

MARINE SCIENCE TOOLS – C-BASS CAMERA ARRAY

Professor: Teresa Greely, Ph.D

Hey there. My name is Sarah Grasty, and I am a project scientist on what we call the C-BASS Project here at the college of marine science. So the C-BASS stands for camera-based assessment survey system, and that's what you're looking at here.

So first, I'll explain what is on this big contraption and then what we use it for. So what we have right here in the front is something that we're testing. And it's called a DIDSON, which is a forward-facing sonar. And it's extra difficult. Usually these are used when they're stationary and they kind of look like an ultrasound when you look at the data on a computer.

So we're moving-- we're towing C-BASS at three to four knots. So that's going pretty quick, so you get a lot of noise. So this is an experimental part of the system.

And then if we move further back, there's also an altimeter, which is telling us how far C-BASS is from the bottom so we don't run into any of the bottom features. There's also a fluorometer, which is giving us continuous measurements of the surrounding turbidity and chlorophyll.

So turbidity is a measure of how dirty the water is, how much clay particles and mud particles are in it. And then the chlorophyll is an indicator of how much phytoplankton is in the water.

And then if you go here, it's not on right now, but this is where the CTD would be. And what the CTD is measuring is salinity, temperature, and it's giving us a depth using pressure. So we can also tell how deep C-BASS is in the water.

And then if you keep moving, along here in the middle there's this long canister. And that is where all of the really important parts of C-BASS are housed. So that's where the computer is. That's where all the communications go through. And it has all the power distribution. So this is how we tell C-BASS if we want certain lights on or off and the lasers on and off. And that's also where the hydrowire comes down through and that's what C-BASS is towed with.

So it's connected the whole time, unlike something like an autonomous underwater vehicle. And it's different from an ROV or remotely operated vehicle in that the ship doesn't have to stay relatively stationary and then the ROV maneuvers itself around. So we can actually tow this at pretty high speeds, which also increases our sampling efficiency. So we actually can cover quite a bit of ground in a small amount of time.

And what we're doing with that right now is basically counting fish. And so since we know how far along we've traveled-- so we know the length of a transect that we make-- and we also know what the field of view of the camera is, we can get a density estimate of the fish in a certain area. And you can actually extrapolate that out to a population estimate.

And what we're also doing is using this to create habitat maps. So in addition to filming fish, we're also filming bottom features. And the way we actually go about planning a cruise with C-BASS is using something called multibeam bathymetry, and that tells you what the depth changes are in an area.

And along with that, you also get something called a backscatter map, and that indicates differences in bottom type. So rock will return something different than mud, which will return something different than sand. So we're using that in tandem with the multibeam, planning out transects, and going and filming them. And then there's another student in the college working on creating these habitat maps.

So again, using some of the video and the film to figure out what the backscatter corresponds to on the video and then extrapolating that out to the whole study area that we have the multibeam and backscatter four.

So I'm excited to keep working on this project, and I'm fortunate enough to have a job for the next three years working on a really interesting project and learning more about what the system can do and hopefully convincing all of you and the fishermen and the managers around here who do fishery stocks that this is a good instrument to use.