



Natural Resources Management and Engineering

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GPS SURVEYING and NRME

By: Dr. Thomas Meyer

Dr. Thomas H. Meyer has created and runs a Global Positioning System (GPS) base station here at UConn. The data are available free of charge and downloadable via the Web. This base station, along with hundreds of others, constitutes the federal Continuously Operating Reference System, or CORS (www.ngs.noaa.gov/CORS/).

CORS is a program created and administered by the National Geodetic Survey (NGS) NGS is the department of the federal government that is responsible for the creation and maintenance of the national spatial infrastructure. In other words, NGS determines the position of all things within the US in terms of their latitude, longitude and height. CORS is a key element in that mission.

Today, surveyors and mapmakers avidly embrace GPS as a positioning technology because it delivers centimeter-quality locations. It does this in less than an hour and without the need for an unobstructed view from survey marker to survey marker on the ground. This eliminates the need for chainsaws and limb-pruning tools to cut a line-of-sight pathway, as was necessary before GPS.

To attain these advantages, however, the GPS measurements must be corrected for spatial errors after they have been collected. The correction process depends upon measurements collected at base stations like ours! These base stations are permanently fixed GPS receivers whose position is known with very high accuracy. The high accuracy, known location of the base station is "compared" to the lower accuracy, unknown location of the GPS data. A mathematical correction between the known and the unknown positions transform the GPS data to high accuracy data points.

NGS owns and operates many CORS base station receivers itself, but more stations lead to better accuracy and convenience. NGS recruits other

organizations, such as UConn, to participate in the Cooperative CORS. Thus, the Cooperative CORS is a huge, international, ground-roots network of base stations for everyone's use and benefit. All the stations operate without cost to the users as a public service. It is very appropriate that UConn participate in the program as befits our role as a land-grant university. The NRME CORS base station (<http://www.ngs.noaa.gov/CORS/Coop/>) is our contribution to the Cooperative and it was the first CORS station in Connecticut.



Antenna on WBY

Receiver and computer

Our base station's antenna is located on the southeast corner of the roof of the W.B. Young building. It can be seen easily from the parking lot. It's the white disk just above the roof over which is a funny silver metallic fuzzy looking thing, a lightning repeller. A long cable connects the antenna with a GPS receiver that is housed inside the building, locked inside an equipment rack along with a computer that records the measurements all day, all night, every day. These data are posted to our host web page that is updated on the hour (www.nrmecors.uconn.edu). Surveyors across New England use this base station for their daily work, as do NRME students who use it to correct their own GPS measurements. Additionally, this base station is used by geophysicists who study plate tectonics and other geodynamics, and even for weather prediction!

NRME DEPARTMENT HAT

Show your NRME Pride!

The new NRME departmental ball cap is dark blue featuring the NRME logo in green, a preformed brim, and is adjustable to fit all. The hats are \$5 apiece and can be purchased through Deb Horton in the main office on the third floor of the W.B. Young building.

WHERE'S THE NRME HAT NOW?

A pictorial series of our departmental hat traveling throughout our planet! As you, our faculty, students, alumni and supporters venture out on expeditions, research, outreach or vacations, take the NRME hat with you, snap a photo of the hat in it's exotic location and submit it to NRME News and we'll try to post it. Please include the location, date and those present with your submission. For ease, please submit either in a digital format.



Torres del Paine National Park in the Patagonia region of Chile, South America, on the annual scientific research expedition. January 2005.

Photo by Kristina Giano

WHO WAS THAT MASKED BANDIT?

By: Kersey Lawrence

In the last issue of the NRME News (Vol. III, Issue 1, Oct./Nov. 2005) I asked for answers to several question about two pictures of an animal's tracks. A few students (and even a professor!) responded with great guesses and correct answers!

Here is the synopsis of the photos: The top photo shows the track pattern where the animal is moving in the direction from the left to the right in the picture, called the direction of travel. The bottom photo is a close-up of the two tracks farthest to the right in the top photo. Both photos illustrate a typical two-by-two walking pattern that is very characteristic of this mammal.

"Two-by-two" means that the tracks are side by side, appearing as a paired front and rear foot. The front feet are smaller, and the rears are larger.

The rears are longer and deeper because they carry more of the weight of the animal and hence more of the heel pads show up in the substrate. You can see that the front is on the left of the pattern in the forward pair and switches sides of the body, appearing as the right track in the second pair, i.e. the front and rear feet alternate sides of the body. The pairs are slightly diagonal, and the angle of the tracks also alternates. This is typical of wide-bodied animals that have to place their feet clear of their bellies. The track pattern of this mammal is highly diagnostic and once you know it you will be able to recognize this animal even from old "fuzzy" tracks where the number of toes and shape of the feet are unclear.

You can see the smaller, left front foot towards the top, right corners of the pictures, on the left side of the direction of travel. The larger, right rear foot is slightly behind the front, toward the bottom of the photo and on the right side of the direction of travel. You can also make out five long toes on each foot, some with claw marks in the mud ahead of the toes.

Taking into account that this was in the morning along the shores of a reservoir... it all adds up to a raccoon that was probably ambling along in a comfortable gait after doing some "fishing"!

Please contact Kersey if you are interested in tracking, a tracking presentation, or seeing this column continued.

DATES TO REMEMBER

Dec. 9 Last day of classes.

Dec. 12 Final exams begin. Find your schedule at: <http://www.registrar.uconn.edu/examdir.htm>

Dec. 17 Final exams end.

Dec. 18 Undergraduate Commencement Ceremony.

Jan. 17 Spring semester begins.

SUBMISSIONS

To submit articles or information to NRME News by faculty, students, clubs or organizations contact: Kersey at WBY Office 5, phone: 486-1259, e mail: Kirstin.Lawrence-Apfel@uconn.edu, or see Deb in the Main NRME Office.

We are interested in your ideas and input for the NRME News; after all, it represents you and your interests!

PLEASE HAVE SAFE AND HAPPY HOLIDAYS!



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