PROPOSAL CRITERIA

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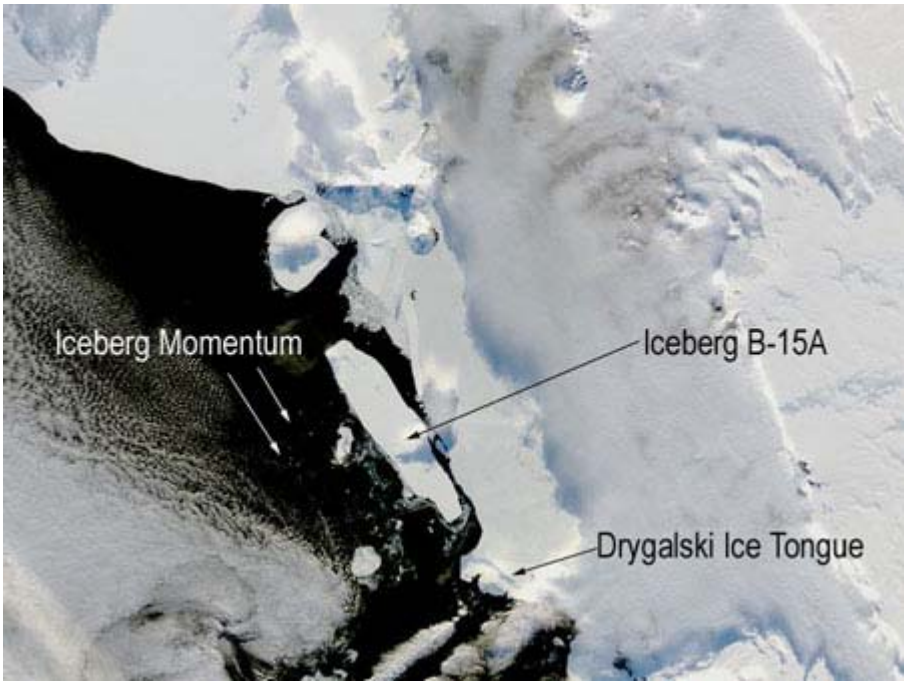
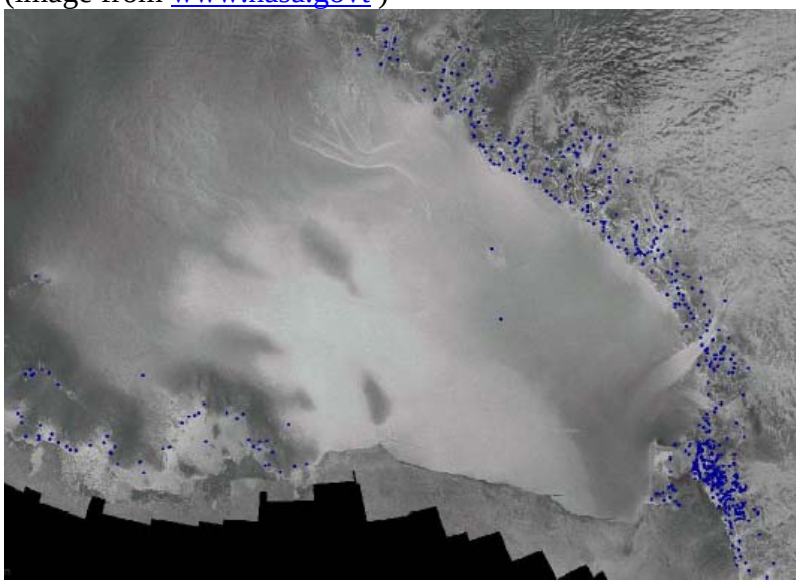
Feature

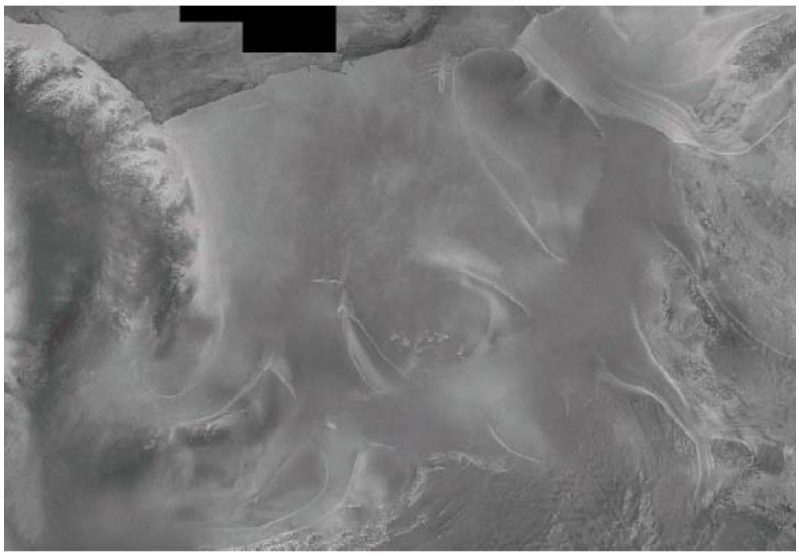
- We are interested in Icebergs;
  - How they are formed
  - What influences are acting on icebergs as there life progresses? (could they die?)
  - What effect do icebergs have on the environment around them?



(image from www.nasa.govt)



Ross Ice Shelf



Ronne and Filchner Ice Shelves

Location

Icebergs can be found in many locations in and around Antarctica. When they are found in Antarctica it is because they are trapped by frozen sea ice. We have not yet chosen a specific Iceberg, but tend towards the areas of Antarctica where large icebergs are formed, the ice selves of Ross (-81.5 Lat -175 Lon), Ronne (-78.5 Lat -61 Lon) and Filchner (-79 Lat -40 Lon).

Processes

- **What creates Icebergs?**
  As the temperatures rises, ice near the edges of Antarctica melts, and at times giant pieces fall off into the water creating icebergs. Cracks and crevasses near the edges of ice shelves, where they are near water, are likely to help create icebergs. As ice melts near the top of crevasses the water flows down into them, on refreezing the water expands making a larger crack, until it eventually causes a large slab to fall.

- **Calving events**
  This is a process by which, ice breaks off of ice sheets to make icebergs. This is driven by climate change and drives sea level rise. Ice sheets such as those in Antarctica spread under their own weight and flow off the land over the water. Ice shelves are thick floating lips of ice sheets that extend out past the coastline. Researches have been able to show that narrower shelves should calve more slowly than wider ones.

- **What reduces the number of Icebergs?**
  As temperatures rise, the icebergs melt into the sea. Only the icebergs that float away to warmer parts will melt away completely.

- **What moves the Icebergs?**
  Icebergs float on the sea and get carried away by the ocean currents. Some get trapped in sea ice and others on the sea floor and will not float away.

Why investigate this?

- Melting ice from Antarctica affects sea level, as ice melts, the sea level rises. If the sea level rises, countries where we live will be affected. If icebergs are 5x larger than Brunei, like Iceberg B15, we should be concerned.
- To see if the number of bergs have changed.
    - If the number of icebergs has increased it could mean that more pieces are falling off Antarctica and temperature is rising.
    - If the number of icebergs are decreasing it could be due to melting of existing icebergs.
    - If the icebergs are melting, is this faster than usual? Will this cause sea level rise?
    - If more pieces are falling off, are these larger than usual?
- Icebergs are a hazard: ships could sink, they can create large waves.
- The icebergs contain ice rafted debris, these are tiny rocks and minerals contained in the icebergs, as the icebergs melts into the sea some of the minerals are taken in by the plankton and by that produce more plankton for the animals to eat.
    - The plankton absorb the carbon dioxide, this helps to decrease the carbon dioxide in the air which reduces the problem of the greenhouse effect.
    - NASA research has suggests that massive icebergs have reduced plankton growth by taking over plankton growing areas.
    - We can research ways to ensure massive icebergs are not created and research ways to minimize the effect of icebergs on plankton growth. This may result in approval to take measures to break up large icebergs to increase its melting and plankton growth.
- Icebergs could be linked to global warming and sea level rise.
- It is easier to see how everything works in an iceberg than it would be to the how all of Antarctica works. In relation to global warming, and sea level rise.
- If icebergs are bad, can we stop pieces falling off to make icebergs. If they are good can we control the making of icebergs like controlled burning to prevent a forest fire.
- Some scientists may want you to spend money on researching Antarctic volcanoes, but it is highly unlikely that a volcano will erupt, it may take years before one does decide to erupt, until then your money could be wasted. In that time our research could have already gathered enough information to cover your investment.