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How ocean current data can contribute to sustainable fisheries

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How ocean current data can contribute to sustainable fisheries

- Introduction – Global fisheries and aquaculture
- The use of satellite data in fisheries
- Opportunities for Ocean current data use in fisheries
- Concluding remarks

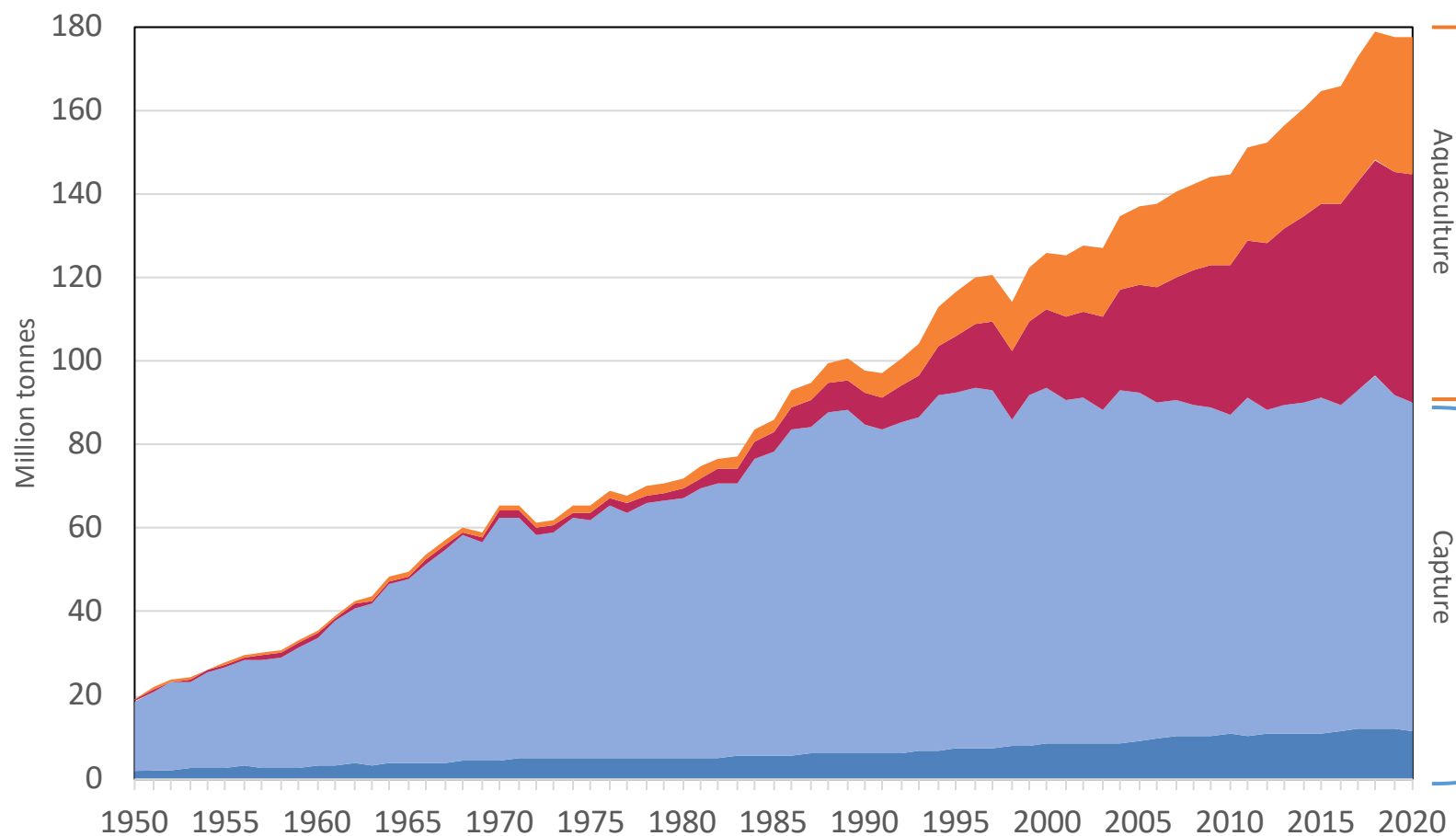


<https://www.fao.org/publications/sofia/2022/en/>



TOTAL FISHERIES AND AQUACULTURE PRODUCTION 2020

214 Million tonnes - A RECORD



**ANIMAL PRODUCTION =
178 Mt**

Capture fisheries = **90.3
Mt**
(12.7% Inland)

Aquaculture = 87.5Mt
(62.2% Inland)

**ALGAE PRODUCTION = 36
Mt**

■ Capture fisheries - inland waters ■ Capture fisheries - marine waters

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■ Aquaculture - inland waters

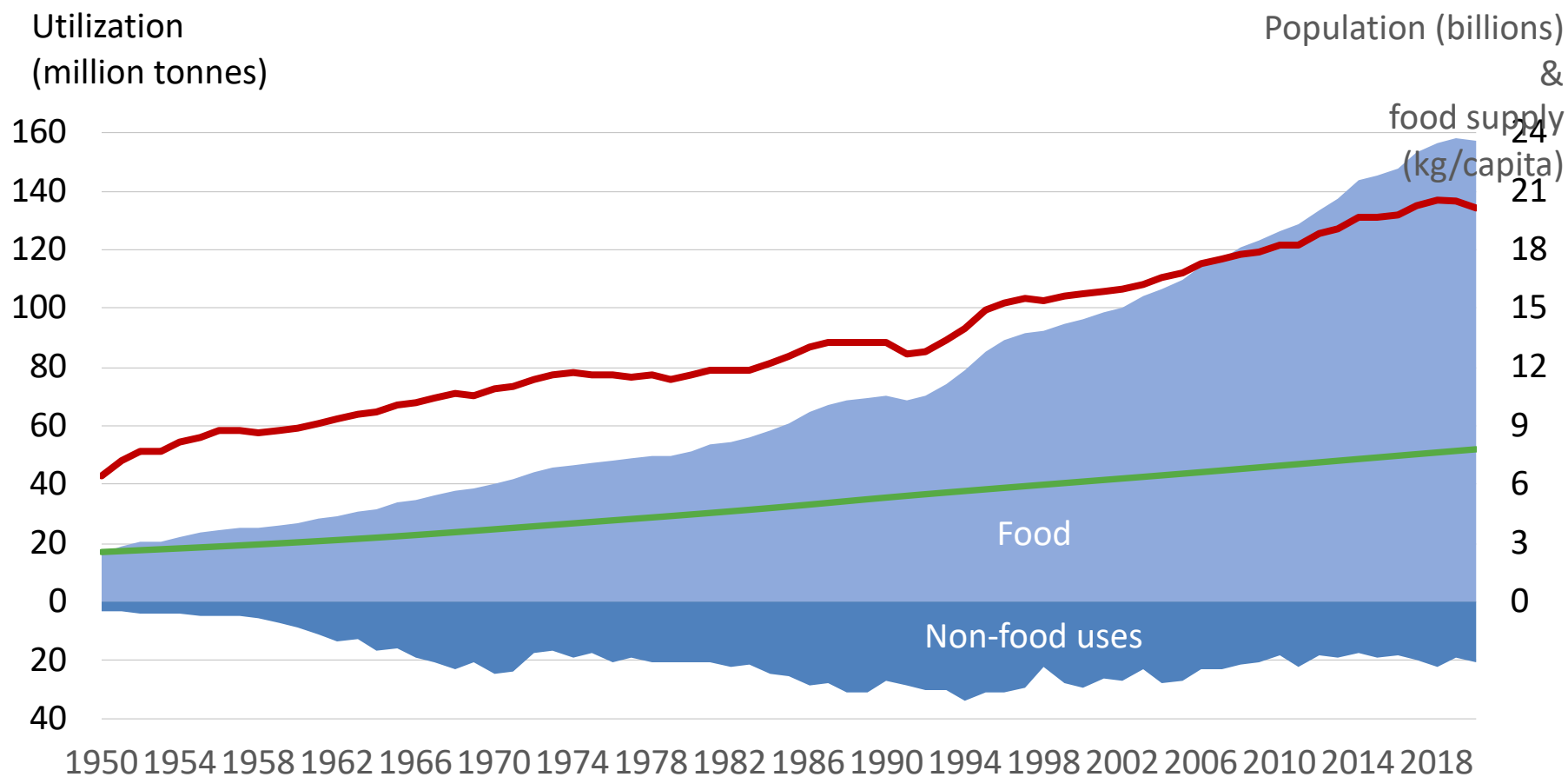
■ Aquaculture - marine waters





UTILIZATION AND APPARENT CONSUMPTION

157 million tonnes - 20.2kg/person



Population (Billions)

Per capita apparent consumption (kg)

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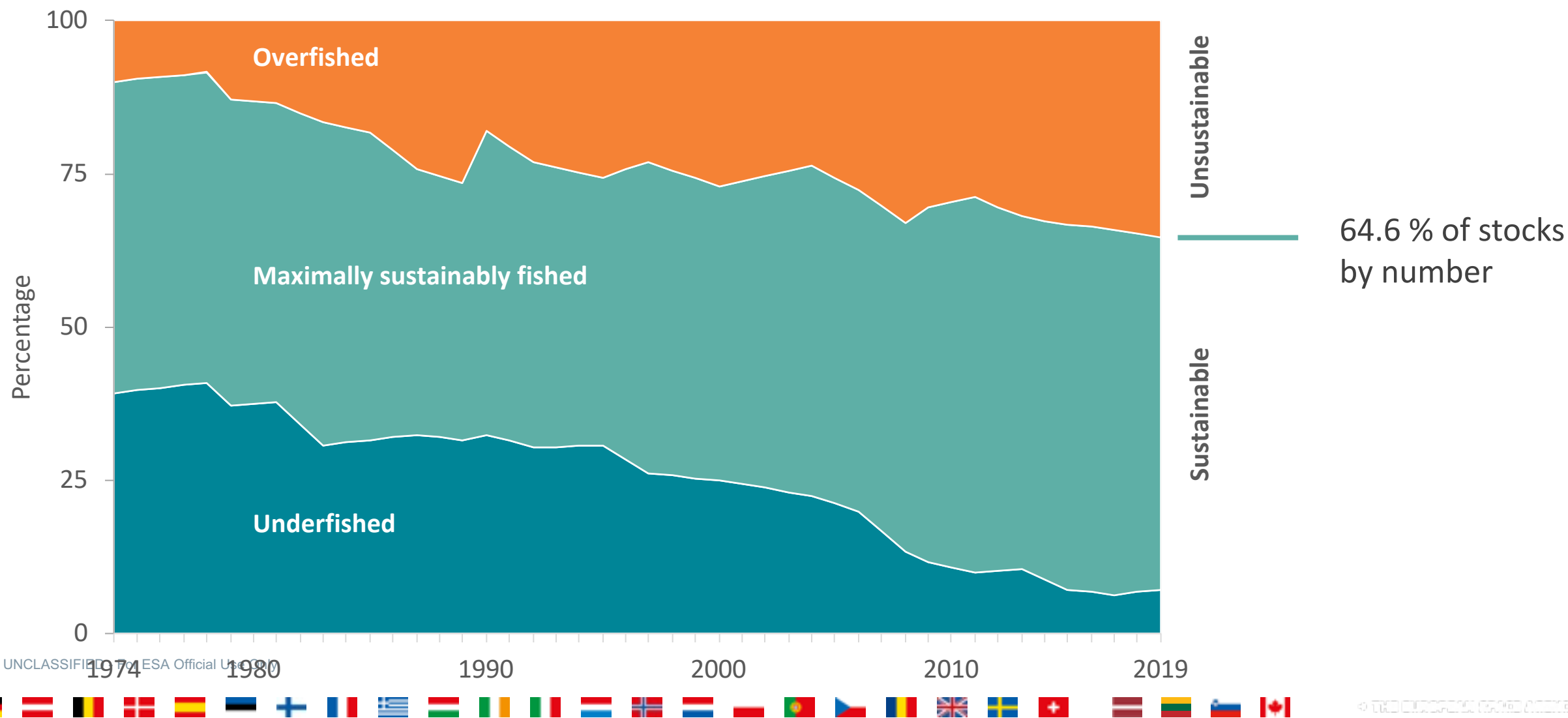


FISHERY RESOURCES ARE
DECLINING DUE TO
OVERFISHING, POLLUTION,
POOR MANAGEMENT...





GLOBAL TRENDS IN THE STATE OF THE WORLD'S MARINE FISH STOCKS, 1974-2019





FISHING SUPPORTS LIVELIHOODS, BUT IS ONE OF THE MOST DANGEROUS OCCUPATIONS

600 million people dependent on fisheries for their livelihoods.

59 million people are employed in the primary sector



Aquaculture
35%

Fishing 65%

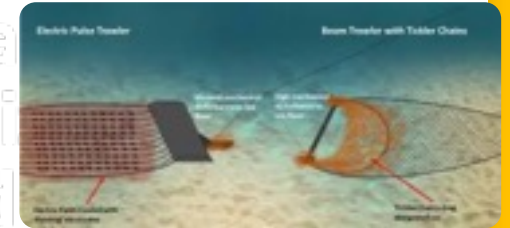
100,000+ FISHERS ARE KILLED WHILE DOING THIER JOB
EVERY YEAR

TECHNOLOGY IS THE KEY TO SUSTAINABLE FISHERIES

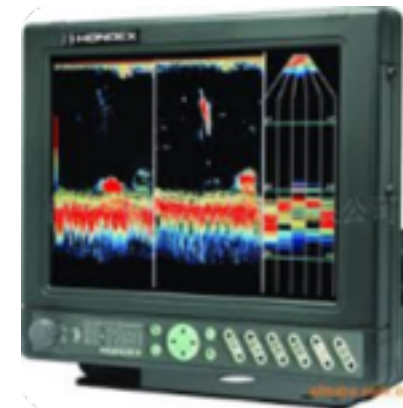
Technology is instrumental for a commercial fishing industry, which operates in an economically viable, environmentally responsible, socially acceptable and safe manner, contributing to human well-being, food security and poverty alleviation.



Propulsion systems



Electric pulse trawl



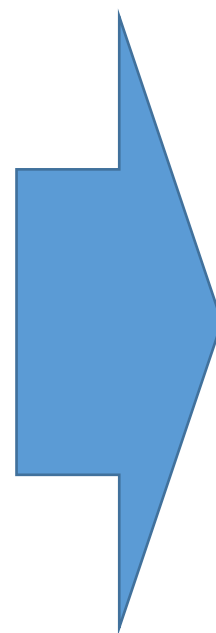
Fishfinder



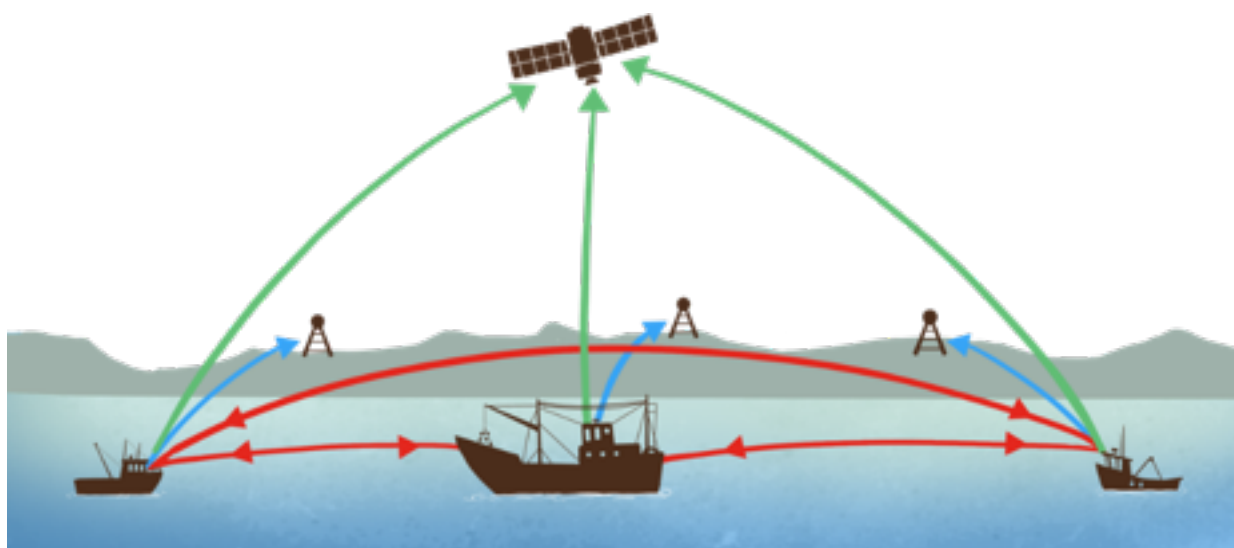
Computerized weighing/grading

SATELLITE TECHNOLOGY IS USED FOR FISHING SAFETY, PERFORMANCE AND COMPLIANCE

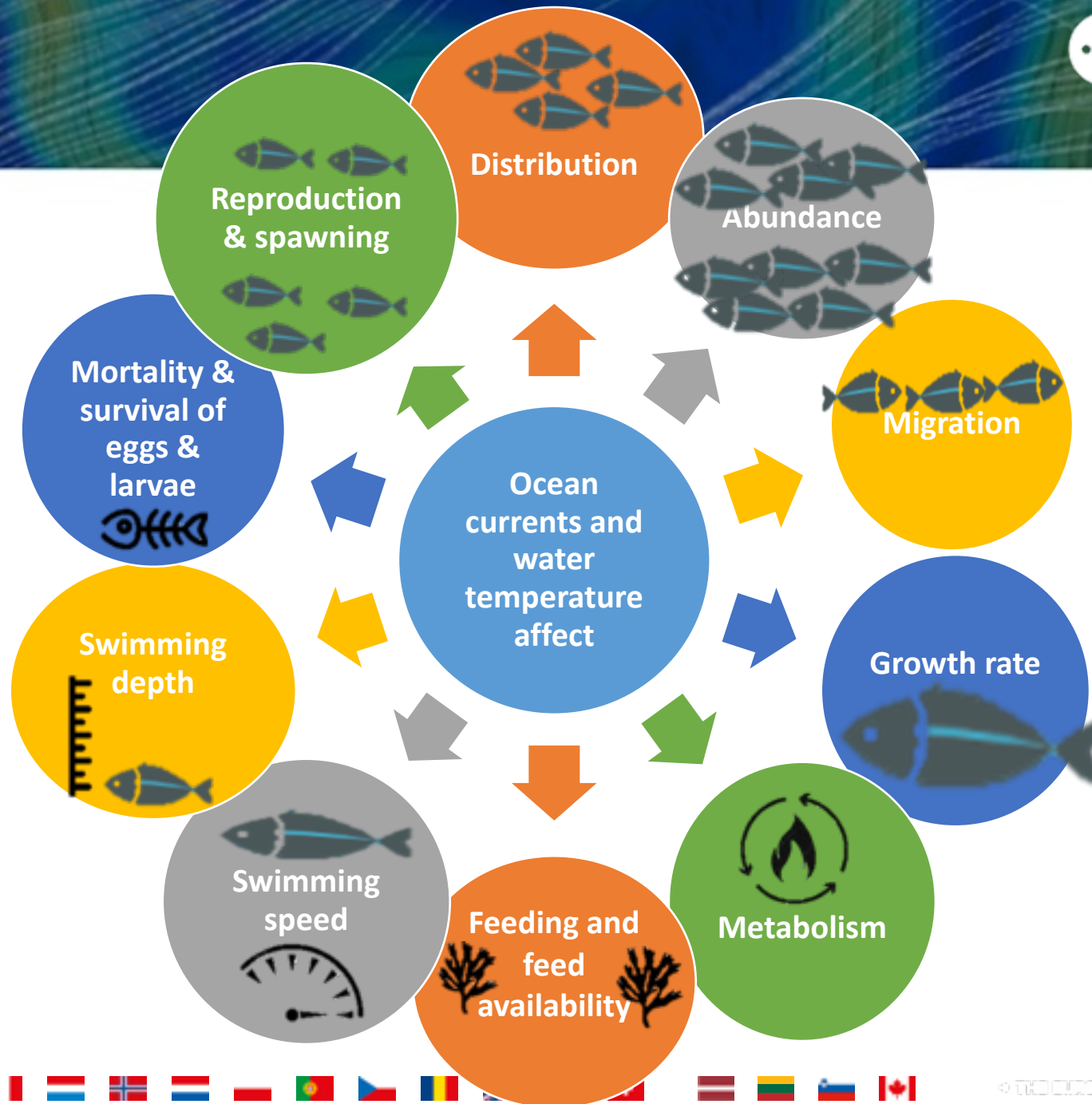
- Global Positioning System (GPS)
- Global Navigational Satellite Systems (GNSS)
- Automatic Identification Systems (AIS)
- Vessel Monitoring Systems (VMS)



- Navigation
- Safety at sea
- Search & Rescue (SAR)
- Finding fishing grounds & gears
- Monitoring vessel operations for management
- Reducing Illegal, Unreported and Unregulated Fishing (IUU)
- Weather forecasts
- Early warning

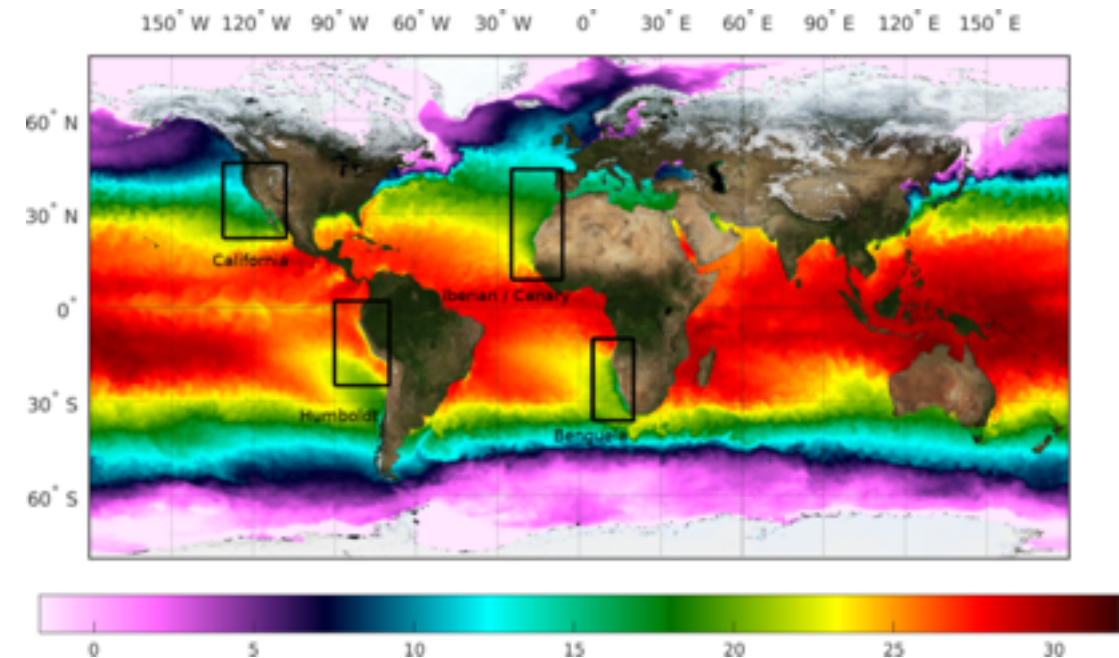
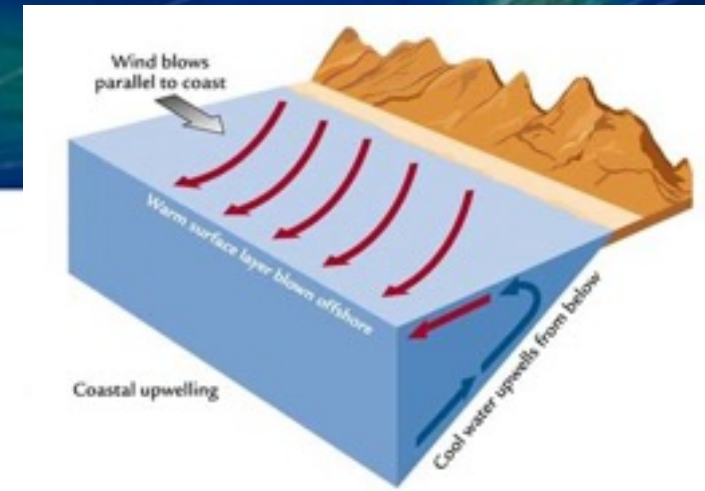


OCEAN CURRENTS AFFECT FISH STOCKS AND FISHERIES



Eastern Boundary Upwelling Systems (EBUSs)

- EBUSs result from wind-driven circulation, with nutrient rich deep waters reaching the surface
- EBUS = a highly productive areas for fisheries.
- 2% of ocean surface, but 20% of global fisheries production
- High uncertainty about how they will evolve under climate change scenarios
- Ocean circulation data could support the calculation of an upwelling index and help decision makers with the adaptation of fisheries

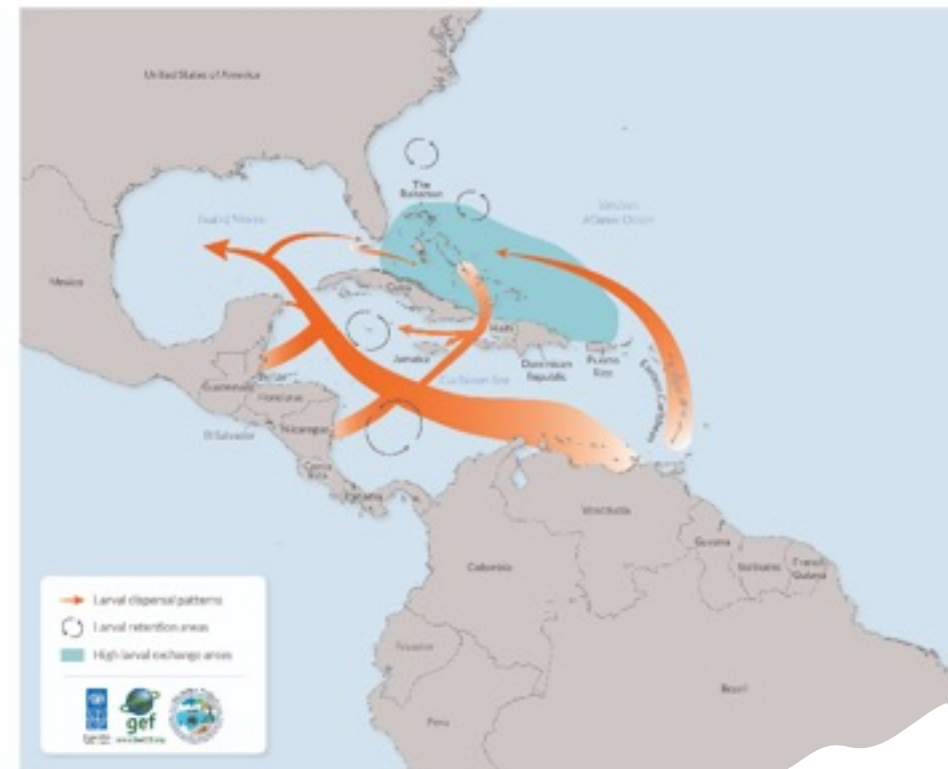
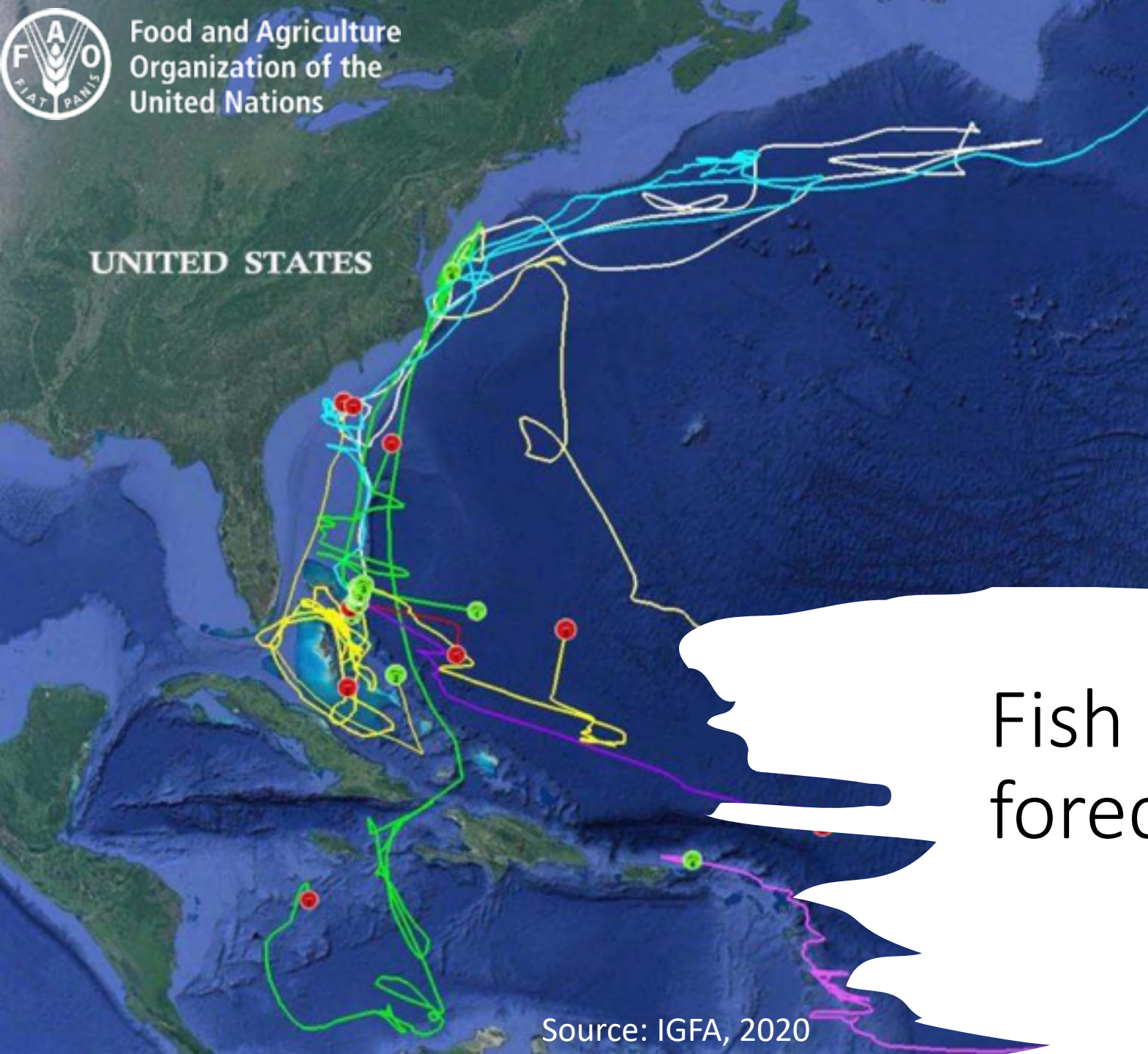


Global sea surface temperature from satellite data showing the California, Peru, Canary and Benguela ecosystems and upwelling (Source: Oceansoda project)).



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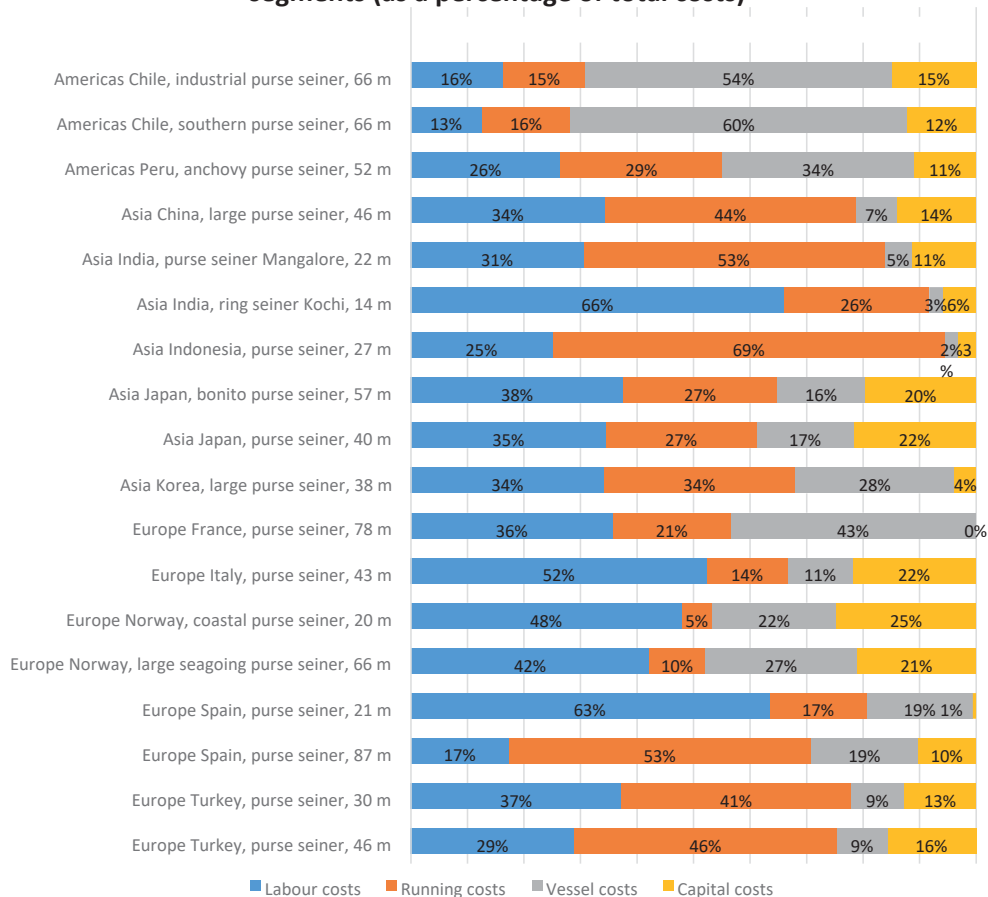
Fish stock migration
forecasting

Source: IGFA, 2020

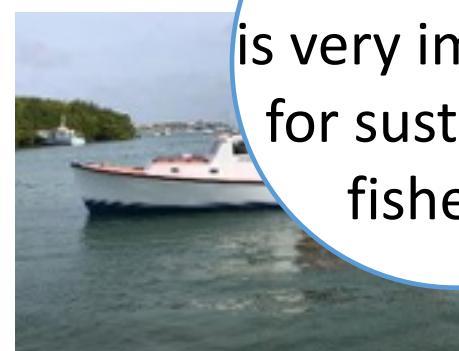


INCREASING ENERGY EFFICIENCY IN FISHING

Cost structure for average vessels in the purse seiner fleet segments (as a percentage of total costs)



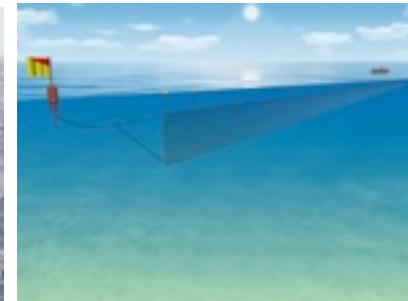
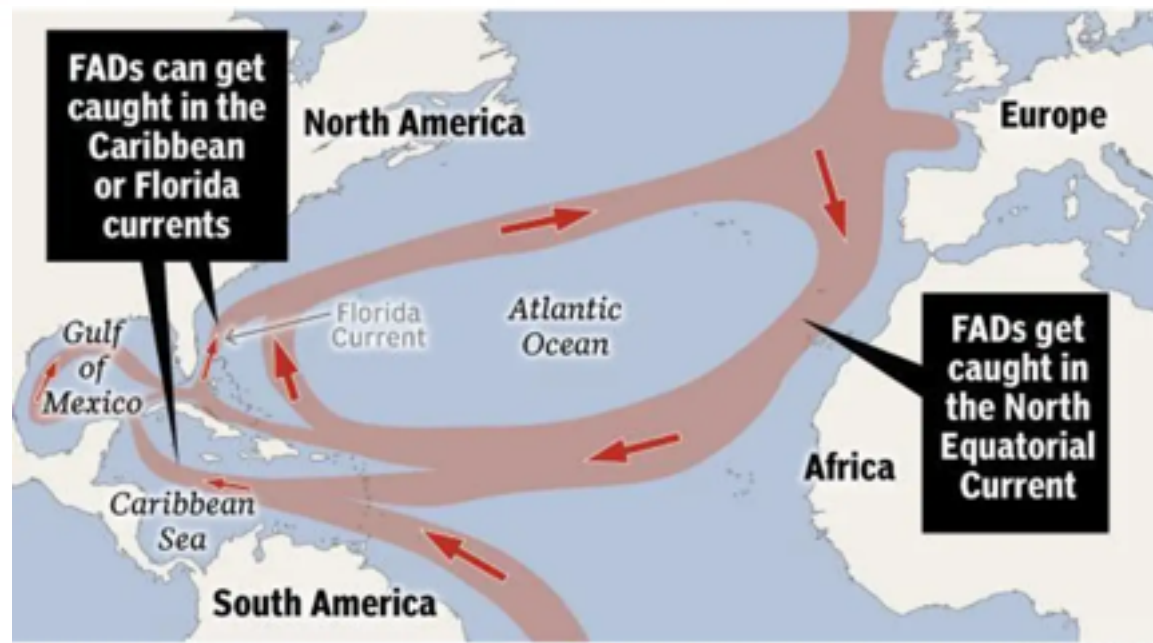
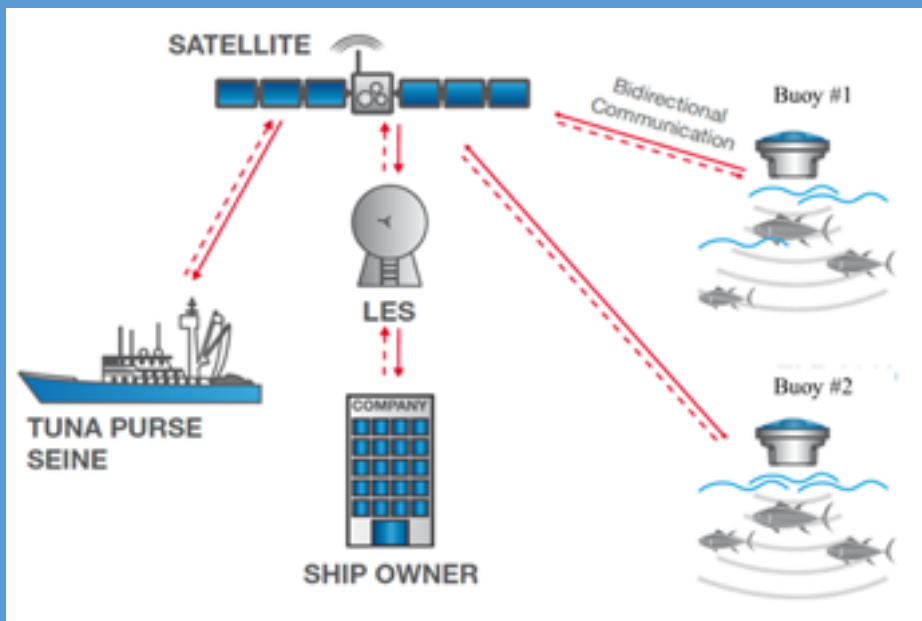
■ Labour costs ■ Running costs ■ Vessel costs ■ Capital costs



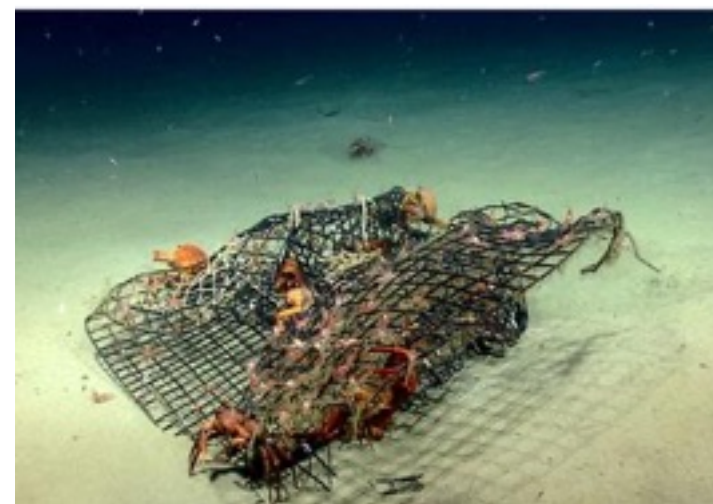
Fuel efficiency
is very important
for sustainable
fisheries



Drifting Fish Aggregating Devices (dFADs) and other drifting gears



Source: FAO & IFREMER)



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Pollution
affecting
fisheries

Pollution
caused by
fishing and
aquaculture
operations



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Data usage for parametric insurance in fisheries

Weather index risk insurance

- Windspeed
- Temperature
- Rainfall
- Wave height

Source: FAO



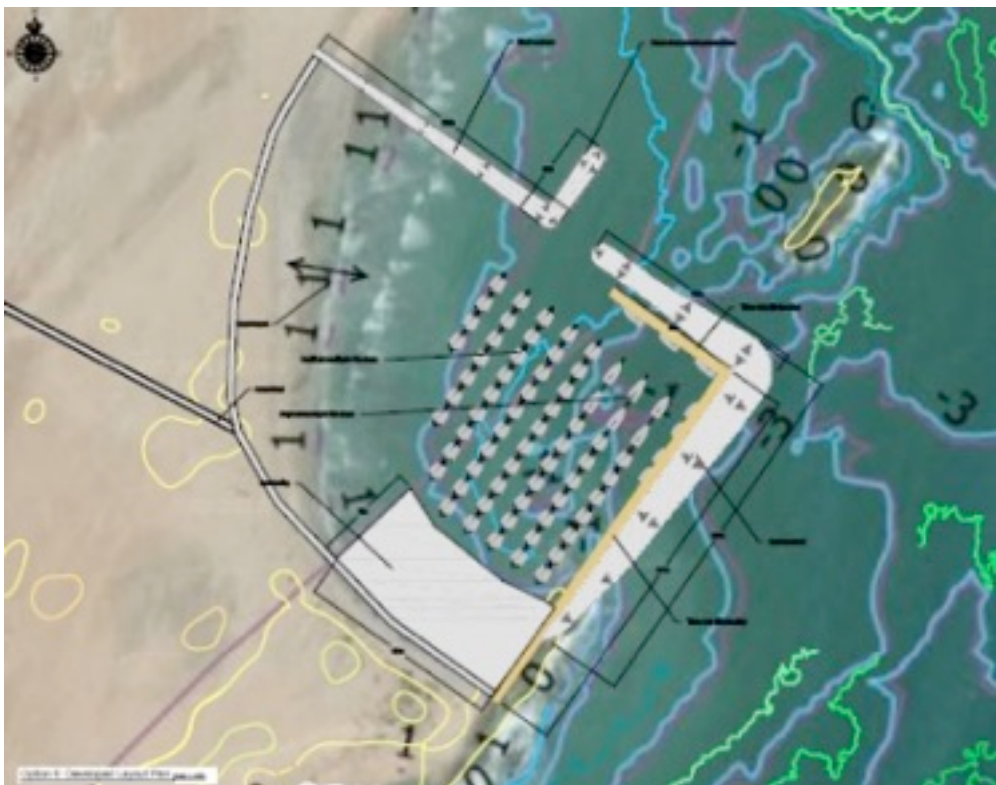
Source: Science, 2019



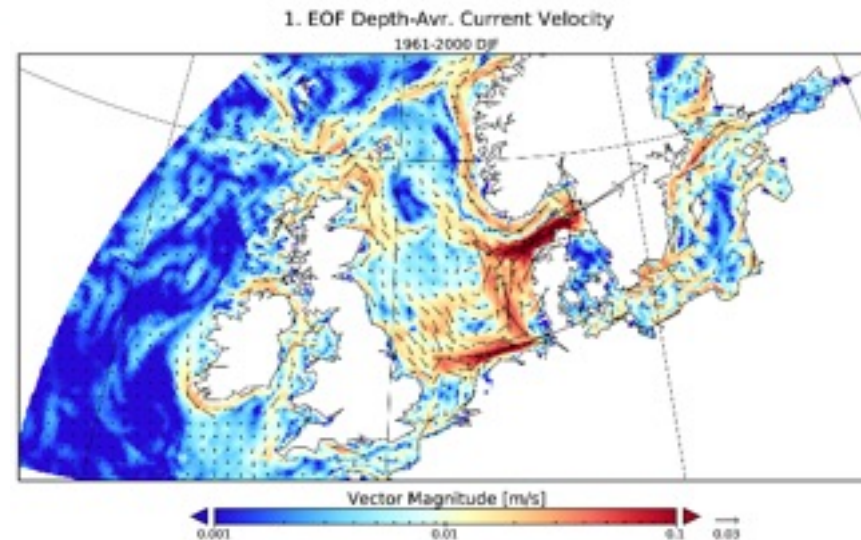
Ocean current data can support conservation and management decision making:

- Establishment of MPAs
- Closed seasons
- Allocation of fishing quota
- Search new fishing areas

Siting of fishing harbour and fish farm location



Source: FAO Somalia, 2020



Source: Max Planck Institut, 2015



Source: FAO, 2017



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Thank you

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