# *EOSC Activities in the Biomedicine and Life Sciences community*

Cymon J. Cox
Centro de Ciências do Mar (CCMAR),
Universidade do Algarve,
Faro, Portugal

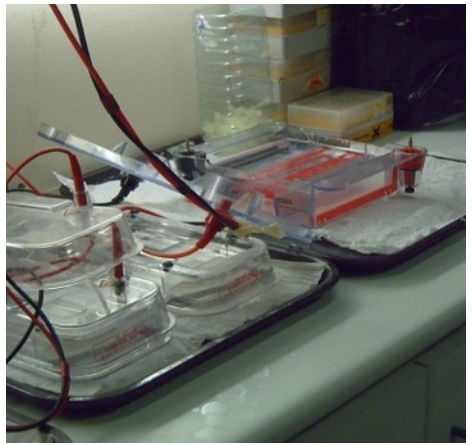
Ibergrid, 2022 - The 11th Iberian Grid Conference
Universidade do Algarve, Faro, Portugal
10th - 13th October 2022

# Centro de Ciências do Mar (CCMAR), host and partners

IPMA
Instituto Português
do Mar e da Atmosfera

UAlg
UNIVERSIDADE DO ALGARVE

CCMAR
Centro de Ciências do Mar
Algarve



# Core Activities

## RESEARCH
Our ocean, our future:
understanding, protecting and exploring

## TRAINING
Training scientists to meet the
challenges of today and the future

## BUSINESS
Developing the Blue Economy
through research and innovation

## SOCIETY
Delivering science for society to support
education, policy and conservation

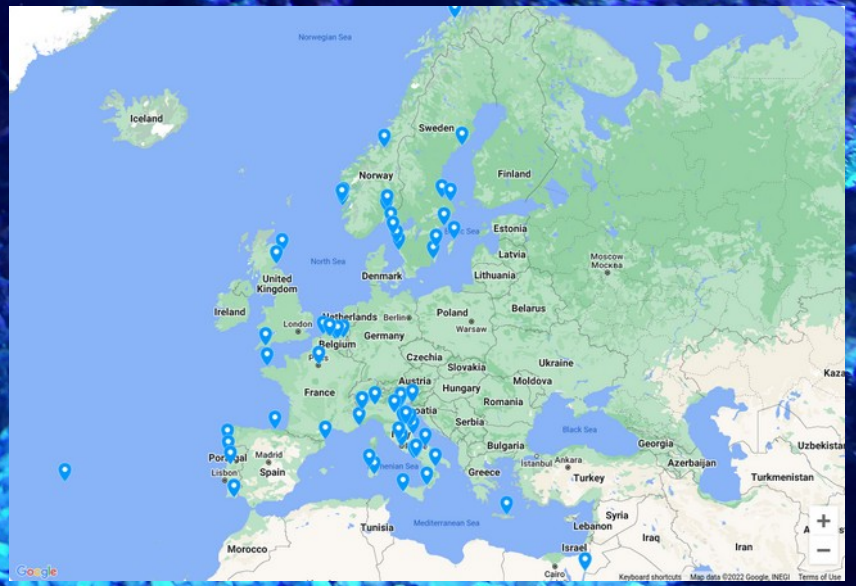
## COLLABORATION
Enhancing research capacity with
partnerships and collaborations

# European Infrastructures

## EOSC Projects

# European Marine Biological Resource Centre

Our planet's richest biodiversity
lies beneath the waves -
EMBRC makes its exploration possible



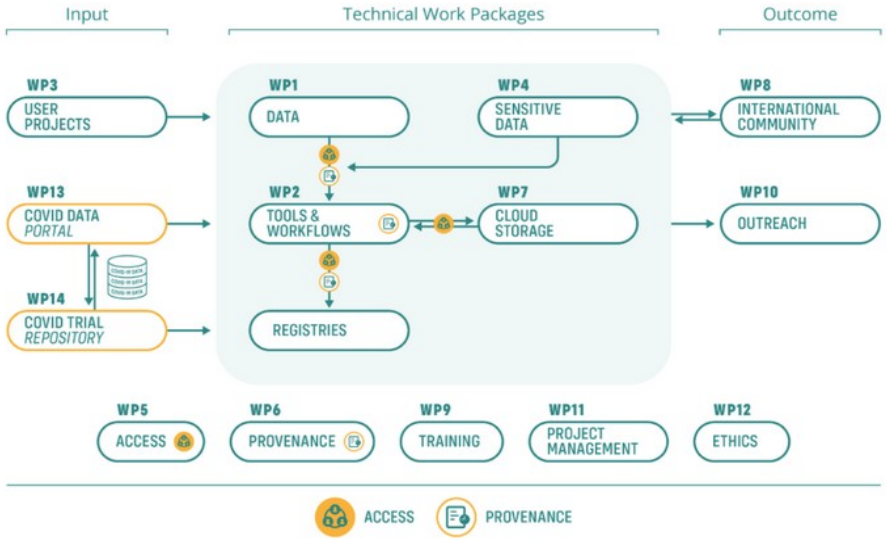
# EOSC-Life - *Providing an open collaborative space for digital biology in Europe*

- H2020 INFRAEOSC-04-2018-2020 - Research and Innovation Action (RIA)
- Started 03/2019 – due to finish 08/2023 (extension)
- 69 participants, 13 pan-European RI's, 14 countries
- Total funding: 26,145,996.25€

EOSC-Life

# EOSC-Life - *Providing an open collaborative space for digital biology in Europe*

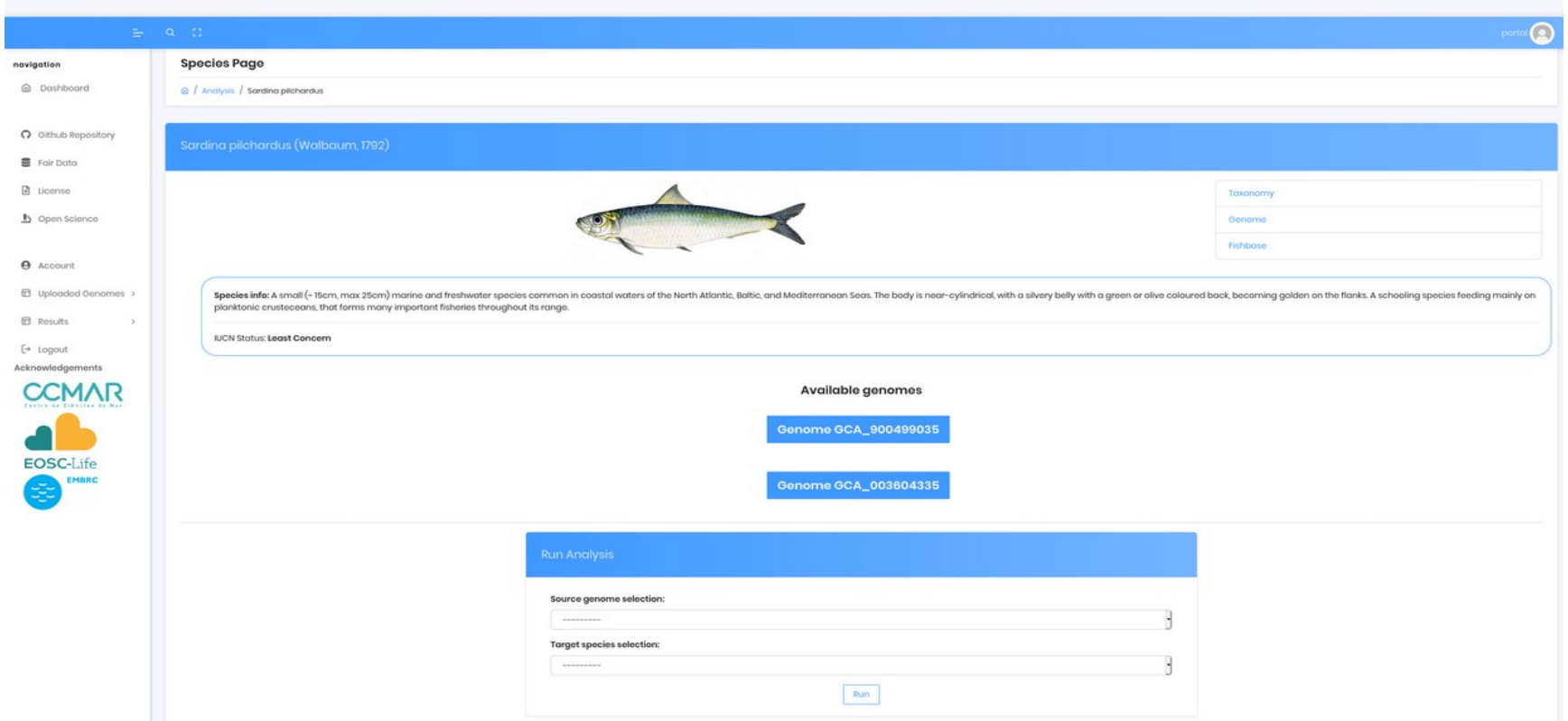
- Create an open digital space for life science and biomedical research
- Publish FAIR data and catalogue of services in the EOSC
- Implement interdisciplinary workflows
- Develop tools and workflows via funded projects
- Address policies and standards for sensitive data (human medical)
- COVID (rapid crisis reaction) – data portal and repository




EOSC-Life

# EOSC-Life - *Providing an open collaborative space for digital biology in Europe*

Work Package 3, Demonstrator Projects, D4: *Marine Eukaryote Genomics Portal – access to tools and data-flows for marine genome annotation*



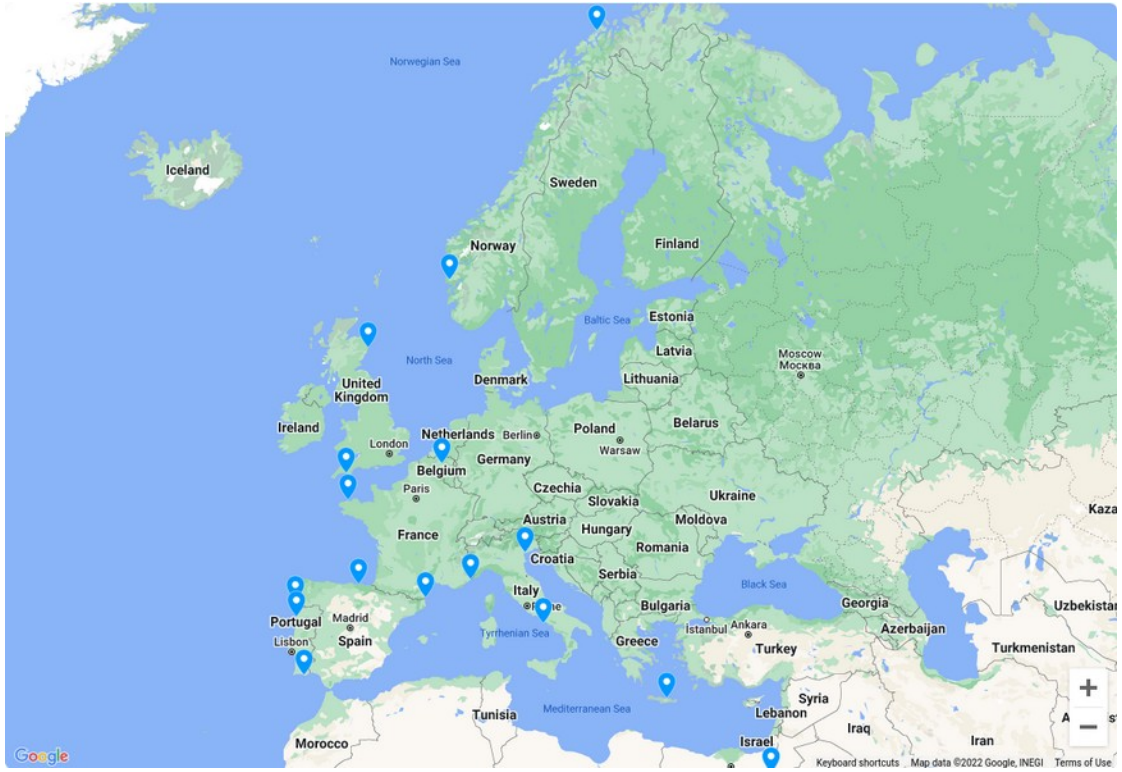

GFFAlign workflow (Galaxy Toolshed) – in collaboration with Roscoff Marine Station, France

EOSC-Life

# EMBRC - EMO BON

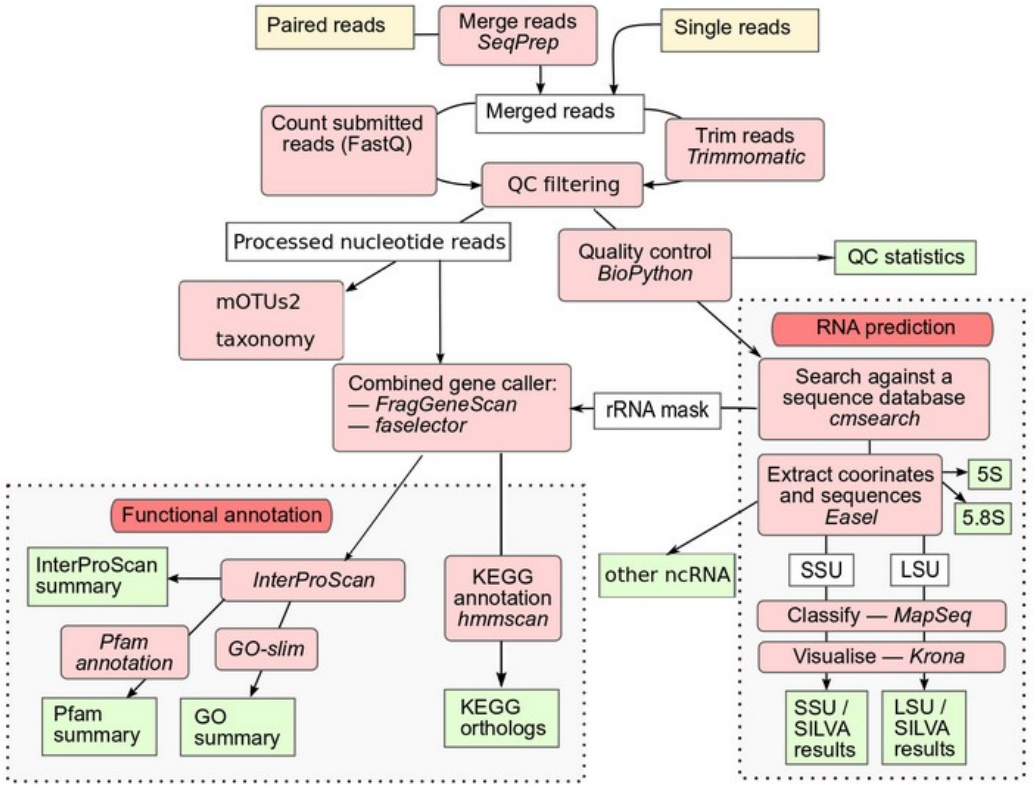
- Understand marine ecosystem services supported by microorganisms
- Sample microbial marine biodiversity (eDNA metagenomics), EOVs, and EBV's
- Standardisation: SOP's, common analytical workflows, FAIR, published DMP
- RO-crate data products: raw sequence data, taxonomic inventories, community gene function profiles, metadata

EMO BON
EUROPEAN MARINE OMICS
BIODIVERSITY OBSERVATION NETWORK



# EOSC-Life Open Call 1

- "*A workflow for marine Genomic Observatories data analysis*"
- Collaboration between EMBRC and ELIXIR.uk (EMBL-EBI MGnify team)
- Data analysis and provenance (metadata) workflows
- Generate taxonomic inventories and community gene function profiles – RO-Crate data products
- TRL 4/5 (Technology Validated in Lab/Relevant Env.)



# The first interdomain digital architecture for integrated use of environmental data

Pilot 5.3.1

## Marine Omics Observation

T.5.3 Use Case 3

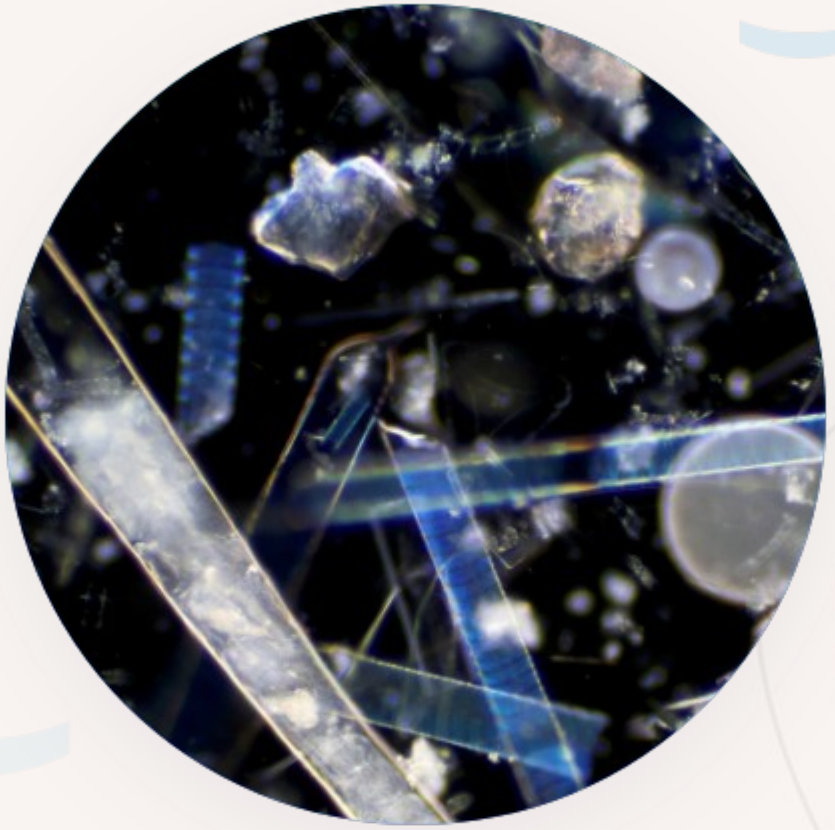
## Biodiversity Observation

**Cymon J. Cox** CCMAR/PT, Christina Pavloudi HCMR/GR, Katrina Exter, Marc Portier VLIZ/BE, Maria Luisa Chiusano UNINA/SZN/IT, and Alice Soccodato, Ioulia Santi EMBRC-HQ/FR

Funded by the European Union

# FAIR-EASE WP5 Use Case

- Pilot 5.3: Marine Omics Observation
- Using EMO BON RO-crate data products:
  - Virtual Research Environment
    - Data dissemination
    - Data visualisation
    - Data analysis (interoperability)
  - Cloudification
  - EOSC integration/sustainability
- TRL 7 (Operational Service) for inclusion in EOSC-L services catalogue (within Blue Cloud?)



# Virtual Research Environment

- Interrogate EMO BON data products in RO-Crates, among sites, and through time (campaigns), links to raw data, sample, and workflow metadata
- Visualise and compare community composition and gene function profiles
- Correlate with EOVs/EBV’s
- Re-run analytical workflow on subsets of data
- Possible exemplar services:
  - Gene discovery/bioprospecting
  - Indicator/sentinel species/communities
  - Water quality evaluation / algal bloom prediction

# VRE – data interoperability

- Machine-operable access via API's
- Interoperability
  - Biogenomics/proteomics/metabolomics (EMBL-EBI)
  - Taxonomic/distribution, biodiversity (WoRMs/GBIF/OBIS/Lifewatch)
  - Ocean physics, biogeochemistry, bathymetry, etc (SeaDataNet/Cloud, Euro-Argo, CMEMS, EMODNet)
  - Imaging (Euro-Bioimaging)
  - Spectral heterogeneity (remote sensing), weather/climate
  - many others

# EOSC-Association Advisory Groups and their Task Forces

5 **Advisory Groups** help steer the implementation of EOSC

Within each AG there are **Task Forces** (13 in all) to help address key areas of implementation

## AG - Research Careers and Curricula

## TF - Upskilling countries to engage in EOSC

*”Any activity required to improve engagement with EOSC – policy development, infrastructure, investment in skills, and education”*

BioData.pt|ELIXIR.pt “Data Stewardship” course

CCMAR

Centro de Ciências do Mar

Thanks for your attention – I'm happy to answer any questions (if there is time)

CCMAR | UAlg UNIVERSIDADE DO ALGARVE