An automatic oil spill detection and early warning system in the Southeastern Mediterranean Sea

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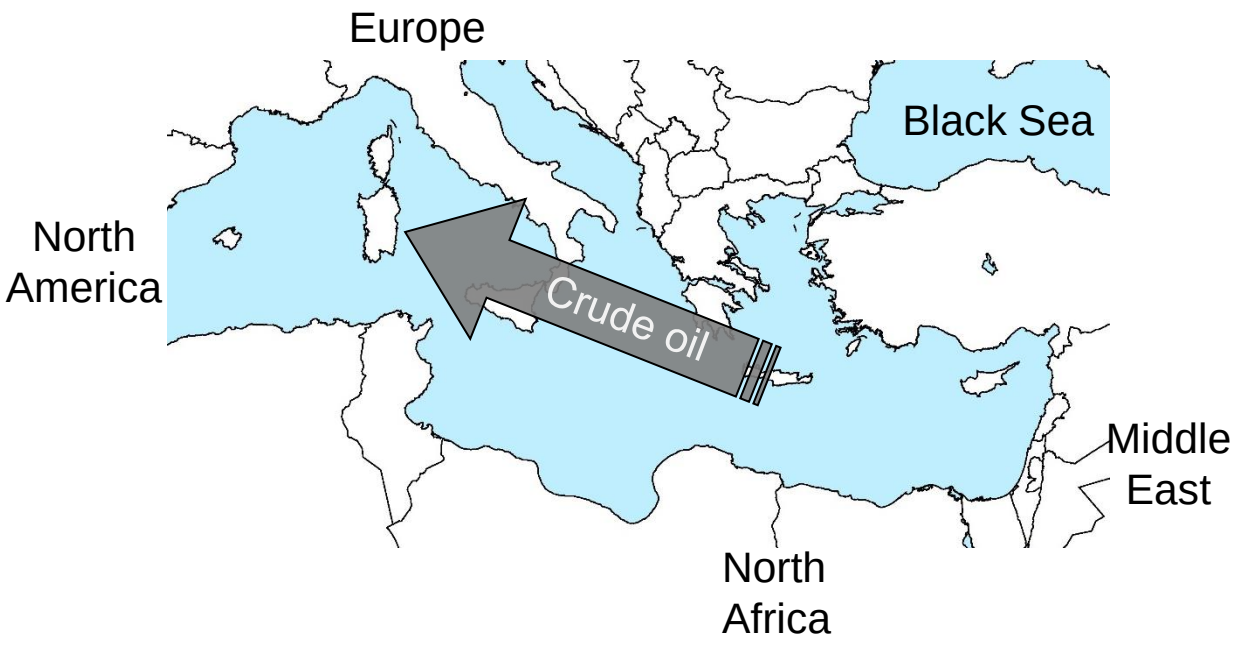
Southeastern Mediterranean Sea

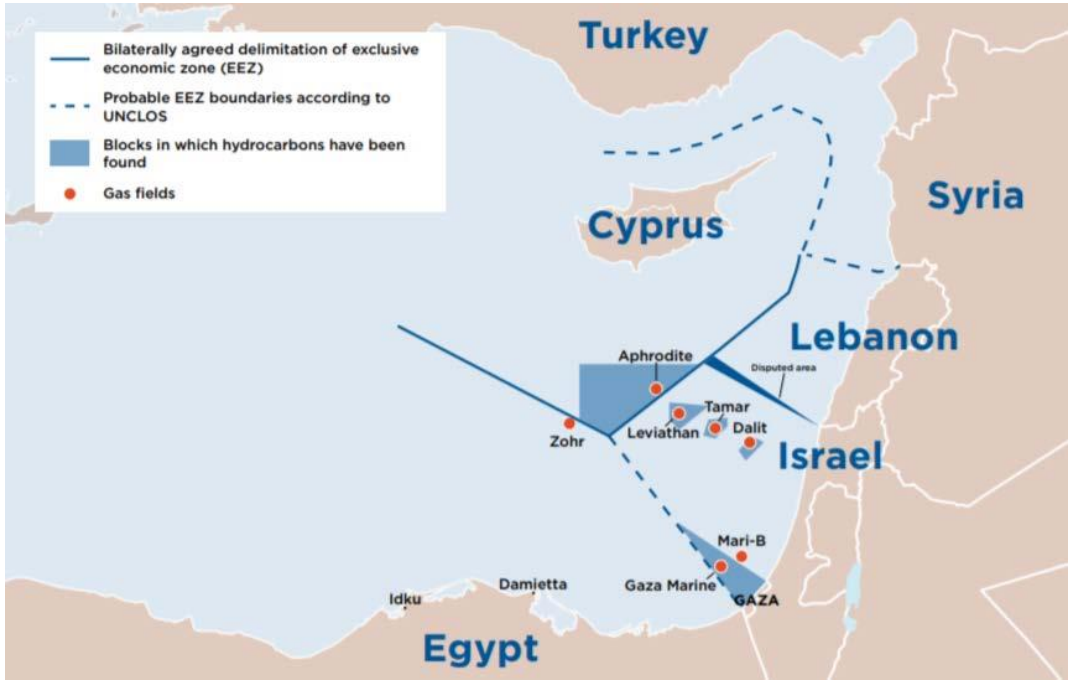
High Marine Traffic

- Shortest shipping route from Asia to Europe
- Oil transit center



Discoveries of large gas fields in 2010

- Increasing number of offshore oil and gas exploration and exploitation activities



(European Parliamentary Research Service, 2019)

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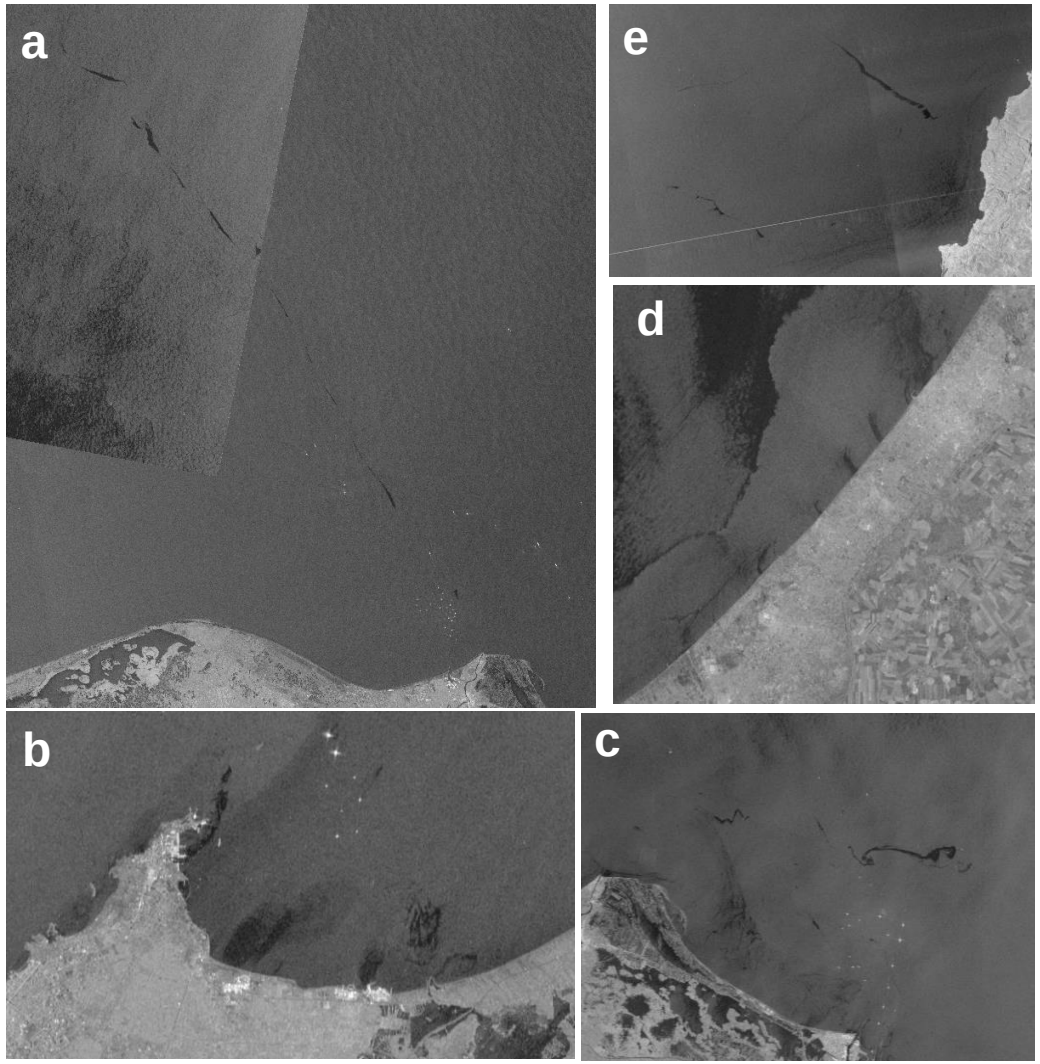
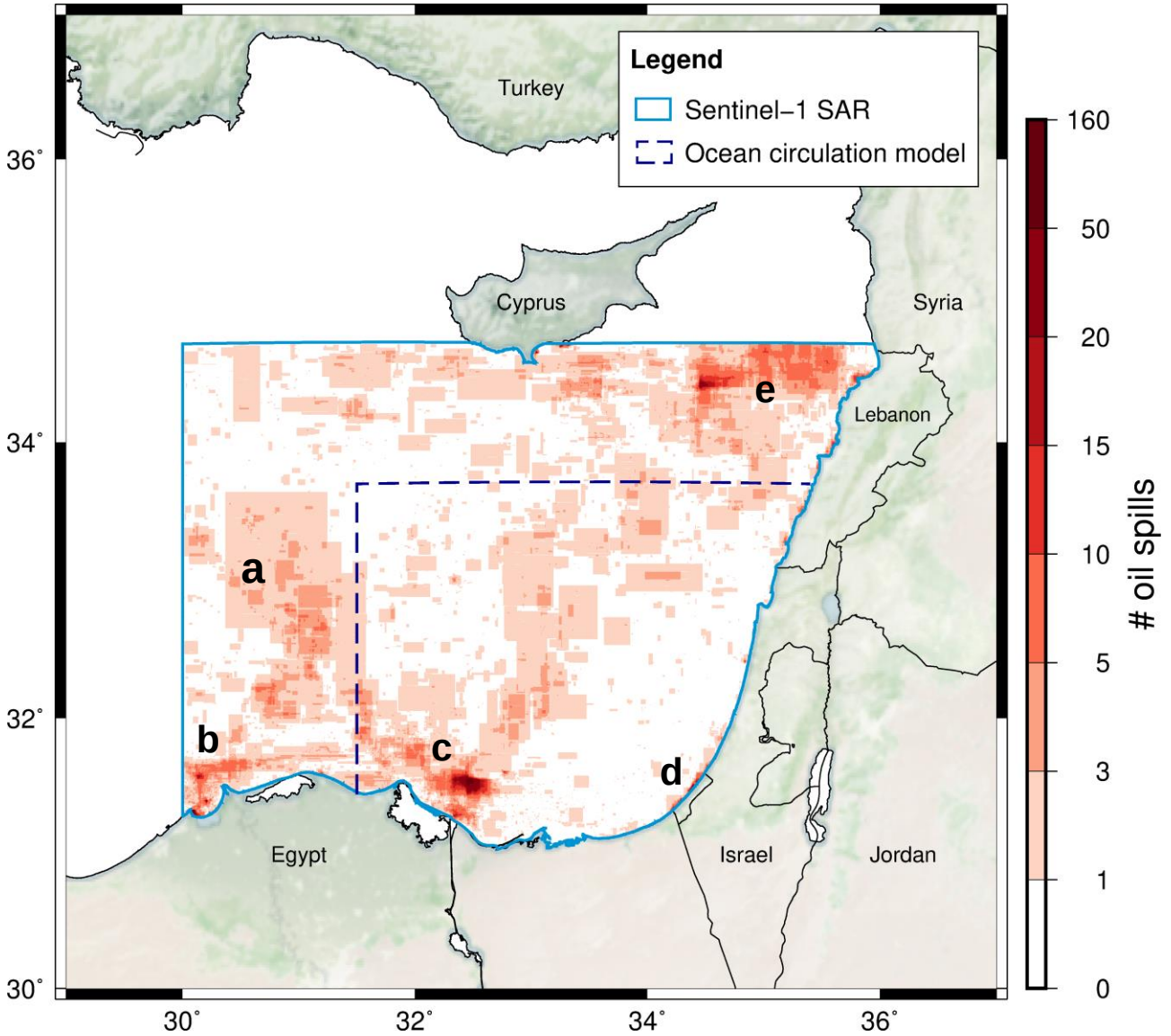
Study Area





- The amount of oil spills collected in the study area from 2015–2018 with a total of 9768 oil spills from 5930 Sentinel-1 scenes.

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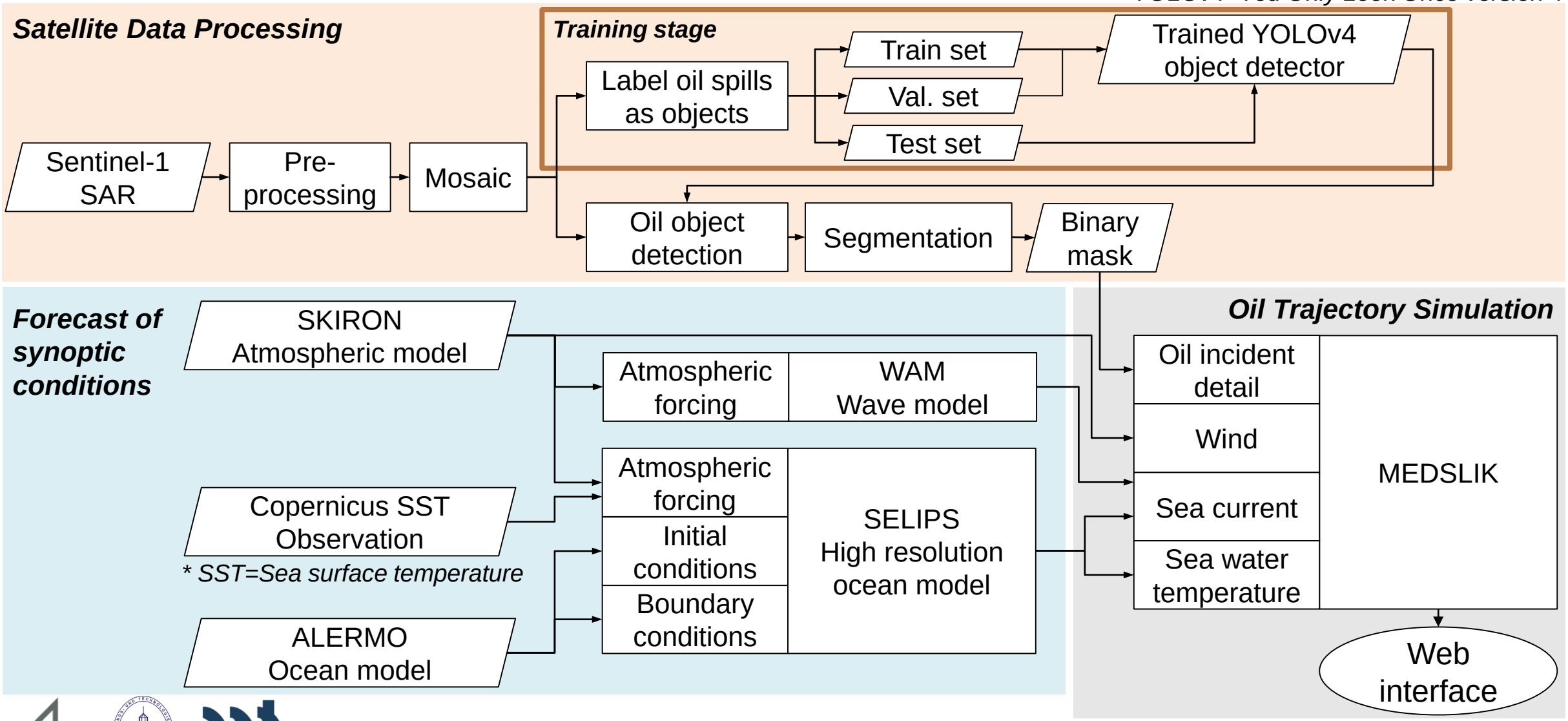
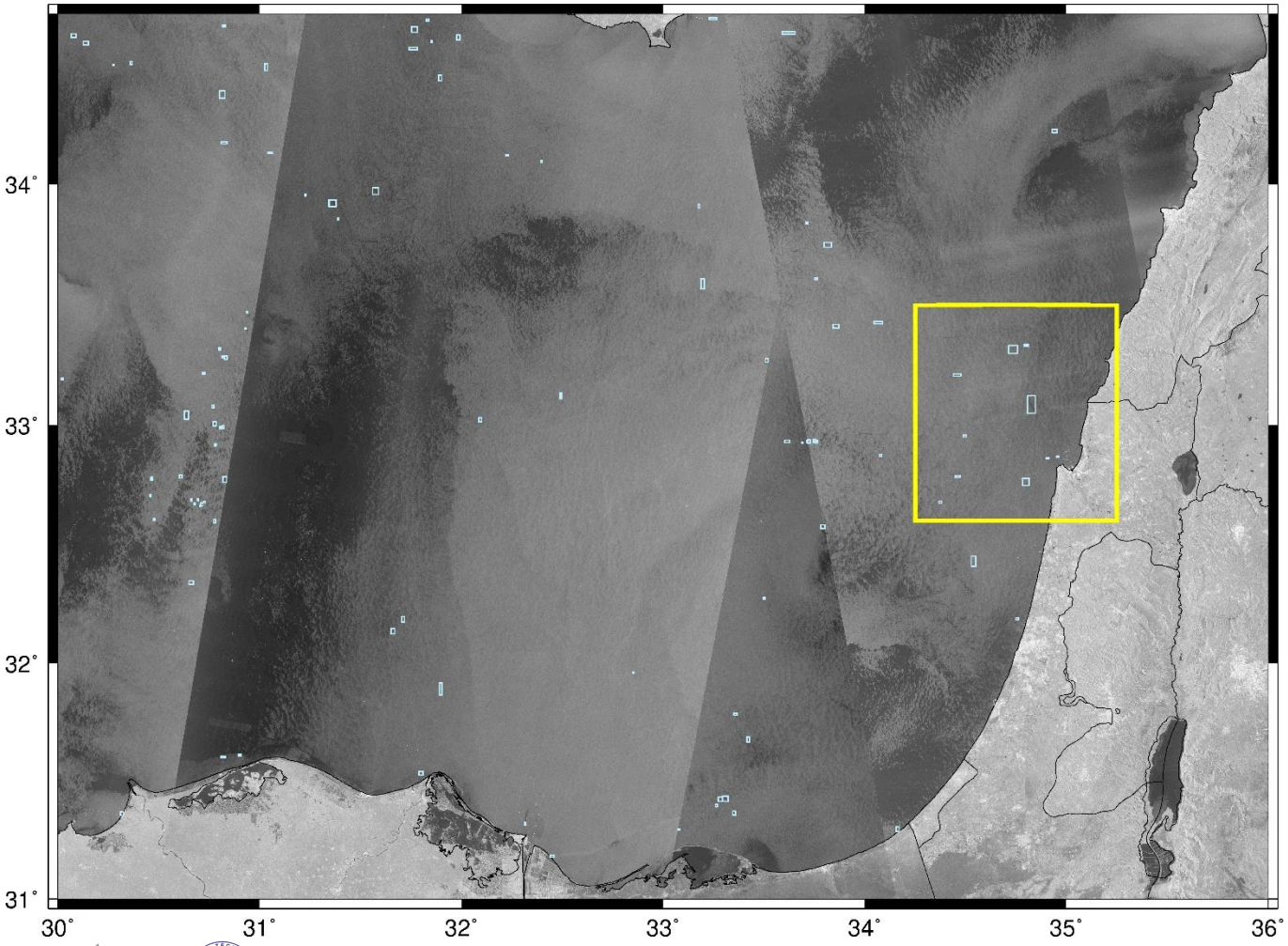
Oil Spill Detection and Early Warning System

** YOLOv4=You Only Look Once version 4*



Oil spill detection by trained YOLOv4 object detector

2021/01/19 18:00:00–2021/01/25 18:00:00



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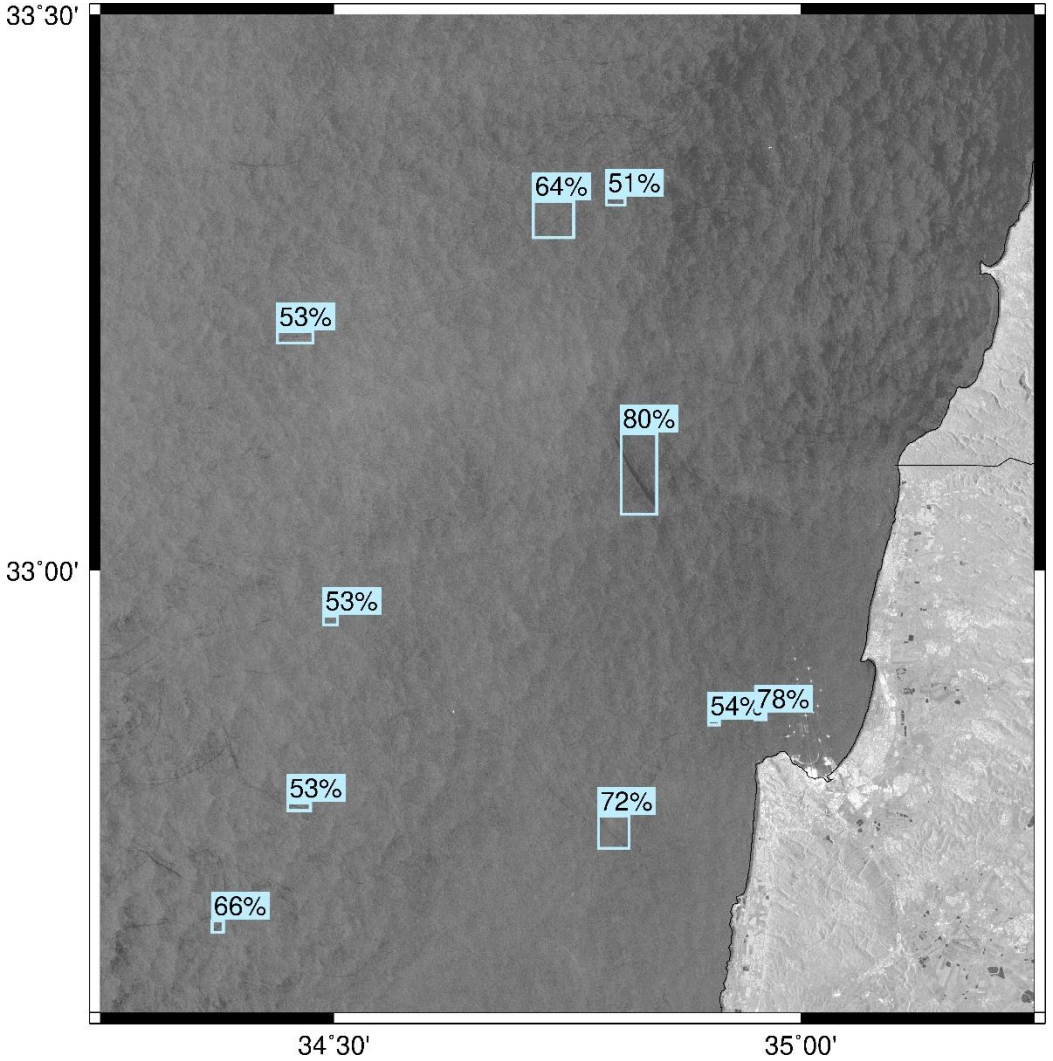

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Oil spill detection by implemented detector

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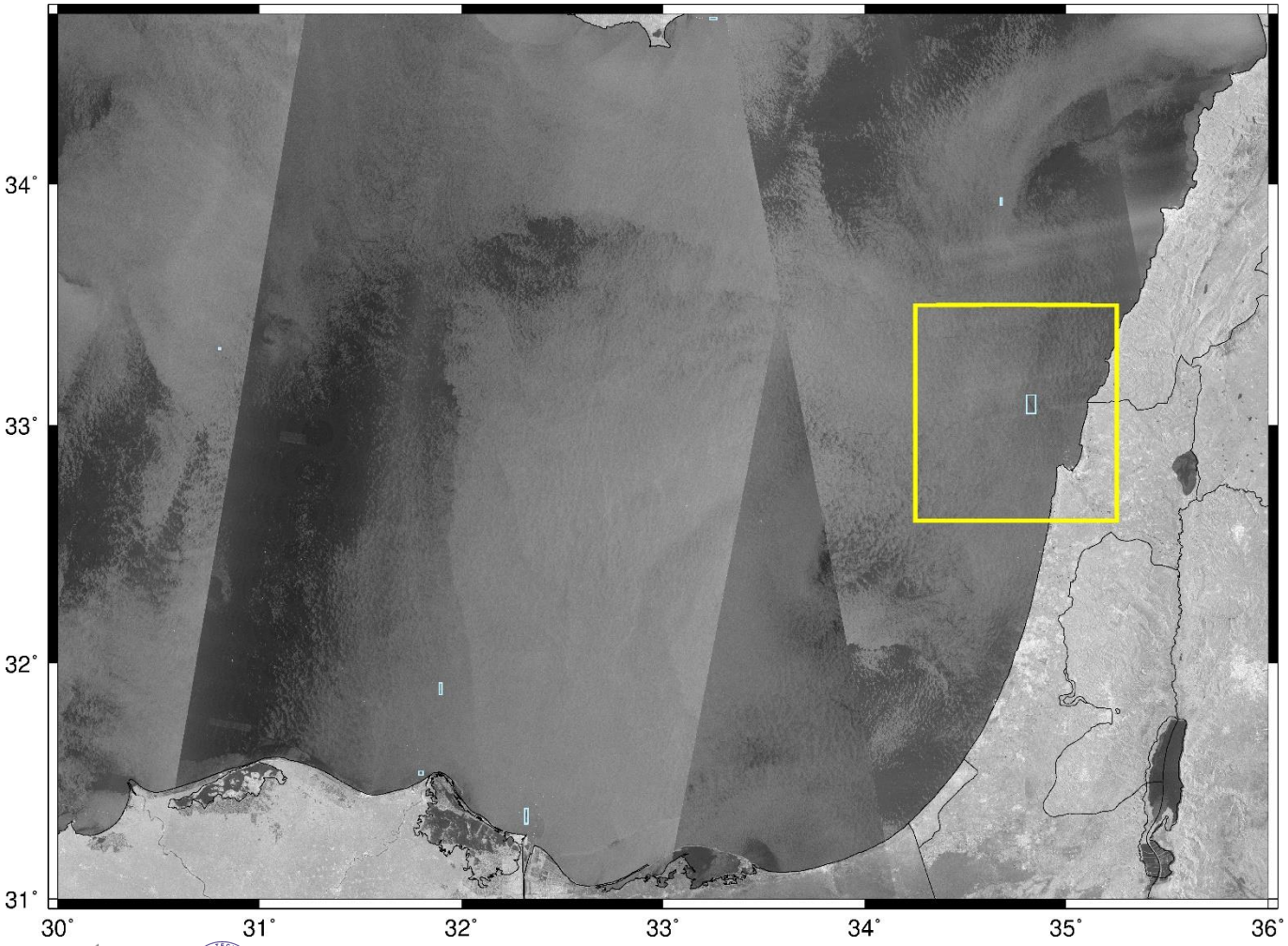

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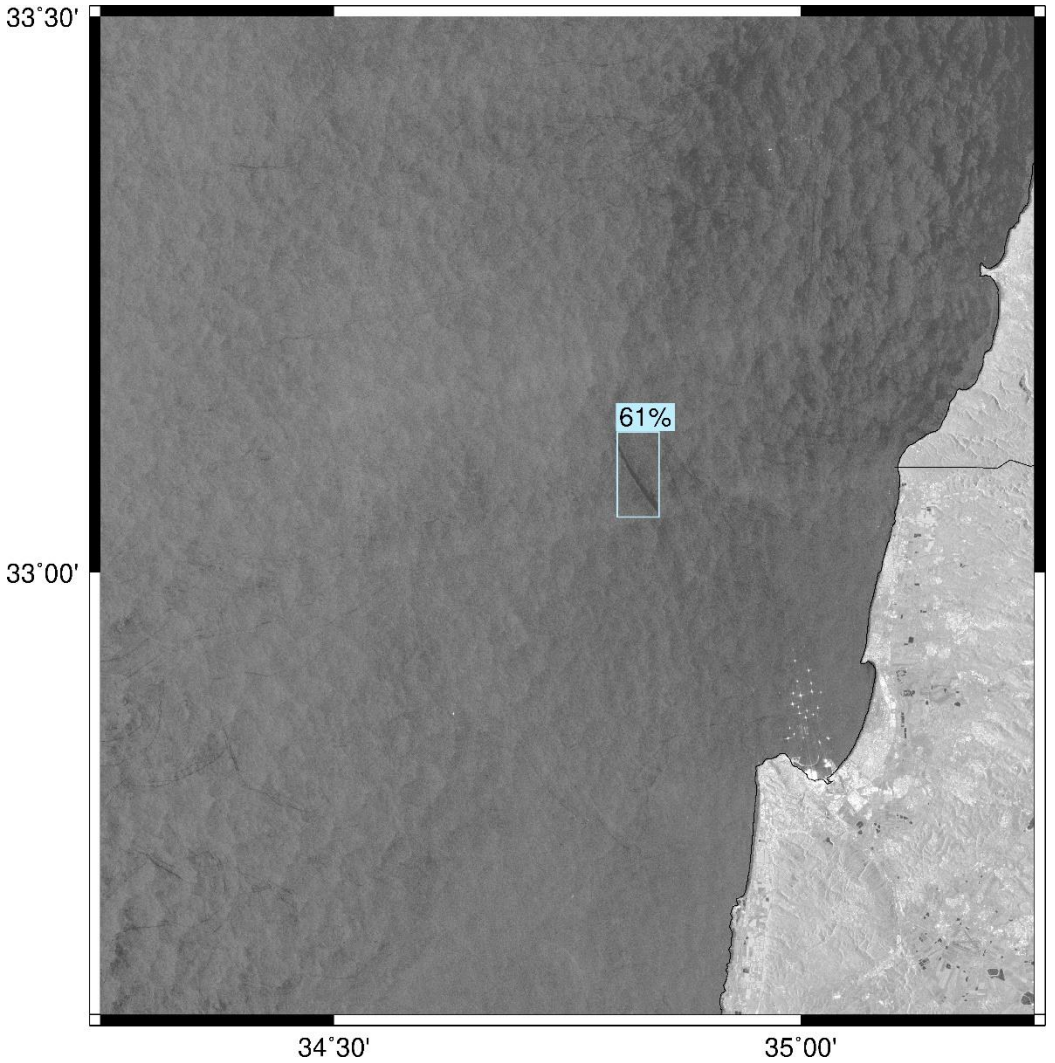

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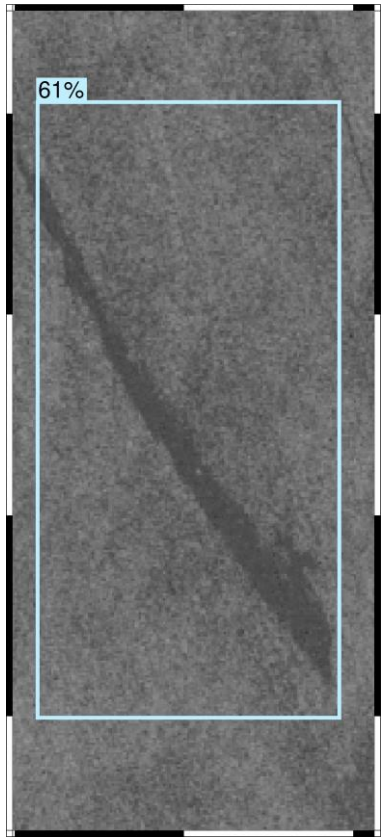
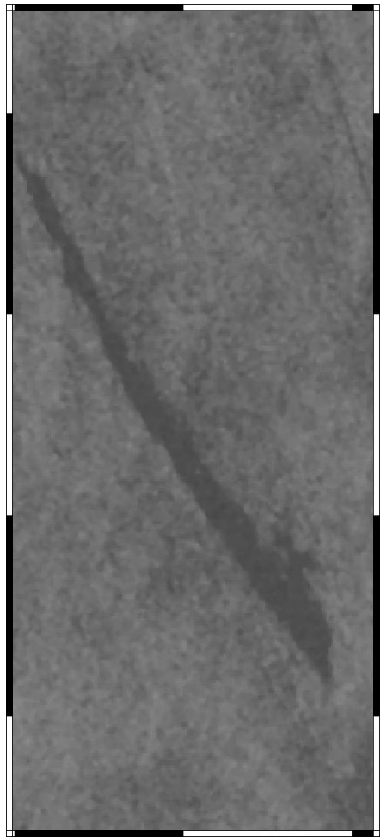
Segmentation

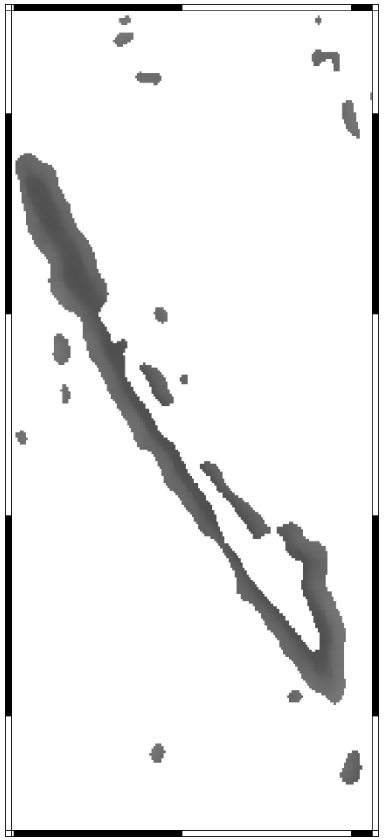
Load image



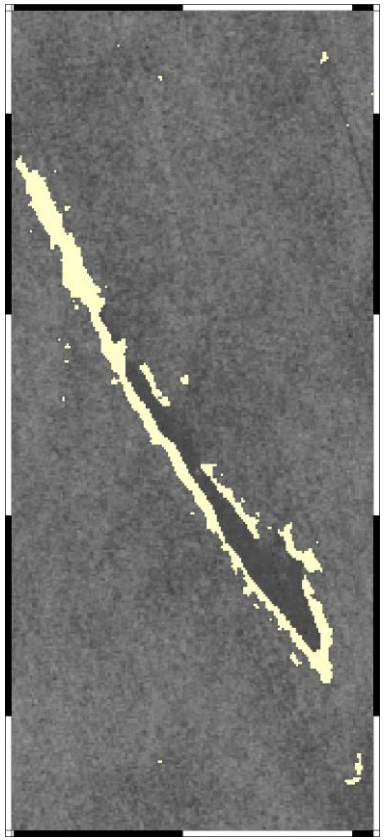
Median blur



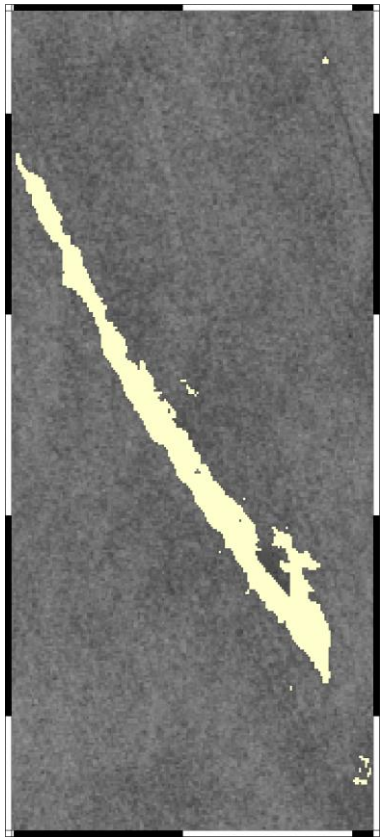
Data at/near edge



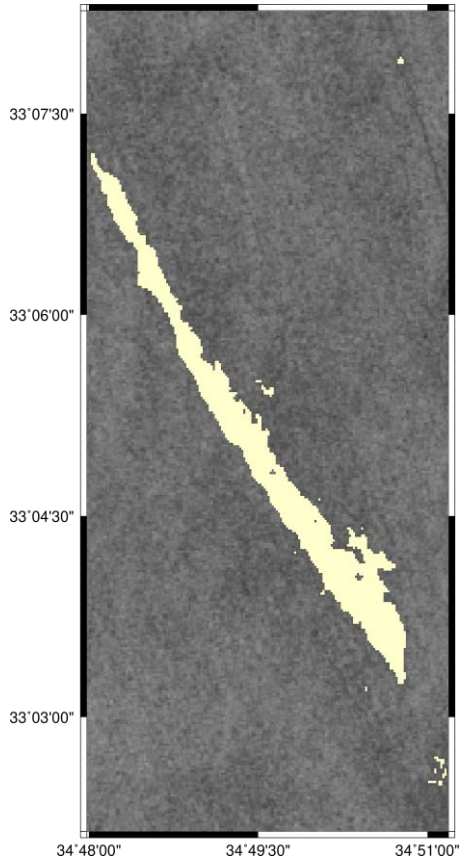
Seed points



Region growing



Oil binary mask



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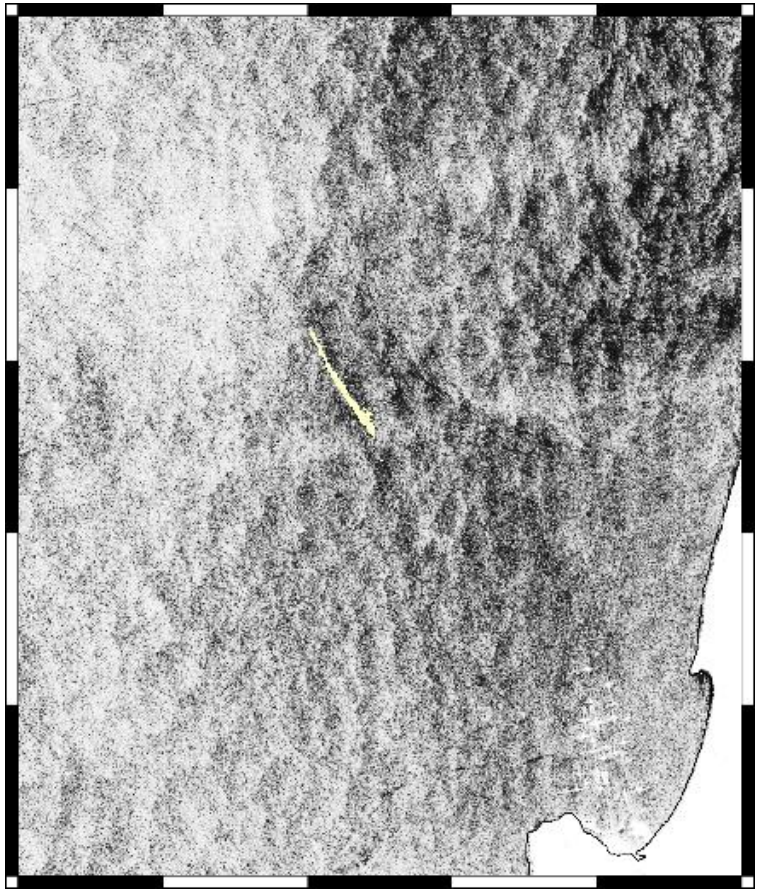
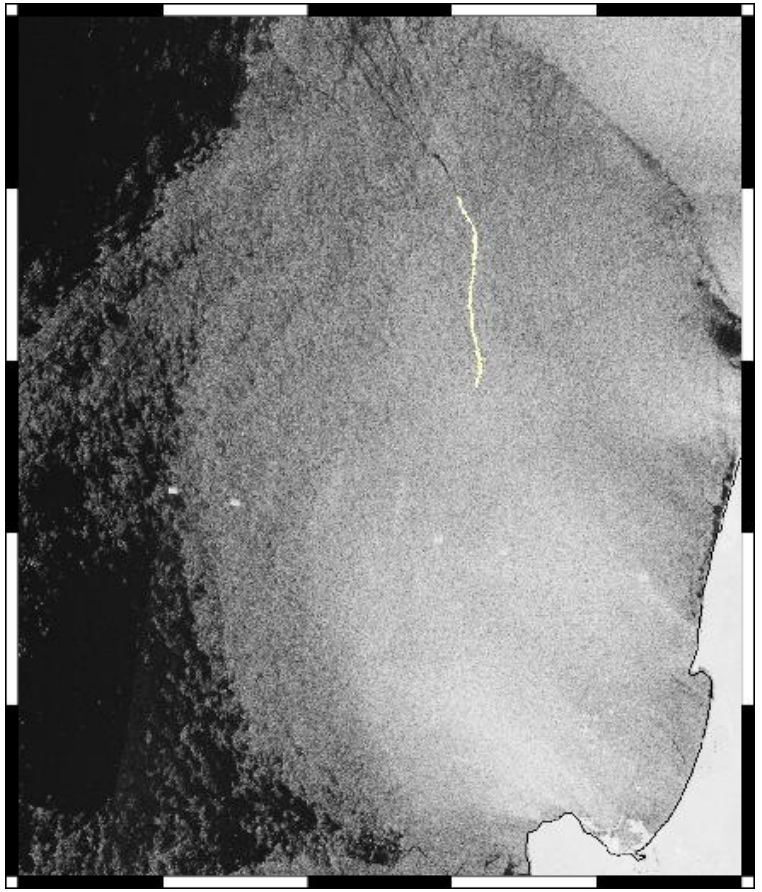
SAR observations and simulation of oil slick trajectory by MEDSLIK

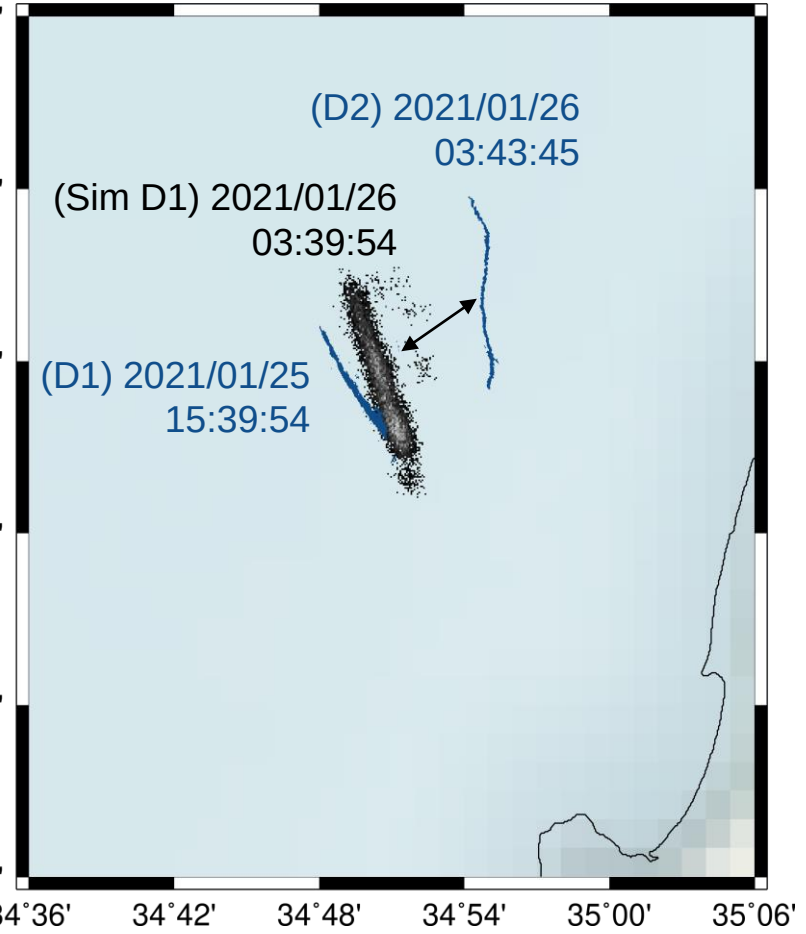
D1: 2021/01/25 15:39:54



D2: 2021/01/26 03:43:45



Simulation from D1



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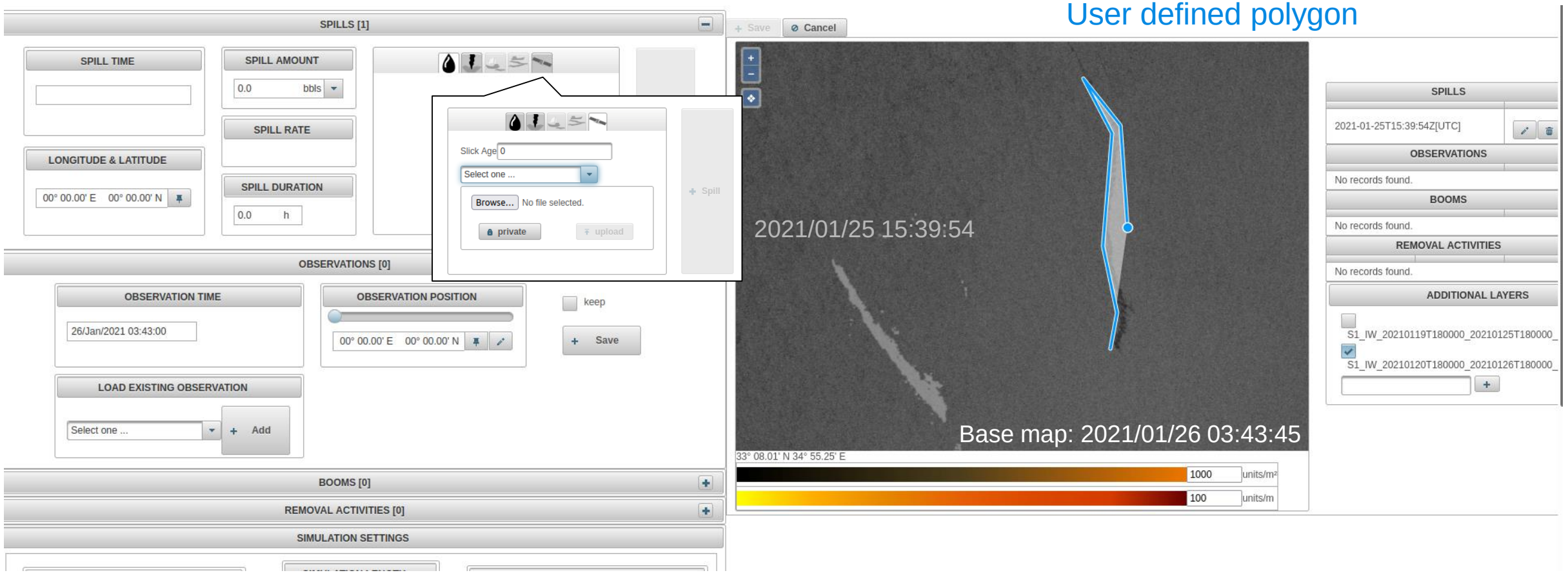
Web Interface



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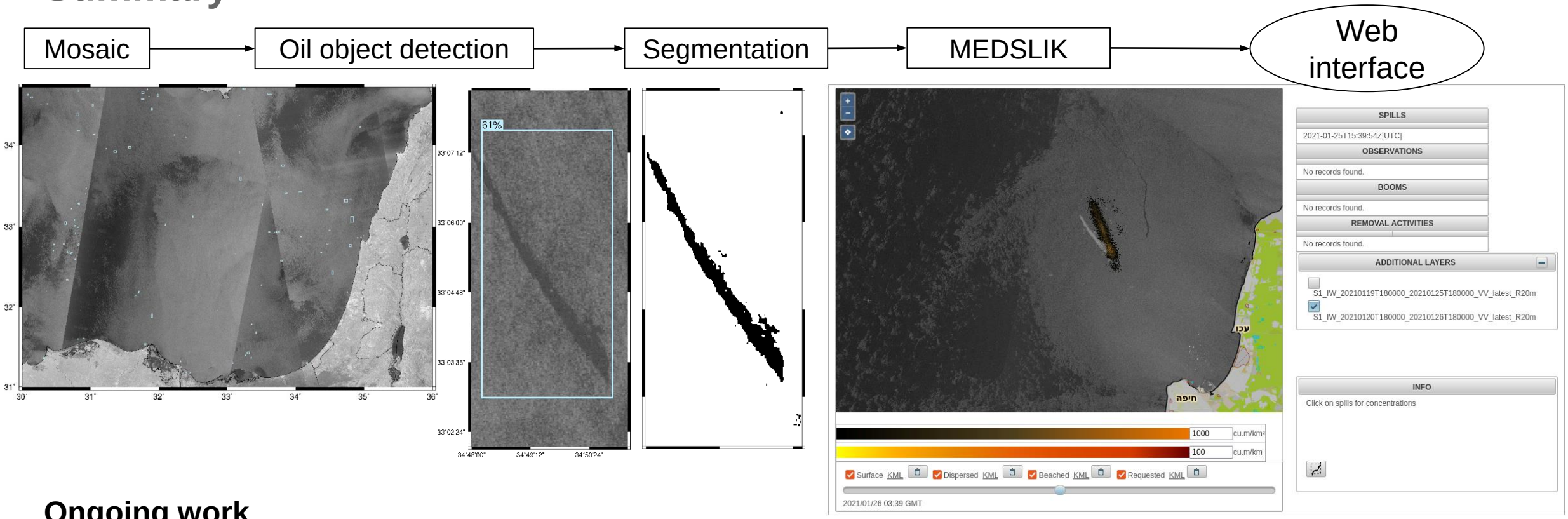
Summary



Ongoing work

- Further improve object detector by refining training dataset w.r.t. look-alikes
- Test the whole system on a daily basis to adjust the detection strategy and find the best segmentation method
- Calculate the false alarm and false negative rates of the detection system

Contact

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