



Doctoral Thesis Title: Development of a methodology for detecting methane plumes in off-shore Oil & Gas facilities using satellite imagery.

Supervisor/s: Luis Guanter Palomar

Abstract:

Society's interest in methane is constantly growing due to its interest in fighting the global warming. This is forcing both industry and national authorities to develop new environmental regulations in order to monitor greenhouse gas emissions. This is affecting especially the off-shore domain, since it represents a 30% of the worldwide production of the Oil & Gas industry, which is increasingly growing.

The high availability of satellite imagery that offer the right features in order to detect methane allows us to track and monitor emissions produced by off-shore facilities' constant activity. The objective of this investigation is performing a thorough research of the capabilities that some of the open-source data satellites like Sentinel-2 and Landsat-8/9 offer, and how we can leverage this data in different observation conditions, such as viewing angle, sun angle, latitude and longitude, etc. since there are few studies that tackle this subject.

This will allow us to explore the potential of satellite data in maritime environments in order to develop more accurate methodologies for methane plume detection and quantification. Finally, this methodologies will be tested in various regions of interest and the results will be compared with oil spill observation data to try to establish correlations between both of them in high industrial activity areas.

Available Means:

The goal of the project is developing a framework of off-shore methane detection methodologies and a public software application based on the framework in order to democratize the accessibility of methane data. Resources needed for this project are:

- Programming Languages and Image Processing Software: Python, QGIS.
- Cloud-computing platforms such as Google Earth Engine and CREODIAS.



- Satellite Imagery: Sentinel-2, Landsat-8, Landsat-9, etc.
- Resources and Oil Spill Expertise from Orbital EOS.

References:

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