

→ E04SD - EARTH OBSERVATION

FOR SUSTAINABLE DEVELOPMENT

Climate Resilience | Philippines

Inundation Monitoring Service in the Philippines

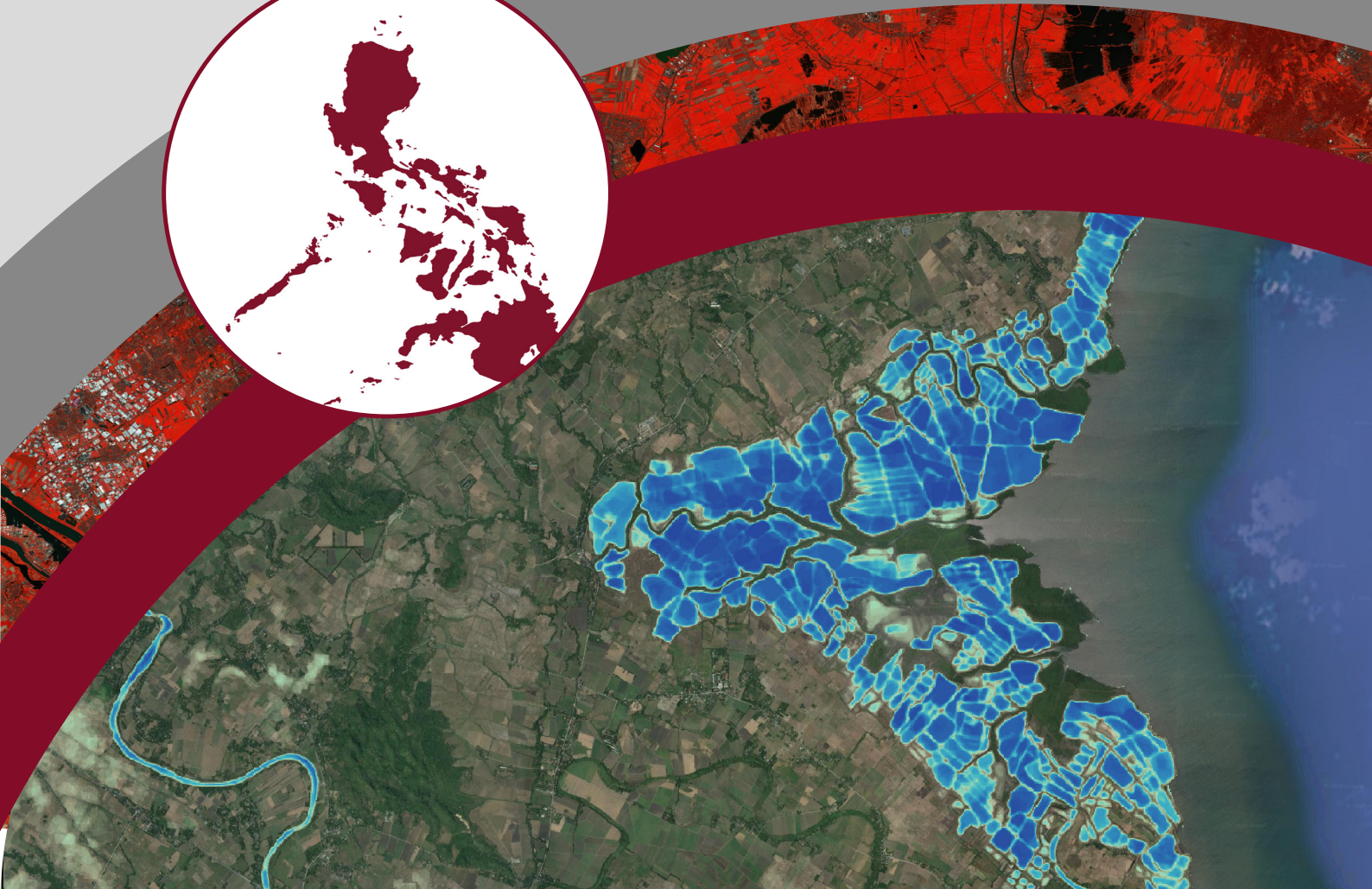


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1. INTRODUCTION

Earth Observation (EO) data has significant potential to support climate resilience planning, design and implementation. Since 2019, The European Space Agency's Earth Observation for Sustainable Development Climate Resilience (EO4SD CR) cluster has worked with several International Finance Institutions (IFIs) to apply EO-derived data and services to support real-world climate resilience projects. One such collaboration is with the Asian Development Bank (ADB), where EO data was provided to improve the flood risk management related to its projects in the Philippines.

As part of this collaboration, the EO4SD CR cluster developed an Inundation Monitoring Service (IMS) for the Jalaur River Basin, on Panay Island. The IMS is a satellite-based tool that detect both seasonal fluctuation of water bodies and long-term changes. The maps provide by the IMS show the extent of flooded areas over time, which helps the ADB to build a more detailed understanding of the flood response in a particular area.

As well as delivering the IMS product, the EO4SD CR cluster has also provided a capacity building programme to support ADB staff to better understand and use EO-derived data and services in their work.

About ESA's EO4SD Climate Resilience Cluster

Since 2008, the European Space Agency (ESA) has worked closely with International Financing Institutions (IFIs) and their client countries to harness the benefits of EO in their operations and resources management. [Earth Observation for Sustainable Development \(EO4SD\)](#) is a new ESA initiative which aims at increasing the uptake of EO-based information in regular development operations at national and international level.

The ESA EO4SD Climate Resilience Cluster aims to provide insight about the potential of EO to support of climate-resilient decision making at the regional and national scale. In collaboration with several IFIs, the EO4SD CR cluster has developed EO-based integrated climate screening and risk management products and services to help manage climate-related risks and capitalise on the opportunities that climate resilience can create. The EO4SD CR cluster is also working to build the capacity of IFI staff and IFI client states, allowing stakeholders to autonomously use EO-based information for climate resilience decision making.

2. ADB'S INTEGRATED FLOOD RISK MANAGEMENT SECTOR PROJECT

The Philippines ranks third among countries with the highest disaster risk and is among the top 10 countries with the most people affected by disasters. Climate change is likely to increase the intensity and frequency of typhoons and heavy rainfalls, exacerbating flooding in existing flood-prone areas, increasing landslides and mudslides, and extend flooding to new areas.¹

Flood risk management in the Philippines has been largely ineffective due to a lack of local and integrated flood risk management and planning, suboptimal flood protection infrastructure, and limited investment. The ADB is working to improve this through its Integrated Flood Risk Management Sector Project² in six river catchments in the country: Abra, Abulog, Agus, Buayan-Malugon, Jalaur and Tagum-Libuganon.

The ADB's Integrated Flood Risk Management Sector Project aims to:

- improve flood risk management planning through strengthening data acquisition and data management, and improving flood protection asset management;
- rehabilitate and construct flood protection infrastructure; and
- raise community awareness and prepare and implement disaster (flood) risk reduction and management plans to reduce different groups' vulnerabilities.

In order to build a detailed picture of the possible extent of areas at risk of flooding, the ADB requires new data to accurately map historical events. The EO4SD CR cluster has worked with the Bank to develop an IMS for the Jalaur River Basin, Panay Island, which will help to measure and respond to rising river levels and flooding.

¹ World Bank (2020) The Climate Change Knowledge Portal: <https://climateknowledgeportal.worldbank.org/>

² ADB (2018) Republic of the Philippines: Preparing the Integrated Flood Risk Management Sector Project: <https://www.adb.org/sites/default/files/project-documents/51294/51294-002-tar-en.pdf>



Image 1 The Jalaur River Basin (main map) is located on the Eastern side of the Philippine island of Panay (inset).³

3. USING EO DATA TO PROVIDE AN INUNDATION MONITORING SERVICE TO THE ADB

To meet the ADB's requirement for more detailed data on floods in the Philippines, the E04SD CR cluster developed an automated IMS. The ADB needed to build a more detailed picture of flood response in specific areas surrounding its projects. This allows for better planning for infrastructure investment in flood protection, and disaster response and early warning. A pilot product was produced covering the Jalaur River basin, with the view to extending the product to cover five other river basins in the Philippines.

The IMS is driven by satellite data, and can detect seasonal fluctuations of water bodies, and long-term changes. Understanding how these seasonal fluctuations are changing over time, allows the ADB to better understand the influence of climate change on flood extent.

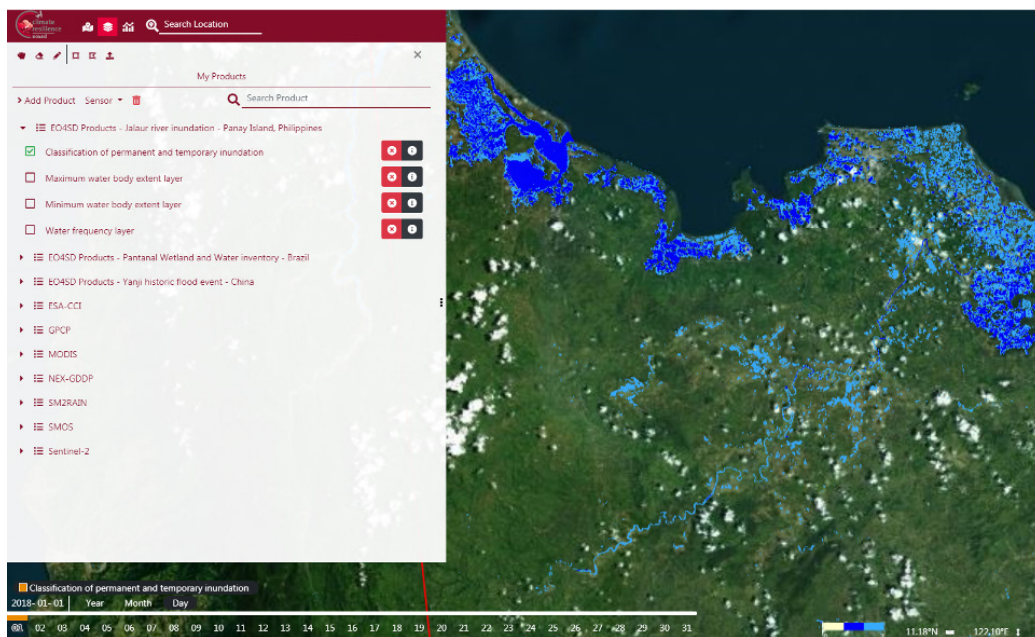


Image 2 Classification of permanent and temporary inundation as viewed on the E04SD CR Platform.⁴

³ USAID (2013) An Assessment of Water Security, Development and Climate Change in Iloilo, Philippines, and the Tigum-Aganan Watershed.

⁴ E04SD CR platform: <https://explorer-eo4sdcr.adamplatform.eu/>

The IMS can be accessed through the EO4SD CR Platform⁵, and exports data as PDF maps as well as GIS files for further manipulation. The maps provide a record of the extent of flooding in areas over time, which helps the ADB to build a picture of the flood response of a particular area.



Image 3 Maximum inundation extents - Jalaur River Basin (1990 - 2015).

⁵ EO4SD CR platform: <https://explorer-eo4sdcr.adamplatform.eu/>

4. CAPACITY BUILDING

Alongside the EO service provision, the E04SD Climate Resilience Cluster delivers capacity building support to foster the sustained uptake of EO-based data and services by IFIs and Client States to support climate change resilience. The goal of the capacity building is to enable the sustainable and autonomous application and use of the provided services and data.

Led by the National Observatory of Athens' Centre of Excellence BEYOND with support from E04SD Climate Resilience Cluster partners GMV, Acclimatise, Telespazio VEGA UK and GeoVille, the capacity building activities provide both targeted support through practical training, and awareness raising and knowledge transfer through online courses and webinars.

In March 2020, the E04SD Climate Resilience Cluster delivered a seminar on Integrated Flood Risk Management to ADB and the respective local partner, the Department of Public Works and Highways (DPWH). The seminar provided practical information about how EO data and services can mainstream into climate-resilient decision making to over 100 participants. The presentation used real-world examples of prototypes that have been applied by IFIs around the world including:

- i) Providing flood risk information to support the Inundation Monitoring Service (IMS) in the Philippines;
- ii) Shoreline monitoring and change detection in Monrovia; and
- iii) Examples of how EO-based services contribute to decision-making.

The capacity building activities were designed to build the capacity of ADB staff to use EO-derived information to support its projects and outputs and allow the DPWH to use EO services to support its work.

In addition to targeted support and training, the E04SD Climate Resilience Cluster has also delivered a webinar series to raise awareness, acceptance and understanding of EO-based information services and the associated benefits, impacts and usefulness with regard to the specific priorities of the stakeholders.

The seven-part webinar series, delivered in June and July 2020, is aimed at all those interested in developing a foundational knowledge of EO and how it can be applied practically in the context of climate-resilience projects and programmes.

The series draws on the E04SD Climate Resilience Cluster's experience working with IFIs including the Asian Development Bank, The World Bank, the International Finance Corporation, Africa Risk Capacity and the European Bank for Reconstruction and Development, to provide 'hands-on' sessions and guided tutorials for existing climate resilience platforms.

Partners of the Climate Resilience Cluster



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Cover image: Map showing the Water frequency (2015-2018) near Barotac Nuevo, Iloilo, in the Philippines. GMV.