Bryant: Our study concerns Mexico City, Mexico which resides in an endorheic basin and therefore has suffered flooding problems for centuries.

Bryant: Mexico City is one of the most populated cities in the world and many of the causes of flooding can be blamed on humans. For example: urbanization, subsidence and therefore damage to drainage systems, and debris clogging the drainage systems can all be credited to mankind.

Bryant: The community has normal concerns; they're worried about infrastructure such as power grids, and septic systems. They're concerned about personal property and most importantly, human life. They are also interested in ways to prevent flooding.

Bryant: Everything we learn in our project will be shared with our partners and end users: (INEGI), (CONAGUA), (Monterrey Tech), and (CAALCA). All of these organization work toward improvement of the city.

Ryan: Our project is designed to study flood vulnerability in Mexico City using physical and social data. We used physical data to derive flood maps and social data to evaluate vulnerability. We collected several social statistics from our project partner INEGI and input these statistics into Microsoft Excel to perform a flood vulnerability assessment. We used the Landsat 5 Thematic Mapper to derive surface reflectance data used to create inundation maps. CONAGUA has provided us

with rain gauge data which is used to analyze storm events. LiDAR data was given to us by our partner INEGI as well and was used to create our DEM's to be used in our models. To validate these results we used the HAZUS model from FEMA.

Fang: Two surface reflectance products from Landsat 5 TM are used for Feb 2010 flooding.

Fang: Based on the difference of reflection before and after flooding date, we use Isodata classification in Erdas software to create this inundation map to show where was flooded in Mexico City.

Fang: Water depth map is another product that was widely used in the flooding management.

Fang: We extract the flooding polygon from the former inundation map and use the DEM to get the mean elevation on flooding boundary in each catchment which is supposed to hold the water from flowing out. Subtracting the mean elevation on the boundary by surface elevation, we get this water depth.

Fang: Which can help us to show the flooding depth and assess the economic damage.

Pedro: The use of Physical information, such as the flooding maps developed using LANDSAT, proved to be a useful tool. Tools such as these helped to ascertain the areas that were prone to flood during the inundation event of February, 2010. To identify which of these areas were susceptible social factors to

this type of natural hazard, we conducted a Principal Component Analysis (PCA) including both socio-economic aspects and the flood areas calculated in square Kilometers. From this analysis, we gathered the percentage of contribution of each variable to the first three components, who account for over 92% of the total variance. Then with the percentages of contribution we were able calculate a multiple-criteria risk analysis between several rasters of socio-economic and physical parameters.

Pedro: This was possible using ArcGIS weighted Overlay Function. This function takes into consideration the percentages of influence, calculated with the PCA analysis, and it overlays the criteria to obtain a vulnerability and Hazard of place raster.

Rohini: We are utilizing HAZUS - MH, a multi hazard model created by FEMA (Federal Emergency Management Agency). HAZUS was primarily created for United States and comes with default inventory for all the states at census tract level. So far, we have successfully implemented the model for Mexico City by utilizing HAZ-I (HAZUS International) tool created by Giedrius Kaveckis. In addition to that, we have also collected various inventory information including the location of basic amenities and other social data which would be an input for the model. Due to the unavailability of discharge data, we weren't able to run the model successfully so far. Our future work would include successfully running HAZUS for the federal district and integrate more social and inventory information to do in-depth analysis of flood affected region.