SOCCOM

Southern Ocean Carbon and Climate Observations and Modeling

Broader Impacts and Education

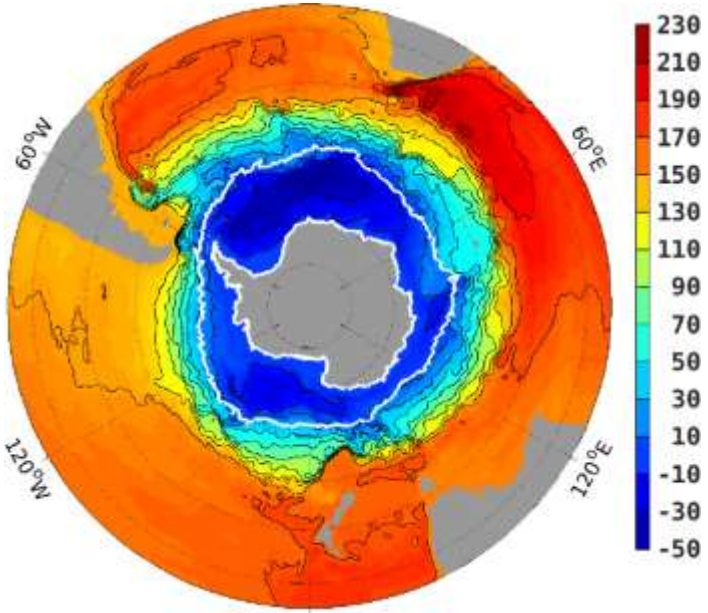
Greta Shum
Climate Central

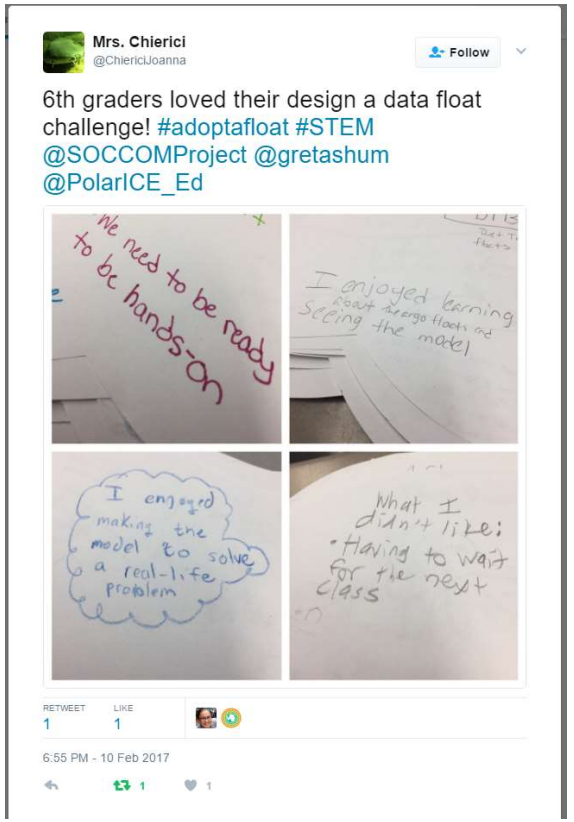
CLIMATE CENTRAL

Research
Journalism
Data Visualization

Public Audience
Policy Makers

SOCCOM



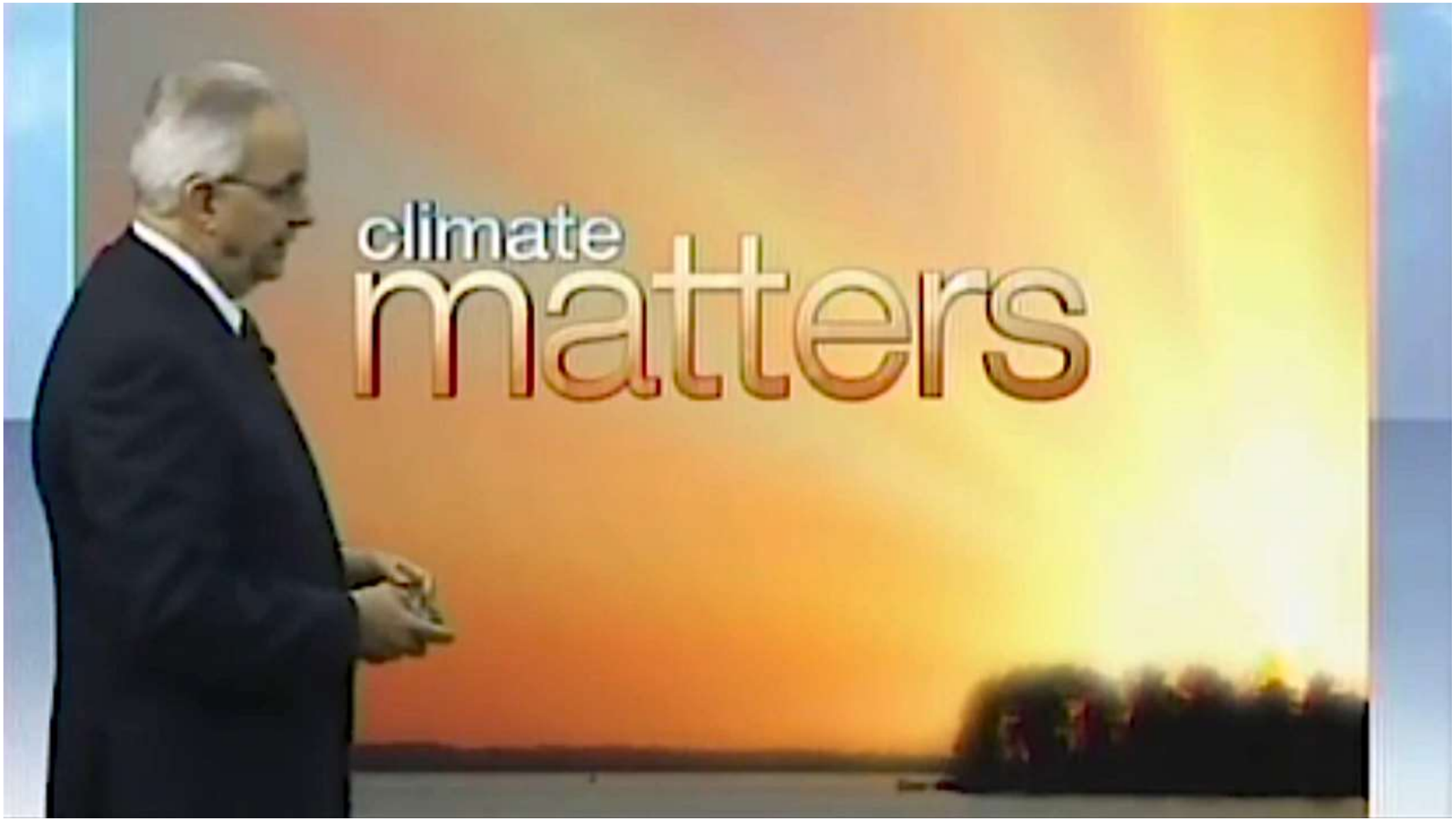


Observations

Modeling

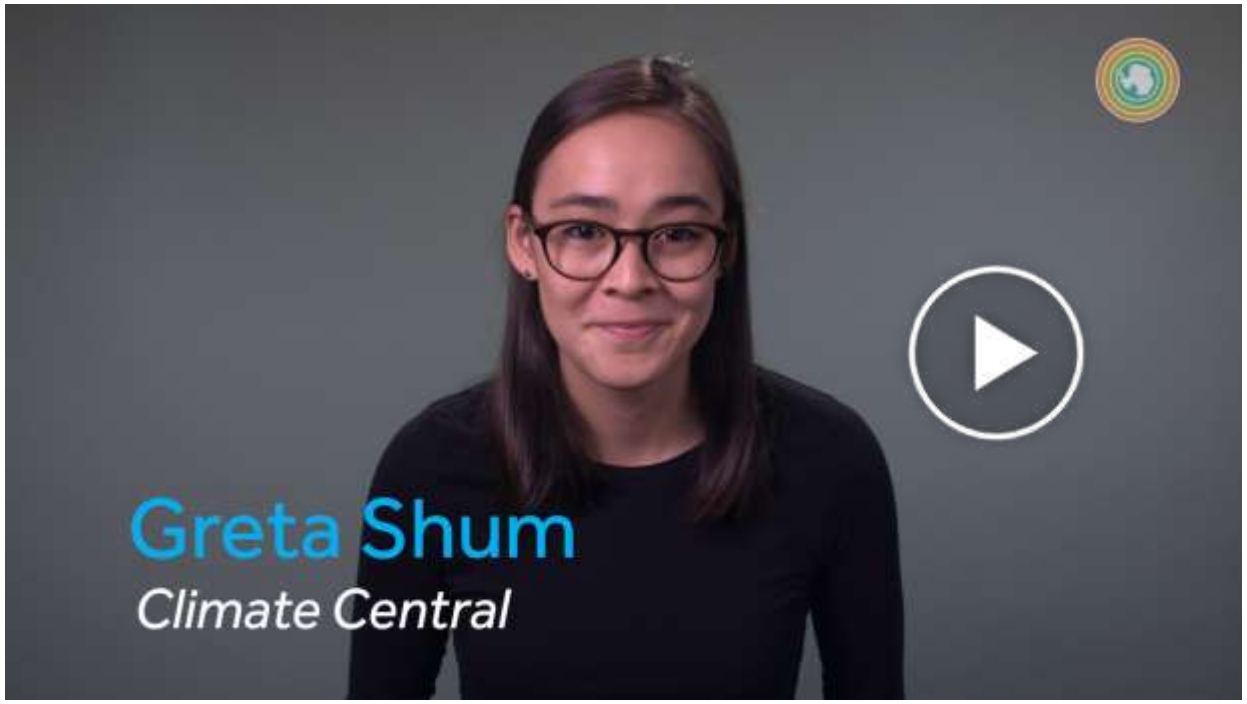
Broader Impacts


Google
Hangouts
Videos
Social Media
TV
Meteorologists


climate
matters

Multimedia Modules

Then we tested it…



Changing Biologies Module

The majority of biological productivity throughout the global oceans depends direcly on nutrient supply from the Southern Ocean. Any change to its physical dynamics ripples out and can affect food web supply chains. This module will give you tools to understand the Southern Ocean's role today and how changes to the climate system may be magnified by it.

Nutrients are the base of the food web. They're formed when organic matter dies, decomposes, and falls to the ocean floor. At these extreme depths, nutrients are carried by deep ocean currents for hundreds of miles until the water upwells and rises to the surface. Upelling only occurs in certain locations. But 80 percent of global deep water upwelling takes place in the Southern Ocean.

Upelling is one of two major physical mechanisms that make the Southern Ocean a major player in global ocean biological nourishment. Ekman Transport is the other. This process causes winds blowing around the Antarctic continent act to transport newly upwelled surface water in the Southern Ocean northward. The nutriends in these currents are used to sustain about 75% of ocean life. The result is that deep water drainage in the Southern Ocean is one of the most important mechanisms for nourishing biological productivity.

Videos

Changing Biologies

Handouts

Ekman Transport: How it Works

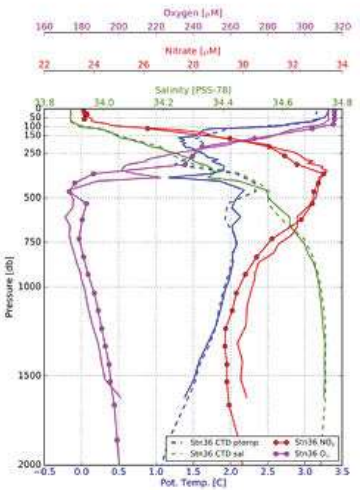
Reading a SOCCOM Float Profile

A Guide to Southern Ocean Upwelling

Summary of How Fisheries and Coral Reefs are affected by Climate Change

Ask-A-Scientist

Ken Johnson, MBARI
Jorge Sarmiento, Princeton
Seth Bushinsky, Princeton
Lionel Arteaga, Princeton



For more information, contact soccom@climatecentral.org

Adopt-a-Float

Floats on Boats Releasing autonomous floats in the Southern Ocean in the name of science

Classic Flipcard Magazine Mosaic Sidebar Snapshot Timeslide

DEC
28

Floats away!

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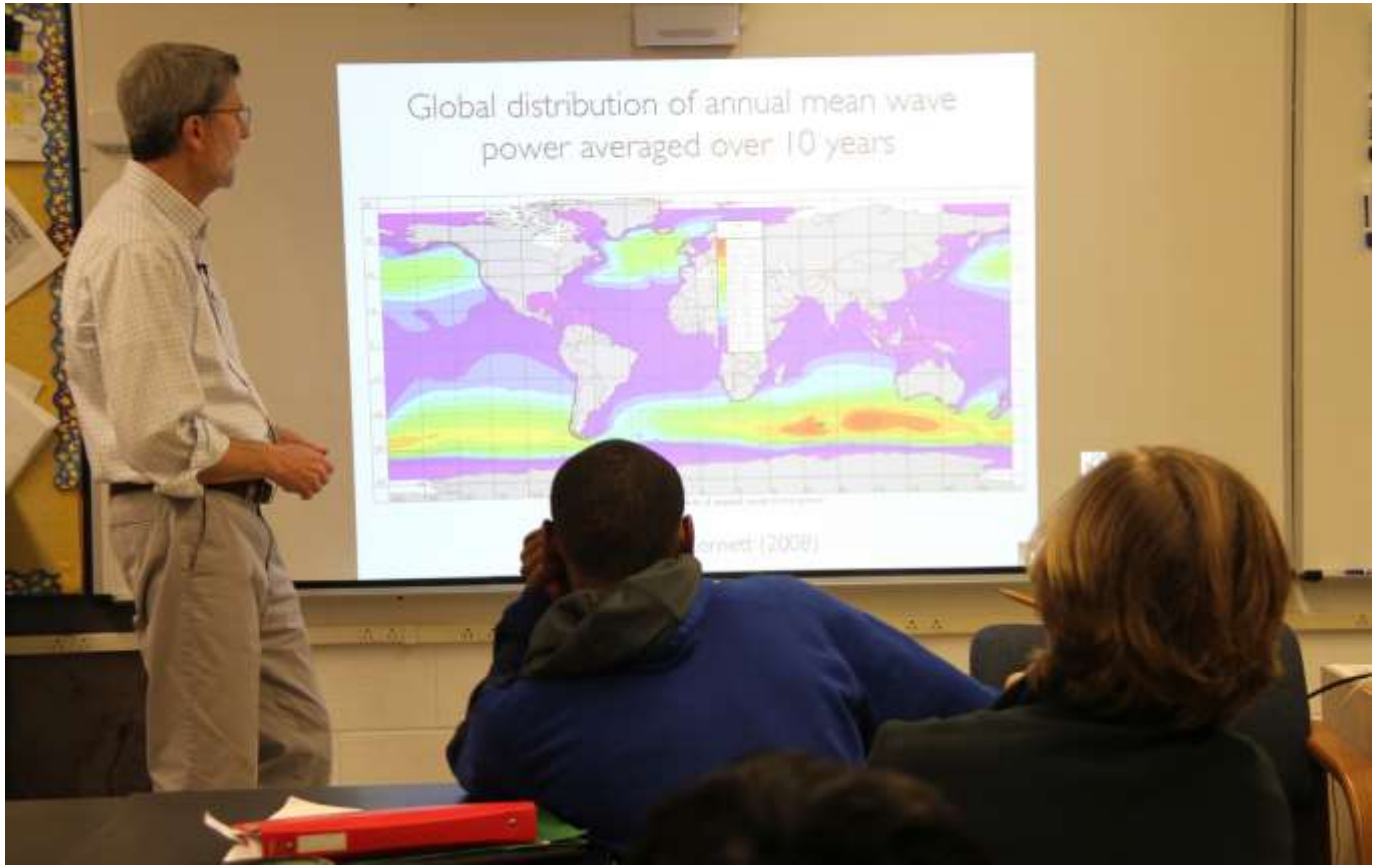

Global distribution of annual mean wave power averaged over 10 years


To think like a scientist
SOCCOM
Homeroom 112

SOCCOM at Sea

Hey there, my name is Greta Shum, and I'm writing to you from a ship in the Southern Ocean! I'll tell you about my adventures aboard this research vessel as well as the science. Learn more about my project in particular, at soccom.princeton.edu

THURSDAY, JANUARY 5, 2017

How Do They Work?

By now, you know that these SOCCOM floats open incredible windows into a vitally important part of our climate system, the Southern Ocean, but how exactly do they do that?

Let's take a look. First off, there are the sensors.

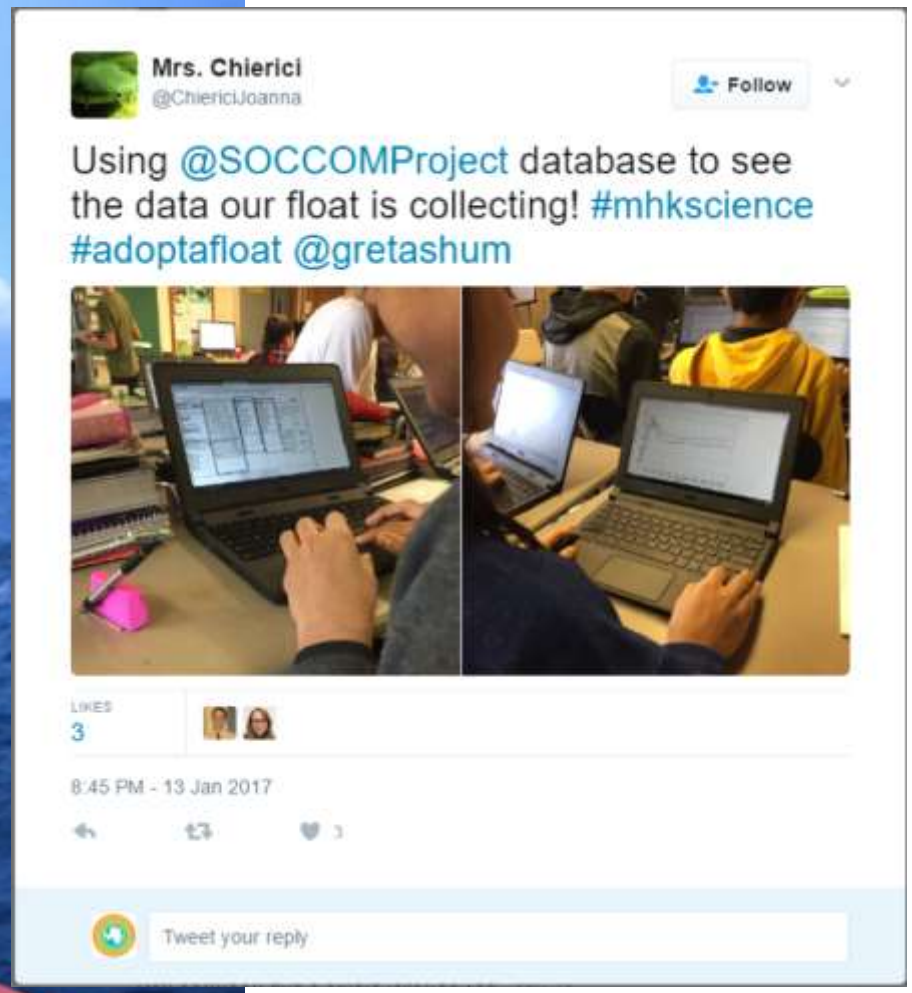
Here's a photo of the top of one of the floats with the sensors labeled.

To start, take a look at the temperature and salinity sensor. That's the black tower that has the tall holes in it. Salinity is measured by measuring the water's conductivity. If the water has higher conductivity, that means there are more ions in the water, which means a higher salinity. If you know the temperature and pressure, you can calculate an exact number for the salinity of the water from this device.

The temperature probe is actually called a "thermistor" not a thermometer. The traditional mechanics of a thermometer use mercury, but a thermistor is actually a resistor (a metal, ceramic or polymer) whose resistance changes very precisely with temperature. Put thermo- and resistor together, and what do you get? Thermistor!

The reason why the pressure sensor is labeled differently is because you can't actually see it! It's behind all the other sensors, but it measures the pressure of the water around the float, and from that you can calculate the depth.

Because the float has these three sensors (T, S, and P), scientists will say that this float has a "CTD," which stands for Conductivity, Temperature and Density, and that'll get you your bread and butter parameters that you need to know about the water in every profile.


Mrs. Chierici
@ChiericiJoanna
Follow
Using @SOCCOMProject database to see the data our float is collecting! #mhkscience #adoptafloat @gretashum
LIKES
3
8:45 PM - 13 Jan 2017
Tweet your reply

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@ChiericiJoanna

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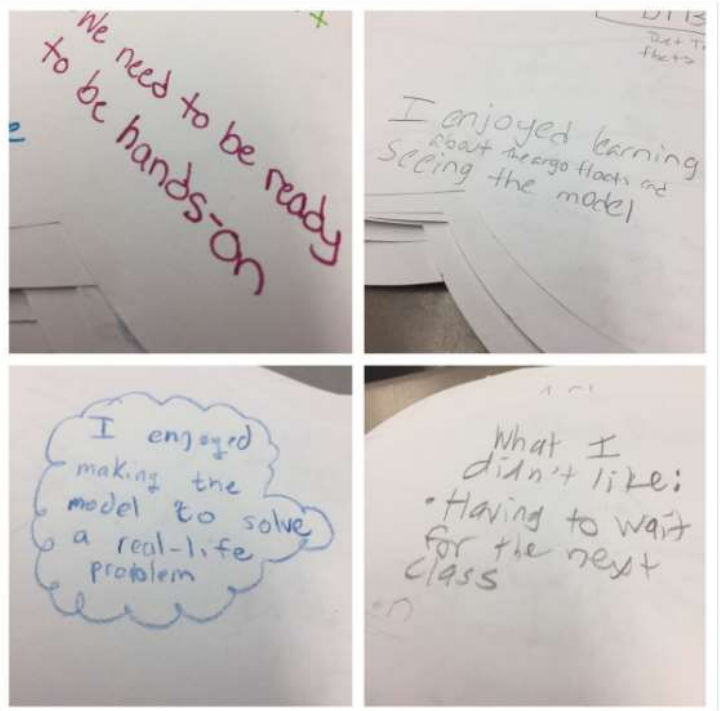
6th graders loved their design a data float challenge! #adoptafloat #STEM @SOCCOMProject @gretashum @PolarICE_Ed



RETWEET 1 LIKE 1

6:55 PM - 10 Feb 2017

1 1

AdoptAFloatViz 6.0 - Data visualization for SOCCOM, a US NSF sponsored project focused on carbon and climate in the Southern Ocean

Adopt-A-Float through SOCCOM. Floats and Schools

Using ISUS nitrate sensors and Deep-Sea DuraFET pH sensors in Webb Research Apex and Sea-Bird Electronics Navis profiling floats

Quick Instructions | Float list and link to complete Ascii data files | Data Adjustments | Map of float tracks | Apex/ISUS description page

Select Output Type and Send Request:
Plot / Text File — SEND

Raw Data or Adjusted Data:
Raw / Adjusted

Data Quality Flag:
All Data / Good and Quest / Good Only

What dates?
All Dates available / Week Ending on End Date / Month Ending on End Date / Specify Start/End Date

Change dates: (MM/DD/YYYY)
Start Date 09/17/2007
End Date 04/28/2017

Select Float (ctrl click for more than one)

Huey, Princeton Day....pH/N/O
Louie, Princeton Day....pH/N/O
Dewey, Princeton Day....pH/N/O/FL
Jose Iriarte, Blog Win...pH/N/O
J.W., JW Middle Sch...pH/N/O/FL
Nemo, JW Middle Sch..pH/N/O/FL
Tator Tot, Lakeside Wils..pH/N/O6/FL
Pi, Lakeside Wilson.....pH/N/O6/FL
Eep, Lakeside Wilson...pH/N/O/FL
Z-Pod, Lakeside Wilson.pH/N/O/FL
X-Pod, Lakeside Wilson.pH/N/O/FL
Kaia, Lakeside Wilson...pH/N/O/FL
Moby Dick, JW Middle...pH/N/O/FL
RE Byrd, Princeton Day...pH/N/O/FL
RF Scott, Princeton Day...pH/N/O/FL
Titus, Bear Tavern Elem....pH/N/O6/FL
Southstar, M.H. Kreps MS..pH/N/O/FL
Kirby, M.H. Kreps MS..pH/N/O/FL
Jorge, Princeton.....pH/N/O6/FL
Darwin, Passaic Valley HS.pH/N/O/FL
Mann, Passaic Valley HS...pH/N/O/FL
Bell, John Witherspoon MS.pH/N/O/FL
Sundevil Sam, Sandia Prep S..pH/N/
Sundevil Lion, Sandia Prep S..pH/N/
EH Shackleton, Princeton Day.pH/N/
12542SOOCN.....pH/N/O/FL

Select One X Variable

Nitrate[µmol/kg]
Depth[m]
Pressure[dbar]
Date
Salinity[pss]
Temperature[°C]
Sigma_theta[kg/m^3]
Oxygen[µmol/kg]
OxygenSat[%]
Chl_a[µg/l]
b_bp700[1/m]
CDOM[ppb]
pHinsitu[Total]
pH25C[Total]
TALK_LIAR[µmol/kg]
DIC_LIAR[µmol/kg]
pCO2_LIAR[µatm]
Chl_a_corr[mg/m^3]
b_bp_corr[1/m]
POC[mmol/m^3]

Select Y Variables (ctrl click >1)

Nitrate[µmol/kg]
Depth[m]
Pressure[dbar]
Date
Salinity[pss]
Temperature[°C]
Sigma_theta[kg/m^3]
Oxygen[µmol/kg]
OxygenSat[%]
Chl_a[µg/l]
b_bp700[1/m]
CDOM[ppb]
pHinsitu[Total]
pH25C[Total]
TALK_LIAR[µmol/kg]
DIC_LIAR[µmol/kg]
pCO2_LIAR[µatm]
Chl_a_corr[mg/m^3]
b_bp_corr[1/m]
POC[mmol/m^3]

Autoscale X & Y axis: On / Off

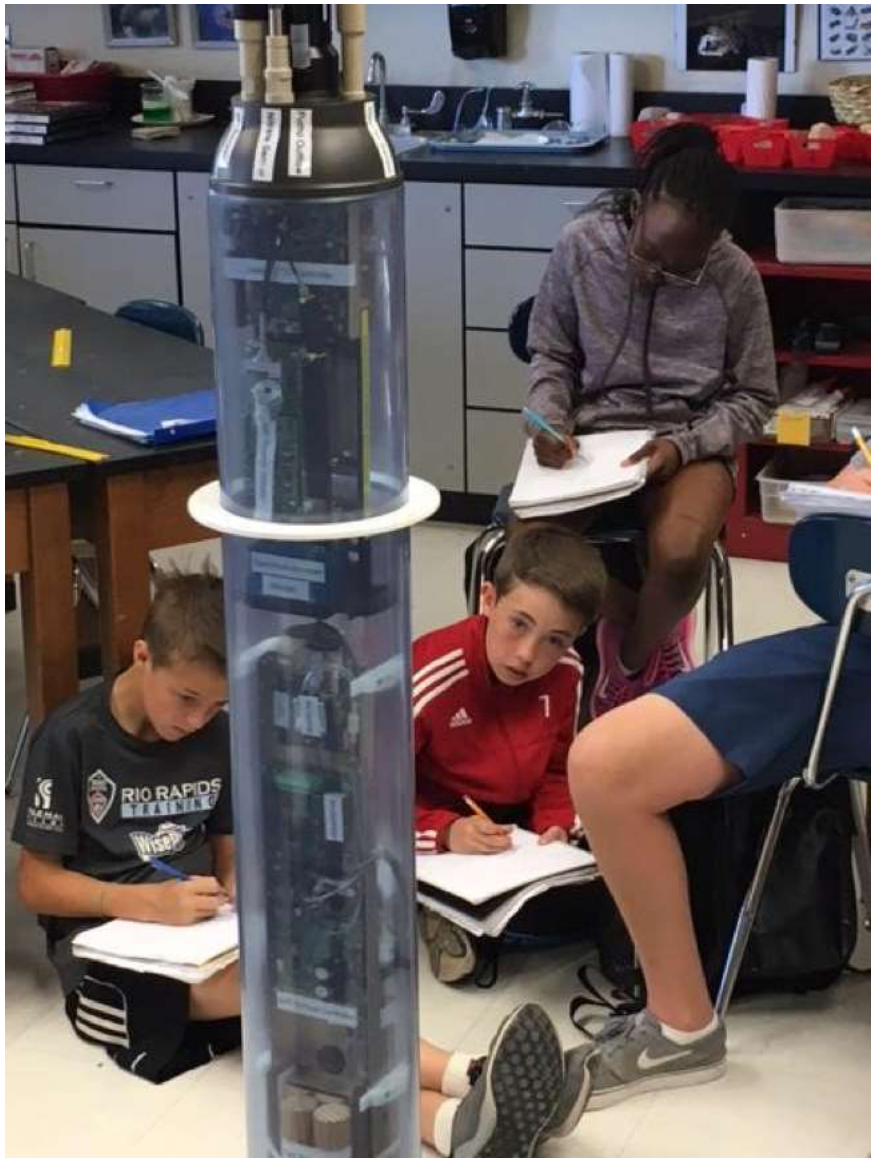
Enter Ranges if Autoscale is Off
(Min & max ranges default to 0 and 200 if Autoscale off and box is empty. Depth ranges are entered as negative values on Y axis and as positive values on X axis.)

X Min: X Max:
Y Min: Y Max:

Y Stack: (In a single graph, multiple Y variables or multiple stations are stacked vertically if it is On) On / Off

Enter Min and Max Depth range for data used in Time Series Plot (X Var = Date)
Min Depth: 0
Max Depth: 1050

SOCCOM


RIO RAPIDS

Thank you!