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# TOOL FACTSHEET



## Tool name

SNAP toolbox

## Tool type

Processing and analysis of satellite images.

## Short description of the tool

The Sentinel Application Platform (SNAP) has been jointly developed by Brockmann Consultants, Array Systems Computing and C-S to combine all the Toolboxes for the Sentinel satellite programme of the European Space Agency. The basic functions include: accessing Earth Observation (EO) products; exploring the product components such as bands, masks and tie point grids; viewing and processing of a variety of remotely sensed data. Although the tool has been developed for ESA satellites, it will also work for a variety of other EO satellite missions

## Source (where/ link)

[EAS SNAP webpages](#)

## Licence cost or other type of costs (e.g. maintenance)

Free open source toolboxes for the scientific exploitation of Earth Observation missions under the Scientific Exploitation of Operational Missions (SEOM) programme.

## General requirements (technical and input data)

It does not have any specific computational requirements.

Input data are the satellite images from the European ERS-ENVISAT missions, the Sentinels-1, 2 and 3 missions and a range of non-European missions.

## Management dimension for which the tool could be used

- Policy / Management
- Environmental
- Economic / Market
- Other sectors

## Main functionality

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Site identification | <input checked="" type="checkbox"/> Modelling  |
| <input checked="" type="checkbox"/> Mapping             | <input type="checkbox"/> Stakeholder engagement  |
| <input type="checkbox"/> Economic analysis              | <input checked="" type="checkbox"/> Ecosystem services assessment                        |
| <input checked="" type="checkbox"/> Scenario analysis   | <input checked="" type="checkbox"/> Other: Extraction and analysis of the satellite data |



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### **Fields of application (i.e. issue to be solved)**

EO data processed by SNAP can be used for all aspects of the Ecosystem Approach to Aquaculture (EAA) and Marine Strategic Planning (MSP), but usually in combination with other tools. Some examples include risk and environmental impact assessment, primary production, occurrence of the algal blooms, physical oceanography (temperature, salinity, currents, wave height etc), sediment transport and coastal management (see Cristina et al., 2014, 2015 and Brigolin et al. 2017 for references).

### **Circumstances in which it can be implemented (strength and opportunities)**

SNAP is an intuitive desktop application used for visualisation, analysis and processing of EO data. Some examples are listed of useful EO data for aquaculture: 1) the resolution of Sentinel 2 with a maximum of 10 m allows for detailed mapping of the coastal zone which could make a substantial contribution to marine spatial planning (Brigolin et al. 2017); 2) the satellite data from Sentinel-2 (Multispectral Instrument) and Sentinel-3 (Ocean Land Colour Instrument) can provide valuable information about water products including total concentration of chlorophyll *a* (TChl*a*), total suspended matter (TSM), colour dissolved organic matter (CDOM) and attenuation coefficient ( $K_d(490\text{ nm})$ ) ; 3) these products are indicators of the water quality in coastal and marine environments with extensive spatial and temporal coverage, providing a good tool for monitoring and management of marine systems (Cristina et al. 2014); 4) this extensive data from EO could contribute to the implementation of EU policy such Water Framework and Marine Strategy Framework Directives (Cristina et al. 2015), amongst others.

### **Limitations**

SNAP is very slow if there is not sufficient computing power for the manipulation of high definition satellite images which have large file sizes.

### **Technical skills needed to operate the tool**

The operation of the tool SNAP software requires reasonable computing skills.

### **Background knowledge needed to implement the tool**

Users need to have knowledge about satellite remote sensing and their available “products”. However, the space agencies do provide useful information on their websites on how to access and use their “products”.



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### How can the tool contribute to the EAA

Please select the EAA steps that the tool can contribute:

1.  Scoping
2.  The identification of issues and opportunities
3.  Prioritisation of issues
4.  Objectives
5.  Management actions
6.  Monitoring

### How can the tool contribute to the MSP

Please select the MSP steps that the tool can contribute:

1.  Define goals and objectives
2.  Gather data and define current conditions
3.  Identify issues, constraints, and future conditions
4.  Develop alternative management actions
5.  Evaluate alternative management actions
6.  Monitor and evaluate management actions
7.  Refine goals, objectives and management actions

### AquaSpace case studies in which it has been implemented

**Case study name:**

Algarve Coast, PT

**Reference and link to case studies report and Masters Module:**

AquaSpace D4.2 at [www.aquaspace-h2020.eu](http://www.aquaspace-h2020.eu) Library/Reports page

Masters module unit 6 (Remote Sensing and Spatial Planning) at [www.aquaspace-h2020.eu](http://www.aquaspace-h2020.eu)  
Masters module page



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### Other bibliographic references

- Brigolin,D., Porporato, E.M D., Prioli,G., Pastres R., 2017. Making space for shellfish farming along the Adriatic coast. ICES Journal of Marine Science, 4(6), 1540–1551. <https://doi.org/10.1093/icesjms/fsx018>
- Cristina, S.C. V., Moore, G. F., Goela, P.R.F.C., Icely, J.D., Newton, A., 2014. In situ validation of MERIS marine reflectance off the southwest Iberian Peninsula: assessment of vicarious adjustment and corrections for near-land adjacency. International Journal of Remote Sensing, 35(6), 2347-2377. <http://www.tandfonline.com/doi/abs/10.1080/01431161.2014.894657>
- Cristina, S., Icely, J., Goela, P.C., DeValls, T.A., Newton, A. (2015). Using remote sensing as a support to the implementation of the European Marine Strategy Framework Directive in SW Portugal, Continental Shelf Research, 108, 169-177.

STEP, 2017. Science Toolbox explanation platform. <http://step.esa.int/main/toolboxes/snap/> Accessed on 9<sup>th</sup> November 2017.

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