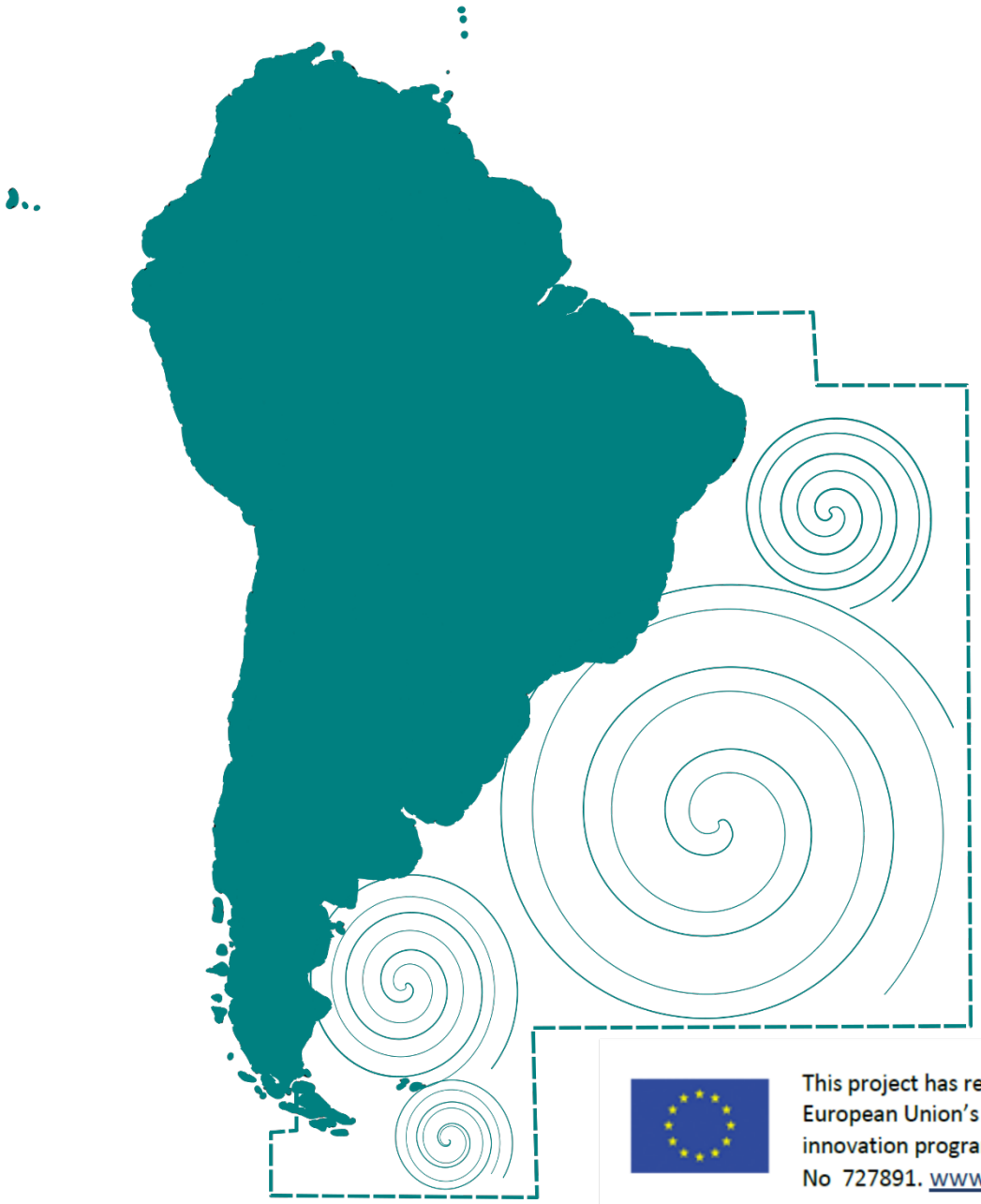

Summary report of recommendations, insights and needs detected

Alexandre Rodríguez
Executive Secretary
EU Long Distance Advisory Council (LDAC)

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P1. Shortfin Squid (*Illex argentinus*) – Prof. Wei Yun

Key role of China as first country in fishing (catch volume), trade (value of landings) and consumption (internal market and exports) of oceanic squids

a. Characteristics of the fishery:

- Squid-jigging active since 2002 – increase in no of boats, CPUEs
- Sensitive to climatic and environmental variations: link between Antarctic sea ice extent and fisheries productivity due to ocean currents

b. Scientific research undertaken

- Development of Habitat Suitability Index (HSI) model for creating robust predictions
- Finding: High sea ice extent years means more suitable habitats (i.e. productive yields) for *Illex argentinus*; low sea ice extents the opposite.

c. Present challenges:

- Improve knowledge of squid fisheries through determination of habitat suitability by integrated HSI models (comparison of water-depth temperature scenarios)
- Integrating ecosystem/environmental predictive models with stock biological assessments (e.g. linkeages btw fishing effort and sea temperatures?);
- Use of mapping as visualization tool for informing management decisions (spatial distribution of sea ice and water temperature)

P1. Fishing activity trends of Spanish fleet in ASW – Raul Vilela

a. Characterisation of the fishery:

- Operates in Malvinas/Falkland Waters and the High Seas of the Patagonian shelf (HSPS)
- Main species by catch volume: *Merluccius hubssi (43%), Illex argentinus (32%) and Patagonotothem ramsayi (13%)*
- Number of Spanish freezer trawlers stabilised since early 2000s (btw 18-26).
- Strong seasonality component – "chasing the fish" in their migrations out of HSPS (predominance of catches in 1Q and 3Q of year)

b. Scientific research undertaken

- IEO observer programme uninterrupted for over 30 years
- Type of information collected: haul data; biological data related to catches and discards; oceanographic info (incl. water temperature, wind speed…)
- Several projects on seabed mapping for identification and protection of VMEs – implementation by EU/Spain of UN 61-105 through fishing ban.

c. Present challenges:

- Extending this research to other flag states operating in the area with similar methodologies and building (uninterrupted) time series to get the full picture.
- Lack of implementation of UN 61/105 due ineffective protection of VMEs by non-EU flag states: risk of IUU fishing due to squid and deep-sea species fisheries in those areas.

P1. Scientific knowledge and advice for conservation and sustainable management of Faklands fisheries – A. Arkhipkin

a. Characteristics of the fisheries:

- Vast extension of Patagonian shelf (1.2 million sq.km)
- Rich fishing grounds due to water mixing by confluence of currents: Malvinas/Falklands (cold sub-antartic, high productivity) and Brazil (warm subtropical, low productivity).
- Fisheries: largest economic sector for FI: over 60 million GBP annually, of which 4 m is dedicated to scientific research and control
- Property rights (ITQs) introduced in 2007
- Main species by catch volume / licences: Squids (*Illex argentinus and Lolligo)* and finfish
- Mixed regulatory approach: TAC (Tootfish and Blue Whiting) and TAE (squids, finfish)
- Joint ventures based on mutual interest: Falkland provides access to resource (quota) and logistic support; while foreign fishing investors provide vessels, expertise and access to markets.

b. Scientific research – conservation and management measures undertaken

- Temporal/spatial restrictions for fishing Loligo gahi (nursery / feeding grounds)
- Temporary Marine Protected Areas for Patagonian toothfish spawning (1 July-31 Aug)
  - MPA in force since 2005 - MSC Certification completed in 2014
- Temporal MPA closure for southern blue whiting (since 2010)
- Bird & seal mortality mitigation on trawlers (incl. 100% observer coverage in 2018-9)

Panel 1. Overall conclusions

1. Need for international cooperation for research:

- Data sharing for main commercial species in the ASW via research and management agreements is essential, in particular on fisheries and biological data of straddling stocks both within and outside the EEZ of Argentina and the Malvinas/Falkland Islands SAC (e.g. Illex argentinus and M Hubbsi).
- Need to ensure continued monitoring of the fleets by scientific observers from those countries.
- Promote collaborative research on gear selectivity, TCMs or by-catch mitigation measures.

2. Identify research priorities:

A multilateral action plan to be defined through a stepwise approach for data collection programmes on:

- Biology (population structure, age and growth, feeding and spawning grounds, migrations…);
- Habitat characteristics (suitability, benthos, population dynamics);
- Fisheries management (fishing effort, presence, flag state and international norms);
- Climatic and environmental conditions with different spatial and temporal scales.

3. Set an adequate international legal framework for scientific cooperation in the region

- Main aim: avoid overfishing and IUU fishing.
- Political tensions between stakeholders lead to patchy data.
- Absence of institutional mechanisms or arrangements to share and exchange information and agree control and management recommendations that can be enforced.
- Improve MCS and compliance by all fleets for VME protection in international waters / high seas.

P2. Deep-sea fisheries in ABNJ – William Emerson (FAO)

a. ANBJ Deep Sea Project (2014-2019)

- Improve understanding via reviews and studies of DSF, e.g. alphonsinos, orange roughy
- Educated, mobilized and empowered RMFOs to protect VMEs.
- Enabled 8 deep sea RFMOS to conduct impact assessments on the marine biodiversity in potential VMEs sites prior to fishing (e.g. alphonsinos and orange roughy).
- 18 new sites have been established to protect VMEs (e.g. corals and sponges) covering almost the entire Indian Ocean!

b. ABNJ Deep Sea Fisheries (2022-2027) – Global Coordination with Common Oceans

- Focused on DSF sustainability – data poor stocks; and on VMEs and deepwater sharks;
- Structured in four components: 1. Governance, legal, enforcement, compliance;

2. Science and science-management interface; 3. Cross-sectoral activities affecting DSF;

4. Knowledge management, communication.

c. FAO International Guidelines on Management of Deep-Sea Fisheries in the HS:

- Apply precautionary approach
- Enhance fisheries management and support RFMOs
- Extend data collection and research programs
- Promote transparency
- Provide training

P2. Interactions between fishing and VMEs – ATLANTIS Project on seabed mapping – José Luis Del Río (IEO)

a. Characterisation of fisheries

- Spanish bottom trawl fishing activities in the area started in 1983
- Target species: hake (*M. hubbsi & australis*) and cephalopods (*Illex argentinus & D. gahi*).
- International waters - No RFMO in High Seas of the Patagonian Shelf.

b. Scientific research undertaken - ATLANTIS Project on VMEs in HSPS

- Legal obligation: Implementation of UNGA Resolutions 59/25 and 61/105; FAO International Guidelines in 2008 and Council Reg. (EC) 734/2008 on the protection of VMEs in HS (Art. 8. Flag States responsibility);
- Extensive and costly mapping of the seabed in 2007-2010 – 13 multidisciplinary surveys (geology, fisheries science, benthic ecology) for selection of suitable areas.
- Analysis of VMEs: combination of scientific surveys + comercial data on catch and effort + VMS ➡️ 99% of fishing effort taking place in HSPS shallowest strata above 300 m depth.
- Main habitats: geomorphology (canyons and gullies; rocky outcrops; mud volcanos; pockmarks; mega ripples)& benthos (cold-water coral reefs; coral gardens; sponge fields);

c. Present challenges

- 9 candidate VMEs (43,000 sq.km) for protection to EC and UN –
  Result: Bottom trawling ban since 1 July 2011 for Spain (EU) only
- Rich data available for use and benefit of other fleets in the region

P2. The value of remote sensing as tool to support compliance in fisheries mgment. for ASW – Tony Long (GFW)

a. Context / purpose

- Advances in big data and technology allow access to public, free and visible data.
- To create new knowledge publicly shared about human activities at sea.
- How? By breaking down big data through IT into accessible information.
- Tool to promote good governance: MS, multistakeholder and multiagency cooperation

b. Why remote sensing matters?

- MCS systems are based on VMS but increasing importance of AIS (compulsory for EU).
- Some States are voluntarily publicly sharing VMS data (Indonesia)
- Predictive models with algorythms for filling data gaps on fishing trajectory per gear
- GFW "package": carrier vessel portal + vessel history + dark vessel detection

c. Present challenges

- Operators and MS to embrace "theory of change" to fight IUU fishing and reward compliant operators who are easy to track and have no gaps in reporting (track records)
- Collaborative surveillance – switch of paradigm in MCS
- Future developments of GFW: work on SSF or MPAs; voluntary commitments from MS.
- Unveiling "dark fishing fleets" (example of North Korea) through combination of 4 satellite technologies: AIS, optical imagery, radar images (SAR), night-time imaging (VIIRS)

P2. Fisheries Governance: new approaches – J. Touza (ARVI)

a. Context

- Fishing industry is constantly evolving and adapting to the state of resources and market demands – climate change, overfishing and aquaculture production are limiting factors.
- Fishing value chains makes the living for roughly 10% of the world population.
- Growing demand of fish consumption in the world – avge. increase of 3% annually
- Wild fish is a source of rich protein high in good fat acids and minerals.
- Food production system with low CO2 footprint– help tackle and mitigate climate change
- Solid international legal framework and legal foundations for fishing in the high seas:
  - UNCLOS 1982 / UNFSA 1995 / RFMOs
  - FAO Code of Conduct for Responsible Fisheries
  - Regulations on fight against IUU fishing (EU, and worldwide – FAO IPOA and PSMA)
  - UN 2030 Agenda – SDG14 + UN Decade of Marine Science

b. Challenges related to the ASW

- Fishing resources renewable but not infinite! Need for cooperation
- Predominant fishery: Illex Argentinus (10-40% of total catches in the area)
- Big fluctuation (1 Million to 350 thousand t from 2015-2017) and seasonality in terms of landings in recent years (uncertainty)
- Short-lived, highly migratory species very sensitive to environmental changes
- Shared stock managed individually by coastal and flag MS – subject to intense fishing pressure - difficulty to implement sound conservation measures – desire for multilateralism and collaboration btw administrations for sound conservation measures

SUSTAINABLE FISHERIES MANAGEMENT IN SW ATLANTIC: A SCIENTIFIC APPROACH

1. Identification of research needs and priorities
   - States participating in DSF in the ASW should assess their research needs and priorities associated with actions identified in FAO (voluntary) guidelines, particularly regarding fisheries sustainability (i.e. target species) and biodiversity conservation (i.e. VMEs and non-target species)
   - VME data obtained in ATLANTIS Project are very valuable in an area of relatively poor knowledge (HSPS) – however, completion and implementation by all active fleets in the area is still lacking
   - Further integration of research & fisheries data under multidisciplinary approach required.
   - Periodic review and update of VME measures (e.g. new indicators, buffer zones and limits of closed areas, or threshold values for “encounters”).

2. Lack of multilateral forum for regional governance
   - The absence of an RFMO limits coordinated mechanisms to share and exchange scientific data in order to prepare advice and agree on regulatory measures in Patagonian Shelf;
   - Political will is essential for regional cooperation on IUU availing of pool of resources.
   - Increased data sharing and transparency between coastal States, port states and DWF flag states.

3. MCS - Big data and remote sensing for improving transparency of fleets activities
   - Increased use of big data for deciphering fishing activity and human activities at sea.
   - Remote sensing to estimate fleet sizes and catch rates – complementary to VMS (and ERS)
   - Embracing “theory of change” by compliant operators to fight IUU fishing in their benefit.
   - Use of satellite technologies coupled with cross-check data for detecting “dark fishing fleets”.

Thank you	Obrigado
Gracias	Спасибо
Grazas	Merci
谢谢	Takk fyrir

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