

Anticipation Hub EO Working Group

Members:

- Veronica Bell, Red Cross Australia
- Elijah Kingori, IFRC
- Jamon van den Hoek, Oregon State
- Arjen Haag, Deltares
- Joel Myhre, PDC
- Greg Hampe, PDC
- Anne Schneibel, DLR
- Rui Kotani, GEO Secretariat

Objectives

- Document existing projects
- Identify opportunities
- Effective Frameworks

Summary of existing Anticipatory programs using EO data

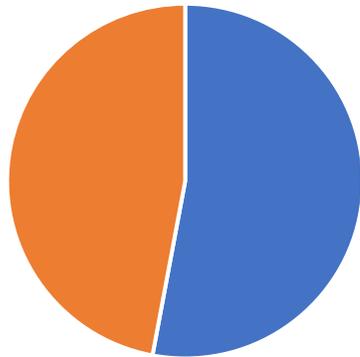
- Perils
- Researchers/developers
- Stakeholders
- Sensors
- Triggers
- Actions

Data so far

- [Imagecat Anticipation Hub.docx - Google Docs](#)
- Not a lot known on triggers or sensors
- Many not EO
- Many not anticipatory
- Need some help

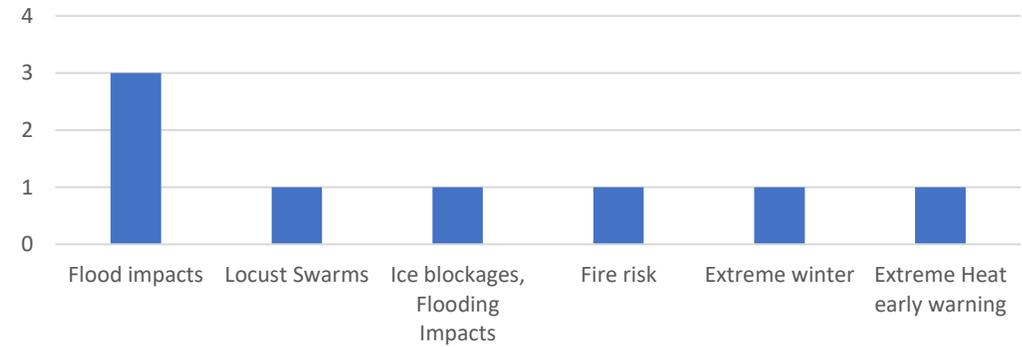
Overview

Anticipatory



■ Yes, we think. ■ Not Quite

Mostly Weather (anticipatory)



Project Names

Extrema

Fire Danger Forecast

Floodforesight

HYDRAFloods

Improved Drought Early Warning and Forecasting (DEWFORA)

Landslides R&D via IMMAP
Afghanistan

Locus Watch

Model of Models
New global characterization of landslide exposure

Petabencana.id

Remote Sensing data used for DZUD early action in Mongolia

The coproduction of the Early Action Protocol for floods in Uganda: A model of strong collaboration for the effective scale-up of FbF

Unnamed project

UNOSAT introduces AI in its flood rapid mapping operations for the benefit of national disaster management authorities

Water Peace and Security

Water, Humanitarian Aid and Migration programme

35 (ish) NGOs, Agencies, Universities, Consultants Involved in Modeling

- Any solution S.L. City of Athens
- Aratos Systems
- Copernicus
- Deltares
- EU
- European Geosciences Union
- Extrema
- Food and Agriculture Organization of the United Nations
- GEO
- HYDRAFloods
- ImageCat
- Indonesian National Disaster Management Authority
- JBA
- Law and Internet Foundation
- Mongolia Red Cross
- Mongolian National Agency for Meteorology and Environmental Monitoring
- NASA (SERVIR)
- NASA Disasters Program
- National Observatory of Athens
- Nations and Kapodistrian University of Athens
- Natural Resources Canada
- Netherlands Red Cross Data and Digital team
- Oakridge National Labs
- Pacific Disaster Center
- River Ice Team of Alberta Environment and Parks
- Uganda National Meteorological Authority
- Uganda's Water Authority
- University of Colorado
- University of Oulu
- University of Reading through FATHOM
- UNOSAT
- USAID
- USAID IMMAP
- Water Peace and Security
- WFP Cambodia

When in the
disaster
process?

Mostly unclear

As a flood event unfolds

Beginning of winter in question

Days before rainfall

Months in advance

Not clear

Prior to drought

Prior to extreme heat event

Prior to flooding

Real time during flooding event

Upon formation of ice which will later cause flooding

Need more information!

Anticipatory and may be EO based

Anticipatory and EO, but in development

Need more Information

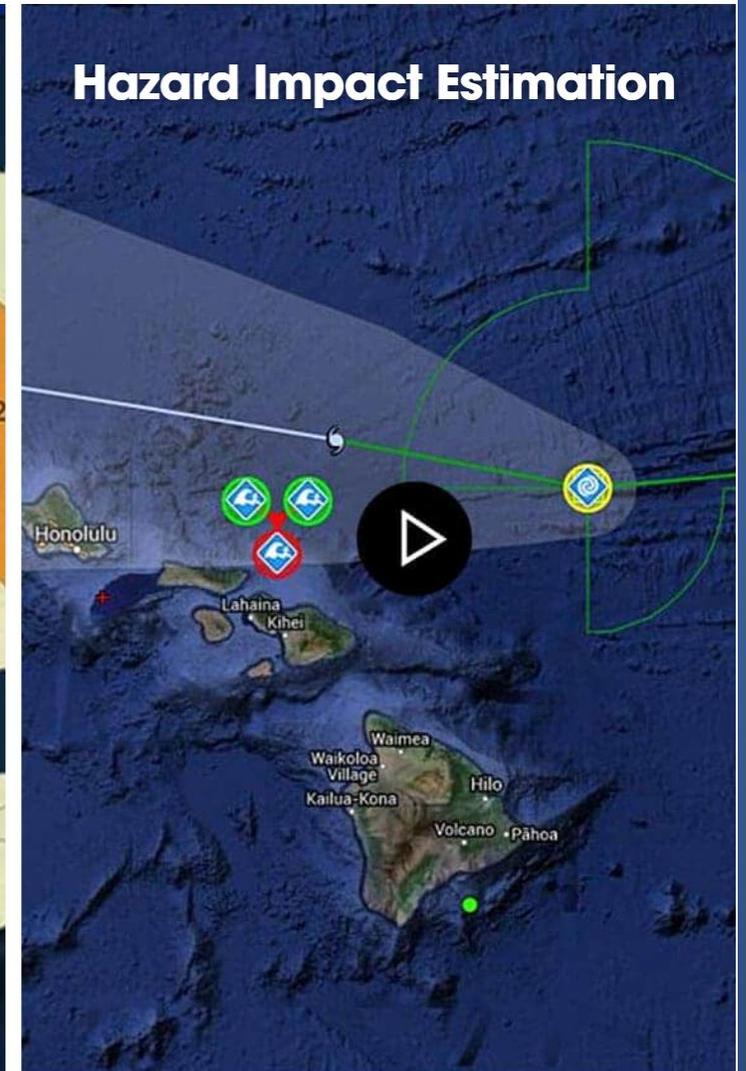
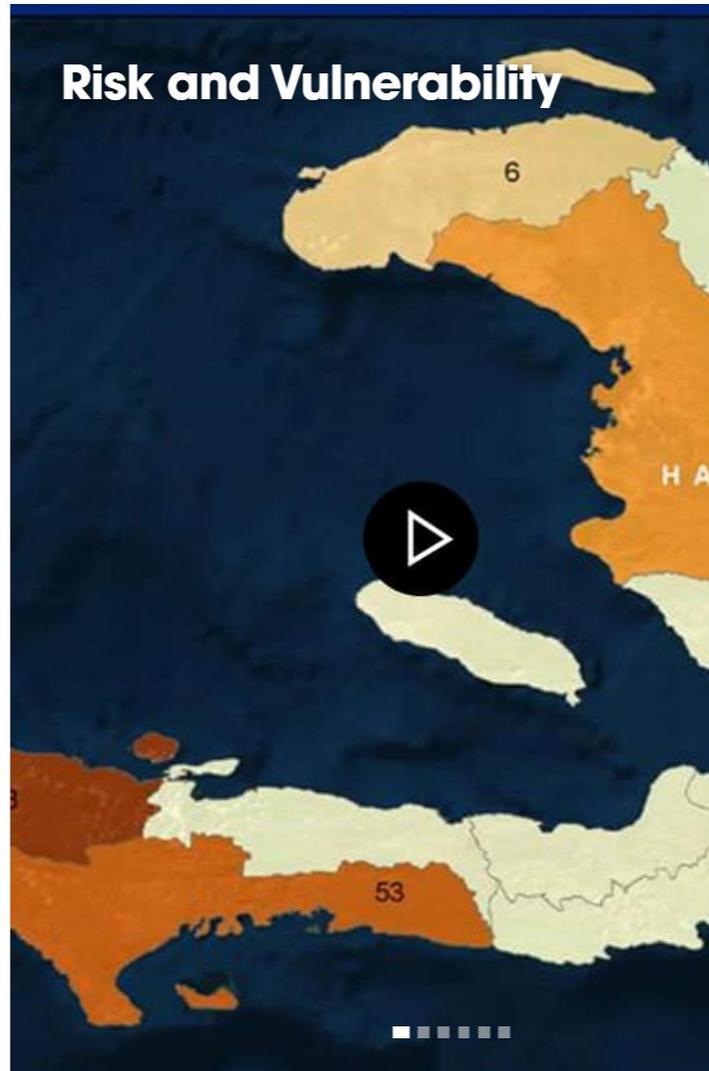
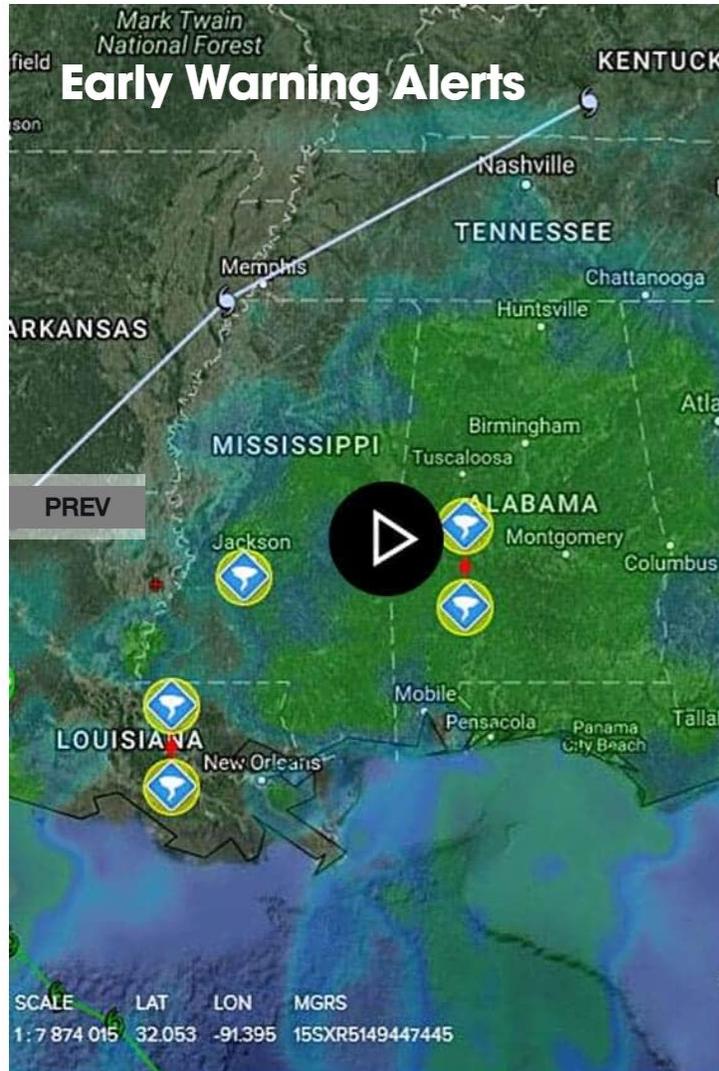
Not EO and anticipatory

Predicting	Sensors and Data
Drought impact	Advanced meteorological, hydrological, and agricultural forecasting methods
Extreme Heat early warning	LST (land surface temperature) from satellite imagery
Extreme winter	EO data on snow cover, drought index, ground observation data, anomalous precipitation and temperature, snow depth, air temperature forecast and precipitation forecast
Fire risk	Meteorological forecast data from European Centre for Medium-Range Weather Forecast
Flood impacts	AI analyses satellite data and produces related mapping
Flood impacts	Climate Data (sensors?)
Flood impacts	Evidence of flood forecast skill from scientists at the University of Reading and was combined with local context knowledge and ground assessments from practitioners at the national hydro-meteorological services, DWRM and UNMA, to provide actionable
Flood impacts	HydroMT
Flood impacts	Python API built on top of Google Earth Engine Python API
Flood impacts	SAR, Optical, exposure data
Flooding, not predictive	ASCD Finder Tool
Flooding, not predictive	Satellite data (unspecified)
Flooding, not predictive	Social media data
Ice blockages, Flooding Impacts	SAR, C-SAR
Landslide risk	Satellite data and open source data on population, roads, and infrastructure
Locust Swarms	Local rainfall data
Water based conflicts	Rainfall information, regional political and socio-economic factors

Need a closer look

Effort name	Who	Predicting What	Users
Floodforesight	JBA	Flood impacts	Municipalities in the UK
Water, Humanitarian Aid and Migration programme	Deltares	Flood impacts	Northern Nigeria, operational, UNFAO
Improved Drought Early Warning and Forecasting (DEWFORA)	Deltares	Drought impact	Africa
Extrema	Extrema, National Observatory of Athens, Nations and Kapodistrian University of Athens, University of Oulu, Aratos Systems, Anysolution S.L. City of Athens, Law and Internet Foundation	Extreme Heat early warning	Greece, scaling up globally.
Remote Sensing data used for dzud early action in Mongolia	Mongolian National Agency for Meteorology and Environmental Monitoring, Mongolia Red Cross	Extreme winter	Mongolia - National Agency for Meteorology and Environmental Monitoring, Mongolia Red Cross
Fire Danger Forecast	EU, Opernicus, Nasa, GEO, https://gwis.jrc.ec.europa.eu/partners	Fire risk	Global, EU

Discover some of the many capabilities of DisasterAWARE.





[About](#) ▾

[Publications](#) ▾

[Apps](#) ▾

[Projects](#) ▾

[Partners](#)

[Contacts](#)



Welcome to GWIS

The Global Wildfire Information System (GWIS) is a joint initiative of the [GEO](#) and the [Copernicus](#) Work Programs. In the [new GEO GWIS work program for the years 2020-2022](#), the Global Wildfire Information System (GWIS) aims at bringing together existing information sources at regional and national level in order to provide a comprehensive view and evaluation of fire regimes and fire effects at global level and to provide tools to support operational wildfire management from national to global scales.

[Visit the brand-new
Country Profile](#)

[GWIS Applications](#)

Google doc link- looking for follow up

- [Imagecat Anticipation Hub.docx - Google Docs](https://docs.google.com/document/d/16bSrLq4oCvHnH2hkpi3gAkBuqKLpQE8r/edit)
 - <https://docs.google.com/document/d/16bSrLq4oCvHnH2hkpi3gAkBuqKLpQE8r/edit>
- Make sure the information is accurate
- “Claim” program
- Be willing to supply additional details on:
 - Trigger
 - Sensors
 - Decisions supported
 - Use on the ground
- Email:ckh@imagecatinc.com

Identify opportunities

- Where can existing programs be augmented?
- Where can methods be extended to new perils, frameworks, domains?
- What are the opportunities for new tools, methods?
- What research needs to be done?

New Applications

- Use CAT Models
- From hazard-based triggers to impact-based triggers

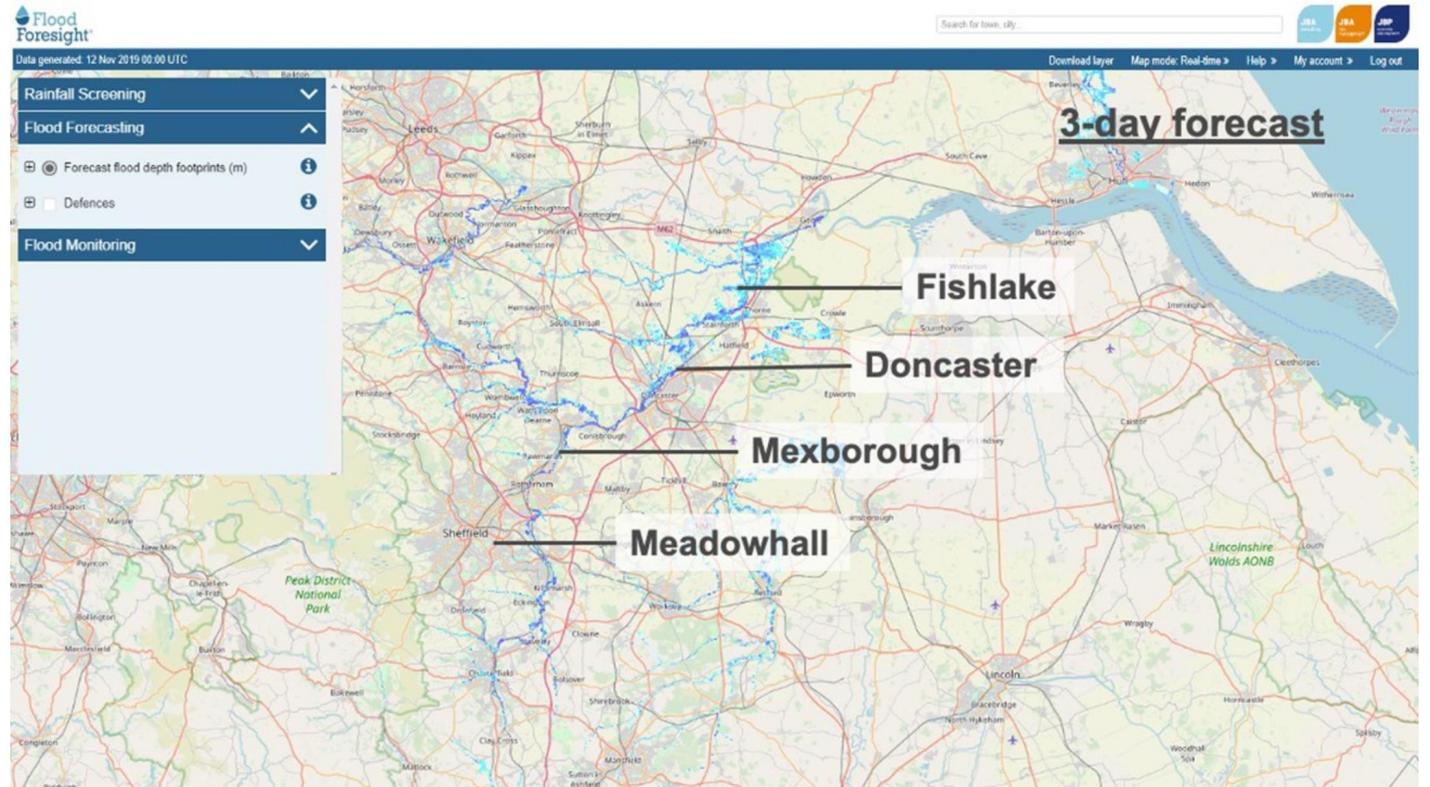
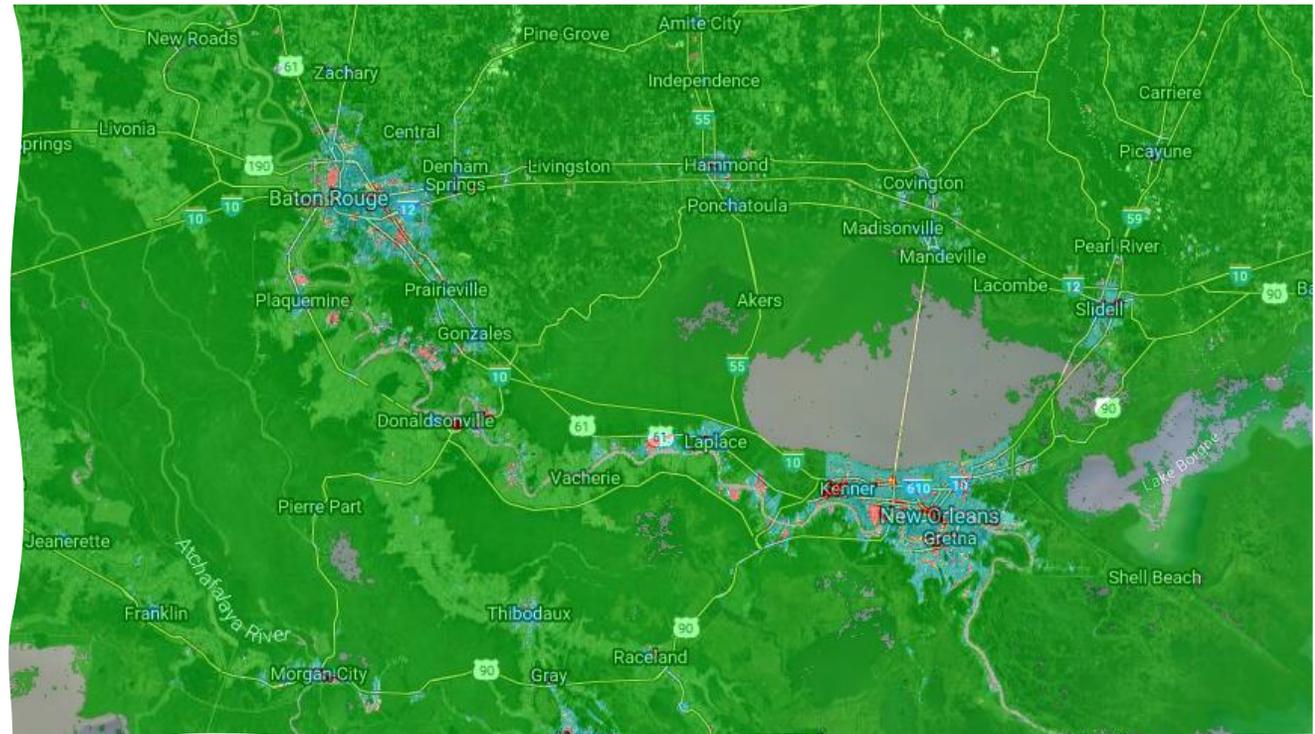
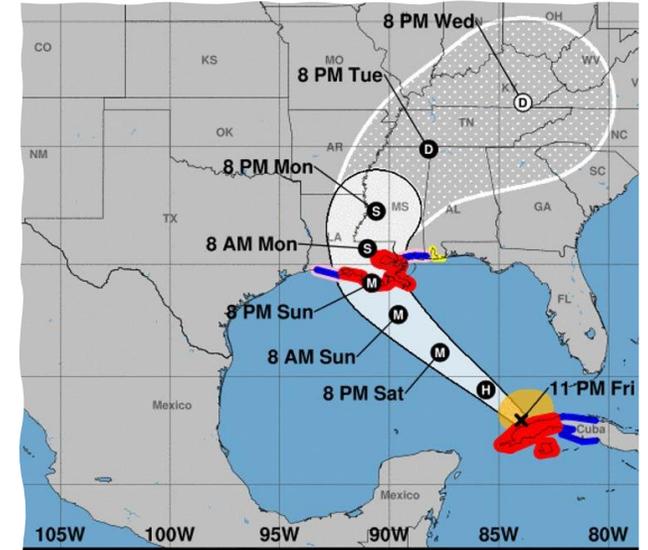
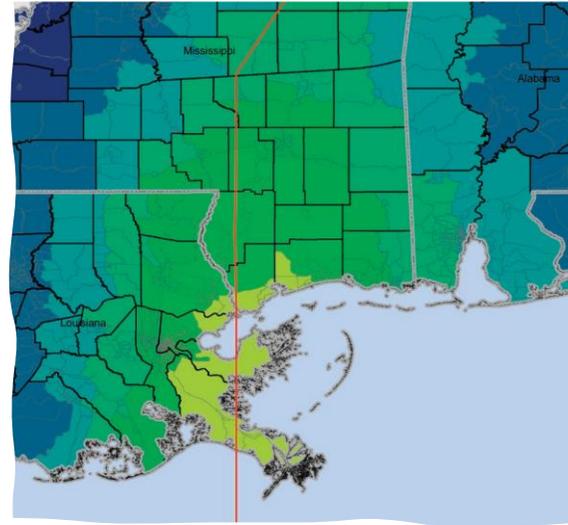
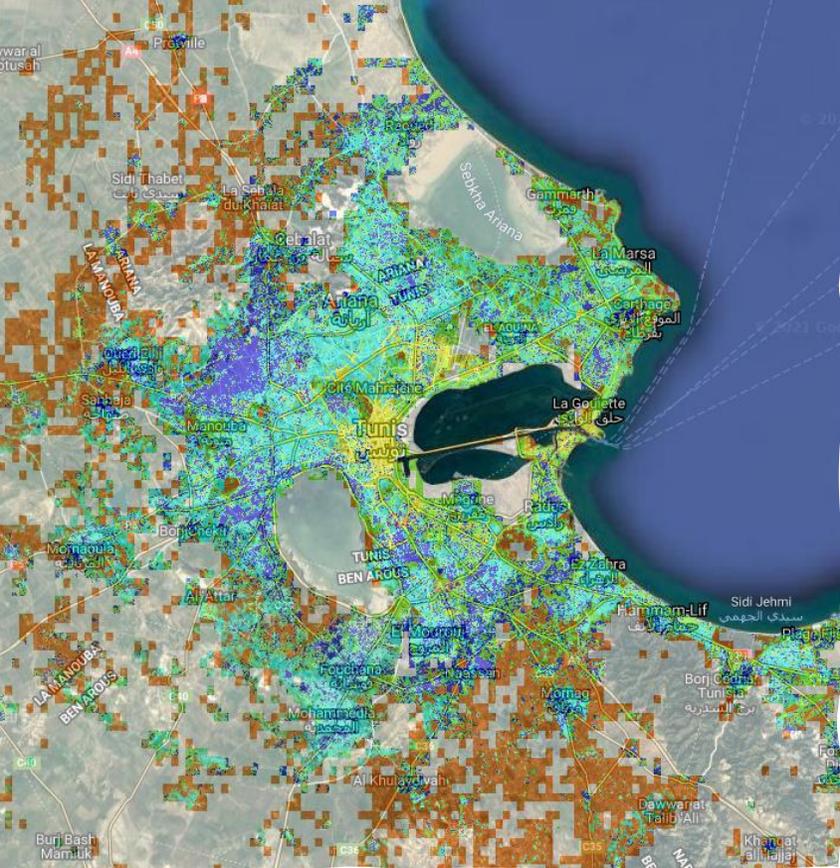


Figure 1: Flood Foresight 6 November 2019 - three-day forecast.

New Applications

- New Perils
 - Wind!
 - Volcano
 - Even Earthquake





New Applications

- Exposure
 - High resolution Exposure
 - Critical Infrastructure
 - Vulnerable Populations

New Applications

- Extend framework to immediate post-event
 - Disasters evolve
 - Cascading impacts
 - Unexpected triggers



Social Networking and Citizen Science

- Remove silos
- Raise awareness
- Reduce uncertainty
- Validate triggers before release
- Raises awareness and acceptance of uncertainty

“There are no false alarms, only drills” –Citizen interviewed about early warning in Mexico City



M 4.3 - 2km E of Carson, CA

2021-09-18 02:58:34 (UTC) | 33.831°N 118.264°W | 11.9 km depth

Did You Feel It?

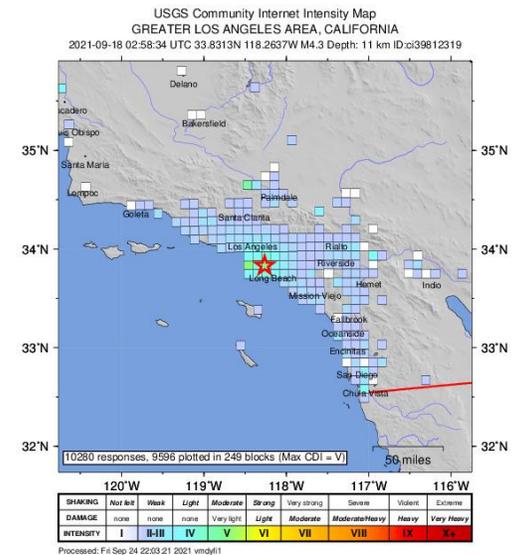
[Felt Report - Tell Us!](#)

[View all dyfi products \(1 total\)](#)

Catalog	CDI	Responses	Source
✓ CI	V	10280	US ⁵

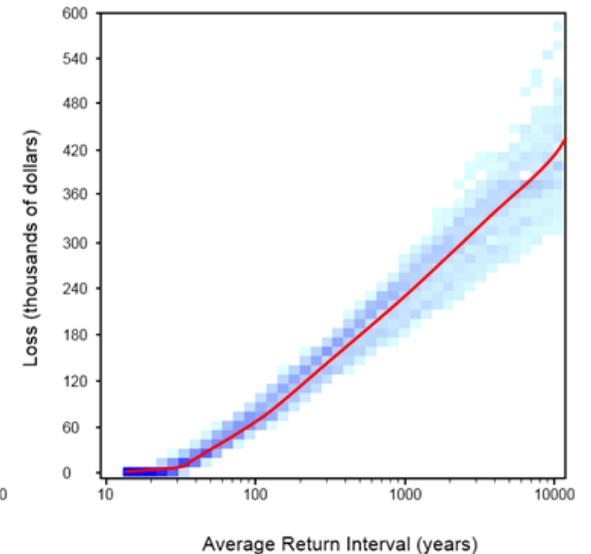
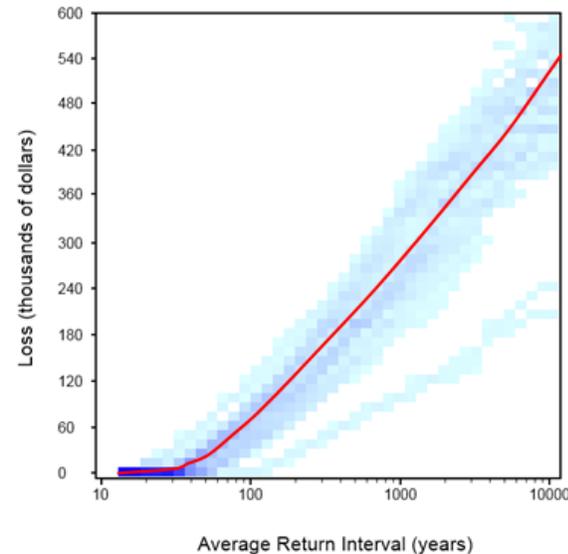
Contributed by US⁵ last updated 2021-09-24 22:03:32 (UTC)

- ✓ The data below are the most preferred data available
- The data below have NOT been reviewed by a scientist.



Understand Uncertainty

- Can be reduced by better EO-based exposure and vulnerability
- False alarms or basis risk can result in unreasonable expectations or distrust of the system



On to WP3

- Utility of models – are they serving all stakeholders' needs or are there gaps?
- Reflection on who the data/models are aimed at and those stakeholders' capacity to engage with them – eg communities don't need technical info, they need accessible, easy to understand, tailored messages that drive action to mitigate disaster/crisis impacts
- Sustainability of models – do they require ongoing technical/financial support? Can national actors engage with them in a sustainable way? If not, what needs to happen for this to be the case?
- Is science/data and local knowledge connected or are the two working in parallel silos?