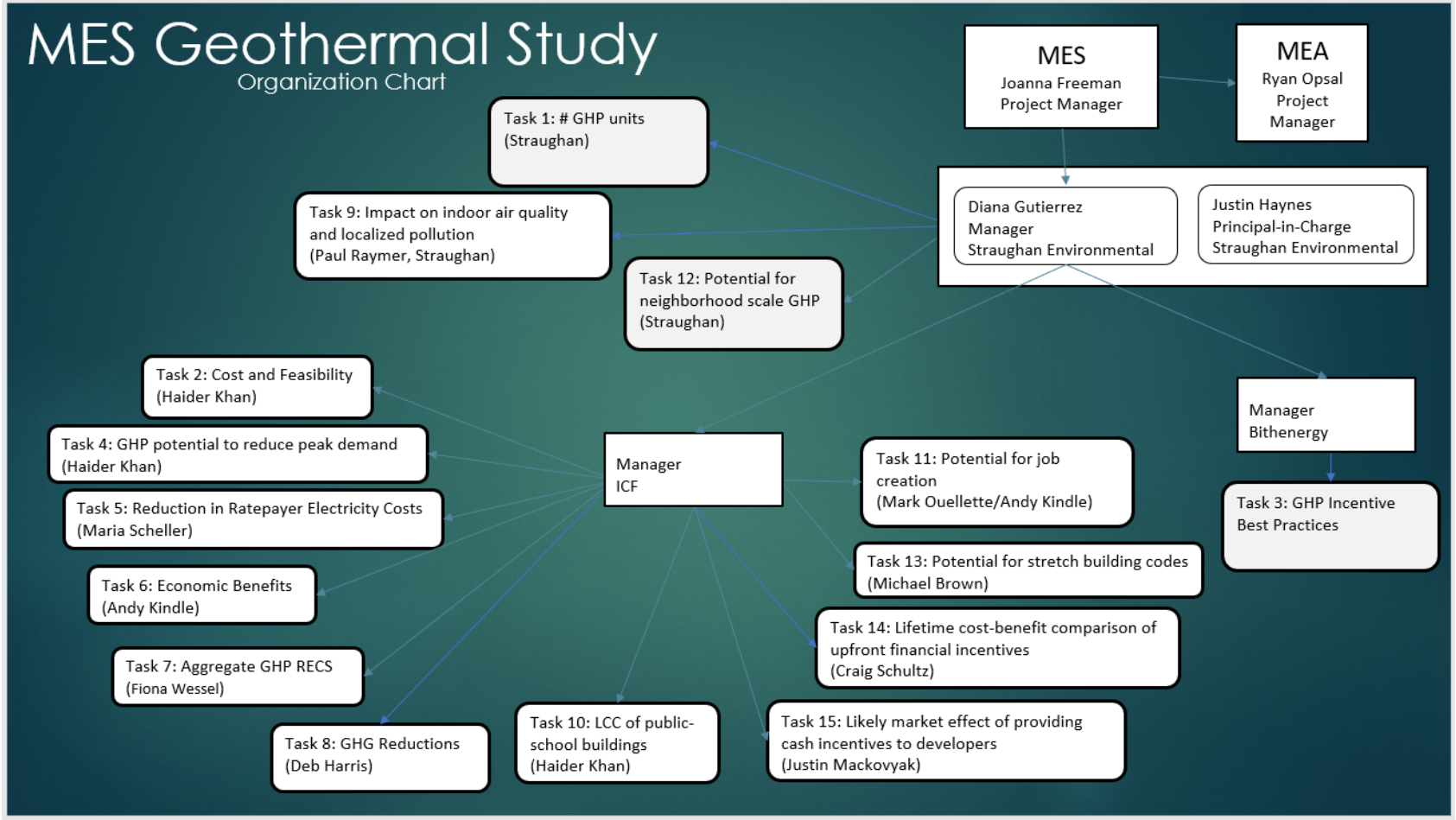
Geothermal Study for the Maryland Energy Administration

CURRENT STATUS PRESENTATION TO THE MEA WORKING GROUP

FRIDAY AUGUST 19, 2022

Organizational Chart



Task 1: Number of geothermal heating and cooling units currently operating in Maryland

Data Sources

- County Health Department Data – geothermal well permits (8 of the largest counties) & FOIA requests
- MDE excel spreadsheet on all well permits (2020) - used cut-off date of 1975 through present
- MEA excel spreadsheet – from renewable energy grant programs only (ZC & county data only)

Assumptions

- 1975 cut-off date, assuming installed wells are still operating
- Only considered closed loop GHSP systems (less than 1% of wells for GSHP were open loop)
- Classification: residential, commercial, county/local, federal/state, schools

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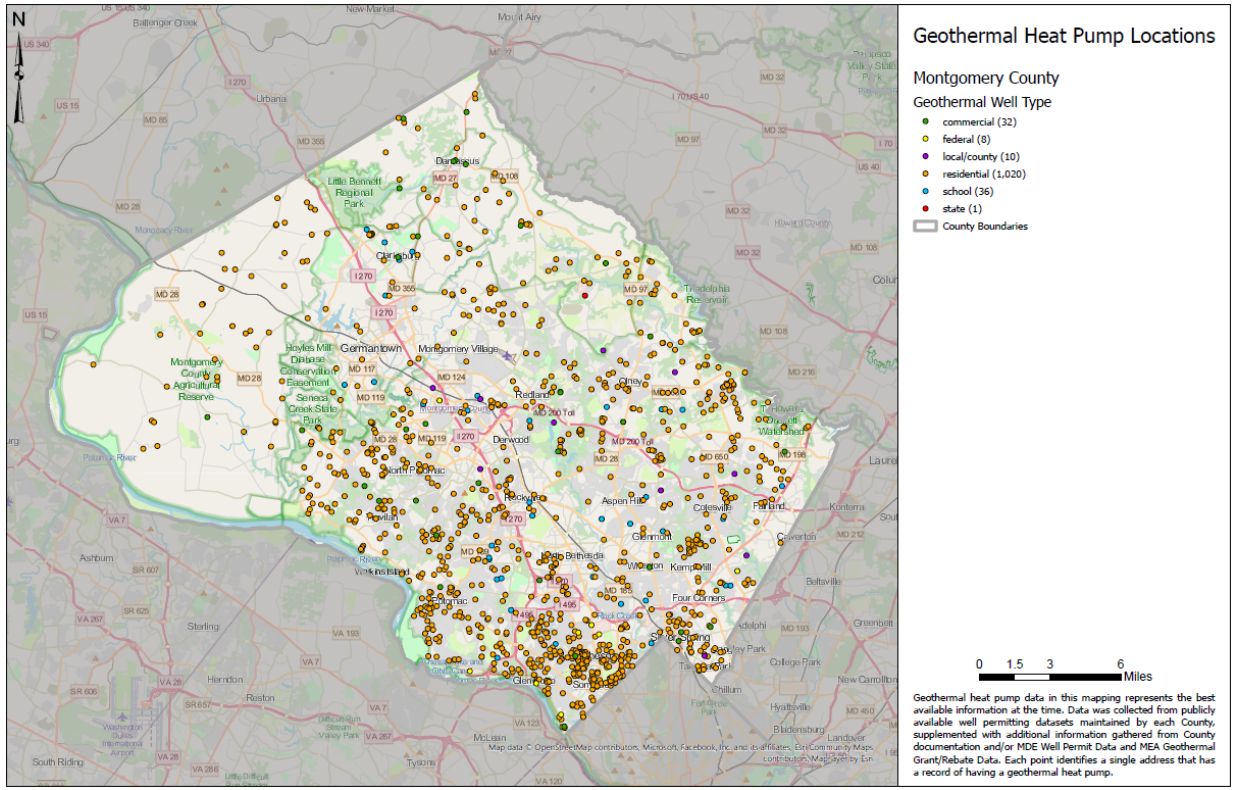

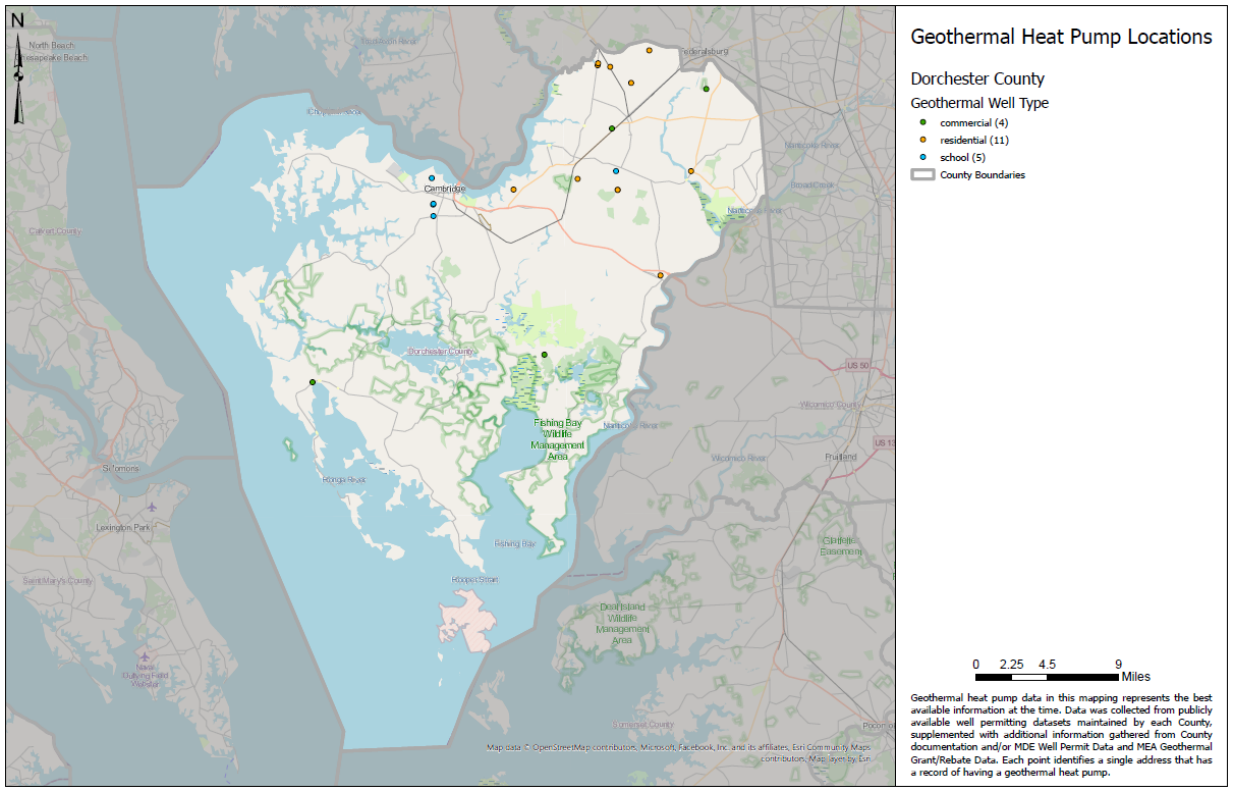

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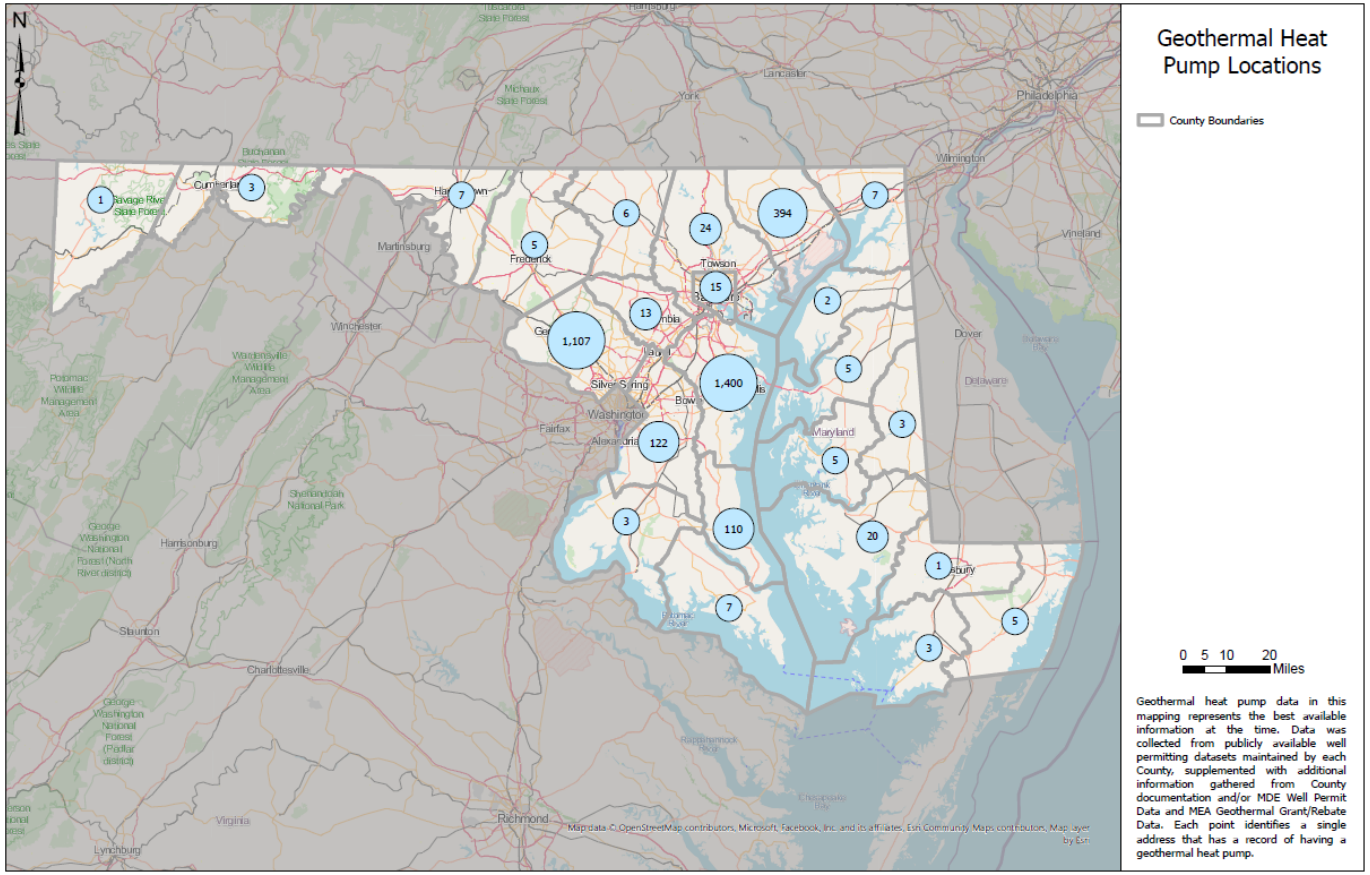

Geothermal Heat Pump Locations in Maryland	
Name of County	Total Number of GHP Units
Allegany	3
Anne Arundel	1,400
Baltimore City	15
Baltimore	24
Calvert	110
Caroline	3
Carroll	6
Cecil	7
Charles	3
Dorchester	20
Frederick	5
Garrett	1
Harford	394
Howard	13
Kent	2
Montgomery	1,107
Prince George's	122
Queen Anne's	5
Somerset	3
St. Mary's	7
Talbot	5
Washington	7
Wicomico	1
Worcester	5
Total	**3,268**

Task 3: National and international best practices designed to incentivize the use of geothermal heating and cooling systems

- Rebates
- Tax Credits
- Pilot Programs
- Statewide Mandates to reduce GHG emissions

Task 9: Impact of geothermal heating and cooling system on indoor air quality and **localized pollution**

- Environmental impacts focused on – air, water, thermal, light, soil pollution
- Limited negative environmental effects
  - Soil contamination from refrigerants
  - Thermal pollution can affect soil ecosystems and microhabitats, changes in soil chemistry
  - Noise pollution during construction

Task 12: Potential to build neighborhood-scale district geothermal systems or convert existing utility infrastructure to be provided to an entire community

- Existing neighborhood-scale district GSHP systems is nascent
- Efforts center around scaling up systems from individual to community level to allow for load sharing to increase system efficiency
- Examples include:
  - several communities Oregon and California
  - Colorada Mesa University campus GSHP system
  - High School campus in Utah
  - New York has a large-scale pilot program (ConEd)
  - Massachusetts (Eversource Energy) - Framingham 2-yr pilot program
  - Mass. Non-profit (HEAT) researching scaling up geo-micro districts (at the study stage)
  - DOE – Community Geothermal H & C Design and Deployment Funding Opportunity (300K – 13M)