FAO of the UN
Rome, Italy

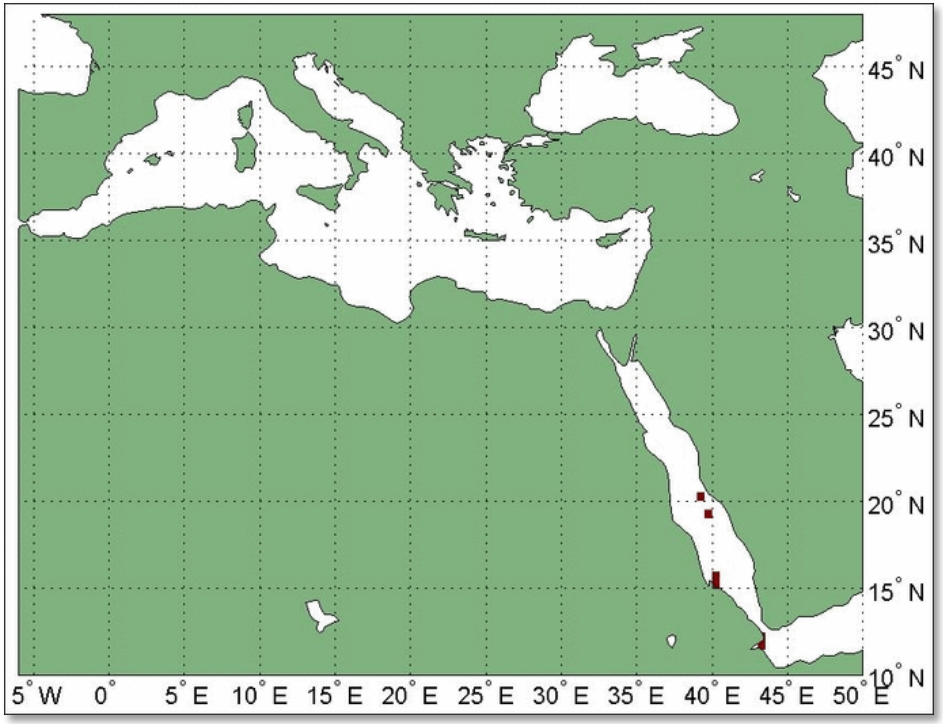
Food and Agriculture Organization of the United Nations

Data needs for Blue Growth; Policy issues and information needs for sustainable fisheries

Anton Ellenbroek, Fisheries Department, FAO-Rome
July 6th, Auditorium St Exupery

Overview BlueGrowth Data Needs
FAO's comprehensive approach

- 2030 Agenda; Sustainable Development Goals
  - FAO flagship publication SOFIA
  - Firms Partnership & GRSF
  - Common oceans; ABNJ
  - Global Fishing Watch
  - Regional Database
  - Stock assessment & e-training
  - Climate change impact on fisheries and aquaculture
  - Spatial planning; Copernicus data and the detection of aquaculture farming systems
- FAO's Global Data Framework for Blue Growth



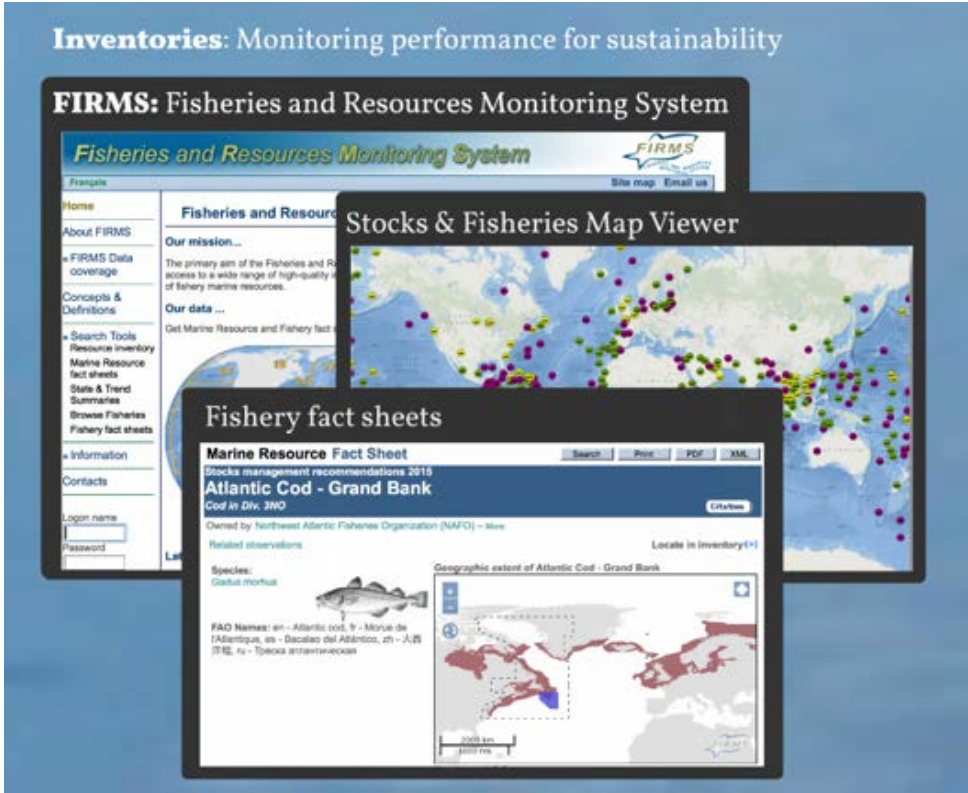
Sustainable fisheries and aquaculture
FAO dissemination of materials

- FAO Key publication: SOFIA
- But also FIGIS, FAOStat, FishstatJ
  - Characterize fisheries
  - Disseminate factsheets
  - Answers policy questions
  - Monitoring of performance
- New development
  - SDG 14.4.1 online monitoring
  - SDG 14.4.1 training

www.fao.org/fisheries/statistics

Sustainable fisheries data needs
Stock monitoring and assessment; dissemination

- Monitoring sustainability performance
- FIRMS; Fisheries & Resources Monitoring System
  - More than a system; a team
  - Provides governance model
- Stocks and fisheries Map Viewer
- Fisheries Fact sheets
- Global record of stocks and Fisheries



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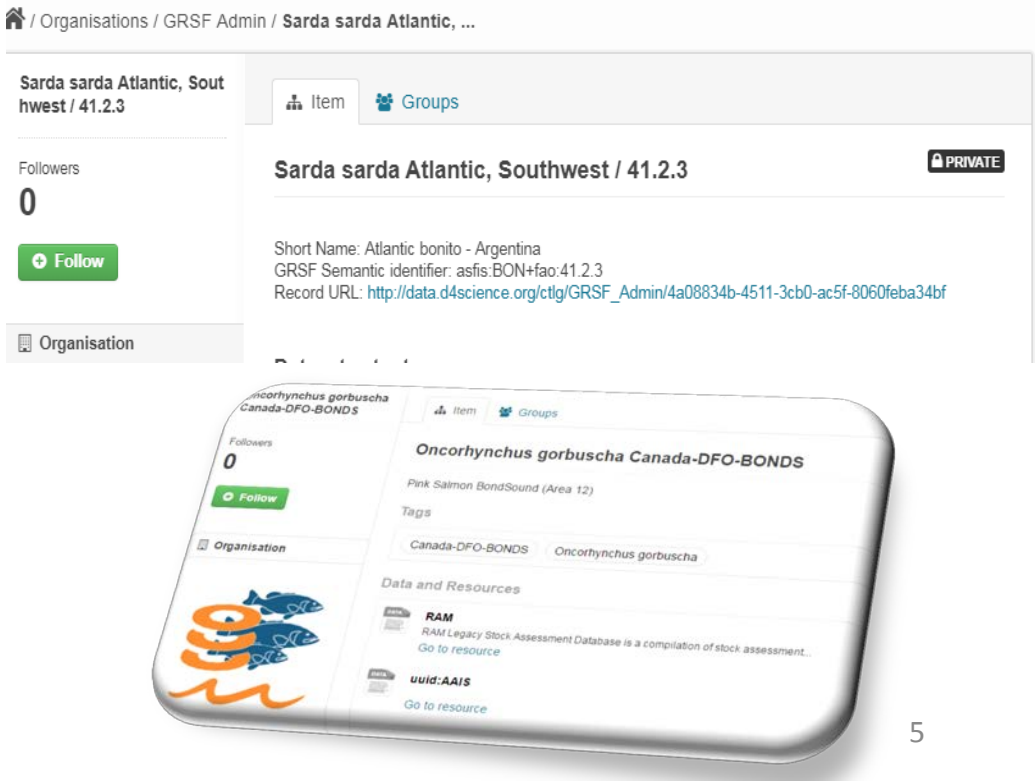
Global Record of Stocks and Fisheries
2018 release of catalog

- Harmonize existing fishing indicators
- Unique Identifiers for global stocks
  - Collaboration of main data providers (FAO, RAM, SFP)
  - Serves many different purposes (SDG14.4.1, Traceability)
  - Includes geographic identifiers
- Public data services
  - Built on a semantic knowledge base (can be queried)
  - Metadata driven and time aware
  - CKAN catalog publishes the results



Common Ocean
Areas Beyond National Jurisdiction (ABNJ)

UN environment · THE WORLD BANK IBRD • IDA | WORLD BANK GROUP · WWF · GLOBAL FORUM · IUCN · CONSERVATION INTERNATIONAL

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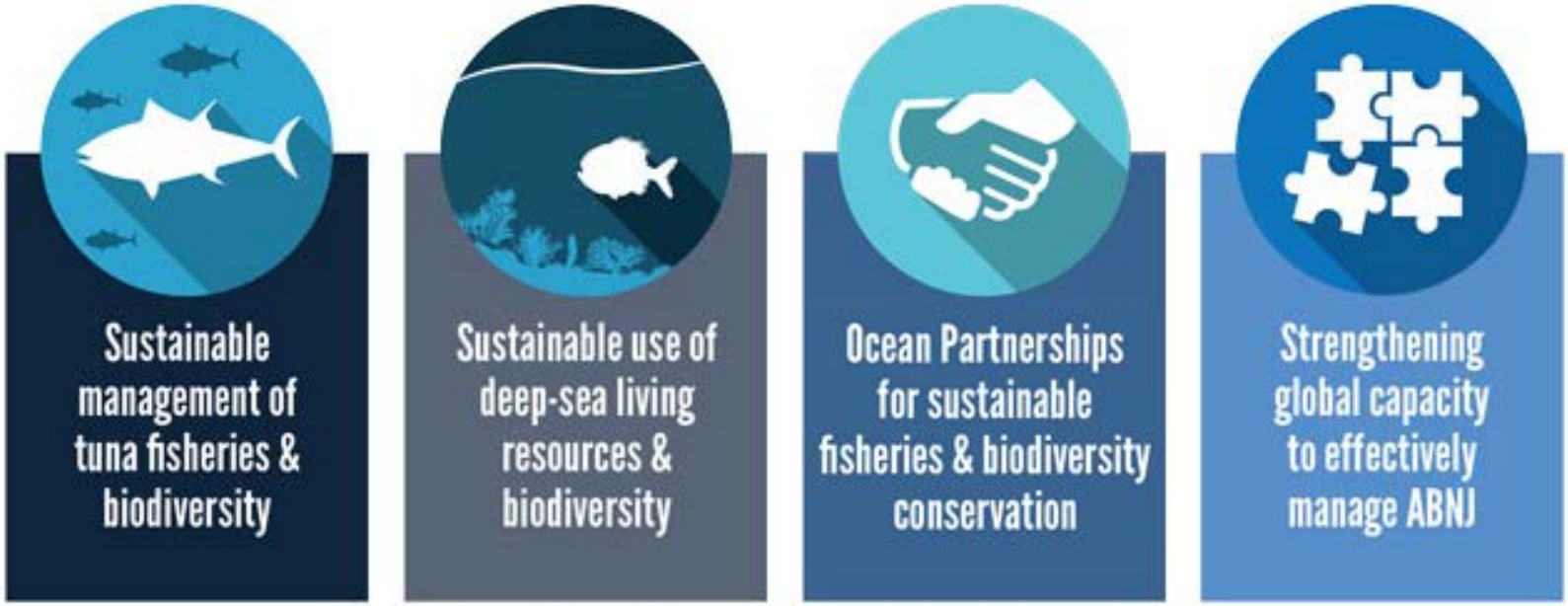
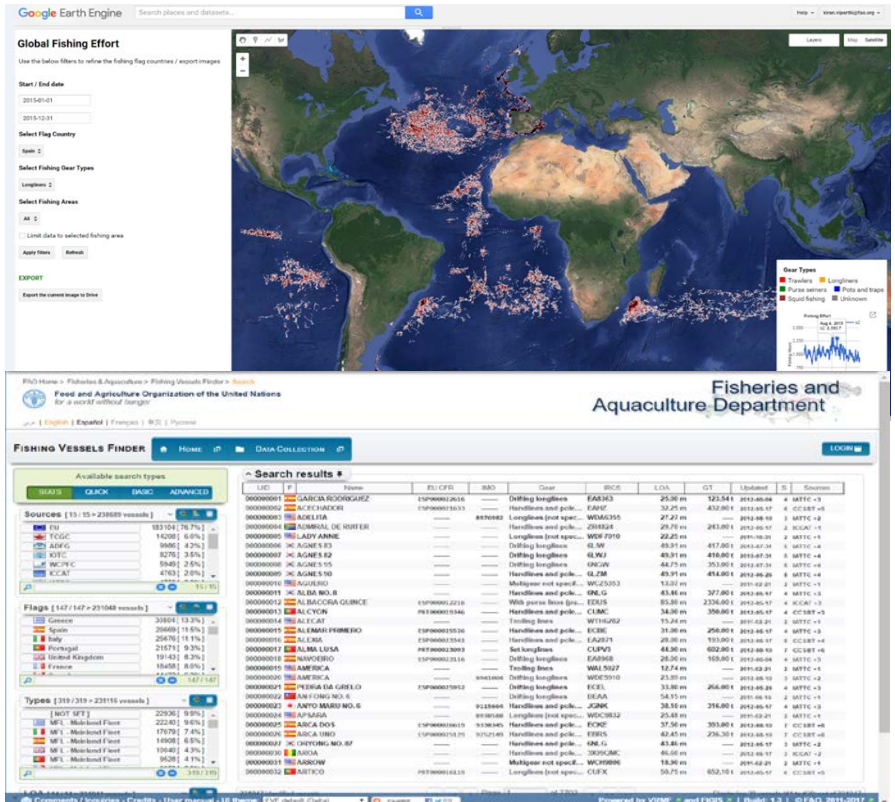
ABNJ / Common Oceans – A GEF Project



Google Earth Engine partnership
FAO Fisheries and Global Fishing Watch

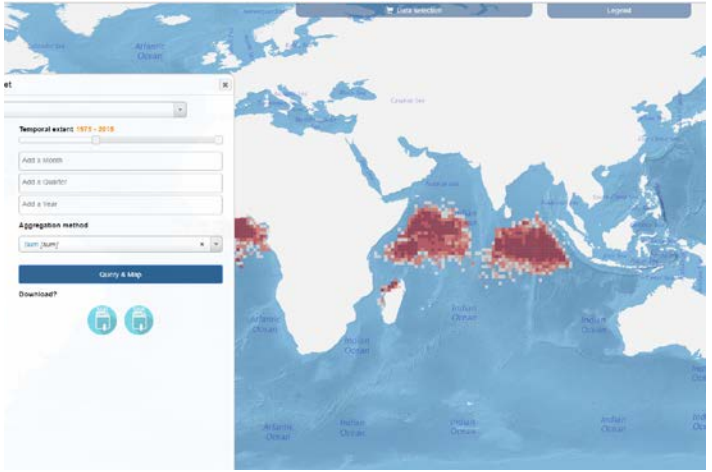
- Estimating intensity and global distribution of fishing capacity, fishing activities. (Global Fishing Watch)* SDG 14
- FAO Vessel Registry and reference data

- Other FAO / GEE projects:
  - Collect Earth (augmented visual interpretation of RS data for land monitoring) – SDG 2 and 15
  - Water Productivity (regional mapping of performance of water use in agriculture) SDG 2 and 6
  - SEPAL *System for Earth observations, data Processing & analysis for Land monitoring*-SDG 2,6 and 15
  - Desert Locust Mapper (locust presence monitoring and risk mapping tool) - SDG 12
  - Estimation of GHG emissions from fires - SDG 13
  - Rift Valley Fever risk mapping tool - SDG 2, 3
  - Post-Harvest Loss Indication Tool (PHLINT)* - SDG 12



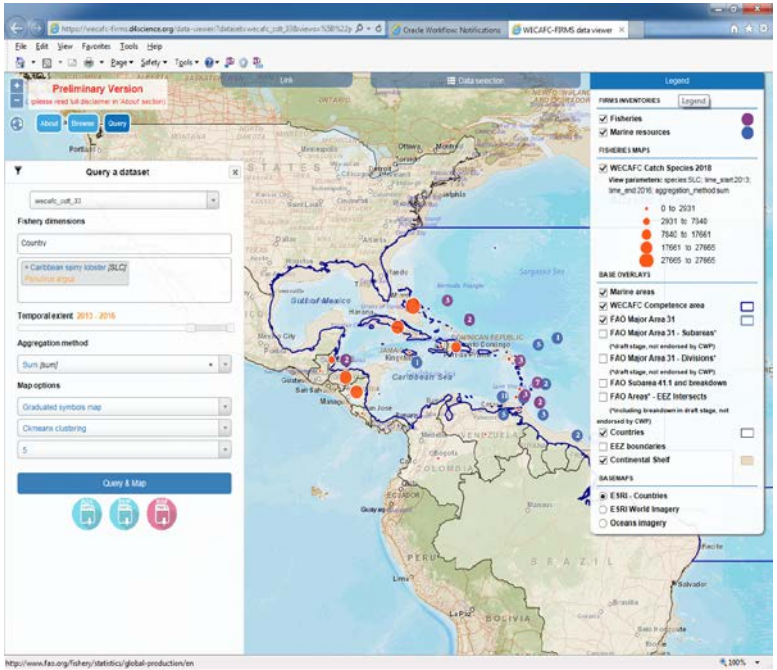
Support to stock monitoring
Harmonized data access and sharing

- FAO Tuna Atlas allows to harmonize and standardize fisheries capture date
  - From major fisheries bodies
  - Harmonize spatial / temporal / species / gear / “flag” dimensions
- Harmonized data are shared in public OGC and CKAN repositories



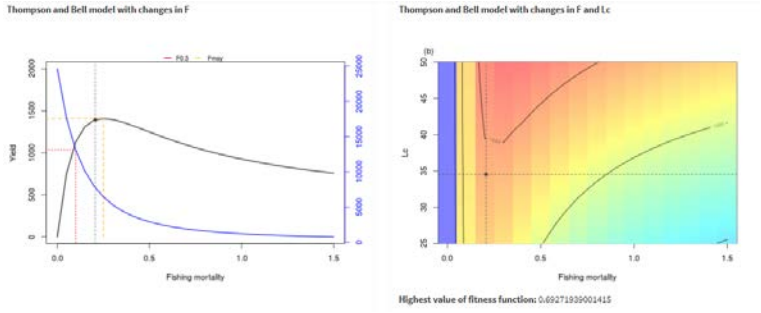
Support to stock monitoring
Regional Database for Fisheries

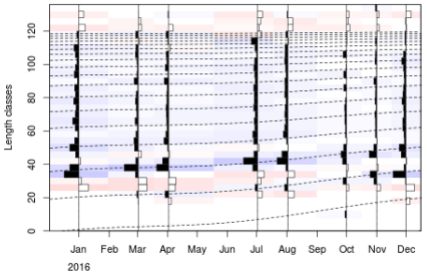
- The Metadata driven approach results in data and infra interoperability;
  - Map viewers; GeoNetwork based
  - Data analysis by assessment teams; reproducible stock reports
  - Cross domain analysis; generate fisheries data in NetCDF format



SDG14.4.1 Monitoring
Tools for capacity building

- SDG14.4.1 is about proportion of fish stocks within biologically sustainable levels;
- FAO support the capacity development towards understanding his complex indicator
- Use the infrastructure R, Rshiny and Docker approach





Length infinity in cm: 125.267001434338
Curving coefficient: 0.170751668707574
Time point anchoring growth curves in year-length coordinate system, corrsponds to peak spawning month: 0.953701318481756
Amplitude of growth oscillation:
Summer point of oscillation (ts = WP - 0.5): 0.696269078345535
Growth performance index defined as phiL = log10(K) + 2 * log10(Linf): 3.42803831994958
Biological reference levels

	Fmsy	F05	Emsy	E05
1	0.25	0.10	0.52	0.30

Current yield and biomass levels

	curr.Lc	curr.tc	curr.E	curr.F	curr.C	curr.Y	curr.V	curr.B
1	NA	NA	0.47	0.21	0.33	1391.77	0.00	7742.89

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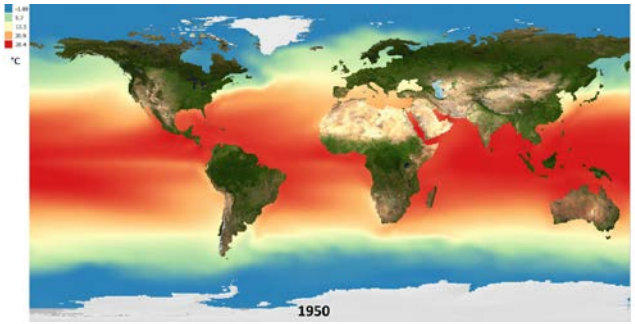
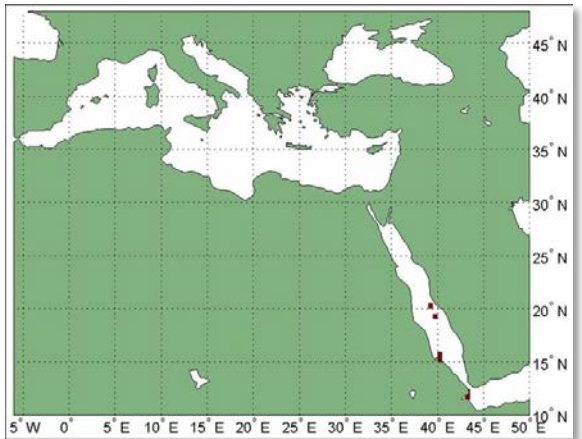
FAO Fisheries and Climate change
Upcoming report

- July 2018: 628-page report
- The impacts of climate change on fisheries and aquaculture
- 200+ authors, peer-reviewed
- Disaggregated impacts
- Adaptation options

Climate change modelling for fisheries
A complex mix of biological, environmental and fisheries data

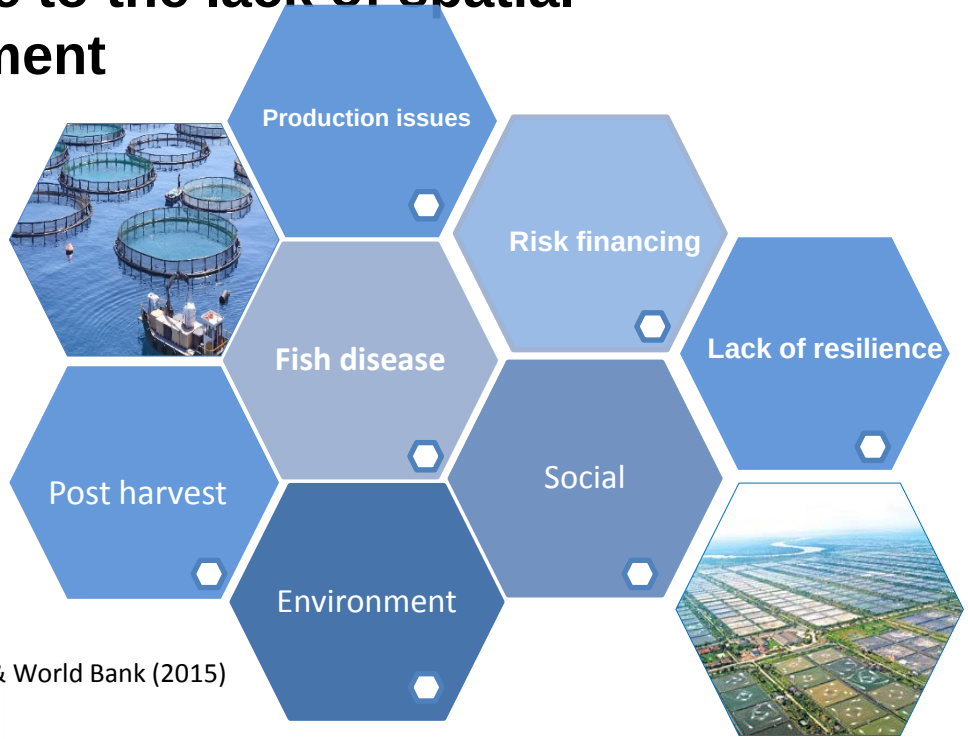
- Species distribution based on generated timeseries of forecasted environmental values
  - NOAA and NASA for climate indicators
  - AquaMaps for other (environmental)
- To create a harmonized and uniform experimental data space
- Example: Sea surface temperature forecast
- We modeled forecasts of species invasions
- We are working to forecast stock distribution





FAO support to the Aquaculture sector
Global Policy requiring spatial scientific-evidence

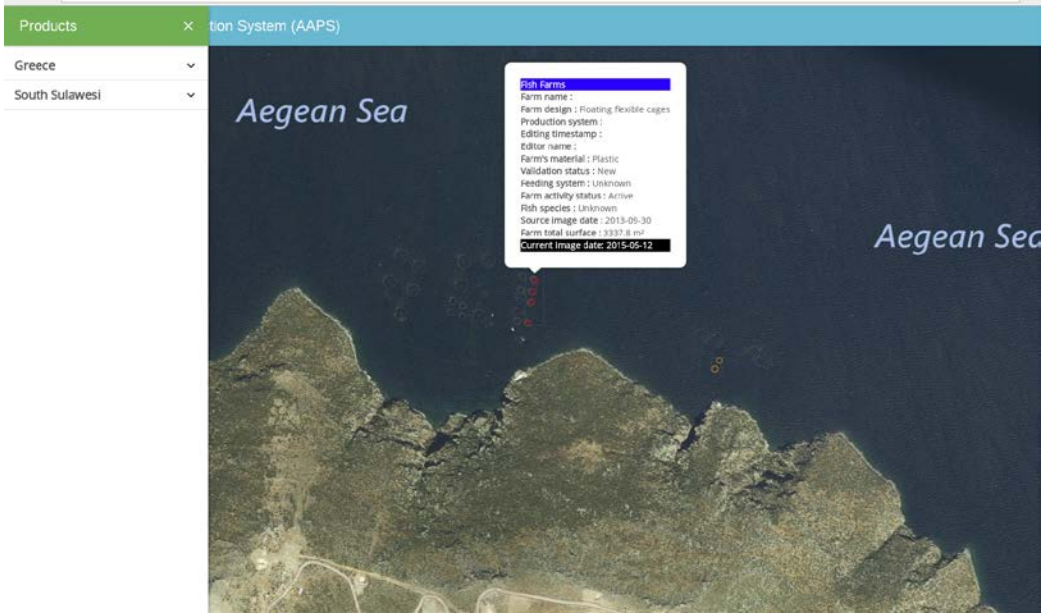
Common problems due to the lack of spatial planning and management



Source: FAO & World Bank (2015)

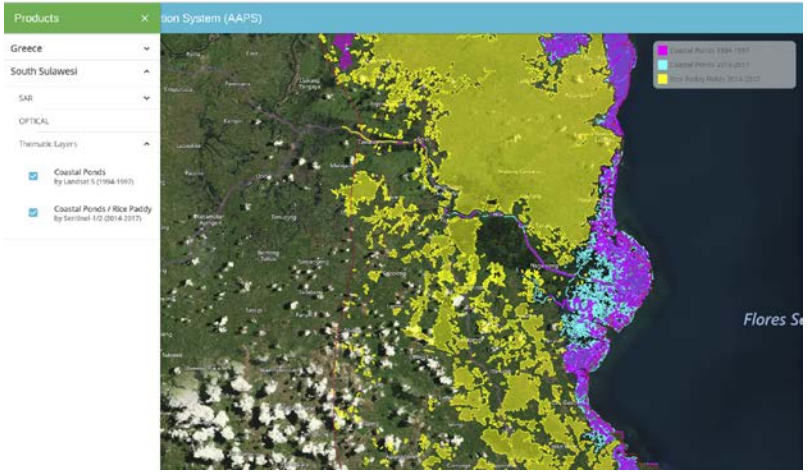
Detection of Aquafarms for inventories
A semi-automated workflow

- Based on free optical imagery
  - Detect cages algorithm
  - Edit cage attributes
  - Publish data to a geoserver
- Maps now available include
  - Greece (Months to prepare)
  - Malta (Hours to prepare)
  - Easy to reproduce



Copernicus downstream application
A infrastructure supported work-flow

- Based on Sentinel and Landsat imagery
  - Analysis of shrimp / fish ponds
  - Analysis of images from EO data catalog
- Comparison between 1994-1997 and 2014-2017
  - Unique S1 and S2 and Landsat composite
  - Quick scan of Land-use classification
- Output to a standard SDI (Geoserver)
  - Accessible by GIS Software
  - Available for WPS processes; e.g. to
    - Merge with other layers
    - Compute suitability



FAO's Global Data Framework for Blue Growth
Copernicus collaboration options

Global vessel Registry

Partnerships and networks

Capacity building

International standards

Statistics

Comprehensive knowledge bases

Tools, Collaborative data infrastructure