45th STUDENT CONFERENCE (E2)
Student Team Competition (3-GTS.4)

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PROJECT AQUACULTURE

Abstract

Oceans and seas represent over 70% of the earth's surface, living aquatic resources can provide a significant contribution to food, energy and bio-based products. Addressing global societal challenges, new ways have to be found to manage and exploit aquatic living resources in order to maximise benefits from oceans, seas and inland waters, including the optimization of the aquaculture food security. One of the main problems of the coastal aquaculture structures is water pollution: contaminated areas nearby the sea may bring polluted water inside aquaculture structures through marine currents and wind. In this way, the farming of the aquatic organisms is at risk. "Project Aquaculture" aims at monitoring the status of the coastal aquaculture structures and alerting these structures' owners to take countermeasures against possible incoming "pollution waves". Different types of satellite imagery are used and mixed in order to predict this kind of risk:

- Radar images, e.g. Cosmo-SkyMed data, are used to calculate the speed and the direction of the wind and the water currents over the seas/oceans.

- Visible images, e.g. Landsat data, Copernicus data, are used to evaluate water quality in order to determine whether a site of interest is polluted or not.

Using these two types of imagery, it's possible to predict which coastal areas are at high risk of pollution. A software platform is being developed to automatically process images to give end-users clear information about the status of their aquaculture structures. Afterwards, a low cost hardware platform will be built and placed in some areas to increase the accuracy of the predictions. This project has been designed during the COSMO-SkyMed Hackathon, COSMOsmHack in collaboration with e-Geos, Bic Lazio and with support of Telespazio and Tas-I. The hackathon held at the ASI(Italian Space Agency) in november 2015.