**Innovations in Mapping**

**Sextant Lab**

Due Wednesday, May 11 at 10am

Hard copies due at the beginning of class.

Objective: To practice measuring latitude and longitude using a sextant and to reflect on why this was an important skill for 18th c. mapping.

Sextant activity for Monday, May 9 at 11:30am:

* Latitude – see page 15 of the sextant packet & these guidelines:
* Longitude – follow the instructions on the “Longitude with Sextant” handout to determine longitude using the altitude of the sun (*not the planetarium worksheet* which measures longitude with the slightly different stick/shadow method). See page 13-14 of sextant packet for similar version of this method.

ARTIFICIAL HORIZON INSTRUCTIONS:

* Always use the shade to protect your eyes when looking at the sun.
* Place the artificial horizon on level ground or face the artificial horizon (such as the Puddle) so that a shadow is cast at the side opposite the sun. The front of the horizon should not have a shadow. You should be standing behind the artificial horizon facing the sun.
* Without the sextant, look into the center of the liquid and move your head so that you see the sun reflected on the liquid surface.
* Bring up the sextant to your eye and move the index arm until you see 2 suns, one on the liquid and the double-reflected image on the mirrors.
* Line up the 2 suns by moving the index arm.
* Apply index error if needed.
* Halve the remaining angle to get the altitude of the sun.

Lab Report Contents:

1. Group Submission
2. Latitude by Polaris (200 words)
   1. Present any data you were able to collect. If you were not able to measure explain why not.
   2. Describe the method for determining latitude by sighting Polaris at the planetarium.
   3. When and where would this method have been useful to land surveyors or geographers in the 18th c.? Why?
3. Latitude by Sun (200 words). On Monday, May 9 we will try again to measure latitude outside with an artificial horizon*. If we are successful, please complete this part of the lab report.*
   1. Present your data. What was the latitude for the point you chose to measure?
   2. Describe how you can find latitude by sighting the sun with your sextant (refer to handout packet on sextant use).
   3. Describe any challenges associated with this method.
   4. When and where would this method have been useful to land surveyors or geographers in the 18th c.? Why?
4. Longitude in the Planetarium (200 words)
   1. Present your data. What was the longitude for your point in the planetarium? (If you were unsuccessful at the planetarium you can try again outside when the sun is out with the stick, your phone compass, and a sheet of paper.)
   2. Summarize the method for determining longitude by measuring a shadow at high noon (as we did at the planetarium using the worksheet provided by Nicole Hastings)
   3. Describe any challenges associated with this method.
   4. When and where would this method have been useful to land surveyors or geographers in the 18th c.? Why?
5. Longitude outside. (200 words) On Monday, May 9 we will practice measuring longitude towards the end of our morning session. *. If we are successful, please complete this part of the lab report.*
   1. Present your data. What was the longitude of the point you chose to measure?
   2. Summarize the method for finding longitude by measuring the altitude of the sun at local noon.
   3. What tools & knowledge are required to be able to measure longitude this way?
   4. When and where would this method have been useful to land surveyors or geographers in the 18th c.? Why?
6. Individual Submission
7. Write a 200-word reflection answering the following questions: *Why were 18th c. geographers interested in having information about latitudes and longitudes? How did it impact the way that maps were made?*