



HarmonIA

Harmonization and Networking for
contaminant assessment in the Ionian and
Adriatic Seas

Deliverable T3.2.2 - GIS layers with contaminants probability density

Work Package T3

Case Study of Contaminant Dispersion

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October 2019

How to cite: D. Ivankovic, I. Vucic (IOF, Croatia), M. Lipizer, M.E. Molina Jack, D. Canu (OGS, Italy), G. Giorgi (ISPRA, Italy), S. Papazisimou (RWG Greece), C. Zeri (HCMR, Greece), A. Castelli (IMB/EPA, Montenegro), B. Cermelj (NIB, Slovenia), V. Vaniček (CHA, Croatia)
2020 WPT3 HarmonIA Deliverable T3.2.2 - GIS layers with contaminant probability density

doi: 10.6092/b75f4798-36c0-4334-bb2c-120d2e7a1c34

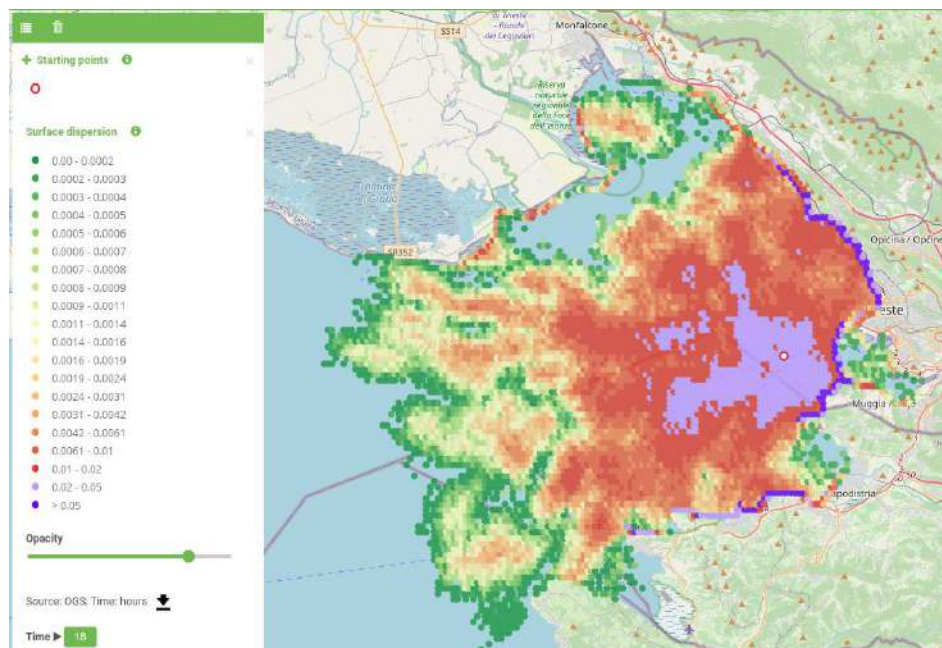


1. Introduction

Deliverable description: Probability density maps of contaminant distribution on target areas. The maps are based on the results of D. T.3.1.2.

Probability density maps of oil distribution from spills occurring from selected releasing points have been obtained from the oil spill model simulations. Releasing (starting) points were chosen in coordination with stakeholders and partners, and they represent, for each case study area, points with higher probability of oil spill accident.

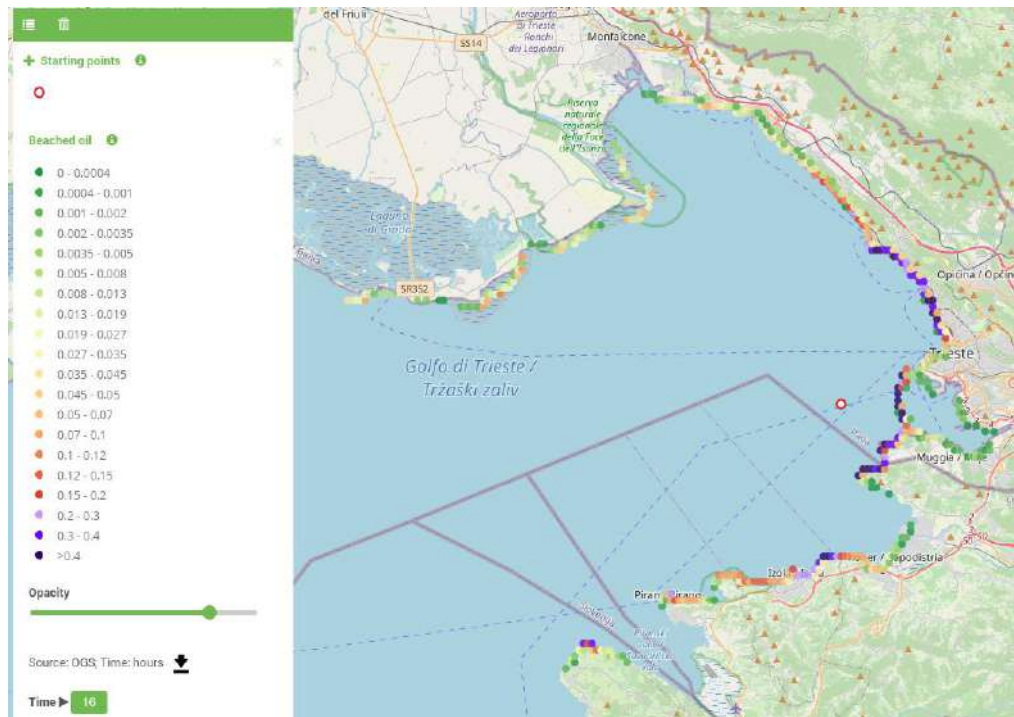
Each map represents the 10-days evolution of an oil spill for the surface oil, for the beached oil and for oil dispersed in water column. We assumed an equal probability of occurrence of an oil spill event for each day of the year and for each of the release areas. To obtain oil drift statistics representative of different weather conditions, we performed an ensemble of 365 simulations for each release point, each driven by a slightly different (1 day shifted) circulation field extracted from the 1-year period, and each tracking oil spill trajectory and transformation for 10 days.



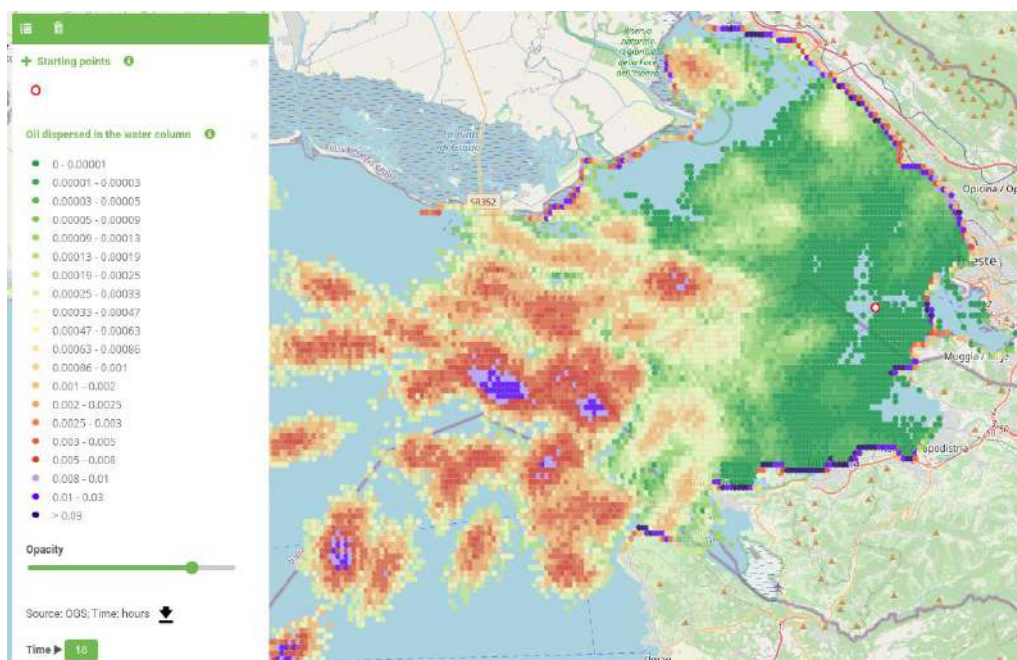
Surface dispersion after 18 hours for Trieste case study area



T3.2.2 GIS layers with contaminants probability density



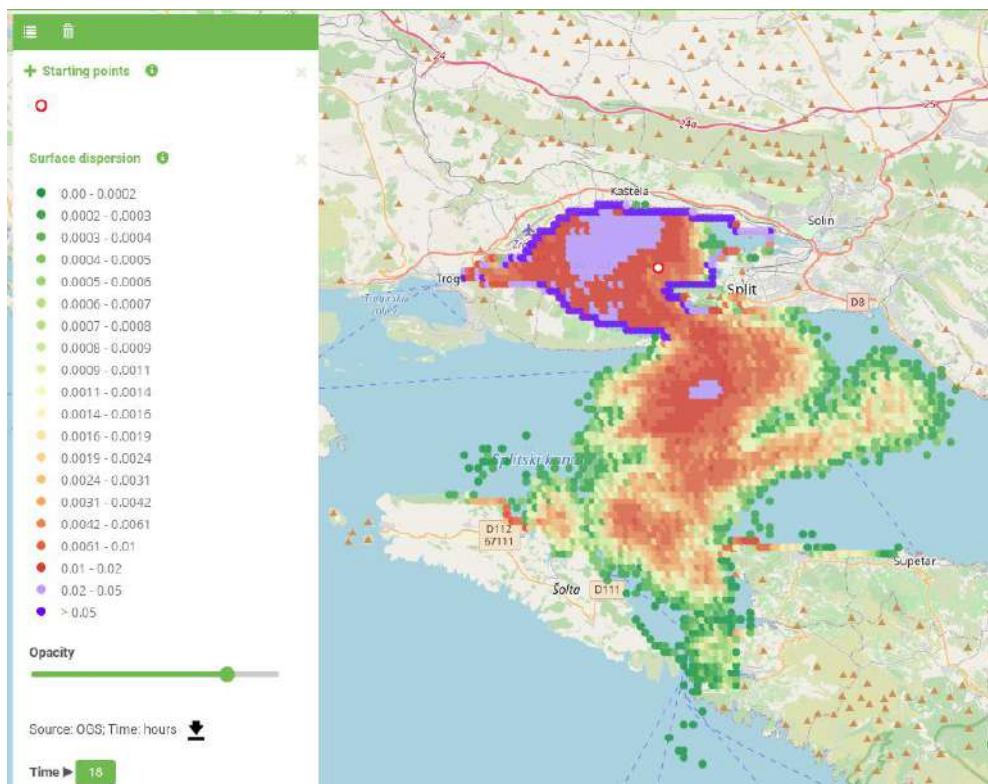
Beached oil after 18 hours for Trieste case study area



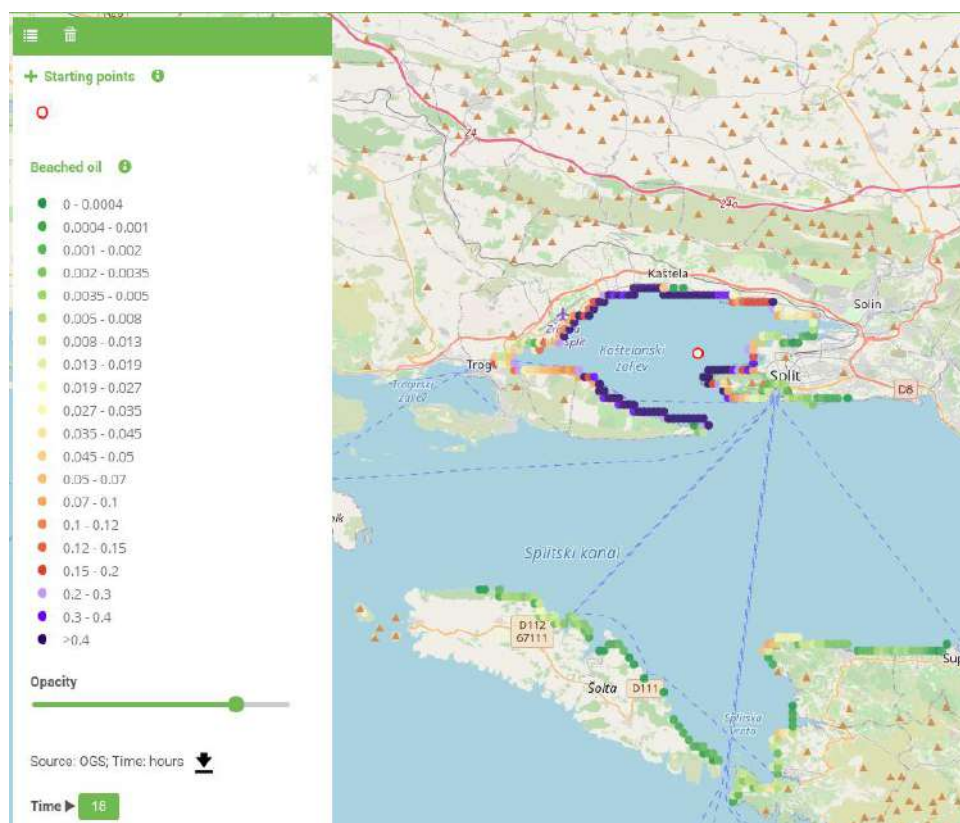
Oil dispersed in water column after 18 hours for Trieste case study area



T3.2.2 GIS layers with contaminants probability density



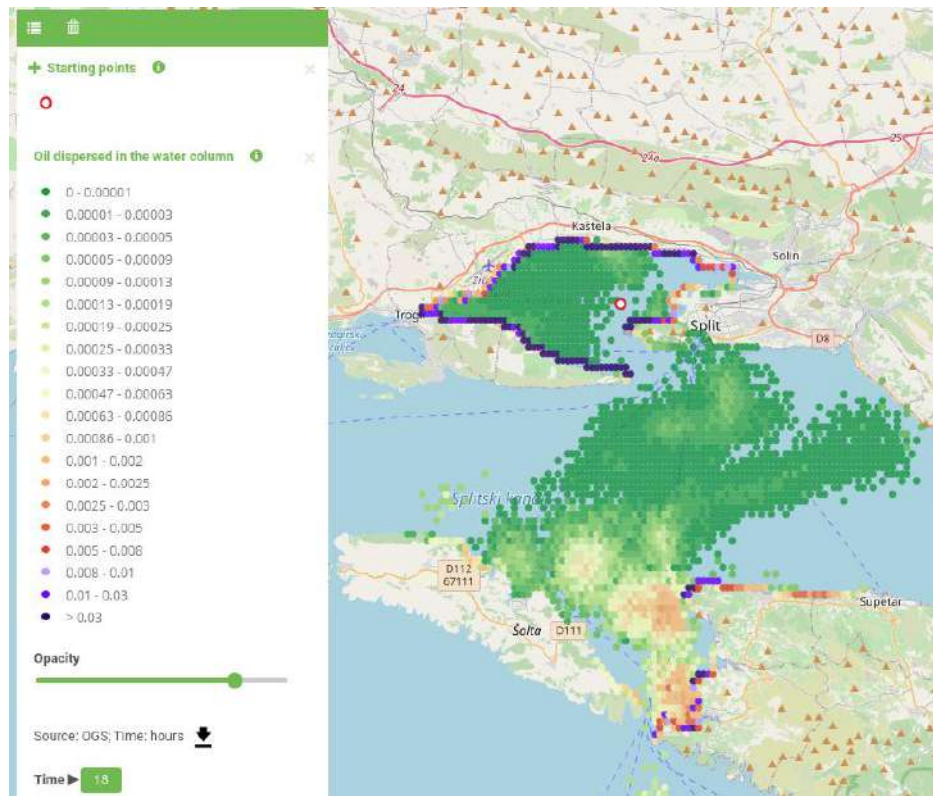
Surface dispersion after 18 hours for Split case study area



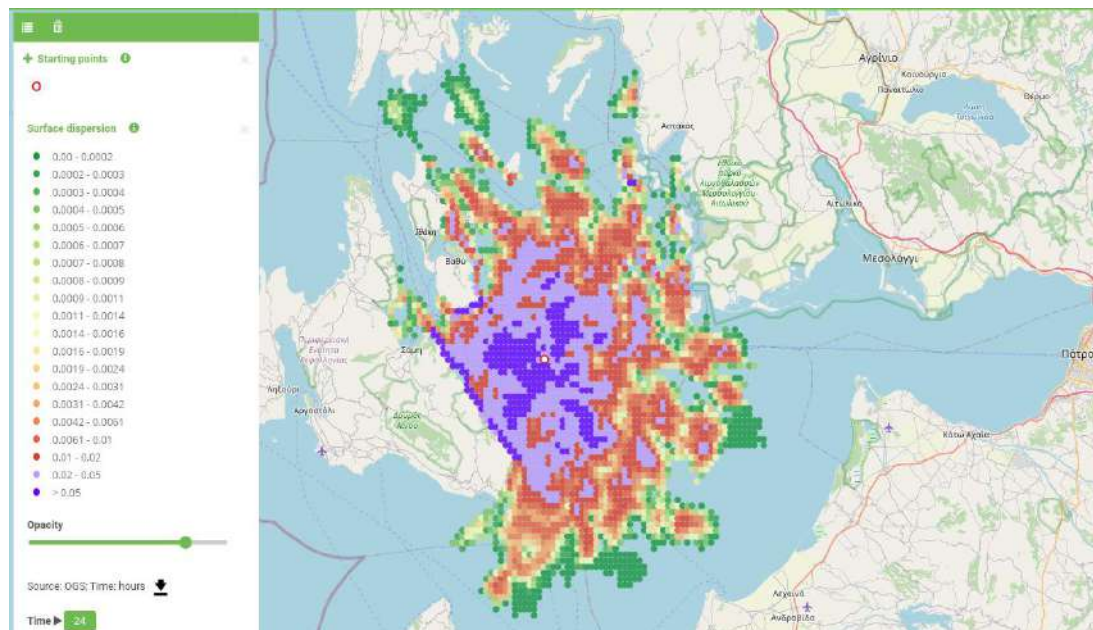
Beached oil after 18 hours for Split case study area



T3.2.2 GIS layers with contaminants probability density



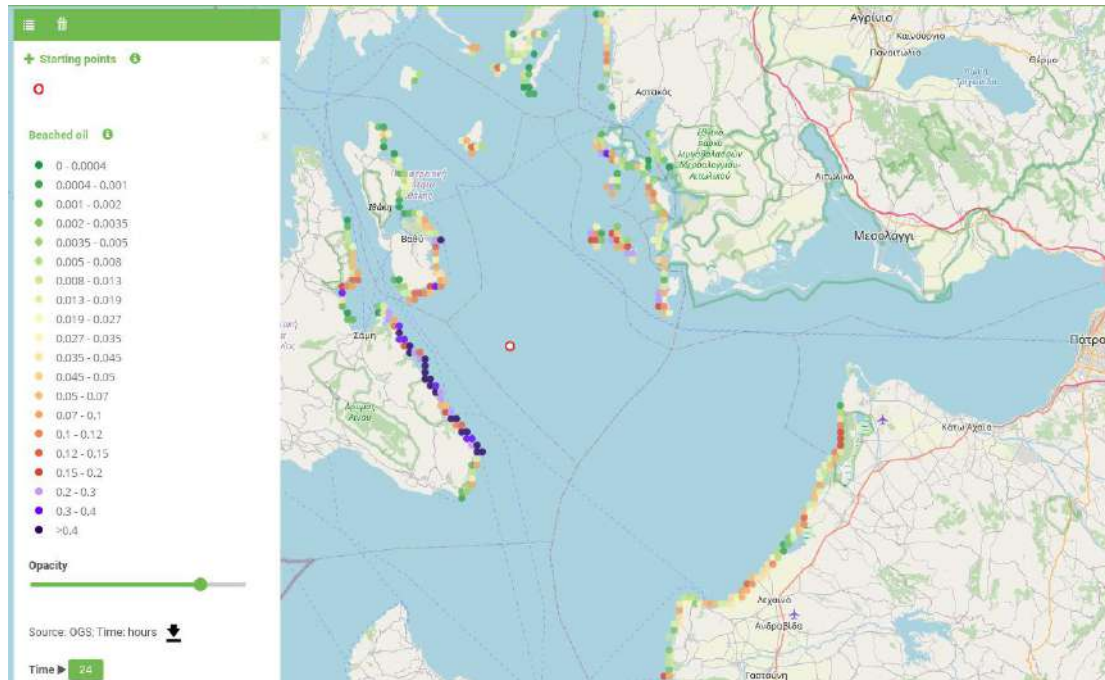
Oil dispersed in water column after 18 hours for Trieste case study area



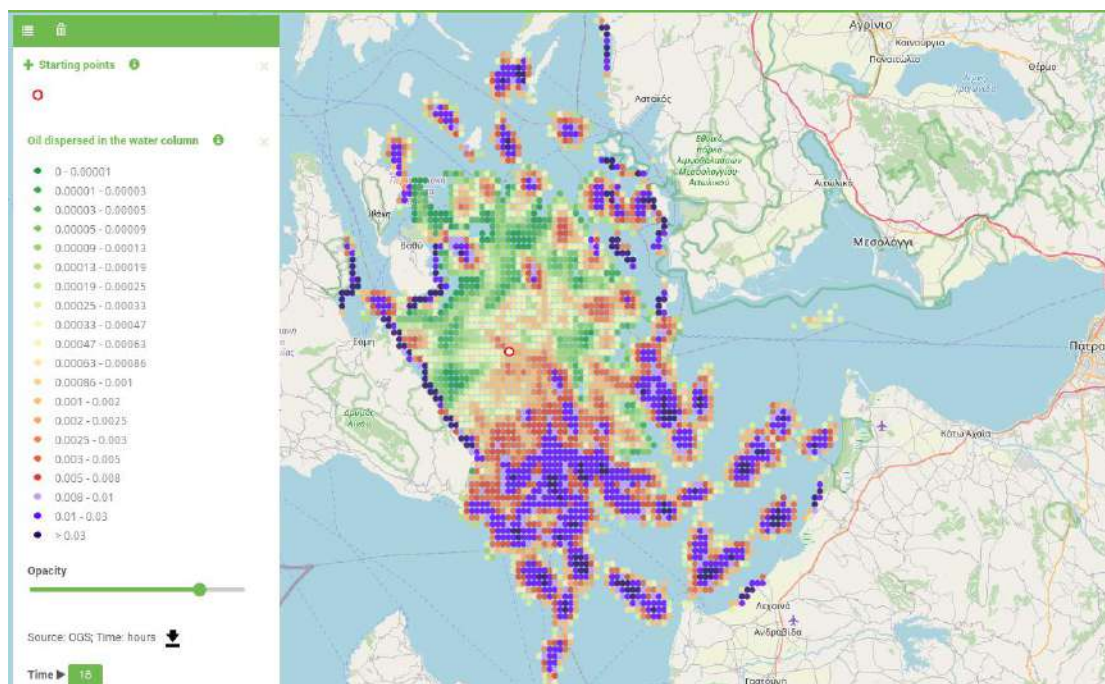
Surface dispersion after 24 hours for Patras case study area



T3.2.2 GIS layers with contaminants probability density



Beached oil after 24 hours for Patras case study area

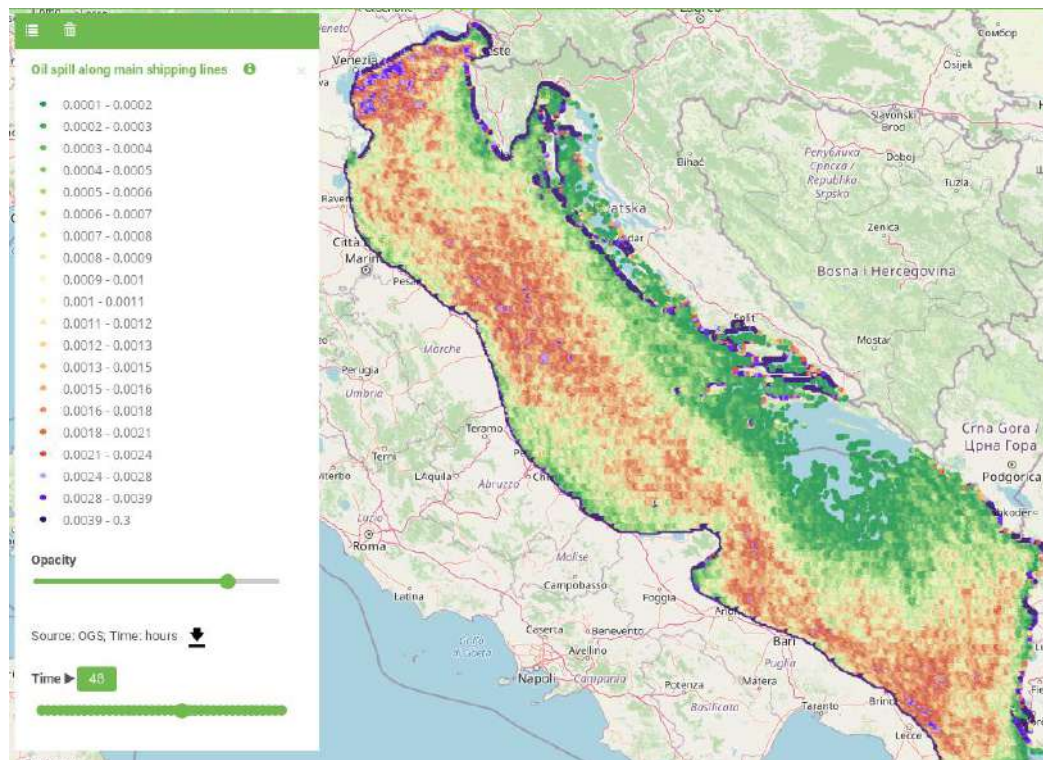


Oil dispersed in water column after 24 hours for Patras case study area

A simulation of oil spill along the main shipping routes is modeled, setting a spill probability modulated by the traffic density. The results will therefore depend on the combined contribute of the oil spill occurrence, of its probability, and by the oil behaviour in the sea, which is determined by the



marine circulation and by the oil transformations. The results give hourly layers of surface, dispersed and beached oil, for ten days after the oil release. The results represent therefore, for each point of the Adriatic Sea basin, probability (hazard) of oil spill from the main traffic routes.



Results from oil spill modelling with source of pollution along main shipping lines (surface oil 48 hours after the spill)

After revising all of the collected layers, and according to deliverable definition, we decided to use certain layers for making probability density maps. Main criteria was that all of the layers that we choose have to have the coverage of all Adriatic-Ionian region. Also, it had to be as detailed as possible in targeted areas. Some of the layers couldn't meet the requirements, so we took the opportunity of project workshop that took place in Split in February of 2019. to contact some of the Stakeholders. After the contact that we had with Croatian Hydrocarbon Agency, we found out that, apart from platform location, there is no other publicly available layers. So the main source for the layers on carbon exploration and traffic density is EMODnet Human Activities site.

<https://www.emodnet-humanactivities.eu/>

All layers are visible on HarmoNIA GeoPortal

<http://jadran.izor.hr/harmonia/>

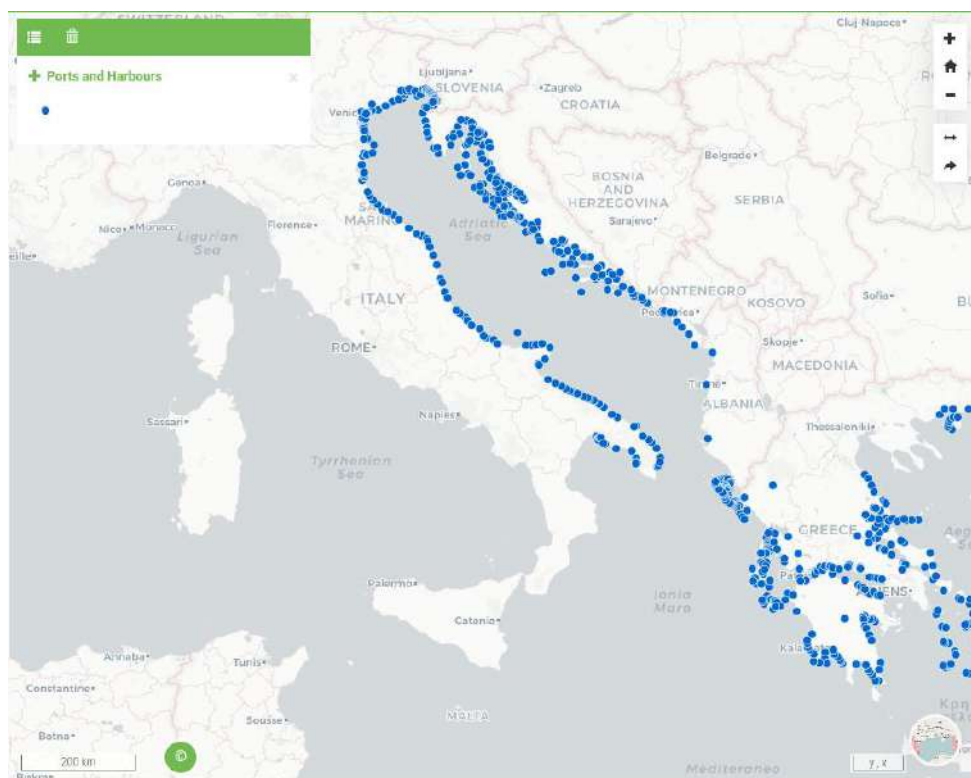
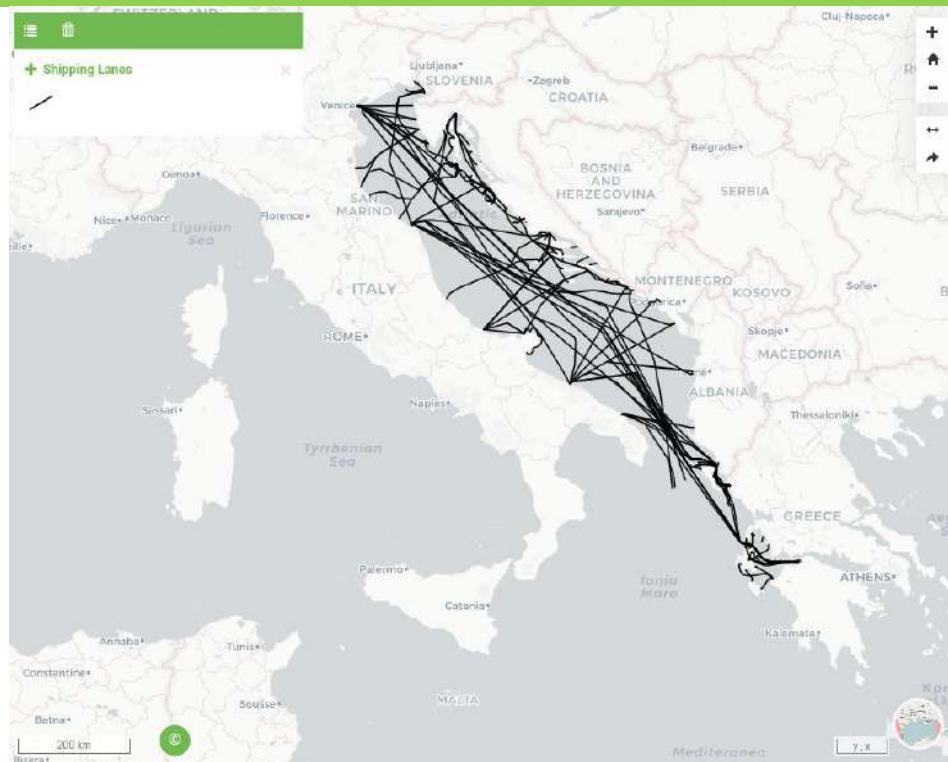


2. List of layers

- Shipping lanes
 - Combination of HAZARD layer and layers received from project partners. Used as indicator of possible contamination caused by marine traffic. Good coverage of the whole Adriatic-Ionian region.
- Ports and Harbours
 - HAZADR layer describing big and small ports. Used as indicator of socio-economic activity at the coast. Good coverage except for Albania.
- Hydrocarbon extraction - offshore installations
 - Data extracted from EMODnet layers of Offshore Installations available through EMODnet Human Activities. Good coverage of the whole Adriatic-Ionian region.
- Vessel Density 2017 avg
 - Data extracted from EMODnet layer Vessel Density available through EMODnet Human Activities. Showing average vessel density for all type of vessels for year 2017. Good coverage of the whole Adriatic-Ionian region.
- Oil exploration blocks in west Greece
 - Layer provided from Region West Greece describing areas with concessions for oil exploration. Possible source of pollution in the future.

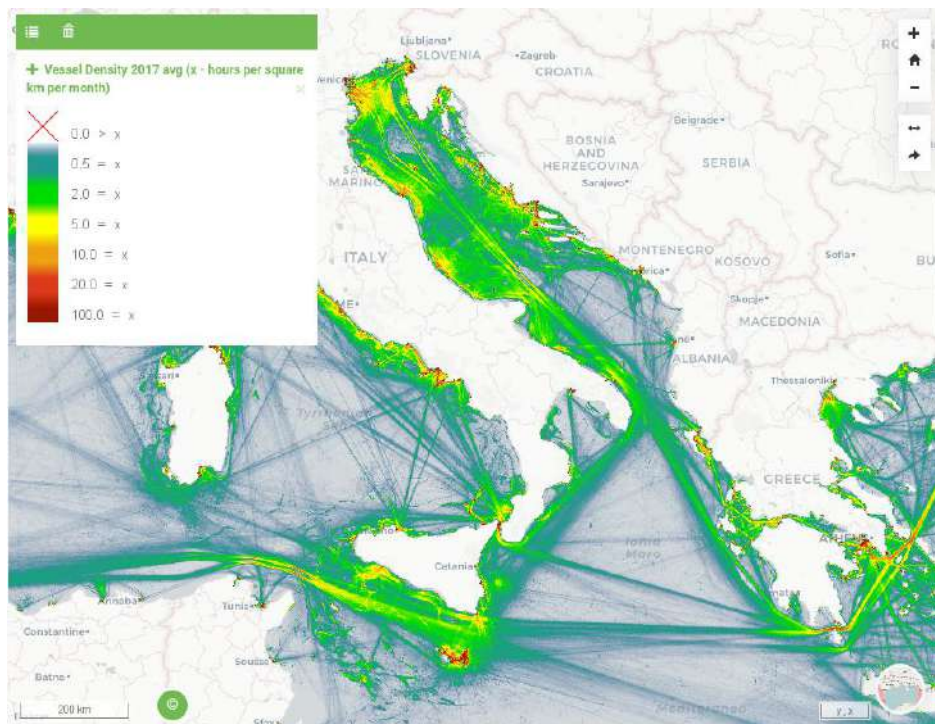
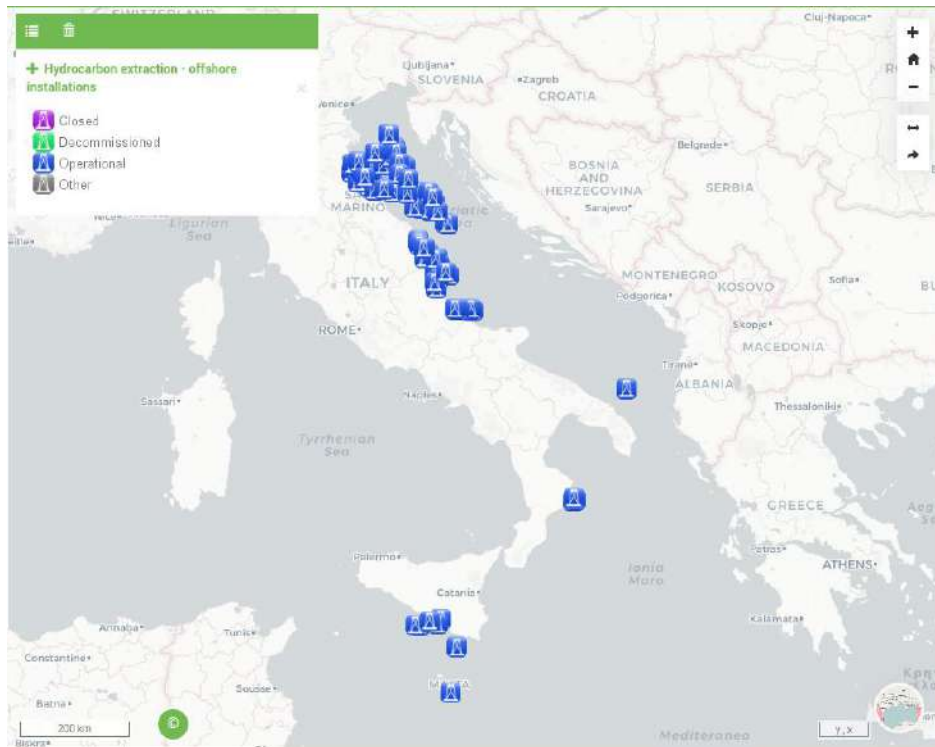


3. Adrion region



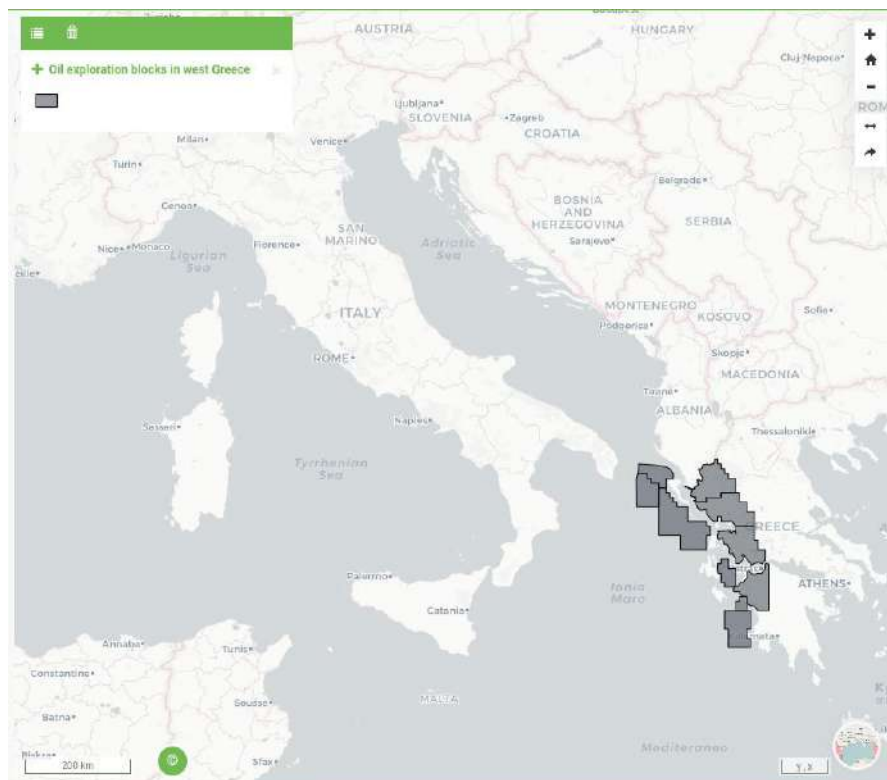


T3.2.2 GIS layers with contaminants probability density



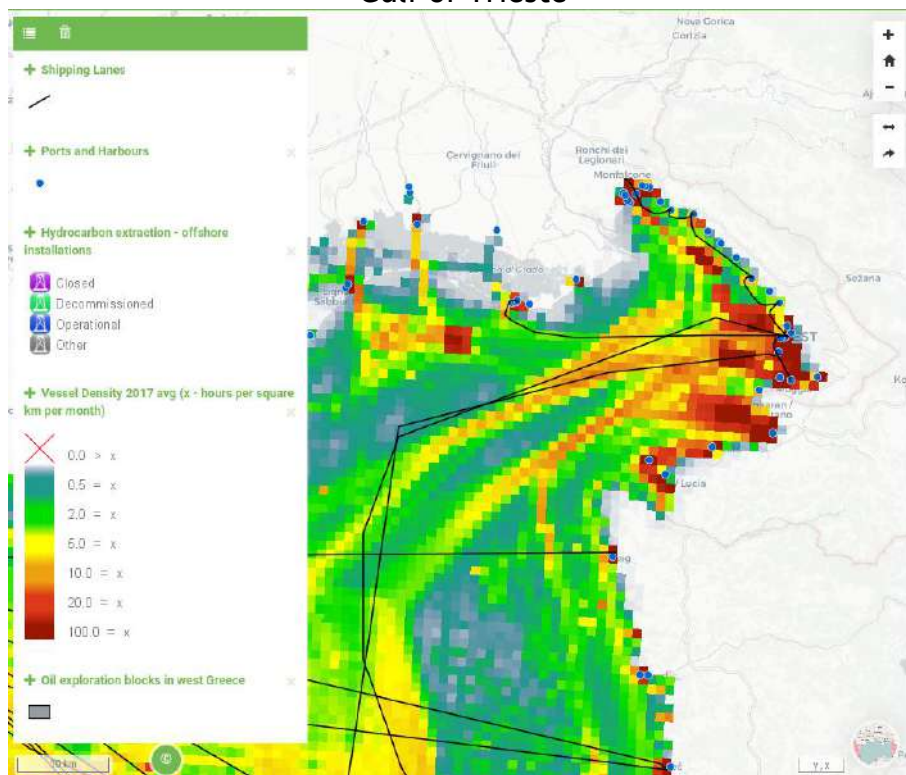


T3.2.2 GIS layers with contaminants probability density



4. Case study areas

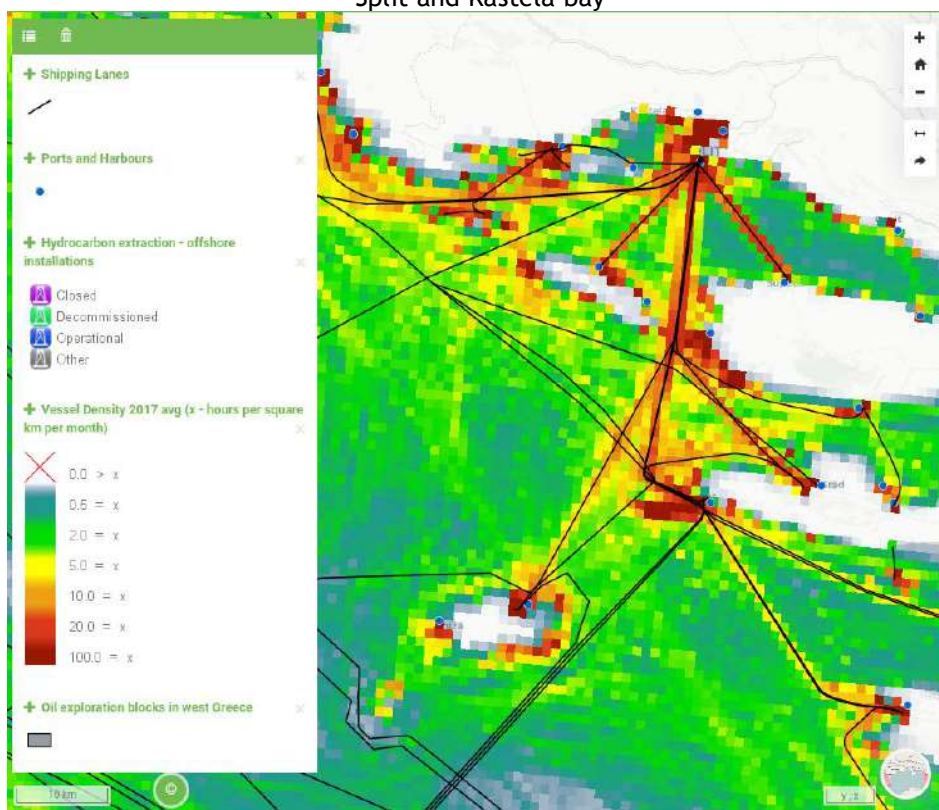
Gulf of Trieste





T3.2.2 GIS layers with contaminants probability density

Split and Kaštela bay



Patras region

