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European Marine Observation and Data Network Partnership for China and Europe (EMOD-PACE)

China-European Union Marine Data Network Partnership (CEMDnet)

中国-欧盟海洋数据网络伙伴关系 - 中国-欧盟海洋数据网络伙伴关系

Strengthening international ocean data through the EU's ocean diplomacy with China

EMODnet Steering Committee Meeting 19 April 2021

Contact details: ***eu-chinapco@emodnet.eu***

The project "International Ocean Governance: Strengthening international ocean data through the EU's ocean diplomacy with China" is financed by the European Commission EuropeAid/139904/DH/SER/CN.

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1 How we met?

2 What we want to achieve?

3 Where are we now?

4 What's on the horizon?

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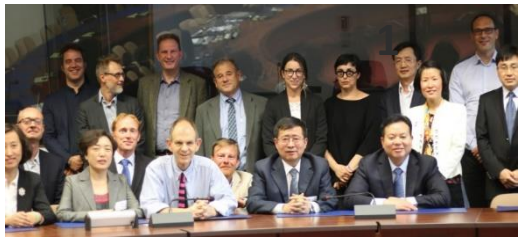
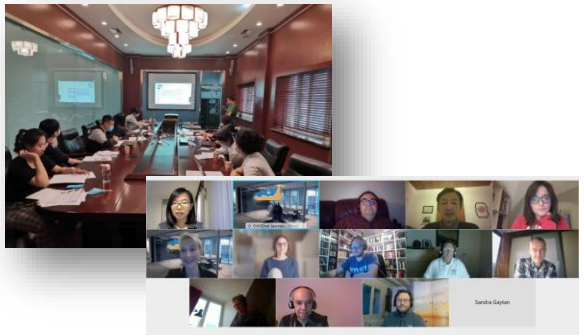


EU China Blue Year Event - forecasting, data, monitoring, planning, indicators

June 2017

EU delegation visited NMDIS



September 26, 2018

July 16, 2018

China and EU signed a Blue Partnership for the Ocean

February 2020

*EMOD-PACE, **EMOD**net **PA**rtnership for **C**hina and **E**urope* A European project funded through the Foreign Policy Instrument: (€3.5million, 30 months)

January 2021

EMOD-PACE, CEMDnet Mid-term meeting

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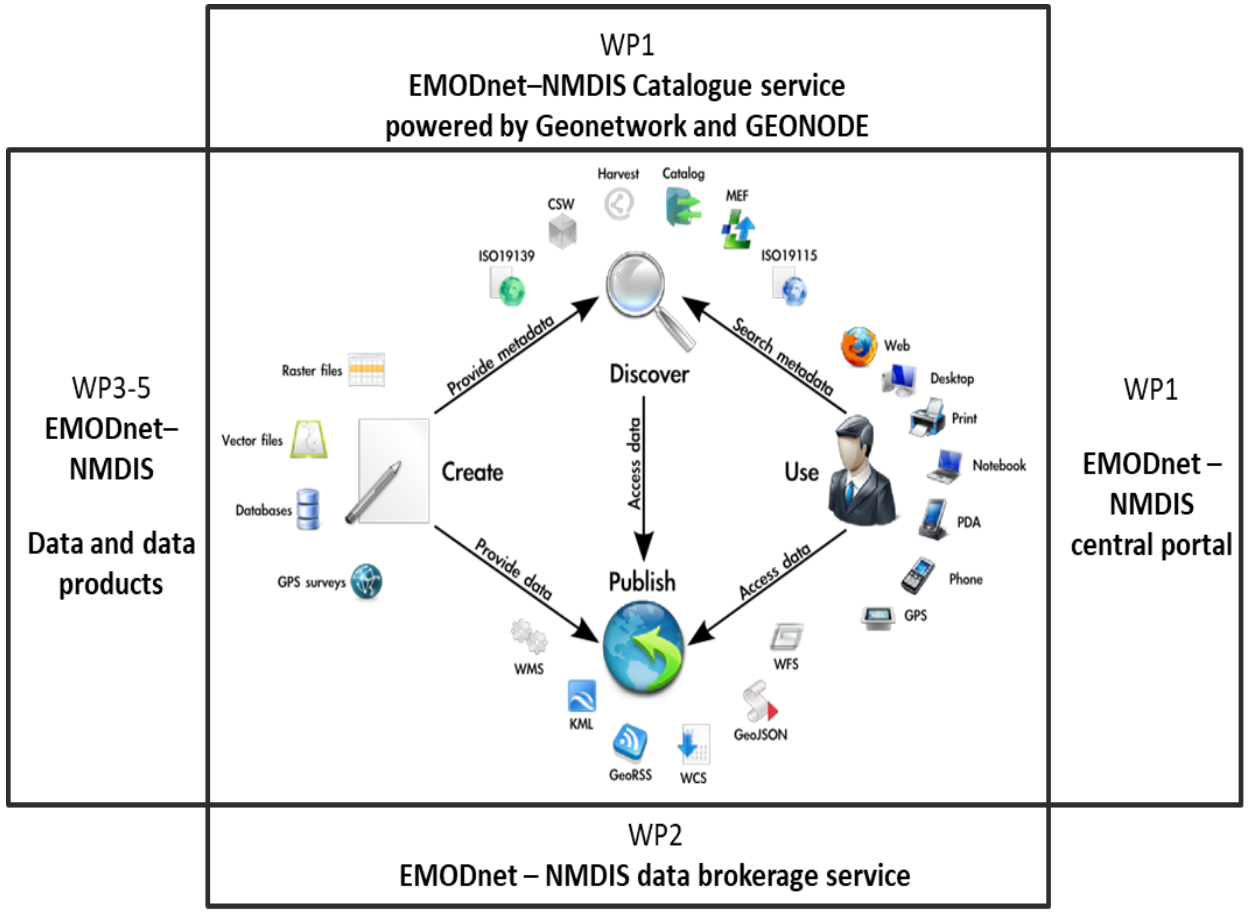
EMODPACE-CEMDNET
Objectives

- **To Facilitate** European and Chinese engineers and scientists to build up a picture of the marine environment using data from both sources.

- **To Promote** international ocean governance and support the implementation of global commitments by making ocean marine data and data products more easily accessible and by providing better data and data products.

How to Achieve our common objectives



EMOD-PACE Work Packages

Work Package 0 - Project Coordination, Management and Communication

Work Package 1 - EU-China Web Portal, creation of interoperable information system linking EMODnet & NMDIS

Work Package 2 - Establishing data interoperability between EMODnet and NMDIS

Work Package 3 - Comparison of European and Chinese models for regional sea reanalysis

Work Package 4 - Comparison of European and Chinese models for seabed habitat and ecosystem vulnerability

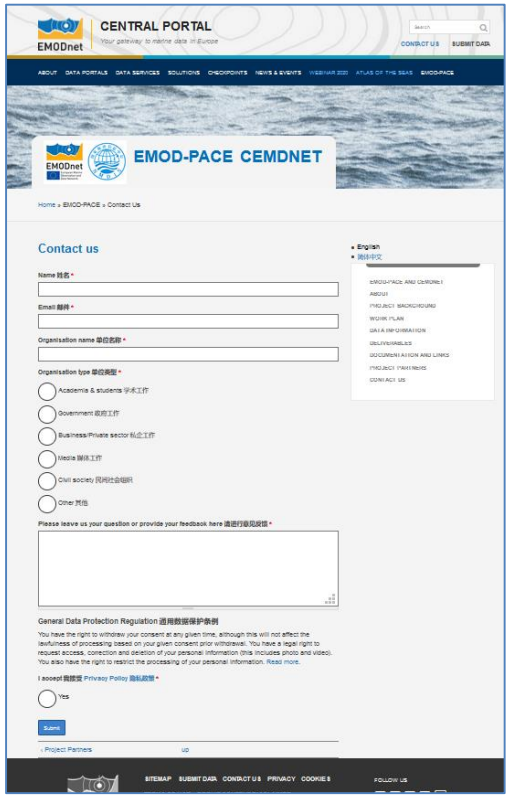
Work Package 5 - Coastal Adaptation

- Relative sea level changes & Absolute sea level changes
- Coastal erosion
- Wetland degradation
- Vessel traffic density

WP1: EU-China Web Portal, creation of interoperable information system linking EMODnet & NMDIS

The main aim of this work package is to **create a bilingual web portal** that provides **visibility to the project results and gives access to data and products** currently available in EMODnet, NMDIS and other Asian marine data systems, as well as those developed during the project.

The portal will be the **central entry point for the project and**, by displaying the results, will **promote cooperation and facilitate dialogue** and/or feed into policy meetings on key ocean governance areas and topics as defined by the call.



WP1: EU-China Web Portal, creation of interoperable information system linking EMODnet & NMDIS
Milestones and Deliverables

Milestones and deliverables achieved:

Month 6 : 1-2.1. Publication of bilingual web portal with project information https://www.emodnet.eu/en/emod-pace and also on CEMDnet NMDIS web-site http://www.cmoc-china.cn √

1-2.5. English user-helpdesk operational https://www.emodnet.eu/en/emod-pace/emod-pace-contact-us √

Month 12: 1-2.2. Web-site operational, including bilingual map viewer https://www.emodnet.eu/geoviewer/#!/ √

1-2.7. Fully operational Geo-server monitoring plugin √

Deliverable 1.0 (joint WP1-WP2) The minutes of the inception, mid-term and final meetings (M20)

Planned Progress next 12-18M

Month 24: *1-2.3. Web-site operational including downloadable data from both NMDIS and EMODnet*

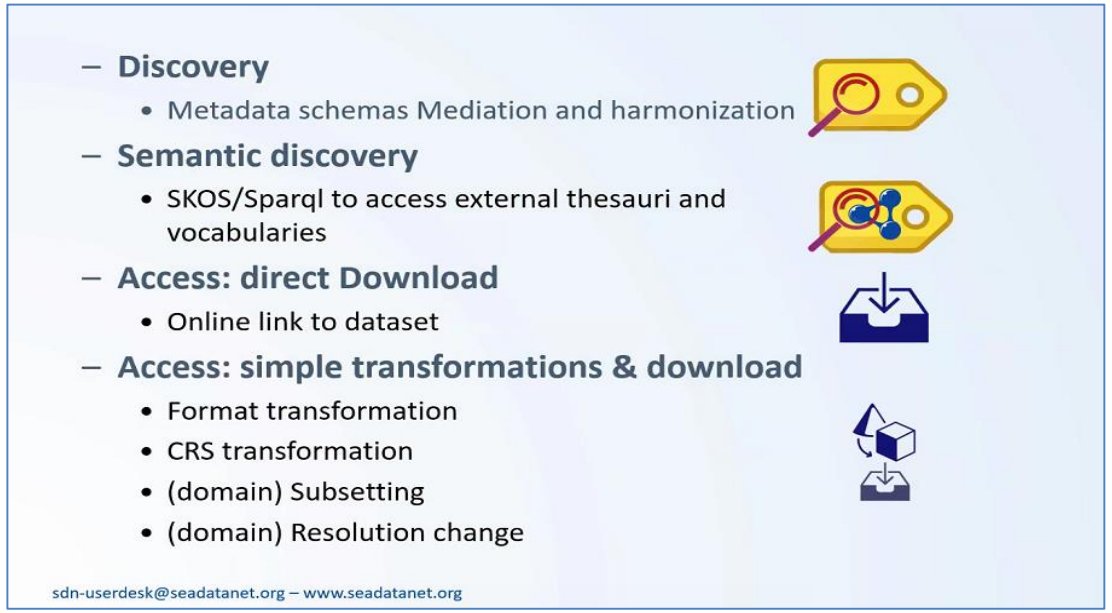
1-2.6. Operational service to remove duplicates

Month 30 (Final): *1-2.4. Fully operational information system linking EMODnet with NMDIS (M30).*

WP2: Establishing data interoperability between EMODnet and NMDIS

This work-package will aim at **maximizing interoperability of marine data between the EU EMODnet and Chinese NMDIS marine data systems**. This will be implemented by developing and **deploying an 'EMODnet – NMDIS data brokerage service'** for common discovery and access to data from EMODnet Thematic portals and NMDIS portal(s). This will involve WP2 Biology, Chemistry, Physics and Bathymetry subgroups work to:

Brokerage Main Functionalities



1. **Harmonise metadata and adopt common standards** or to convert standards in use in EMODnet and NMDIS for selected data types

2. **Develop a 'User Interface'** component of the data brokerage service for discovery and access by users

3. **Develop a component for automatic machine-to-machine communication** so that NMDIS data can be visualised and downloaded through EMODnet and EMODnet data be available through the NMDIS system

4. **Provision of a gateway to the EMODnet – NMDIS data brokerage service** at the EU – China portal in cooperation with WP1.

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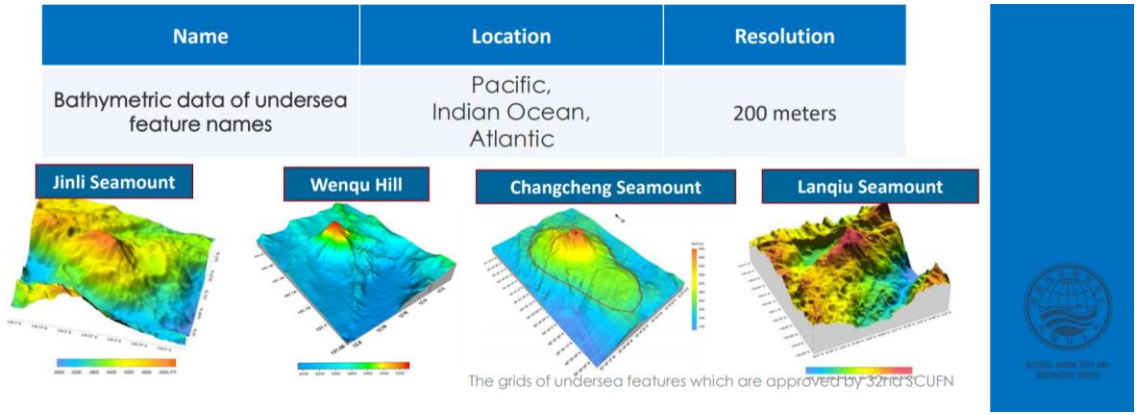
WP2: Establishing data interoperability between EMODnet and NMDIS
Milestones and Deliverables

Milestone 1-2.3. *Web-site operational including downloadable data from both NMDIS and EMODnet (M24)*

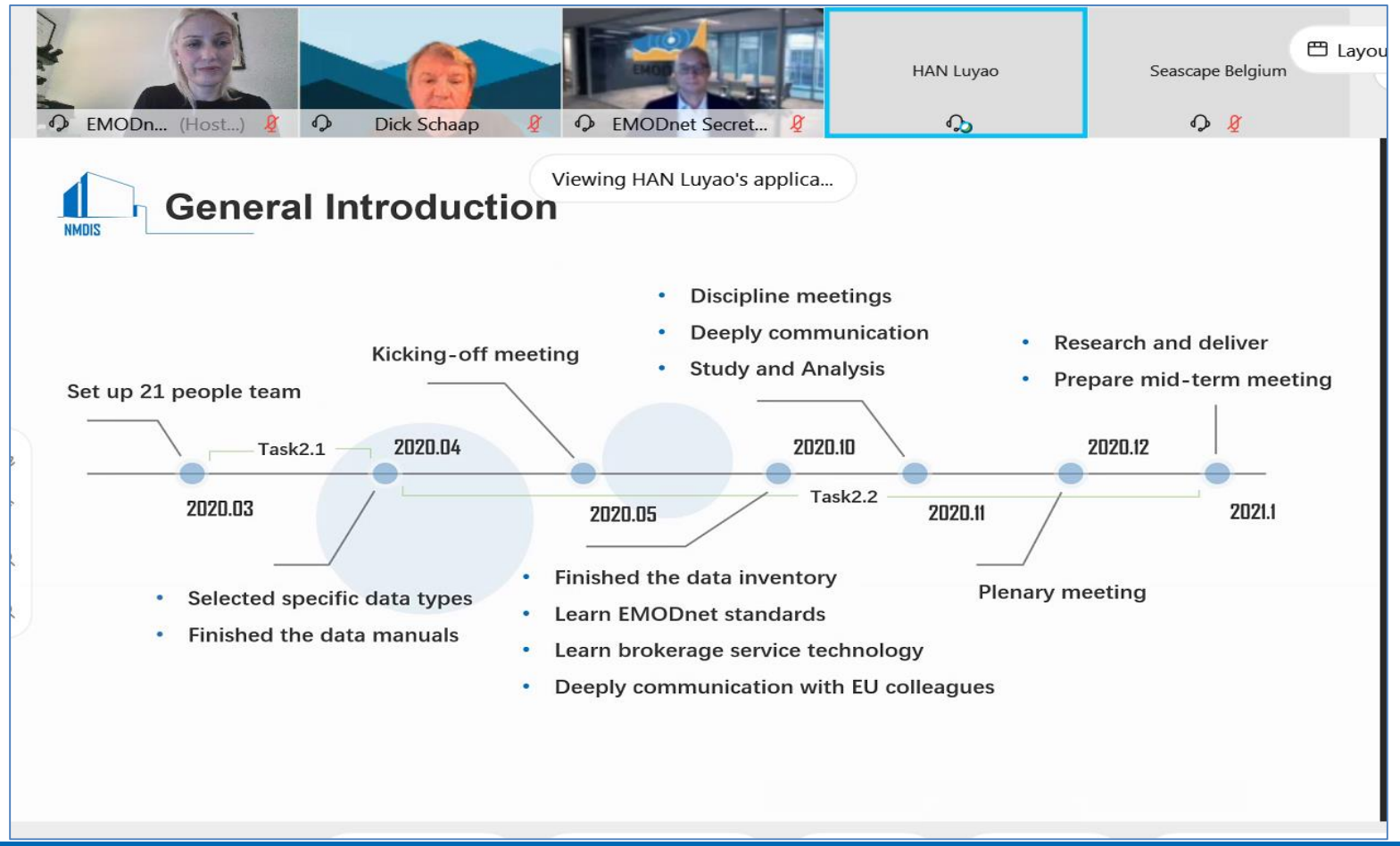
Deliverable 0.2 *Project Interim report 1: Contribution to the giving the detailed specifications of the components of the planned EMODnet – NMDIS data brokerage service*

Deliverable 1.0 (joint WP1-WP2 deliverable) The minutes from the inception, mid-term and final meetings (M20)



Example of bathymetric data products accessible from NMDIS

WP2: Establishing data interoperability between EMODnet and NMDIS
Year 1: Highlights and Achievements



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WP2: Establishing data interoperability between EMODnet and NMDIS
Year 2: Planned Progress

The next part of the project will focus on Task 2.3. Development and implementation of the EMODnet – NMDIS data brokerage service and physics NRT data exchange.

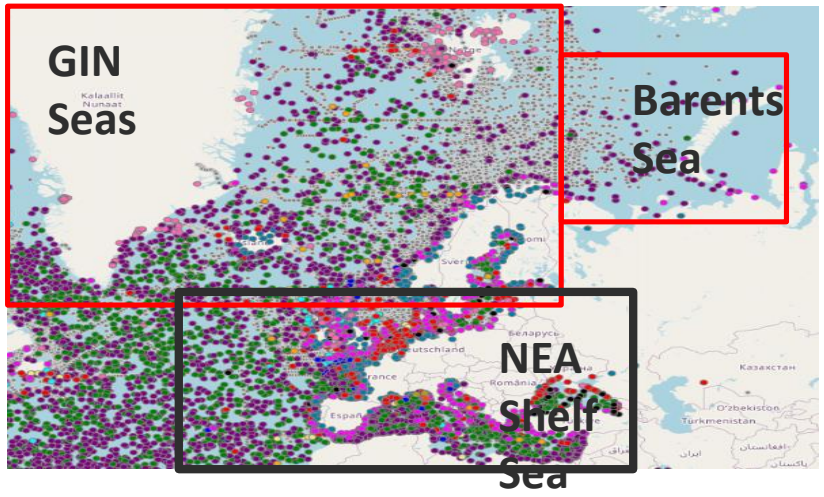
As next step, it was agreed that NMDIS would share the following data sets as part of EMOD-PACE WP2:

- **Chemistry:** Chemical data of China ocean surveys from 2008 to 2017: Analysis and test data of marine chemical samples, including dissolved oxygen, pH, nutrients, alkanes, alcohols and other elements;
- **Biology:** Biological data of China ocean surveys from 2001 to 2017: biological sample analysis data from observation site, including chlorophyll, benthos, plankton and other elements;
- **Bathymetry**: Submarine topographic data of China Ocean Survey by multi-beam bathymetry surveys for scientific interesting areas made on scientific ocean cruises from 1998 to 2017;
- **Physics:** Operational NRT data from national monitoring activities, and archived oceanographic data sets from scientific ocean surveys.

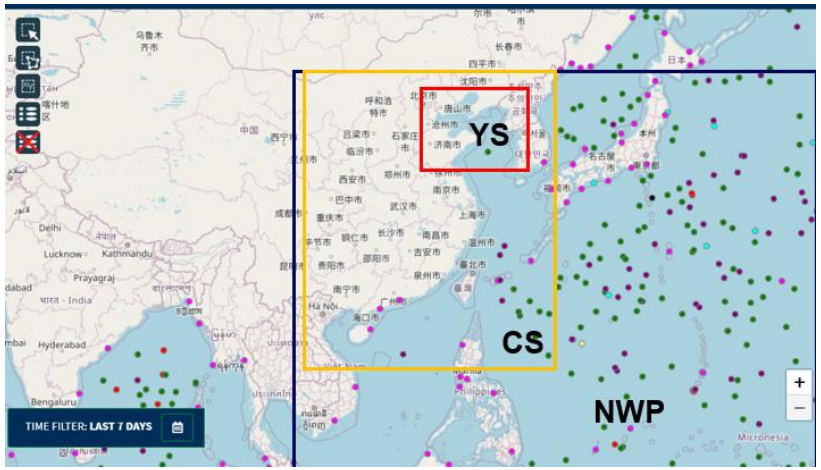
WP3: Comparison of European and Chinese models for regional sea reanalysis

- To identify reasons for **similarities and differences** between European and Chinese **ocean circulation models and reanalysis product**s and also the most promising ways to improve the reanalysis.
- The analysis will be carried out in one European sea-basin and one Asian basin. The same data will be used by both EU and Chinese teams for calibration and validation.

WP3 area in Europe



WP3 Areas in Asia



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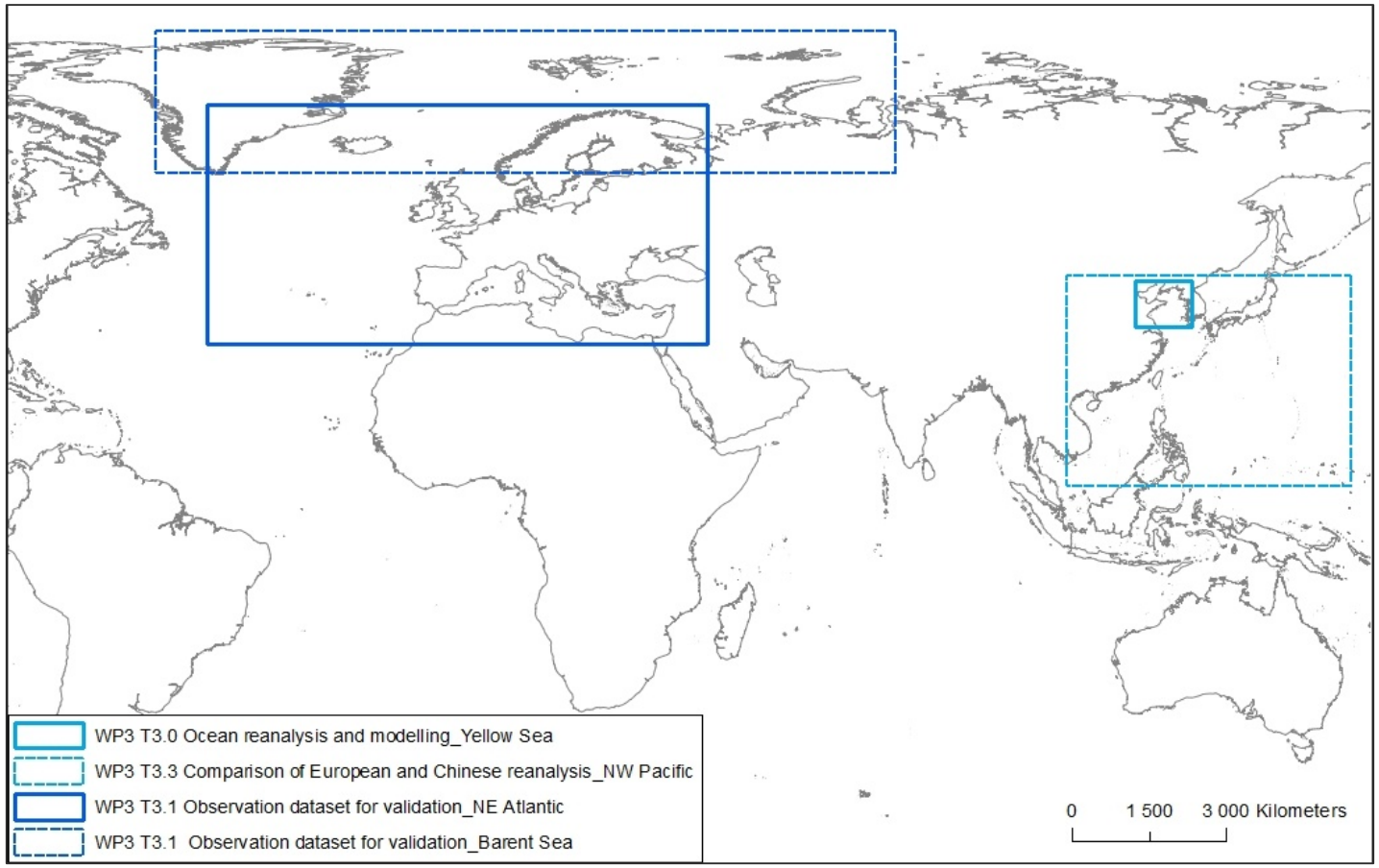

Areas of Interest for the EMOD-PACE CEMDnet Collaboration for WP3: Comparison of European and Chinese models for regional sea reanalysis

WP3: Comparison of European and Chinese models for regional sea reanalysis

Milestones and Deliverables

Milestones achieved:

Month 12: 3.1. Choice of regions of European and Asian sea-basins made and observation dataset for validation established √

Planned Progress next 12-18M

Month 24: *3.2. Intermediate progress of comparison between reanalyzes*

Month 30 (Final): *3.3. reanalysis of circulation models by comparison with historic data in two sea basins – one in Europe and one in Asia – is completed*

Deliverables achieved:

Month 12: D3.1. Short report on choice of sea-basins and models made, including a list of data made available √

Planned Progress next 12-18M

Month 24: D3.2*. Draft report on comparison between reanalyses*

Month 30: (Final) D3.3. *Final report on comparison between reanalyses*

WP3 Comparison of European and Chinese models for regional sea reanalysis Year 1 Achievements

- **Task 3.1 Observation dataset for validation (M1-M12):**

This task prepared an observation dataset for validation studies in Tasks 3.2 and 3.3. The task is implemented as part of joint activity JA3.1.1 “Data review” and JA3.8 “Common validation dataset”. The dataset covers sea level, SST, T/S profiles and currents in the selected European basin and Asian basin.

- **Task 3.2 Comparison of coastal ocean models**

The subtask 3.2.1 Literature review, originally scheduled from M13 has been advanced already and the WP leads are in contact with their Chinese NMDIS counterparts to examine coastal ocean model and hindcasts in both European and China Seas. The subtask is implemented in joint activity JA3.1.4 and an internal report on the “Review of coastal ocean models for regional sea reanalysis in Europe and China” was submitted.

- **Task 3.3 Comparison of European and Chinese reanalysis**

Literature review: this work is implemented as part of joint activity JA3.1.3 ‘Data assimilation review’ an internal joint report on ’Review of data assimilation methods for regional sea reanalysis in Europe and China’ was completed.

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WP3: Comparison of European and Chinese models for regional sea reanalysis

WP3 Joint activity	WP3 Joint Activities Description	Internal deliverable (Deadline indicative)
JA3 1.1	Data review: Availability of observations for validation of regional sea reanalysis	31 Oct. 2020, report (can be combined with JA3 8)
JA3 1.2	Review of reanalysis evaluation in regional seas	31 Oct. 2020, report
JA3 1.3	**Review of data assimilation method**	**31 Oct. 2020, report**
JA3 1.4	**Review of Coast Ocean models**	**31 Oct. 2020, report**
JA3 2	WP3.2 Yellow Sea model inter-comparison	30 Sep. 2021, report
JA3 3	WP3.2 NWP1 model inter-comparison	30 Sep. 2021 , report
JA3 4	WP3.2 Tidal model intercomparison in NWP2	30 Sep. 2021 , report
JA3 5	WP3.3 Intercompare/ validate CMEMS and NMDIS global reanalysis in NWP region	30 Sep. 2021 , report
JA3 6	WP3.3 Intercompare/ validate CMEMS and NMDIS global reanalysis in NE Atlantic & European Seas	30 Sep. 2021 , report
JA3 7	WP3.3 Intercompare/ validate CMEMS and NMDIS global reanalysis in GIN and Barents Sea	30 Sep. 2021, report
JA3 8	**WP3.1 Common observation dataset for model validation**	**31 Dec. 2020, dataset & report**
JA3 9	**WP3.3 Common validation and intercomparison method for reanalysis in the regional sea**	**31 Dec. 2020, report**

WP4: Comparison of European and Chinese models for seabed habitat and ecosystem vulnerability

Work Package 4 aims to **compare European and Chinese model**s being used for the study of the following:

- **Seabed habitats**
- **Ecosystem vulnerability**

This will be carried out by analysing the applicability of each side's models in different areas.

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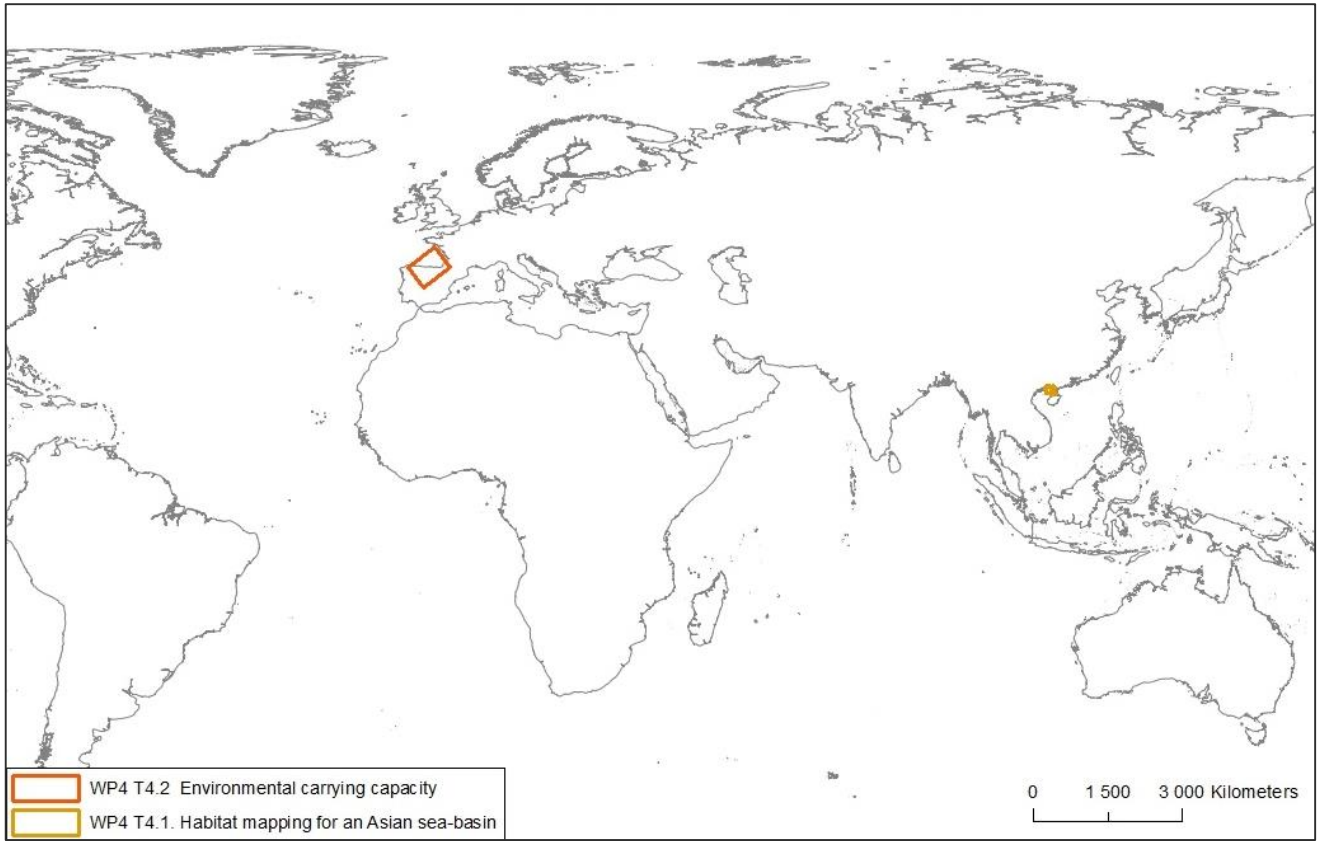


Areas of Interest for the EMOD-PACE CEMDnet Collaboration for WP4: Comparison of European and Chinese models for seabed habitat and ecosystem vulnerability Tasks 4.1, and 4.2 i.e., Habitat mapping for an Asian Sea-Basin (Beibu Gulf), and Environmental Carrying Capacity in the Bay of Biscay.

WP4: Comparison of European and Chinese models for seabed habitat and ecosystem vulnerability
Milestones & Deliverables

Milestone achieved

Month 12: 4.1. Choice of test areas made, identification of data requirements for the analyses and gathering of available data where possible √

Deliverables achieved:

Month 12: 4.1. Short summary report summarizing choice of test areas, identification of data requirements and list of required data and data already gathered √

Planned Progress next 12-18M

Month 24:

4.2. Draft report describing the mapping method and the suitability of EUNIS approach to China, showing a single sea basin as an example

4.3. Draft report on the suitability of ECC approach to Europe, showing the Bay of Biscay as an example and eventually another European basin

Month 30 (Final):

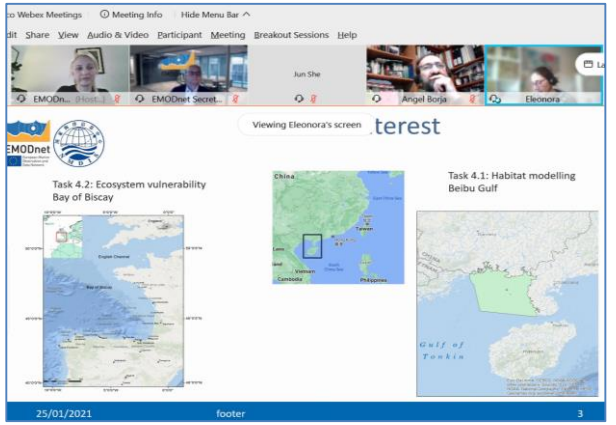
4.4. Final report describing the mapping method and the suitability of EUNIS approach to China, showing a single sea basin as an example

4.5. Final report on the suitability of ECC approach to Europe, showing the Bay of Biscay as an example and eventually another European basin

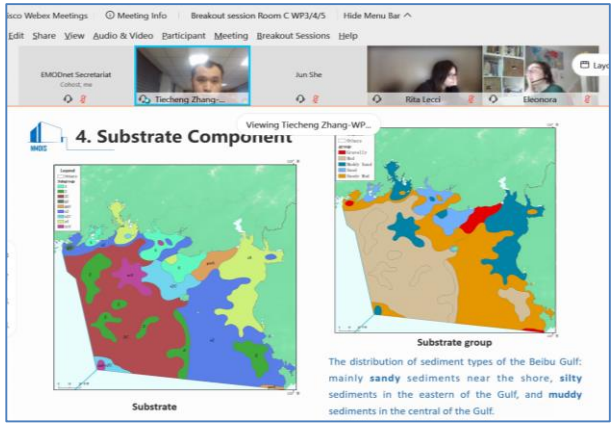
WP4: Comparison of European and Chinese models for seabed habitat and ecosystem vulnerability

Year 1 Achievements

Task 4.1 aimed at creating the full coverage harmonised input layers which will be used to deliver a EUNIS broad-scale habitat map for the basin of interest. In particular these input layers are: a gridded-layer of depth to the seafloor (i.e. bathymetry) using the best available data; a substrate layer classified using EUNIS substrate classes; a gridded-layer of light attenuation at the seabed.



Task 4.2 aims at applying the Chinese methodology to assess the Environmental Carrying Capacity and vulnerability to a selected European area, adapting it to the needs and terminology of Europe, and collating information from the selected area for a correct application, under the guidance of NMDIS.



For the above tasks in year one, efforts were made to:

- select the test areas for both tasks;
- identification of data requirements and
- creating an inventory of available datasets.

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WP4: Comparison of European and Chinese models for seabed habitat and ecosystem vulnerability

Joint Activity	Joint Activity Description	Internal deliverable (Deadline indicative)
JA 4.1.1	Literature review	19th January 2021
JA 4.1.2	Data collation and preparation – depth to the seabed	19th January 2021, Datasets inventory; 19th June 2021, Data layer delivery
JA 4.1.3	Data collation and preparation – seabed substrate	19th January 2021, Datasets inventory; 19th June 2021, Substrate layer
JA 4.1.4	Data collation and preparation – optical properties	19th January 2021, PAR/Kdpar deliverable; 19th June 2021, PAR at seabed
JA 4.1.5	Data collation and preparation – biological observations and other explanatory variables	19th January 2021, Datasets inventory; 19th June 2021, data collation delivery
JA 4.1.6	M12 reporting	19th February 2021
JA 4.1.7	Identify ecologically-relevant thresholds for classifying the explanatory variables	November 2021
JA 4.1.8	Combine classified layers into a single physical habitat map	December 2021 for first draft; March 2022 for confidence maps and June 2022 final draft with overall confidence maps
JA 4.1.9	M24 reporting	19th February 2022
JA 4.1.10	Assess the EU habitat mapping method and suitability of the EUNIS classification in basin of interest	January 2022, preliminary assessment; July 2022, final assessment
JA 4.1.11	Final reporting	July 2022

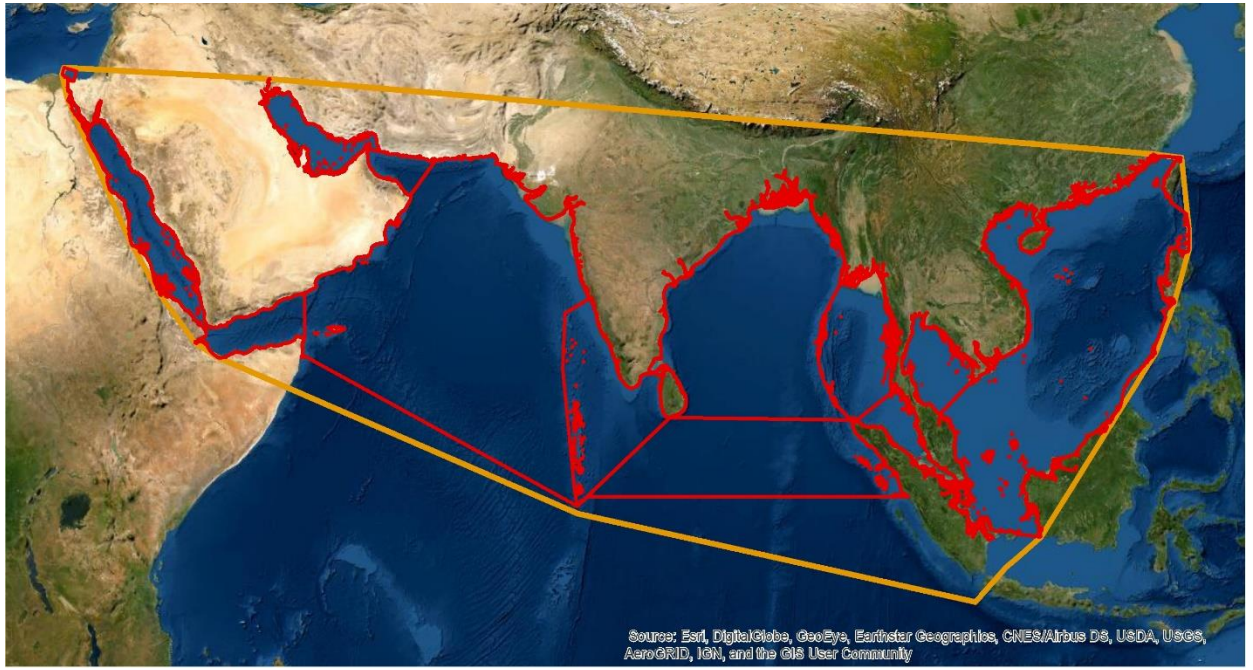
WP4: Comparison of European and Chinese models for seabed habitat and ecosystem vulnerability

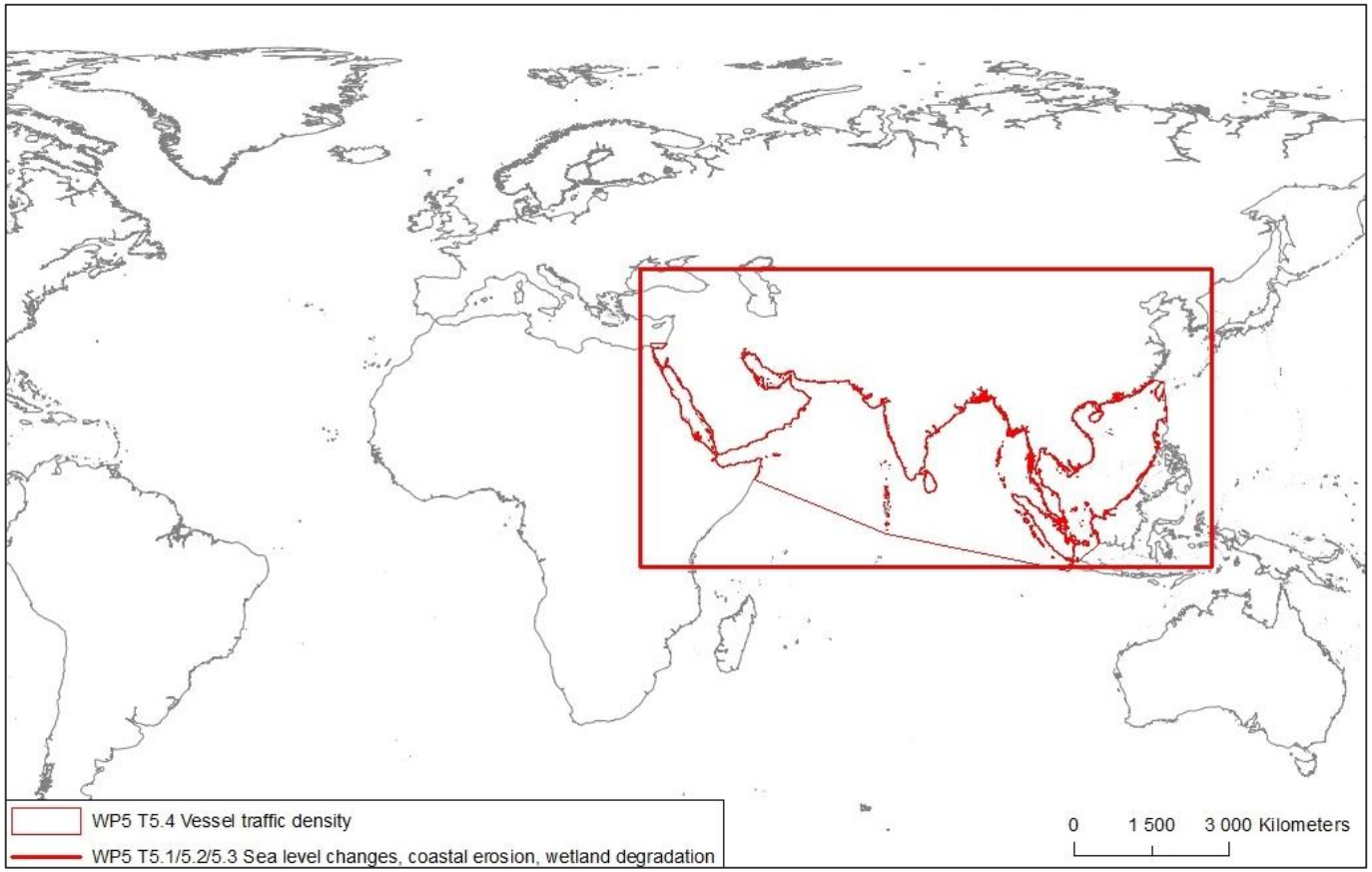
Joint Activity	Joint Activity Description	Internal deliverable (Deadline indicative)
JA 4.2.1	Literature review	January 2021
JA 4.2.2	ECC method selection	January 2021
JA 4.2.3	Application to Bay of Biscay	January 2022
JA 4.2.4	Assessment application	January 2022
JA 4.2.5	Application to other basin?	July 2022
JA 4.2.6	M24 Report	February 2022
JA 4.2.7	Final report	July 2022

WP5: Coastal Adaptation

The aim of WP5 is to **provide data/information products** covering the Seas crossed by the **maritime silk road** on:

- Relative sea level changes
- Absolute sea level changes
- Coastal erosion
- Wetland degradation
- Vessel traffic density





Areas of Interest for the EMOD-PACE CEMDnet Collaboration for WP5: Coastal Adaptation Tasks 5.1,5.2, 5.3.5.4 i.e., sea-level changes, coastal erosion, wetland degradation, vessel traffic density

WP5

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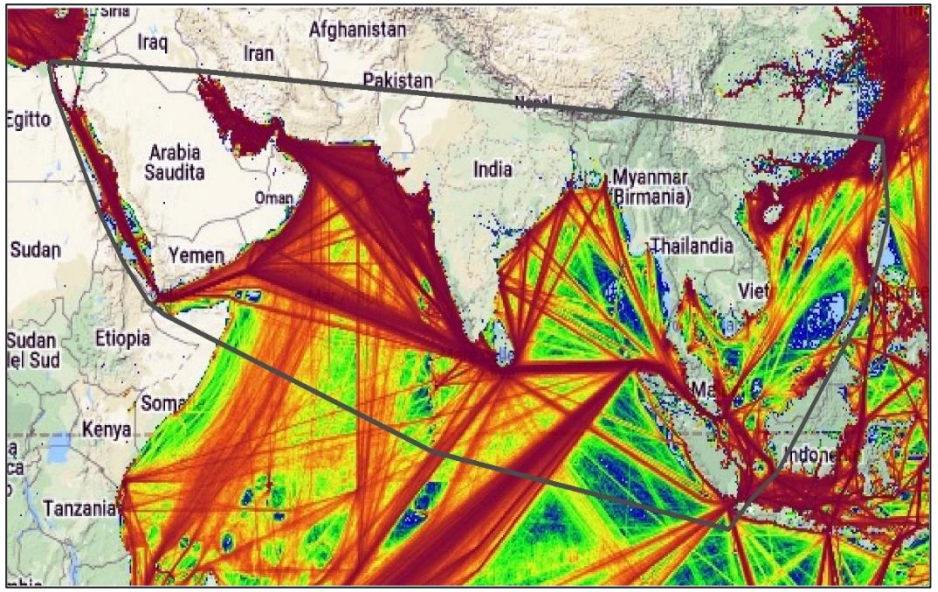
Milestones and Deliverables

Milestones achieved Month 12

5.1. Digital map available on line. Formats and standards agreed for parameters √



Planned Progress next 12-18M

Month 24

5.2. Digital map available with all parameters available for feedback

Month 30 (Final)

5.3. Fully operational digital map incorporated in project web-site

Deliverable Month 30 (Final)

5.1. Online discussion paper on the translation of mapped coastal behaviour into mapped coastal resilience, an applied data product with clear added value because it can be used in decision making

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Joint Activity	WP5 Joint Activity Description	Internal deliverable (Deadline indicative)
JA5.1	Assessment report on sea level rise impacts on storm surge and related wetland/coastal erosion hazards	31th July 2022
JA5.2	Review of existing knowledge for relative and absolute sea level rise in the AoI	30th April 2021
JA5.3	Consolidated list of tide gauge stations and application of trend extraction with alternative methods	30th January 2021
JA5.4	**Consolidated list of model/reanalysis/projection data sets**	**30th November 2020**
JA5.5	Evaluation of C3S barotropic surge model estimates of storm surge return periods	30th November 2021
JA5.6	**Decision of the AoI on the basis of regions with different coastal types, in combination with data availability/literature**	**30th November 2020**
JA5.7	Validation of coastal erosion in the Hainan island	31th July 2022
JA5.8	Generation of mapping products and indicators derived from Earth Observation data in order to analyse the coastal erosion and wetland degradation trends in the AoIs	30th April 2021
JA5.9	**Grid of the Area of Interest for the vessel density maps**	**30th October 2020**
JA5.10	Vessel density maps	29th October 2021
JA5.11 (Deliverable 5.1 from proposal)	Online discussion paper on the translation of mapped coastal behaviour into mapped coastal resilience	31th July 2022

Work Package 0: Project Coordination, Management and Communication

Milestones and Deliverables

Milestones:

Month 6: **1-2.5.2. Technical Support Facility operational √**

Months 12, 24 and 30: **6.1**, *6.2 and 6.3:* **Presenting project progress at Marine Knowledge Expert Group and in month 30 results incorporated into the final report √**

Deliverables:

0.1 Inception report to describe e.g. initial findings, project quality assurance plan, progress in collecting data, any difficulties encountered or expected in addition to the work programme and staff travel (M2); √

0.2 Interim report 1 including a technical report on achieved value of indicators to date. and with corresponding invoice and the financial report (M12); √

0.6a-c Minutes of inception, mid-term, WP1-WP2 specific and final meeting (M2, M11, M20, M30);

0.7a-c Minutes of Steering Committee meetings (M1, M12, M24).

0.8. Report on the Performance Monitoring System Methodology and Approach, including fine-tuning of indicators and log frame, responsibilities, timeframes and resources needed for monitoring (M2); √

0.9a-i. Three-monthly performance monitoring summary reports using performance indicators (M6, M9, M12, M15, M18, M21, M24, M27, M30)

0.10. Short communication and dissemination plan (M3); √

Planned progress M12-18

0.3 *Interim report 2 including a technical report on achieved value of indicators to date. and with corresponding invoice and the financial report (M24);*

0.4 *Draft final report to be submitted no later than one month before the end of the period of implementation of tasks (M29);*

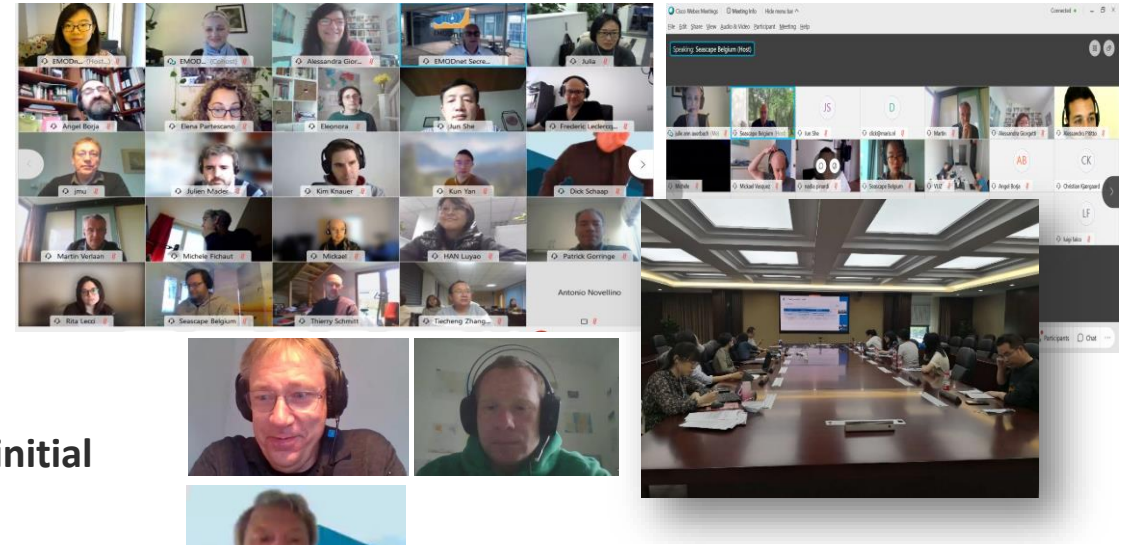
0.5 *Final report with the same specifications as the draft final report, incorporating any comments received from the parties on the draft report (M30);*

0.11. *Leaflet (bilingual in English and Chinese) on project communicating key objectives, partnership (M14).*

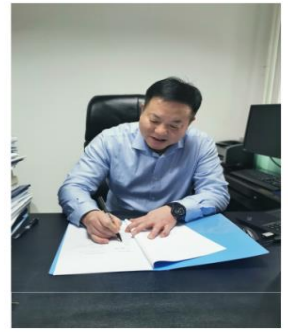
Summary Current Status

The consortium has achieved all milestones in the first year on time.
In summary, this includes:

- Enhancing communication bilaterally (M6);
- Delivery of a **web-portal for the project** (M6);
- Release of the **EMOD-PACE online map-viewer, including the creation of initial draft layers** (M12);
- **Initial summary reports on the choice of sea-basins** in each region (M12).
- In addition, through the good will established, EMODnet Secretariat and NMDIS have prepared and signed a **Memorandum of Understanding**. This will provide a good basis and context for reinforcing the cooperation in the area of data access in the European and Asia Region.
- **Common Work Plans** agreed with NMDIS & Implementation of **Joint Activities** well underway for substantive Work Packages 3, 4, 5
- Creation of a Work Package '0' Project Coordination, Management and **Communication Geographic Information System (GIS)**, to act as a visual reference and data cataloguing tool.



Signing of the Memorandum of Understanding between
EMODnet & NMDIS



Mr. XIANG Wenxi, Deputy DG of NMDIS signing the MoU.

Mr. Jan-Bart CALEWAERT, Head of the EMODnet Secretariat signing the MoU.

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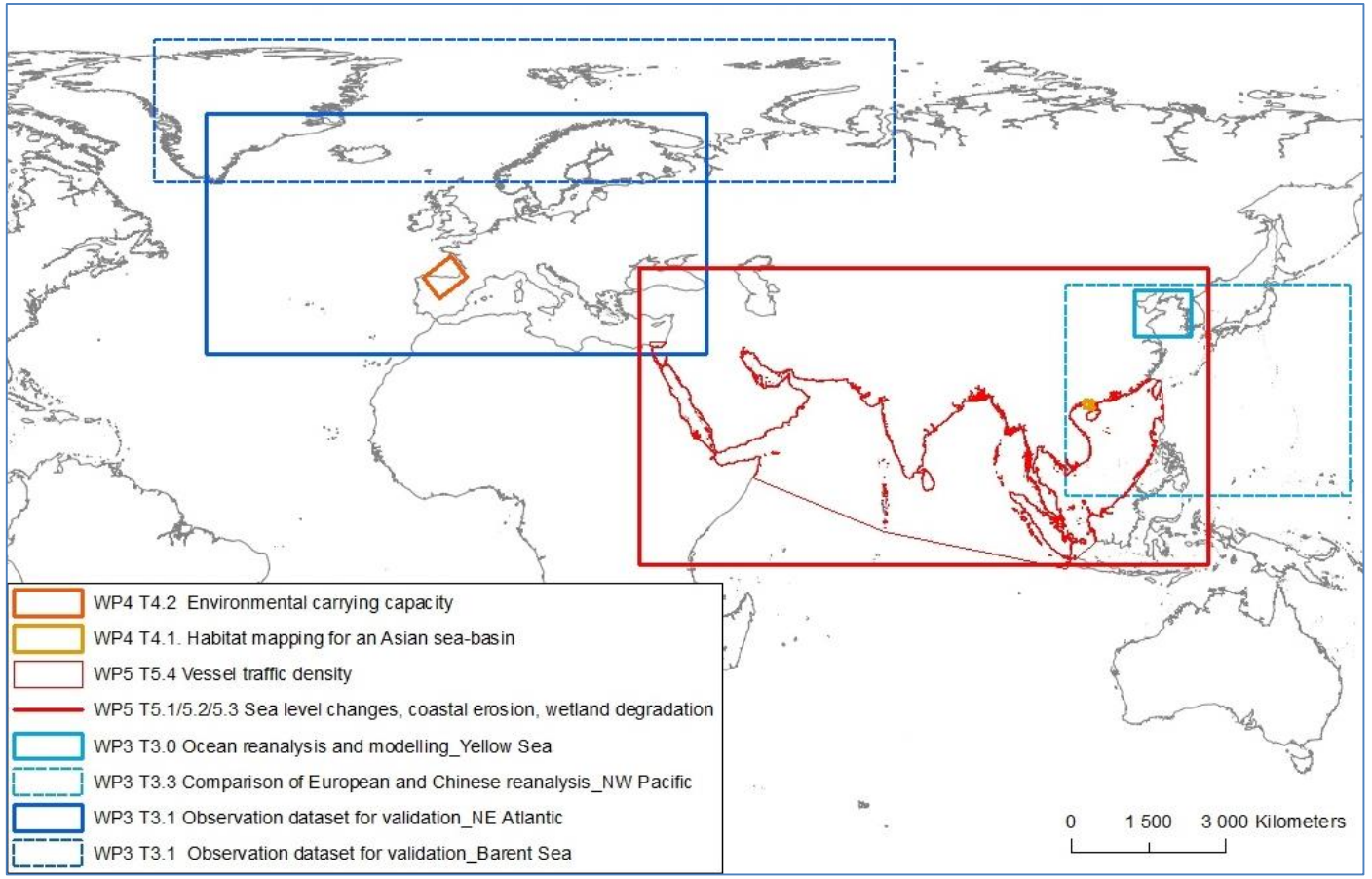
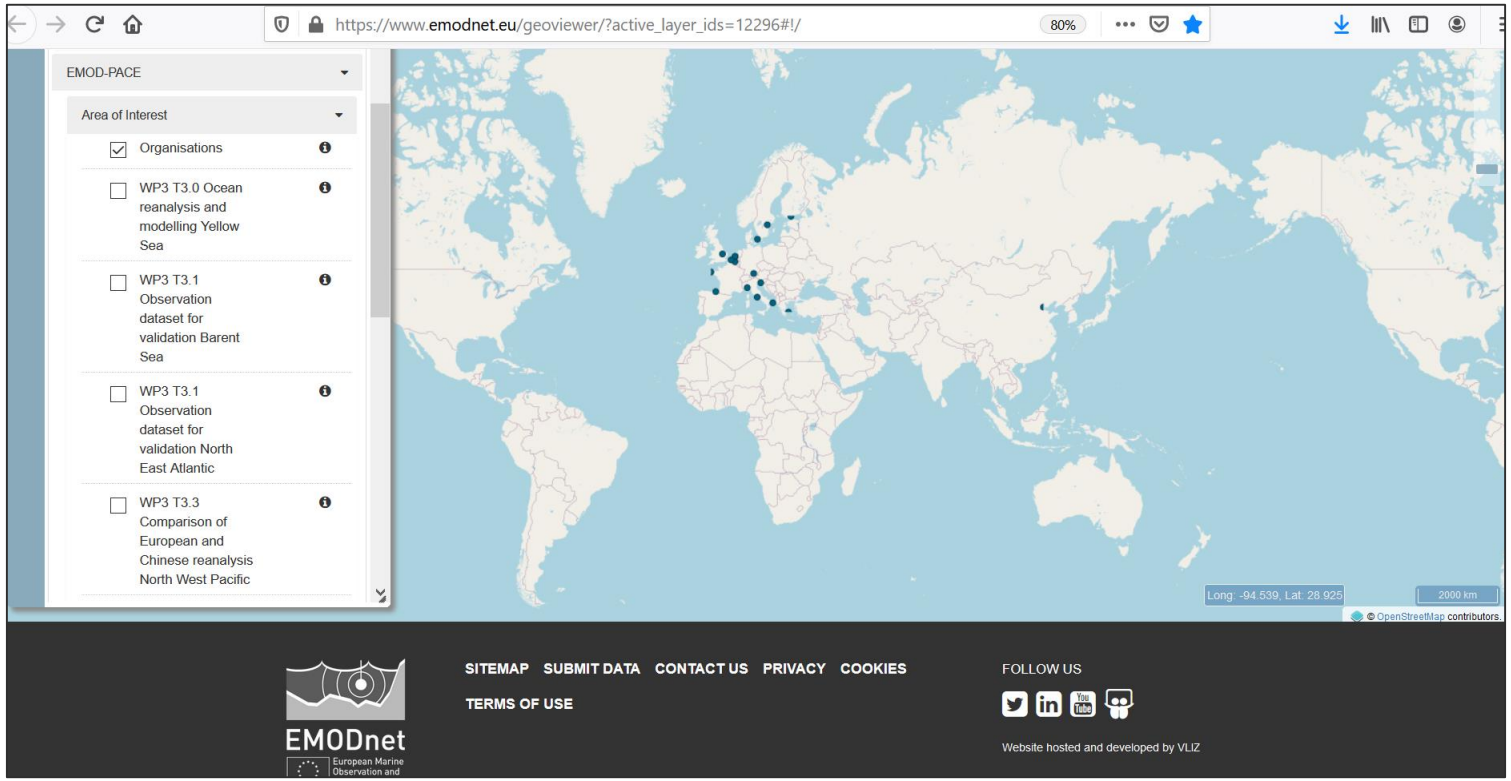
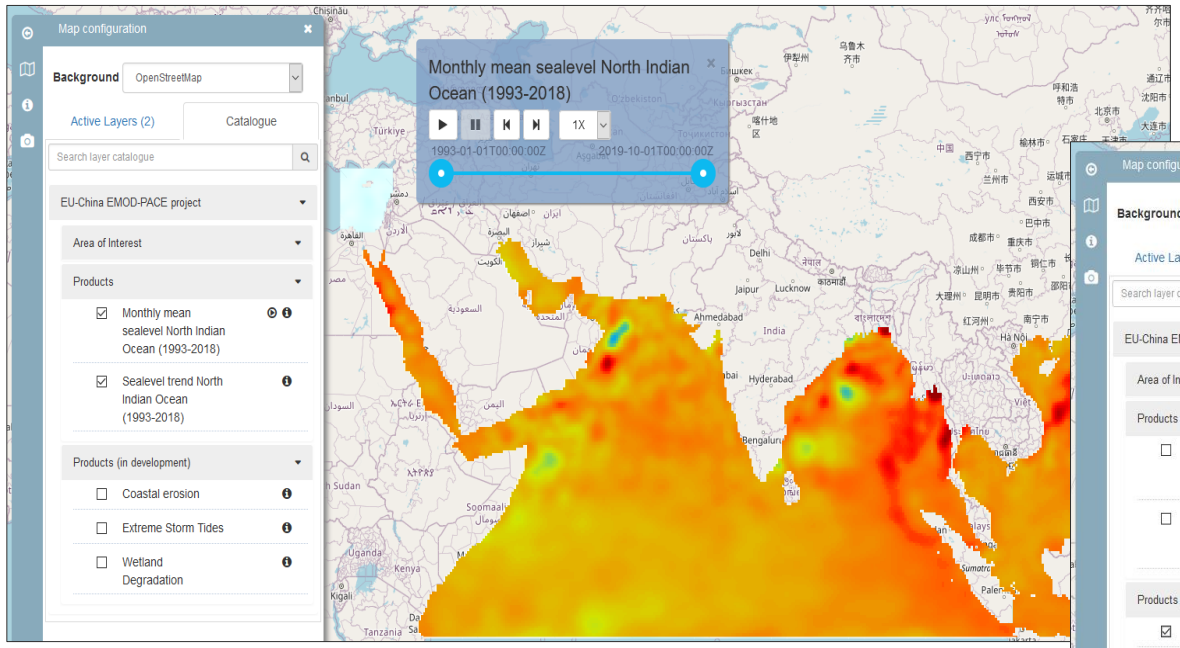


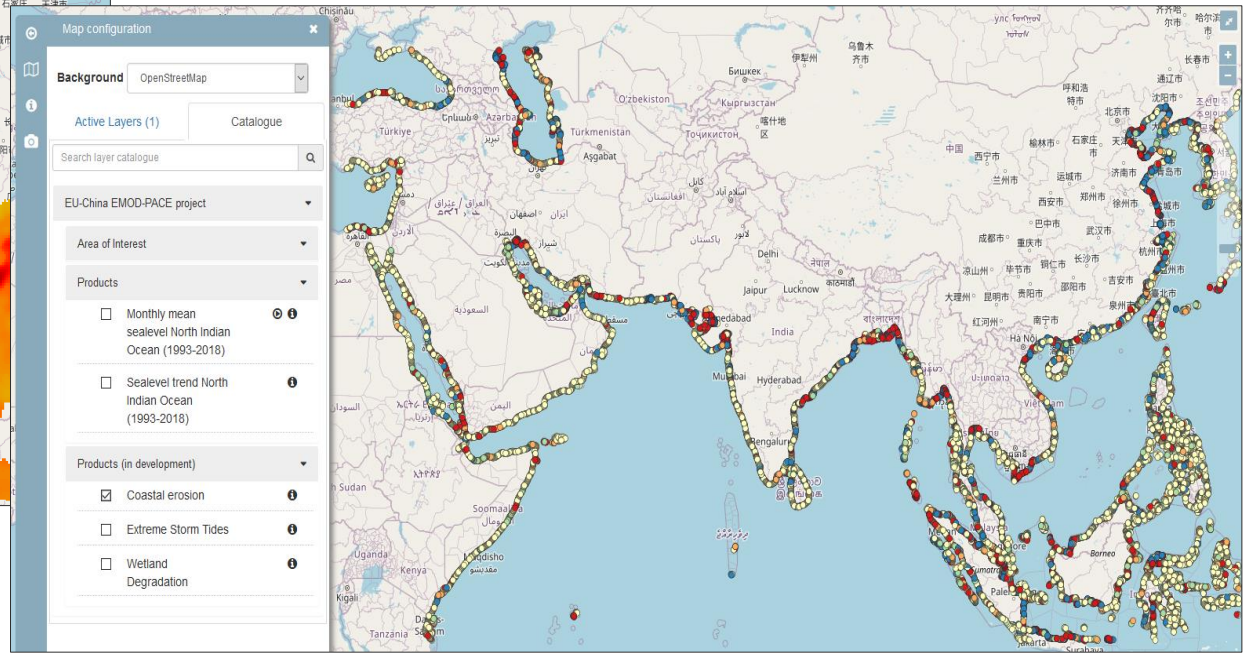
Areas of Interest for the EMOD-PACE CEMDnet Collaboration for WPs 3,4, & 5



Screenshot example of the EMOD-PACE number of organisations layer as seen through the EMOD-PACE project [map viewer]



EU-China EMOD-PACE Monthly mean sea-level and trend for North Indian Ocean 1993 - 2018



EU-China EMOD-PACE Coastal erosion map for 'Maritime Silk Route Seas'

+ initial map layers for extreme storm tides and wetland degradation

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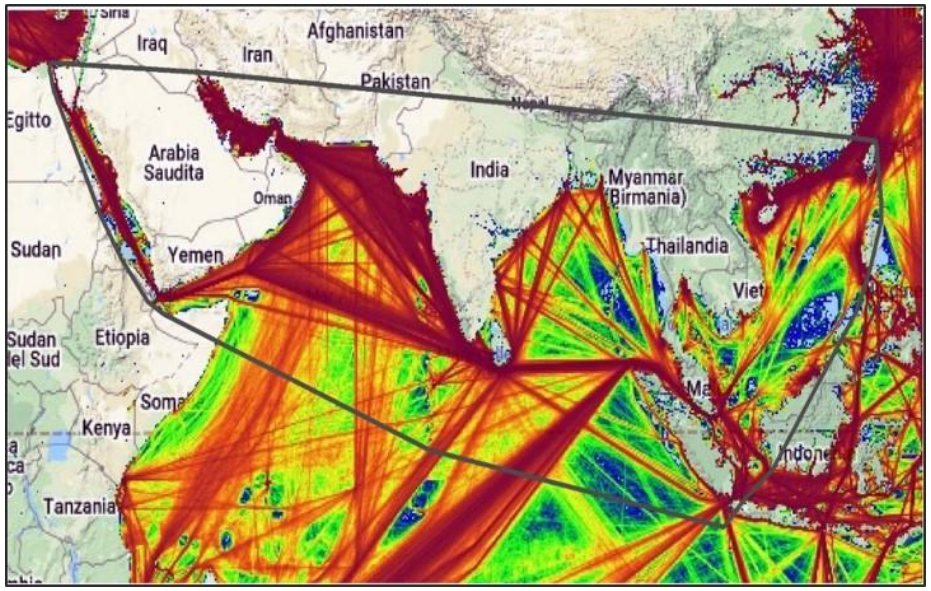
Coming soon – new map layers, analyses reports and brokerage technology. Over the course of the project, EMOD-PACE will be making their outputs available, including:

•Updated **map layers** and exciting new layers on, absolute sea level changes, satellite-based coastal erosion, relative sea level change, wetland degradation, maritime traffic routes, vessel density and low-carbon routes.

•**Brokerage Technology** to link EMODnet and NMDIS data repositories for access to catalogues and available data and data products will also be developed.

•All supporting **technical reports** describing mapping methodologies, comparing the suitability and applicability of EU-China models as well as online **discussion papers** will be made available.



Vessel density map for North Indian Ocean

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Our Next Steps together

- Accomplish the EMOD-PACE CEMDnet cooperative project results which include:
  - Well operated data and interoperable system between EMODnet & NMDIS – WP1 & WP2
  - Safe and fast access to wider range of data and data products – WP1 & WP2
  - Continuously update and share marine information products – WP3, WP4, WP5 + WP1
  - Collaboratively verify and improve methods and standards – WP1-5
  - Jointly develop and publish reports and papers – WP3-5

- Establish sustained China-EU partnership on ocean data exchange and service, to benefit the larger regions.

Next 12M roadmap

- Partners will continue to undertake the agreed activities as outlined in the workplan, but
  - Now extended with **Common Work Plans for the substantive Work Packages 3-5**,
  - With a '**flexible adaptive' schedule** of consecutive remote workshops and physical meetings to monitor and fine-tune the progress and address any difficulties that may arise until a physical meeting is possible.

- Build on the established trust, connections and collaboration between NDMIS and EMODPACE colleagues, to
  - Increase the pace of **concrete steps for further developments and implementations** envisaged of the extended work plan during the coming six months before the next main meeting: scheduled for Month 19 – now proposed for **November 2021 in Tianjin in China if possible**.
  - Emphasis on the **development of operational interoperability solutions for data and data product discovery and access by counterparts in WP1 and WP2 data platform** and the results of the stock-taking exercises for available data for the next phase, in particular through WP1 and WP2, under the guidance of WP0, to ensure that the brokerage will meet the needs of both sides.

- Further development and AGILE implementation of the Common Work Plans for the substantive Work Packages 3, 4 and 5.

- Collaborate on the Wider regional collaboration with interested stakeholders.

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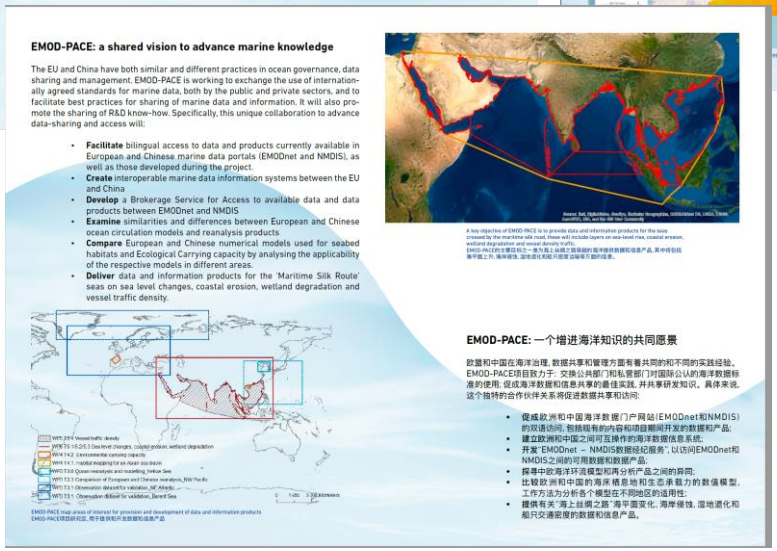
project leaflet



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Key Challenges & Opportunities Ahead

- Identification of data/product gaps and resolution if possible in each work package.
- To determine 'work-around' solutions where-ever data itself cannot be made openly accessible.
- Communication in English (NMDIS has started courses for all of their personnel), and suggest that some Mandarin Chinese is learnt by some of the EMOD-PACE consortium out of courtesy!
- Determining the ultimate added value brokerage functionalities and their implementation between EMOD-PACE and CEMDnet.
- The NMDIS web-services will be accessible to EMOD-PACE, and there is a need to ensure sustainability of the brokerage (as although there will be an open version made in the coming year, it is currently a proprietary software).
- **Ensuring there is easy and effective uptake of the EMOD-PACE data products through the maritime sector so that access barriers are visibly lowered and data applied to support areas of policy connected with ocean governance.**
- **Optimize the full potential of the MoU, by using it to broaden the collaboration in the Asia Region.**

Expanding the Partnership 2021 and beyond through Regional Collaboration

Possible input from UNESCO for International Oceanographic Data and Information Exchange (IODE)

- Advise the EMOD-PACE project in the identification of relevant data experts from Asian marine data and information centers or other organisations.
- In consultation with NMDIS and the EMOD-PACE project, compile an inventory of relevant Asian data centers and key contacts in these institutes.
- Perform a liaison role between the project and other Asian marine data centers. VLIZ and the EMOD-PACE project coordination office will liaise with IODE to ensure that contact is established with other Asian NODCs in a way that best supports the outcomes of the project and the position of EMODnet in the global context.
- Assist and provide guidance and support to the process which aims to determine the accessibility of data and products potentially available through other Asian data centers in OGC compliant formats.
- Assist with the communication and dissemination of results, communication materials and activities.
- Where possible, act as ambassadors of EMODnet and the EU-China collaboration.

Thank You

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For related news, outputs and activities, please visit:

- For EMOD-PACE information, news and map-viewer, please visit https://www.emodnet.eu/en/emod-pace
- The CMOC/China web portal executed by WMO_ICO Centre for Marine Meteorological and Oeanographic Climate Data. http://www.cmoc-china.cn/
- European Marine Observation and Data Network, (EMODnet) Central Web Portal www.emodnet.eu
- National Marine Data and Information Service, China (NIMDIS) http://www.nmdis.org.cn/