

Vacancy at Deltares (13-Mar-2019)

MSc project (afstudeerstage) Remotely sensed sand dune vegetation/habitat mapping from Goeree to Solleveld-Kapitelduinen

Deltares advises Rijkswaterstaat concerning the development of Spanjaards Duin, a dune area located within Natura2000 area Solleveld- en Kapitelduinen in Zuid-Holland. Spanjaards Duin was created in 2009 as nature compensation measure for the expected increase in emission of nitrogen by the activities at Tweede Maasvlakte. Nitrogen stimulates plant growth of fast-growing species that outshade smaller and slower-growing species, leading to a loss in diversity. Permanent quadrats (PQs) have been monitored and vegetation types in the larger Rijnmond area have been mapped in 2013. Questions that we have are: What is the current status? Are there gradients in composition/diversity visible? What has changed? Has the vegetation changed? Which techniques can be used to map habitat type H2190 (Vochtige duinvalleien, Humid dune slacks) and habitat type H2130 (Grijze duinen, Dune grassland)

Deltares has a vacancy for a MSc student who is well-familiar with dune vegetation and experienced in remote sensing of natural (herbaceous) vegetation. The project will be carried out at Deltares in close collaboration with and financially supported by Rijkswaterstaat – WVL. The objective of this MSc project is to develop a method for the mapping of sand dune vegetation/habitats from Goeree to Solleveld-Kapitelduinen.

You will make the following key steps:

- Contact data holders and local managers. Make an inventory of existing in situ (incl. PQs and shapes from a previous vegetation mapping exercise) and remote sensing data sets (incl. aerial photographs, high and medium resolution satellite data), read up on literature about image classification, dune vegetation and habitat mapping, and write / finalise a research proposal.
- Create practical directory structure and short scripts for storing and handling the in situ and remote sensing data.
- Preparation of existing in situ data, ground truthing, preferably incl. collection of spectra with a field spectrometer (not available at Deltares).
- Image processing (algorithms to be determined in the proposal phase) using open source software preferably Python (R is an option), ESA SNAP, Earth Engine, GRASS-QGIS, GeoServer
- Create tentative maps and validation statistics, map the differences (with error assessments), and technical reporting.
- Interpretation of the result, and reporting in a style that fits in with Spanjaards Duin project
- Upload your results to the MEPduinen repository and present key results in the MEPduinen viewer <https://mepduinen.openearth.nl/mepduinen/> (see e.g. Folders Habitat typen, Flora)
- Include references to historic NOx studies, and include time series or composites of the Sentinel-5P TROPOMI NOx maps and their field validation data.
- Give presentations for interested (e.g. Deltares, Rijkswaterstaat, University) experts.
- Finally, you will compile, finish and present your MSc report.

Expected impacts of your research are a reproducible methodology that can be used in future coastal dune studies and an overview of possible dune vegetation/habitat changes from Goeree to Solleveld-en Kapittelduinen.

You will learn about working in a dynamic knowledge-intensive environment for applied-research (Deltares) and about data science and data management in the context of nature-based solutions (nature compensation and policy making).

Function requirements

The candidate must have:

- Good programming skills and a hands-on approach to, and affinity with large datasets
- Very good background in image processing and remote sensing of natural vegetation
- Interest and preferably knowledge of data science techniques (machine learning, deep learning)
- (The field sites are relatively hard to reach by public transport, so good planning skills or a driving licence might be useful)

Further Particulars

The appointment will preferably be 1.0 fte for the duration of 6 months. We offer a modest remuneration (stage-vergoeding) in case you do not qualify for a scholarship.

Additional Information

Further information can be obtained from marieke.eleveld@deltares.nl and stephanie.ijff@deltares.nl

Applications

Written applications, including a motivation letter, CV, list of grades, two professional references and preferably a report or paper, should be addressed within one month after this announcement per e-mail to: marieke.eleveld@deltares.nl