

Polar Ice

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Melting Land Ice Raises Sea Level. Melting Sea Ice Does *Not*!

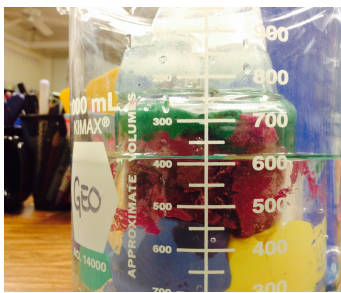
Bucket G

An analog for an icecap on LAND, such as on Greenland, or on Antarctica (glaciers!)

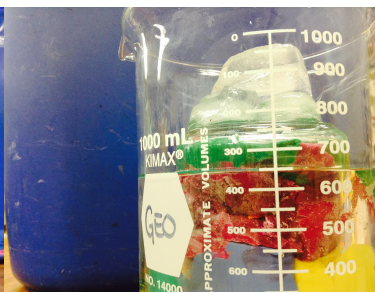
Bucket I

An analog for an iceberg in WATER, such as floating sea ice near the North Pole

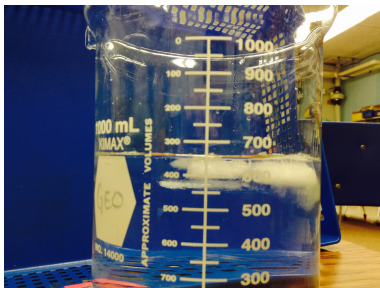
Experiment 1



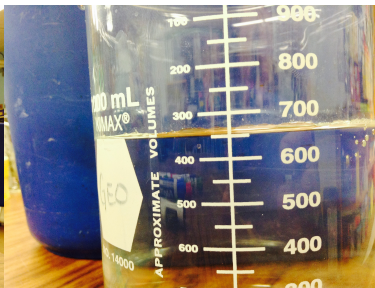
10:25 610 ml



11:06 650 ml G is UP !

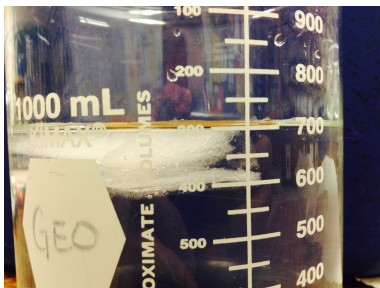


10:25 655 ml

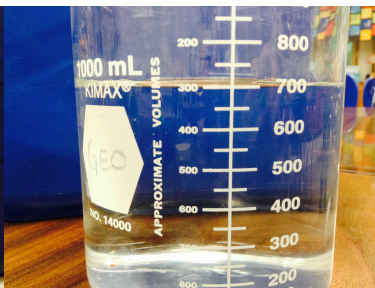


11:06 655 ml I is SAME !

Experiment 2

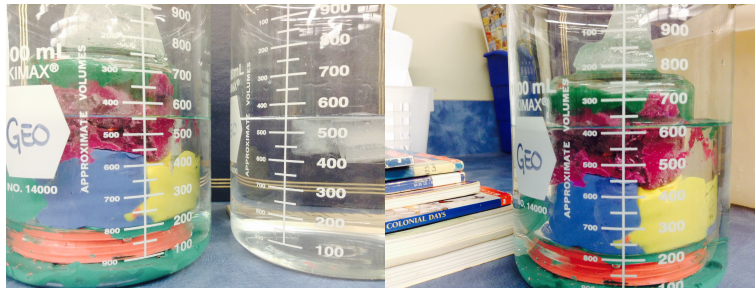


11:09 705 ml

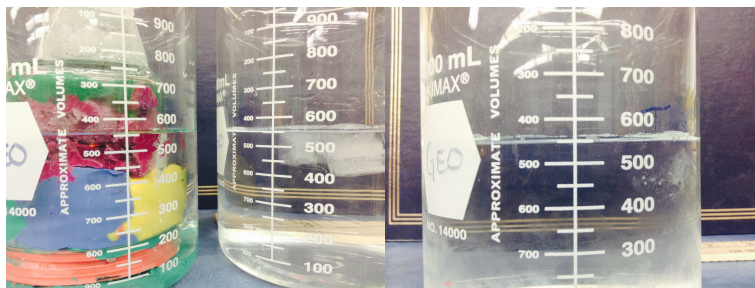


12:26 705 ml I is SAME !

Experiment 3



13:41 555 ml 14:49 615 ml **G is UP !**



13:42 555 ml 14:03 555 ml **I is SAME !**

Bottom line:

Land ice, when it melts, still needs to flow into the ocean, raising sea level.

Sea ice, already in the water, does not raise sea level.

Icebergs (like ice cubes in your drink) illustrate Archimedes' principle.

Εὐρήκαμεν! (Go look *that* up on the Internet!)

Some additional, reputable, sources on land ice versus sea ice and their effect on sea level:

<http://tinyurl.com/loss-of-land-ice-not-sea-ice>

<http://tinyurl.com/Archimedes-melting-ice-html>

An accessible paper on Greenland's ice mass loss from satellite gravity measurements:

<http://www.princeton.edu/main/news/archive/S35/40/38C46/>

An accessible paper on Antarctica's ice mass loss from satellite gravity measurements:

<http://www.princeton.edu/main/news/archive/S43/04/11E77>

Princeton's "Polar Ice" website:

<http://polarice.princeton.edu>

How did the Littlebrook classes do in predicting the outcome of the experiment?

Note: I did not discuss at all what might happen! I only discussed how we measure the mass of the melting ice on Greenland and Antarctica using time-variable gravity satellites (the GRACE mission) – not what it might do to sea level when it is melted (which is a bit more involved than this experiment could ever show). But I was curious what the “uninformed” opinions might be. Littlebrook 2nd, 3rd and 4th grades performed, in this respect, at about U.S. Senate level. Keep on experimenting, keep on learning!

4-McKenna: 1 correct answer

4-Wadyka: 2 correct answers

4-Rossi: 1 correct answer

3-Saide: 1 correct answer

3-Federico: 0 correct answers

3-Carlone: 3 correct answers

2-Cohen: 0 correct answers

2-Ryan: 3 correct answers

2-Saltiel: 1 correct answer

Bonus question:

How many ml of ice-melted water gets added in bucket G, on average, per minute?