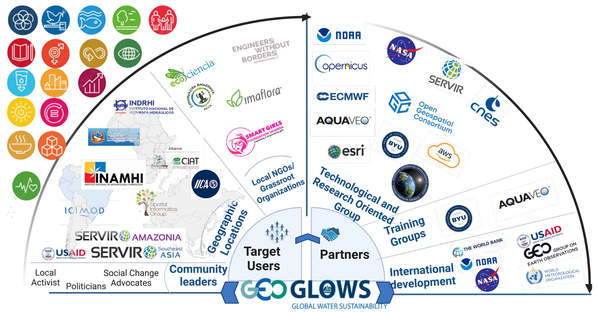
Integrated Global and Local Hydrologic Models for Flood Early Warning and Water Resources Management

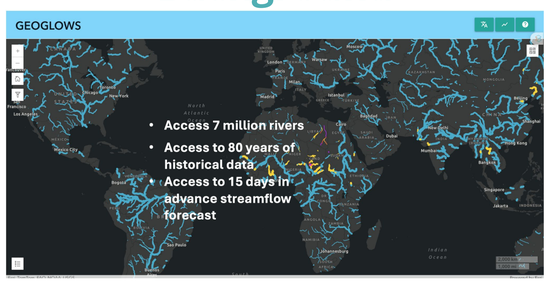
The NASA GEOGLOWS project addresses the lack of historical streamflow data, especially in developing countries, to enhance water resource management. By integrating global hydrological models, locally observed data, and satellite information, it provides retrospective analysis and forecasts for 7,000,000 rivers worldwide. Collaborating with local stakeholders, the project has been active in Africa, South America, and Asia since its inception.

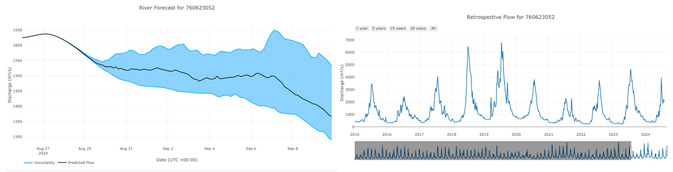
Partners & Collaborators

- National Hydrological Services
- SERVIR local stakeholders
- Nile Basin Initiative (NBI) in East Africa.



Background



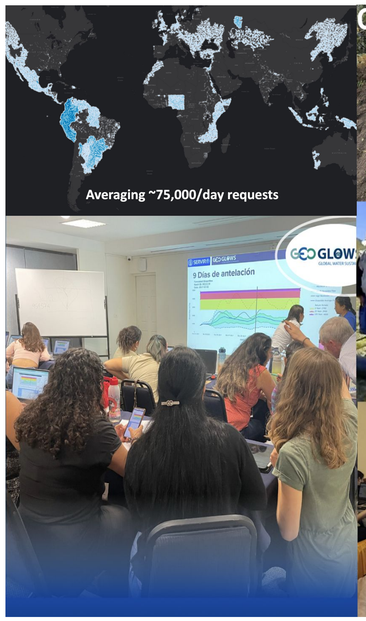


Challenge: Lack of historical streamflow data in developing countries.

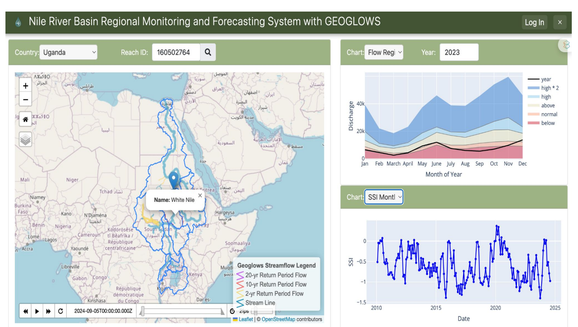
Negative Consequence: Limits actionable water forecasts for decision-makers.

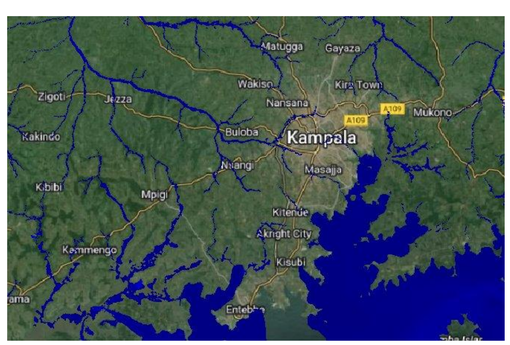
Solution: GEOGLOWS global hydrological model.

Objective: Provide reliable water data for better resource management worldwide.

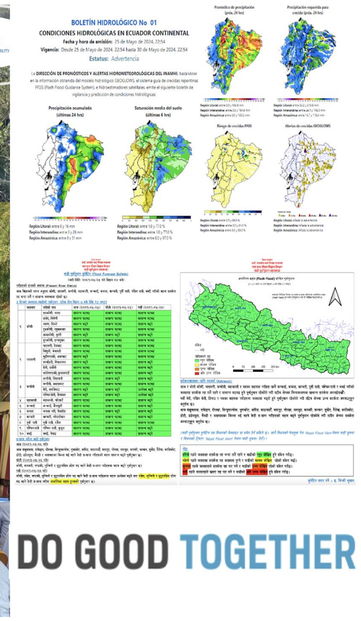


The GEOGLOWS hydrological modeling services are accessed more than 75,000 times daily from different regions of the world. These services have been used to design irrigation systems, estimate hydropower generation and are integrated into flood warning bulletins in Ecuador a, Nepal and others.





We are co-developing with the NBI a dashboard that provides current status, drought indices for streamflow, and long-term outlook (left). We are also using the new high resolution river network and FABDEM to create flood maps (right).



Outcomes & Impacts:

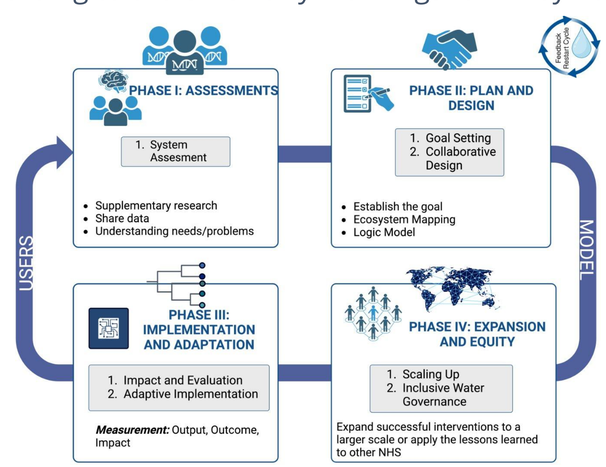
South America: The INAMHI GEOGLOWS platform provides real-time monitoring for 3,200 rivers, enhancing flood risk management and disaster response efforts.

Africa: GEOGLOWS extends flood forecasts in Malawi during Cyclones Ana and Gombe, helping communities prepare and saving over $40 million in losses.

Asia: Customized Flash Flood and Streamflow Prediction Tools improve flood forecasting, enhancing early warnings and response to extreme events.

Next: Greater Impact & EW4All

Learning from our successful experience in Ecuador we have developed an adaptation of a Theory of Change model for integrating GEOGLOWS within an organization to achieve and measure greater impact.
We are using this model for additional stakeholder engagements including work under US PREPARE to provide additional countries in Africa early warnings according to the UN's Early Warnings for All by 2027



DO GOOD TOGETHER

Presenter: Jim Nelson

More Information: