Global GIS Mapping of Ocean Multi-Use Potential with Offshore Wind and Tourism

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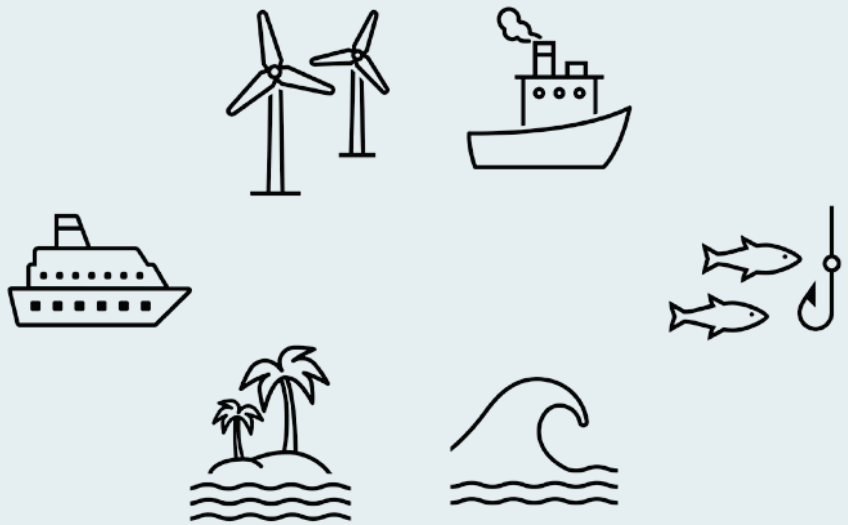
Ocean Multi use

- A way to better use highly-contested, finite ocean space
- Different ocean users functioning jointly
- Ensuring long term and added benefits



Sustainable ocean usage is possible with investment in Multi-use

This Project: Offshore Wind and Tourism

- Offshore wind and tourism often compete
  - Leads to a dedicated use of the other
  - Either offshore wind *or* tourism

But what if we identify locations that can support this tourism energy and clean energy instead?

Where is there potential to combine offshore wind and tourism?

Methods

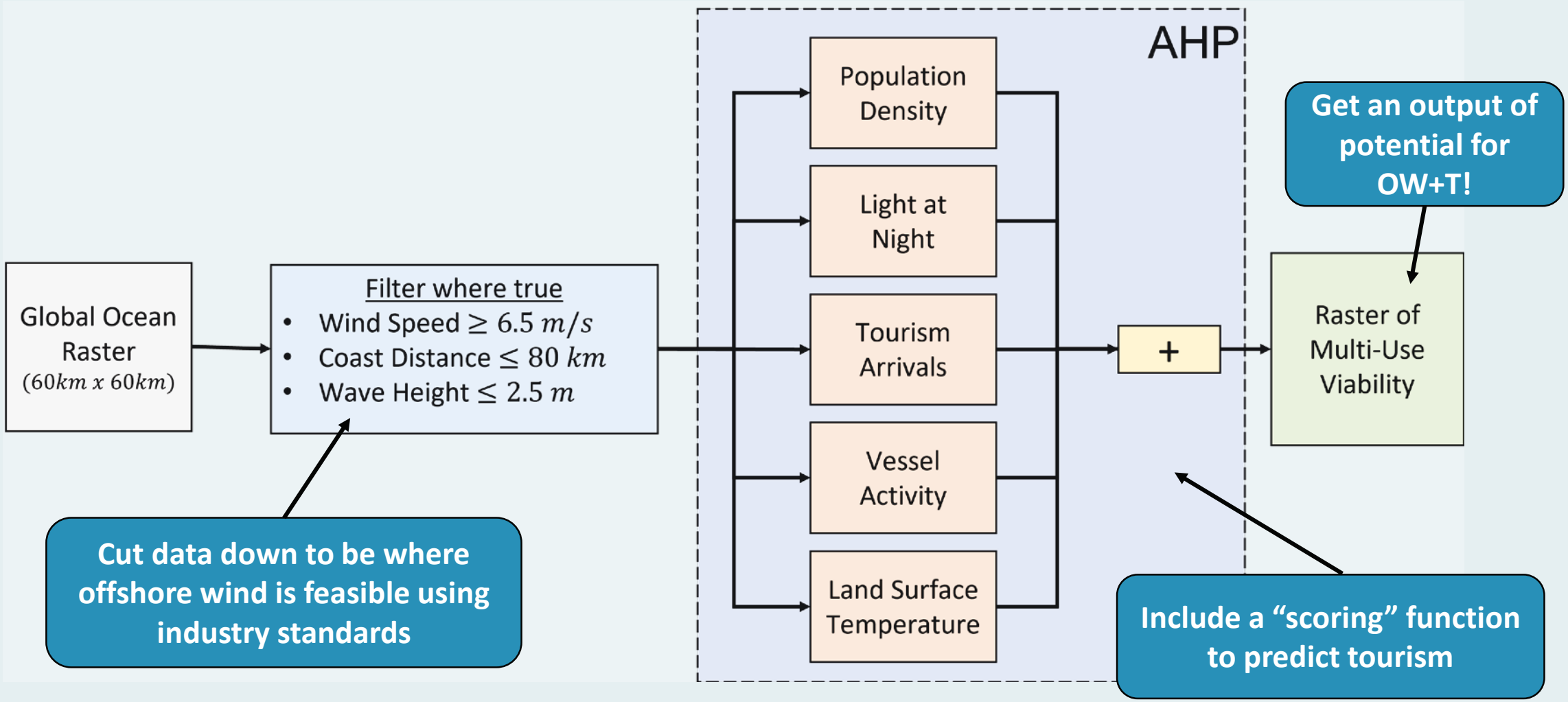
- Identify potential for Offshore Wind and Tourism (OW+T) Multi-Use on the ***Global Scale***
  - By using global dataset – we can compare ideal locations for targeted studies.

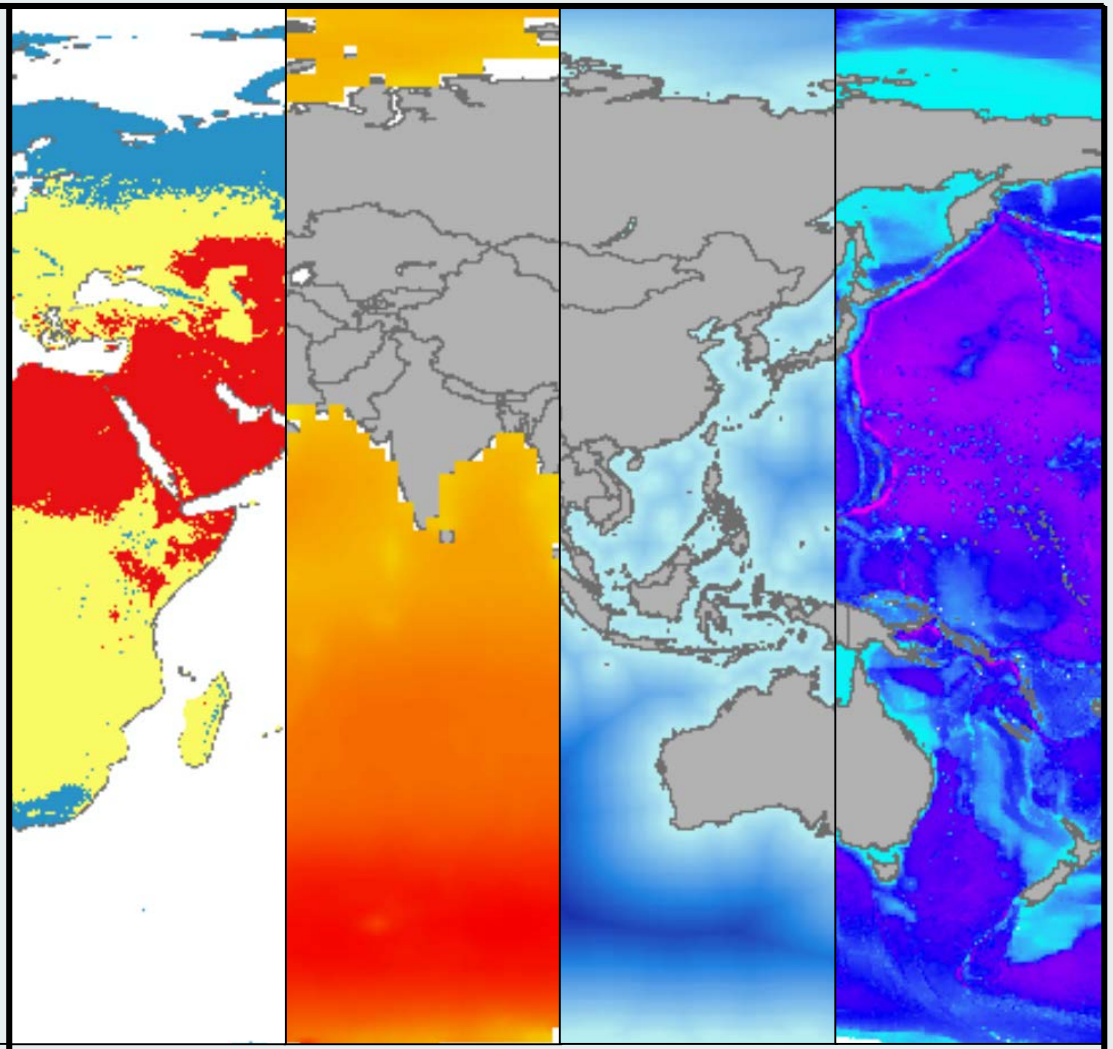
- Process:
  - Select criteria and features
    - On the global scale
  - Aggregate into a multi-use potential score
    - Use Analytical Hierarchy Process
  - Visualize the results

Aggregate many source of global data to indicate areas to support OW+T

- Find data which represents potential for + **Offshore Wind Energy** and **Tourism**

Methods cont.





(1) Wind Speed

(2) Social Data

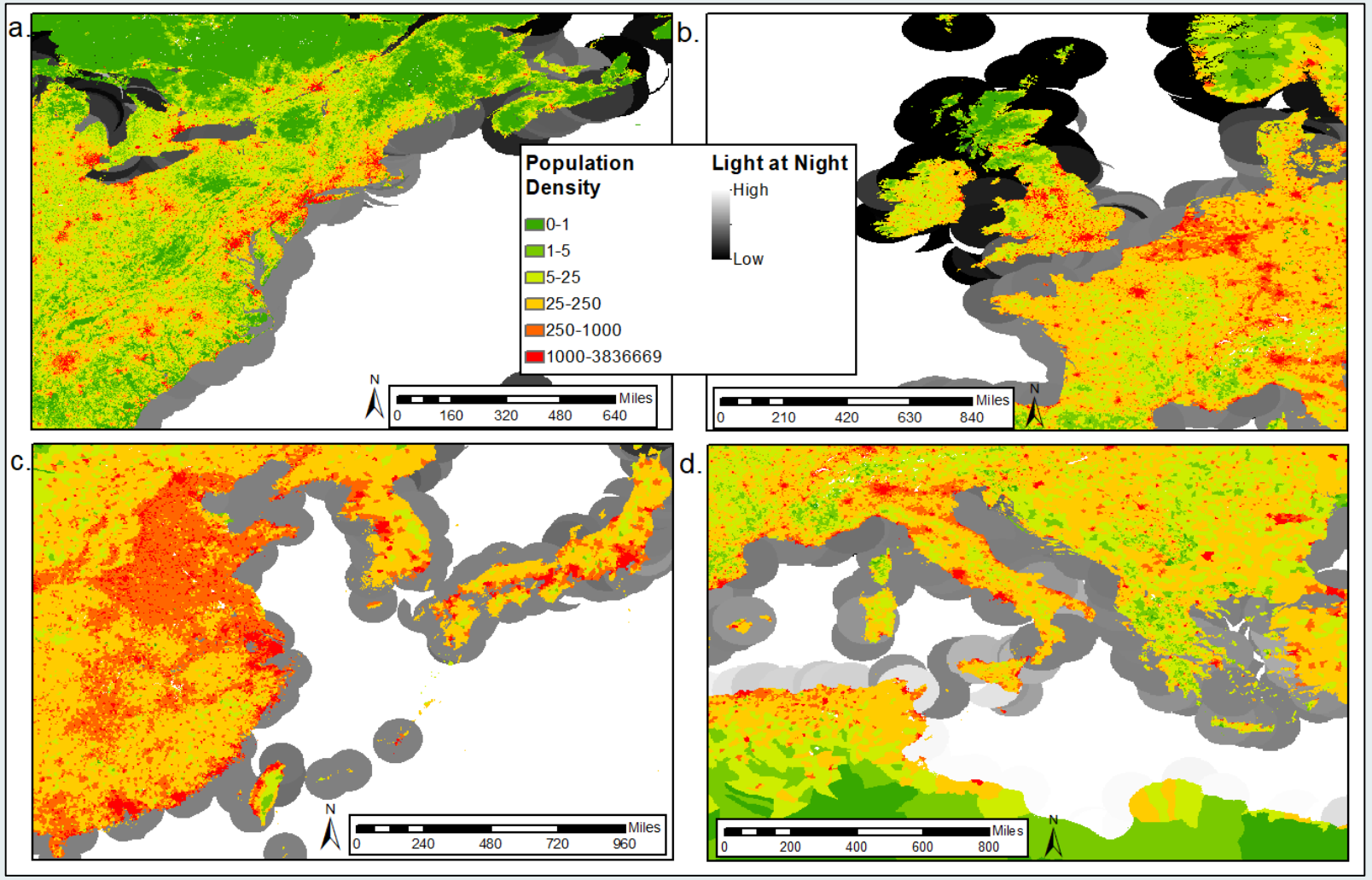
- Population Density
- Light at Night
- Ship Activity
- Tourism Arrivals

(3) Other Environmental Data

- Temperature
- Wave Height
- Distance from Shore
- Water Depth

Global Tourism Potential

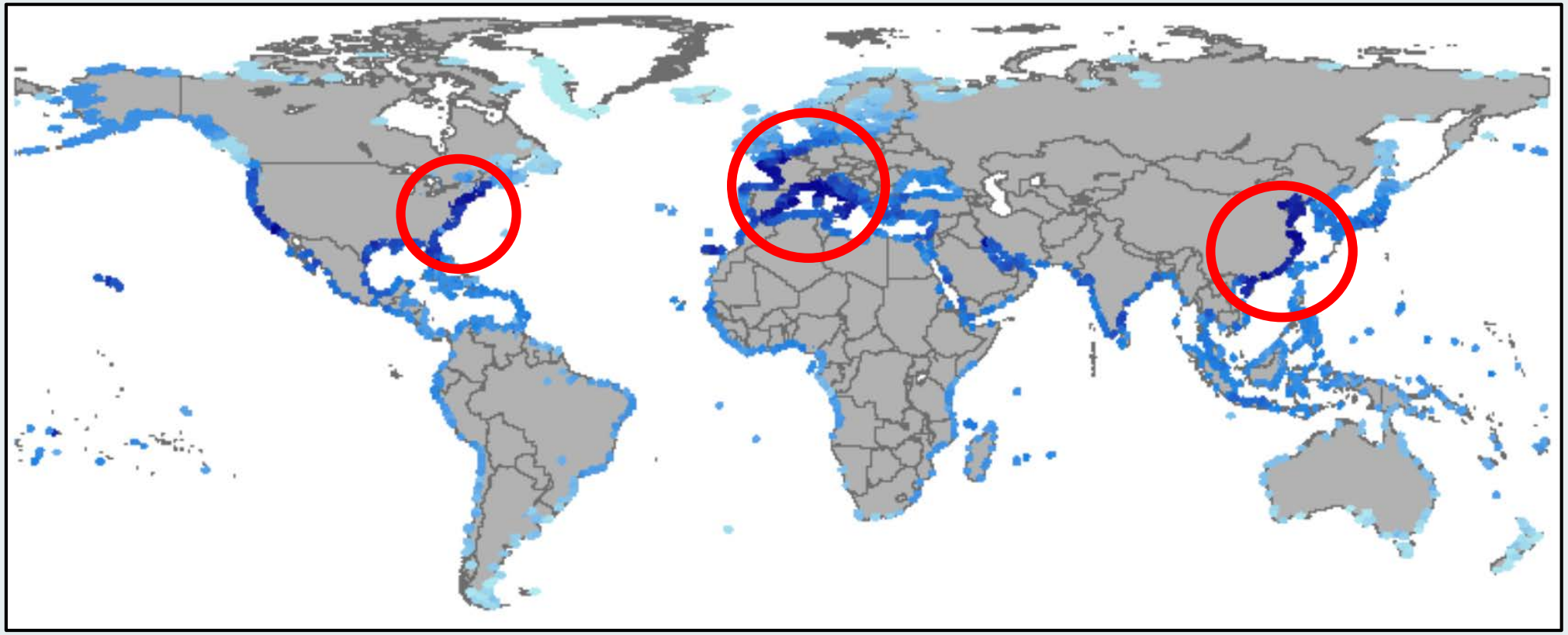
Light at Night and Population Density predict for tourism potential – Extrapolated out to the ocean



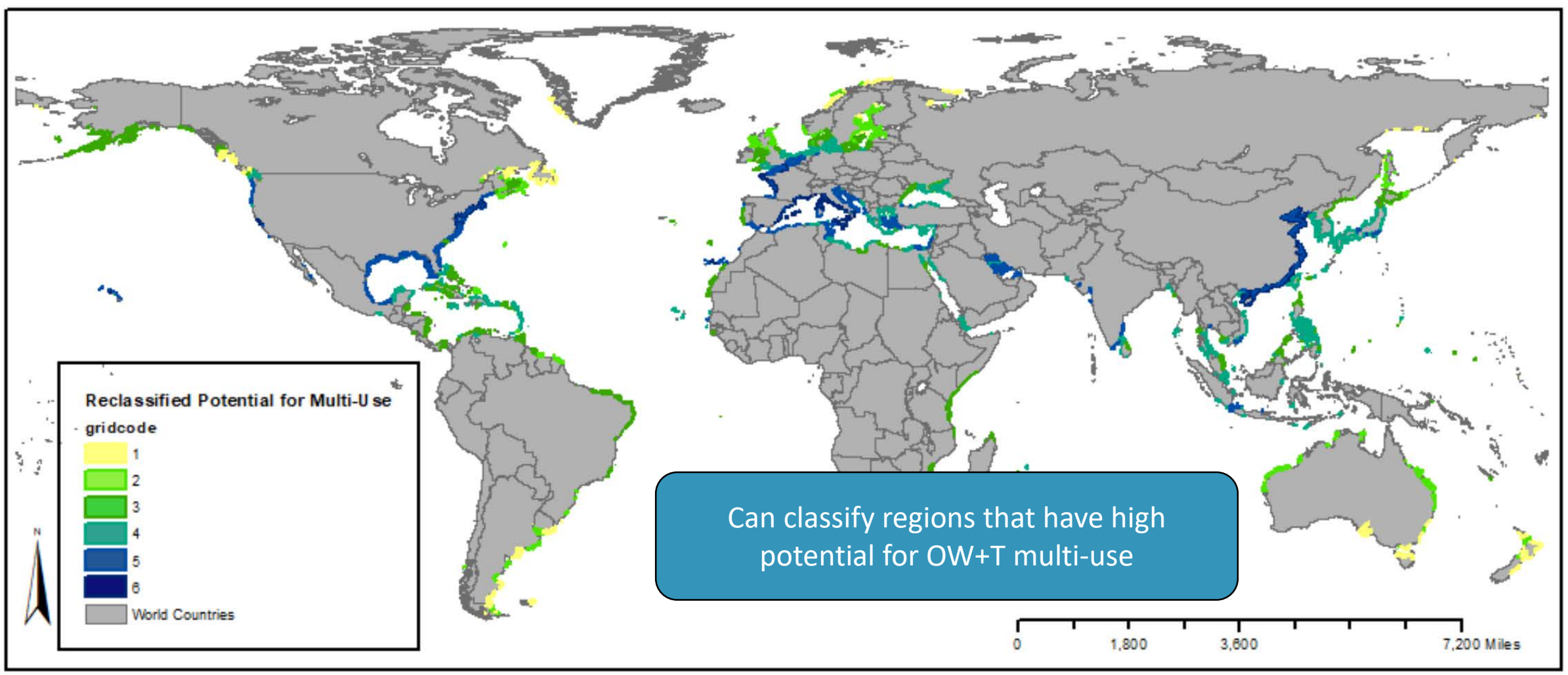
Results – Total Score

- Areas with the most potential are circled in red
  - Low population limits potential in many areas

Find differences throughout the global which are a result of the combination of many global data sets!



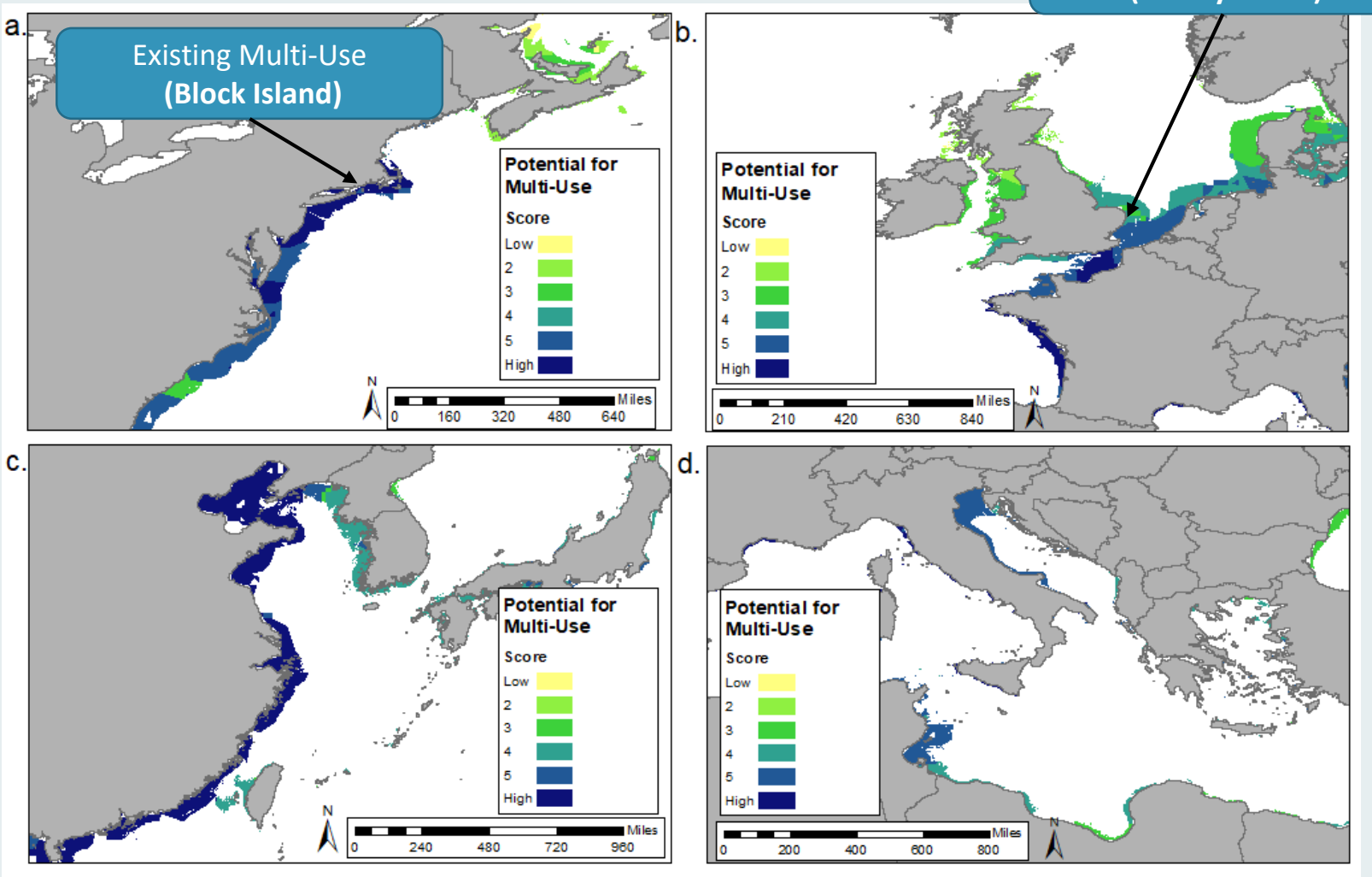
Results – Classified Regions



Can classify regions that have high potential for OW+T multi-use

Results – Targeted Regions

Able to identify regions which have varying levels of potential and validate scoring!



Next Steps

- Include more in-depth tourism indications
  - Economic data from paid sources.
  - Higher-fidelity investment data sets which include more detail than tourism indicators used.
- Transition to local areas
  - Instead of limiting to exclusively global dataset – consider transitioning to local nuances given this initial best guess for a good location.
- Make data more accessible
- Explore impacts of climate change on these variables
  - Identify regions which are tolerant to climate change by including climate forecasting into the model.

OCEAN SCIENCES MEETING 2022

Thank You!

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Questions?

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