Are extreme events represented in station records?

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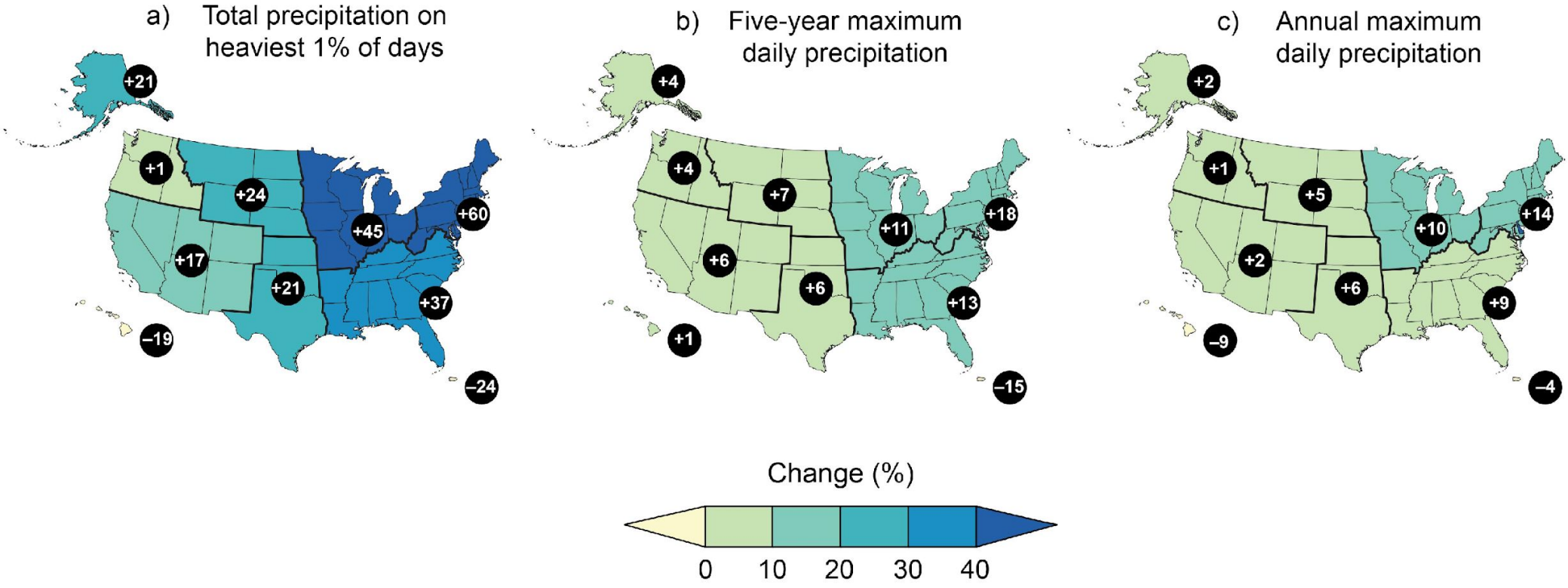
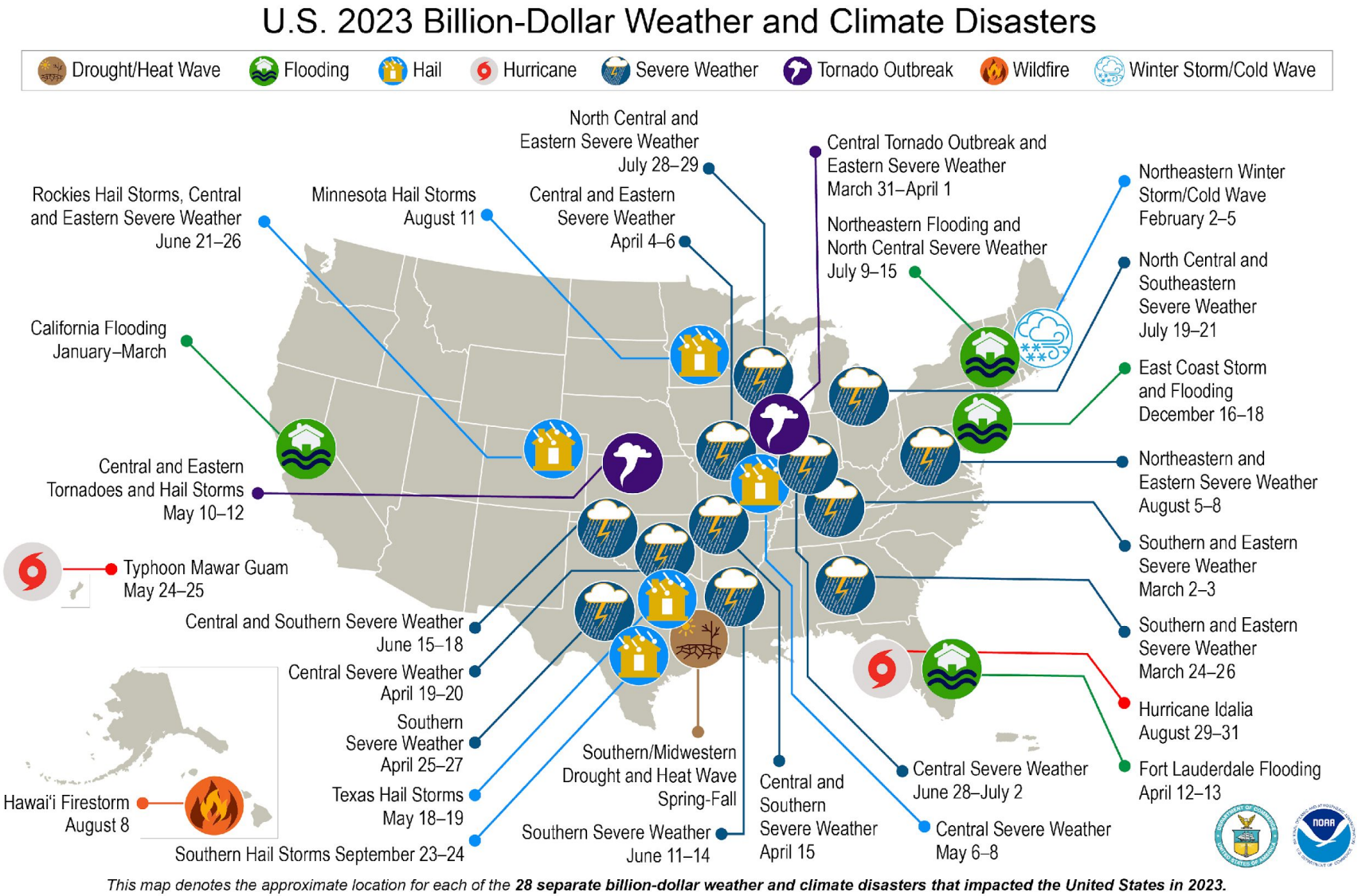
Hydrological intensification – rain tends to be more heavy when it falls

Observed Changes in the Frequency and Severity of Heavy Precipitation Events



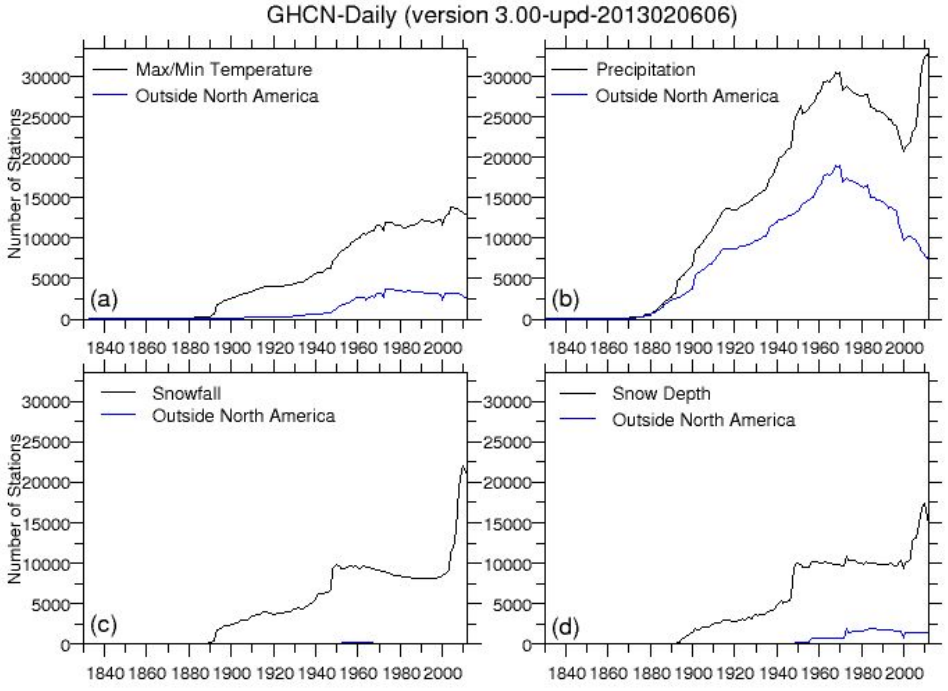
5th National Climate Assessment

Leading to damaging floods, some unprecedented



NOAA NCEI

To understand the risk of extreme precipitation, it helps to place events in a long-term context



NOAA; USGS

However, extremes can also make station records less reliable

- Rain gauge undercatch tends to get worse under heavy rainfall, wind
- During floods, stations may be washed away, or stop recording temporarily
- Or, an extreme event might simply take place in an area without stations
- Need to understand the reliability of station records for different kinds of extremes

Proposed strategy

- Find extreme events over the US in the past few years using NOAA's disaster database
- For each event, pinpoint rainfall amount and distribution with products that use satellite and radar data, such as Hydro-Estimator and MRMS
- Look at gaps and data quality for weather stations and stream gauges in the affected area
- Based on several case studies, assess under what circumstances station records represent accurately (or not) extreme events

Methods and tools

- Python and QGIS
- Visualize and map precipitation and streamflow extremes, identify stations within affected areas, plot time series and quantify data coverage

Outcomes

- Recommendations to better study risk of extreme events
- Potentially more accurate information about flood hazards

Questions/comments?