

Technology to Fill Data Gaps at Sea

*Benefiting food security, the environment,
labor rights, and national security.*

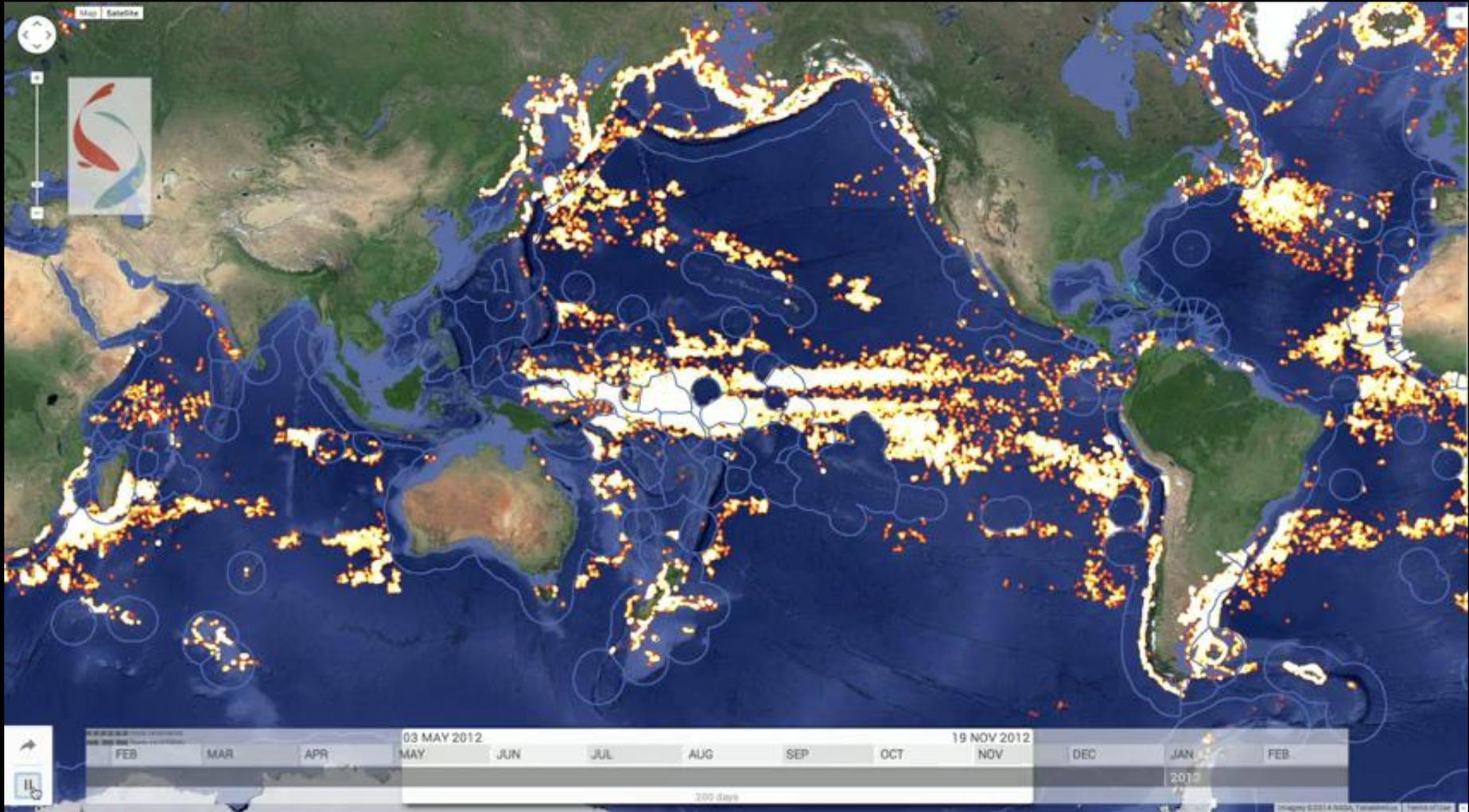
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Current State of Fisheries

- $\geq 80\%$ of world fish stocks are fully or overexploited
- A need to feed our planet: nearly 1 billion people are under-nourished
- Global fish production has increased steadily at $>3\%$ annually over the last 50 years, outpacing population growth
- Pervasive problems with IUU (illegal, unreported, and unregulated) fishing and slavery/trafficking/labor rights within both large-scale and small-scale fleets
- Common misconception: “no viable solutions for an enormous ocean full of small boats”

**All statistics from the Food and Agriculture Organization (FAO) report
“State of World Fisheries and Aquaculture 2014”*

Satellite Data: Starting to Paint a Picture of Fishing



Global Fishing Watch (data from 25,000 vessels over 2 years)

95% of the **5 Million** Boats Globally are Invisible

Challenge:

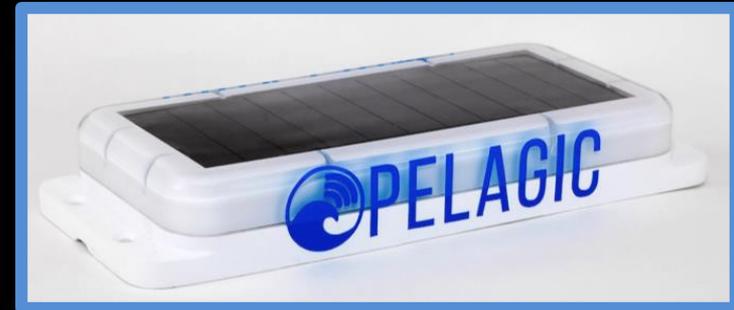
Put **all** vessels on the map to improve fisheries management, the livelihoods of fishers, and the environmental sustainability of our marine resources.





Global Data Solutions for Fisheries

- Ultra-light vessel tracking system features low-cost, rugged sensors
- Monitors fleet location, activity, storage temperature, catch methods, and vessel to vessel interactions
- Integrates with any existing traceability or analytics platform



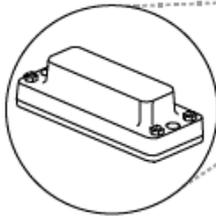
**Facilitating vessel-to-shore
traceability and sustainable management**

Technology Architecture

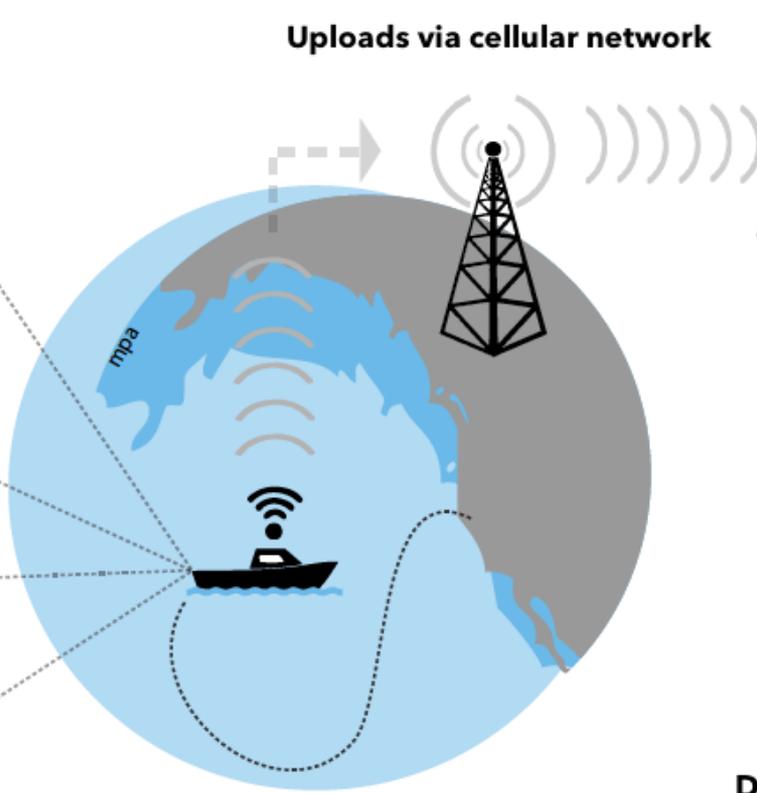
**Solar-powered device,
automatic data collection,
simple installation**



**Application-specific
wireless sensors**



Uploads via cellular network



Cloud-based data analytics



**Data visualization and alerts
on a customizable dashboard**

Appropriate for Vessels of Any Size



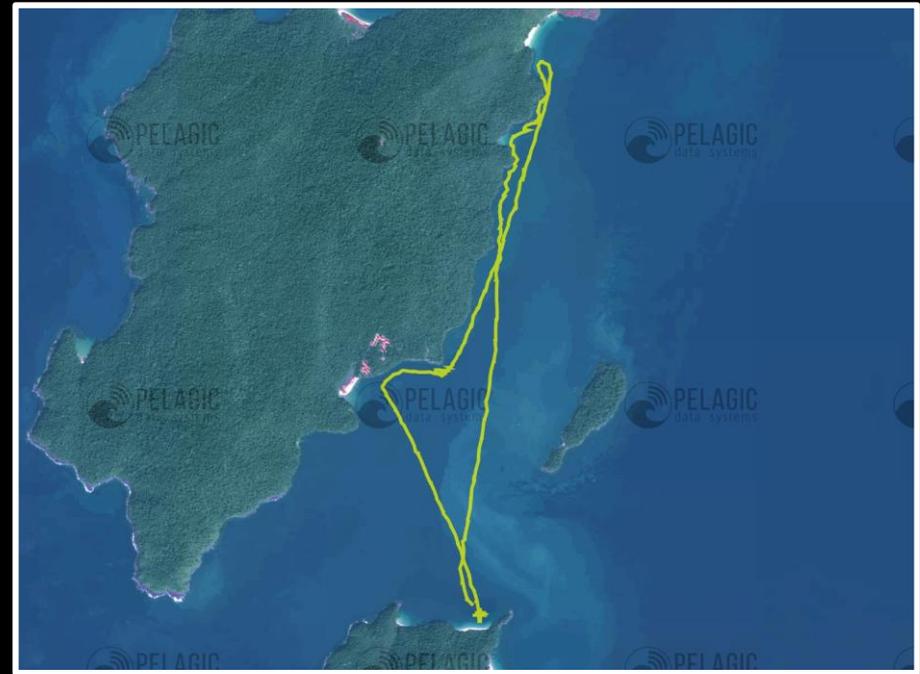
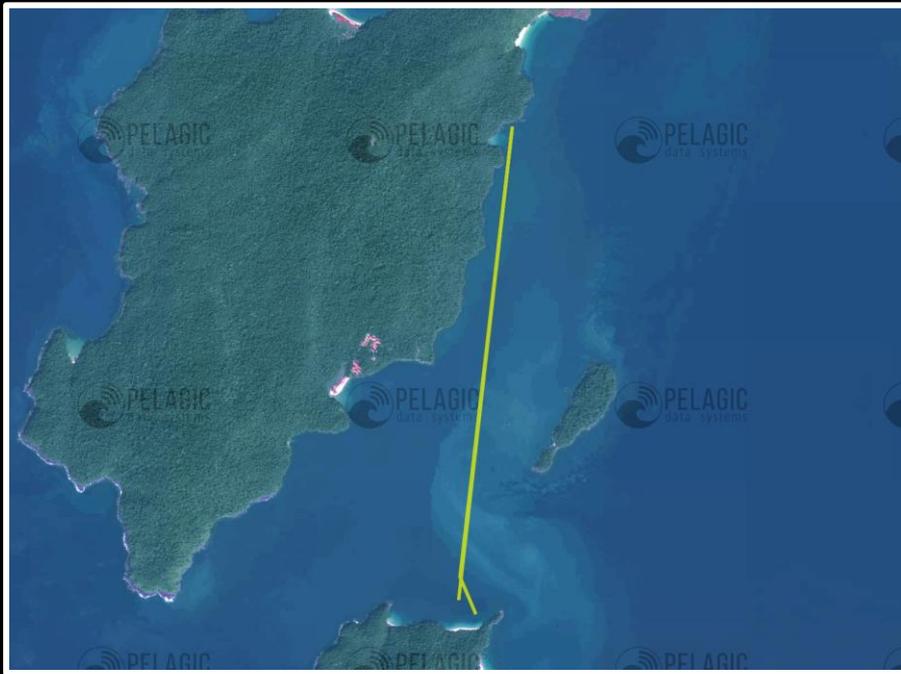
From GPS Points to Behavior



Benefits of High Data Density

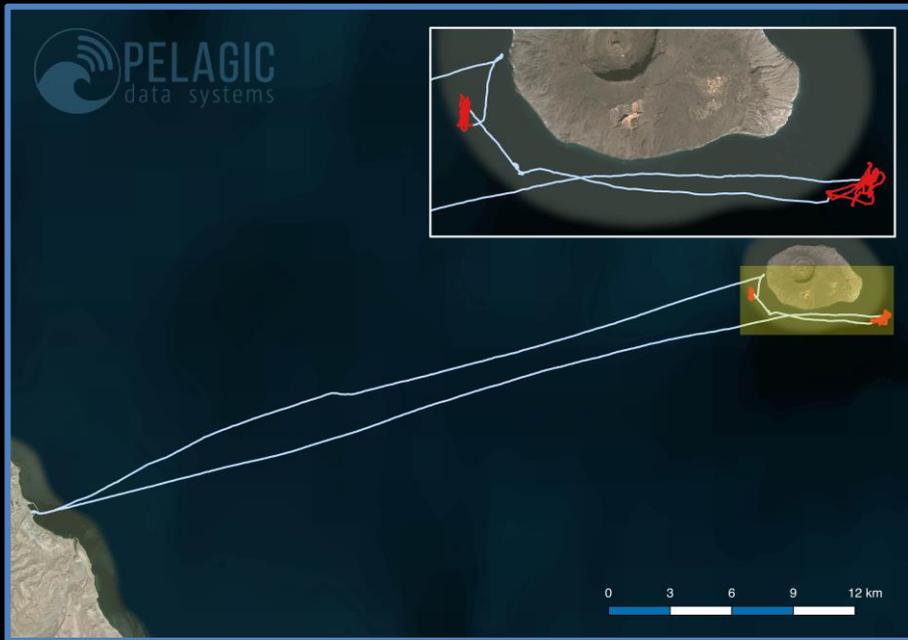
1 Location per Hour
(traditional satellite VMS)

>600 Locations per Hour
(from Pelagic Data System)



Identify Fishing from Different Gear Types

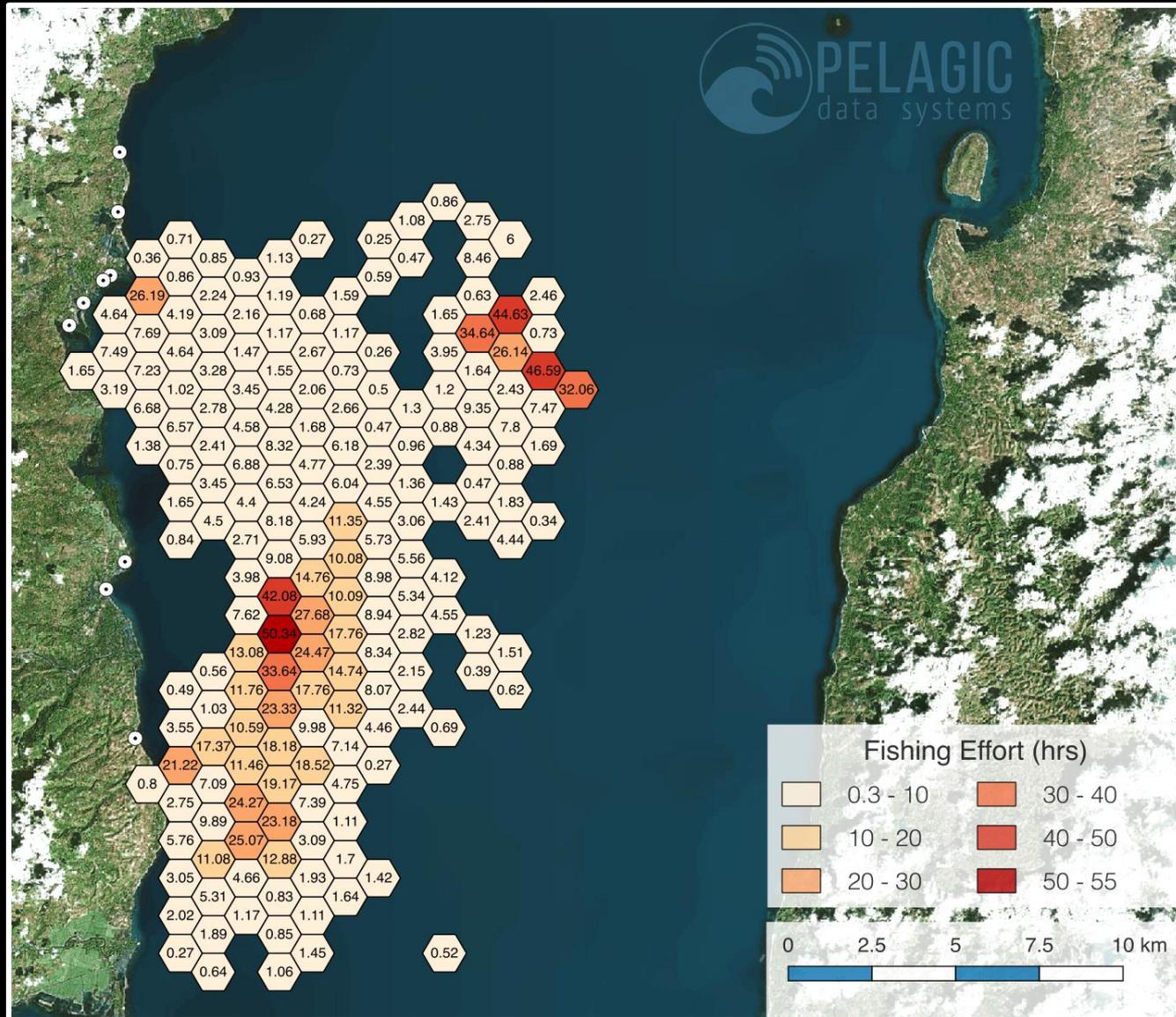
Hand Line



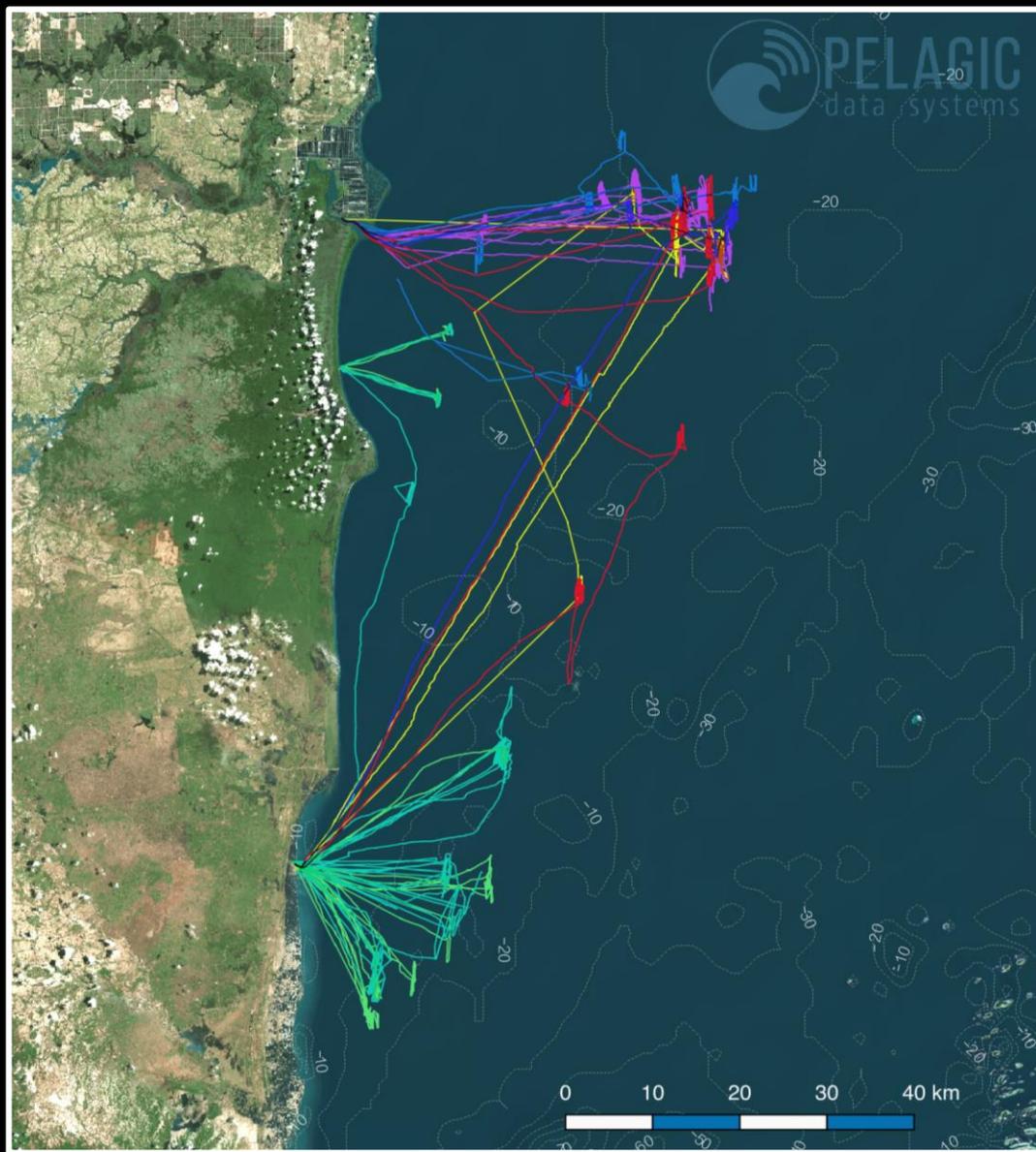
Crab Traps



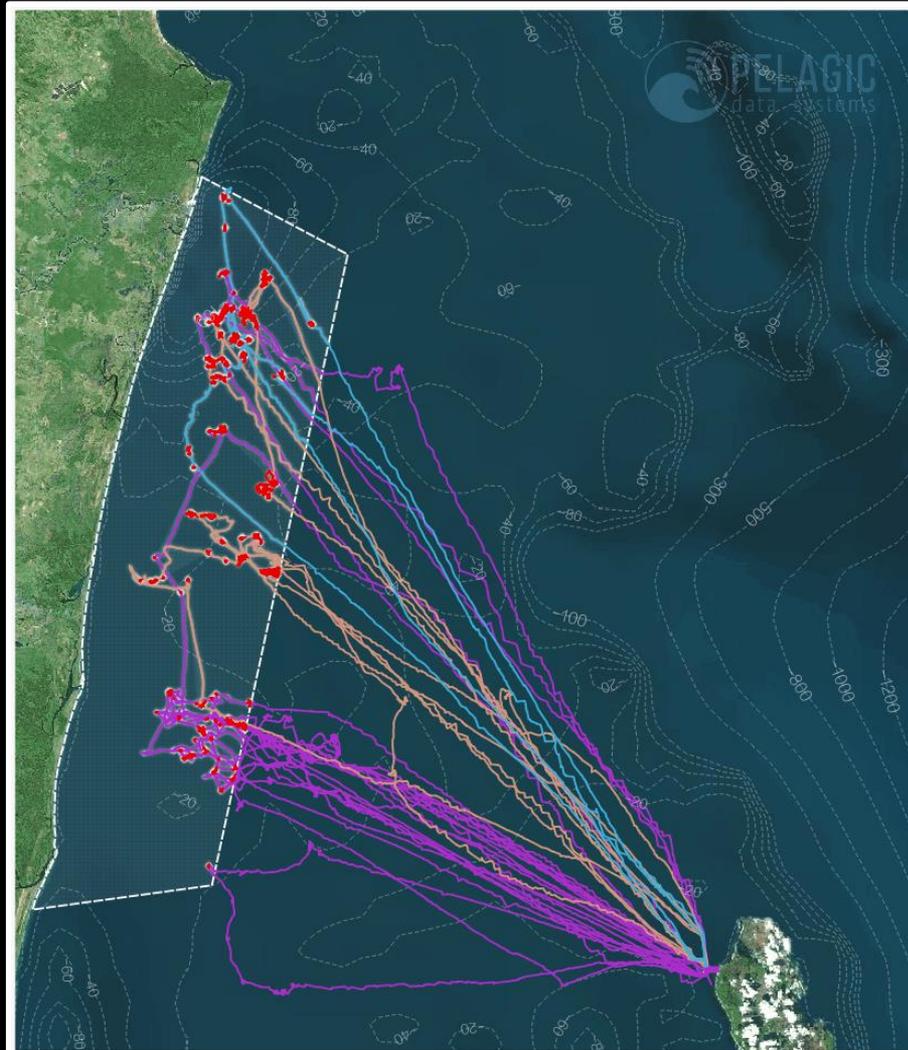
From Individuals and Fleets



Visualize Interactions Among Vessels



Spatial Zoning Applications



Community 1 Boats

- Illegal Boat 1
- Illegal Boat 2
- Illegal Boat 3

Map Info

- Illegal Fishing
- Exclusive Use Zone

Community Infractions

- Boat 1: 2 Infractions
- Boat 2: 5 Infractions
- Boat 3: 12 Infractions

0 4 8 12 16 20 km



Pelagic Data Systems
Marine Spatial Planning Example

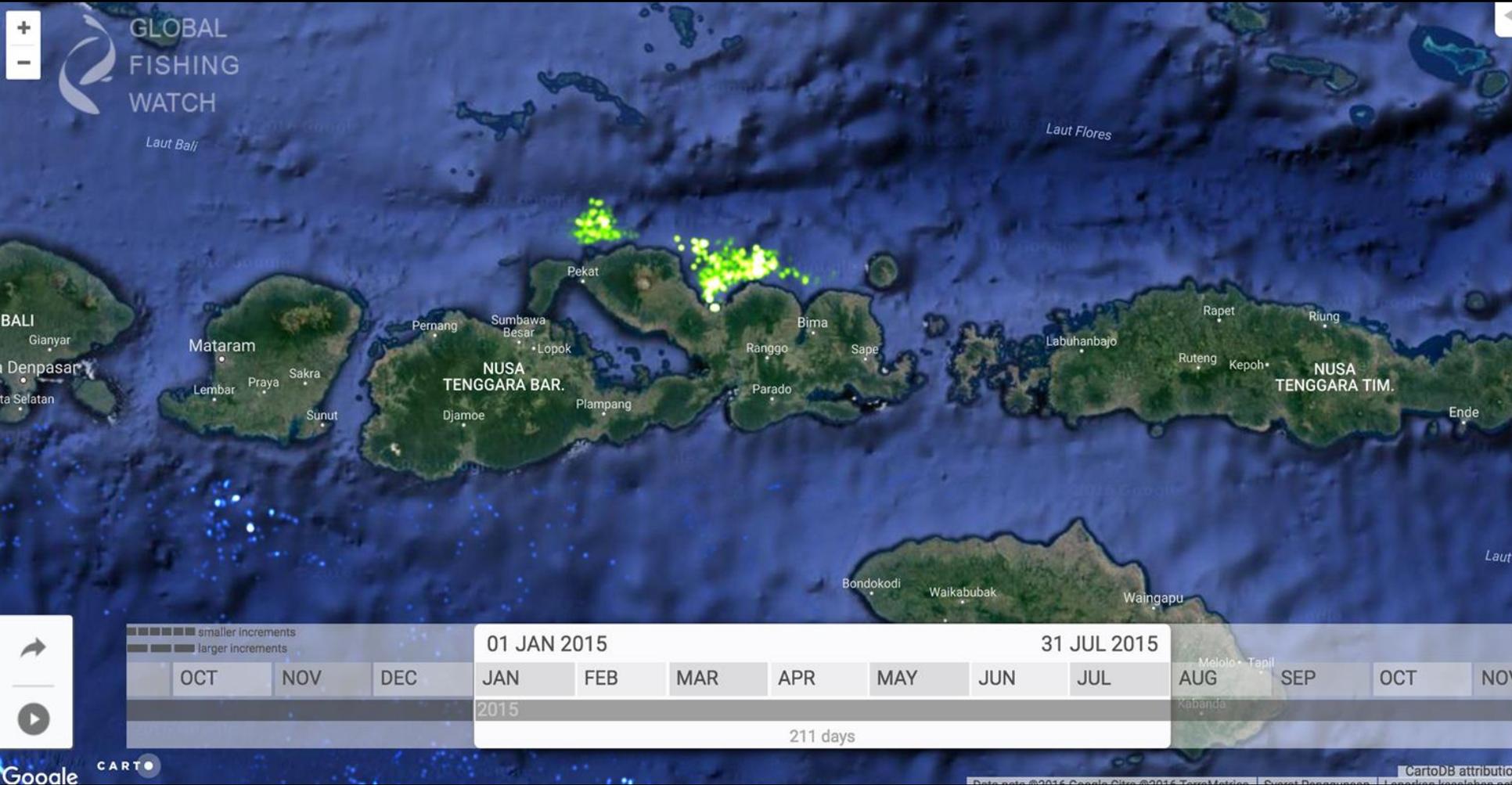


Information We Deliver

- Legality of the catch (time, place, and gear used)
- Effectiveness of management interventions (fishing effort by location and over time)
- Risk of labor infractions (vessel behavior and vessel-to-vessel interactions)
- Origin of seafood and how it was handled at sea



Integrating Small-Scale Fisheries into the Global Context



The Broader Technology Landscape

- Complements multiple existing types of vessel monitoring across scales (AIS, VMS, and GPS data streams from different classes of vessels)
- Leverage other types of information acquired in the supply chain to improve transparency across multiple issue areas (social, ecological, economic)
- The technology now exists to monitor ocean use more similarly to the way we monitor the airspace globally



Pelagic
data systems

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