



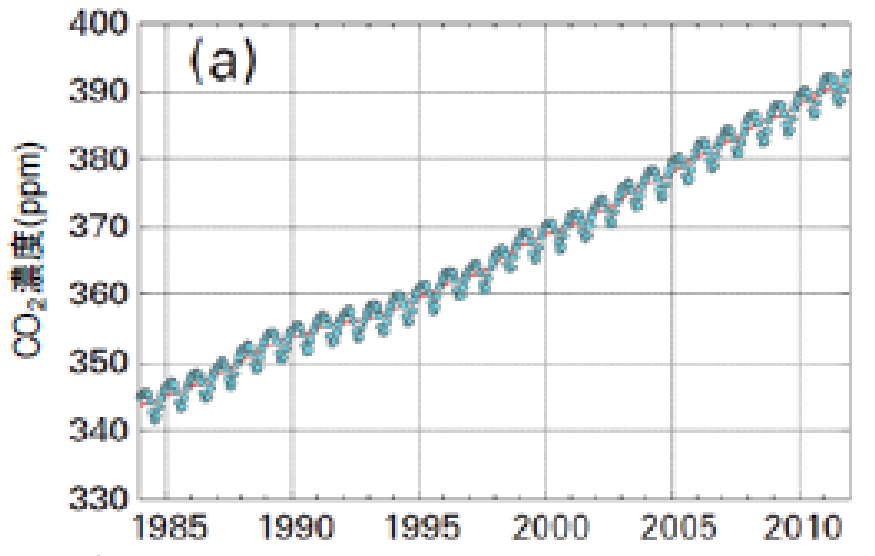
地球温暖化防止とサンゴ礁保全に関する国際会議
**International Conference on
Climate Change and Coral Reef Conservation**

Shiro Wakui

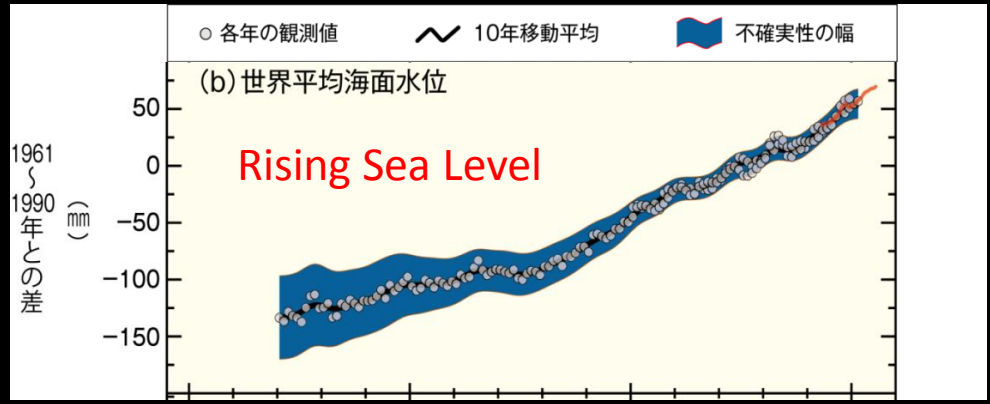
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海洋酸性化とその影響

Impact of Ocean Acidification

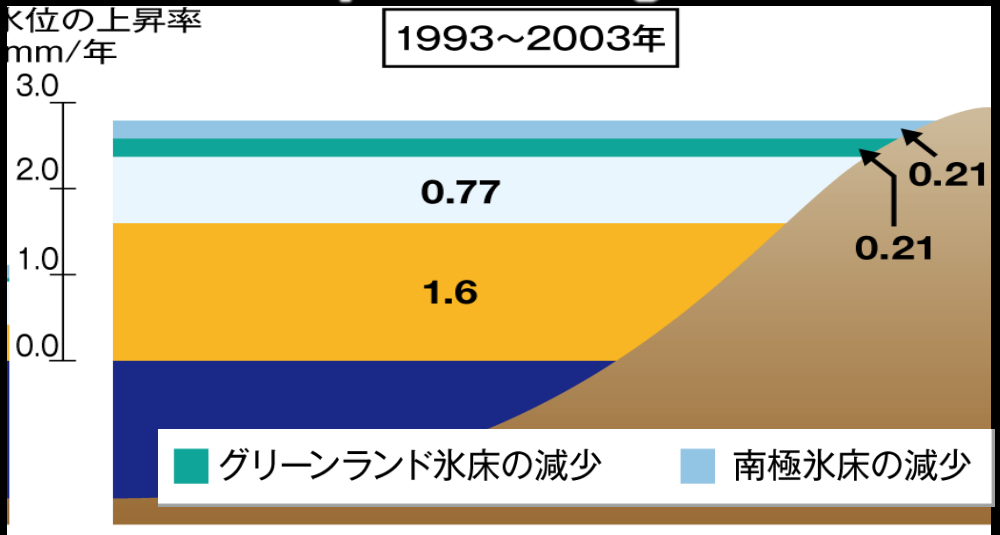


- 世界2011年の世界平均のCO₂濃度は390.9ppm。最近10年間は2.0ppm/年の割合で上昇。
- 世界と日本の平均気温も上昇。日本の気温の上昇率は世界平均よりも大きい
 世界の年平均気温偏差 100年あたり0.68°C
 日本・年平均気温偏差 上昇率: 100年あたり1.15°C



- 世界平均海面水位の20世紀を通じた上昇量は17cm(上昇率は1.7mm/年)。(IPCC第4次評価報告書より。)
- 90年代以降の上昇率は3.2mm/年に加速しているとの報告がある。(世界銀行、2012: “Turn Down the Heat: Why a 4° C Warmer World Must be Avoided”より)

Impact of Melting Ice



- グリーンランドの氷床の減少は、表面の融解と氷床の崩壊により起きているとの研究がある。

海洋酸性化とその影響

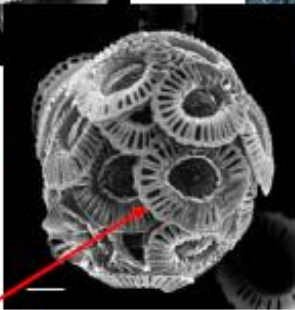
Impact of Ocean Acidification

酸性化の影響を受ける可能性のある円石藻類(植物プランクトン)とサンゴ礁



Courtesy of the National Oceanic and Atmospheric Administration Central Library Photo Collection

CO₂濃度を上げると...



形が崩れ、円形がギザギザになっている

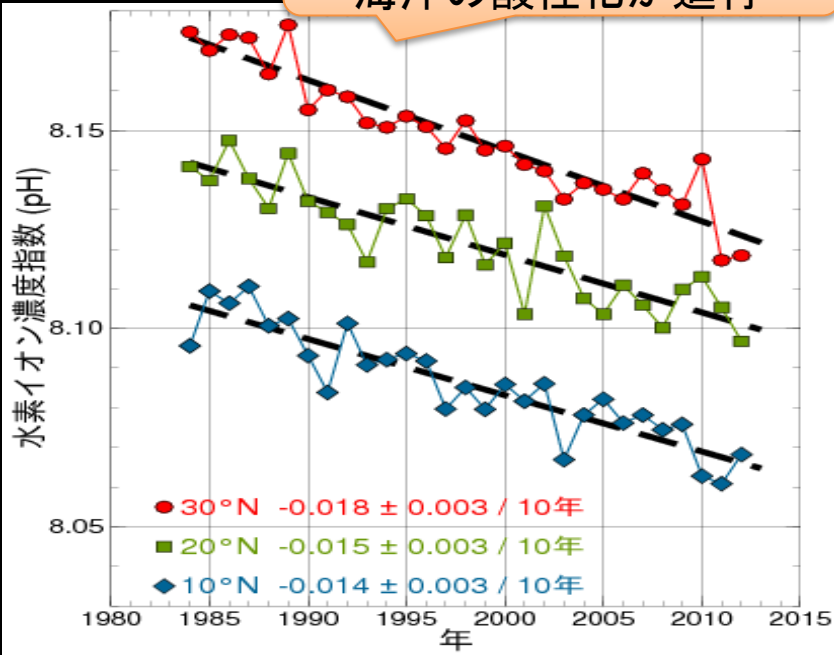
円石藻類 (Emiliania huxleyi)を対象に、二酸化炭素を高濃度にした場合の実験結果

円石藻類写真の出典: Reprinted by permission from Macmillan Publishers Ltd: Nature (Riebesell, U. et al. 2000. Reduced calcification of marine plankton in response to increased atmospheric CO₂. Nature 407, 364-367.), copyright (2000) <http://www.nature.com/>

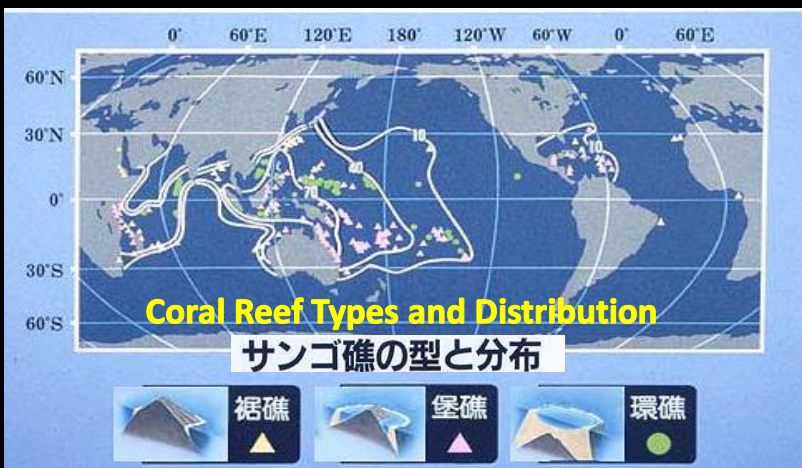
- 大気中のCO₂の増加は海洋の酸性化を引き起こす。
- 海洋の酸性化は、炭酸カルシウムの殻を作る海洋生物(サンゴなど)と、それらに依存する生態系に悪影響を与えると予測されている。

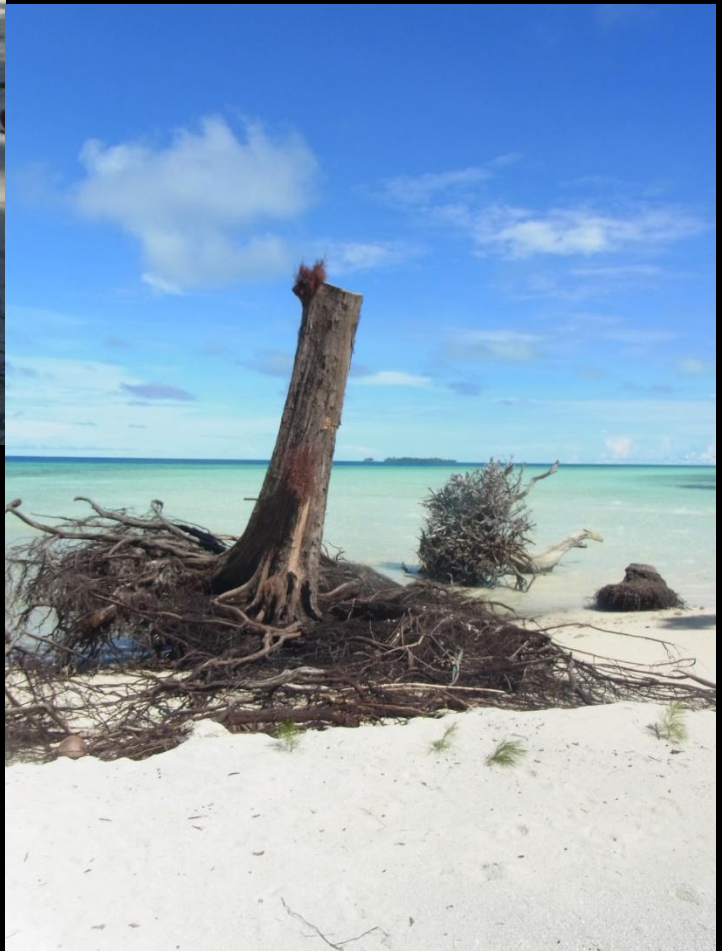
Worldwide Trend of Acidification

どの緯度でもpH値が低下 = 海洋の酸性化が進行



東経137度線の北緯10,20,30度における冬季表面海水中の水素イオン濃度指数の長期変化(気象庁, 2012)





The sinking of Ngibtal

The fish-bearing Breadfruit Tree of Ngibtal Island In the old days in Palau there was an old woman named Dirrabkau who lived by herself on an island called Ngibtal on the shore-reefs of what is now Ngiwal State.

The woman had a son named Mangidabrutkoel whom she did not see often as he travelled through other villages.

The men of Ngibtal always passed by the house of Dirrabkau after a day's fishing but they never offered some of their catches with her. Though the woman was fond of fish she was never able to eat any. The only food she ate were the fruits of the breadfruit tree (Meduu) which grew in her yard. One day, after a long absence, Mangidabrutkoel came to visit his mother. Dirrabkau took this chance to complain to her son that while others of the village had plenty of fish to eat, she never had some for her pot.

Mangidabrutkoel sympathized with his mother. Before Mangidabrutkoel set forth on his next trip, he went to the yard, to the breadfruit tree by the water's edge. He cut off one of its branches and water gushed from the stump, flowing spasmodically to the rhythm of the waves hitting the shore.

With each surge, fish jumped out of the tree. From then on, Mangidabrutkoel's mother had a steady source of fish right in her yard. This breadfruit tree became the envy of all the people of Ngibtal island.

"While we must go out to sea for our fish, the old Dirrabkau only sits under her tree to get all the fish she wants, they moaned." Finally, not being able to contain their envy, the people went over to Dirrabkau's house and cut down the fish-bearing tree. The water started to flow from the tree trunk in great torrents of water. All kinds of fishes flowed out of the breadfruit tree.

People were shouting with joy as with baskets, they collected all the fish they can carry with them home. All day, water flowed out of the tree trunk. The village people, not realizing the danger facing them and the island, went home with many catches. During the night as people were asleep, the water kept rising until the whole island was flooded before the Sun even rose on the horizon.

To this day the site of the island, with its pathways and house platforms, can be seen from the watery surface off the shore of Ngiwal.

