european multidisciplinary seafloor & water column observatory

emso

EMSO ERIC and ENVRIPLUS perspectives related to JTF Smart Sensor

November 13th 2017

Brest

Jean-François Rolin - Ifremer

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Long Time series fixed point observatories

EMSO generic

Data management
Data quality checking tools
Onshore supervision
Onshore servers
Onshore power feed and data transmission – if cabled
Offshore infrastructure
Generic instruments
Instruments

Choice of architecture:

- Full observatory design – stand alone connected or overall power needs – data rates -…..
- Segments and units:
  - onshore servers
  - Power feed onshore, main cable, (branching unit), node, extension cables, Junction Box, Instrument module
  - Benthic station, station over seabed, mooring line and surface buoy ; acoustic communication segment, inductive segment, satellite transmission segment
  - Cabling of sensors units/instruments to Instrument module/Junction Box
  - connectors

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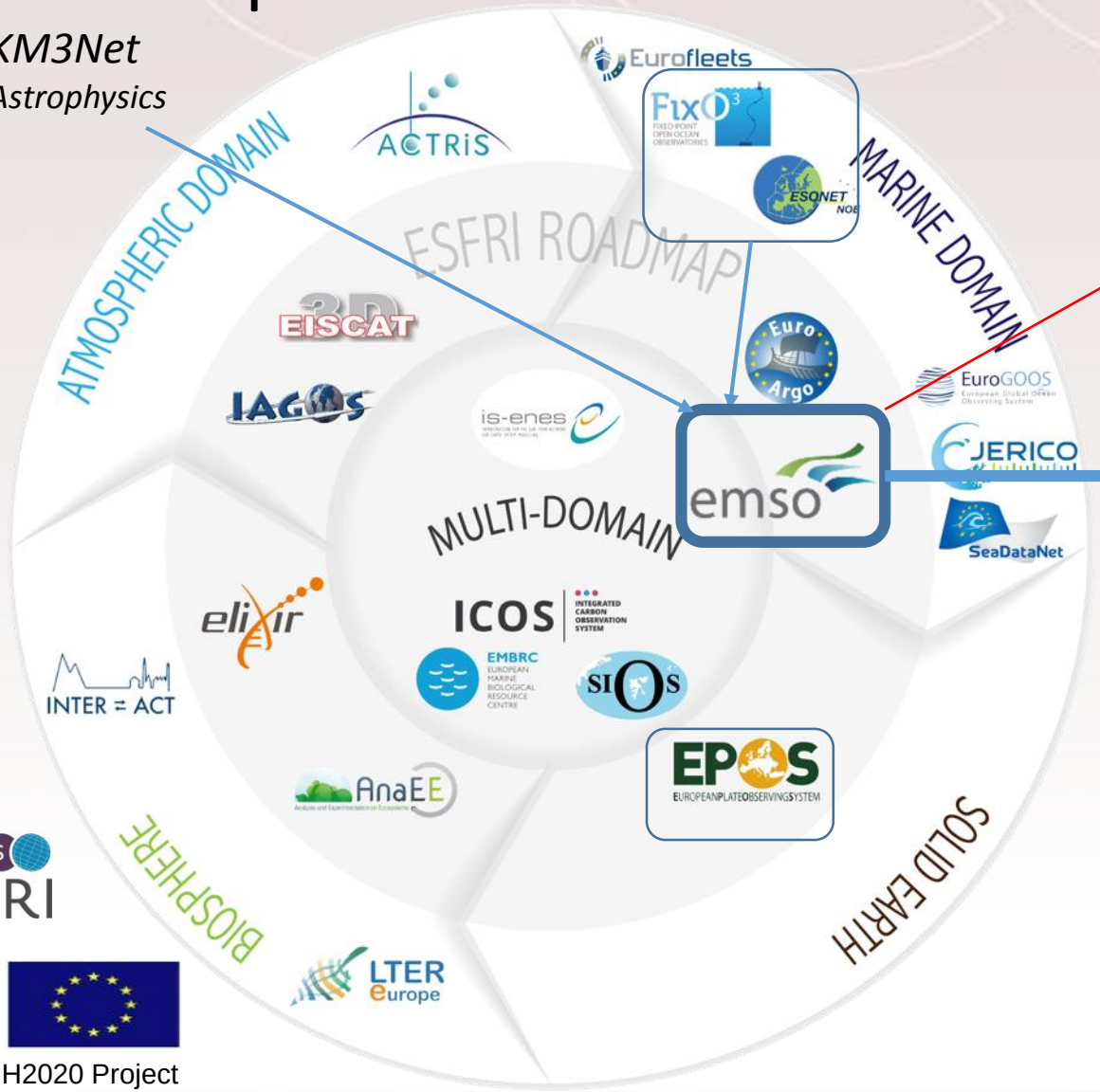
Commitments of EMSO ERIC to JTF Smart Cable

- EMSO community and associated ESONET have been supporting the JTF since Rome meeting.
- EMSO letter of support.
- Indication of Interest for Wet Demonstrator from EMSO PLOCAN and potentially EMSO Ligurian and West Ionian.
- Common interest on the « generic » instruments and associated data management.
- Opportunity of a « Design Phase *» where Smart Cable could be one of the « Major Upgrades » of EMSO ERIC. (**see presentation from EC officer Agnès Robin*)
- JTF Task in ENVRIPLUS

European Research Infrastructures

KM3Net
Astrophysics



plus ENVRI

H2020 Project

European Research Infrastructures

KM3Net
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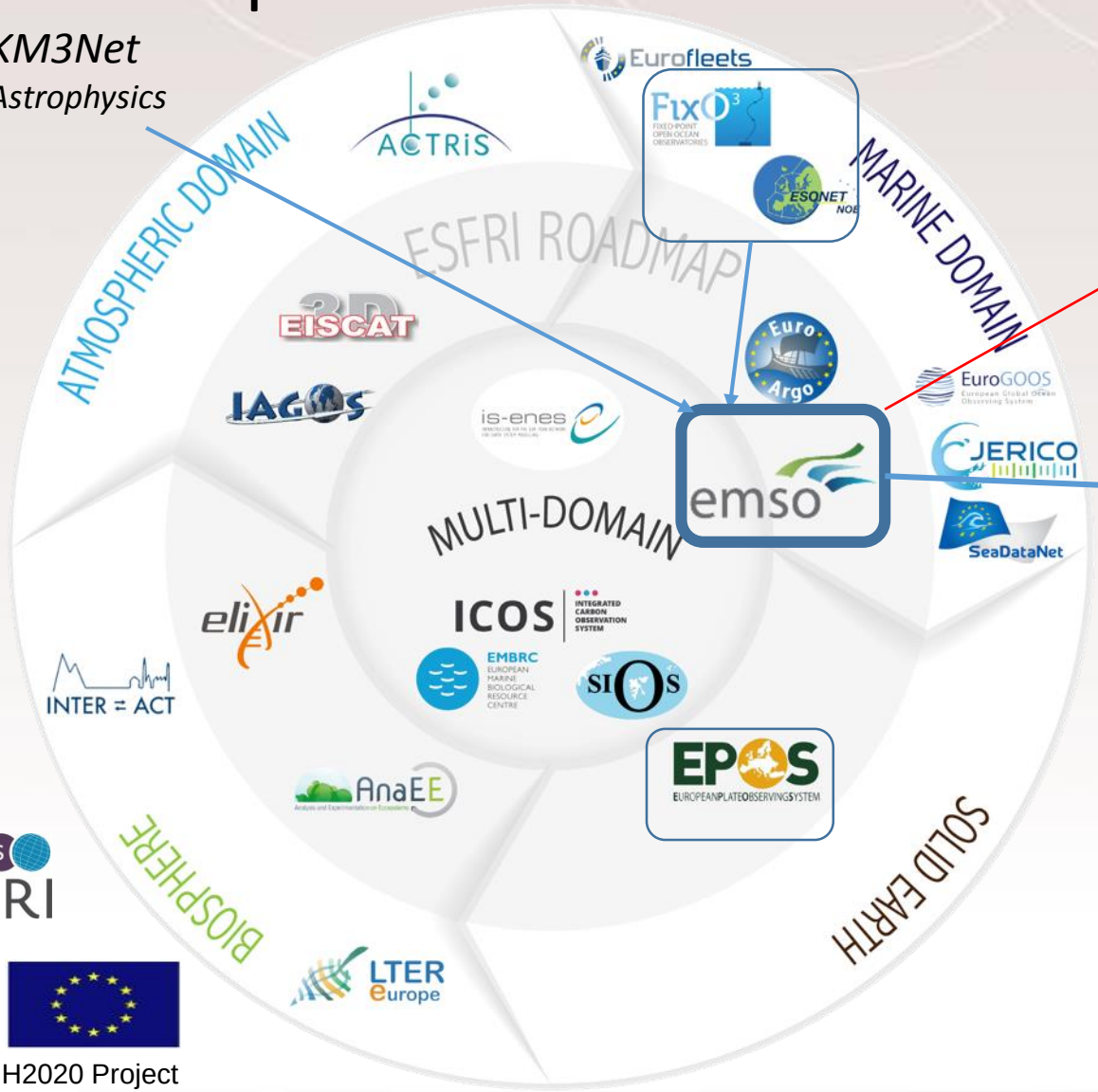

EC Funds

plus ENVRI

H2020 Project

Project Number: 654182

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EGIM - Guidelines

Measure variables homogeneously

- Same sensor references and hardware
- Same qualification methods
- Same calibration methods
- Same data format and access
- Same maintenance procedures

Adapt

- To all types of nodes
  - Mooring line
  - Seabed station, cabled or non-cabled
  - Surface buoy
- To specific sensors
- To new sensor

EGIM - Parameters

Generic parameters

(*H. Ruhl & all, 2011*)

Temperature, Conductivity, Pressure, Dissolved O_2, Turbidity, Passive acoustics, Ocean currents

Optional parameters

Fluorescence /Chlorophyll-A, pH, Partial CO2 pressure, Partial CH4 pressure, Images, Acceleration

This data can support
the Global Ocean Observing System – Essential Ocean Variables concept,
the Marine Strategy Framework Directive
towards evaluating environmental status

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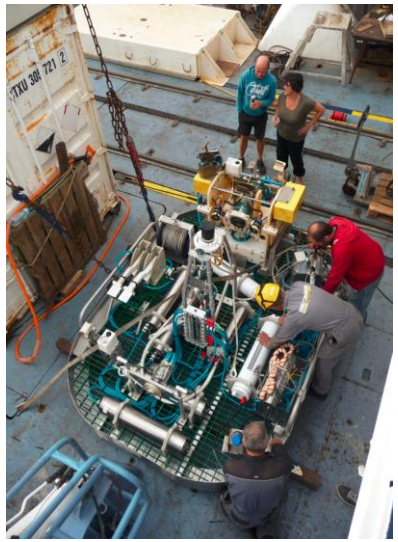
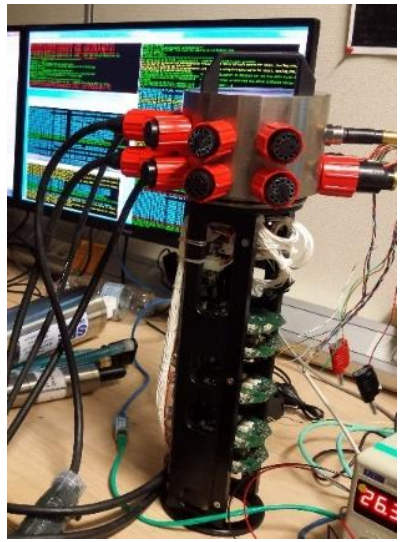
EGIM Electronic core, COSTOF2

(Ifremer license to RTSYS)

- Energy distribution and control
- Time stamping with a common atomic clock
- Measurement data backup and storage
- Active protection against fouling
- Very low power consumption
- Embedded software including
  - Power or Ethernet failure management
  - (future) EXIF agent and sensor ML interpreter





SERVICE MODULES INTERFACED
ATOMIC CLOCK PRECISE TIME REFERENCE
The Data & Power Interface (DPI) for cabled observatories
ACOUSTIC MODEM EVOLOGICS S2C R12-2277
IRIDIUM MODEM NAL RESEARCH
INDUCTIVE MODEM SEABIRD AND OCEANOR - WP12 product
NAS – Data storage
SCIENTIFIC PAYLOAD OF THE PLATFORM: INTERFACED SENSORS
AXIS camera – HIGH DATA VOLUME SENSOR
CHEMICAL ANALYZER CHEMINI Fe
CHLORINATOR
OCEAN BOTTOM SEISMOMETERS (and GURALP CMG 3ESPD OBS) – HIGH DATA VOLUME SENSOR
OXYGEN OPTODE AANDERAA 4330
AIS Transponder KanAton 3
METEO STATION GILL MAXIMET
CISICS IFREMER
TEMPERATURE STRING
LEICA GR25
TURBIDIMETER WETLAB Eco-NTU
PRECISE PRESSURE PAROSCIENTIFIC 8CB4000-I
ADCP RDI TELEDYNE WORKHORSE - HIGH DATA VOLUME SENSOR
CTD SEABIRD SBE37SMP
BARS (Benthic and Resistivity sensor) University of Washington
pCO2 OPTODE AANDERAA –WP12 product
pH ANALYZER SENSORLAB – WP12 product
Hydroctopus
pCO2 wet chemistry analyser for surface operation (nke)

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EGIM Data Power Interface

- Voltage converter
  - 250-400 VDC to 30 VDC
- Signal converter
  - Optical to Ethernet (future)
- Backup batteries (10 days)
  - In case of power failure, the system has 10 days autonomy (Managed by COSTOF2)

EGIM

- Length 800mm
- Ø 850mm
- 130 daN