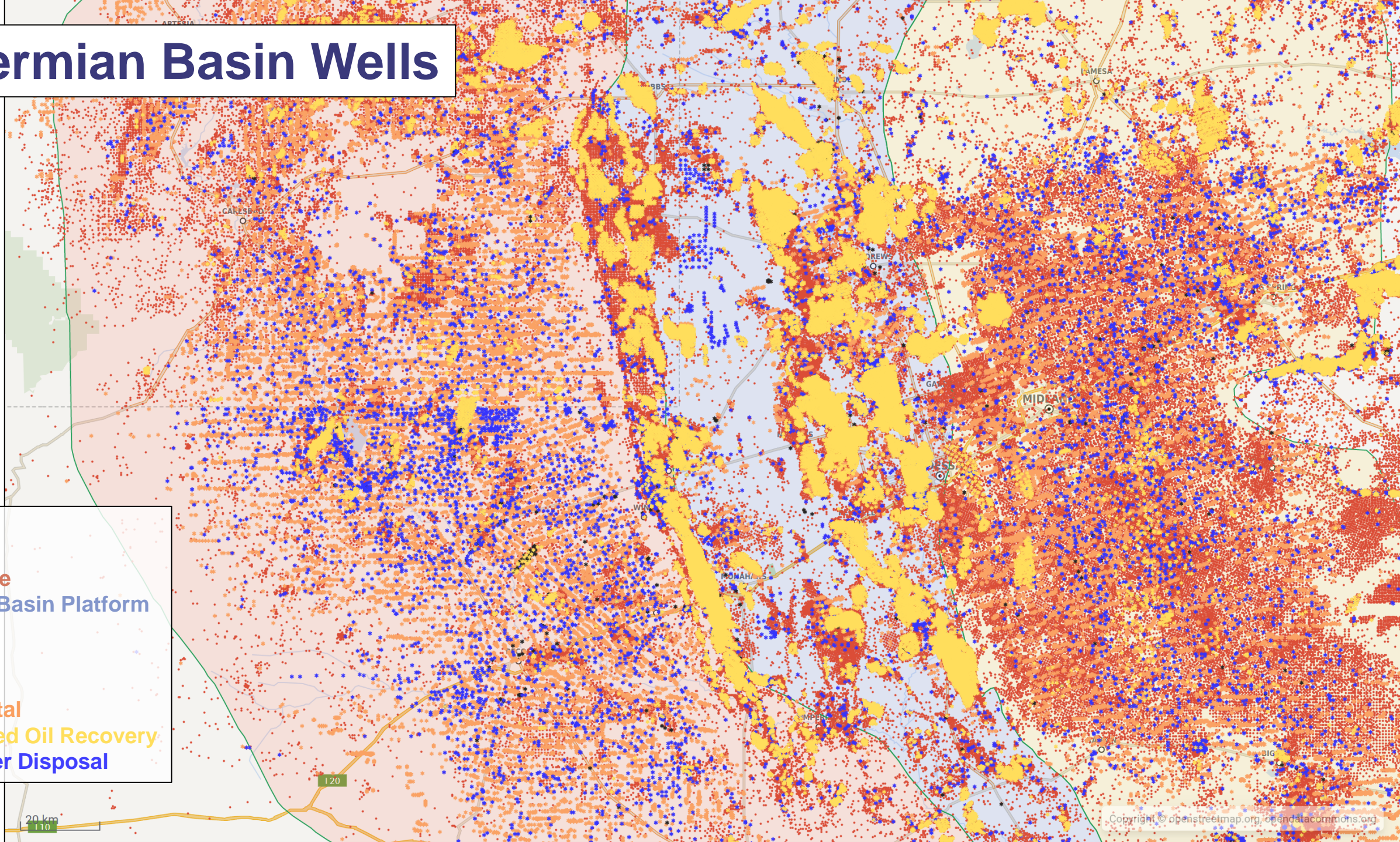
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Permian Basin Wells

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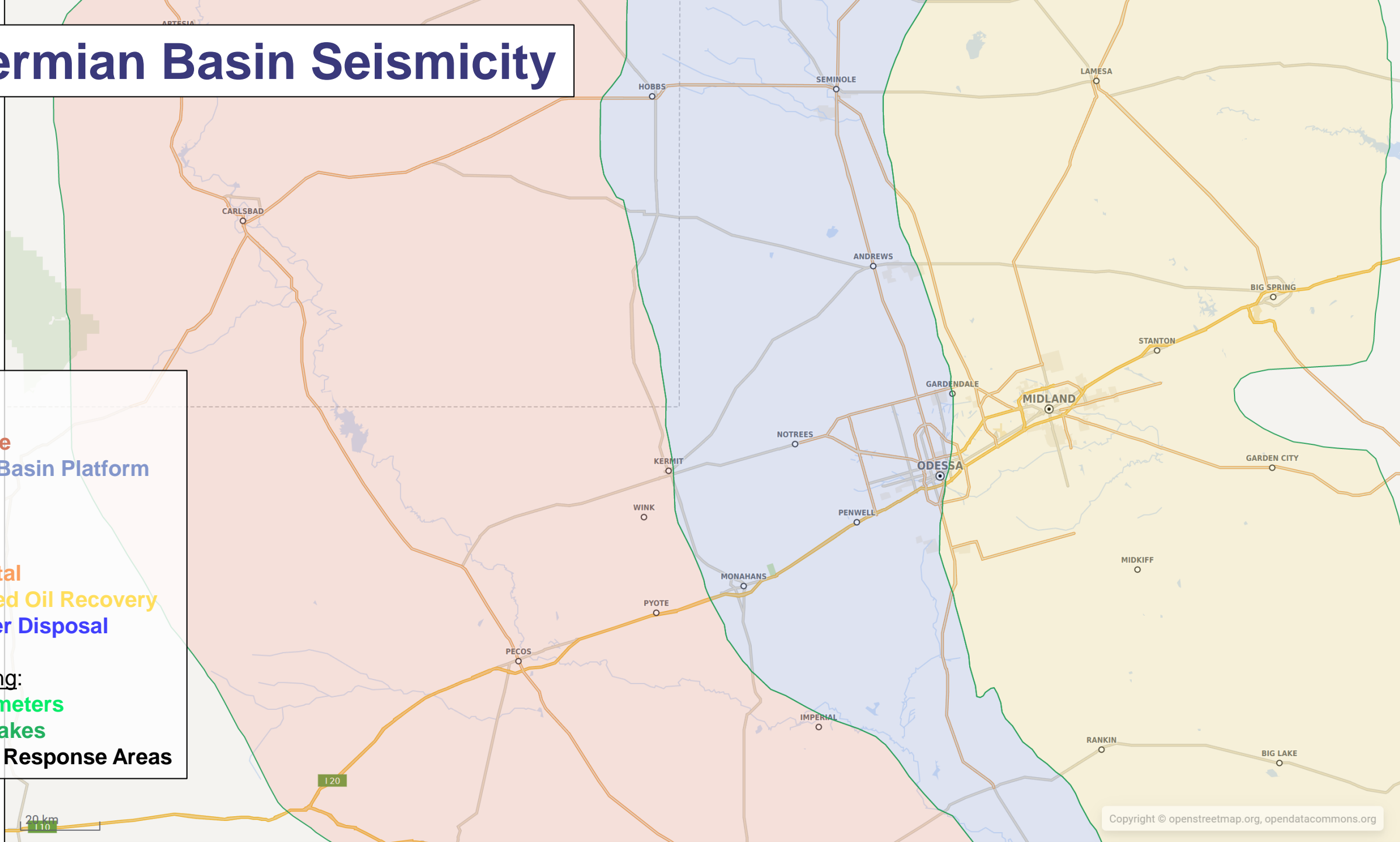
The Permian Basin is monitored

Permian Basin Seismicity

Areas:
Midland
Delaware
Central Basin Platform

Wells:
Vertical
Horizontal
Enhanced Oil Recovery
Saltwater Disposal

Monitoring:
Seismometers
Earthquakes
Seismic Response Areas

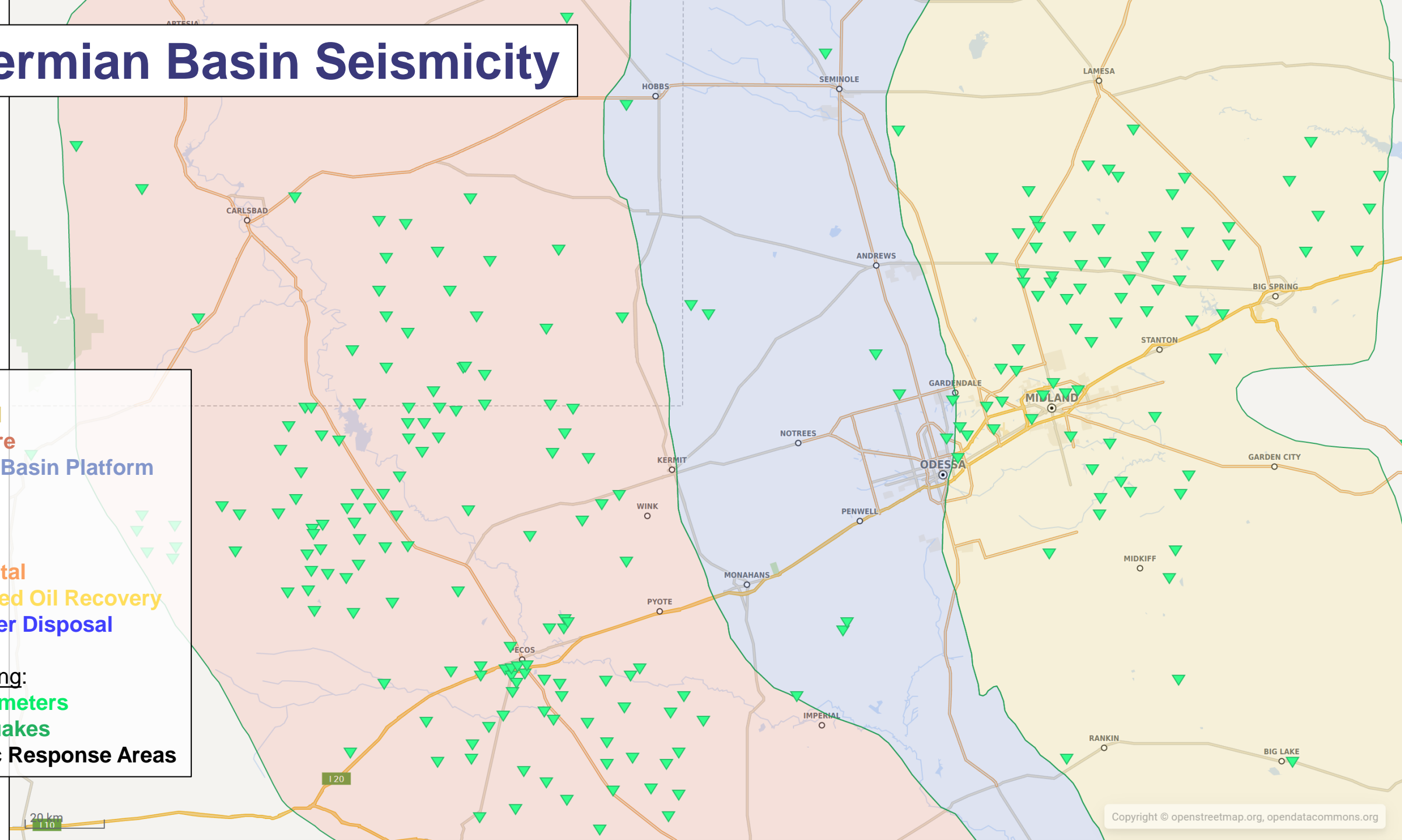


Permian Basin Seismicity

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Permian Basin Seismicity

Areas:

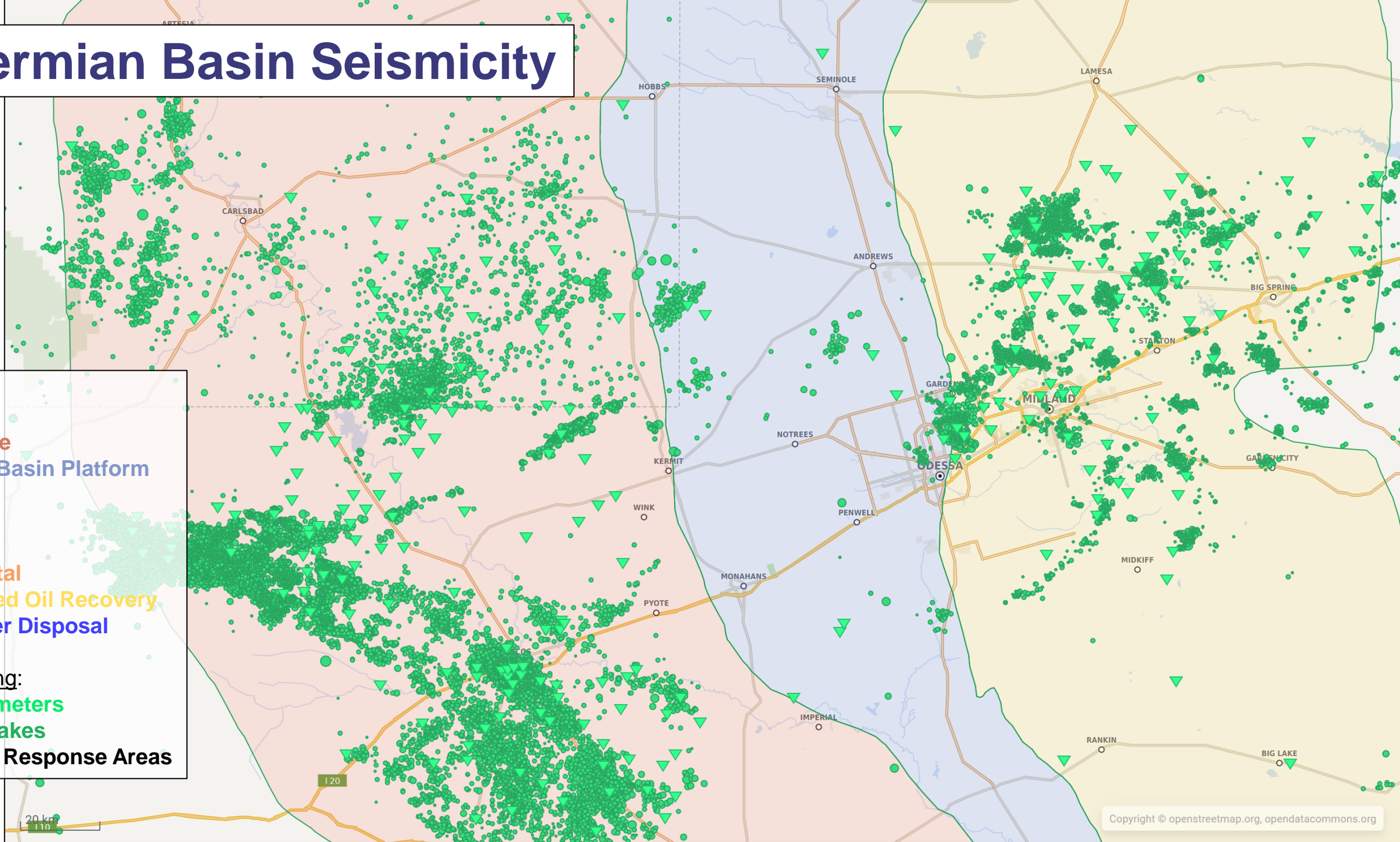
- Midland
- Delaware
- Central Basin Platform

Wells:

- Vertical
- Horizontal
- Enhanced Oil Recovery
- Saltwater Disposal

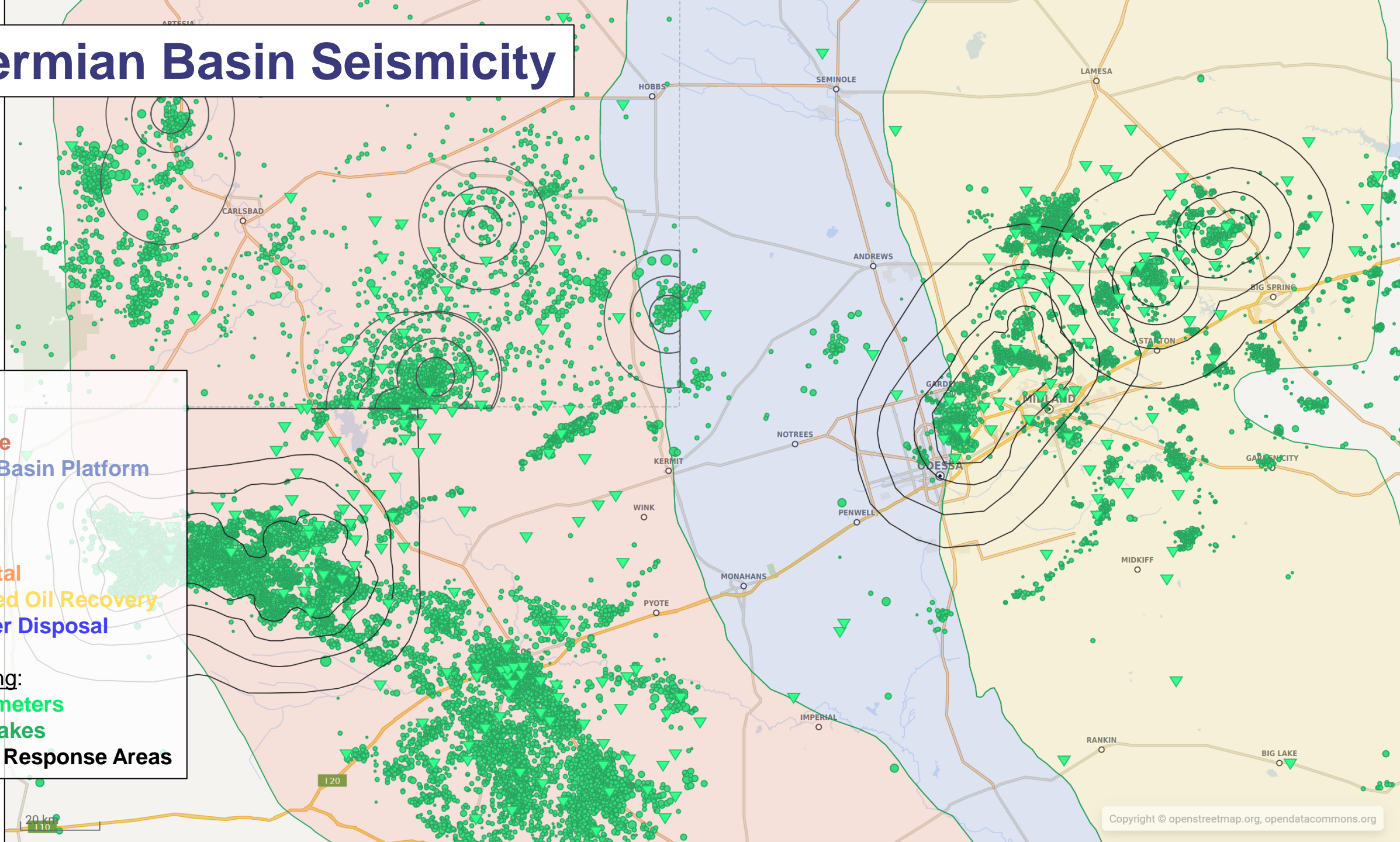
Monitoring:

- Seismometers
- Earthquakes
- Seismic Response Areas



Permian Basin Seismicity

- Areas:**
- Midland
 - Delaware
 - Central Basin Platform
- Wells:**
- Vertical
 - Horizontal
 - Enhanced Oil Recovery
 - Saltwater Disposal
- Monitoring:**
- Seismometers
 - Earthquakes
 - Seismic Response Areas

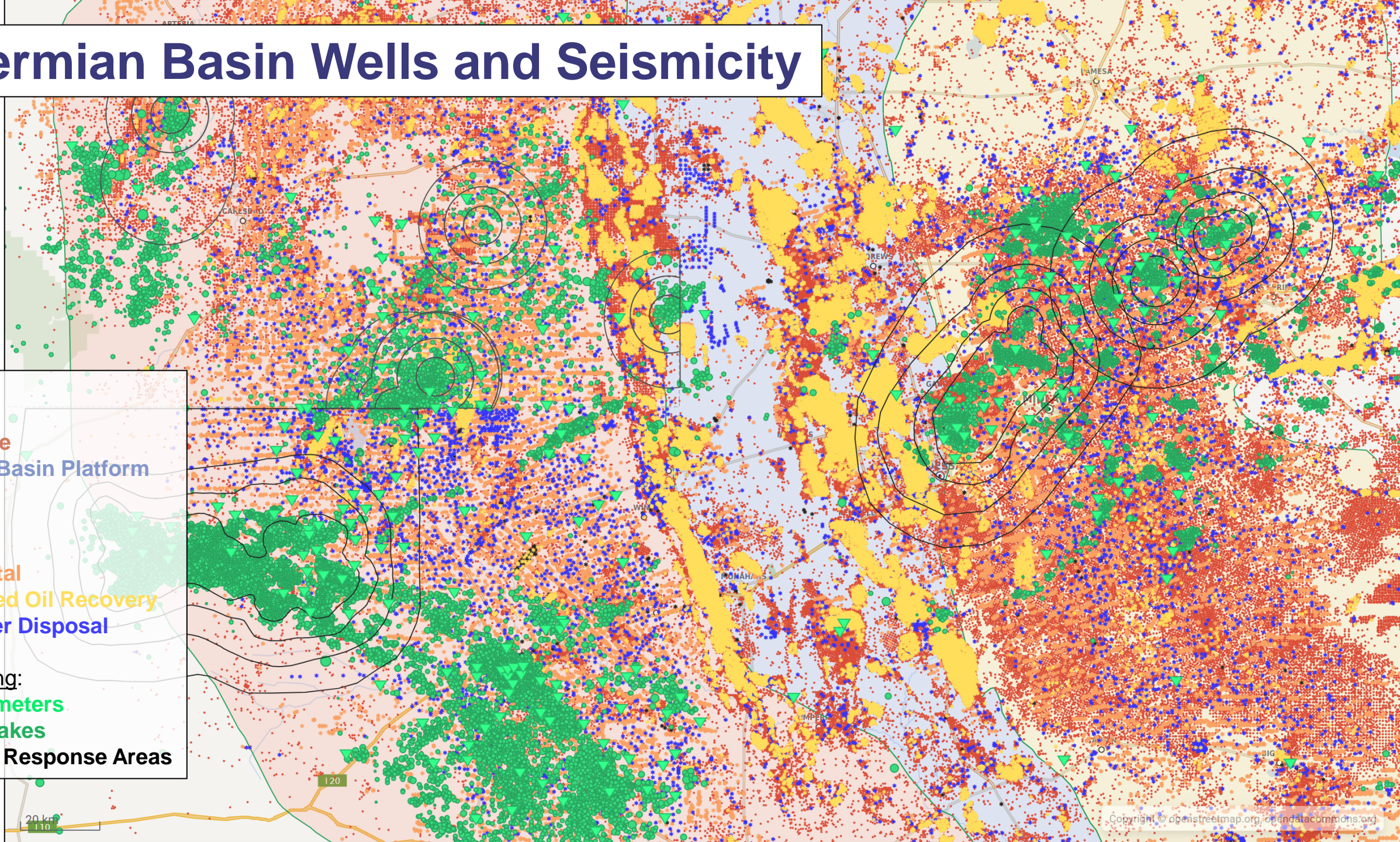


Permian Basin Wells and Seismicity

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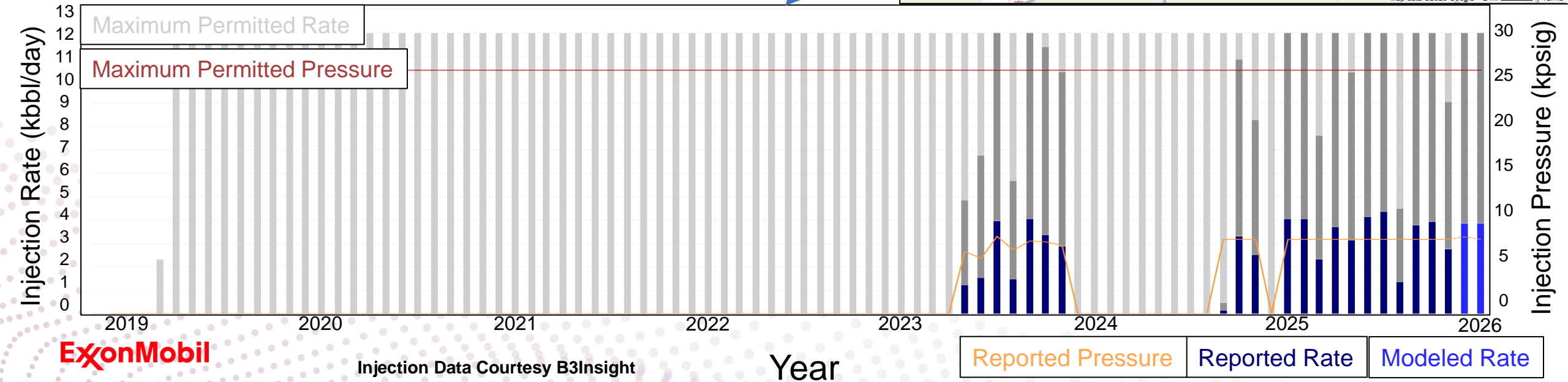
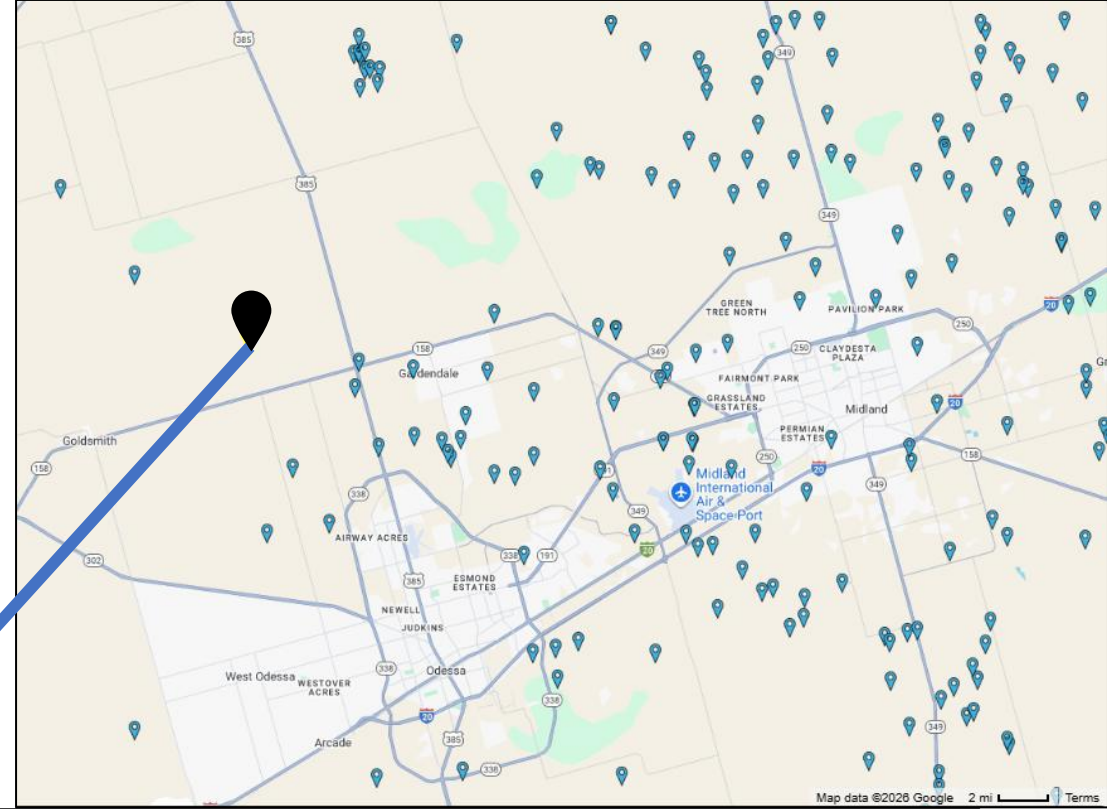




Data is improving

Saltwater disposal reporting

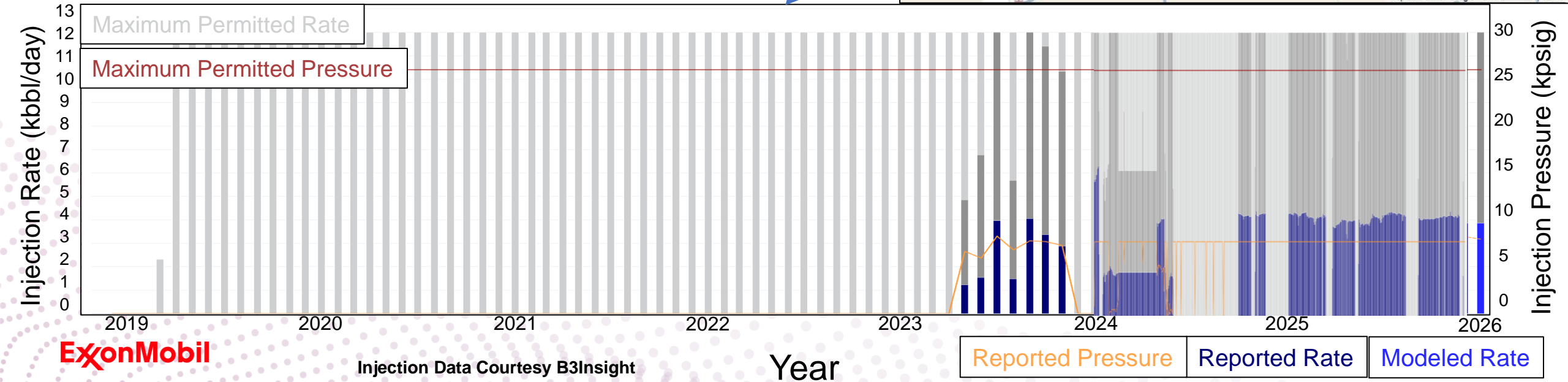
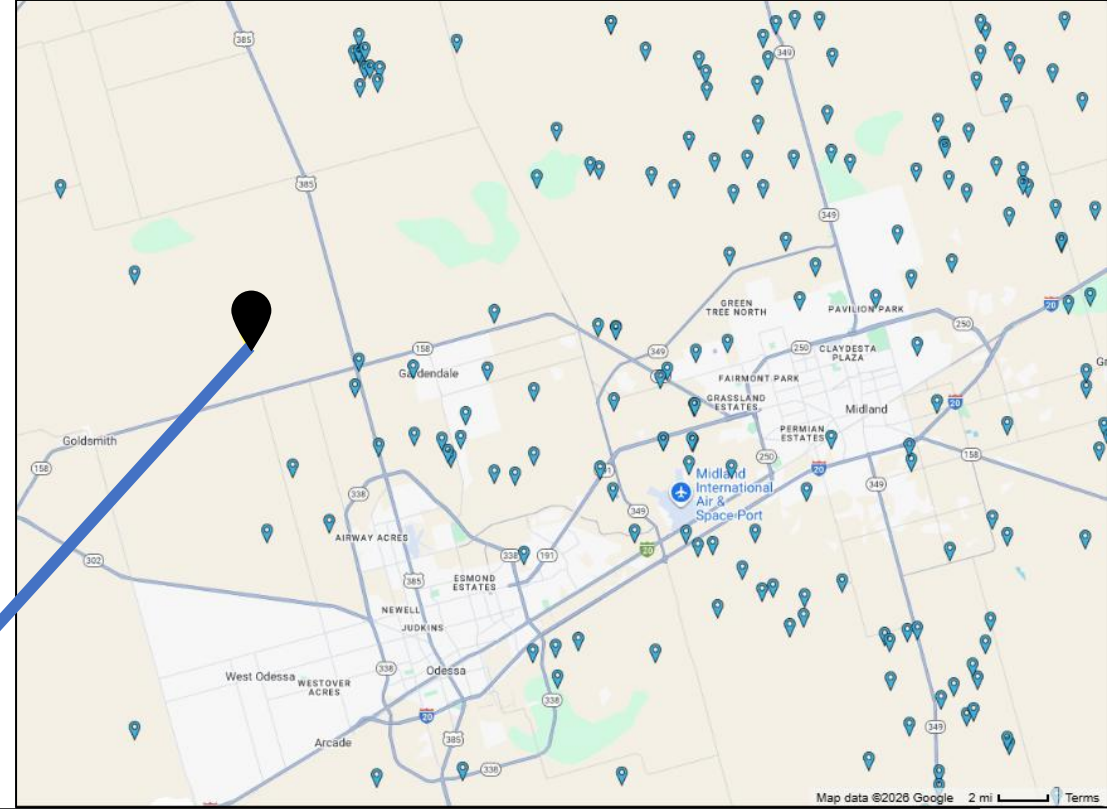
From annual reporting of monthly volumes...



Saltwater disposal reporting

From annual reporting
of monthly volumes...

... to weekly reporting
of daily volumes

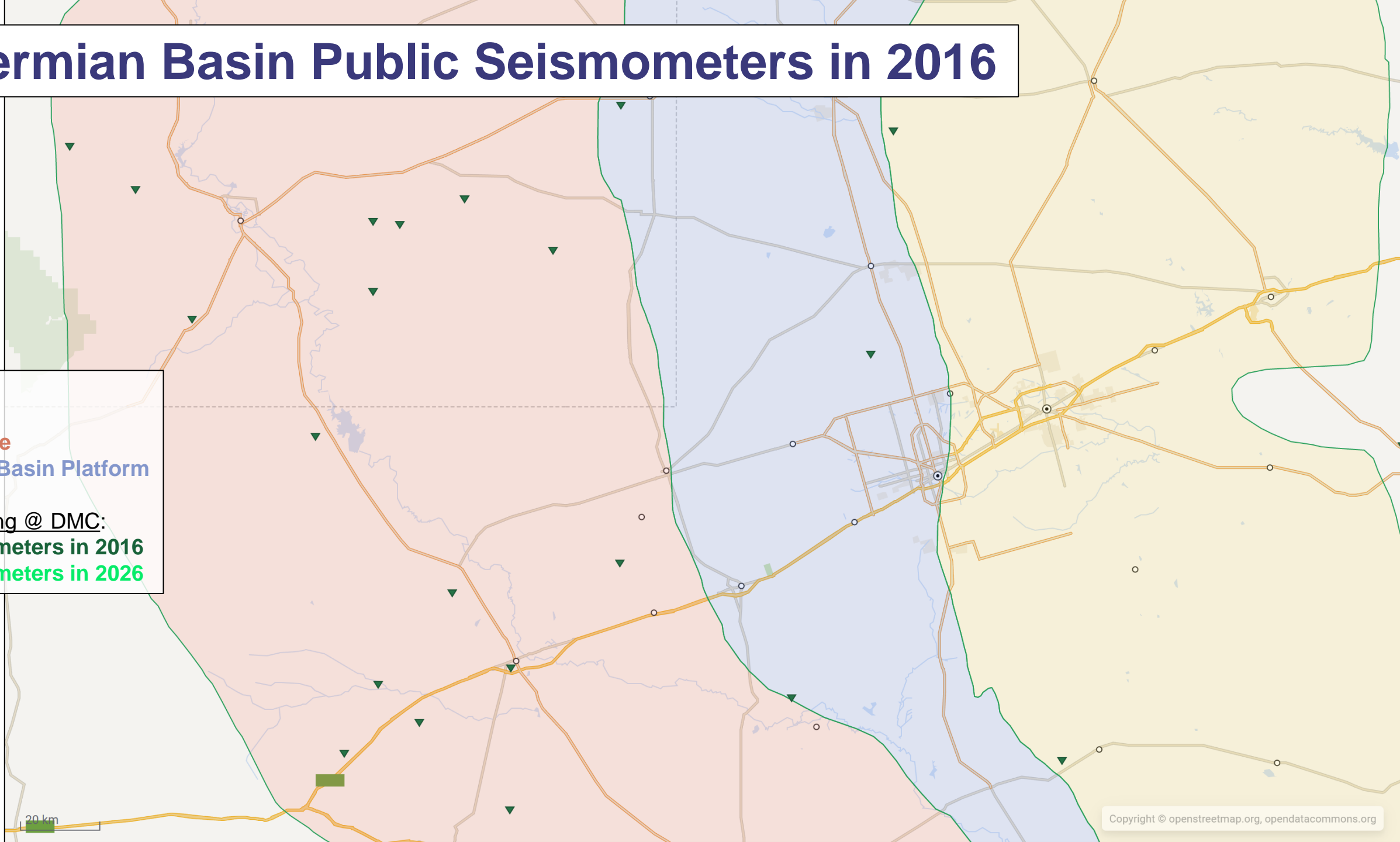


Permian Basin Public Seismometers in 2016

Areas:
Midland
Delaware
Central Basin Platform

Monitoring @ DMC:
Seismometers in 2016
Seismometers in 2026

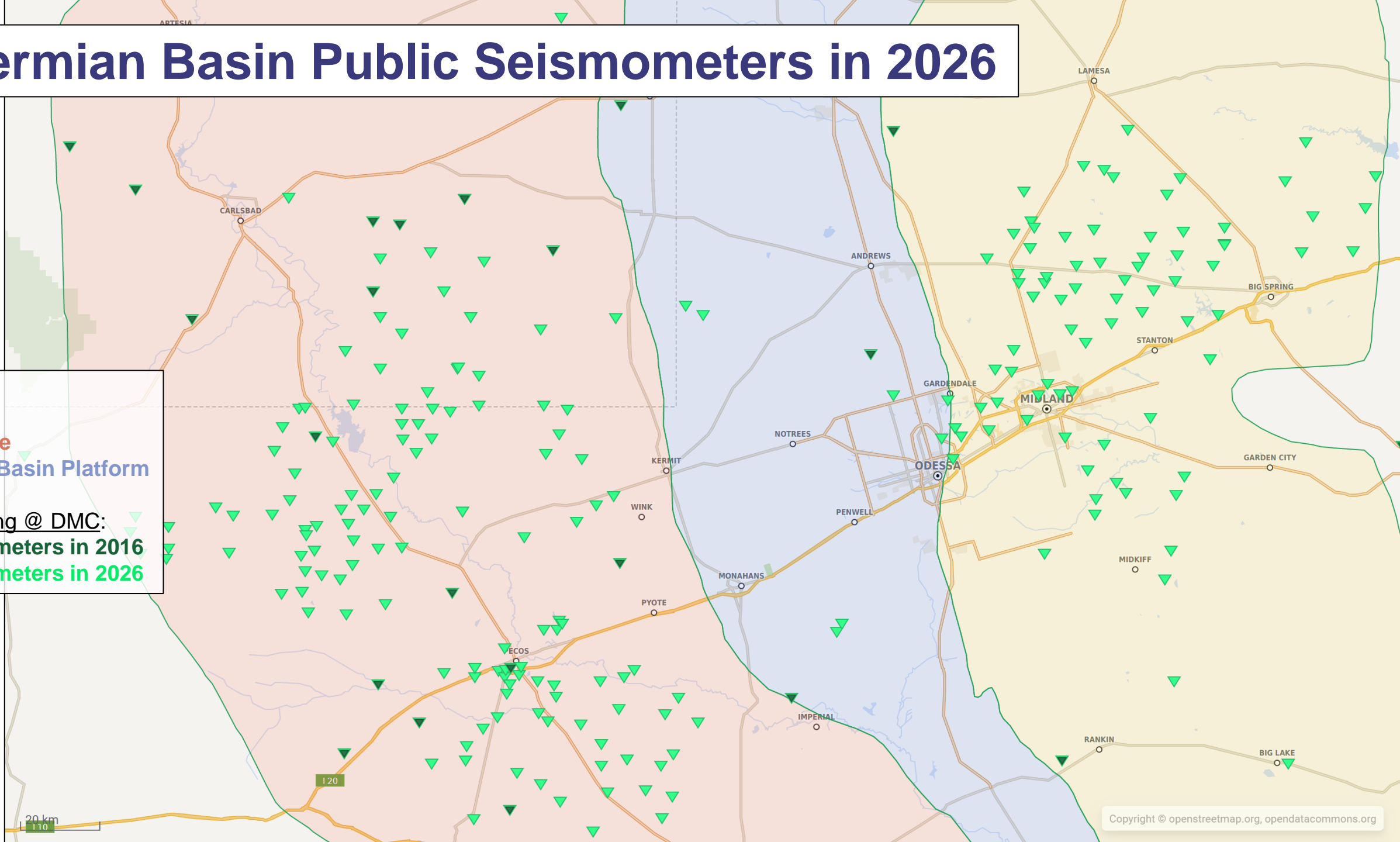
20 km



Permian Basin Public Seismometers in 2026

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Monitoring @ DMC:
Seismometers in 2016
Seismometers in 2026





What can we do with better data?

Analysis requires tools

Tools create insights from data (inputs) to help make decisions

Tools are ideally:

- Based on peer-reviewed publications
- Open-source
- Easy to use for a non-expert

TexNet & ExxonMobil co-developed tools

tools.texnet.beg.utexas.edu

TexNet Software Tools Portal

Welcome to the TexNet Software Tools Portal

The TexNet Software Tools Portal empowers you to assess geoscience and seismology scientific problems using advanced peer-reviewed science tools. Please select a tool below to begin your analysis.

Geomechanical Injection Scenario Toolkit

Plan and forecast injection scenarios with a comprehensive toolkit for analyzing geomechanical impacts.

1.0

GIST + □

Reactive

Fault Slip Potential

Assess the likelihood of fault slippage due to subsurface activities with modeling tools designed for seismic risk mitigation.

3.2

FSP + □

Proactive

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All models are wrong, but some are useful.

- George Box, 1976