



## A CONVERSATION WITH:

# MICHAEL STEELE

## SENIOR PRINCIPAL OCEANOGRAPHER

### Which systems thinking skills do you use?

#### #3: Respond to Uncertainty and Ambiguity

Through my work, I quantify uncertainty. I am helping NASA measure changes in ocean surface temperature and salinity in the Arctic Ocean. We measure these parameters using surface drifting buoys and then compare our data with the satellite data.

#### #11: Identify Feedback Loops

I work to accurately measure the ocean warming part of the "ice-albedo feedback" in the Arctic climate.

#### #15: Respond to Changes Over Time

In my scientific career, I have transitioned from just trying to figure out what's up in the Arctic Seas, to documenting the fast rate of warming and ice melting in Arctic Seas so that society might do something to mitigate global warming.

### 1. What is your role within the STEM community?

I work at the Polar Science Center in the Applied Physics Laboratory at the University of Washington as a research scientist.

### 2. What complex problem do you address in your work?

I try to understand the basic properties of the Arctic Sea ice and the ocean system. I research how these are changing as a result of global warming.

### 3. What elements do you need to consider when addressing this problem?

I need to form an hypothesis to explain preliminary results, and then I need to do experiments to see if I am right or wrong. It is really important to look at the results objectively. If the results indicate that my hypothesis is wrong, I have to go back to the drawing board and figure out a new explanation. This is actually the most fun part of my job!

### 4. How did you get to where you are today?

I grew up in a suburb of Los Angeles. I spent a lot of time in a local, pretty undeveloped, park which teemed with wildlife like frogs, dragonflies, and snakes. In high school, a school trip to Yosemite National Park in winter blew my mind and set me on a career path to study Earth Science. I chose the Arctic Seas as a research topic because it was so different from my background and I longed to explore extreme environments. I eventually learned that the people who live there don't necessarily think of their home as any more extreme than Los Angeles!

### 5. What advice do you have for becoming a systems thinker?

There is a lot of value in a narrow view where you burrow down into the gritty details of a problem to make progress. At the same time, it is also very rewarding to look up from that narrow view and see the Big Picture, i.e. to think in a systems way. I frequently borrow concepts from other fields and apply them to my research; this is a great way to "get out of the box" that my colleagues might be stuck in. The Arctic is a really interesting place that encourages a systems approach to research. I have worked with people who study rivers, plankton, and clouds, and these collaborations have led to really fun projects.