CHALLENGES IN THE DESIGN AND IMPLEMENTATION OF A SUSTAINABLE FISHERIES MANAGEMENT FOR THE SOUTH WEST ATLANTIC:

A SCIENTIFIC-BASED APPROACH

MARCH 4TH, 2021

The value of remote sensing as a relevant tool to support compliance on fishing activities

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Global Fishing Watch

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement. No 727891. www.farfish.eu

INTRODUCTION

Recent advances in big data and technology are rapidly transforming our ability to generate new insights and make them public and visible. At Global Fishing Watch we believe it's vital to seize this opportunity.

That's why our purpose is to **create and publicly share knowledge about human activity at sea to enable fair and sustainable use of our ocean.**

We create new knowledge by using cutting edge technology to turn big data into actionable information. We share that information publicly, and for free, to accelerate science and drive fairer, smarter policies and practices that reward good behavior and protect biodiversity, fisheries and livelihoods.

And we promote international cooperation and transparency around ocean data to enable a new era of ocean governance.

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Remote sensing Technology

Most Monitoring, Control and Surveillance systems are based on:

Vessel Monitoring Systems (VMS)

but,

Automatic Information System (AIS) is becoming increasingly prevalent.

Note: The EU mandates the use of AIS on its fleet.

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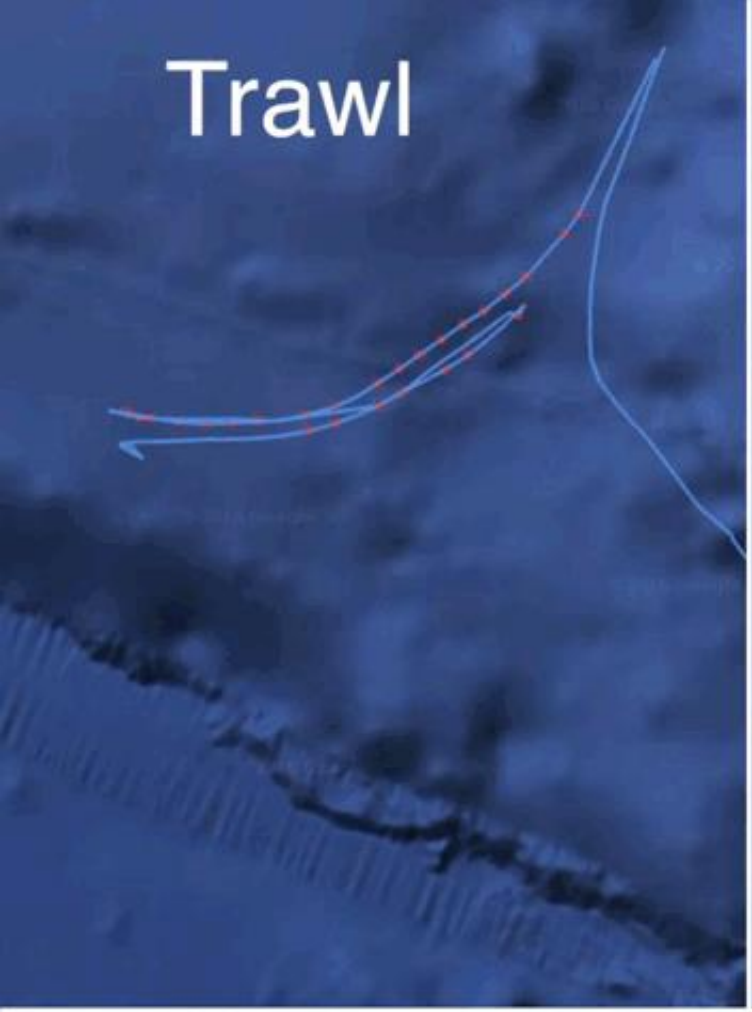
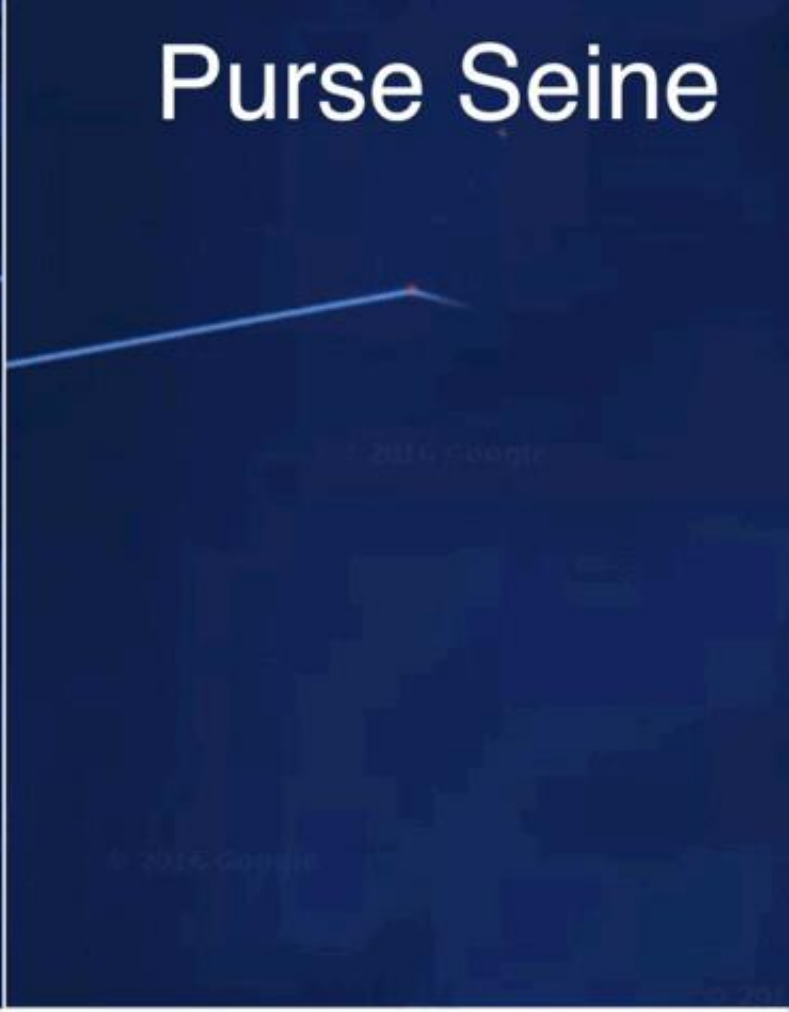
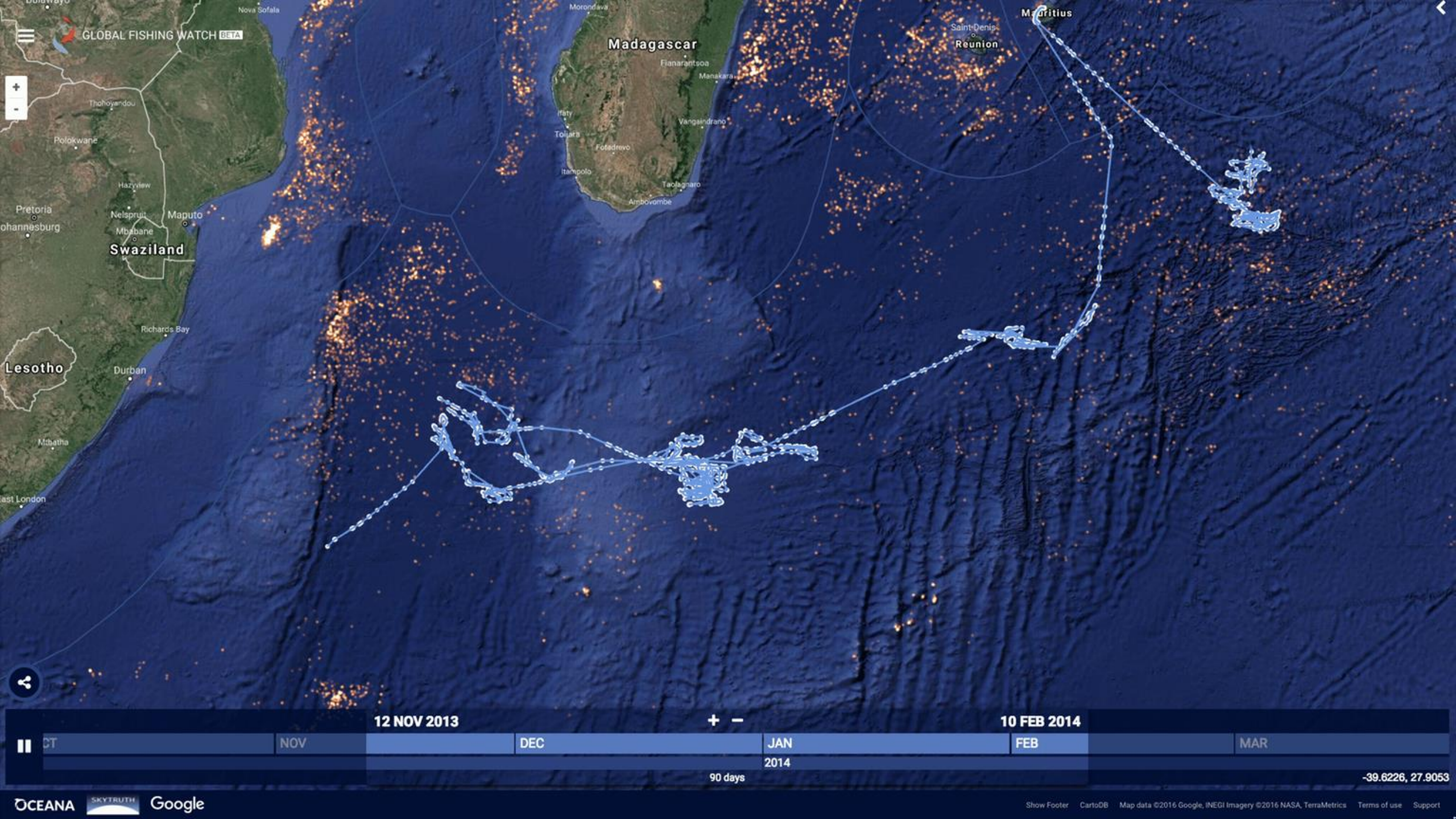
Example: Indonesia
The benefit of adding VMS to AIS tracking


Trawl


Longline


Purse Seine


ZMGO


GLOBAL FISHING WATCH BETA
Madagascar
Fianarantsoa
Manakara
Toliara
Fotadrevo
Taolagnaro
Ambovombe
Morondava
Nova Sofala
Thohoyandou
Polokwane
Hazyview
Pretoria
ohannesburg
Nelspruit
Maputo
Mbabane
Swaziland
Richards Bay
Lesotho
Durban
Mbatha
ast London
Saint-Denis
Reunion
Mauritius
12 NOV 2013
10 FEB 2014
OCT
NOV
DEC
JAN
FEB
MAR
2014
90 days
-39.6226, 27.9053
OCEANA
SKYTRUTH
Google
Show Footer
CartoDB
Map data ©2016 Google, INEGI Imagery ©2016 NASA, TerraMetrics
Terms of use
Support

THEORY OF CHANGE

- Law-abiding fishers are tracked easily and openly, demonstrating their compliance.
- Rogue operators stand out due to their patchy track record or suspicious behaviour.
- Compliant fishers can be rewarded through faster, more efficient port entry / landings. Non-compliant can be prioritised for inspection or denied port entry.

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Some of the GFW Product

- Carrier Vessel Portal
- Vessel History: to strengthen port controls and risk assessments through the use of open source data
- Dark vessel Detection: Those vessels that chose not to transmit their position or those vessels not fitted with tracking systems

- Scoping:
  - Small-scale Fishing - how can we help in the management of that fleet?
  - Marine Protected Area - soon to launch a management portal

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Dark fleet targets declining squid stocks

Distribution

A Popular Dish

Japan
One of the top 5 seafoods consumed

S.Korea
Top seafood by production value

N.Korea
3rd largest export until recent sanctions

In Decline

Decline in catch since 2003

80% in South Korean waters

82% in Japanese waters

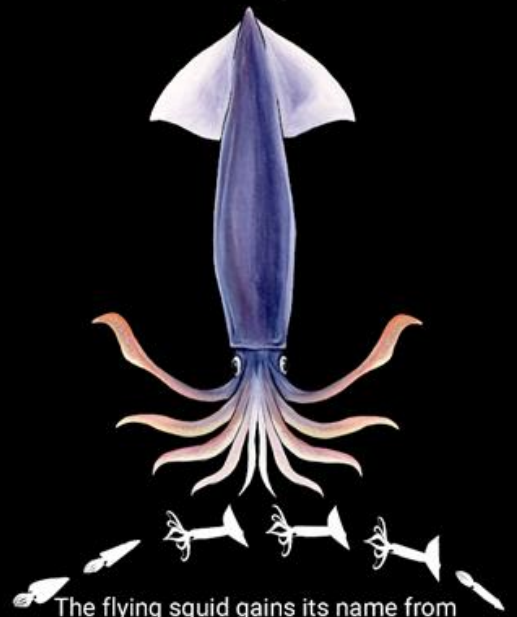
A Costly Catch

Estimated catch by Chinese vessels detected in waters between Japan, Korea and Russia in 2017-2018

>160,000 metric tons

> 440 million USD

Japanese Flying Squid
Todarodes pacificus

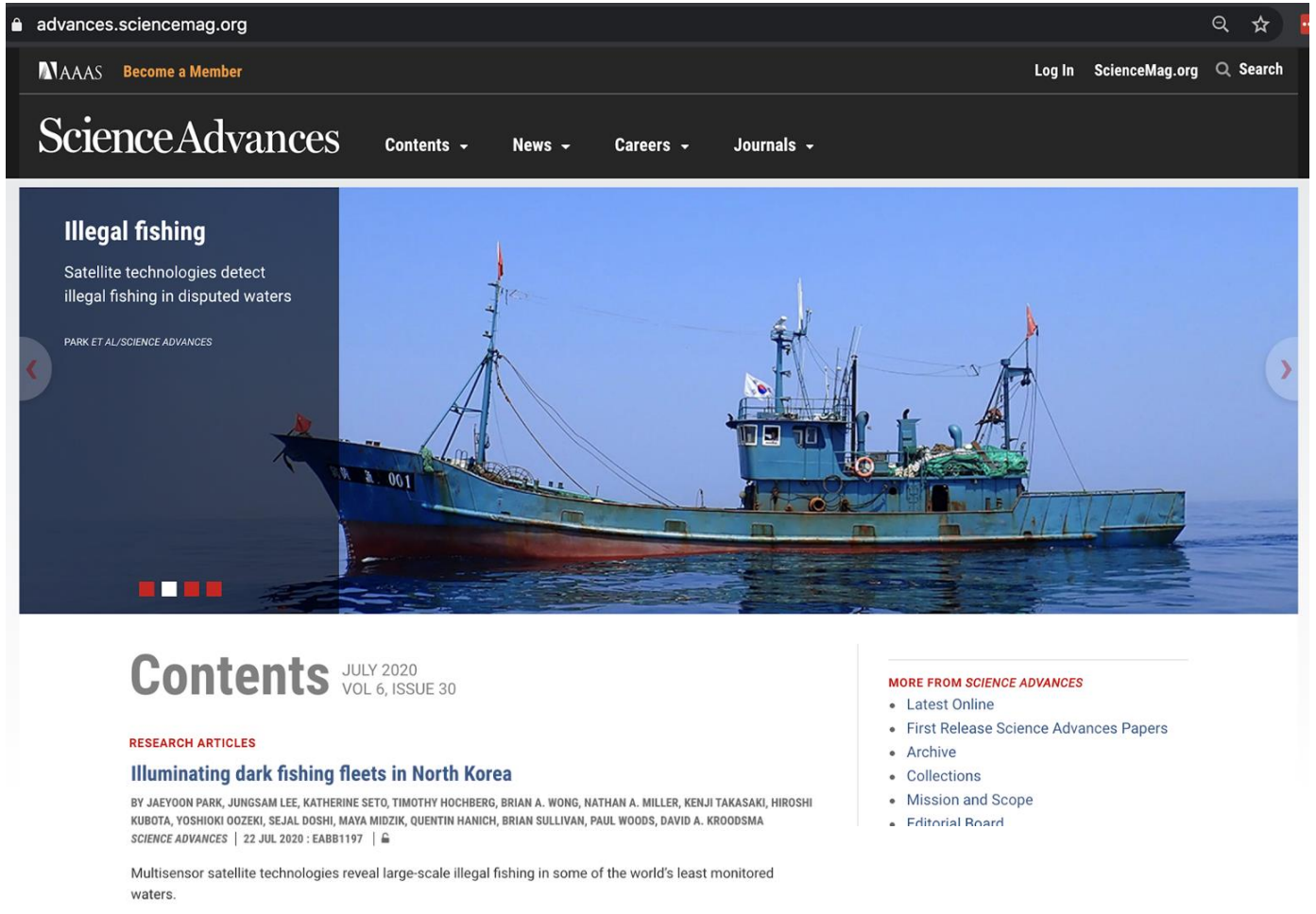


The flying squid gains its name from the way it can spread its mantle like a parachute to draw in and eject water, using propulsion to fly above the waves

Scientific approach:

A research paper on satellite technologies to detect dark fishing vessels

Published in *Science Advances* on July 22, 2020



Four satellite technologies

AIS

Collision avoidance system that constantly transmits a vessel's location at sea - provides detailed vessel information, but are used by only a fraction of vessels

spire

ORBCOMM

Optical imagery

High resolution optical imagery offers the best visual "proof" of vessel activity and type.

planet.

Radar images

Synthetic Aperture Radar (SAR) can identify large metal vessels and penetrate clouds

KSAT KONGSBERG SATELLITE SERVICES

esa European Space Agency Agence spatiale européenne

JAXA Japan Aerospace Exploration Agency

Night-time imaging

Visible Infrared Imaging Radiometer Suite (VIIRS) picks up the presence of fishing vessels using lights to attract catch or conduct operations at night

NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

NASA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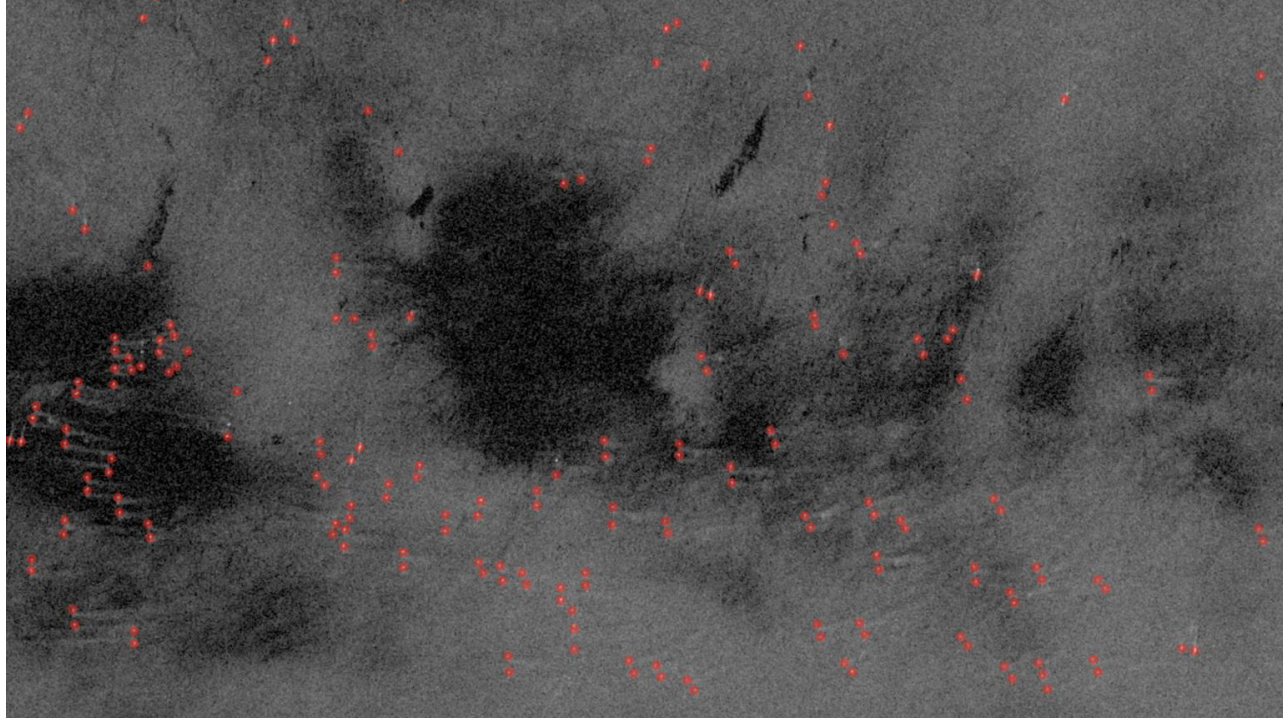
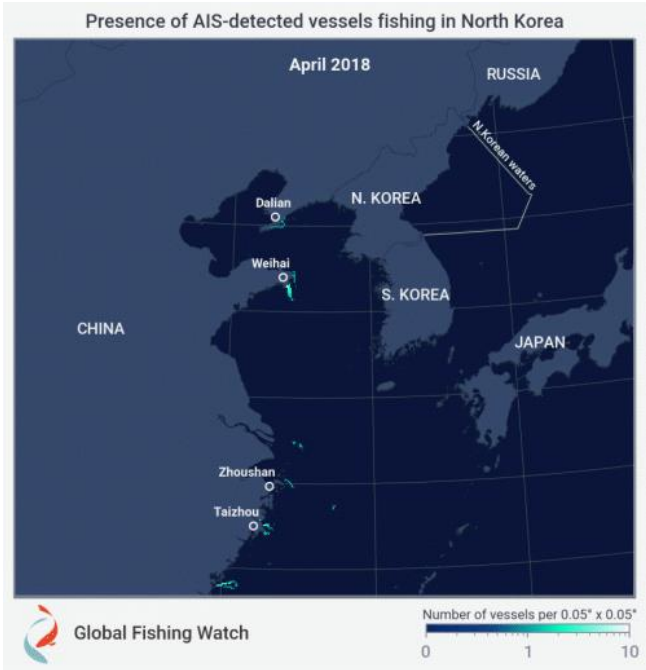
413170919(-11min)




Presence of AIS-detected vessels fishing in North Korea
April 2018
RUSSIA
N.Korean waters
Dalian
N. KOREA
Weihai
S. KOREA
CHINA
JAPAN
Zhoushan
Taizhou
Global Fishing Watch
Number of vessels per 0.05° x 0.05°
0
1
10


Example tracks of vessels fishing in North Korea
April 2018
RUSSIA
N.Korean waters
Dalian
N. KOREA
Weihai
S. KOREA
CHINA
JAPAN
Zhoushan
Taizhou
Global Fishing Watch

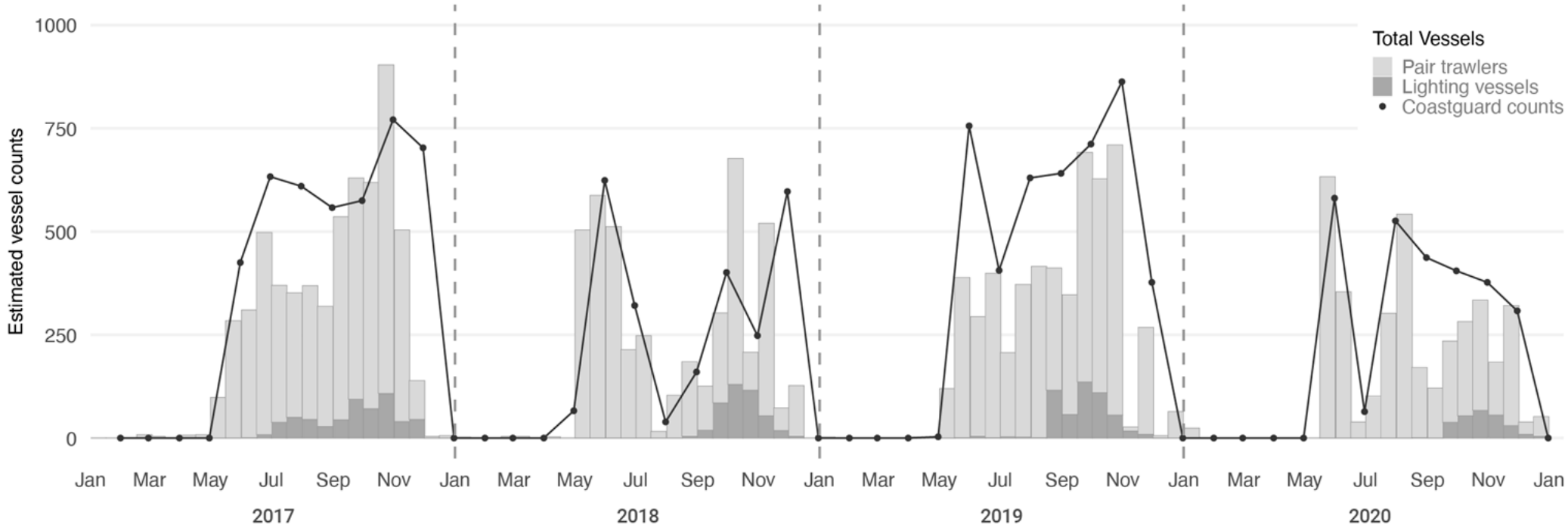
Optical imagery

Pair trawlers

Lighting vessels

Combining these technologies reveals dark fleet activity in detail

- ~1,000 vessels per year despite UN sanctions
- Likely caught >160,000 metric tons of squid (2017-2018)
- Catch valued at >$440M USD (2017-2018)
- Operation continues in 2019/2020



RESEARCH NEEDS AND PRIORITIES

1. Increased data sharing and transparency between coastal States and distant water fishing fleet flag States

1. Regional cooperation on IUU including the use of shared remote sensing data for high risk areas

1. Strengthening port controls in the region with a focus on ports with high volumes of foreign vessels

1. Regional study using remote sensing to estimate fleet sizes and catch rates to estimate catch and support stock assessment efforts

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Thank you

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