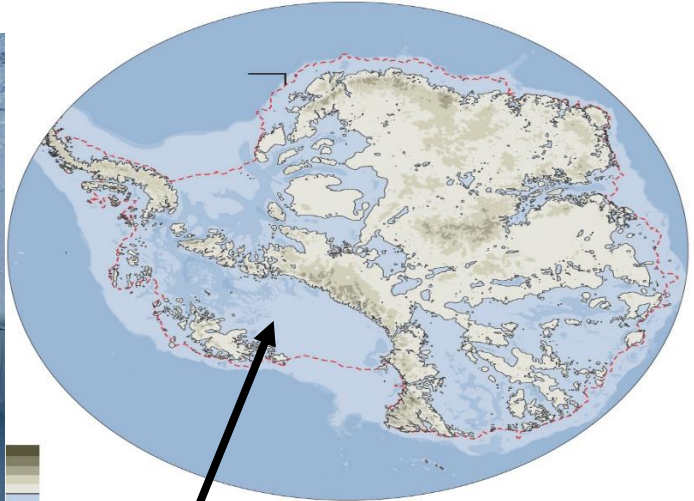


Climate Model Predicts West Antarctic Ice Sheet Could Melt Rapidly



A view from a NASA airplane of large icebergs that have broken from the calving side of Thwaites Glacier in Antarctica in November 2014. A disaster scenario of West Antarctic ice sheet disintegration could occur much sooner than previously thought, new research suggests.

For half a century, climate scientists have seen the **West Antarctic ice sheet**, a remnant of the last ice age, as a sword of Damocles hanging over human civilization. The great ice sheet, larger than Mexico, is thought to be **(((potentially vulnerable to disintegration from a relatively small amount of global warming, and capable of raising the sea level by 12 feet or more should it break up.)))** But researchers long assumed the worst effects would take hundreds — if not t, thousands — of years to occur. Now, new research suggests the disaster scenario could play out much sooner. Continued high emissions of heat-trapping gases could launch a disintegration of the ice sheet within decades, according to a [study](#) published Wednesday, heaving enough water into the ocean to raise the sea level as much as three feet by the end of this century. With ice melting in other regions, too, the total rise of the sea could reach five or six feet by 2100, the researchers found. That is roughly twice the increase [reported](#) as a plausible worst-case scenario by a United Nations panel just three years ago.

INTRODUCTION: Wikipedia data: West Antarctica Ice Sheet(WAIS) volume = 2.2 million Km^3 . The purpose of this application is to validate “if” WAIS melts the oceans would rise over 12 feet as stated.

HINTS: Area of sphere = $4\pi r^2$, earth radius = 6374 km. , 71 % of earth’s surface is water, density of ice = 916.7 kg./m^3 , density = mass/volume , $d = m/V$, $m = d V$, $\text{km.} = 1000 \text{ m.}$, density of water = 1000 kg./m^3
 $\Delta h A = \Delta V$, Thus, $\Delta h = \Delta V/A$, 3.37 ft./m. ,

QUESTIONS: (a) Convert 2.2 million km^3 to m^3 ? , (b) Find mass (in kg.) of WAIS? (c) Find volume (ΔV in m^3) of water in melted WAIS? , (d) Find area of earth’s in m^2 ? , (e) Find area (A) of earth’s surface which is water(oceans)? , (f) Find height (in meters) oceans will rise (Δh) when WAIS melts? , (g) Convert Δh in (f) to feet?

ANSWERS: (a) $2.2 \times 10^{15} \text{ m}^3$, (b) $2.016 \times 10^{18} \text{ kg.}$, (c) $\Delta V = 2.016 \times 10^{15} \text{ m}^3$, (d) $5.105 \times 10^{14} \text{ m}^2$, (e) $A = 3.625 \times 10^{14} \text{ m}^2$ (f) $\Delta h = 5.56 \text{ m.}$, (g) $\Delta h = \sim 18.8 \text{ ft.}$

EDITORS COMMENT: 18.8 ft. is > 12 ft rise. But, West Antarctica Ice Sheet is partially under the ocean already. Thus, ΔV is slightly inflated. Only above sea level melted ice should be considered in ΔV making Δh closer to 12 ft.