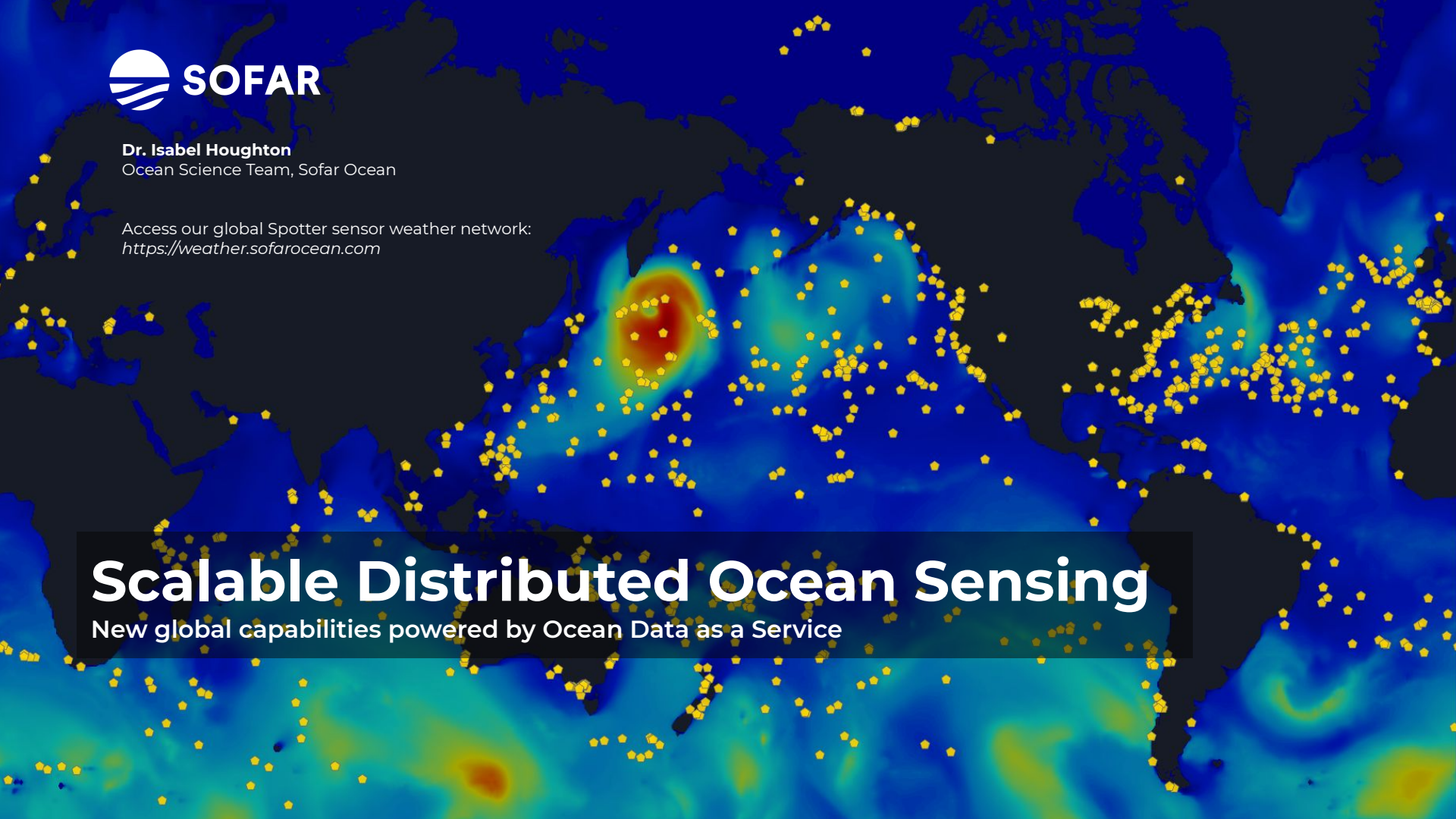
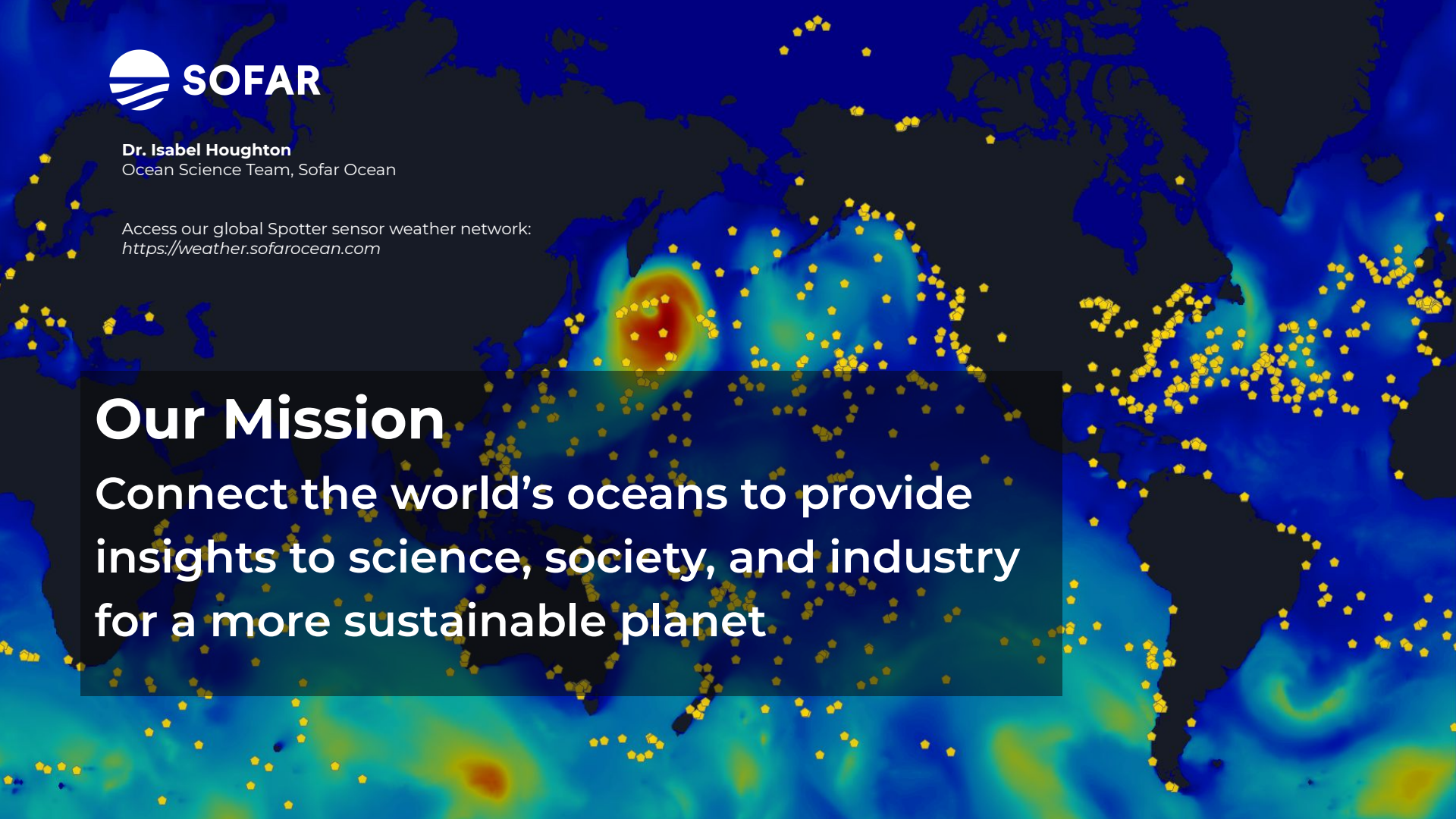


Dr. Isabel Houghton
Ocean Science Team, Sofar Ocean

Access our global Spotter sensor weather network:
https://weather.sofarocean.com

Scalable Distributed Ocean Sensing

New global capabilities powered by Ocean Data as a Service



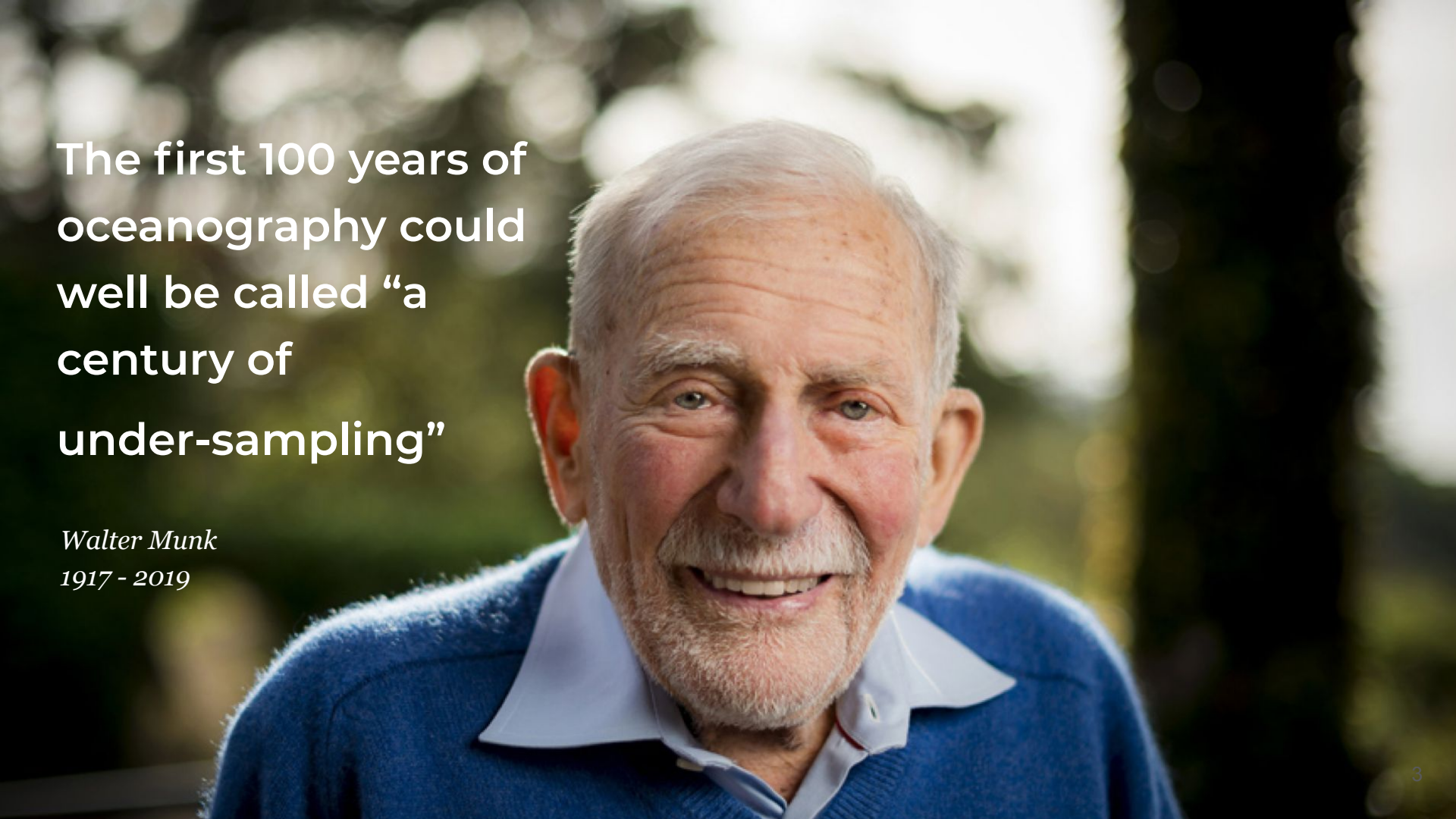
SOFAR

Dr. Isabel Houghton
Ocean Science Team, Sofar Ocean

Access our global Spotter sensor weather network:
https://weather.sofarocean.com

Our Mission

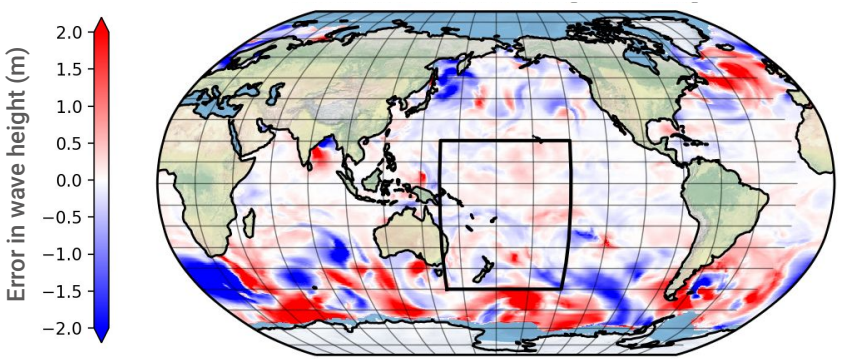
Connect the world's oceans to provide insights to science, society, and industry for a more sustainable planet


The first 100 years of oceanography could well be called “a century of under-sampling”
Walter Munk
1917 - 2019

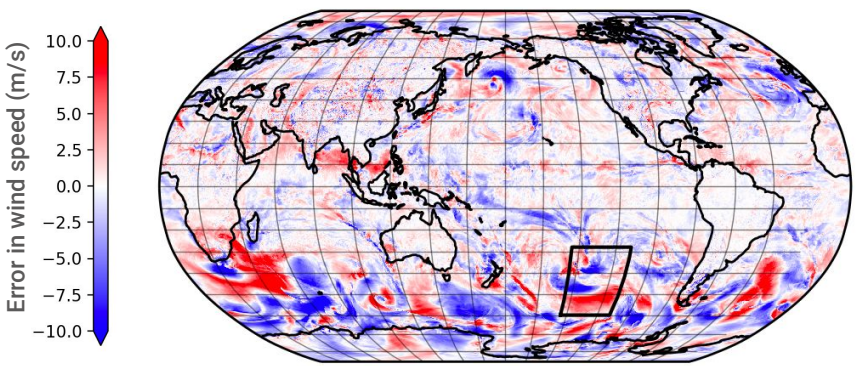
Impacts of Ocean Data Gap

- Large uncertainty in ocean environmental awareness and predictability.
- Low fidelity ocean weather forecasts.
- Hampers science and climate modeling.
- Increases risk of coastal hazards.
- Reduces operational efficiency and safety at sea.

Error in surface wave field



Error in U10 winds



Above: difference between 3-day forecast and hindcast (NH summer 2019).

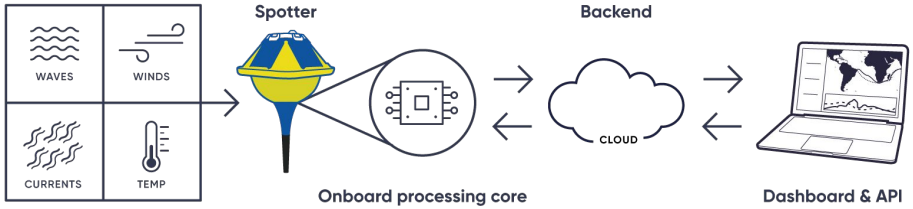
Close the data gap, how?

- Apply learnings from distributed sensing in space and on land.
- Complement short-dwell remote sensing with long-dwell, hi-res, in-situ data networks.
- Develop real-time integrations with operational data delivery, modeling and, forecast systems.
- Develop analytics to derive new insights to deliver strategic advantages.

Spotter: Real-time ocean data

Spotter is a science-grade metocean buoy powered by the sun and connected through satellite. Every Spotter measures and calculates:

- Surface wave spectrum (swell, sea, period, direction)
- Wind speed and direction
- Surface current and direction
- Sea surface temperature
- Barometric pressure
- Acoustic intensity (ambient noise)



Raghukumar et al. 2019: Journal of Atmospheric and Oceanic Technology

Voermans et al. 2020: Journal of Geophysical Research: Oceans

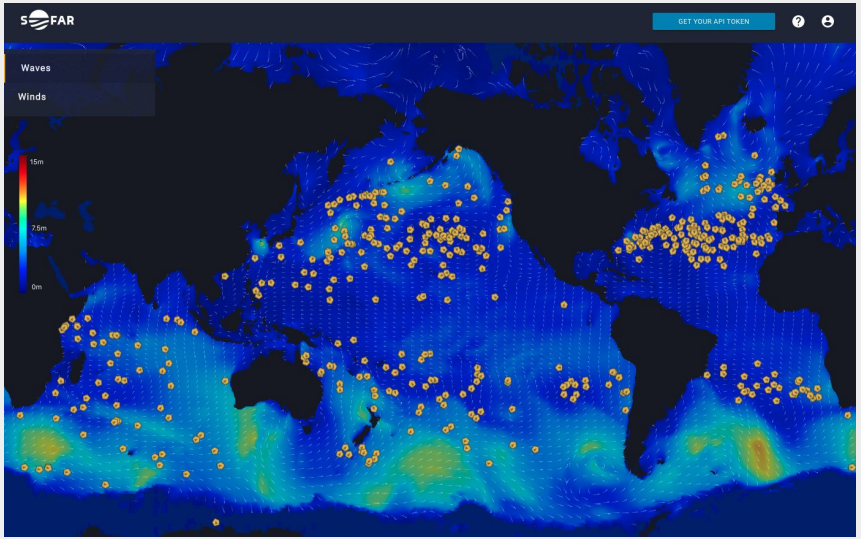
Spotter Grid: Global ocean network

Sofar operates the largest open-ocean sensor network in the world, delivering real-time data to the Sofar cloud.

Trusted by:

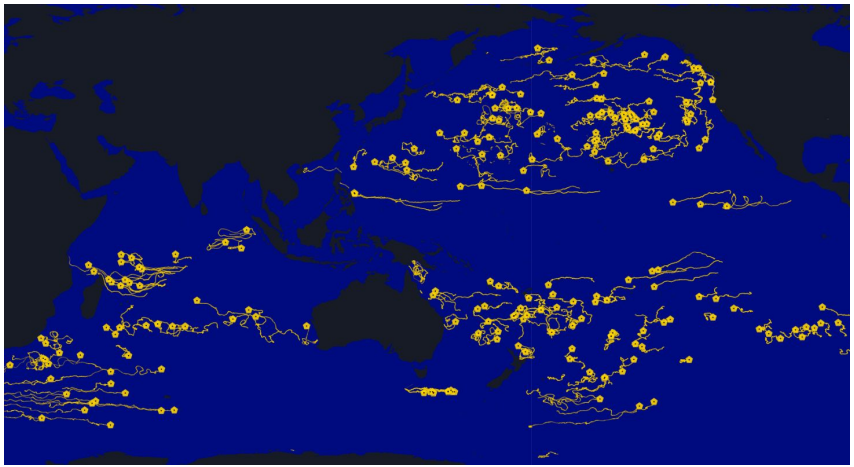
Sofar Network **Today**

500+ sensors



Rapid network expansion

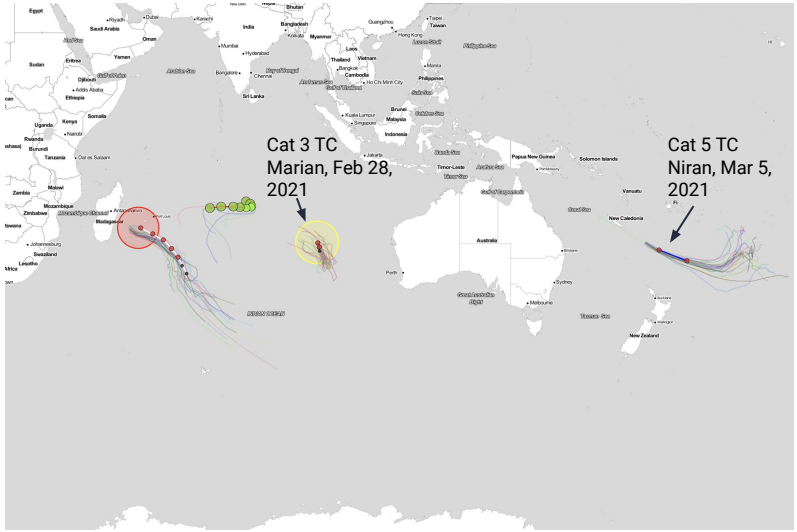
Rapid network growth through combination of massively scalable hardware, and extensive network of deployment partners and options.



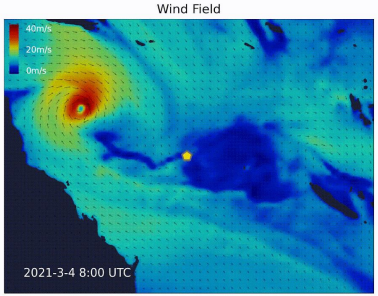
Recent drift tracks recorded by sensors in the Indo-Pacific.

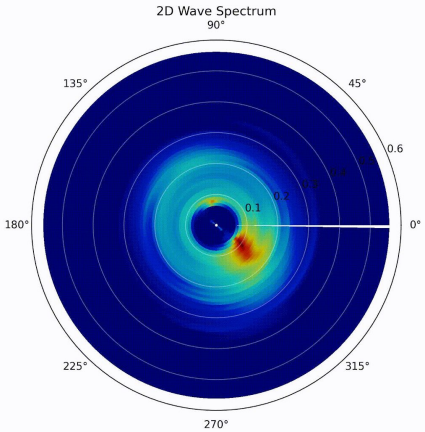
Rapid expansion in Northern Atlantic in last 3 months.

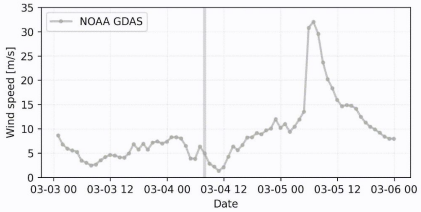
Real-time environmental awareness

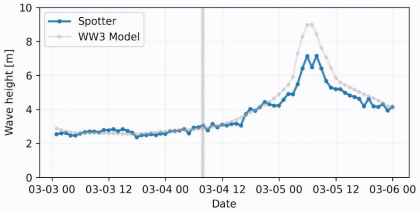


Cat 5 Tropical Cyclone Niran







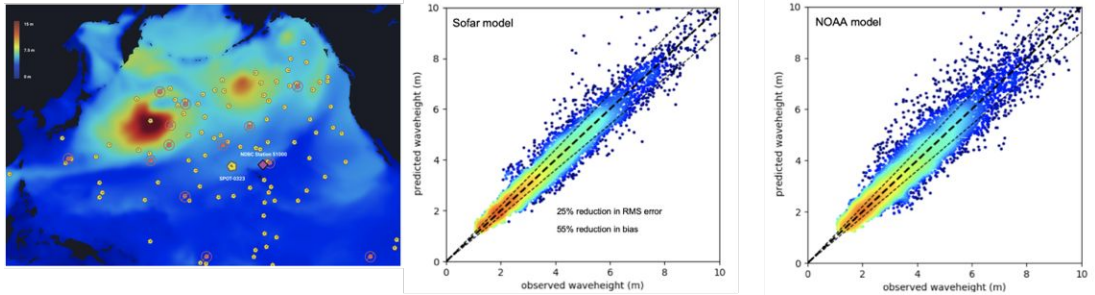


Innovating assimilation

Optimized Interpolation

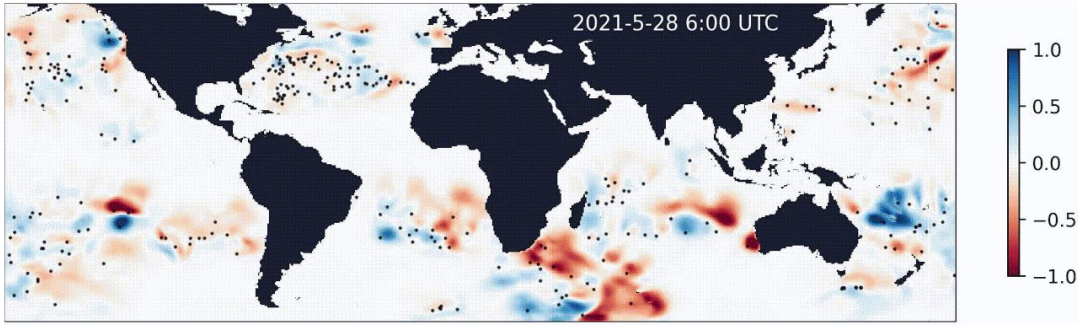
Optimized Interpolation (OI) can **reduce RMS errors** by 20%-50% in short-term forecasts as compared to NOAA (see here). We currently include OI assimilation in our operational forecasts.

See Smit et al. 2021, *Ocean Modelling*



Spectral Wave Assimilation

Sofar's new spectral OI model assimilates the complete wave directional spectra (as opposed to bulk statistics). This new capability radically improves medium range wave forecasts and reduces uncertainty in the prediction of wave field characteristics and arrival times globally.



Global error field. Colors indicate difference between NOAA model and Sofar spectral DA model.

Scalable distributed ocean sensing

Connecting the world's oceans.

SOFAR

QUESTIONS?

Dr. Isabel Houghton
Ocean Science
+1.209.768.2490
isabel.houghton@sofarocean.com

https://www.sofarocean.com

Access our global Spotter sensor weather network:

https://weather.sofarocean.com