Using NASA Global landslides catalogue and GPM IMERG for early warning – case of Elgon-Uganda

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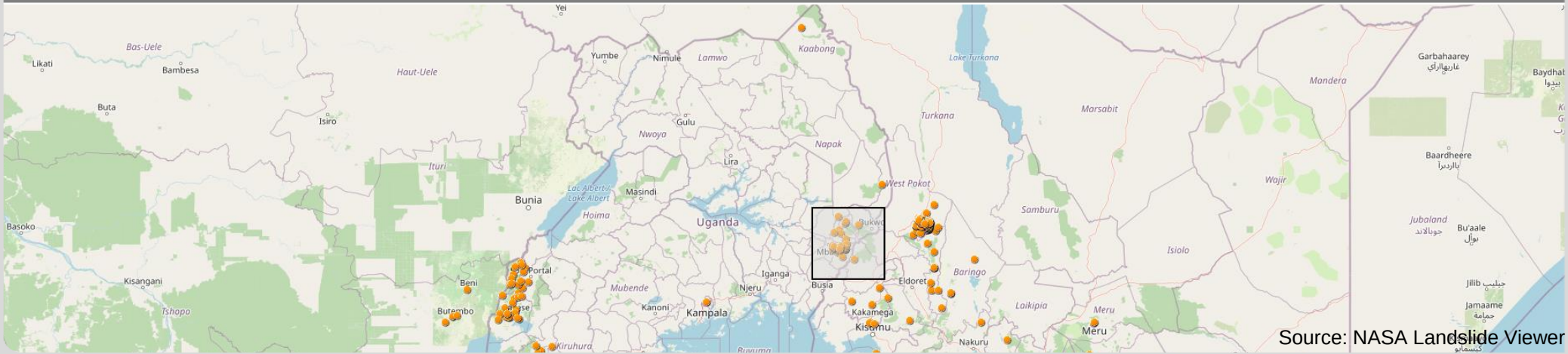
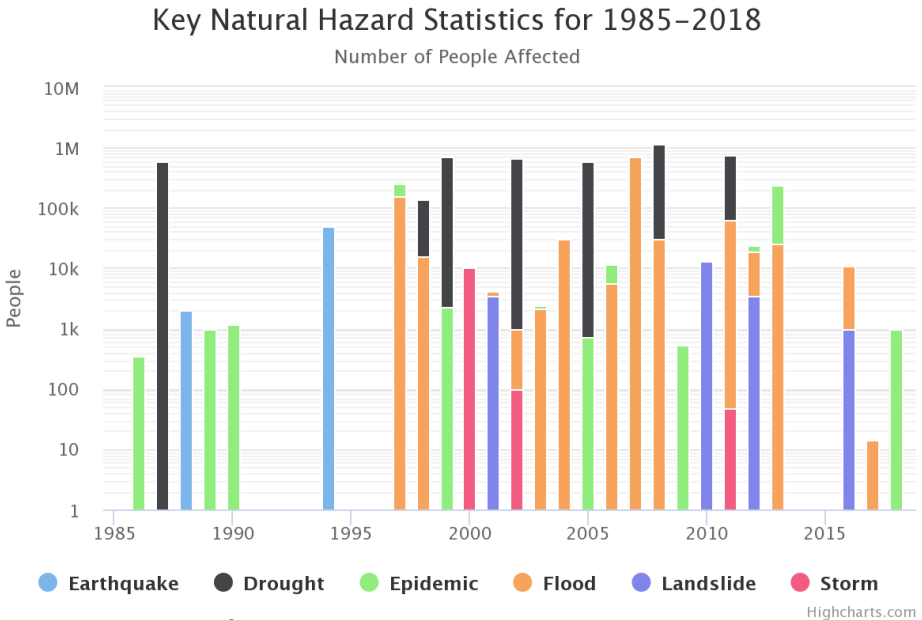
GPM Mentorship program, 29. June 2022



Motivation

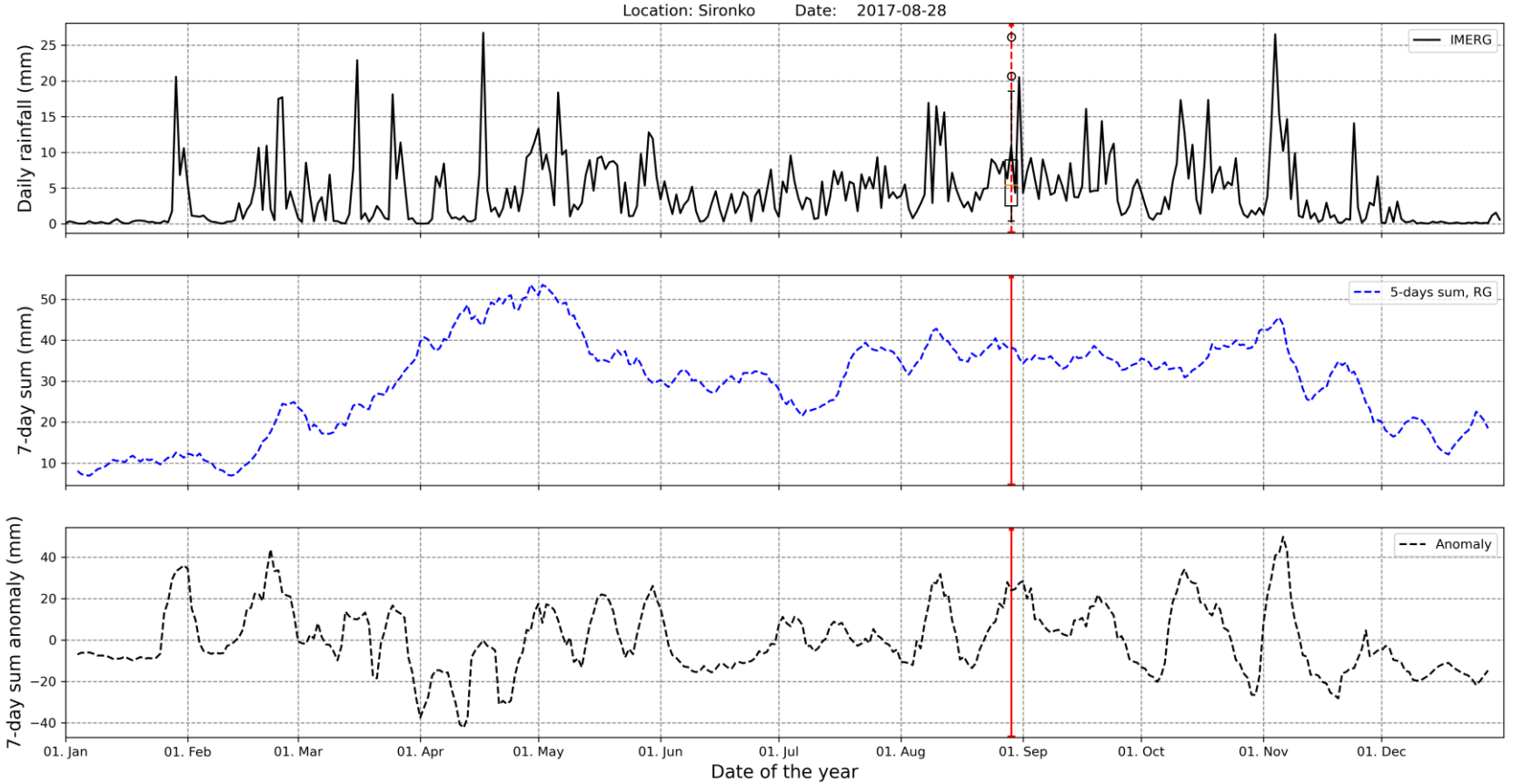


Statistics of Natural hazards over Uganda.
Source: World Bank, 2020

- Are current products adequate to inform stakeholders of landslide risk and nowcast events?
- Are there trends in the numbers of landslide cases and can they be correlated with inter-annual precipitation variability?
- Can ancillary data from other missions (e.g., Landsat) be helpful in supporting risk assessment and event mapping?
- How can the results be meaningfully shared with local stakeholders?

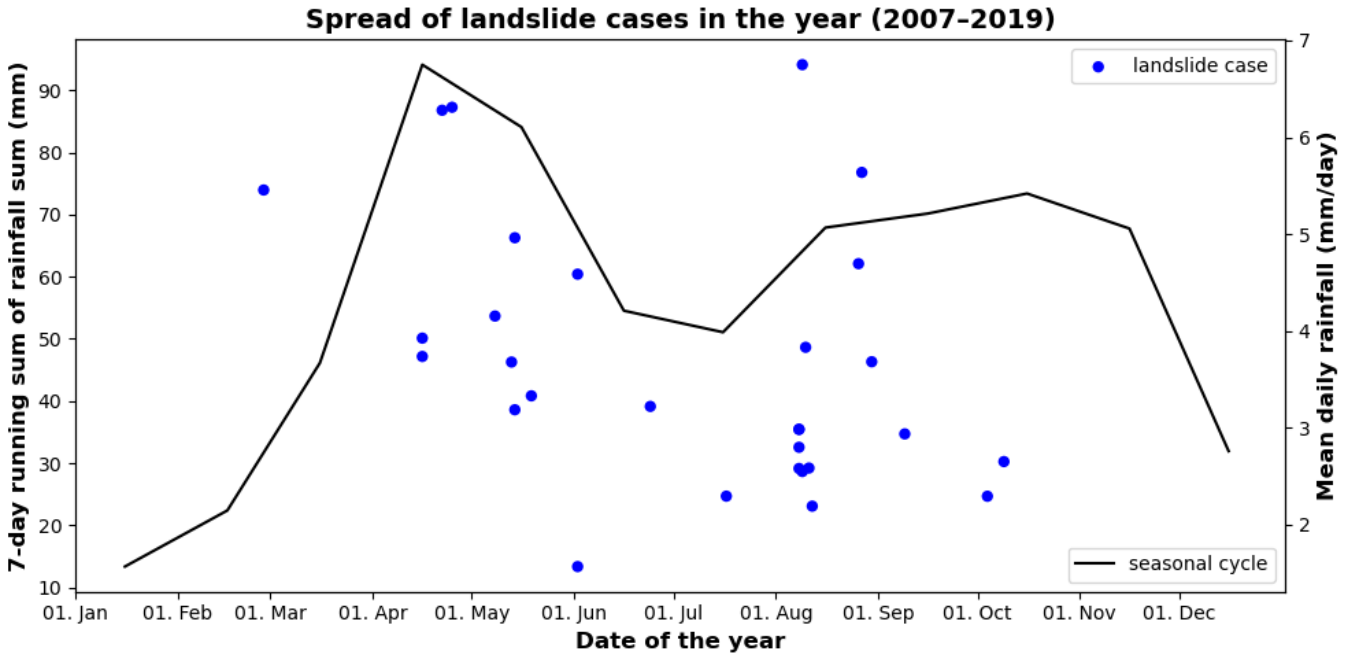
- Almost 70% of natural disasters are hydro-meteorological (World Bank, 2020). These are projected to increase (Collins et al. 2019).

First results

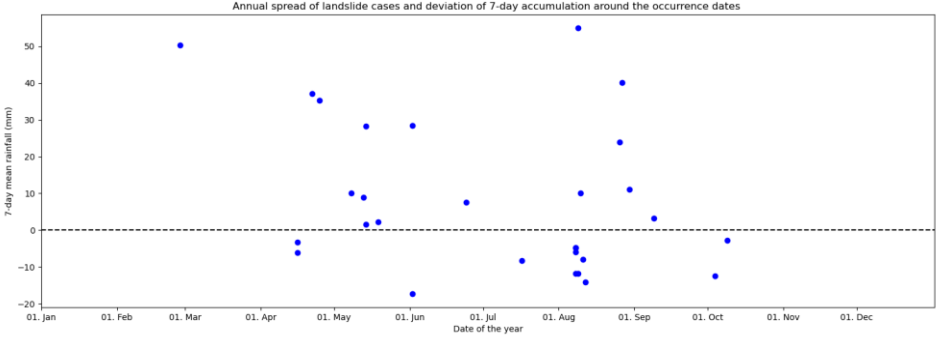


- 29 landslide cases (2007–2019) from the NASA catalogue. - Not very many public sources.
- Analysis against IMERG-F precip. – rainfall is one of the trigger.
- Other factors may be topography, population and land-use?

First results



- Landslide events related to rainfall cycle – precip. clearly a trigger.
- Setting a precip. threshold not easy – little data and other factors.



Next steps

- Prototyping – are there ideas from this project we can implement into the already existing platforms, e.g., the NASA landslides viewer?
- Studying landslide cases using images - google earth engine – help attribute cases to other factors other than precip., e.g., land use. - However, clouds a big hindrance. - radar a possible solution.
- Compare landslide cases against forecasts from the LHASA model.
- Dissemination strategies – assess what avenues are already existing, e.g., office of the Prime Minister, Met Service forecasts and bulletins.

Lessons learned

- NASA has quite a number of products with natural disasters information but one must know how to find, and use it.
- The products provide good guidance – most products are global – down-scaling not easy due to lack of data – working with Met Services could be a solution.
- IMERG rainfall can be used as predictor for landslides warning – though difficult to set a threshold.
- Besides NASA landslides catalogue, there are no data archives publicly available.
- Landslides resources:
  - LHASA: https://gpm.nasa.gov/landslides/projects.html#LHASA
  - Landslide viewer: https://data.nasa.gov/Earth-Science/Global-Landslide-Catalog/h9d8-neg4
  - Google earth engine – for images.