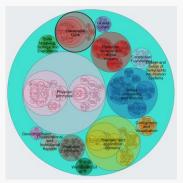
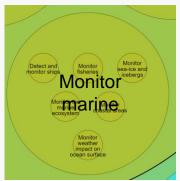




The EO4GEO Body of Knowledge and its content for Marine applications



Florian Albrecht



University of Salzburg,

Department for Geoinformatics – Z_GIS

EO4GEO Solutions





BoK tools – The EO4GEO Body of Knowledge and its content for Marine applications

- What is a BoK? What is the EO4GEO BoK?
- Example concept "Monitor the marine ecosystem"
- Role of skills
- Diversity of skills for an EO workflow
- Overview of EO4GEO tools that use the BoK

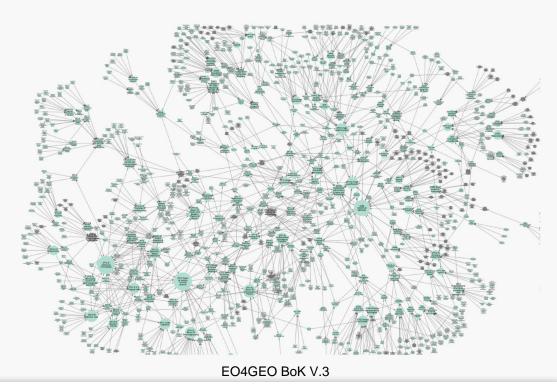




What is a Body of Knowledge (BoK)?

A formal description of a professional domain represented by a complete set of concepts in a structured way, including the theories, methods and technologies.

-> A common vocabulary for the Earth observation & geographic information (EO*GI) domain

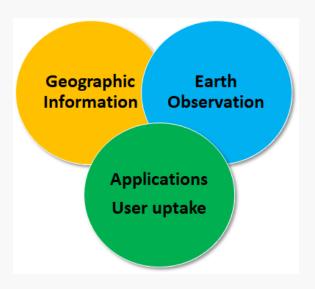






The EO4GEO Body of Knowledge

- Development
 - Builds on previous initiatives from GI
 - Addition of detailed EO part
 - Addition of market oriented perspective
- Current status
 - 381 concepts from GI
 - 520 concepts from EO, of which 71 describe
 EO services and their user communities
 - 901 concepts in total (257 fully described so far)
- Access via https://bok.eo4geo.eu/, more information on http://www.eo4geo.eu/bok/



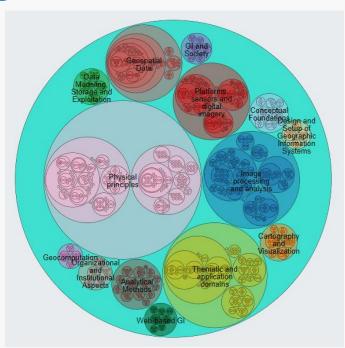
Three main knowledge areas in the EO4GEO BoK





The EO4GEO Body of Knowledge

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Version 5 of the EO4GEO BoK





Example BoK concept "Monitor the marine ecosystem"

TA13-6-1 Monitor the marine ecosystem

	Unique ID	TA13-6-1	https://bok.eo4geo.eu/TA13-6-1
	Description	what the concept is about	"EO is an efficient tool to monitor ocean waters and to complement ocean in-situ monitoring programmes"
	External resources	referenced literature, further reading	ESA (2012) Sentinel-3: ESA's Global Land and Ocean Mission Martin, S. (2004). An introduction to ocean remote sensing. []
	Skills	things you can know, learn, apply	Estimate chlorophyll-a concentration for monitoring harmful algal blooms (HAB) - Analyse ocean currents - Estimate evaporation rates - []
	[]		





Roles of skills

TA13-6-1 Monitor the marine ecosystem

Estimate near-surface chlorophyll-a concentration for monitoring harmful algal blooms (HAB)

- Skills as learning outcomes of a training action
 - Course "Satellite Oceanography" or "Ocean Remote Sensing"
- Skills as requirements in a job offer
 - Job offer "Marine EO specialist"
- Skills as task in a business process
 - Service element "Early warnings for aquaculture about harmful algal blooms"



Algae blooms in the Baltic Sea - contains modified Copernicus Sentinel data (2019), processed by ESA. CC BY-SA 3.0 IGO







Process
Outcome
Outcome
Service

Select imagery from a satellite sensor with spectral bands suitable for mapping Ocean Colour

PS1-7 Optical spectro meters

TA14-1-1-1 Ocean Colour (OC)

IP1-7-1 Atmospheric correction

Apply atmospheric correction to extract Ocean Colour from EO imagery

Apply radiative transfer modelling to retrieve inherent optical properties (IOP) from Ocean Colour reflectance values

IP3-8-2 Radiative transfer modelling

PP1-3-9 Optical properties of water

Estimate near-surface chlorophyll-a concentration for monitoring harmful algal blooms (HABs)

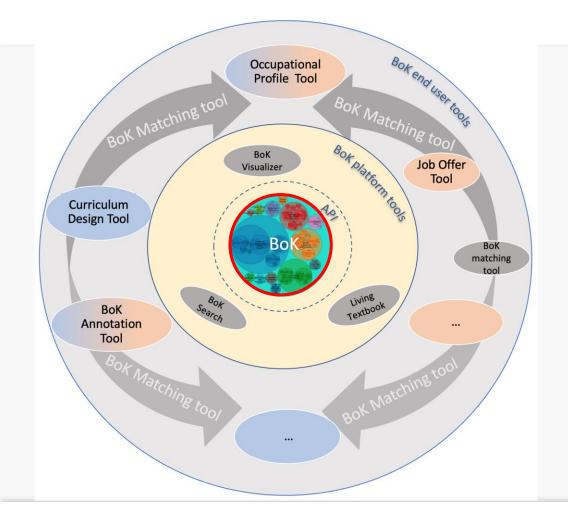
Design a map of chlorophyll-a concentration according to the requirements of HAB management for aquaculture

TA13-6-1 Monitor the marine ecosystem

TA11-1-2 Users in fishing IP3-1-1-4 Water quality variables













Editing and exploring the EO4GEO Body of Knowledge with the Living Textbook



Rob Lemmens

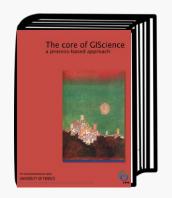


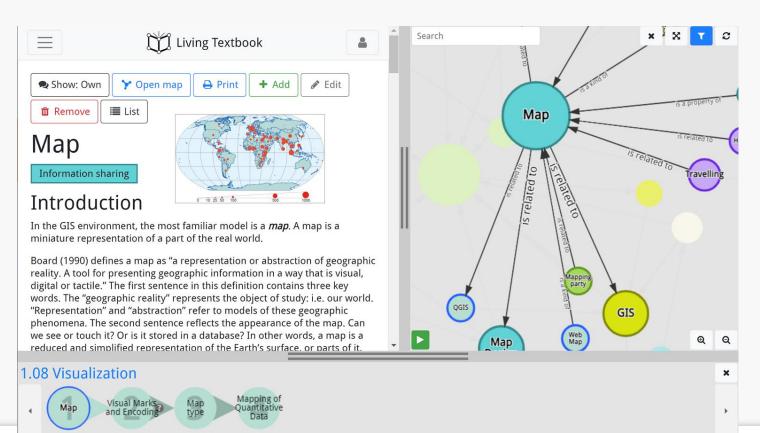
University of Twente
Faculty of Geo-Information Science and
Earth Observation (ITC)

Living Textbook – course content









Editing tool for EO4GEO BoK







[TA13-6] Monitor marine

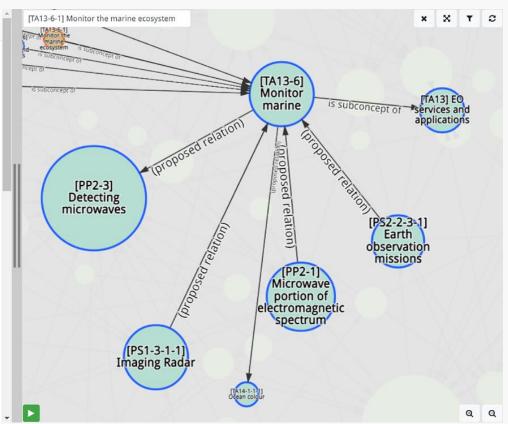
Monitoring marine inlucdes monitoring of marine safety (e.g. marine operations, oil spill combat, ship routing, defence, search & rescue, ...), marine resources (e.g. fish stock management, ...), marine and coastal environment (e.g. water quality, pollution, coastal activities, ...), and climate and seasonal forecasting (e.g. ice survey, seasonal forecasting, ...).

External resources

 European Environment Agency. (2016). Monitoring of marine waters. Retrieved from: https://www.eea.europa.eu/publications/92-9167-001-4/page024.html

Skills

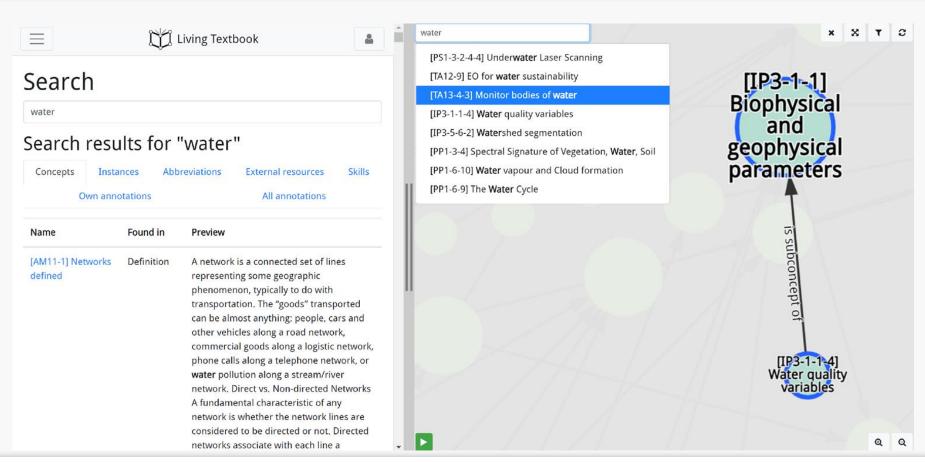
- 1727 Monitor pollution in rivers and lakes
 Monitor pollution in rivers and lakes
- 1731 Assess and monitor water quality
 Assess and monitor water quality
- 1761 Calculate the water depth in coastal areas
 Calculate the water depth in coastal areas
- 1762 Analyse the strength of a hurricane
 Analyse the strength of a hurricane
- 1763 Identify wake trailing to detect ships using EO data
 Identify wake trailing to detect ships using EO data



Concept search and text search







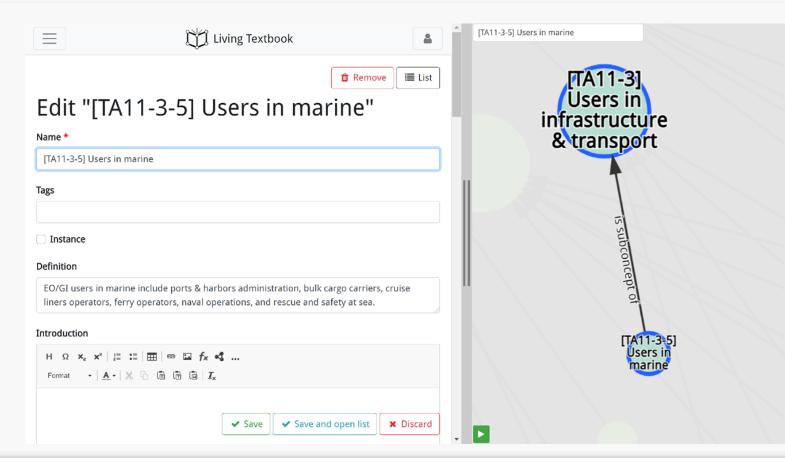
Edit concept content





X X T C

Q Q

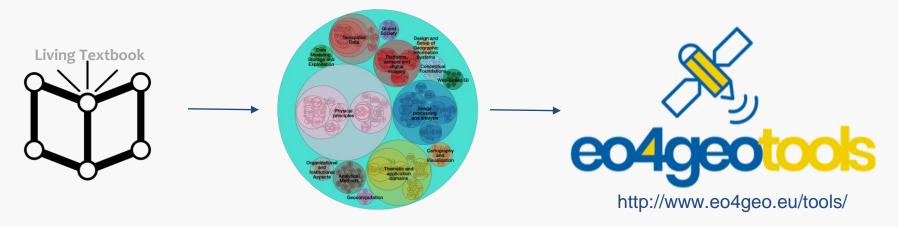






eo4geoplatform

http://bok.eo4geo.eu



Aida Monfort Muriach Geotec - Universitat Jaume I











Define **job offers** based on the **BoK**



HR offices from private companies, public institutions, or academia



Job and Training offers based on the **BoK**Explore **most demanded** Knowledge and Skills

http://www.eo4geo.eu/tools/jot

user: azores@eo4geo.eu





Job Offer

Knowledge - BoK concepts

• Skills - BoK concepts skills

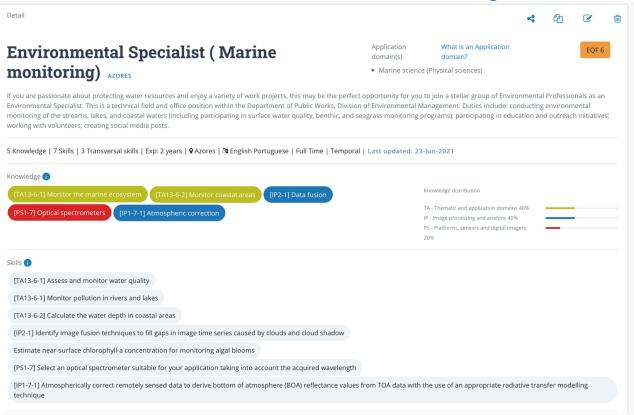
[IP2-1] Data fusion [PS1-7] Optical spectrometers [IP1-7-1] Atmospheric correction [TA13-6-1] Assess and monitor water quality [TA13-6-1] Monitor pollution in rivers and lakes [TA13-6-2] Calculate the water depth in coastal areas [IP2-1] Identify image fusion techniques to fill gaps in image time series caused by clouds and cloud shadow Estimate near-surface chlorophyll-a concentration for monitoring algal blooms [PS1-7] Select an optical spectrometer suitable for your application taking into account the acquired wavelength [IP1-7-1] Atmospherically correct remotely sensed data to derive bottom of atmosphere (BOA) reflectance values from TOA data with the use of an appropriate radiative transfer modelling technique

http://www.eo4geo.eu/tools/jot

user: azores@eo4geo.eu







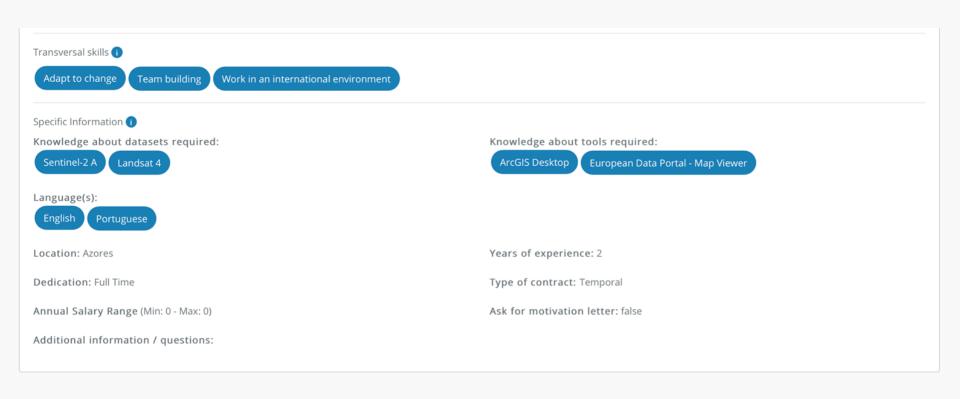
http://www.eo4geo.eu/tools/jot

user: azores@eo4geo.eu

bit.ly/jobazores







http://www.eo4geo.eu/tools/jot

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Define educational offers based on the BoK





Academia, training providers



Common vocabulary for knowledge and skills (**BoK**) Explore **most offered** Knowledge and Skills

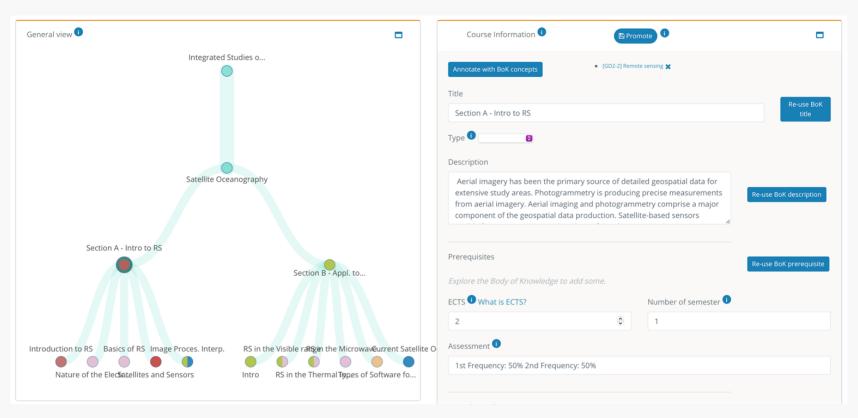
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bit.ly/cdtazores





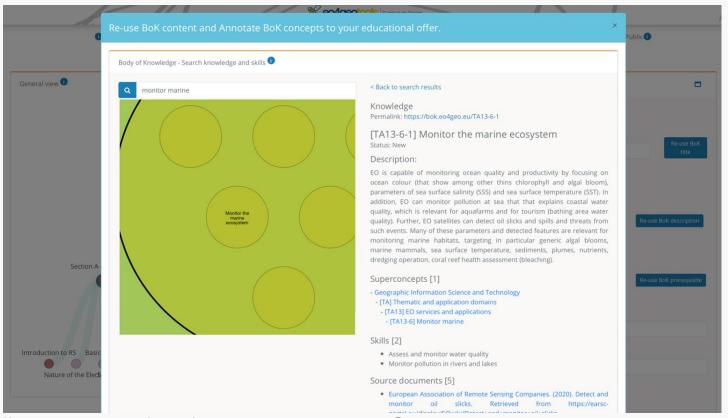


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Integrated Studies of the Ocean (MEIO) EQF: 7 Universidade Dos Açores https://uac.pt/ensino/curso.php?id=4184&l=EN&a=2020/2021&f=FCT Azores General view 1 Info 🕕 Study Program: Integrated Studies of the Ocean (MEIO) Affiliation: Universidade Dos Açores Integrated Studies o.. Study programme's generic objectives: a) To provide a level of academic training that allow the understanding and scientific scholarship in specific areas of marine sciences, demonstrative of deep level of knowledge; b) To strength the capacity to integrate knowledge and how to apply them to solve new problems and situations, often in multidisciplinary and interdisciplinary context: c) To develop theoretical and operational skills for scientific research on original themes on the marine Satellite Oceanography environment; d) To deepen the reflection on the ethical and social implications and responsibilities that result from the development of new marine scientific and technological solutions; e) To improve the scientific dissemination of marine science and technology into society, whether specialists or nonspecialists, in a clear and unambiguous way; f) To promote the learning throughout life, essentially autonomously; g) To increase the transfer of knowledge of this level of education to the business world. Section B - Appl. to ... The essential skills and knowledge that are expected to achieve with this course of study are as follows: a) Increase knowledge and general understanding of the main branches of marine sciences as biology, Section A - Intro to RS ecology, marine resources and oceanography, and their interactions; b) The high-quality training in a demanding research environment, supported by projects and teams of scientists at national and international level; c) The training methods and advanced R & D analysis techniques applied in the field and laboratory; d) Building the capacity to seek and interpret complex scientific information and conduct original research; as well as conceptualize, plan, implement and manage research scientific; Intro RS in the ThermaTypes of Software fo... e) Interact with multidisciplinary research teams; Nature of the Elecatellites and Sensors f) Find funding to carry out cutting-edge scientific research; g) Communicate ideas and scientific results to specialist and non-specialist audiences; RS in the Visible Regirethe MicrowaveCurrent Satelli... Introduction to RS Basics of RS Image Proces, Interp. h) To acquire skills in the area of entrepreneurship and self-employment.

http://www.eo4geo.eu/tools/cdt

user: azores@eo4geo.eu







Compare any **BoK annotated** resource





All types of audiences

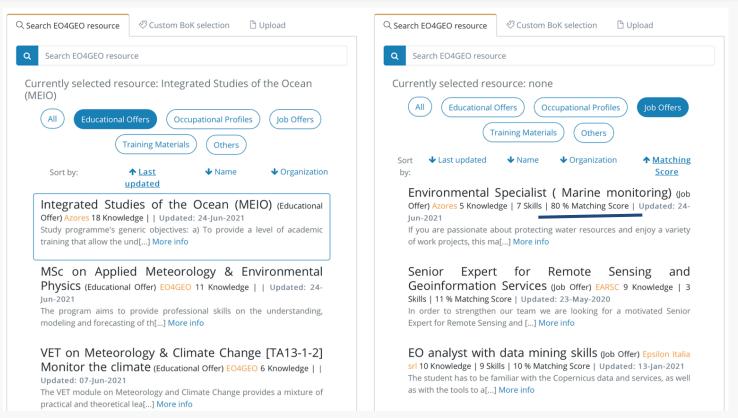


Find best matching job offers to an annotated CV **Rank** educational offers according to an occupational profile

Many more!







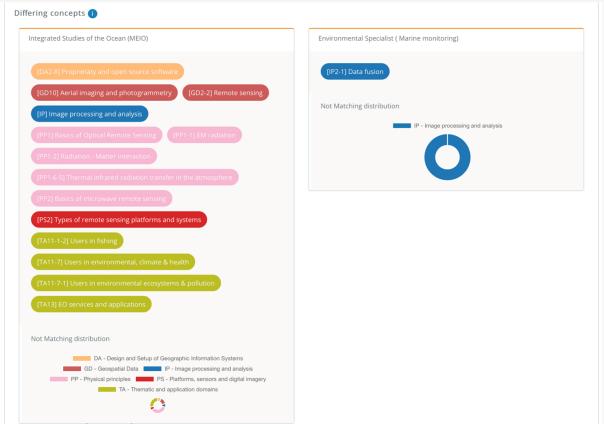
















Thanks!



Tools info: http://www.eo4geo.eu/tools

Test user: azores@eo4geo.eu







More info on the tools: http://www.eo4geo.eu/tools

Tools:

http://www.eo4geo.eu/tools/jot

http://www.eo4geo.eu/tools/cdt

http://www.eo4geo.eu/tools/bmt

user: <u>azores@eo4geo.eu</u> pwd: azores