Final Event –ECCLIPSE Project | 26 April

Puertos del Estado, Madrid

Strategy for the adaptation of the Spanish port system

Antonio Góngora

Topics

Institutional context

Financial perspective

Criteria and Methodology

Observatory

1.- Institutional context

GOVERNANCE (state-owned ports):

- Depending on the Ministry of Transport, Mobility and Urban Agenda

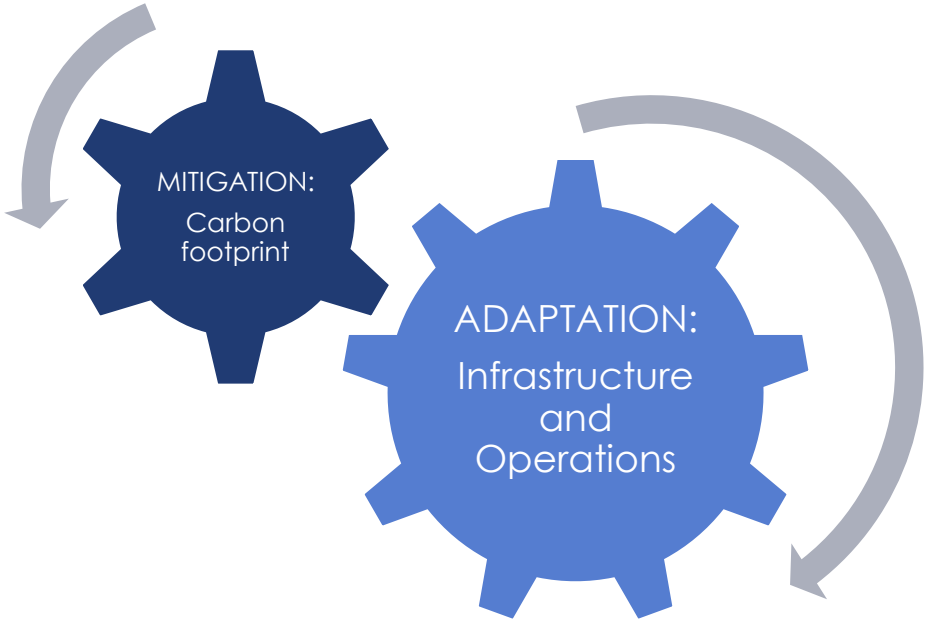
- Puertos del Estado (Spanish Port Agency):
  - Implementation of Government ports policy (Strategic Framework)
  - Coordination and control of efficiency
  - Participation in the approval of PAs Business Plan

- Port Authorities:
  - Provision of land and infrastructures
  - Regulation of access to port services and commercial activities

1.- Institutional context

CC in the Strategic Framework (MITMA)

Adaptation Strategy (formal goals)



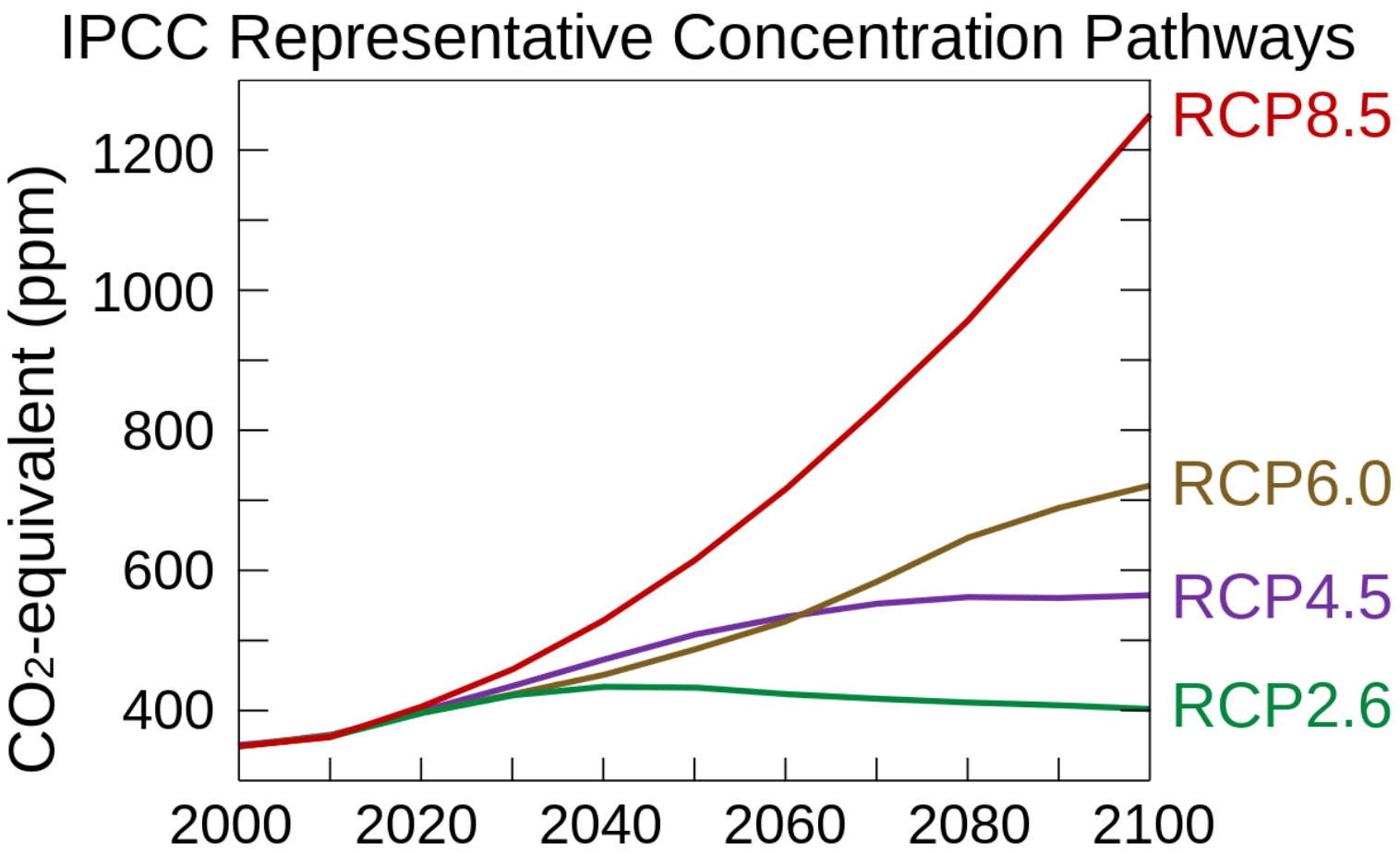
BY 2025:

- ❑ Adaptation Plans, approved
- ❑ CC Observatory, implemented

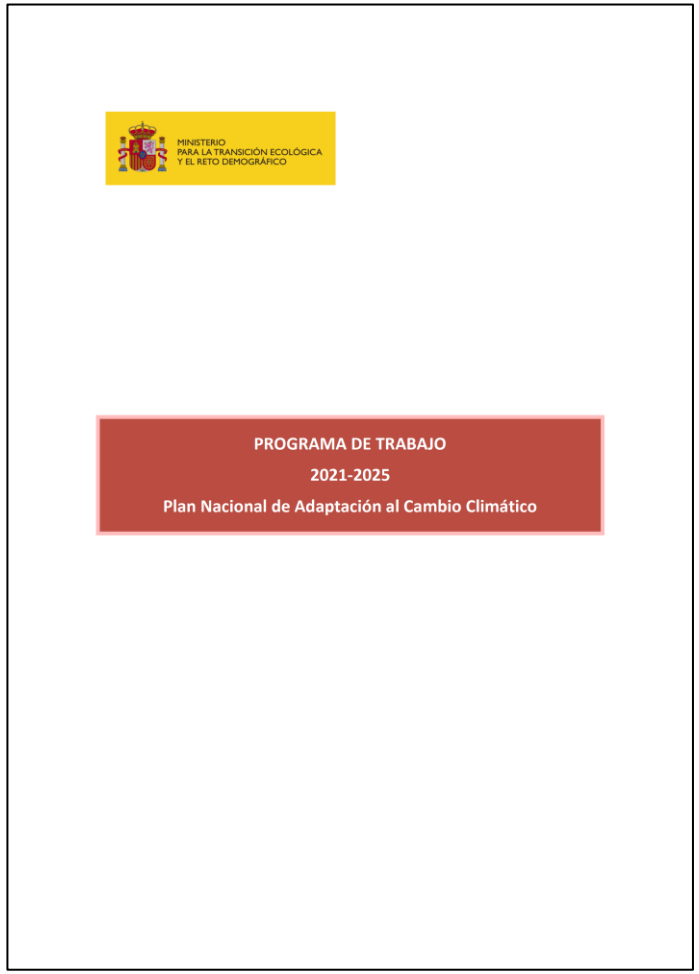
BY 2030:

- ❑ Adaptation Plans, implemented

1.- Institutional context



1.- Institutional context



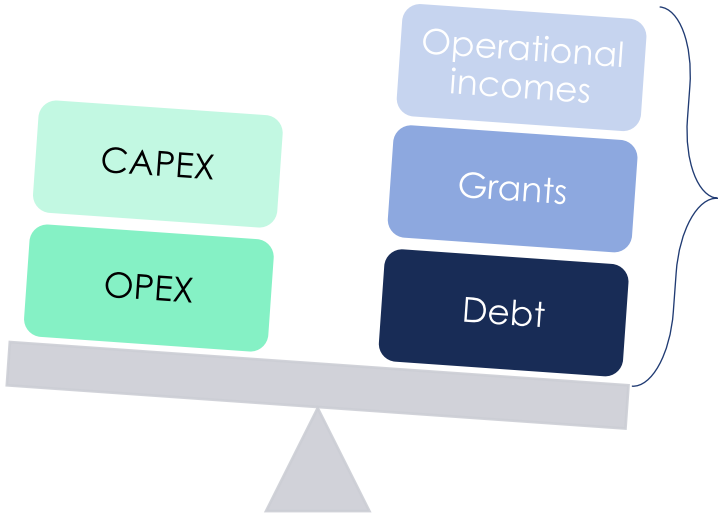
MEASURES ON PORTS (MITERD)…

- ❑ Observation networks
- ❑ Key climate variables
- ❑ Vulnerability
- ❑ KPI
- ❑ Integration into planning tools
- ❑ Infrastructure design recommendations
- ❑ Guidelines and Methodologies
- ❑ Impacts on trade

2.- Financial perspective

APPLICATIONS

SOURCES



PA Financial viability

Taxonomy

EU Regulation

Transparency

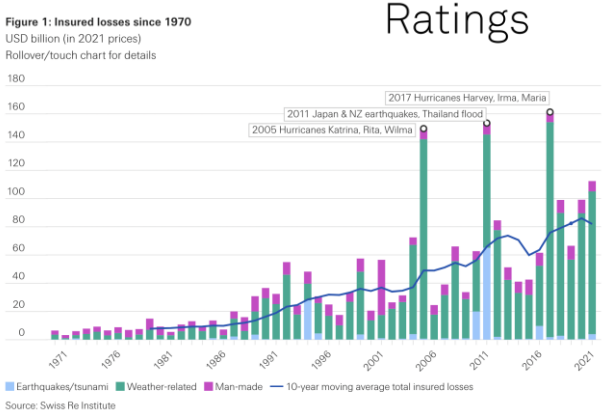
Financial Stability Board Recommendations

MOODY'S

S&P Global Ratings

Risk assessment

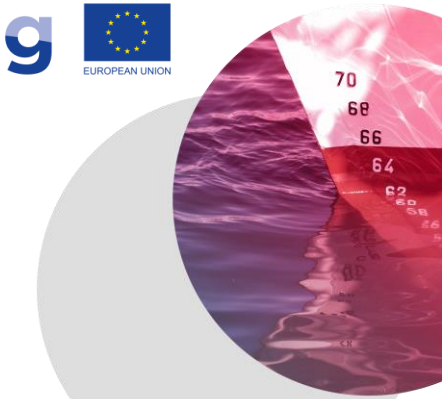
Credit rating Agencies



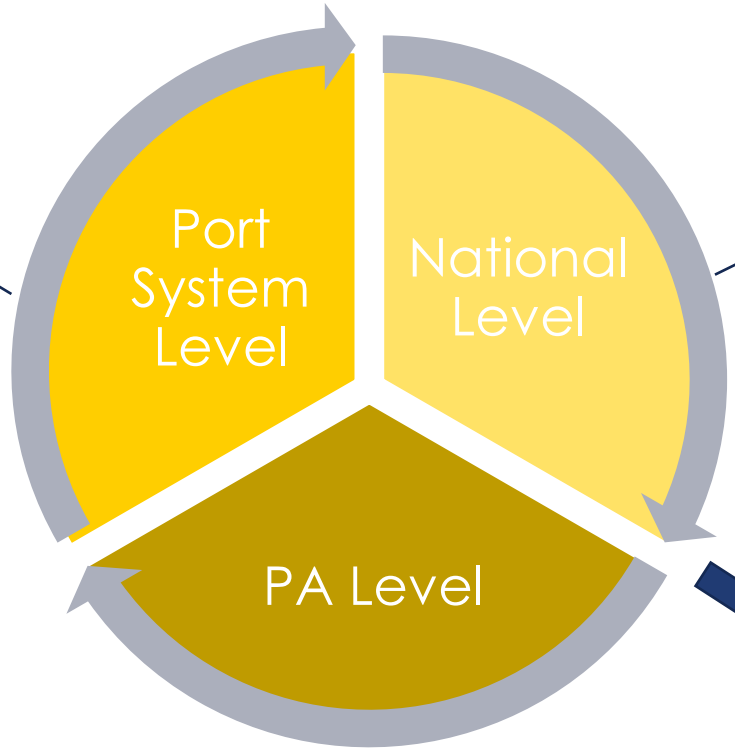
Insurance

Insurance companies

3.- Criteria and Methodology



- ❑ Adaptation Plan (Measures)
- ❑ Observatory

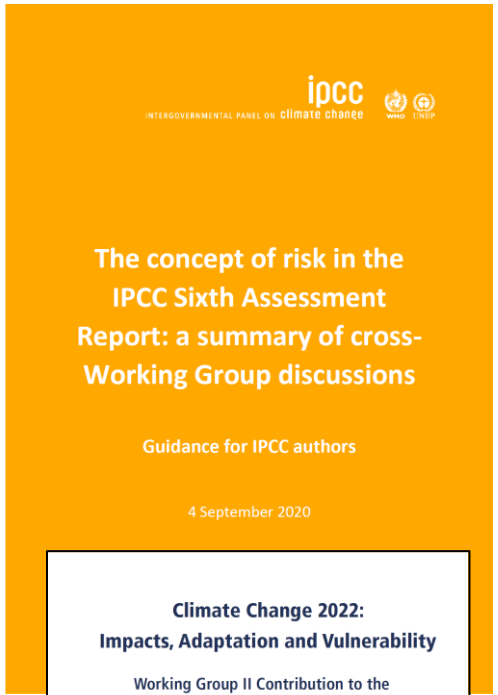


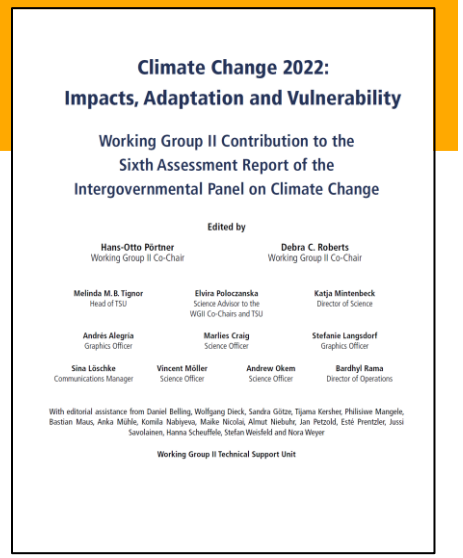
Measures (CC National Plan)

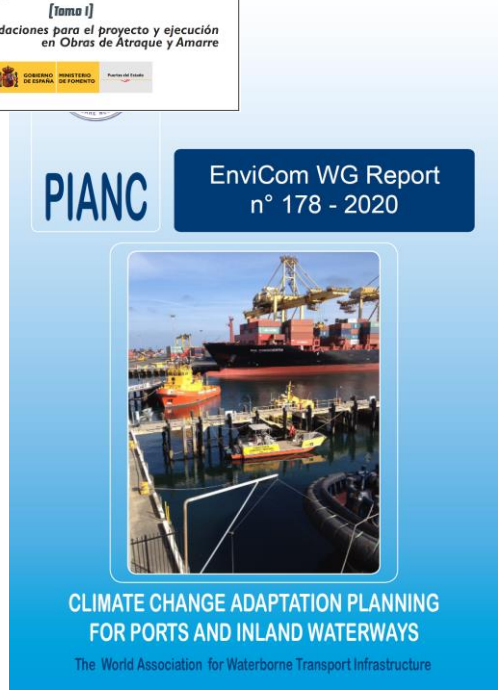
Practical Tools for monitoring and decision making

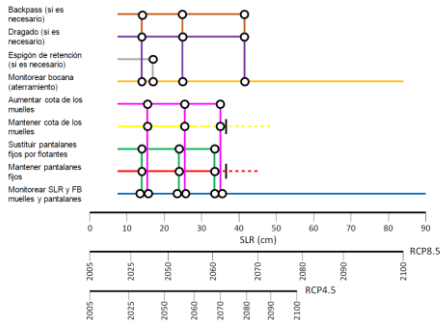
Common methodology

3.- Criteria and Methodology









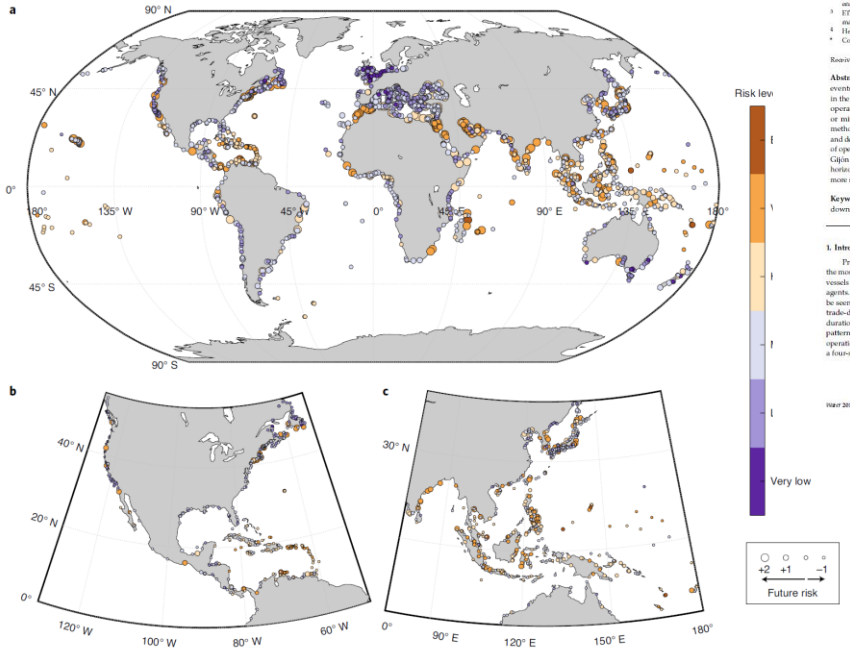
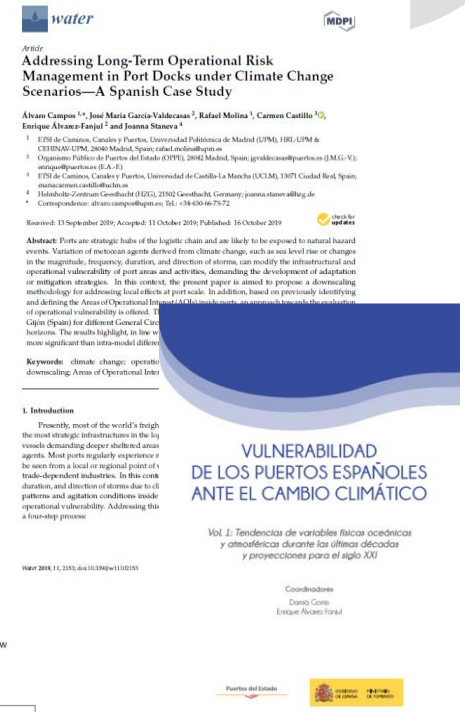
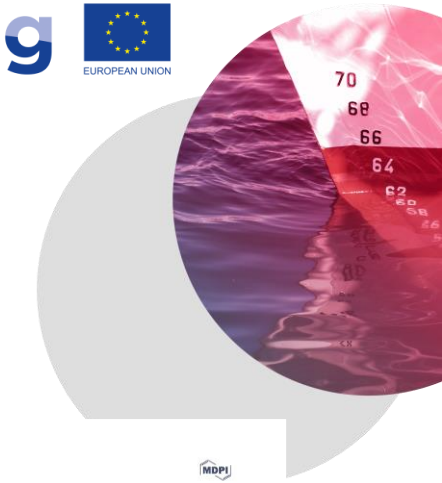


Fig. 3 | Climate risk for the world port sector in the year 2100 under RCP8.5. **a**–**c**, Details of future climate risk for ports worldwide (**a**), for Caribbean and North American ports (**b**) and for Asia–Pacific ports (**c**). The marker size reflects the change in risk level.

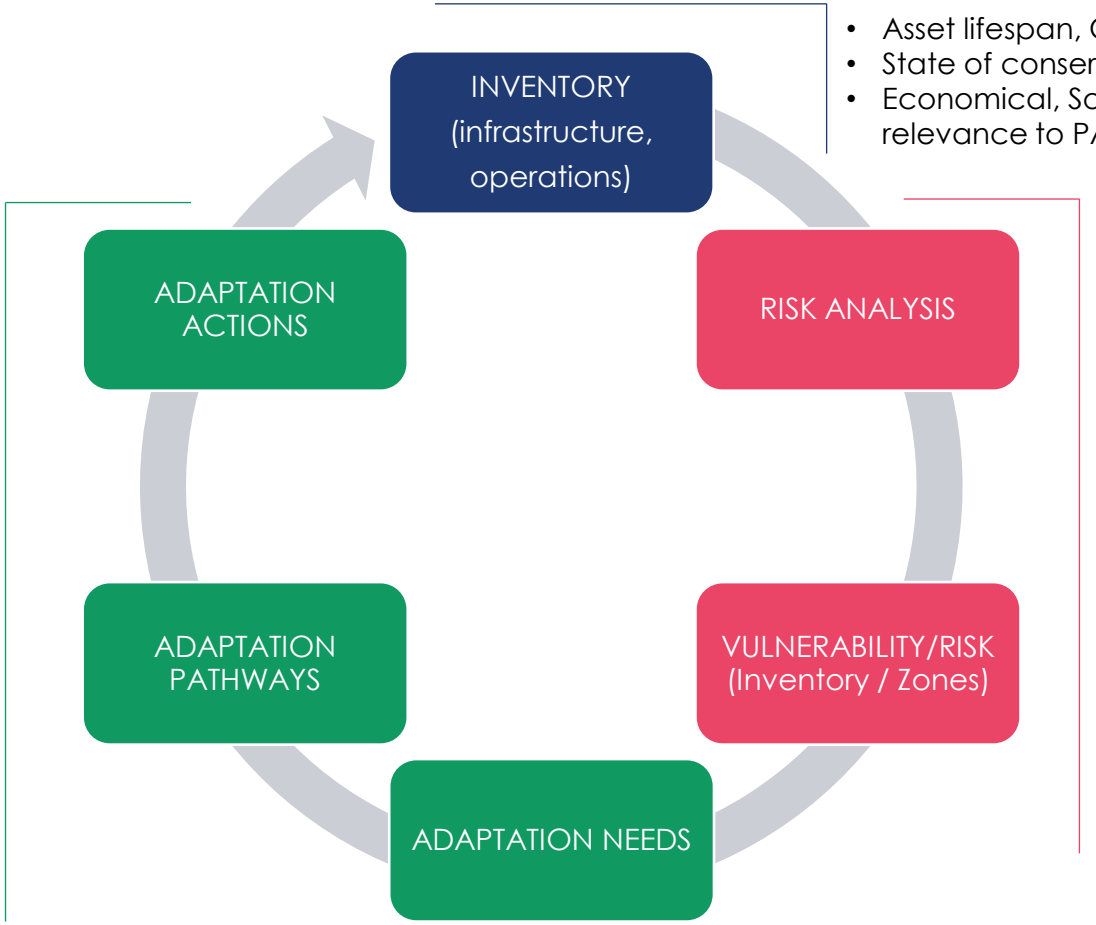




3.- Criteria and Methodology

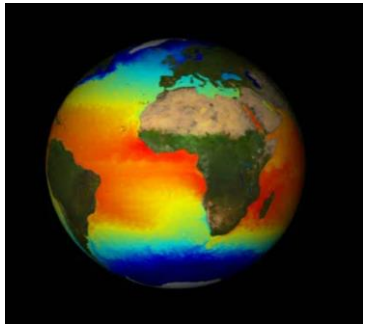
- Asset lifespan, Concession period, …
- State of conservation and maintenance
- Economical, Social or Environmental relevance to PA

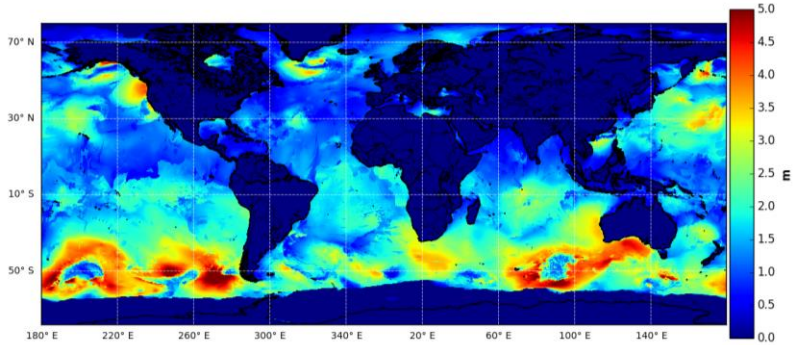
- Assessment on the acceptability of risks
- Identification of adaptation choices (pathways)
- Programming adaptation actions using a cost-benefit analysis approach, where applicable

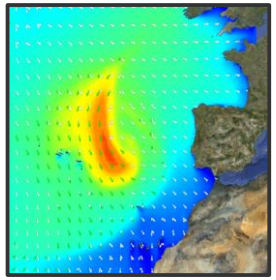


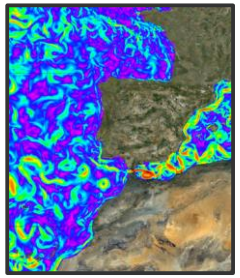
- Climate Hazards: Analysis of non-stationary changes of extreme events (acute hazards) and mean regimes (chronical hazards)
- Exposure: Identification of Key Climate Variables for the analysis: waves, sea level, currents, wind, temperature, etc.
- Vulnerability: Describing impacts and degree of affection from climate hazards, based on exceeding operational and physical thresholds
- Consequences: Describing impacts in terms of Financial, Economical, Social and Environmental costs

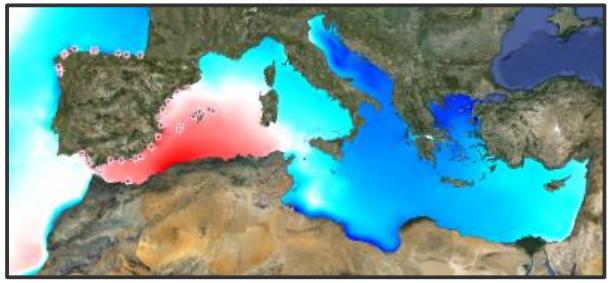
3.- Criteria and Methodology

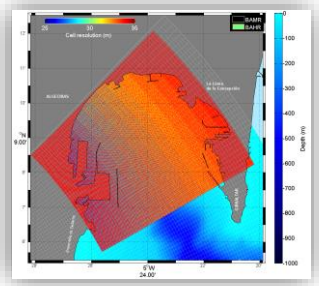


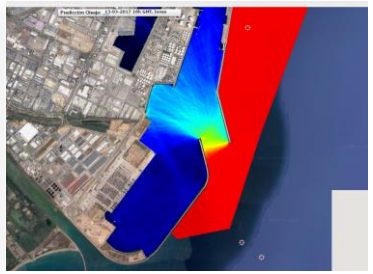


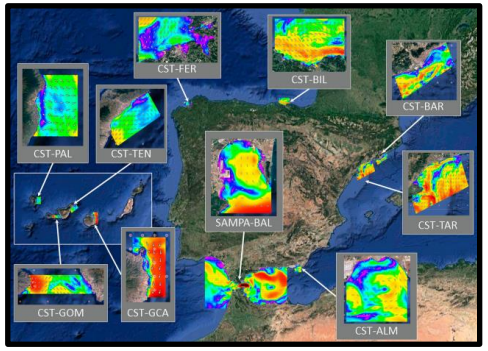












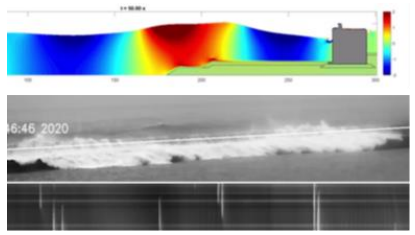
- Global
- Regional
- Coastal
- Port

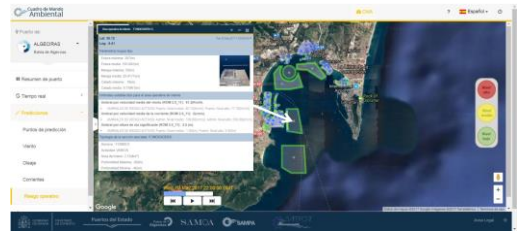
- Thresholds

Tabla 3.2.1.3. ***Valores umbrales de los agentes climáticos y océano-meteorológicos que generalmente se adoptan como limitativos de diferentes modos de parada operativa en las obras de atraque y amarre***

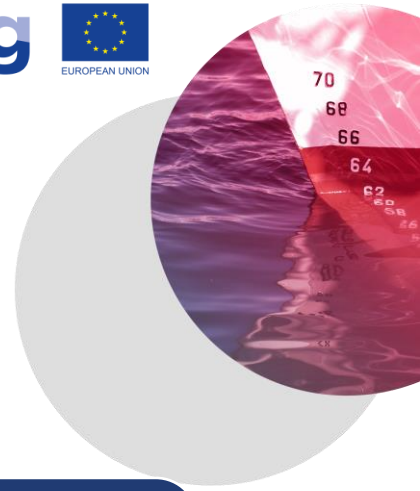
A. MUELLES Y PANTANALES		Velocidad absoluta del viento $V_{10,1\ min}$	Velocidad absoluta de la corriente $V_{c,1\ min}$	Altura de la ola H_s
1. Maniobra de atraque de buques				
Acciones en sentido longitudinal al muelle		17,0 m/s	1,0 m/s	2,0 m
Acciones en sentido transversal al muelle		10,0 m/s	0,1 m/s	1,5 m
2. Paralización operaciones carga y descarga (para equipos convencionales)				
Acciones en sentido longitudinal al muelle				
■ Petróleos	< 30.000 TPM	22 m/s	1,5 m/s	1,5 m
	30.000-200.000 TPM	22 m/s	1,5 m/s	2,0 m
	> 200.000 TPM	22 m/s	1,5 m/s	2,5 m
■ Graneleros	Cargando	22 m/s	1,5 m/s	1,5 m
	Descargando	22 m/s	1,5 m/s	1,0 m
■ Transportadores de Gases Licuados	< 60.000 m^3	22 m/s	1,5 m/s	1,2 m
	> 60.000 m^3	22 m/s	1,5 m/s	1,5 m
■ Mercantes de carga general. Pesqueros de altura y congeladores		22 m/s	1,5 m/s	1,0 m
■ Portacontenedores, Ro-Ros y Ferris		22 m/s	1,5 m/s	0,5 m
■ Transatlánticos y Cruceros (1)		22 m/s	1,5 m/s	0,5 m
■ Pesqueros de pesca fresca		22 m/s	1,5 m/s	0,6 m
Acciones en sentido transversal al muelle		22 m/s	1,5 /s	
■ Petroleros	< 30.000 TPM	20 m/s	0,7 m/s	1,0 m
	30.000-200.000 TPM	20 m/s	0,7 m/s	1,2 m
	> 200.000 TPM	20 m/s	0,7 m/s	1,5 m
■ Graneleros	Cargando	22 m/s	0,7 m/s	1,0 m
	Descargando	22 m/s	0,7 m/s	0,8 m
■ Transportadores de Gases Licuados	< 60.000 m^3	16 m/s	0,5 m/s	0,8 m
	> 60.000 m^3	16 m/s	0,5 m/s	1,0 m
■ Mercantes de carga general. Pesqueros de altura y congeladores		22 m/s	0,7 m/s	0,8 m
■ Portacontenedores, Ro-Ros y Ferris		22 m/s	0,5 m/s	0,3 m
■ Transatlánticos y Cruceros (1)		22 m/s	0,5 m/s	0,3 m
■ Pesqueros de pesca fresca		22 m/s	0,7 m/s	0,4 m
3. Permanencia de buques en muelle (5)				
■ Petroleros y transportadores de Gases Licuados				
Acciones en sentido longitudinal al muelle		30 m/s	2,0 m/s	3,0 m
Acciones en sentido transversal al muelle		25 m/s	1,0 m/s	2,0 m
■ Transatlánticos y Cruceros (2)				
Acciones en sentido longitudinal al muelle		22 m/s	1,5 m/s	1,0 m
Acciones en sentido transversal al muelle		22 m/s	0,7 m/s	0,7 m
■ Embarcaciones deportivas (2)		22 m/s	1,5 m/s	0,4 m
■ Acciones en sentido longitudinal al muelle		22 m/s	1,5 m/s	0,4 m
■ Acciones en sentido transversal al muelle		22 m/s	0,7 m/s	0,2 m
■ Otro tipo de buques		Limitaciones impuestas por las cargas de diseño de los muelles, compatibles con configuraciones de amarre que garanticen la seguridad del buque		

- Downstream services





3.- Criteria and Methodology



Setting and Implementing adaptation measures

Investment Plan	Budget	Procurement documents	Concession and License documents	Safety and Security plans	Business Plan

CAPEX / OPEX (PAs) | WORKS | OPERATIONS | FOLLOW-UP

4.- Observatory

- Observation of Key Climate Variables
(to be developed from the current observing system)

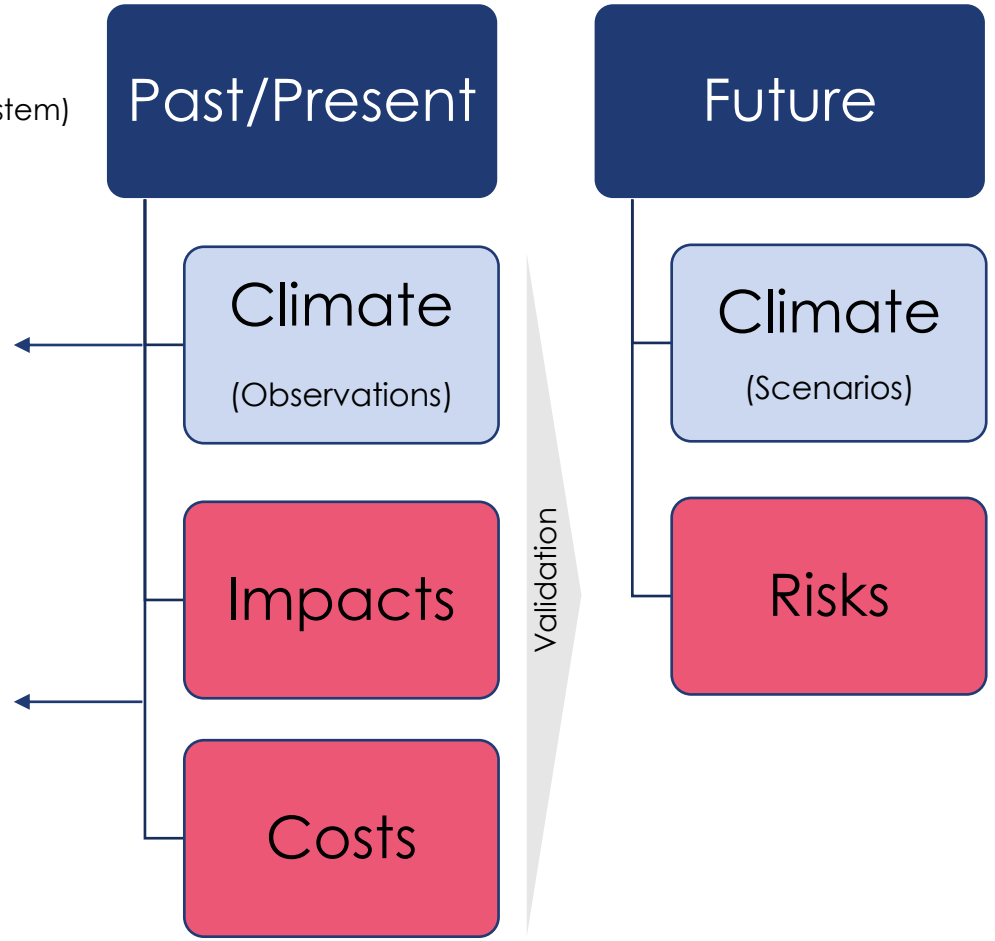
Deep Water Buoy Network
- 15 stations
- Moored in deep water (200-2000 m)
- Multiparameter (Waves+Met+Oce)
- Real time transmission by satellite
- Data since 1996
- Maintenance every 4-6 months

Coastal Buoy Network
- 12 (9+3) stations
- Moored in coastal waters (<100 m)
- Measuring waves and SST.
- Real time transmission by UHF and GPRS
- Data since 1980 decade
- Maintenance every 6 months

Tide gauges Network (REDMAR/REMPOR)
- 41 stations Radar type, 9 with GNSS + 24 Meteo
- Installed in Harbour facilities
- High frequency (2Hz), sea level (1mn) and port agitation. Meteo: wind and atm. pressure
- Real time transmission (1 min) by GPRS or ADSL
- Data since 1992
- Maintenance once per year

HF Radar Network
- 4 systems (2 shared with other institutions)
- Surface current maps and wave data
- Real time transmisión
- Data since 2010
- Maintenance every 6 months, annual callibration

- Collaboration with stakeholders is essential (building communities to register impacts and consequences)
- Confidentiality vs Transparency



- Outputs from climate models
(to be developed from the current prediction system)

- End user applications
- Visualization
- Early warning systems

(to be developed by reference to current systems and applications)

5.- Final considerations

- From an extensive knowledge on climate physics and modelling
- From one of the Europe largest ocean observation networks, including historical data since1980
- From a large experience on operational oceanography providing climate observation and 72h prediction systems, including at port scale
- From the extensive development of downstream services to PAs and end users in the past 10 years
- From an intense and fruitful collaboration with the technical and scientific communities

- To increase scientific and technical knowledge and production on climate variability and interactions with port infrastructure and activities, based on continuous collaboration
- To improve observation on both climate and impacts on ports, including AI
- To develop management tools for PAs and end user services
- To build communities to increase resilience to CC

Thank you

Interreg
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MINISTERIO DE TRANSPORTES, MOVILIDAD Y AGENDA URBANA
Puertos del Estado