Climate Resilience

Extreme Precipitation Indices for Climate Risk Screening
WB project: Extreme Precipitation Indices for Climate Risk Screening

Cluster’s objective: To integrate EO data into the stakeholder’s climate risk screening tools and to develop interactive tools for analysis of extreme precipitation.

Service: The EO4SD CR cluster provided extreme rainfall indicators using state-of-the-art EO and climate datasets to improve IFC’s assessment of flood impact and its link to extreme precipitation. The EO-based extreme rainfall return levels were seamlessly integrated into IFC’s existing climate risk tool. In addition, working with MIGA, the EO4SD CR cluster produced the Rainfall Explorer, a web-based tool that provides reliable insights into potential climate risks to existing and future investments.
Extreme Precipitation Indices for Climate Risk Screening

IFC & MIGA

- The International Finance Corporation (IFC), a member of the World Bank Group, is the largest global development institution focused on the private sector in developing countries.

- The Multilateral Investment Guarantee Agency (MIGA) is another member of the World Bank Group. MIGA’s mandate is to promote cross-border investment in developing countries by providing guarantees (political risk insurance and credit enhancement) to investors and lenders.
Service Concept

- Collaboration with the IFC & MIGA which are looking to enhance their climate risk screening tools. The Cluster worked with the IFC and MIGA to **integrate EO data into IFI’s risk screening tool** that is designed to provide evidence of the materiality of climate risks to a particular location.

Source: World Bank
Service Concept

- The goal was to develop a simple and useful indicator/tool to **link extreme precipitation to flood events**, in order to link flood events to expected losses under future climate change.

- Enable IFC/MIGA understand the **materiality of climate impacts** in order to build business cases for resilience investments.

Source: World Bank
Summary of Activities

▪ Several meetings held with the IFC experts to set out the requirements, current state of their tools/datasets, and the delivery format.

▪ A set of standalone extreme precipitation return level datasets were developed using ERA5 and GPCP precipitation estimates at global scale:
  ▪ Maximum Daily Rainfall (10/20/50/100-yr RL) – Reanalysis and EO
  ▪ Maximum 5-Day Rainfall (10/20/50/100-yr RL) – Reanalysis and EO
  ▪ Maximum 30-Day Rainfall (10/20/50/100-yr RL) – Reanalysis and EO

▪ IFC Climate Risk Screening Tool was updated with these datasets on the EO4SD platform, to allow the retrieval of the EO4SD CR indicators in line with their other datasets.
Summary of Activities

- Extensive analysis of generated indicators and comparison with legacy datasets at IFC was performed.
- Extreme rainfall return level products also delivered through EO4SD CR platform.
Summary of Activities

- To allow further investigation of the return level concept, a prototype was developed using an interactive Jupyter Notebook which enabled the stakeholders set different parameters for calculation of the return levels.

- Following a very positive feedback, the Rainfall Explorer Jupyter Notebook was developed, where the users can specify a location or select a historical flood event from Dartmouth Flood Observatory and perform analysis on the cloud.
Rainfall Explorer

- Rainfall Explorer Web App was developed to enable multi-user public access.
Rainfall Explorer

Two ways to define an event

- By flood event from Dartmouth Flood Observatory archive
- By specifying the site location, radius and date
Flood event in Sacramento, Feb 2019

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User Uptake & Feedback

- Presented the Rainfall Explorer capabilities and use-cases at a dedicated capacity building session for WB group staff, including IFC, MIGA and CCKP.

- MIGA found this tool extremely useful for early screening, as it allows looking up any event that has occurred anywhere on the planet in the past 40 years, and IFI can work out the duration of that event, as well as the significance of that event.