Analysis of 2018 Dikmen Flood and Remedial Measures

MSc Student, Noor Ahmad Yaqubi

Flood Modelling and Flood Management Middle East Technical University NCC





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OUTLINE

□ Importance Of Developing Flood Assessment Maps

Development of Flood Maps

Dikmen 2018 Flood Map (on-going study)

□Flood Prevention and Protection Measures



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Importance of Developing Flood Assessment Maps

- Flood hazard assessment and mapping helps us identify the areas at risks.
- Consequently, can improve flood risk management and disaster preparedness based on (e.g.,100-year events, 50-year events etc.)
- Preparedness measures can include changes in land-use planning, implementation of specific flood-proofing measures, creation of emergency response plans, etc.
- Flood Maps can encourage people living and working in flood-prone areas to find out more about the local flood risk and to take appropriate action.





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Data Sets

- Topographic, digital elevation models(DEM)
- EU Guideline for DEM used in flood mapping demands minimum requirement of 10m*10m, but (5m*5m) are preferred.
- ➢ To Generate DEM, following methods and sources can be used:
- LiDAR (Light Detection and Ranging), (Not Available for TRNC).
- SRTM (Shuttle Radar Topography Mission), (30mx30m Available).
- Conventional surveying and contours maps.
- Aerial Photogrammetry technique (Use of Drones).





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Historical Data

- Historical Data are needed to rise awareness, as well as for the Calibration of flood modelling.
- Calibration to a past historic event is the most effective method to measure a model performance [1].
- Historical Data that can be used:
- 1. Flood Maps
- 2. Water level records in river and channels
- 3. Velocity records
- 4. Flood Marks
- 5. Aerial and satellite photos
- 6. Pictures of flood

[1] Huxley, C., & Ryan, P. (2016). Flood Modeling: How Accurate is Your Model? November. www.floodplain.org



https://commons.wikimedia.org/wiki/File:Aerial_View_Missouri_River_Bismark-Maden_flood.jpg



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*Land Use and related Data

Surface Roughness (Manning's Values)

Hydrological Models

- Are used to determine hydrological parameters (e.g., flow hydrographs) of flood waves from the inputs (e.g., precipitation data).
- Hydrological parameters are used as input data to Hydraulic Models.



www.chiefscientist.qld.gov.au/floods

Hec-HMS



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- Flood routing can be described in 1D, 2D, or 1D/2D models.
- Wide range of Tools can be used: Mike11 1D/2D, Hec-RAS 1D/2D, Flo-2D.
- Result output parameters are, flood extent, flow depth, flow velocity, water surface elevation, etc.





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2018 Dikmen Flood Map (on-going study) Flow Depth Map (Hec-RAS 6.0)



Flow Velocity Map (Hec-RAS 6.0)





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Dikmen 2018 Flood Map

➤ 2018 Observed Flood Area

≻ Modelled Flood Map in Hec-RAS 6.0





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Flood Prevention and Protection Measures

Structural Measures:

- A. Construction of dam, reservoirs, channels, levees, etc.
- B. Flood Proofing of new and existing structures:
- 1. New building can be raised above probable flood levels.
- 2. Installation of protective walls, waterproof closures can be done for the existing structures.
- 3. Bridges must be designed accordingly to prevent their damages and blockage due to flow of debris in the flood.

□Non-structural Measures:

A. Land use planning at local or municipal level can be useful in reducing future flood damages.



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