



BEYOND

Building a Centre of Excellence
for EO-based monitoring of Natural Disasters



Alexia Tsouni

Floods monitoring at national scale - FloodHUB service

Institute for Astronomy & Astrophysics, Space Applications and Remote Sensing
National Observatory of Athens
Greece

BEYOND's Floods Observatory for Greece & South-Eastern Europe

We register major flood events and we publish the flood mapping results produced following the processing and photo-interpretation of satellite Optical and SAR images.

FLOODS OBSERVATORY / ΠΑΡΑΤΗΡΗΤΗΡΙΟ ΠΛΗΜΜΥΡΩΝ

WITHIN THE FRAMEWORK OF THE BEYOND PROJECT SINCE JUNE 2013 / ΣΤΟ ΠΛΑΙΣΙΟ ΤΟΥ ΠΡΟΓΡΑΜΜΑΤΟΣ BEYOND ΑΠΟ ΤΟΝ ΙΟΥΝΙΟ ΤΟΥ 2013

Date	Location
2014/04/21	Lom
2014/06/20	Varna
2014/06/22	Bosnia
2014/06/22	Serbia
2014/06/22	Croatia
2014/06/02	Istanbul
2013/11/14	Spetses
2013/12/02	Argos
2013/11/22	Rhodes
2013/12/02	Kiato
2013/12/02	Korinthos
2013/12/02	Sparta
2013/12/02	Kyparissia
2013/11/25	Rhodes
2013/11/24	Attica
2013/11/14	Argolis
2013/11/11	Attica

Bosnia and Herzegovina Flood - May 22, 2014





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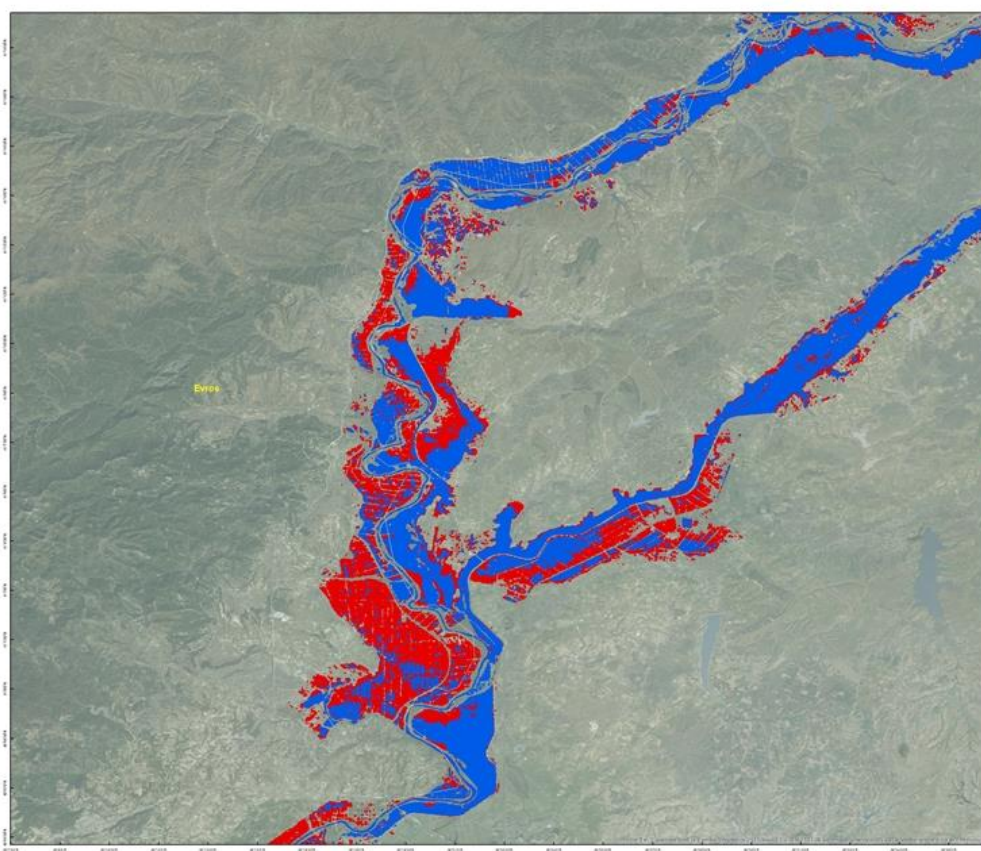
**BEYOND's
Floods
Observatory
for Greece &
South-Eastern
Europe**

**Case study:
Floods in
Greece, Evros
10/02/2015**



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Floods Observatory



**Soufli Area, Greece
Flood Extent Map, 10/02/2015**
Production date: 02/05/2016



Cartographic Information

1:175.000
0 25 50 Kilometers

Grid: WGS 1984 Coordinate System

Legend

- Administrative Boundaries
- Pre-flood extent: 29/01/2015
- Post-flood extent: 02/10/2015

Map Information

The map has been produced by the BEYOND Centre of Excellence. The purpose of the current product is to map the flood extent of the flood event occurred on 10/02/2015 in the area of Soufli.

Data Sources

Inset map based on: ESRI World Imagery Basemap
Processed Imagery: Sentinel 1 SAR images acquired on 29/01/2015 and 10/02/2015. Vector layer: Administrative boundaries from GADM (Global Administrative Areas) database.

Map Production

The map shows the water extent before and after the flood event that occurred in the area of Soufli on 10/02/2015. The pre-flood and post-flood Sentinel 1 SAR GRDH images have been used for the production of the current map. Image processing was done using ESA SNAP v3.0 toolbox. The steps followed were: 1. Radiometric calibration, 2. Speckle noise filtering, 3. Terrain correction, 4. Application of Dem, Permanent water and LULC masks, 5. K-means clustering, 6. Photointerpretation

Dissemination/Publication

The product is available through the BEYOND website at the following URL: <http://beyond-eo-center.eu/index.php/floods>

Framework

The map, elaborated in the framework of the BEYOND project, is realised to the best of our ability. All geographic information has limitations due to scale, resolution and date of original data sources.

Contact

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BEYOND funded under: FP7-REGPOT-2012-2013-1





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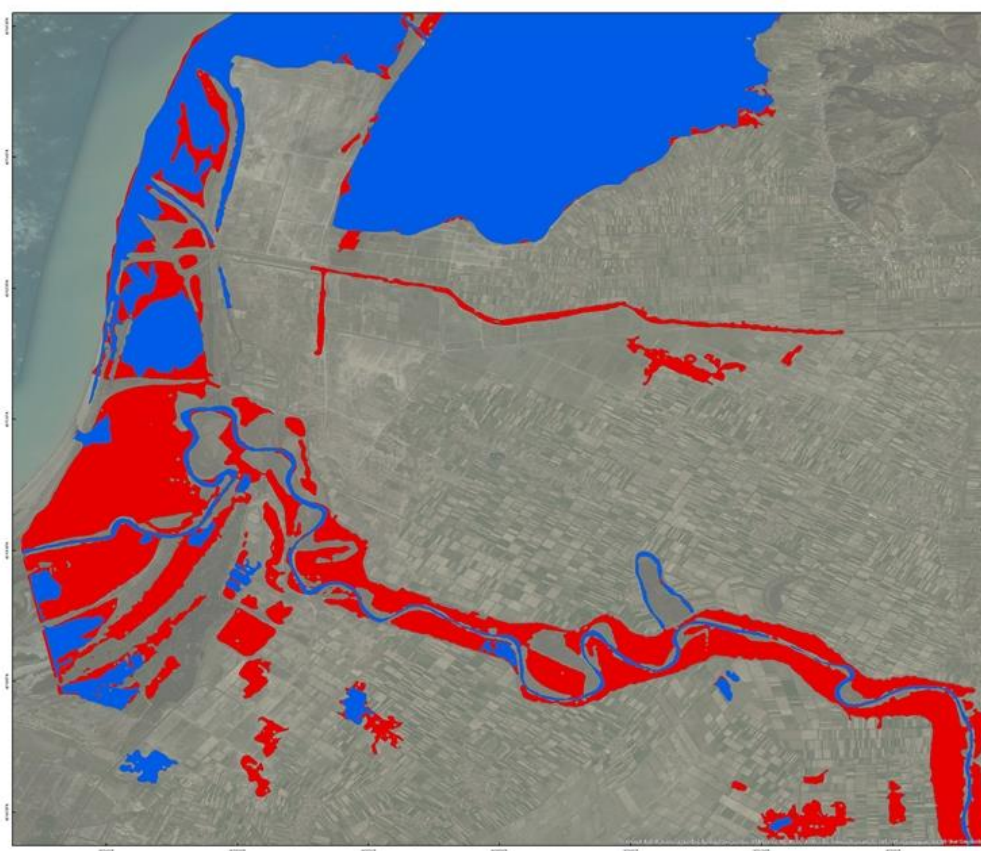
**BEYOND's
Floods
Observatory
for Greece &
South-Eastern
Europe**

**Case study:
Floods in
Albania
02/02/2015**



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Floods Observatory



**Central & South Albania
Flood Extent Map, 02/02/2015**
Production date: 30/04/2016



Cartographic Information

1:70,000
0 7.5 15 Kilometers
Grid: WGS 1984 Coordinate System

Legend

- Administrative Boundaries
- Pre-flood extent: 21/01/2015
- Post-flood extent: 02/02/2015

Map Information

The map has been produced by the BEYOND Centre of Excellence. The purpose of the current product is to map the flood extent of the flood event occurred on 02/02/2015 in the Central and Southern areas of Albania.

Data Sources

Inset map based on: ESRI World Imagery Basemap
Processed Imagery: Sentinel 1 SAR images acquired on 21/01/2015 and 02/02/2015. Vector layer: Administrative boundaries from GADM (Global Administrative Areas) database.

Map Production

The map shows the water extent before and after the flood event that occurred in areas of Central and South Albania i on 02/02/2015. The pre-flood and post-flood Sentinel 1 SAR GRDH images have been used for the production of the current map. Image processing was done using ESA SNAP v1.0 toolbox. The steps followed were: 1. Radiometric calibration, 2. Speckle noise filtering, 3. Terrain correction, 4. Application of Dem, Permanent water and LULC masks, 5. K-means clustering, 6. Photointerpretation

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FloodHub: BEYOND's Floods Monitoring Service Overview

We monitor all the flood events in Arachthos & Acheloos river basins and we publish the flood mapping results produced following the processing of Sentinel-1 SLC images of IW swath mode from the Hellenic National Sentinel Data Mirror Site (the first fully automated process).

Legend

- FOOTPRINTS
- FLOODED_AREAS
- PWATER_AREAS
- DRAINAGE_BASINS

Overlays

- Toponyms
- CLC 2000

Base maps

- BingMaps

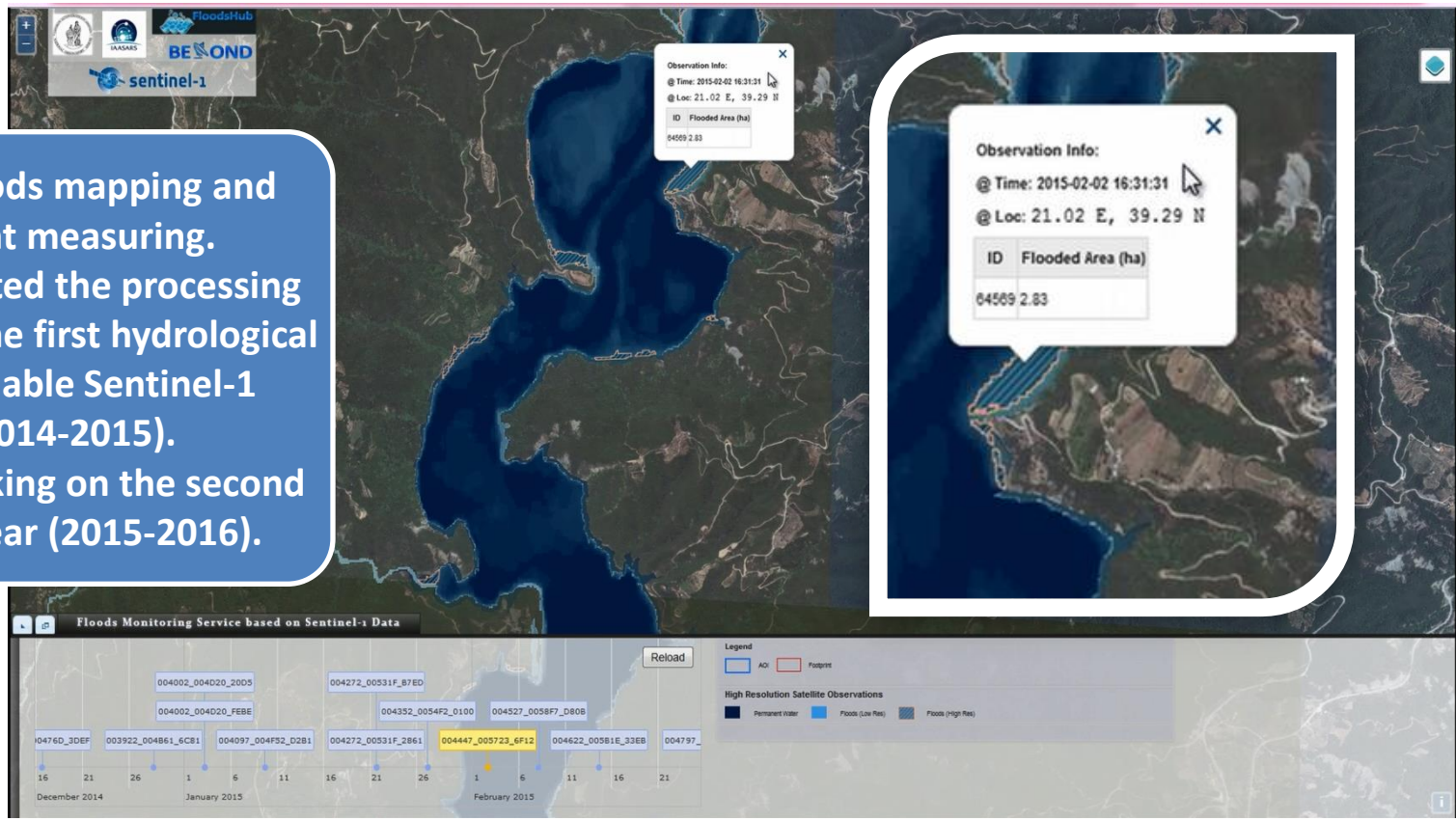
High Resolution Satellite Observations

- Permanent water
- Floods (Low Res)
- Floods (High Res)

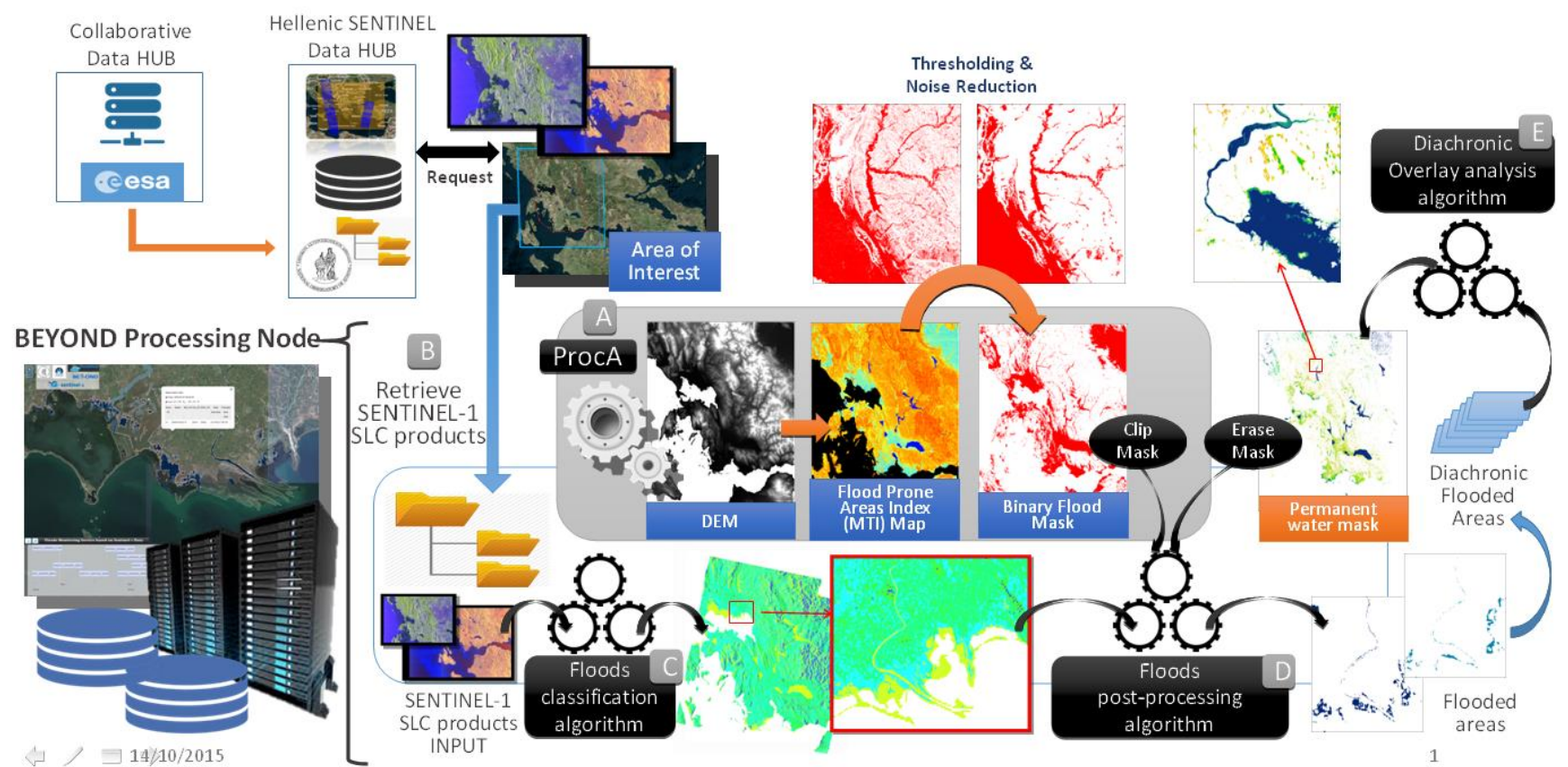
ID	Date	Status
003922_004861_6CB1	2014-01-01	Completed
004272_00531F_87ED	2014-01-01	Completed
004447_005723_6F12	2014-01-01	Completed
005147_006	2014-01-01	Completed
004002_004D20_20D5	2014-01-01	Completed
004002_004D20_FEBE	2014-01-01	Completed
004272_00531F_2861	2014-01-01	Completed
004527_0058F7_0B08	2014-01-01	Completed
004797_005F60_F313	2014-01-01	Completed
005052_00657E_8203	2014-01-01	Completed
004099_004FS2_02B1	2014-01-01	Completed
004352_0054F2_0100	2014-01-01	Completed
004622_005B1E_33E8	2014-01-01	Completed
004972_00638F_34E7	2014-01-01	Completed
005147_006	2014-01-01	Completed

FloodHub: BEYOND's Floods Monitoring Service Detail

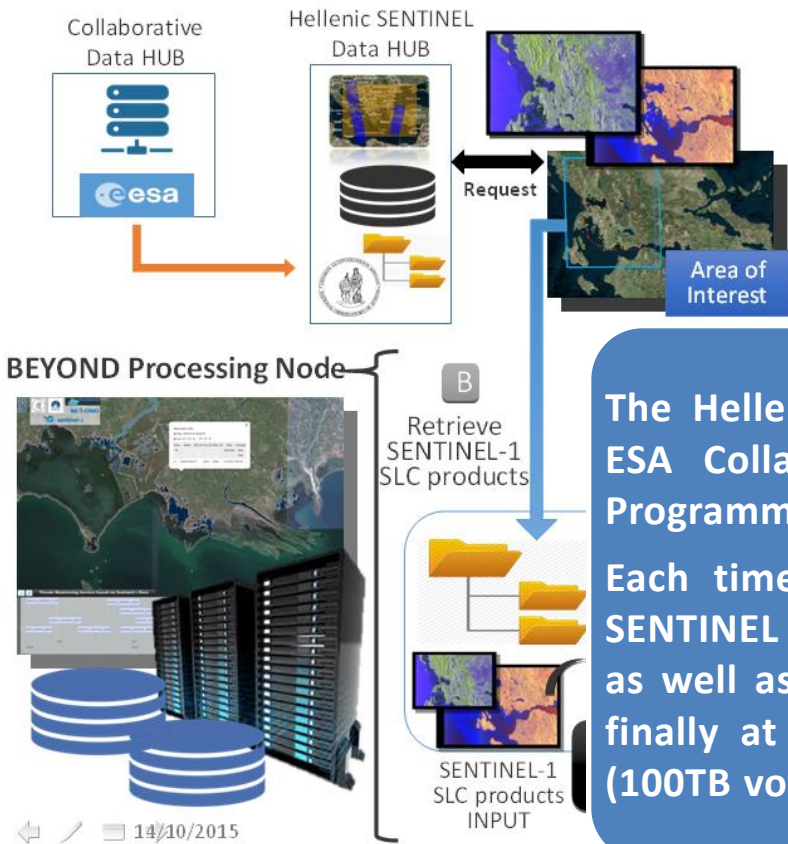
We provide floods mapping and floods extent measuring.
 We have completed the processing and analysis for the first hydrological year with available Sentinel-1 images (2014-2015).
 We are now working on the second hydrological year (2015-2016).



FloodHub: BEYOND's Floods Monitoring Service Architecture



FloodHub: BEYOND's Floods Monitoring Service Architecture



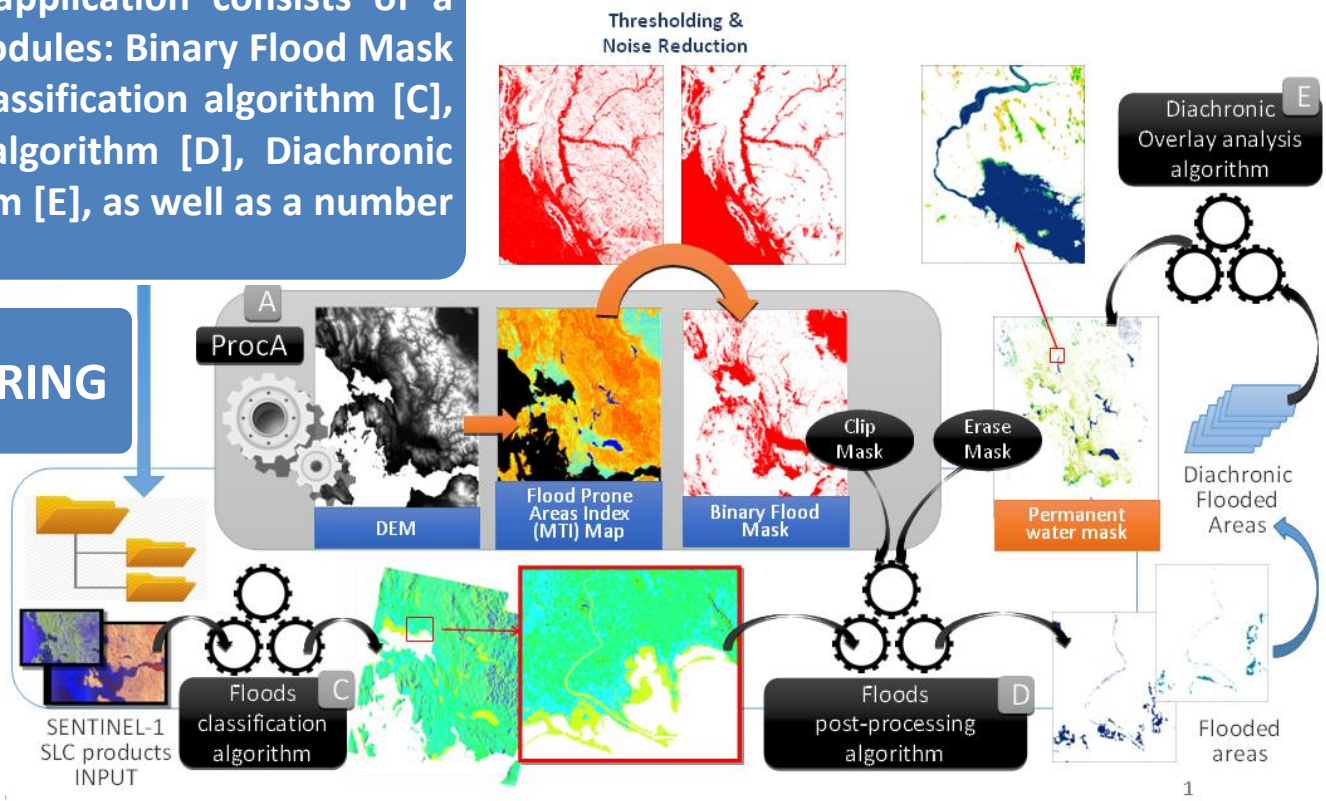
DATA RETRIEVAL

The Hellenic SENTINEL Data HUB continuously monitors the ESA Collaborative Data HUB via a dedicated Application Programming Interface (API). Each time a SENTINEL acquisition is available the Hellenic SENTINEL Data HUB extracts and stores the relevant metadata as well as the acquisition raw data first at a short-term and finally at a local (NOA premises) long-term storage archive (100TB volume).

FloodHub: BEYOND's Floods Monitoring Service Architecture

The floods monitoring application consists of a number of processing modules: Binary Flood Mask extraction [A], Floods classification algorithm [C], Floods post-processing algorithm [D], Diachronic Overlay analysis algorithm [E], as well as a number of input data layers.

FLOODS MONITORING





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