WRANE
Water Research, Assessment and Networking Ecosystem

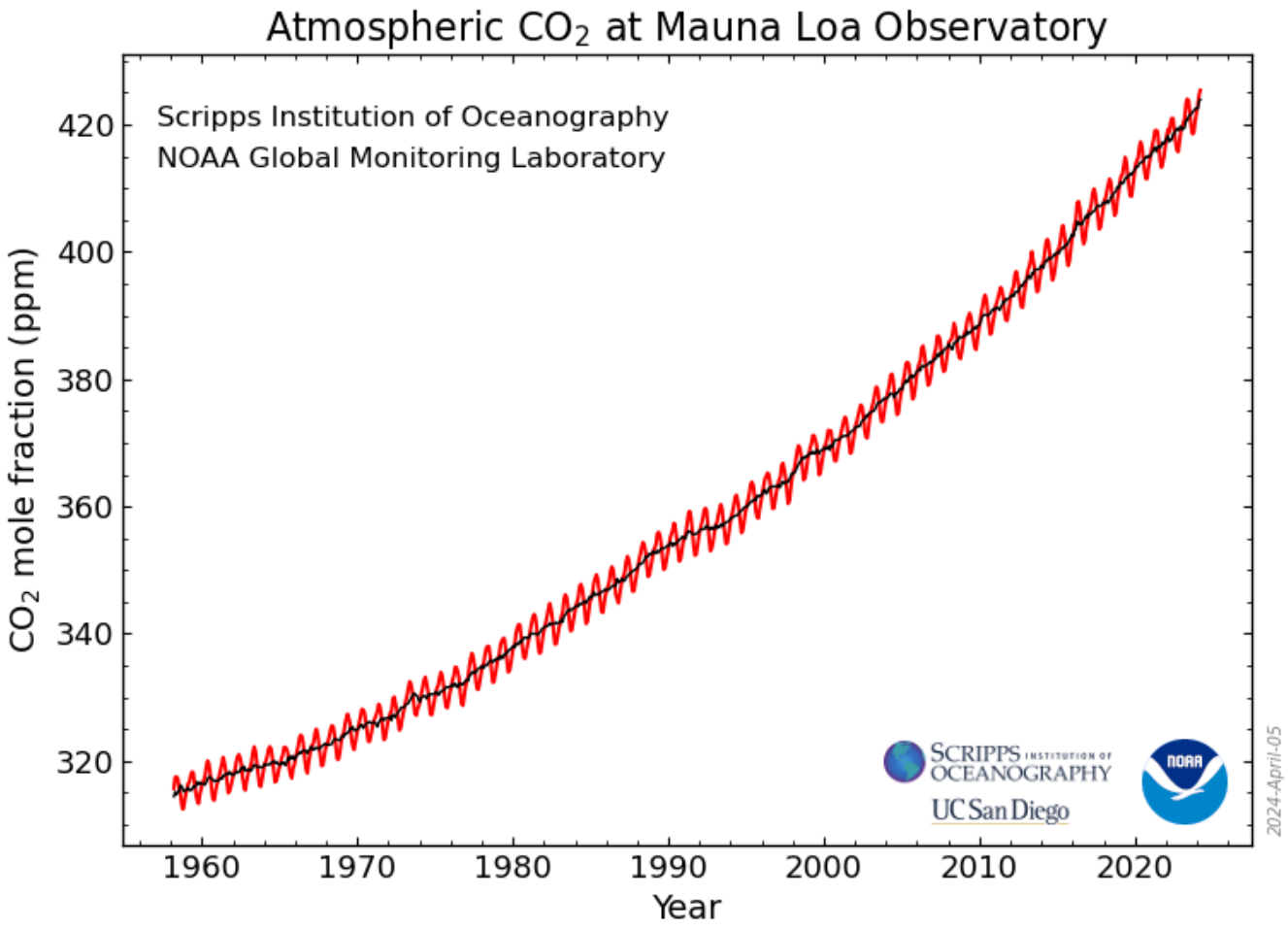
What's in Water?

Ocean Acidification

Presented by: Dr. Tracy Quan

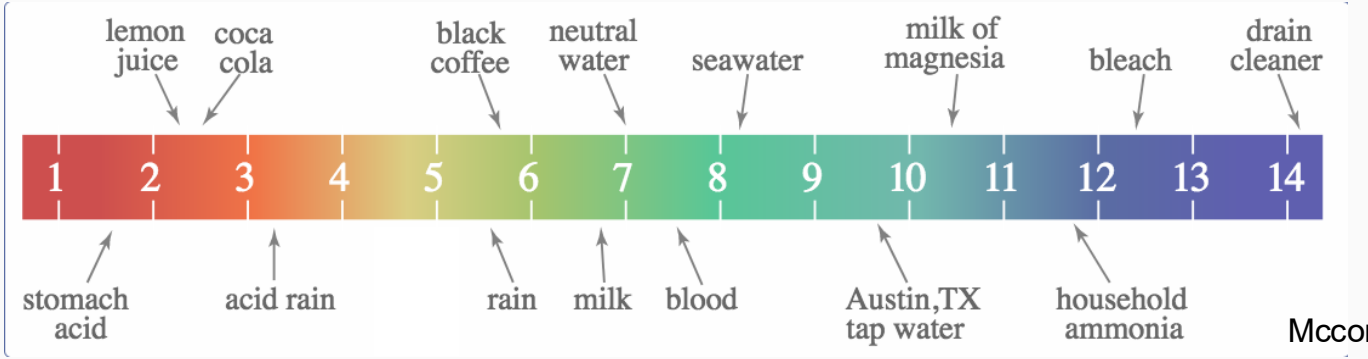
How does high CO_2 in the atmosphere affect ocean chemistry?

WRANE


Atmospheric CO_2 at Mauna Loa Observatory
Scripps Institution of Oceanography
NOAA Global Monitoring Laboratory
CO_2 mole fraction (ppm)
420
400
380
360
340
320
1960
1970
1980
1990
2000
2010
2020
Year
SCRIPPS INSTITUTION OF OCEANOGRAPHY
UC San Diego
NOAA
2024-April-05

pH: a Master Variable

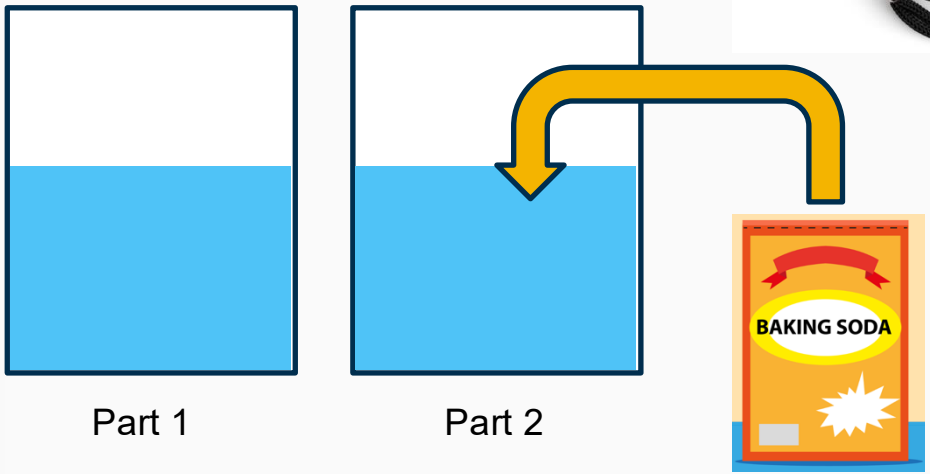
- pH = -log[H^+] = -log[H_3O^+]
- Most natural waters pH ~5.5-8.5
  - Acid mine drainage pH ~2.5-5.5
  - Alkaline waters pH >9



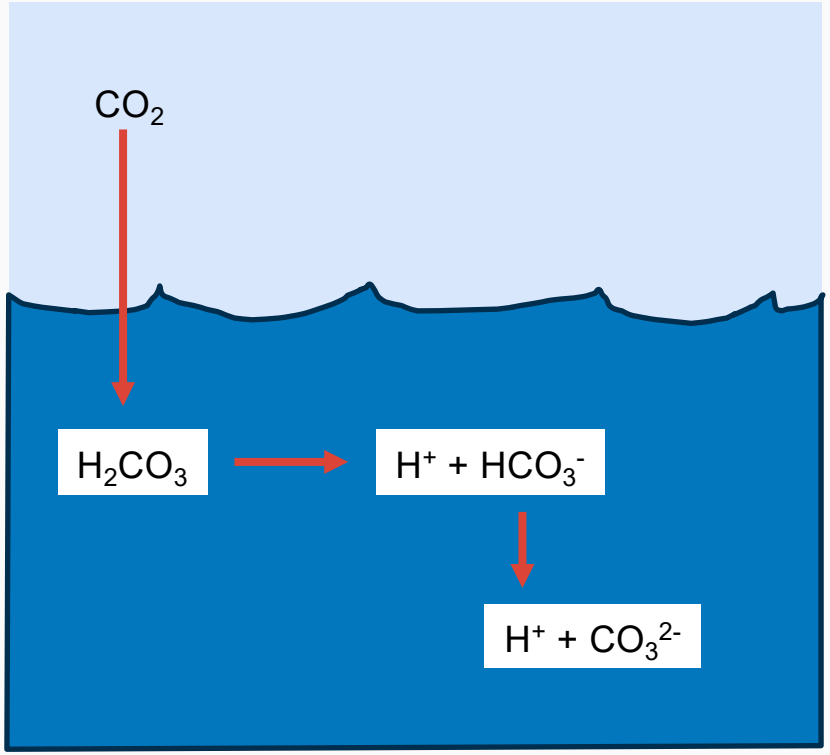
Mccord.cm.utexas.edu

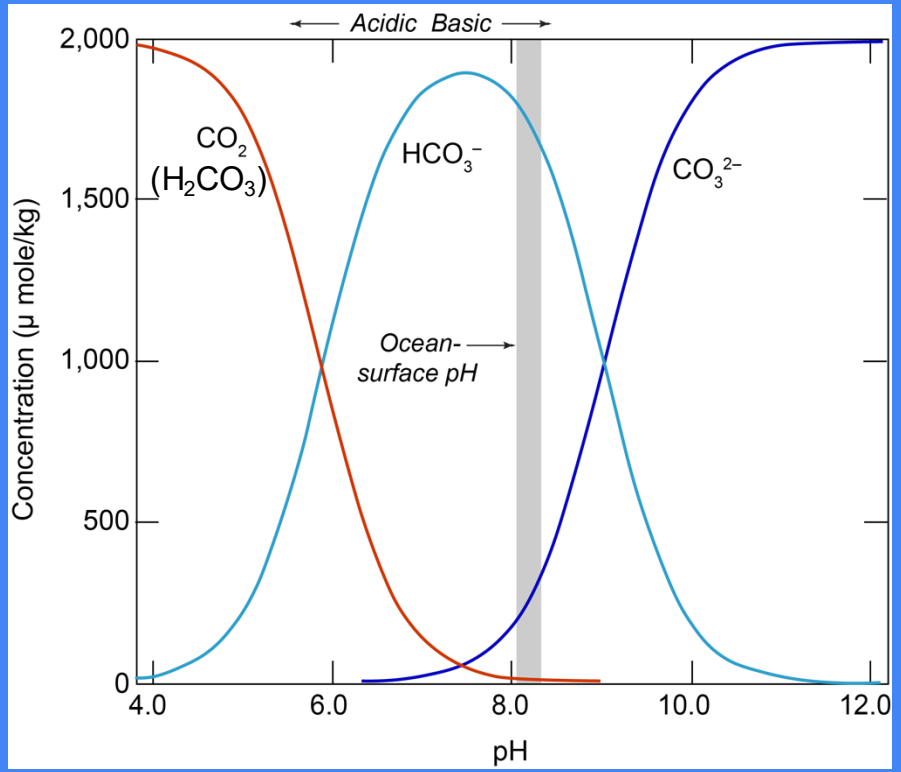
Supplies

- Straws
- pH meter
- Water
  - Part 1: drinking water
  - Part 2: water + teaspoon of baking soda

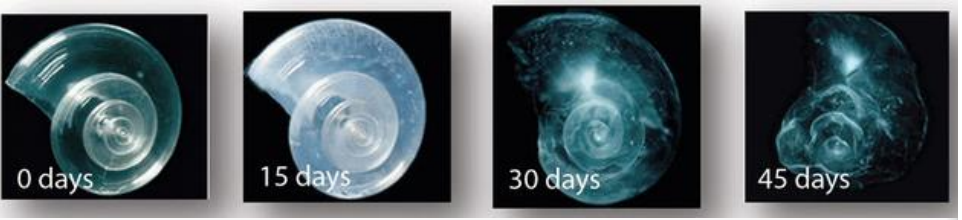


What Happens to CO_2 in Water?

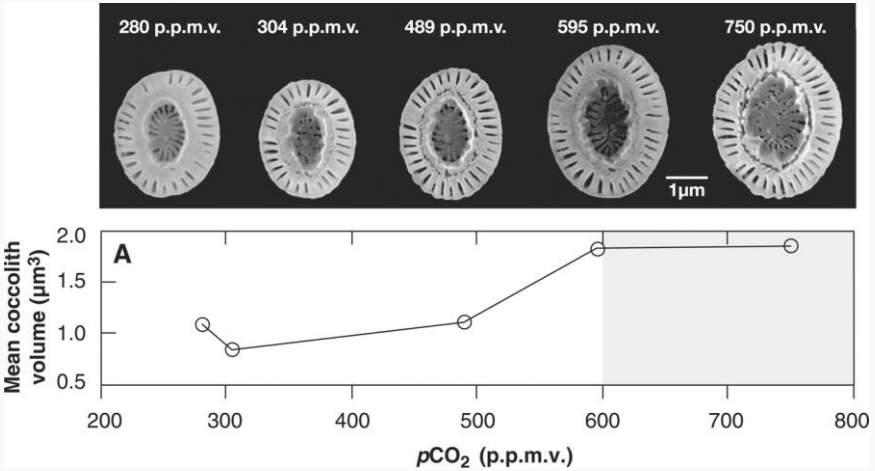




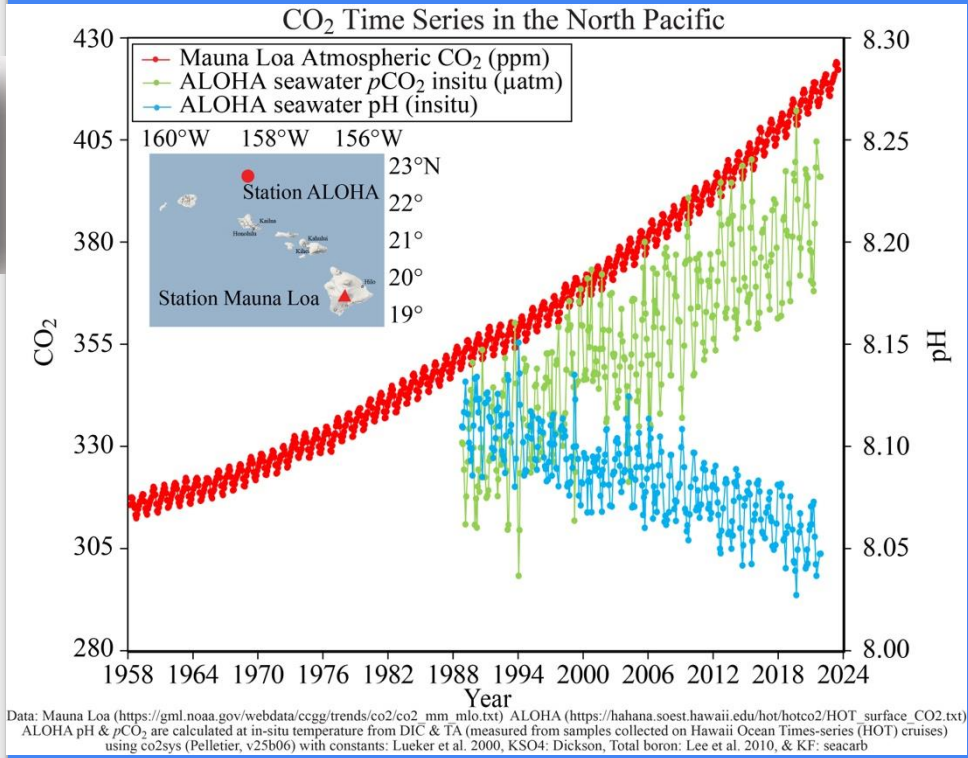
Impacts



Pteropod shells at predicted pH for 2100.
David Liittschwager/National Geographic Stock



Coccolith volume and calcification at different CO_2 concentrations.
Iglesias-Rodriguez et al., 2008



NOAA

Acknowledgements

Contact us:

WRANEgeo@okstate.edu

NSF grant ICER-2119861

Cas.okstate.edu/wrane/index.html

WRANE
Water Resources, Assessment and Networking Ecosystem

Additional Information:

- Ocean Acidification Visualizations: Kings Centre for Visualization in Science
  - Ocean Acidification
  - Graphing Ocean Acidification