

# Group Meeting

Yunlong Pan

# Outline

- Hindcast
  - **PRJ-3932** | CERA / ADCIRC Storm Surge Hindcasts: Historical Storms 2003-2023
  - More information for each storm can be explored at <https://historicalstorms.coastalrisk.live>
  - Explore on CERA
- Flood Forecasting
  - Flood Hub
  - Return Period

# Hindcasts

- This project provides storm surge, wind, and wave model results for 64 named tropical storms and hurricanes that impacted the U.S. Northern Gulf and Atlantic from 2003 to 2023.

The screenshot shows the DesignSafe website interface. At the top, there is a banner with the NSF NHERI DESIGNSAFE logo. Below the banner, a navigation bar includes links for Use DesignSafe, Learning Center, NHERI Facilities, NHERI Community, News, Help, Log in, and Register. A search bar and filters for Website and Datasets are also present. The main content area is titled "DATA DEPOT" and displays a project summary for "PRJ-3932 | CERA / ADCIRC Storm Surge Hindcasts: Historical Storms 2003-2023". The summary includes PI (Kaiser, Carola), Co-PIs (Dawson, Clinton N), Project Type (Simulation), Natural Hazard Type(s) (Hurricane/Tropical Storm), Awards (MuSIKAL: Multiphysics Simulations and Knowledge discovery through AI/ML technologies. | DE-SC0022211 | DOE), Keywords (historical storms, hurricanes, storm surge, wind, waves, ADCIRC-SWAN, hindcasts, CERA, Katrina, Ike, Harvey, Laura, Isaac, Dorian, Matthew, Florence, Sandy, Ian, Idalia), and Version (2). Action buttons for Rename, Move, Preview, Copy, Trash, and Download are available for the dataset. A sidebar on the left lists Published, Published (NEES), and Community Data options, with "Help" currently selected.

<https://www.designsafe-ci.org/data/browser/public/designsafe.storage.published/PRJ-3932>

# Hindcasts

Search a storm by:

Select a storm:



## Hurricane MILTON 2024

Oct 5 2024 - Oct 10 2024

NHC Storm Number	14L
Number of Advisories:	23
Category:	H5
Highest Sustained Winds:	180 mph (290.0 km/h)
Lowest Pressure:	897 mbar (hPa)
Fatalities:	28
Damage:	30 billion (2024 USD)
Areas affected:	Mexico • Cuba • U.S. Florida, Georgia

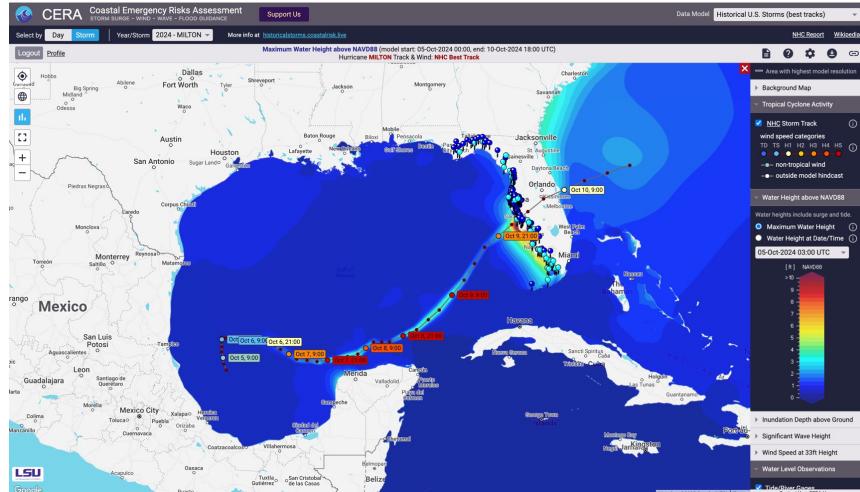


source: [Wikimedia](#)

<https://historicalstorms.coastalrisk.live/>

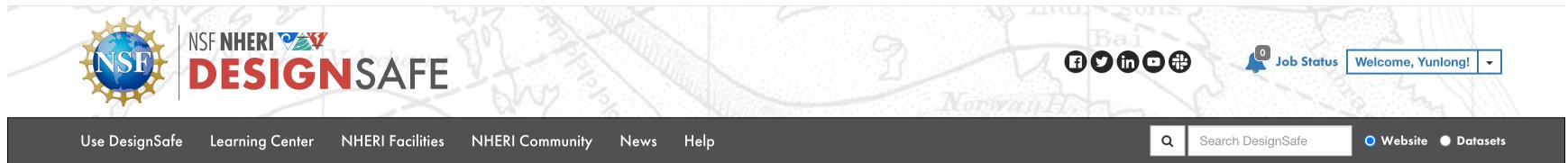
# Hindcasts

- Background Map
- Tropical Cyclone Activity
- Water Height above NAVD88
- Inundation Depth above Ground
- Significant Wave Height
- Wind Speed at 33ft Height
- Topographical Features



<https://cera.coastalrisk.live/>

# Hindcasts-Download



The image shows the DesignSafe website interface. At the top left is the NSF NHERI DESIGN SAFE logo. To the right are social media icons for Facebook, Twitter, LinkedIn, YouTube, and a grid icon. Further right is a 'Job Status' button with a blue notification badge showing '0'. Next is a welcome message 'Welcome, Yunlong!' with a dropdown arrow. Below the header is a dark navigation bar with links: 'Use DesignSafe', 'Learning Center', 'NHERI Facilities', 'NHERI Community', 'News', and 'Help'. To the right of the navigation bar is a search bar with a magnifying glass icon and the placeholder 'Search DesignSafe'. Below the search bar are two buttons: 'Website' (with a blue circle icon) and 'Datasets' (with a black circle icon).

## Initial Onboarding Status

Requesting access initiates the onboarding process for accessing computation and data resources, and your status will change from Waiting for User to Waiting for Staff Approval. A ticket will be auto-generated for tracking and communications. Approval review typically takes up to 1-2 hours during normal business hours, but can take up to 48 hours in some cases. Once approved, your status will change to Completed.

Waiting for Staff Approval

## Data Depot Setup Status

Data Depot Setup will initiate automatically once the Initial Onboarding Status is Complete. When Data Depot Setup Status is Complete you will be able to access the Data Depot private storage areas which is also a prerequisite to utilizing the HPC-enabled tools and applications. Reply to the onboarding ticket if Initial Onboarding Status is Complete but Data Depot Setup doesn't change to Complete.

Preparing

[Get Help](#)

[Continue](#)

# Flood Forecasting

[Google Research](#) [Flood Forecasting](#) [Flood Hub](#) [API Waitlist](#) [Hydrology Model](#) [Publications](#) [Resources](#)



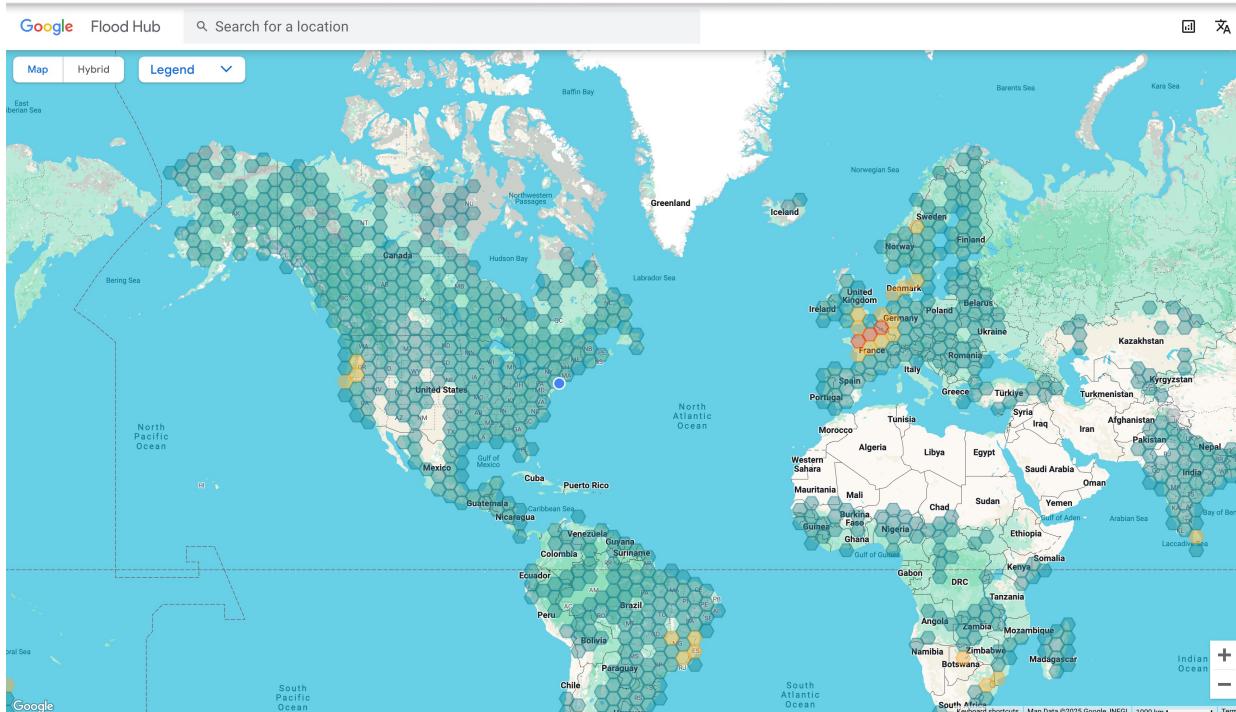
Paper

Blog

Flood Hub

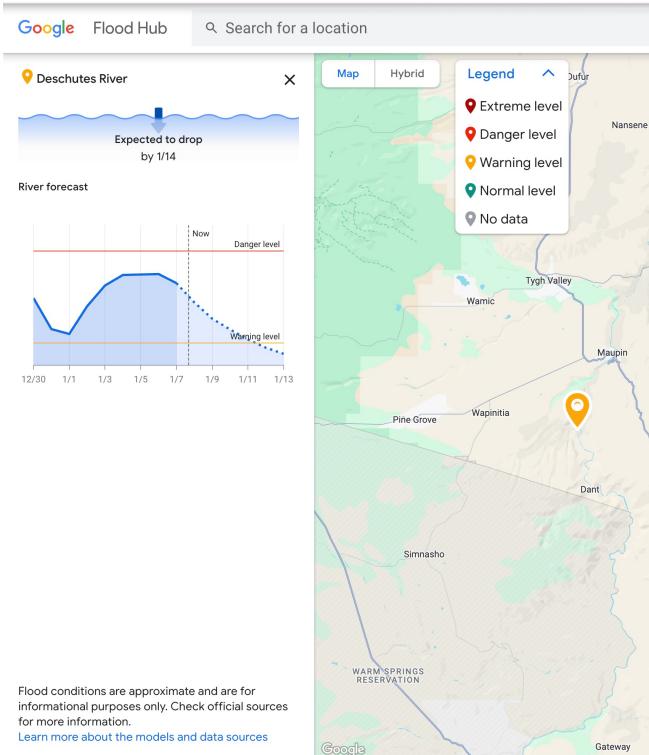
<https://sites.research.google/gr/floodforecasting/>

# Flood Hub



<https://sites.research.google/floods/>

# Return Period



## Models and data sources



## Availability

In which regions is Flood Hub available?

Our models are currently covering more than 5000 locations across river basins in 101 countries. The expert mode allows showing information in over 150 countries, and over 245k locations. Our research teams are working tirelessly to develop ways to expand our coverage.

What information is provided in flood forecasting?

1. A map of current and expected floods.
2. River changes forecasted over time, including alert thresholds that represent 2, 5 and 20 years return period.
3. In some cases, depending on data availability, an illustration of water depth compared to the human body, e.g. ankle height or waist height.
4. Gauge information - see in expert mode when selecting a gauge.

# Flood Forecasting

- Flood Forecasting
  - Nature: <Global prediction of extreme floods in ungauged watersheds>
    - Link: <https://www.nature.com/articles/s41586-024-07145-1>
  - Preprint: <AI Increases Global Access to Reliable Flood Forecasts>
    - Link: <https://arxiv.org/abs/2307.16104>
  - Talk
    - [https://youtu.be/xskF3ggRxog?si=nN6N\\_D8yKPRvB7\\_x](https://youtu.be/xskF3ggRxog?si=nN6N_D8yKPRvB7_x)
  - Code
    - <https://neuralhydrology.github.io/>
    - [https://github.com/google-research-datasets/global\\_streamflow\\_model\\_paper](https://github.com/google-research-datasets/global_streamflow_model_paper)

# Discussion