Nepal Ecological forecasting Project
Vulnerability to climate change is defined by the IPCC 2007 as the degree to which a system is susceptible to, and unable to cope with the adverse effects of climate change, including climate variability and extremes.
Many studies on vulnerability have been focused on natural hazards rather than sustained climate variability and changes. In this study, a vulnerability assessment is performed in Nepal by considering gradual changes in temperature, precipitation, and extreme climate events.

Team Member Introductions
>>[Binita KC]: Hi I am Binita KC. I am graduate student at the University of Georgia, I am the team lead of this project.

>>[Tiffany Webb]: I am Tiffany Web. I am an earth system science undergraduate at the university of Alabama Huntsville.

>>[Elinor Crook] : I am Elin crook and I am also an undergraduate at UAH

>>[Travis Rael]: I am Travis Rael and I am also an undergraduate in earth system science here at UAH.

>>[Eliza Shrestha]: Hi I am Eliza Shrestha, Geomatics engineering graduate from Kathmandu University Nepal.

>>[Laxmi Thapa]: Hi I am Laxmi Thapa Geomatic engineer from Kathmandu University Nepal.

>>[Florencia Tuladhar]: Hi I am Folrencia Tuladhar, graduate of Geomatic engineer from Kathmandu University Nepal. And together we are working on the climate change vulnerability project for NASA develop Fall 2012.

Local Perspectives
>> [Community Member 1] : (Subtitle) Yes, Climate is changing these days. Sometimes there is heavy rainfall at other times there is no rainfall. The monsoon rain is either early or very late for crop season. Sometimes it floods at other time we don't have enough rainfall for growing crops.

>> [Community Member 2] : (Subtitle) Due to early monsoon rain, crop productivity has been reduced to 50%. Due to reduced productivity we cannot grow food [] enough for ourselves so we need to import and purchase food grains from somewhere else which is directly affecting our livelihood.

Research Methodology
>>[Binita KC]: This is our overall methodology. First, we identify urban and rural districts we weighted the men change in temperature and precipitation accordingly.

>>[Tiffany Webb]: We also included socioeconomic variables under sensitivity, adaptive capacity as well as geographical vulnerability.Overall vulnerability was measured as a function of sensitivity, adaptive capacity and exposure.

Significance
>>[Florencia Tuladhar]: This research is important as it has quantified vulnerability posed by climate change derived from the combination of climate and social data.

Datasets, Acquisition and Analysis
>>[Travis Rael]: If we look at a GLDAS image at 0.25 degree resolution we can see the lower temperature in the Himalayan regions of Nepal and the higher temperature in the Terai region. As we look at an image from TRIMM during the month of July we can see the effects of monsoon season in the country showing high values of accumulated precipitation in millimeters per hour.

>>[Florencia Tuladhar]: There are 282 meteorological stations in Nepal. This map shows the spatial distribution of

weather stations collected from department of Hydrology and meteorology.

>>[Eliza Shrestha]: There are different types of disaster that occur in Nepal. For the vulnerability index exposure was measured in terms of events such as drought, hailstorm, flood, heatwaves , landslides, cold wave and they were mapped as climate disaster map according to the events that occured in 2000-2009.

>>[Laxmi Thapa]: We collected statistical data of various socioeconomic data sets for census 2001 from Central Bureau of statics Nepal. Only those variables with higher impacts of climate change were chosen and these variables were then classified into human sensitivity and adaptive capacity. In human sensitivity variables like population density, and household size were taken and in case of adaptive capacity the variables like [] educational level, number of technology users and urban and rural areas were included. These maps were then arranged and then mapped in ArcGIS.

Findings
>>[Binita KC]: From 2000-2009 the hazard frequency was found highest in the middle hills, and in the western part of the country where landslides occur.

>>[Tiffany Webb]: The social vulnerability index or SVI in 2001 show the most vulnerable to be located in the southern area where population density is high.

>>[Tiffany Webb]: The climate change exposure index in 2000-2009 shows various degrees of exposure where high exposure include western mountain, middle-hilly and mountain districts.

>>[Tiffany Webb]: The overall vulnerability index for 2000-2009 includes exposure, sensitivity and adaptive capacity, and place based hazard. With this mapped index, we were better able to identify the least and most vulnerable areas of Nepal.

End Users
>>[Laxmi Thapa]: The resultant maps could guide policy makers to identify, prioritize and to allocate resource to develop a robust integrated approach to increase resilience to climate risk at national and local level.

Project Partners
>>[Jason Kessler]: Its a great pleasure to be sitting here in the SERVIR labs surrounded by develop students and to see the partnership between SERVIR and DEVELOP is really starting to create results.

>>[Sebastian Wessleman]: I am capacity budding lead at ICIMOD for this Himalaya project in Nepal and I very happy with this partnership with develop NASA and we were very happy to help student work here as interns and learn about applied science project.