TIER 1: Flood contour maps

When an event is detected in the global twitter feed by FloodTags, i.e. a 'noise' threshold of number of flood related social media messages at a certain area is exceeded, possible inundation maps are created for that location. These maps give information about the potential people and assets at risk. With multiple cities along the same river we could give an estimate of the inundation map which corresponds best with the available flood information from Twitter. This method should be applied on a subnational to regioanl scale and is maily usefull if detailed locaiton information of tweets is lacking.

Method

Maps of fluvial flooding are created based on Height Above Nearest Drainage (HAND) contours as a first estimate flood map. The end user can then decide which 'scenario' or inundation map is most relevant for the current flood. These maps, which represent the potential extent of inundation, follow a simple static HAND approach as described in Nobre et al. (2016). The different HAND contours represent hypothetical flood extents for different water levels, and give an impression of the floodplain at risk. This gives information about the potential people and assets at risk. The HAND contour map can simultaneously show the extent of inundation and the inundation depth. The depth of the flood is the arithmetic inverse of the HAND height. To illustrate this, the figure below represents uniform hypothetical floods from 1m to 8m stage height in a region of the Philippines. For each of these hypothetical floods the HAND contour represents the area that would be flooded if the stage in the river rises to that level. For example, a 8-m stage flood indicates that when the water increases by eight meters in the river channel, the water will inundate until the 8-m HAND contour. The flood level or inundation depth will then be 8m at the river, and zero at the 8-m HAND contour.

With multiple cities along the same river we could give an estimate of which of these inundation maps is the most possible scenario, by checking which one corresponds best with the available flood information from Twitter.

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Example inundation depth maps for hypothetical floods in the Philippines

GFDRR challange fund

This method was applied for the Philippines in a challange fund project from GFDRR where The Red Cross Red Crescent Climate Centre (RCRCCC) and the Philippine Red Cross (PRC) are using this data for disaster response. Different 'scenarios' of flood maps were created for Philippines solely based on the HAND information. These maps give information about the potential people and assets at risk. In order to estimate which is the most likely scenario for a region hit by a flood event, the maps need to be overlapped with the available flood information from Twitter for a particular province. These have been included in a dashboard where the most likely scenario will be highlighted for the province hit by the flood.

References

 Nobre, Antonio Donato, et al. "HAND contour: A new proxy predictor of inundation extent." *Hydrological Processes* 30.2 (2016): 320-333.