Co-funded by the Erasmus+ Programme of the European Union

Shaping the future workforce of the space / geospatial sector in Poland:

EO/GI Skills needed & EO4GEO solutions

"Current status of EO/GI sector in the business community: new developments, challenges and solutions
- Testimony by The Azores region -

Ana Martins – Oceanography - DOP/FCT-UAc
"Working Group for the Promotion of Space Science"
(ana.mp.martins@uac.pt)

CONTENTS

- Azores EO4GEO Workshop experience – brief summary
- EO/GI status in the Azores – past and present
- EO4GEO tools/training material – Azores
- Summary

Co-funded by the Erasmus+ Programme of the European Union

AZORES EO4GEO WORKSHOP EXPERIENCE (2nd JULY 2021)

- brief summary -

- Welcome and introduction
  - Rector (University of the Azores)
  - Roya Ayazi (NEREUS Secretary General)
  - Francisco Wallenstein (Regional Government)
- The integration of EO4GEO tools in the Azorean maritime ecosystem
  - Margarita Chrysaki (NEREUS)
- Current and future EO/GI skills needed in the Azorean coastal and maritime sector:
  - Pedro das Neves, Regional Director of Sea Affairs;
  - Antoni Jez (Podkarpackie region, PL)
  - Adam Sieczka (Mazovia region, PL)
  - Ana Martins (Academia)
  - Pedro Freire da Silva, CTO of the EO Lab at Air Centre (Private sector)
  - Fábio Vieira, DRCT (Regional Government)
- EO4GEO solutions
  - Margarita Chrysaki (NEREUS)
  - Rob Lemmens (University of Twente)
  - Aida Monfort Muriach (Universitat Jaume I)
  - Florian Albrecht (University of Salzburg)
  - Handa Erdam (Vito technologies)

EO/GI status in the Azores – past and present -

- EO Infrastructures & Platforms / Systems
- EO Research Areas
- EO Education & Outreach
- EO Topics for Collaboration / Development

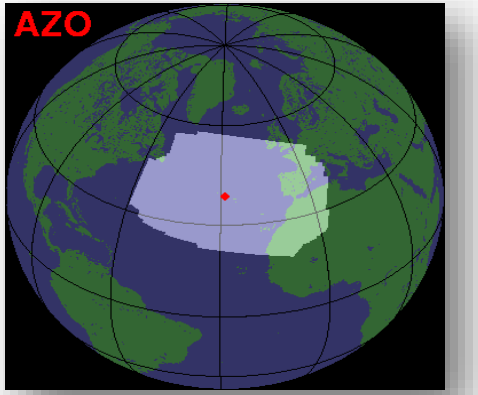
Past EO facilities:

HAZO installation in the "Príncipe Alberto de Mónaco" Observatory (Faial) - April 2001

DETRA

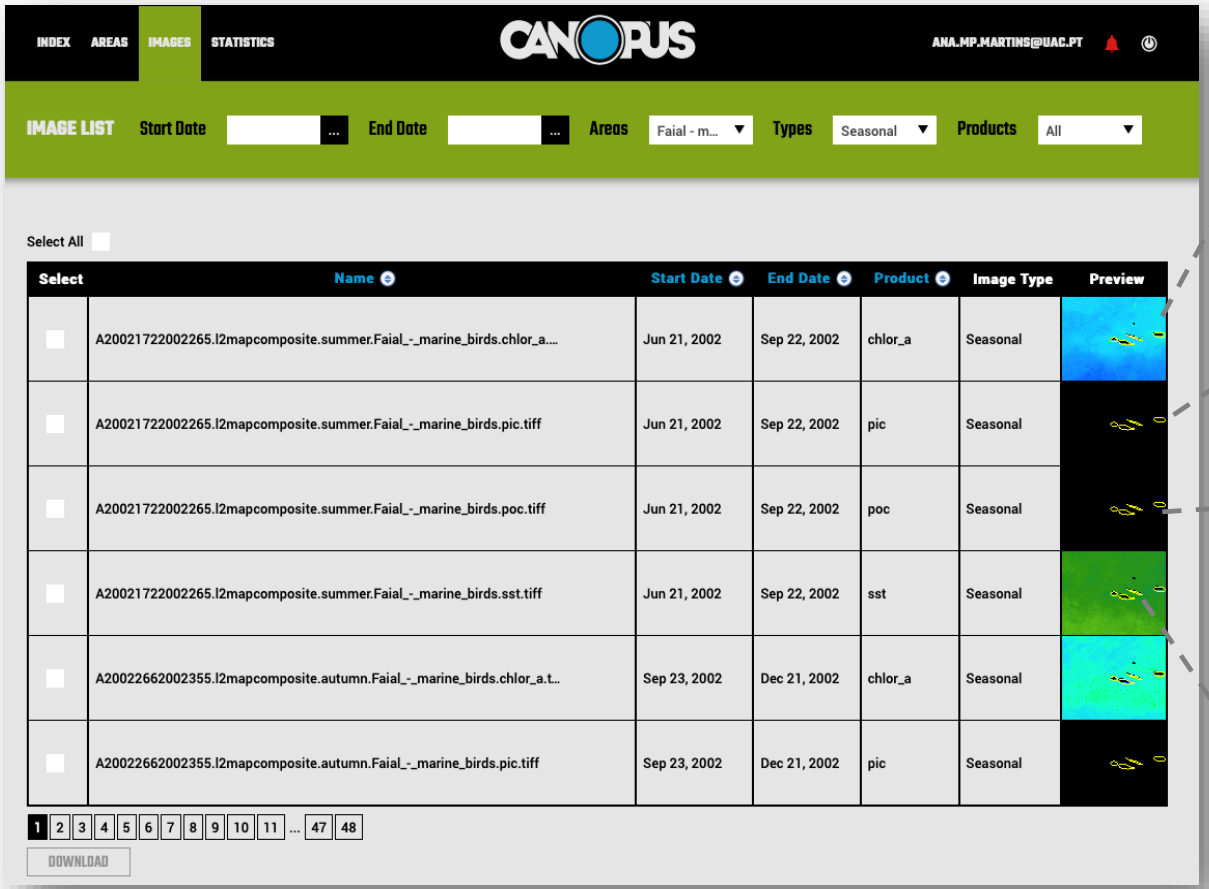
HAZO = HRPT station of the AZOres

First HRPT SeaWiFS station in Portugal and in Central North Atlantic

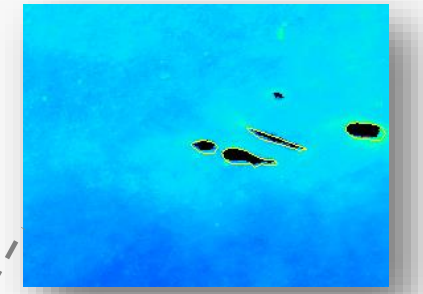


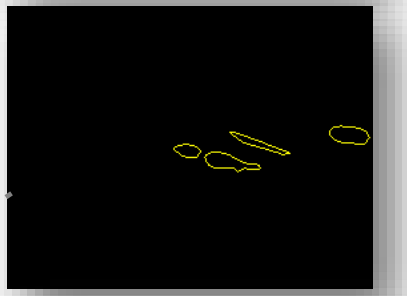
Co-funded by the Erasmus+ Programme of the European Union

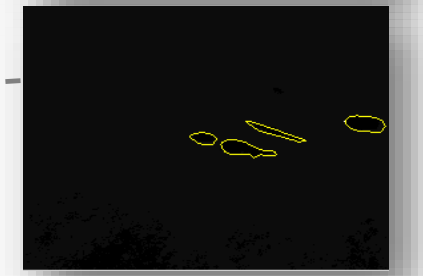
CANOPUS processing system

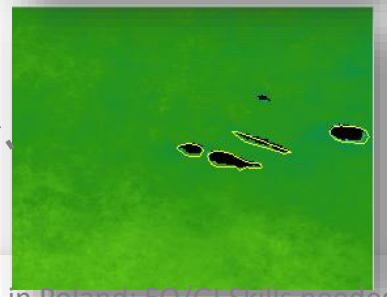


Image's



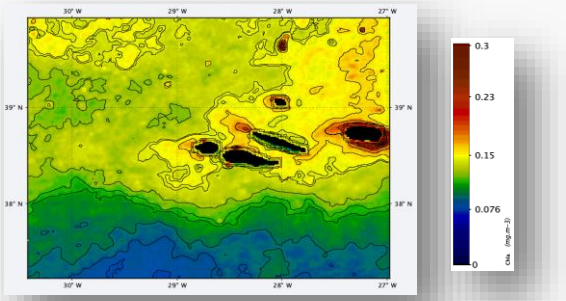




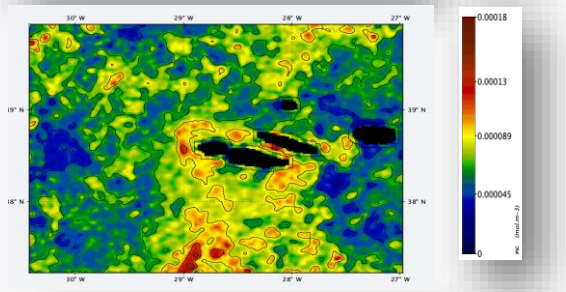


Images quick processing

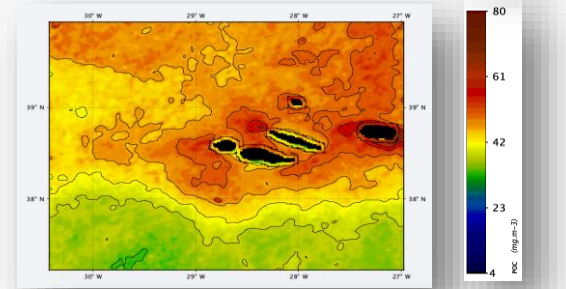
Chla



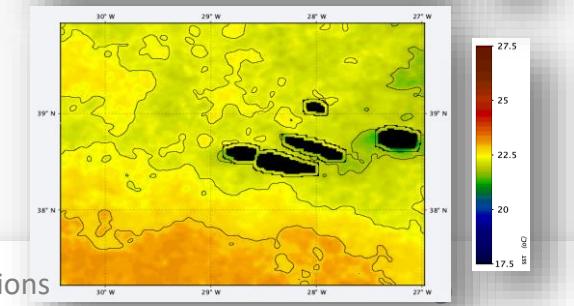
PIC



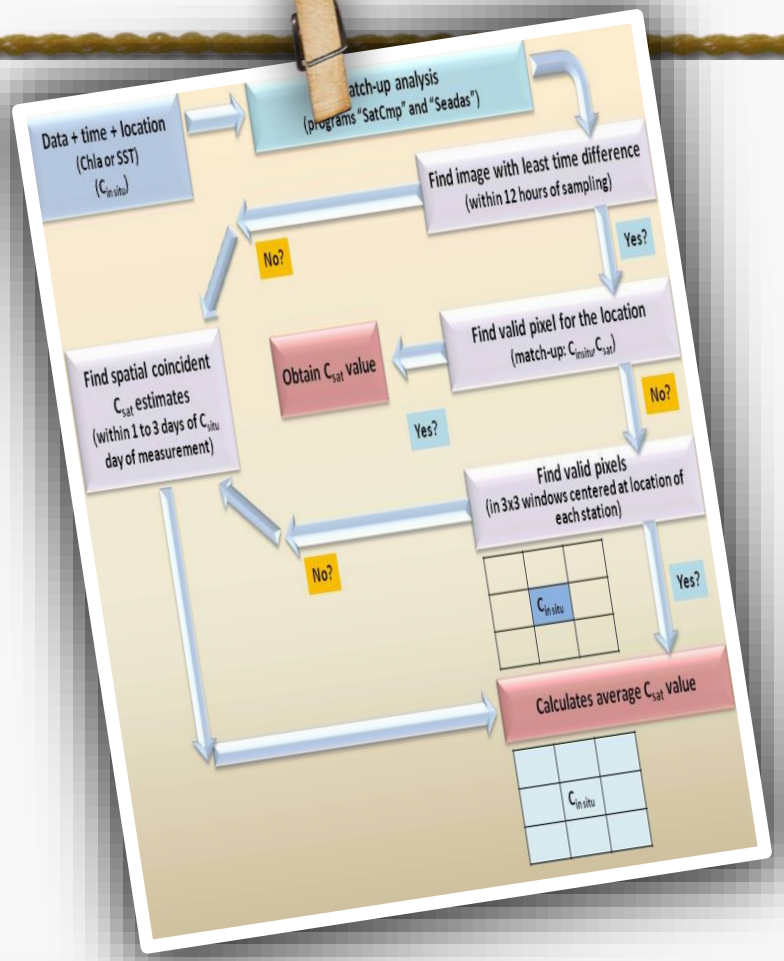
POC



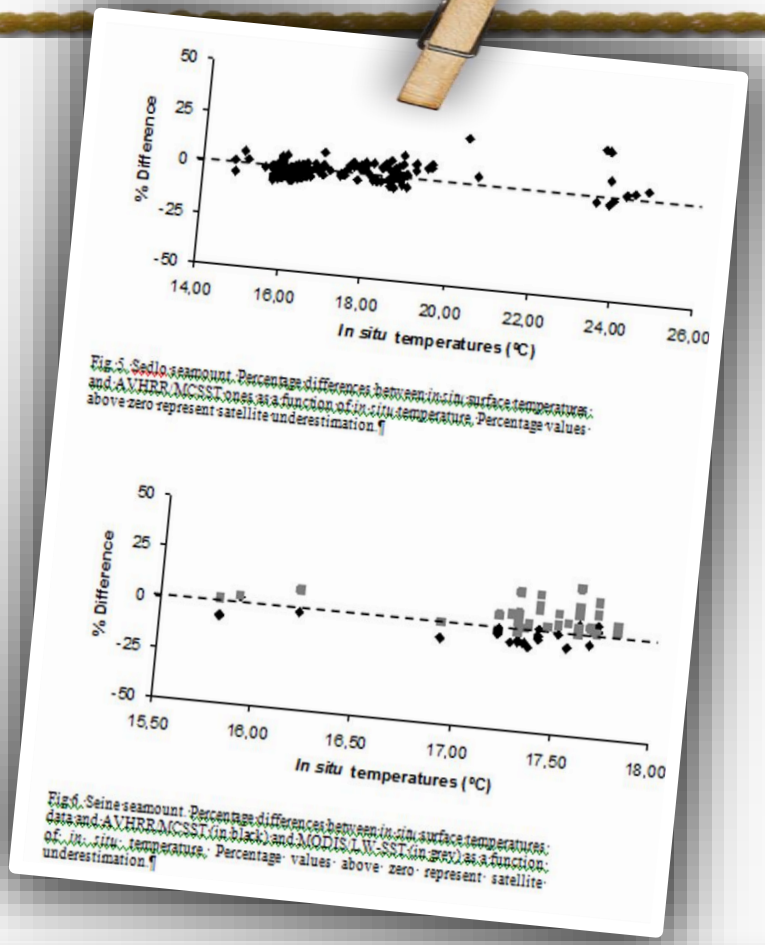
SST



EO **Match-up analyses –** in situ data



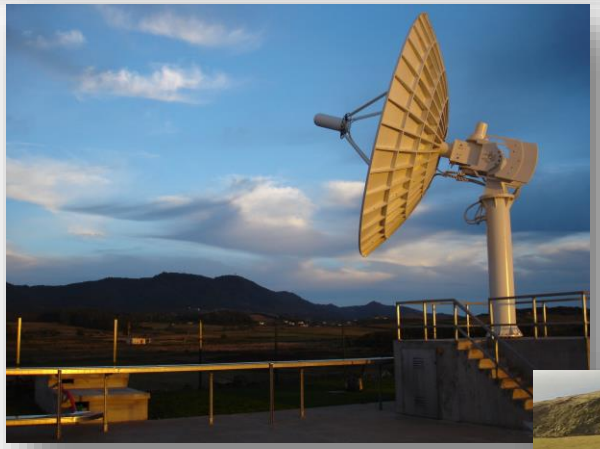
(Mendonça et al., JARS, 2010)



https://ptspace.pt/space-innovation-hub-santa-maria/

Recent EO facilities:

- ESA Tracking station, the Azores International Satellite Launch Programme (Azores ISLP), under the responsibility of the Regional Government
- ESA_Lab@Azores for Earth Observation, as a pole of the Atlantic International Research Centre (AIR Centre)
- Business incubation services, as developed over the last few years (e.g., TERINOV);
- Existing large airport infrastructures and related installations.



AIR CENTRE
ATLANTIC INTERNATIONAL RESEARCH CENTRE

https://ptspace.pt/space-innovation-hub-santa-maria/

Future EO facilities:

- The Azores International Satellite Launch Programme (Azores ISLP) based on a vertical spaceport for mini and micro launchers;
- A landing facility for Space Rider, the future European transportation vehicle for microgravity experiments;
- A Teleport to support ground segment operations and data flow;
- Test facilities for engines and stages for micro launchers;
- A business incubator network for small start-ups and innovative firms;
- Expansion of existing large airport infrastructures.

https://ptspace.pt/space-innovation-hub-santa-maria/

EO Ocean Research areas

(since 2000: 21 years)

- NE Atlantic near-surface ocean mesoscale and large scales space and time variability
- Climate studies
- Ocean productivity
- Ocean and Atmosphere phenomena (Teleconnections)
- Coupled Ocean biogeochemical and physical processes
- Marine Pollution
- Satellite calibration / validation studies
- …

DOP´s **Courses** (Education/Training Skills)

PhD program

Ocean Sciences

Master program

Integrated Studies of the Ocean (MEIO)

(RS course since 2007)

License degree

Ocean Sciences (LCMAR)

Technical degree

Resources and Maritime Activities (TesP)

(new)

Other past **Courses**

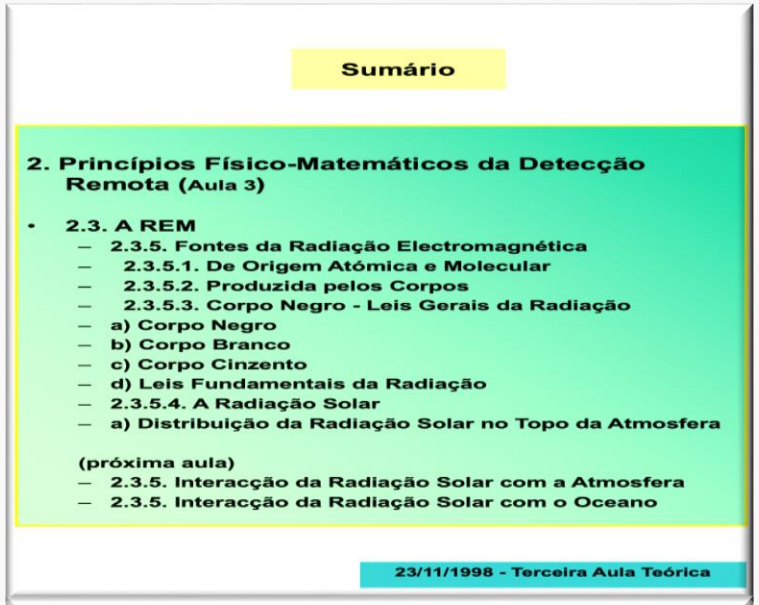
Co-funded by the Erasmus+ Programme of the European Union

Erasmus Mundus

Master course:
Marine Spatial Planning
(Dept. Biology coordination)
(lectured in Spain, Azores, and Italy)

ERASMUS Summer School
Master Program

FORmation of Multi-disciplinary Approaches to Training in Earth Observation (FORMAT-EO)
(lectured in UK)



Marine Biology

License course: Marine Biology (Dept. Biology coordination)
(lectured in the Azores)
Oldest course in RS: (1998 – 2002)

Satellite Oceanography master course (for the last 14 years)

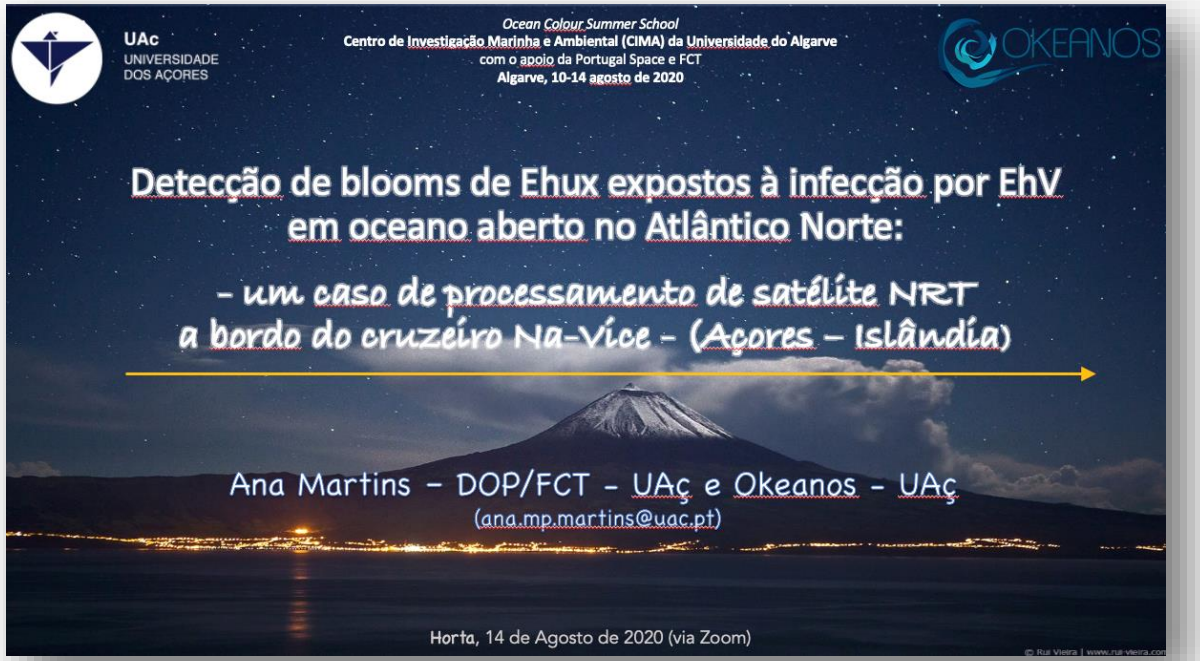
- Course -1 semester – 4 ECTS (T: 16; TP: 12, S:2)

- Weekly classes provide basic concepts in RS and cement these through practical classes where students process different types of ocean satellite imagery (particularly applied for meso to large scale ocean variability)

EO Topics for Collaboration / Development

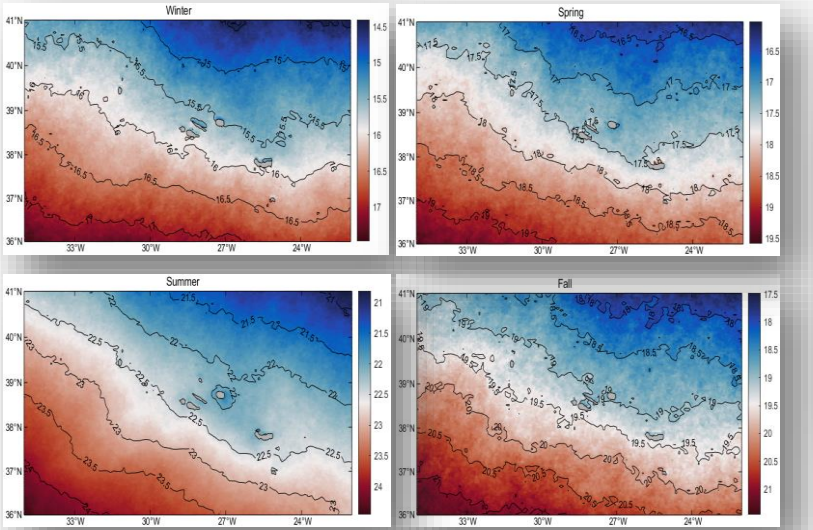
- **Education:** collaboration in summer courses and/or license / master / PhD national / international programs and/or students (co-)supervision

https://www.facebook.com/CIMA.UAlg/photos/pcb.3075979185784077/3075971042451558/?type=3&theater

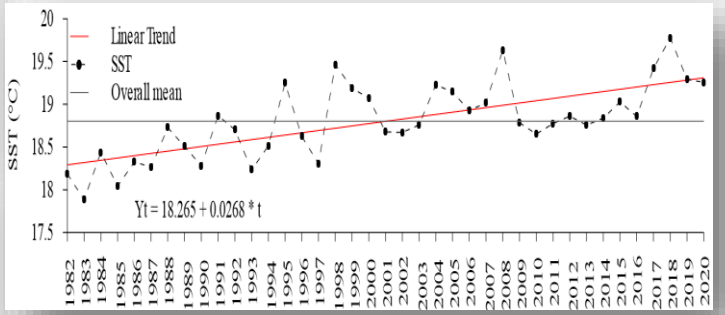


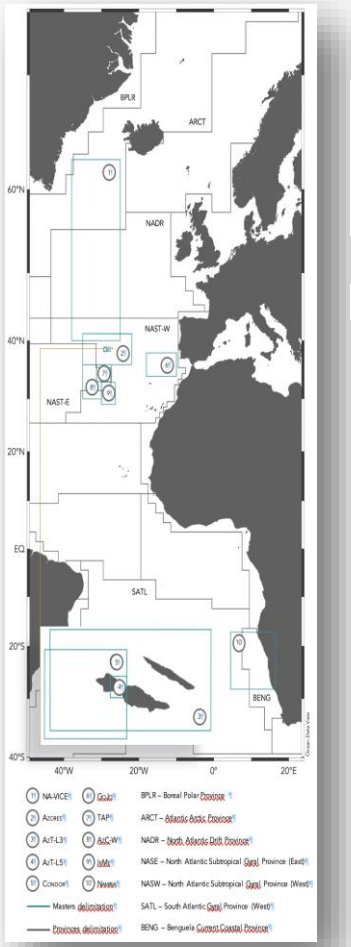
EO Topics for Collaboration / Development

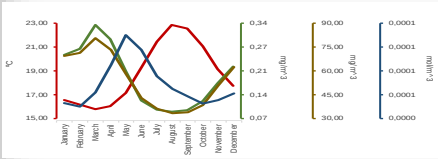
- **Science:** Ocean productivity and space-time variability, relations to climate change and variability, marine pollution, development of new algorithms (e.g., HABs, PFTs, jellyfish, tracking marine litter, etc).

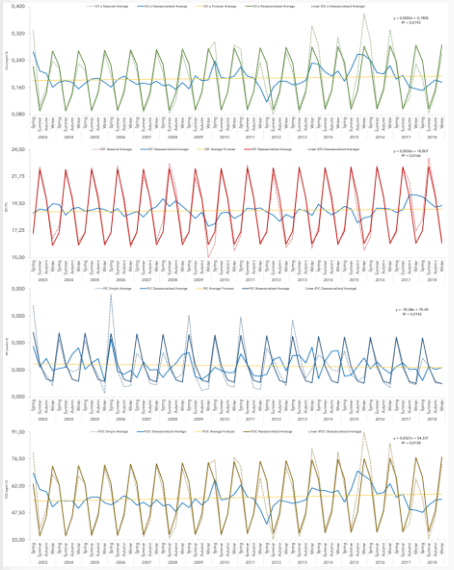


(Tokat et al., 2021) - *in prep*





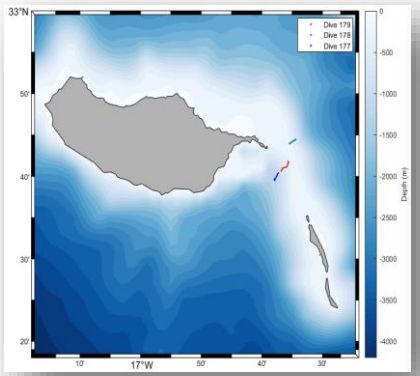


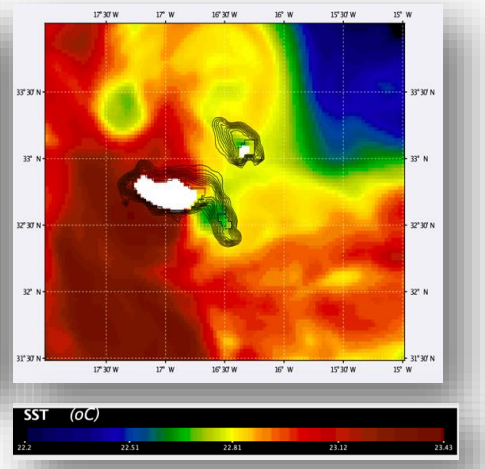


(Loureiro et al, 2021) – *in prep*

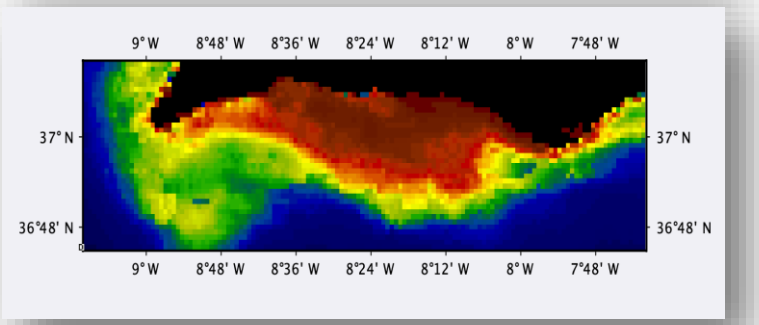
EO Topics for Collaboration / Development

- Science (with private sector): Ocean productivity and space-time variability, relations to climate change and variability, marine pollution, development of new algorithms (e.g., HABs, PFTs, jellyfish, tracking marine litter, etc).





(Braga-Henriques et al., 2021) - *in prep*



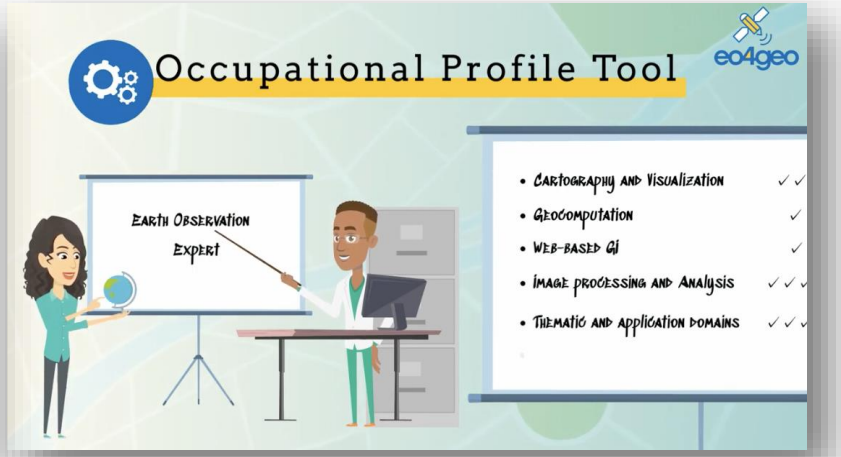
(Suleiman et al, 2021) – *in prep*

EO Topics for Collaboration / Development

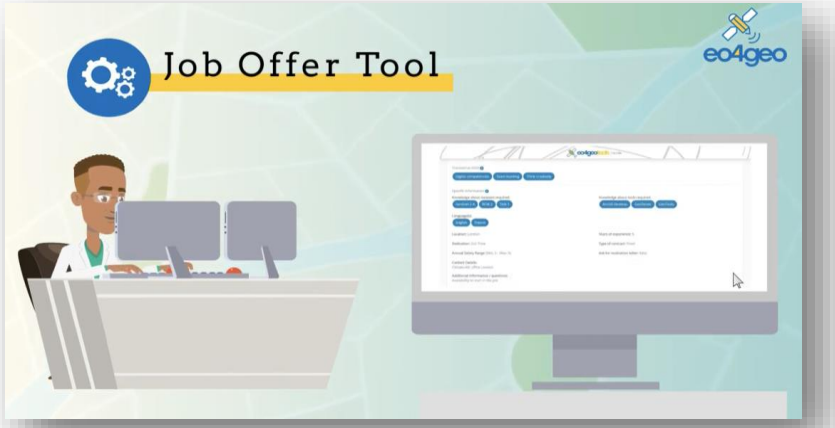
- Outreach: Contribution to EO dissemination to public authorities and general public

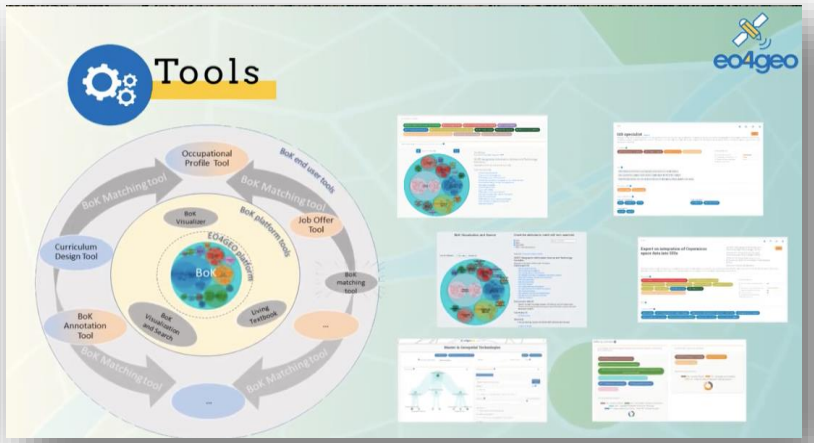
EO public talks

EO/GI solutions



To be introduced this year to the 13th edition Master students – 2nd semester at University of the Azores

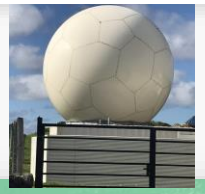




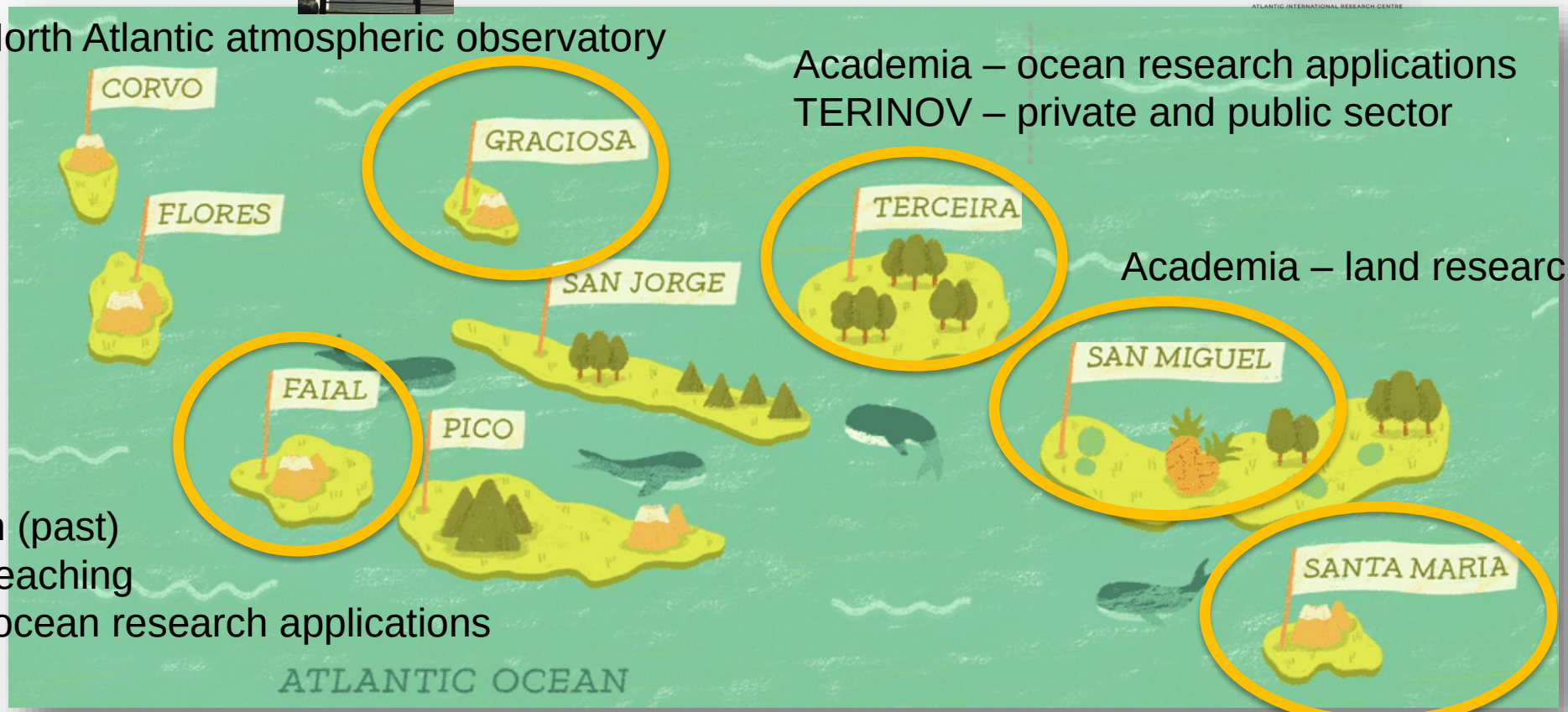
SUMMARY

Co-funded by the Erasmus+ Programme of the European Union

ARM



Eastern North Atlantic atmospheric observatory



Academia – ocean research applications
TERINOV – private and public sector

Academia – land research applications

HRPT station (past)
Academia - teaching
Academia – ocean research applications

Space infrastructures – public and private sectors

Co-funded by the
Erasmus+ Programme
of the European Union

Thank you very much!