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TOWARD A FLOOD INFORMATION SYSTEM (TABÍS) FOR TURKEY

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Flooding is a serious natural disaster in Turkey similar to rest of the world causing significant economical damage and loss of lives every year. Unlike many other natural hazards floods can be predicted ahead of time. Developing real-time flood event prediction models and early warning systems helps minimizing the economical damage and risk of loss of lives. Also hydrologic and hydraulic modeling of the probable floods and developing flood hazard maps allows to proper planning of flood prevention and protection measures. Both the real-time flood event prediction models and hydrologic-hydraulic modeling of flood involve huge amount of data from several disciplines. Turning the atmospheric, meteorological, topographical, hydrological and hydraulic data into information about flood at different complexity levels for researchers, decision makers, operators, and public requires comprehensive modeling and information management systems. This study attempts developing a base platform (TABÍS) for such a flood modeling and information system for Turkey. TABÍS is a web-based platform that allows real-time acquisition, storage, management, and displaying the entire flood related static and time series data. The static data in TABÍS involve water body layer, hydrologic basin boundary layer, flood protection structures layer, historic flood event locations and facts. The time series data involve radar rainfall and flow measurement data. There are other background layers such as administrative boundaries, roads, aerial images, land use / land cover maps etc. TABÍS also stores and displays pre-developed flood maps for the available flood study areas. TABÍS is aimed to be the platform for researchers, engineers, decision makers, and public to produce, store, model, and share all the flood related data and information in Turkey.

INTRODUCTION

The amount of atmospheric, meteorological, topographical, hydrological and hydraulic data collected through radars, satellites, and ground based stations increased significantly in recent years. Smits et al. (2009) reported that the size of observed data in the world exceeded 25 terabyte as of 2009. Converting the collected hydro data into information about flood at different complexity levels for researchers, decision makers, operators, and public requires comprehensive modeling and information management systems. Most of the hydro data have spatial component; therefore, Geographic Information Systems are commonly used for archiving, management, analyses, modeling and sharing of the data. Recently, with the advances in the web technologies and Internet speed, web based GIS platforms became more

popular. The web based GIS platforms allows the data collecting and information developing agencies to share the data and information with the users faster and easier.

This study attempts developing a web based GIS platform (TABİS, 2014) for flood modeling and mapping related data and information for Turkey. The primary motivation of TABİS is 1) developing a database for the existing and future flood studies with flood maps, and 2) displaying the flood maps online in an interactive GIS environment. In the next stage, TABİS will upgrade to a platform that allows real-time acquisition, storage, management, and displaying the entire flood related static and time series data. Currently TABİS has a database for the existing flood studies and the flood maps. The existing flood studies database is extending as the developing parties such as agencies and researchers provide the flood studies and maps. The existing flood studies database includes the information for each flood study:

- Title of the study,
- Contact person and affiliation,
- Publication date of the study,
- Vicinity of the study area,
- Flood scenarios and the list of produced flood maps.

The location with coordinates and some basic facts about the flood study can be displayed on the map (See Figure 1).

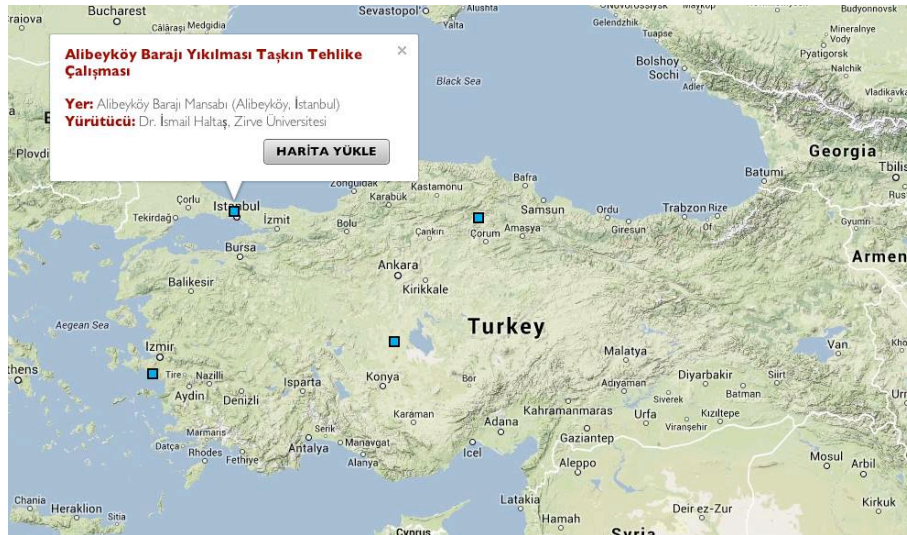


Figure 1. The location and some basic facts about the flood studies on the map.

In the Study Area View each available flood layer (extend, maximum depth, maximum velocity etc.) can be displayed by selecting from the dropdown menu (See Figure 2). The flood layers are stored in the database in KMZ file format. The pre developed pdf flood layer maps at various scales (5K, 10K, 25K, 50K) can also be selected from the dropdown menu and downloaded. If the technical report of the study available in the TABİS, it can be downloaded in pdf file format from the Study Area Information Box.

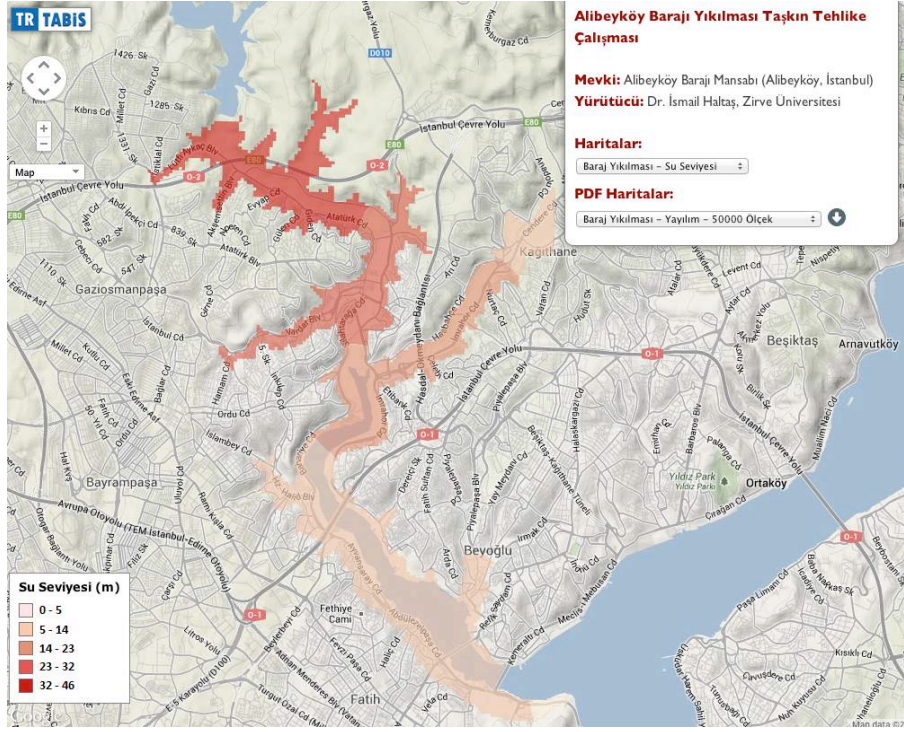


Figure 2. Study Area View for Alibeyköy Dambreak Flood Study displaying maximum water elevation layer.

Another database is developed to catalog the inventory of the past flood events. The location with coordinates and some basic facts about the flood event can be displayed on the map (See Figure 3). The past flood events inventory includes the following data and information for each flood event:

- Name of the city and community where the flood event occurred,
- Date of the event,
- Description of the damage caused by the event,
- Rainfall depth and duration measured in the nearest rain gage station that caused the event.
- Web Link to the news article and/or video clip of the event (if available)

The past flood events database is extending as new information about the past events are collected and added to the database.

The other flood related data layers existing in TABİS are precipitation observation network, streamflow observation network, water body layer, hydrologic basin boundary layer, and flood protection structures layer (See Figure 4). There are background layers such as aerial image, land use / land cover maps etc.

TABİS is aimed to be the platform for researchers, engineers, decision makers, and public to produce, store, model, and share all the flood related data and information in Turkey.



Figure 3. The location and some basic facts about the past flood event on the map.



Figure 4. The water bodies and streamflow network layers with aerial image at the background.

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REFERENCES

- [1] Smits, P., Annoni, A., Craglia, M., “One Information Space, Billions of Sensors, Technologies for Information Management”, *Proc. ICT FP7 Call 5 Intelligent Information Management*, (2009)
- [2] Web Page, TABİS “Taşkın Bilgi Sistemi”, <http://tabis.zirve.edu.tr>, (2014).