FLUIDS

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An iceberg near eastern Greenland. The island's melt is lifting world sea levels. (John McConnico/AP)

Greenland melt seems to be picking up speed

WASHINGTON: ***More than two trillion tons of land ice in Greenland, Antarctica and Alaska have melted since 2003,*** according to new NASA satellite data that show the latest signs of what scientists say is global warming. More than half of the loss of landlocked ice in the past five years has occurred in Greenland, based on measurements of ice weight by the Grace satellite, said a NASA geophysicist, Scott Luthcke. The Greenland melt seems to be accelerating, he said. NASA scientists planned to present their findings Thursday at the American Geophysical Union conference in San Francisco. Luthcke said Greenland figures for the summer of 2008 were not yet complete, but the ice loss this year, while still significant, would not be as severe as in 2007. The news was better for Alaska. After a precipitous drop in 2005, land ice increased slightly in 2008 because of large snowfalls, Luthcke said. Since 2003, when the NASA satellite started taking measurements, Alaska has lost 400 billion tons of land ice. In assessing climate change, scientists generally look at several years to determine the overall trend. Melting of land ice, unlike sea ice, increases sea levels very slightly. In the 1990s, melting Greenland ice did not make world sea levels rise; now that island is adding about half a millimeter to the sea level a year, said Jay Zwally, a NASA ice scientist***. Melting land ice in Greenland, Antarctica and Alaska has raised global sea levels about one-fifth of an inch in the past five years,*** Luthcke said. Sea levels also rise from water expanding as it warms. Other research being presented this week at 2the geophysical meeting points to more concerns about ice melting because of global warming, especially sea ice."It's not getting better; it's continuing to show strong signs of warming and amplification," Zwally said. "There's no reversal taking place." Scientists studying sea ice will announce that parts of the Arctic north of Alaska were about 5 to 6 degrees Celsius, or 9 to 10 degrees Fahrenheit, warmer this past autumn, a strong early indication of what researchers call the Arctic amplification effect. That is when the Arctic warms faster than predicted, and when warming there is accelerating faster than elsewhere on the globe. As sea ice melts, the Arctic waters absorb more heat in the summer, having lost the reflective powers of vast packs of ice. That absorbed heat is released into the air in the autumn. That has led to autumn temperatures in the last several years that are 3.5 to 6 degrees Celsius warmer than they were in the 1980s, said Julienne Stroeve, a research scientist at the National Snow and Ice Data Center in Boulder, Colorado.

Introduction: The earth has a radius of about 6378 km. 71% of the earth is covered by oceans. 10.7584 ft^2 = 1 m^2, Weight density of water = D = 62.4 lb/ft^3 , D = Weight/volumn = W/V , 2000 lb. = 1 ton, 1000 m = 1 m,(a) Show the surface area of the earth is about 5.096 X 10^8 km^2. Hint: Area of a sphere = 4 (pi) r^2. pi = 3.1416 (b) Find the ocean surface area in km^2 ? (c)Find the ocean surface area in ft^2 ?
(d)It was stated that 2 Trillion (10^{12}) tons of ice melted. Convert this amount of ice into pounds? (e) Find the volume of water 2 Trillion tons of water occupies? (f) Verify that the oceans did rise 1/5 inch (0.20 inch) with 2 trillion tons of ice melting? Hint: D = W/Ah, or Ah = W/D , Ah = V , your looking for h. Answers: (a) answer given, (b) 3.618 X 10^8 km^2. (c) 38.93 X 10^{14} ft^2 , (d) 4.0 X 10^{15} lb. (e) 6.41 X 10^{13} ft^3 (f) 1/5 inch = 0.20 inch