SUNY ESF Teams Up With Universities in Norway and Sweden to Offer a Unique Course: **Climate Change and the Ocean**.

As members of the ESF community are well aware, climate change is already here and is altering everything from seasonal temperatures, precipitation, extreme weather events, and more. But we offer few courses that directly study the effects of climate change. Additionally, we have seen among our students an increased interest in the marine sciences, with numbers swelling in our Marine Science minor.

Against this backdrop, a group of us began to discuss offering a course with a simple, direct name: Climate Change and The Ocean. This course grew into a global seminar, as ESF co-coordinators Karin Limburg, Joshua Drew, and Leanne Powers teamed up with Swedish scholars Dr. Yvette Heimbrand and Dr. Max Lindmark at the Swedish University of Agricultural Sciences (SLU), and with Professor Anne Gro Salvanes at the University of Bergen in Norway (UiB), to offer a course in real time across seven time zones, with an additional three time zones to include guest lecturers from North America's west coast.

With lectures ranging from physical/chemical oceanography, to ecology, human drivers, impacts, adaptation, and potential solutions, a set of blue-ribbon lectures were delivered to the 41 ESF, 12 SLU, and 11 UiB students representing undergraduate, Master's, and doctoral students ranging from as far away as South Africa. The SLU and UiB students joined online, and could interact with comments and questions throughout. We at ESF scheduled the lecture at a time of day that would be convenient for participants across all ten time zones.

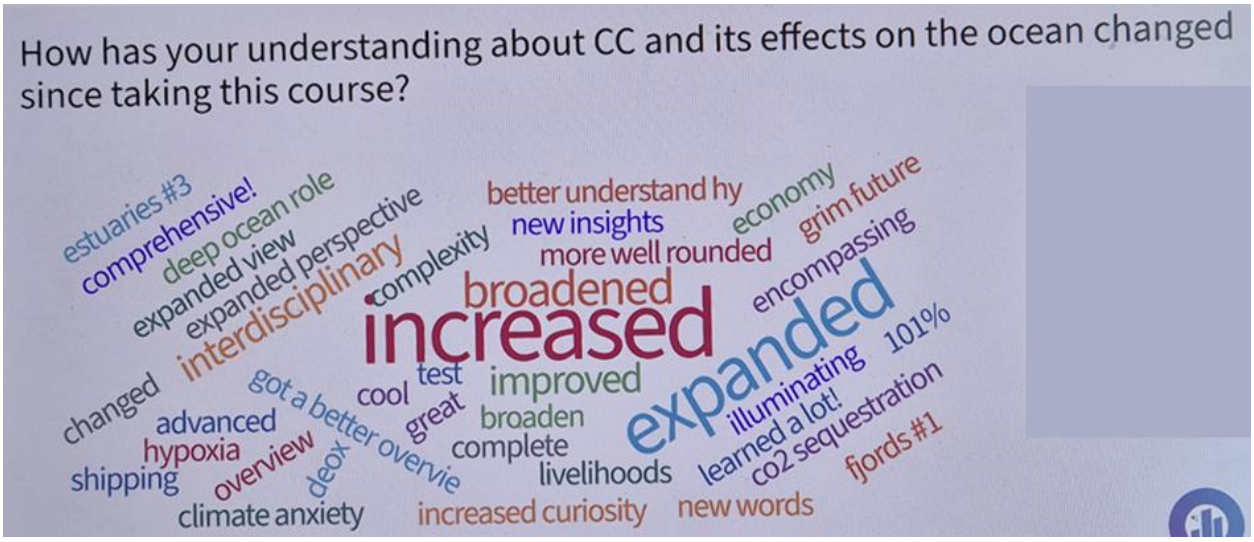
We also wanted to offer all the students the opportunity to interact with each other outside of lecture time. After a little research, we settled on using the platform Discord, where we could build libraries of lecture notes and readings. But importantly, we had lively online discussions of topics inspired by the lectures. There were some surprises, as the European students did not realize the depth of climate disbelief felt by families of many of our students; nor had ESF students a prior view of the attitudes that prevail in Europe, where climate change is generally accepted.

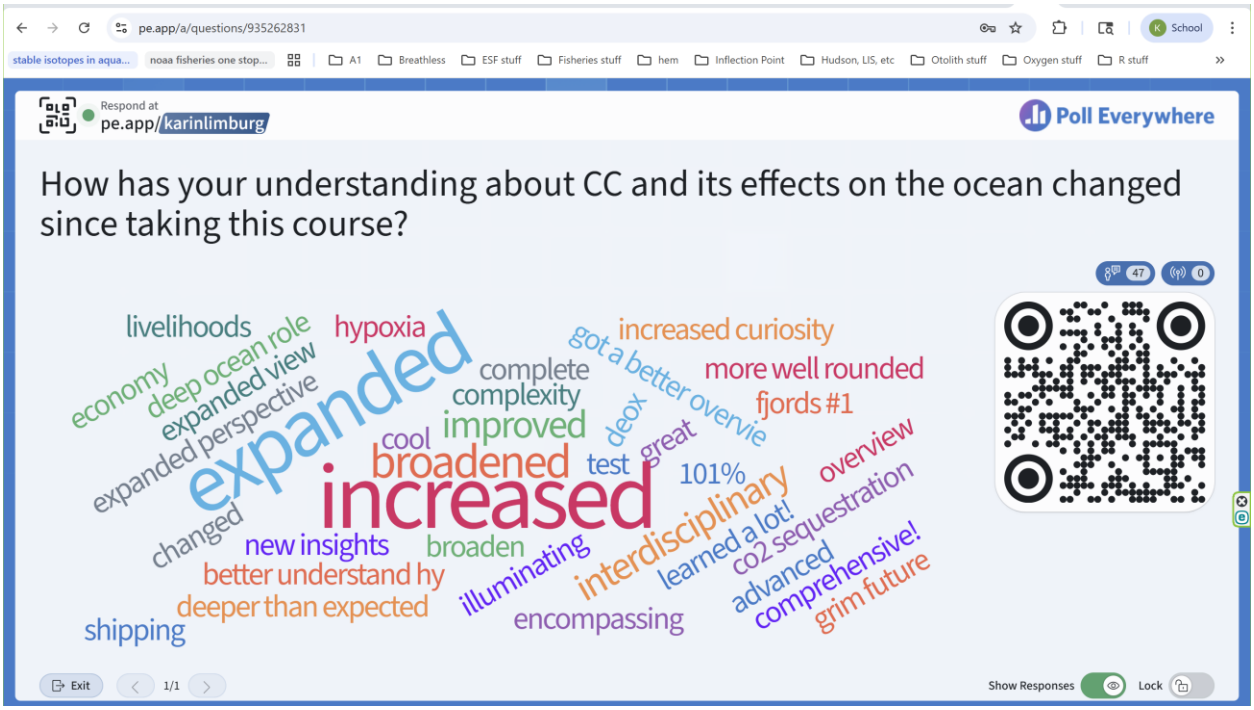
At the end of the course, we were fortunate to have a chance to interact with the Deputy Global Coordinator of the UN Decade of Ocean Science for Sustainable Development at UNESCO's Intergovernmental Oceanographic Commission. In this last class, the students had a real-time taste of global governance of the world's oceans.

Overall, the students came away with a much deeper understanding of the complexity of climate change causes and effects. They were also certain that accessible communication of this knowledge to non-scientists is essential; and that the greenhouse gas emissions that are driving the changes must be reduced.

In an online poll, we asked the students what they got out of the course. Here are answers from our inter-continental student body:

Here are two views of the poll. They contain slightly different words.





In truth, we coordinators loved the course as much as the students! It was a rare treat to learn directly from the world's experts.