I am Yilan Wei, the founder of Chengdu GIS Water Company. Chengdu GIS Water uses in-house hydrological and hydraulic modeling, data analyzing, and GIS technology to solve flood problems. There are basically two aspects to our products. First, we use flood maps to help our clients to identify potential flood risks. Second, we go to client locations to provide on-site loss prevention and engineering solutions.

Here is the information about this catastrophic flood event. On May 1-2, 2010, a historic rainfall event brought large-scale flash flooding to western Tennessee and Kentucky, especially in the Cumberland River Basin. Some areas received more than 43 cm during the two-day event, which exceeded the largest values observed in more than 140 years of records. The resulting streamflow responses to this event are the focus of this study. To model this event, The Hillslope River Routing Model （HRR）which is a hydrologic-hydraulic model simulates excess rainfall and routes both surface and subsurface runoff, separately, using kinematic wave and channel flows using diffusion wave methodologies. This demo here is an application example of scientific achievements to the potential commercial world.

In short, our response to IBM's Call for Code activity is a numerical flood modeling of the Nashville 2010 flood event. We use an IBM cloud server to run our hydrological – hydraulic model. The model's algorithm is based on scientific concepts. It will help us to predict or replay flood events and give clients accurate risk assessments. As you will see, the demo is quite straightforward.

Choose an input file and upload to http://158.85.25.147/

(The example input file can be downloaded from the following link:下载测试数据)

After the model on the IBM server has run, it will return the results. We have visualized the result. Visualized results can be seen here: https://youtu.be/nYonxLtf6W0

Given enough time, we would have made the visualizing process automatic as well. We also have ability to model the flood depth and geometry. But for the demo, it is only the streamflow that is represented.

The input file is generated through DEM, land use, soil, and impervious area data. From there we get the model perimeter for each input unit. More information can be found here: https://github.com/weiyilan/IBM-Call-for-code

In the future, we want to implement our model in a way that's easy for clients to operate. We would like to automate and simplify the input variables. For example, clients would just need to select a region and a flood map could be visualized in real-time. In the future we will also implement VR/AR technology, so our client can easily visualize their flood risk on-site and on the go.

Thanks to the IBM call for code activity, we got this opportunity to showcase our demo and demonstrate our ability to help clients simulate and visualize flood data. Thank you again!