LIFELINES

a community of the future

JULY 14, 2015

Dogleg Strait

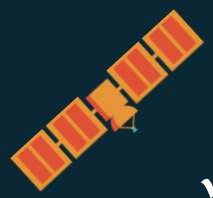
Papua New Guinea

There is still significant unrealized potential for Earth science to help humanitarians save lives and reduce human suffering.

our mission

NASA Lifelines is a community of the future using satellite data and tools to improve humanitarian action.

How do satellites help humanitarian missions?



- ✓ coverage
- ✓ objectivity
- ✓ repeatability
- ✓ detail
- ✓ speed
- ✓ affordability

- ✓ More timely decision-making through real-time and predictive modelling
- ✓ Decision-making supported by greater accuracy of data
- ✓ Greater confidence in the decision-making process
- ✓ Greater accountability across stakeholders

How are humanitarians using satellite data?

Damage and needs assessments

Population mapping

Population migration

Refugee camp mapping

Access to local food

Access to health services

Risk exposure to hazards

Predicting disease outbreaks

Urban heat resilience

Planning evacuation routes

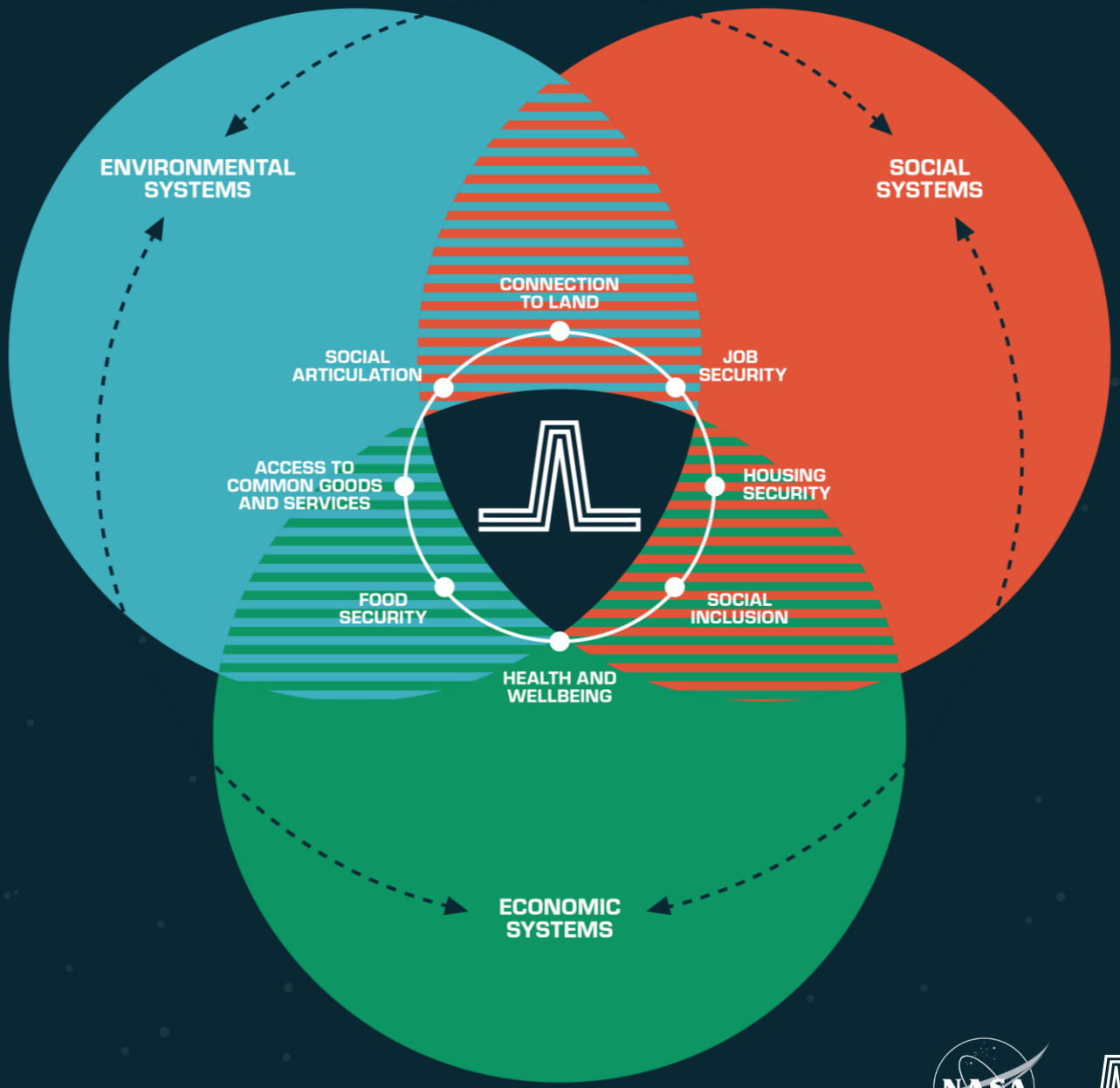
Prosecuting human rights abuses

Access to clean water and air

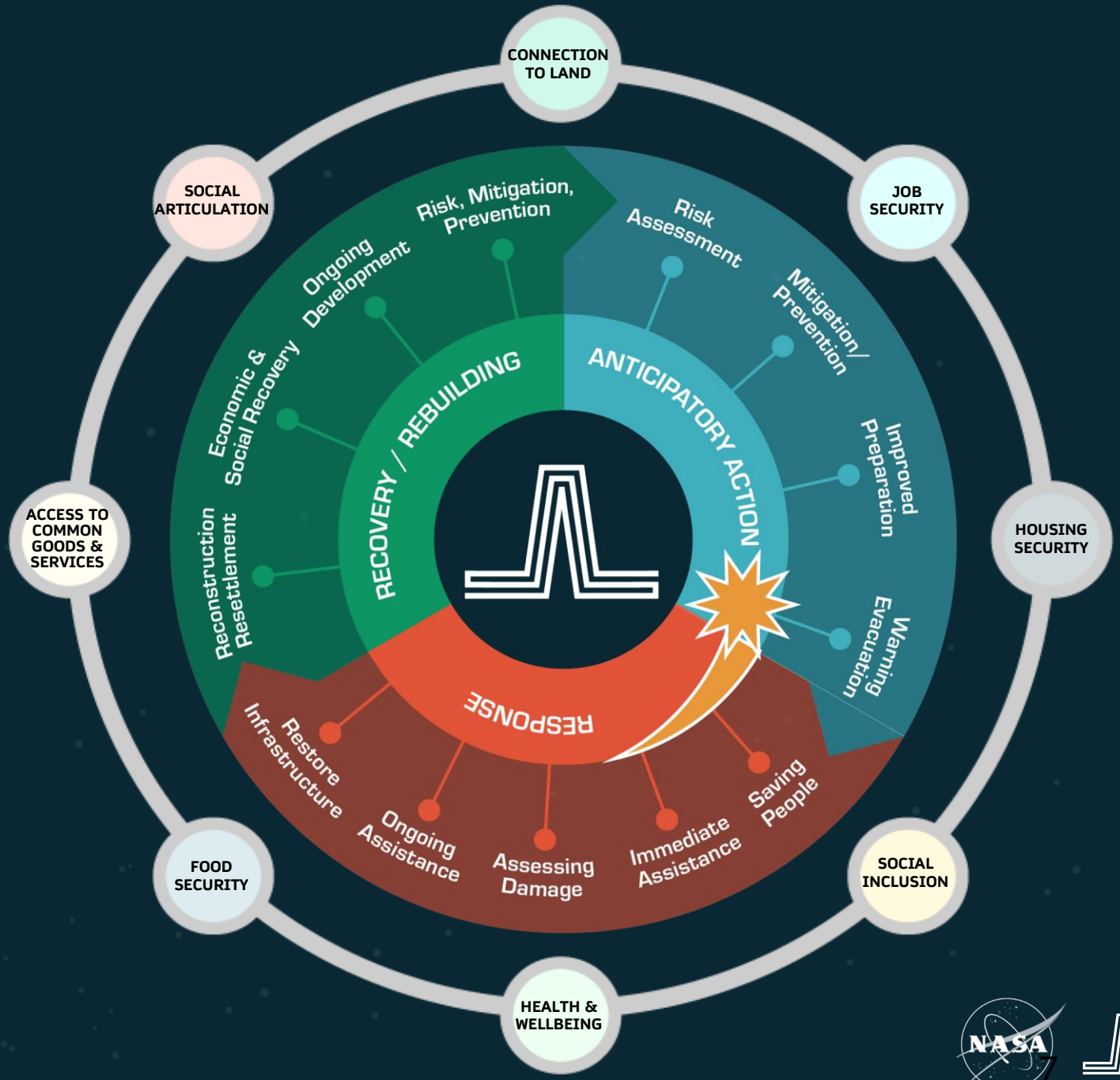
Coastal resource mapping

Shelter planning

And many more use cases



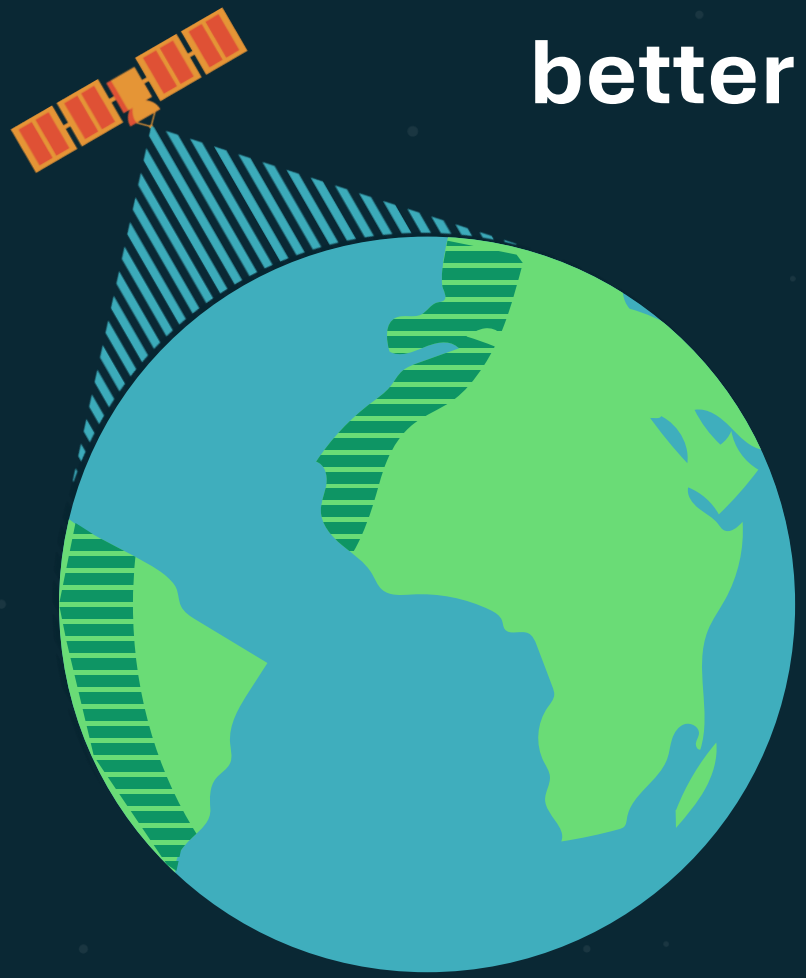
Earth science is a lens that helps understand system complexity against the timeframes and phases of a humanitarian crisis.



What needs to happen for humanitarians to use more Earth science?

- ✓ Awareness Building. While they acknowledge satellite data is valuable, most humanitarians don't know how to take advantage of it
- ✓ Access to Expertise. Access to technical expertise is limited and not equitable, but humanitarians are willing to adopt new approaches
- ✓ Fit for Purpose Earth Science. Provision of data, tools, and trainings designed for humanitarian purposes and contexts (e.g., fast pace, complexity of crises, low bandwidth environs)
- ✓ Partnerships. Beyond technical expertise, humanitarians need data translators and funders and community innovators and others across the diverse stakeholder ecosystem to scale their use of Earth science.

What needs to happen for scientists to better support humanitarian needs?



- ✓ Intentional Networking. Need more time and opportunities to meet collaborators and interact with humanitarians.
- ✓ Access to Funders. Need more funding opportunities to pursue innovative, interdisciplinary humanitarian research and scale proven interventions with their partners.
- ✓ Opportunity to Educate & Learn. Scientists can learn from humanitarian partners and be their technical guides.
- ✓ Humanitarian Impact. Scientists want their work to have a societal impact (stimulate public discourse, contribute to education, support wellbeing and health, and more).

A community of the future to solve challenges together

humanitarians **scientists**

Access to Expertise  Intentional Networking

A community of the future to solve challenges together

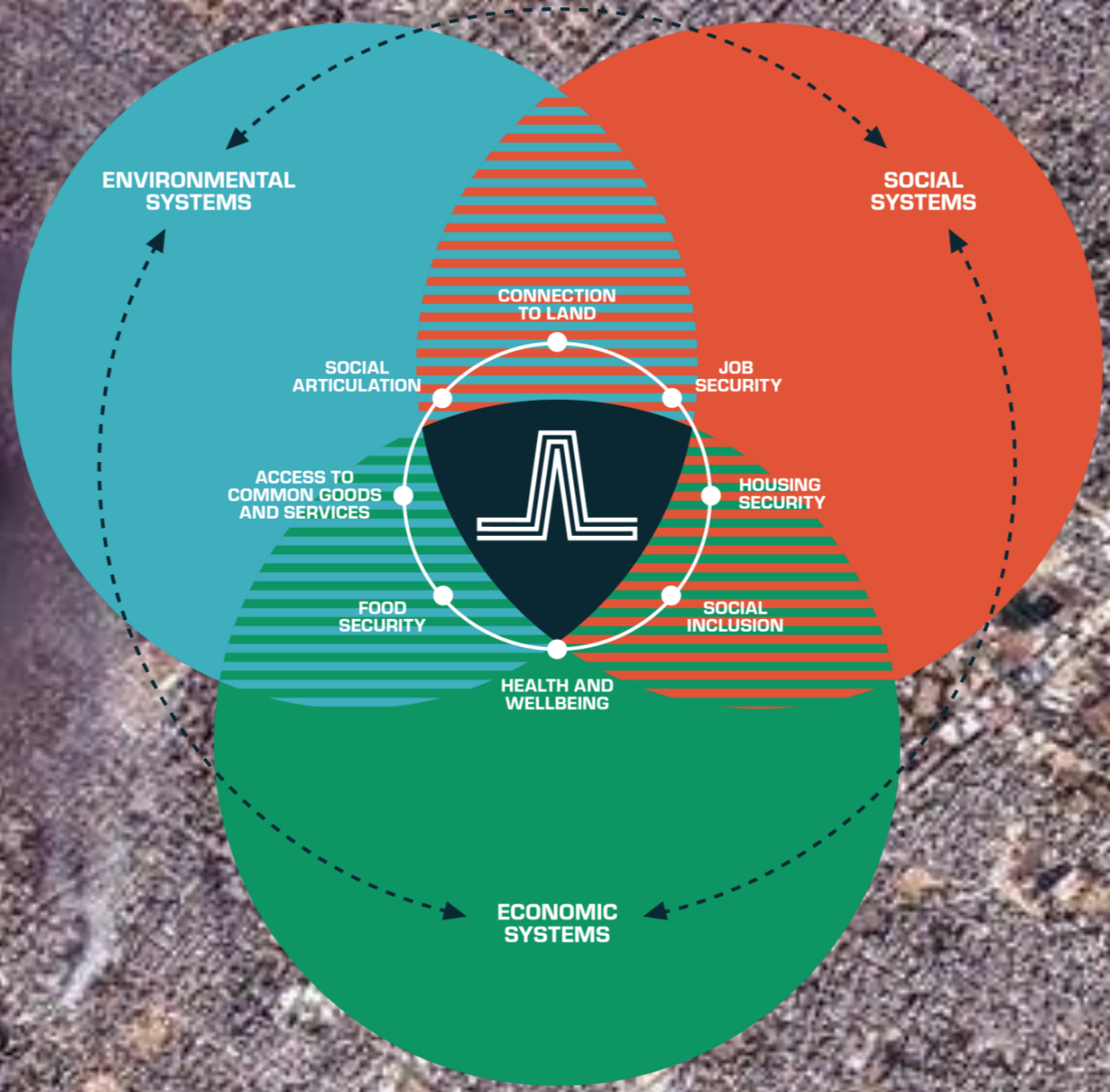
humanitarians		scientists
Access to Expertise	⇄	Intentional Networking
Awareness Building	⇄	Opportunity to Educate & Learn Access to Funders

A community of the future to solve challenges together

humanitarians		scientists
Access to Expertise	⇄	Intentional Networking
Awareness Building	⇄	Opportunity to Educate & Learn Access to Funders
Fit for Purpose Earth Science Partnerships	⇄	Humanitarian Impact

Spotlight

PAX



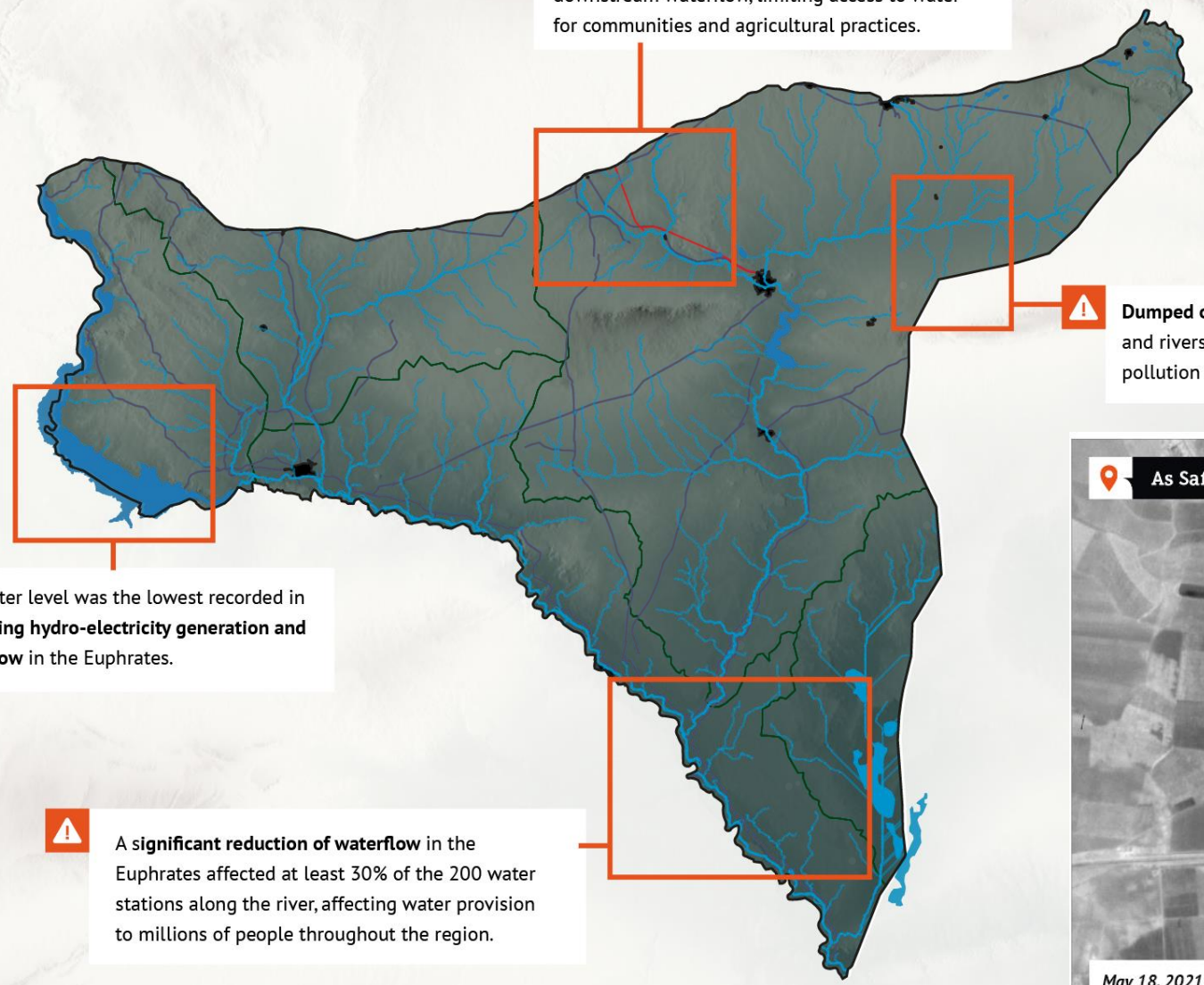
Idlib, Syria –

Tree cover loss (area outlined in green) of a natural forest of maquis oak surrounding an internally displaced persons (IDP) camp. Displacement is a major contributor to deforestation. The increase in heavy winter rains poses more risks as deforestation leads to soil degradation, making the camp prone to flooding impacts.

Impacted water sources

North East Syria

Construction of dams in the Khabur river halted downstream waterflow, limiting access to water for communities and agricultural practices.



Dumped oil waste into streams and rivers resulted in sustained pollution of the Jagjagh river.

Lake Assad water level was the lowest recorded in history, **impacting hydro-electricity generation and downstream flow** in the Euphrates.

A **significant reduction of waterflow** in the Euphrates affected at least 30% of the 200 water stations along the river, affecting water provision to millions of people throughout the region.

Northeast Syria –

The river is engorged north of Sifah bridge to retain water after construction of a dam in late May 2021.

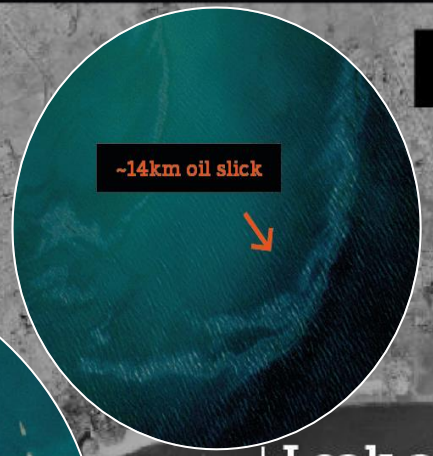
Syrian coast–

A massive leak of over 10,000 tons of heavy fuel oil flowed from the Baniyas Thermal Power Plant on Syria’s coast into the Mediterranean Sea in the early morning of August 23, 2021. Within days, the black toxic substance quickly spread over hundreds of kilometers, washing across the beaches of Syria and dumping tar balls of oil on the shores of Turkey and Cyprus.

Image: Planet

Oil ▸ Overview Oil Spills and Abandoned Tankers

Port of Aden, Yemen



Al Hesweh Nature Reserve

Bird Sancutuary

Container Terminal

Leak at SICHEM FENOL
July 3, 2022

PEARL OF ATHENA, oil spill
July 5, 2022

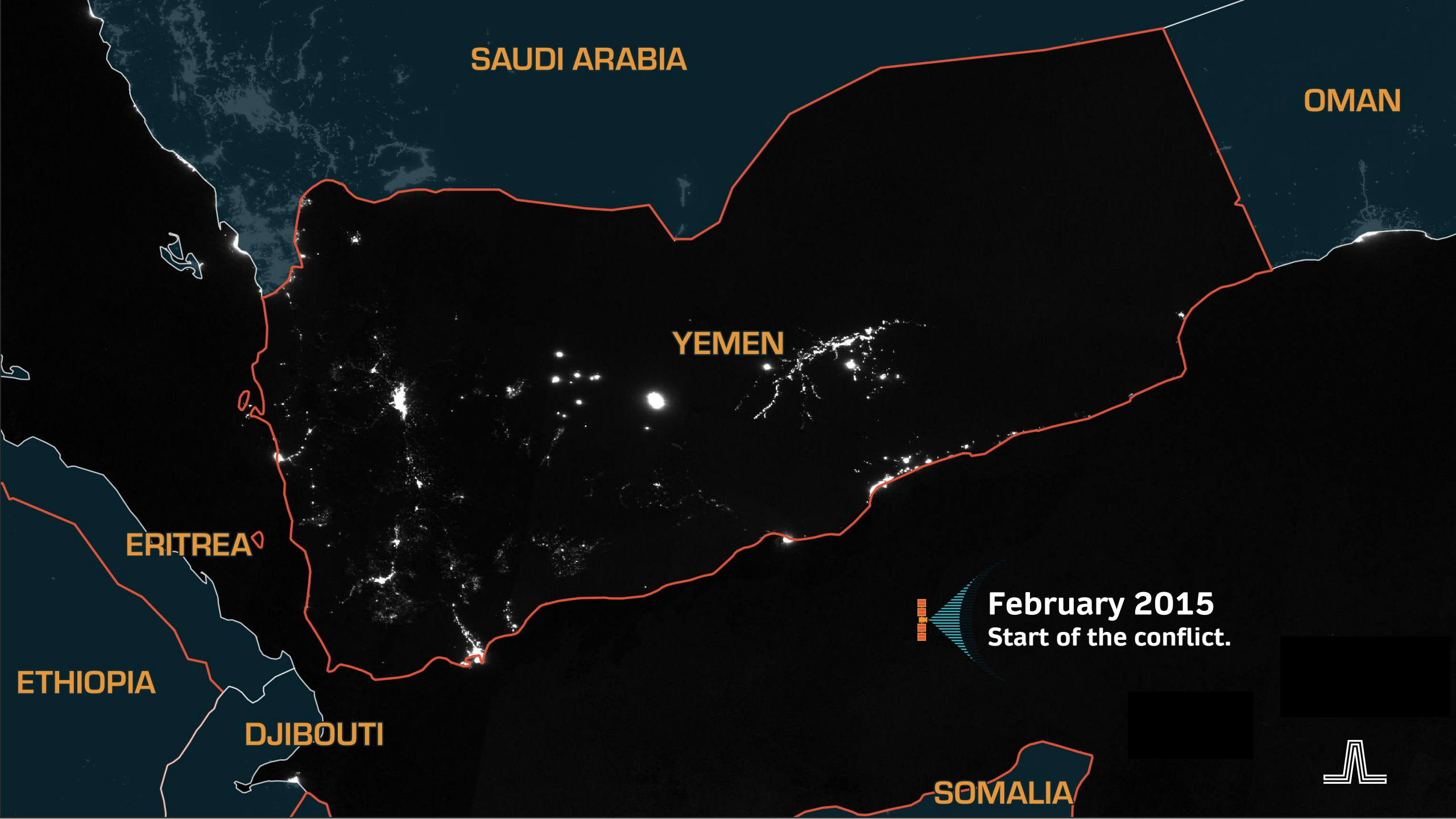
DIA-1, oil spill
July 18, 2022

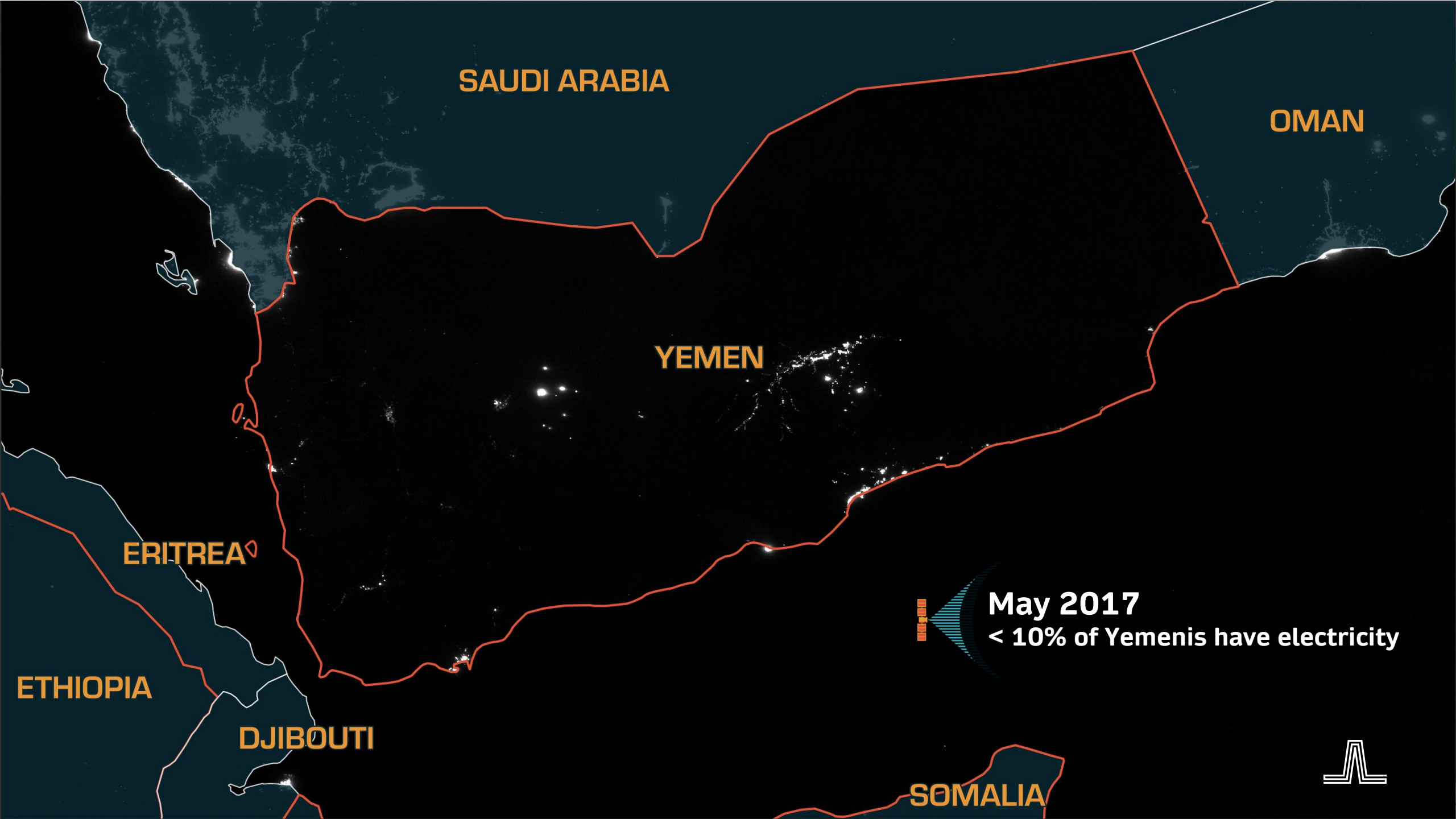
Fairway

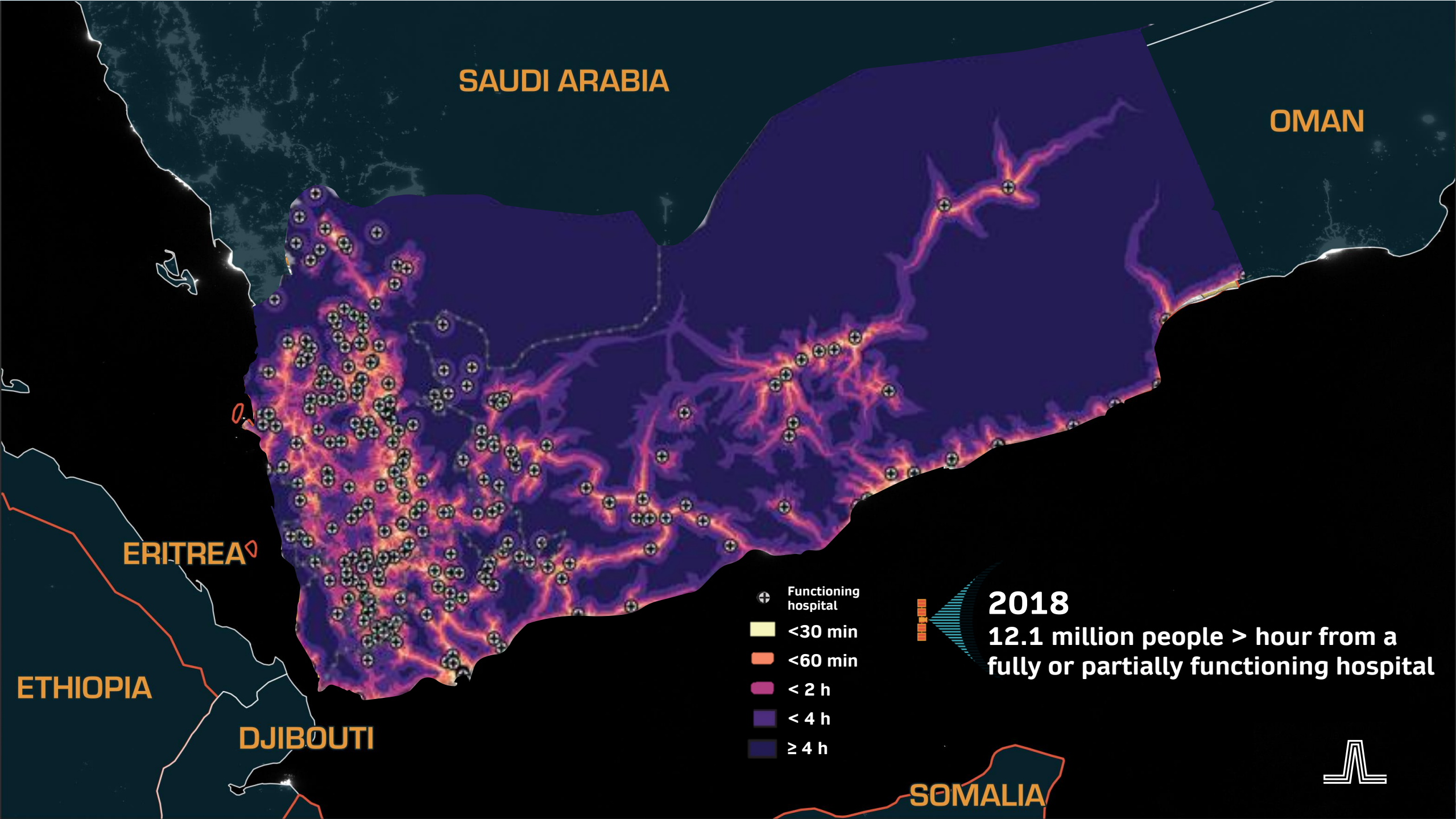
Oil spills

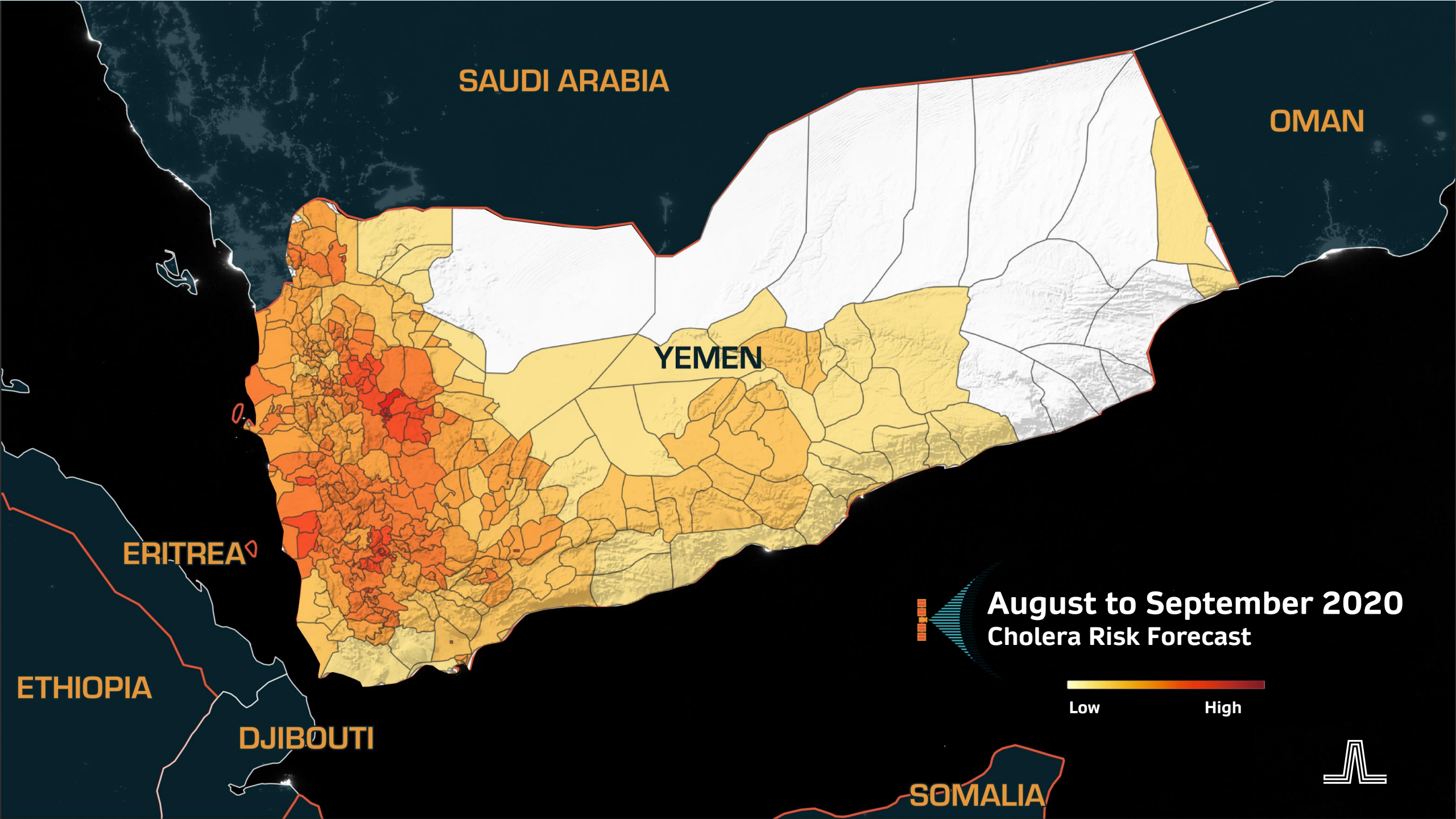
Abandoned ships

PAX


SAUDI ARABIA
OMAN
YEMEN
ERITREA
ETHIOPIA
DJIBOUTI
SOMALIA
February 2015
Start of the conflict.


SAUDI ARABIA
OMAN
YEMEN
ERITREA
ETHIOPIA
DJIBOUTI
SOMALIA
May 2017
< 10% of Yemenis have electricity


SAUDI ARABIA
OMAN
ERITREA
ETHIOPIA
DJIBOUTI
SOMALIA
Functioning hospital
<30 min
<60 min
< 2 h
< 4 h
≥ 4 h
2018
12.1 million people > hour from a fully or partially functioning hospital


SAUDI ARABIA
OMAN
YEMEN
ERITREA
ETHIOPIA
DJIBOUTI
SOMALIA
August to September 2020
Cholera Risk Forecast
Low
High

OMAN

YEMEN

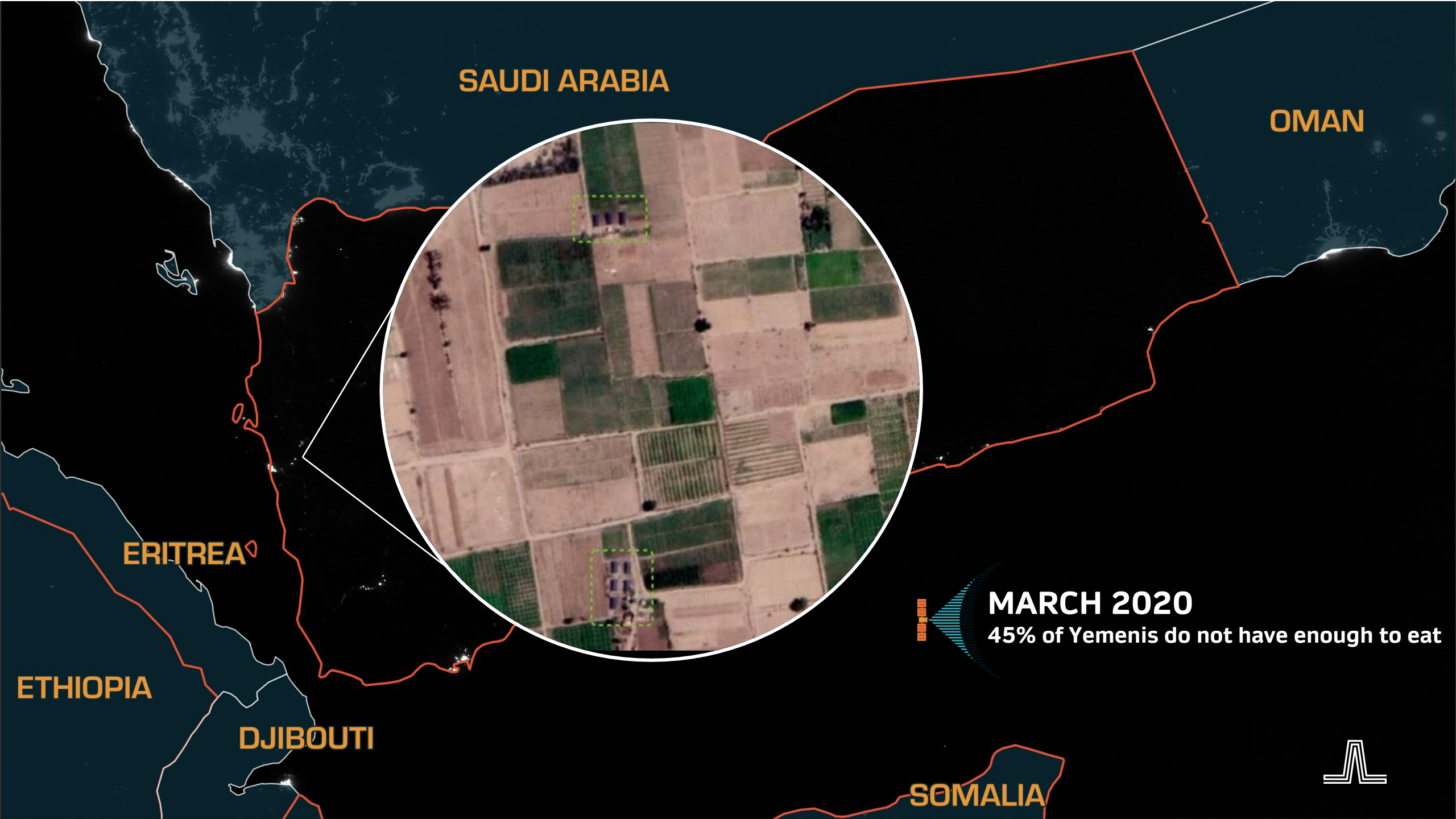
ERITREA

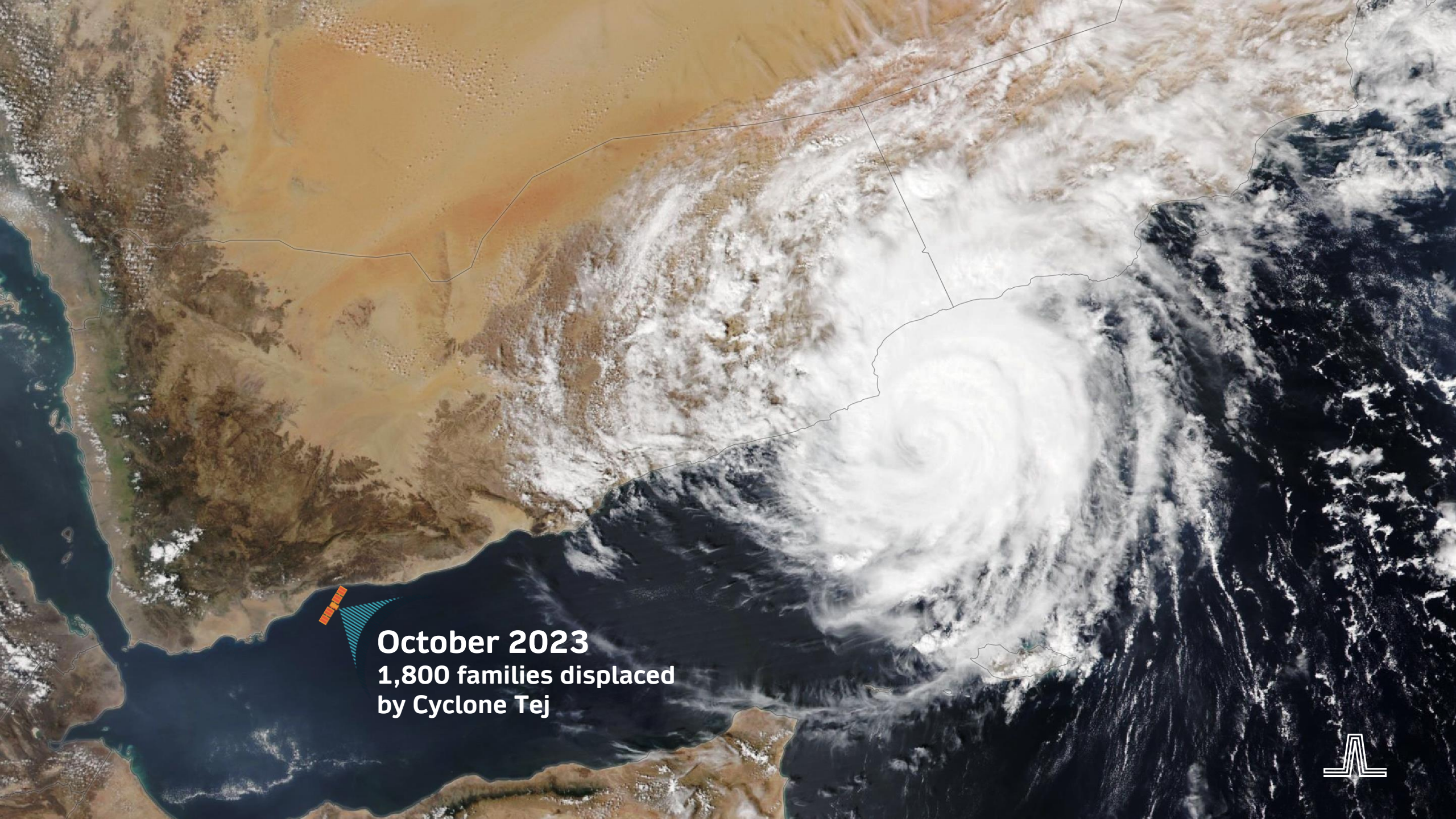
ETHIOPIA

SOMALIA

May to September 2020

Estimated 2,100 excess deaths from COVID-19


SAUDI ARABIA
OMAN
ERITREA
ETHIOPIA
DJIBOUTI
SOMALIA
MARCH 2020
45% of Yemenis do not have enough to eat


October 2023
1,800 families displaced
by Cyclone Tej

GIS ANALYSTS
AGRONOMISTS
OCEANOGRAPHERS
SPATIAL EPIDEMIOLOGISTS
AI/ML ENGINEERS
STATISTICIANS
EARTH SCIENTISTS
FRONTLINE WORKERS
POPULATION MODELERS
ECONOMISTS
POLITICAL SCIENTISTS
CONSERVATIONISTS
JOURNALISTS
URBAN PLANNERS
SOCIOLOGISTS
METEOROLOGISTS

+

COMMUNITY

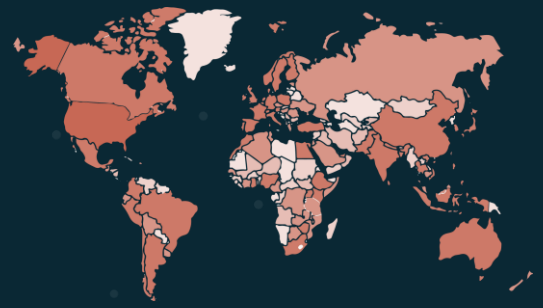
1
Year and counting

21,461
Visitors to website since launch in October

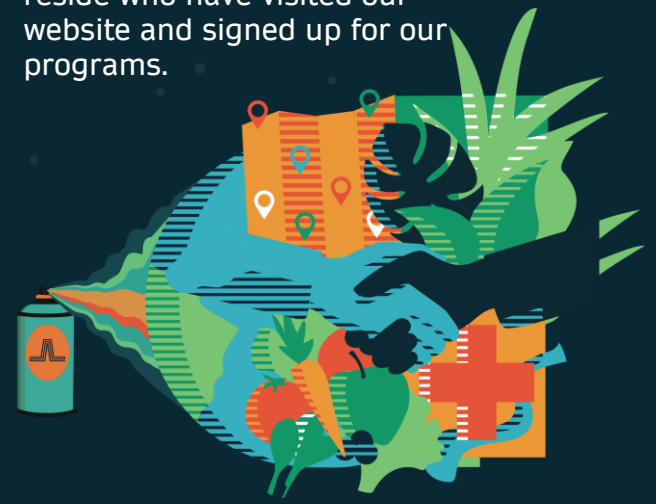
164
Countries represented in the Lifelines community

20
Supper Clubs and counting

2,536
Program sign-ups



Map 1. Country Representation in NASA Lifelines Community. These are the countries where folks reside who have visited our website and signed up for our programs.



328
Simulation participants

100
Over 100 humanitarian organizations engaged

5
Murals

GALLERY

Explore collected community resources, in-depth program information and technical reports in the Lifelines Gallery. Posts have been tagged by professional identity, origin of content, and type of post.

SUBMIT GALLERY CONTENT

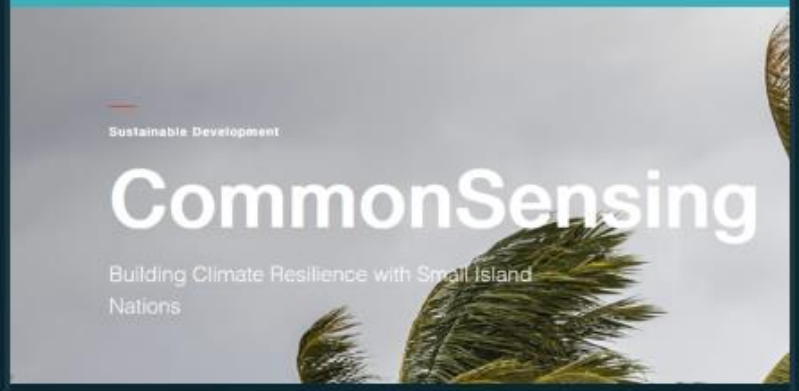
Filter Show all Lifelines Stories Resources Use Cases Data, Tech & Tools

Use Cases

HOW SATELLITE RADAR HELPS SCIENTISTS MAP THE DESTRUCTION IN GAZA

June 14, 2024

Use Cases



COMMONSENSING: BUILDING CLIMATE RESILIENCE WITH SMALL ISLAND NATIONS

June 7, 2024

Use Cases

BEYOND BORDERS: SATELLITE APPLICATIONS FOR HUMANITARIAN EMERGENCIES

June 5, 2024

www.nasalifelines.org