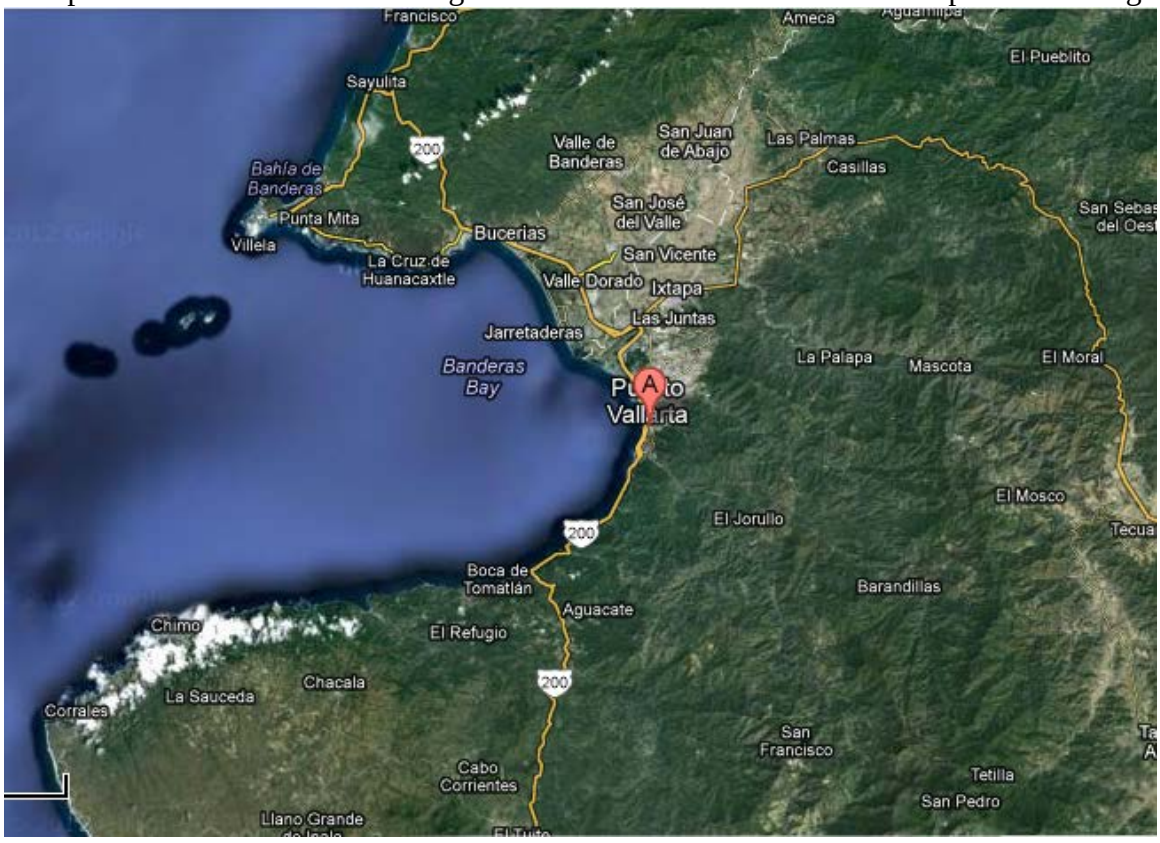
Nick Shearon
MCEN 4151 Flow Visualization
Professor Jean Hertzberg

Clouds 2 Report

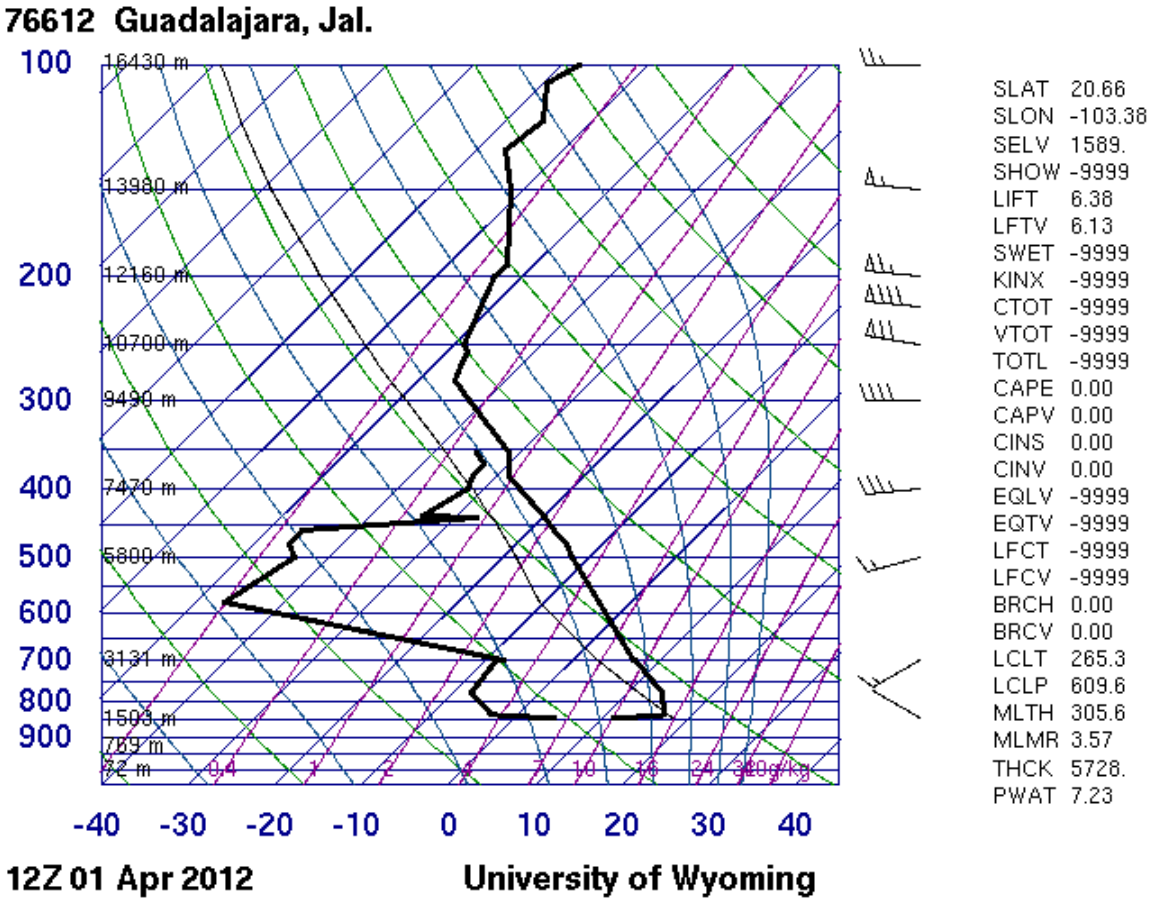
The purpose of this image was to capture cloud activity in Puerto Vallarta during March of 2012. I tried to capture a large landscape image of the bay at sunset. This image was fun to try to capture because of the variety of cloud formations that occurred each night. I struggled mostly with the timing of the image, sometimes I was just not able to get up to a good vantage point in time to take a good shot before the clouds changed. But, in the end, I was able to capture a very interesting cloud landscape.

This image was taken at the Grand Mayan on the 4th floor at approximately 6 pm on April 1st. The camera was facing due west and was level in order to capture this image.



There was an interesting mix of clouds that sunset. I believe there was a lenticularis cloud in front of the sun as well as some radiatus in the other side of the picture. The weather had been constant for the few days before and after this image was taken and there was always a constant breeze moving in from the ocean (east). I believe that there were some interesting physics going on in this particular area seeing as it is the world's largest bay and it is surrounded by mountains and open to the ocean. I believe this is why mixture of clouds was achieved in this image. The mountains may have aided in the formation of the orographic clouds that were moving through the bay. These clouds

are orographic clouds, or cloud formations due to topography. Altocumulus Lenticularis clouds are generally developed in relatively stable atmospheres when air “is forced up and over a topographic barrier that is oriented more or less perpendicular to the direction from which the upper-level wind is blowing. This deflection creates a gravity wave downwind of the topographic barrier not unlike a wave you might generate by throwing a pebble into a pond.” This means that when the air is forced up, it cools and sinks, but it hits the ground, heats back up and rises again causing the wave-like pattern described previously. “When sufficient moisture is present above mountain-top level, ACL clouds develop within the crest of these mountain waves where the air is rising. ACL clouds are continually developing and dissipating in the vicinity of the wave's crest and immediately downwind of the crest, respectively. That is why they appear to remain stationary (hence the name) even though winds are swiftly (sometimes very swiftly) moving through the entire cloud. (NOAA). Below is the skew T graph with a CAPE of 0 which further supports my claim of a stable atmosphere for that day.



In order to take this image, I took several photos from my balcony and stitched them together using photoshop. I then played around with the hues to lighten the image up and saturate the yellows and blues. The clouds were roughly 40 to 50 km away from the camera when the image was taken, and approximately 6500 meters in elevation.

This photo was shot with the following specifications;

CAMERA	Canon EOS Digital Rebel XT
SHUTTER SPEED	1/160 sec
F-STOP	f/8
APERATURE VALUE	f/8
ISO	100
FOCAL LENGTH	18.0mm
LENS	18.0-55.0 mm
PIXEL DIMENSIONS	9168 by 2019

I think this image reveals a very intricate relationship between the mountains and the ocean that were affecting the behavior of the clouds when I photographed them. I like the colors and contrast I was able to achieve, but I wish I was able to crop out the buildings better. Overall, I am really happy with how my image turned out.

Before photos:

Sources:

"Altocumulus Standing Lenticularis Clouds." *NWS Albuquerque*. NOAA, January 5th 2011 9:29 PM. Web. 24 Feb 2012. <http://www.srh.noaa.gov/abq/?n=features_acsl>.

"Atmosheric Sounding." . University of Wyoming, http://weather.uwyo.edu/cgi-bin/sounding?region=naconf&TYPE=GIF%3ASKEWT&YEAR=2012&MONTH=04&FROM=0100&TO=0112&STNM=76612