

Earth to Sky Climate Cast

Climate Change and the California Current at Point Reyes National Seashore – Part 2

[guitar music introduction and female singing]

[Frank Schwing – pull quote]

I think most animals will be pretty robust, whether or not they remain California animals is another question.

[guitar music in the background]

[Cassandra Brooks]

Hi, I'm Cassandra Brooks, with the Pacific Coast Science and Learning Center at Point Reyes National Seashore and I'll be your host for part two of this episode of Earth to Sky's Climate Cast.

In part one we discussed the how climate change and ocean warming might be impacting the California current and the animals that live there. Here we continue our conversation with oceanographer Dr. Frank Schwing about the impacts of climate change on the Point Reyes National Seashore, as well as the potential for dead zones and ocean acidification.

[Cassandra Brooks]

So, Dr. Schwing, I was hoping you could tell us how climate change and changes in the California upwelling currents might specifically affect the Point Reyes region? I know there are a lot of elephant seal haul out sites, and a lot of great white sharks, and many animals specific to this place. Can you comment on how some of these changes will affect them?

[Frank Schwing]

While climate change is a global process the impacts on populations or organisms really occur at very local scales. Could be things like changing in the time of upwelling, and Point Reyes is a very large upwelling area. If we see delays there, it could be particularly sensitive to those changes compared to other areas say off of Washington or southern California where the seasonal cycle of upwelling is not as strong. In terms of marine mammals again one of the things we are probably going to see is big shifts, geographic shifts in distributions. So their traditional haul out areas are associated with a geographic

feature or a point it may be at some point that the conditions are no longer right for them to return to those spots and they'll be seeking other locations for their reproduction or other life history activities that may be further north.

[Cassandra Brooks]

What is the potential for us to have dead zones here off California due to the circulation changes you talked about?

[Frank Schwing]

Well we actually are getting some dead zones here. We are seeing some interesting changes in the oxygen levels through the California current. And we're seeing two things that seem to be occurring. One is that climate change seems to be slowing down the overall clockwise circulation of the Pacific Ocean. So we are seeing less of that subarctic water and its losing the battle with the subtropical water. When you combine that with the upwelling we are getting it's bringing that low oxygen water much closer to the surface than we've seen before. Fairly close to the surface at times, we're seeing what we call hypoxic water, water that is very difficult for most gilled animals to survive in.

An area we haven't talked about much is ocean acidification. We know relatively little about what the impacts of this are going to be. But recent surveys have shown an alarming trend towards higher acidity in the waters off the California current and again because of upwelling these acidic waters are showing up very close to the surface.

[Cassandra Brooks]

Dr. Schwing said these acidic surface waters could be really detrimental in the formation of animals that are calcium carbonate based since carbonate can't form when you reach below a certain pH.

[Frank Schwing]

So that's an area we are really concerned about in terms of being one of the consequences of climate change.

[Cassandra Brooks]

Despite these potential impacts of climate change, are you fairly hopeful that most of the species here off California will be robust to survive the next century of climate change?

[Frank Schwing]

I think most animals will be pretty robust, whether or not they remain California animals is another question. But, both with natural variations in the oceans as well as things

driven by human activities, there will be winners and losers. Some of the animals don't fair so well there will be other animals that will be happy to come in and take their place. The question is whether those animals that are replacing them will be appropriate for the ones that will benefit the various human activities in the ocean. Not only economically, but socially, through recreation and just the intrinsic connections we have with the ocean, living close to it for so many years.

[Sound of footsteps and then breaking waves]

[Cassandra Brooks]

I walked out of Dr. Schwing's office, and out to the beach just across the street, wondering what the future will hold for the California Coast and all the species that live there. One thing is clear, having protected places, like Point Reyes National Seashore, will at least provide a stable place for creatures while they adjust to these tremendous changes.

[guitar music crescendo]

Earth to Sky's Climate Cast is made possible through an innovative partnership between the National Park Service and NASA. The theme music was composed and performed by Karen Savoca. Each episode is written and produced by employees and partners of the National Park Service. For more information on the NASA Earth to Sky Project, and to learn more about how climate change is impacting our national park system, visit www.earthtosky.org.

[guitar music crescendos, woman sings, and music ends]