

## Wilkins Ice Shelf, a mechanical point of view

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*The 4 of April the bridge of about 40 km in length and 500 meters wide in its closer point, than united the platform Wilkins with the Antarctica was broken. All average news notified, adding that it was consequence of the climatic change, like no. The news advance very quickly and I am very slow writing. I'm writing now that the news are old and cold. References: Platform Wilkins, Antarctica, Climatic Change, mechanical, momentum of a force.*

It is certain, the bridge of the platform Wilkins was broken, but is a mechanical breakage. Nothing that to see with the melting of the Antarctic glaciers, that continue being to about 50 degrees low zero.

Let us remember that we lived at interglacial era. The variations of the ice layer in the Antarctica peninsula are very little known. It's true that some parts of the ice layer of the coast West Antarctica are broken, forming great blocks of icebergs in the ocean. If this ice goes to the ocean the level of the water must increase.

The speed whereupon advances glaciers towards the ocean is between ten and one hundred meters to the year. The processes that control the speed of glaciers do not depend on the temperature in the surface of the glacier but in the zone of contact between the ice of the glacier and the ground, that determine the friction. Many variables take part in this process, and the great majority is of mechanical type.

Also the mechanics takes part too in the water level of the oceans, we see it. The global changes are not uniform; depend on the variations of the terrestrial gravitational field caused by the variation of the amount (mass) of ice and changes in the terrestrial rotation as a result of the redistribution of the mass of ice to water.

It is necessary to consider that the great amount of ice near the ocean exerts a gravitational force on the water. The level of the ocean near the ice layer increases and therefore it diminishes elsewhere. If the ice layer is based, the redistribution of the level of the ocean by all Earth varied because there is more amount of water and less attraction near the Antártida.

If the ice layer of the Antártida is based, the Antarctic continent begins to rise since there is lost the weight of the ice that maintains it sunk. Is denominated subsidence, considers that the continents stay floating on the magma. Then the relative level of the ocean for the Antártida lowers and will rise adding itself the previous process elsewhere.

The total amount of mass gained by the oceans in an instability process of the Antarctic ice can be of  $1,8 \cdot 10^6$  GTon, that is comparable to the amount of mass that gains the Earth by the impact of about 2000 comets of the Halley type. That is to say, the Earth is not in balance with the rest of the universe and it is not either in balance with same her. Thanks to these imbalances exist the life, but this is another subject, we return to the breakage of the platform Wilkins.

In very general form the glaciers move towards the ocean and form a small ice platform that floats, until which break and form icebergs.

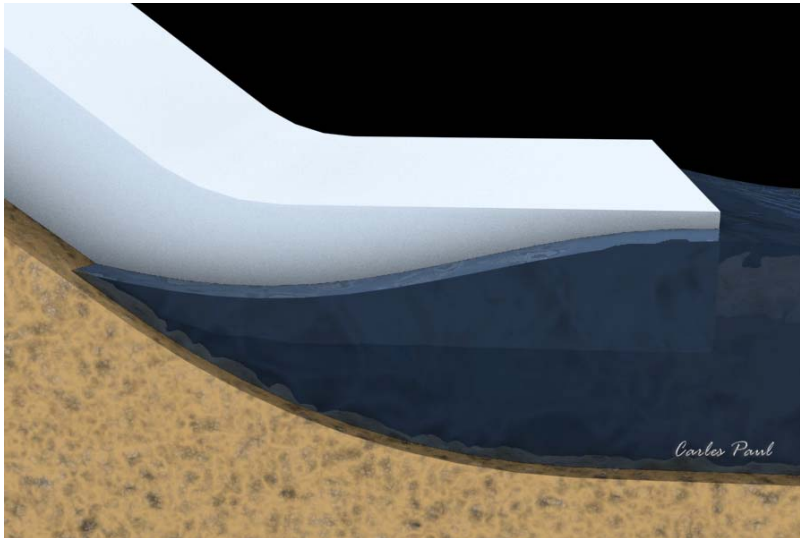


Figure 1: Scheme of an ice platform coming from a glacier

The platform frozen upon the ocean is put under the movement of the waves. What has happened to the platform Wilkins? The ice that formed upon the ocean prevented that the waves arrived at the Wilkins, but due to the increase of the temperature of the east ocean ice has not formed in the amount necessary to restrain the surge. Care, the heating is due to a modification of the sea currents in the Circumpolar Current Antarctica, nothing that to see with the global heating supposing that it exists.

How can the waves break a so great ice block? Very simple, then at the most great better, the platform Wilkins was broken because it had too much ice. It is a consequence of the momentum of a force. Small forces can cause great effects, we see like following the Illustration

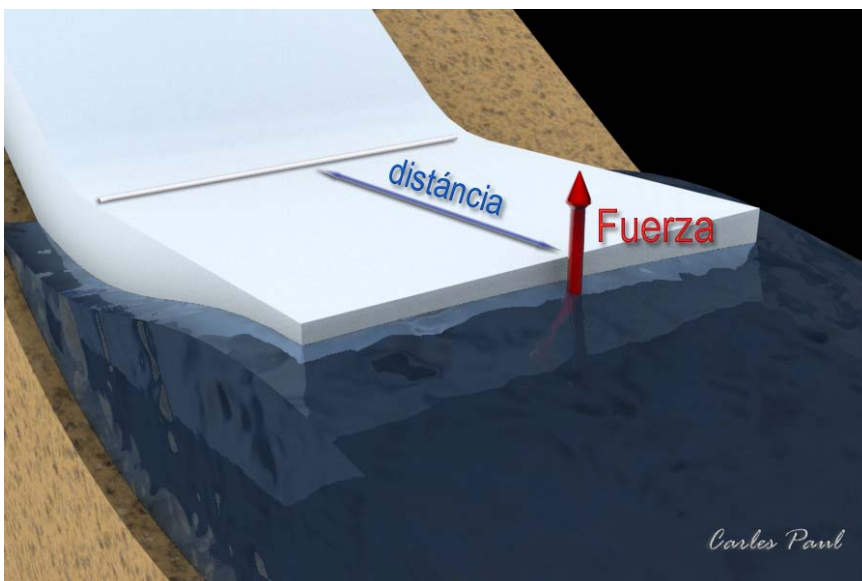


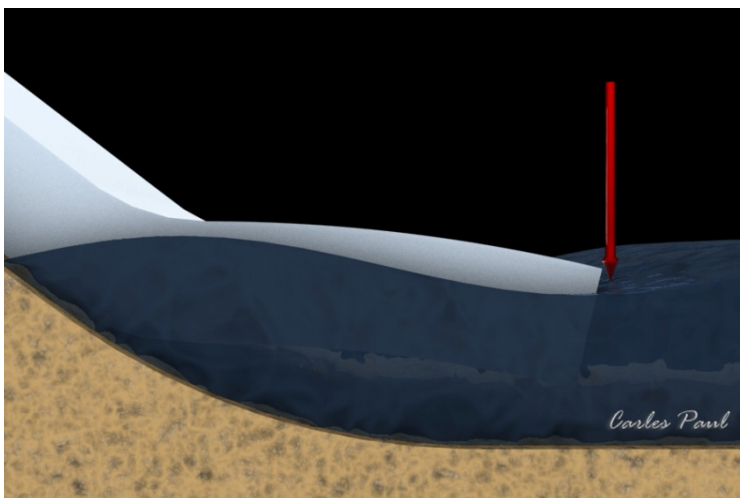
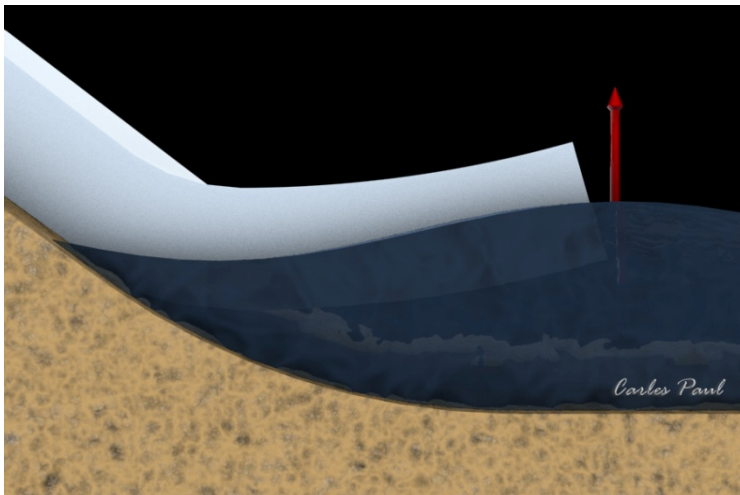
Figure 2: The force of the surge acting on the base of the platform

When the waves hit against the ice cause an ascending and descendent force, following the rate of the waves of the surge. In figure 2 the force is ascending and the effect of the force acts in the base of the platform, the tie point between the part that is on the water and the part that is on the continent.

It is indeed here where the moment acts of the force. The moment of a force is the product of the force by the perpendicular distance to the action axis. If the force is small but the distance is great the moment is great and tends to break the ice.

As example we have the pliers, with them a piece of wire with the force of our hands can be broken simply, only makes lack that the distance between the performance of the force (the hands) to the point where it is applied (the wire) is sufficiently great.

Then, to more ice, more distance, greater moment and greater breakage. In the case of the ice on the ocean, one is put under a continuous swing



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The disappearance of the ice layer on the ocean, has not restrained the waves and these are broken the platform Wilkins, a mechanical phenomenon.