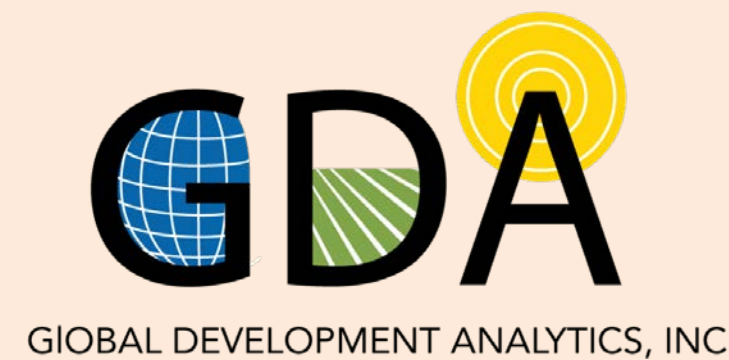


# World Food Security: Elements of Climate and Climate Change and Ramifications of Climate Change Events on Food Security



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Presented during the 26<sup>th</sup> Symposium on Education at



## Motivation for the Course

**Climate literacy is lacking based on a dearth of teaching, scholarship, informal discussions with colleagues, and the literature.**

How do we solve this problem? As part of the La Salle University Summer Academy and a continuation of the successful collaboration NMSU has with La Salle through the Utopia Project, we were invited to participate in their 2016 Summer Academy. The class also offered an opportunity to experiment with a team teaching arrangement covering climate change and food security.

## New Mexico State University – Las Cruces Main Campus

A land-grant institution founded in 1888, New Mexico State University is designated as a Hispanic Serving Institution on a 900-acre campus and enrolls more than 15,000 students from 49 states and 89 foreign countries.



NMSU is a NASA Space Grant College and is home to the very first Honors College in New Mexico. A Hispanic-serving institution, NMSU serves a multi-cultural population of students and community members across the state at five campuses, a satellite learning center in Albuquerque, cooperative extension offices located in each of New Mexico's 33 counties, and 12 agricultural research and science centers.

## La Salle University – Bogotá, Colombia

The La Salle University is a private and nonprofit higher education institution located in Bogotá, Distrito Capital, Colombia. The university was founded by the Lasallian Brothers in 1964 and now has 24 academic programs, an undergraduate population of 14,389 students and 857 graduate students on four campuses (three in Bogotá and one in Yopal, a rural campus 210 km NE of Bogotá). Our course was taught at the Chapinero campus on the east side of Bogotá.

NMSU faculty, staff and students have worked with La Salle on teaching and conducting agricultural projects at their Yopal campus.



## Our two-part short course design

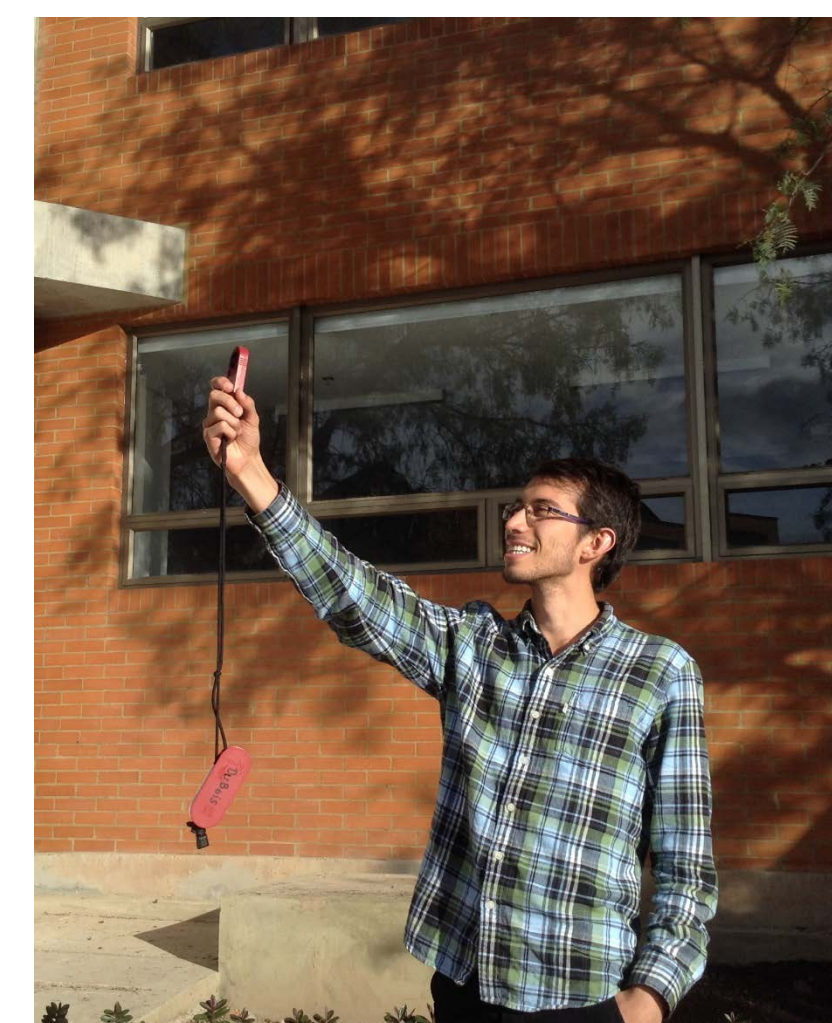
A course was developed and taught during the summer of 2016 at La Salle University, Bogotá, Colombia on the topic of world climate change and food security. This course was a team effort between two faculty at New Mexico State University, staff from Global Development Analytics, and the Universidad de La Salle, Bogotá. The course was offered during the university's intensive two week Summer Academy II and consisted of a combination of lectures from the NMSU faculty, hands on activities, discussion groups, and a hackathon. Students enrolled in the course were mainly civil and environmental engineering juniors and senior undergraduates but not limited to those majors.

Content for the climate change science portion was a blend of the AMS Climate Studies Diversity Project curriculum and information used in previous courses taught by the authors with some adaptation for cultural differences.

## Topics covered in climate change classes

We covered the basic physical processes that lay the foundation for climate change with a focus on impacts to Colombia. We used concepts and graphics from the American Meteorological Society Climate Studies textbook.

The observational methods focused on how climate data can be collected including current technology and their physical limitations. Lectures were followed by outdoor laboratory exercises to measure air and surface temperatures around the La Salle campus. The students were tasked to put these measurements in context of the urban environment.



## Topics covered in the food security class

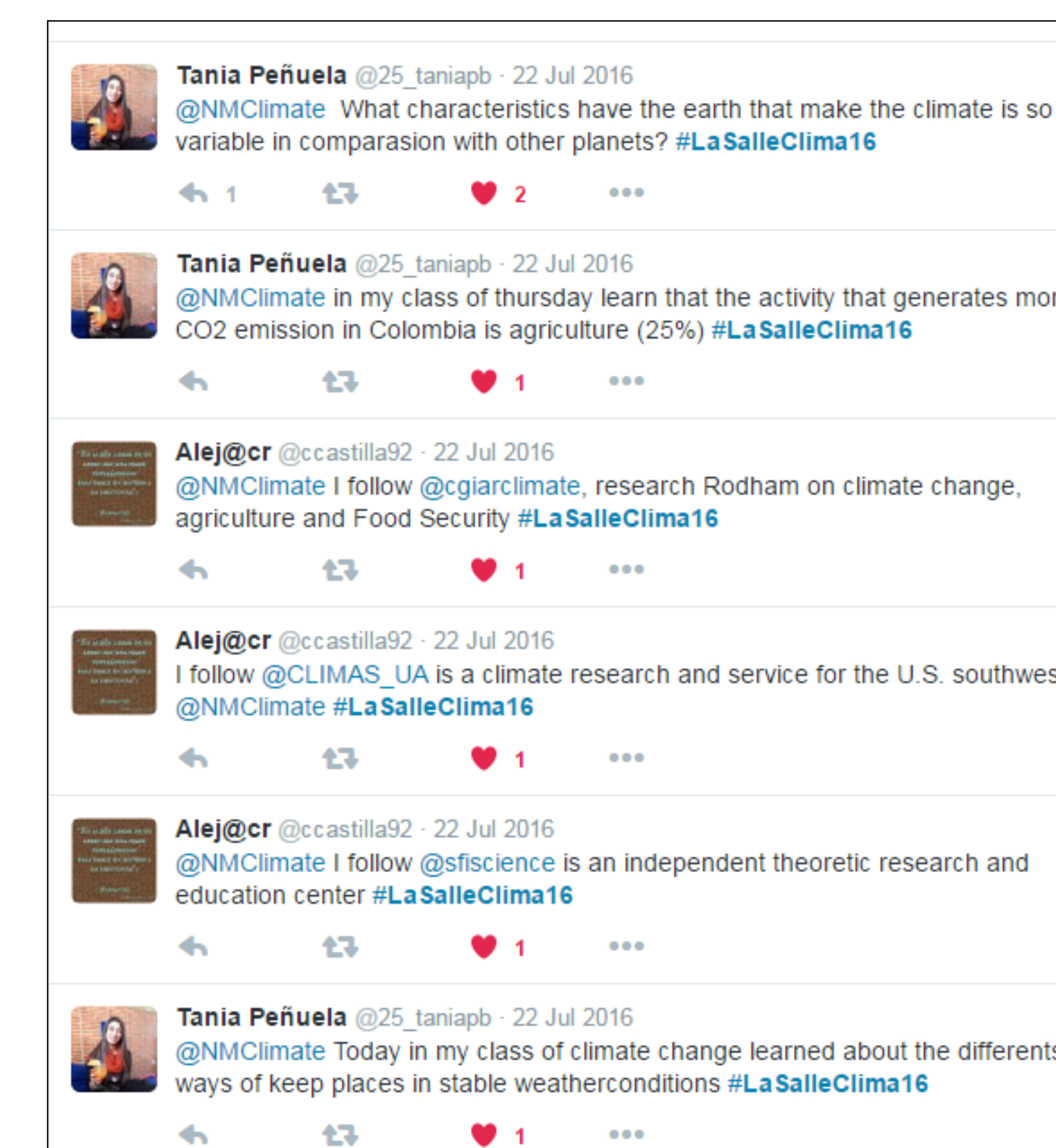
Our goal was to instill in the students a realization of the impacts of current global climate change events on local and world food security. The specific objectives are:

1. Identify principal climate change processes that are impacting food security at the macro level and a more regional level in Colombia.
2. Identify major food chains that have been or will be seriously impacted by global climate change events.

Special attention was paid to agricultural productivity in Colombia. The concept of "climate-smart" food production was investigated to understand the role played by an increasingly variable climate and strategies to mitigate adversity and provide a secure food value chain. The use of a weather data acquisition platform was taught by GDA instructors during the hackathon to capture and analyze Colombian daily weather data, provided through the generosity of the aWhere, Inc. organization.

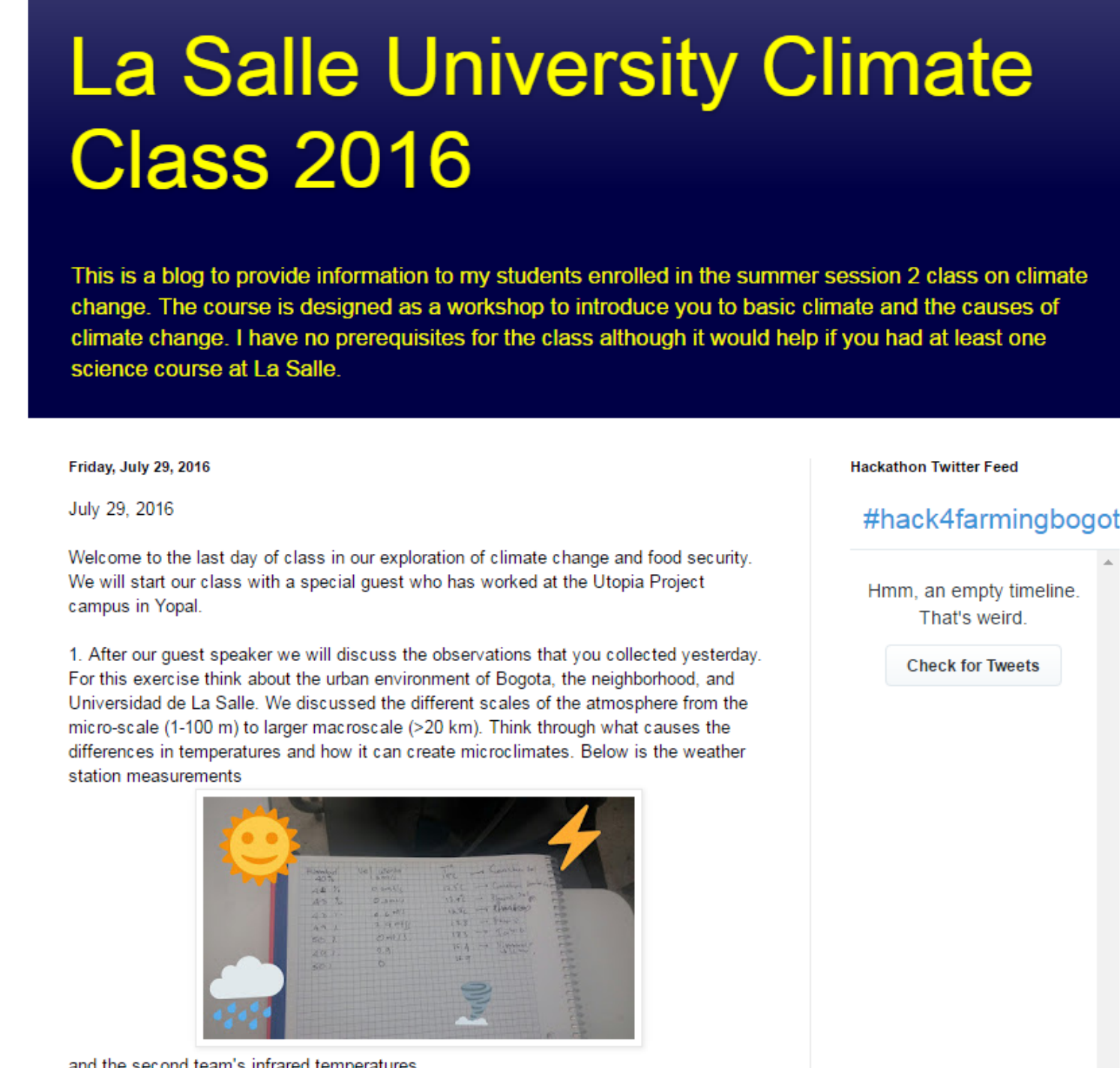
## Using social media in the course

At the start of the climate change course we required each student to set up a Twitter account if they do not have one. We have found that the majority of the students already used Twitter and had smart phones. Day to day communication to the students was facilitated using a course blog, using blogspot.com, and use of Twitter. One of the assignments was to follow at least two internationally known climate scientists. The student's assignments consisted of Tweeting information that they learned that day in the course. We also had the students pose questions on Twitter so that they could start a dialog with others in the class and other scientists. A few examples of the students tweets are below.



Students were evaluated on the number of questions posed on Twitter, their creativity, and whether they demonstrated an understanding of the topic. Students tweets were tracked using Hootsuite.

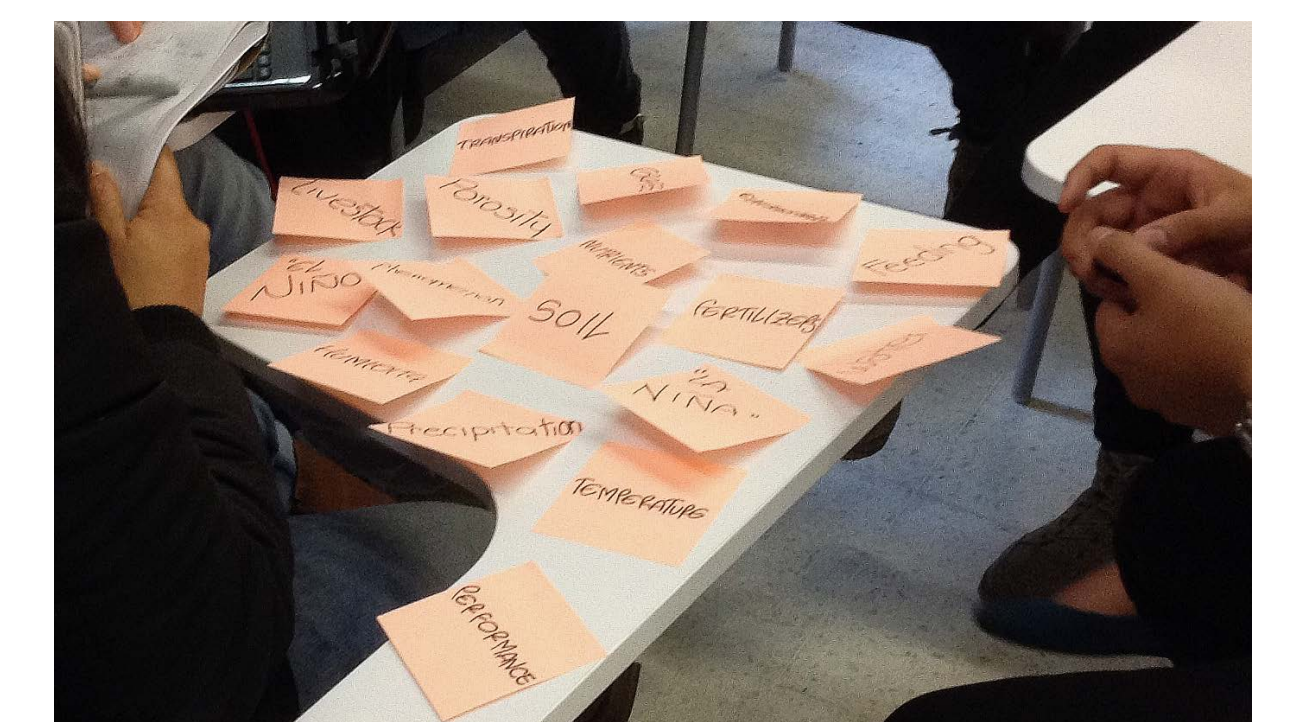
We used a simple blog as our class course management system with daily posts of the homework assignments, keywords mentioned in the class lectures, and posting of data collected during the laboratory sessions. Below is the entry for July 29, 2016 showing a post of one of the group's data collected the previous day.



## Hackathon

The two-day hackathon was led by the staff from Global Development Analytics and incorporated sessions on website and presentation tools, data collection, and basic elements of data analysis using excel. The theme of the hackathon was about learning and inspiring ideas from the participants and building teamwork to solve problems. The students were requested to identify a key problem related to climate change to address and then identify what would be needed to solve this problem including locating data.

Students had to decide as a group what topics they wanted to cover. The instructors helped them to narrow their focus and build on their ideas.



At the conclusion of the hackathon the student teams competed for a prizes and were judged on impact, innovation, climate relevance, and technical achievement.

We recorded the presentations on uploaded them on YouTube, <http://youtube.com/nmclimate>  
Tweets #hack4farmingbogota

## Concluding remarks

- We found that students enjoyed using Twitter as part of the course format and valued the online interaction between classmates.
- There was a significant language barrier. The university requested that the course be taught in English although that was their second language. Some parts of the course were in Spanish when needed.
- The course was taught based on the AMS Climate Studies curriculum and modified to meets the needs of the short course.
- The hackathon was a success with the help of the experienced GDA staff. Based on the evaluations, the students enjoyed all parts of the course.

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