



August 5, 2013

Michael Tollstrup
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814
Submitted via CARB comments webpage:
<http://www.arb.ca.gov/cc/scopingplan/2013comments.htm>

RE: Comments on the California Air Resources Board (CARB) 2013 Update to AB 32 Scoping Plan

Dear Mr. Tollstrup,

On behalf of the following organizations, we thank you for the opportunity to submit the following comments to the California Air Resources Board (ARB) for consideration of the Update of the 2013 Scoping Plan.

As ARB is updating the AB 32 Scoping Plan and focusing on the longer-term – out to 2050 – to address greenhouse gas (GHG) emissions reductions, we are pleased to see ARB make specific reference to coordination with California Adaptation Strategies. Not only is adaption planning imperative to ensuring we can continue to live and work and adapt to the myriad impacts of climate change, adaption projects can serve dual purposes by both reducing emissions and providing ecological benefits simultaneously. In this letter we describe ways the following ongoing coastal and marine management initiatives in California contribute to carbon sequestration: marine protected areas, wetlands restoration, and kelp forests enhancements.

The ARB Scoping Plan Public Workshop presentation acknowledges the opportunities for GHG sequestration in natural lands, and specifically includes wetlands. We appreciate the inclusion of wetlands and the opportunities our coasts can offer for achieving our climate goals. In addition, we want to highlight the contributions of healthy natural ocean systems to GHG reductions and encourage ARB to include oceans in the 2013 Scoping Plan.

The Carbon Benefits of Ecosystem Based Management

A healthy ocean and coast are not only inherently valuable to California, but also vital to our state's future economic well-being. With threats to the global ocean on the rise, California's long history of leadership on ocean protection makes us well-suited to respond to the important challenge of climate

change. More than 90% of the Earth's carbon dioxide passes through the oceans, making oceans a critical part of the global carbon cycle. Vast amounts of carbon are stored in a number of ocean habitats, including sea grass beds, kelp forests, coastal peat bogs, and tidal, freshwater and brackish wetlands.

Inclusion in the Scoping Plan of support for existing tools that have been developed to protect relevant California coastal and ocean resources could play an important role in reducing the state's GHG emissions and combating climate change. In particular, ongoing support for implementation and monitoring of the network of marine protected areas recently created through the Marine Life Protection Act will help to protect and restore some of the valuable resources described below. The state's network of marine protected areas can help moderate the impacts of GHG on marine life by restoring biodiversity and resilience to protected places, with possible spill-over benefits to surrounding areas (scientific studies show an average of 20% higher biodiversity in marine reserves than in similar fished areas). Support for monitoring of the marine protected areas can help track the impacts of GHG on ocean life; sort out the impacts of GHG emissions from impacts of fishing, industrial projects and other activities; and help adaptively manage these protected areas to optimize their benefits as a hedge against GHG effects.

The 2011 California Coastal Adaptation Needs Assessment¹ is an important reference to guide allocation of support for adaptation enhancement activities, and the California Ocean Protection Council, Ocean Science Trust and West Coast Governor's Alliance on Ocean Health can offer expertise. They should be consulted as ARB and the state work to achieve GHG reduction goals.²

The Carbon Benefits of Wetlands Restoration

Tidal wetland restoration projects have potential to sequester GHGs and provide vital adaptation benefits coastal areas vulnerable to impacts of climate change, including sea level rise and more intense storm surges.

The latest data¹ on the carbon sequestration potential of California's tidal wetlands show that salt marshes, estuarine forests, and potentially freshwater tidal marshes play a critical role in sequestering carbon.

Carbon accumulation rates can be substantial in wetland soils because of high rates of plant productivity and low rates of decomposition in these ecosystems. Tidal wetlands store carbon belowground and have low methane emissions, making their restoration a promising technique for reducing greenhouse gas emissions. In addition, wetland restoration projects can facilitate adaptation of coastal areas vulnerable to impacts of future climate change, including sea level rise and more intense storm surges.

¹ http://ca-sgep.ucsd.edu/sites/ca-sgep.ucsd.edu/files/advisors/mrmyers/files/CCSurveyReport_12MB.pdf

² <http://www.opc.ca.gov/2009/12/climate-change/>

The Carbon Benefits of Kelp Forests

Though there is a need for additional research to better understand how these habitats sequester and store carbon, there is substantial evidence that seaweed and kelp forests have the potential to contribute to GHG sequestration as well as improve water quality.

Like all plants, marine seaweeds absorb carbon dioxide and use photosynthesis to grow, while producing oxygen as a metabolic byproduct. There is a growing recognition³ that ocean plants can play a key role in absorbing carbon directly, alleviating the associated problem of ocean acidification⁴, and improving water quality by absorbing nutrients and reducing low oxygen associated with hypoxia and dead zones.

The recovery of the southern sea otter population could result in substantial increases in carbon storage due to potential restoration of kelp forests in California coastal waters.

Recent research has highlighted the global importance of developing habitat use strategies as a mechanism to sequester carbon.⁵ Using the example of sea otters in the eastern Pacific, new data show that sea otters can increase carbon storage in kelp forests by an order of magnitude (10x) compared to regions where sea otters are absent.

Sea otters have historically lived in shallow coastal waters along the West Coast, with a historic range from Alaska down to Baja California. Because of strong federal and state protections, sea otter populations in the United States, including California, have partially recovered from near extinction due to hunting at the turn of the century but their recovery has stalled over the last few years⁶. Scientists suspect that sea otters now suffer from a range of diffuse threats including water pollution, food limitation and disease. In the absence of sea otters, the invertebrate kelp grazers they feed on, such as sea urchins, proliferate and destroy kelp forests. A substantial increase in investment in sea otter recovery and protection could result in substantial increases in kelp forests, which contribute to carbon storage and sequestration.

While shown to be effective on a small scale, innovative methods (and resources) to enhance kelp forests and expand algal culture are needed to test this approach at scales relevant to AB 32.

Conclusions

A growing body of research shows that coastal and marine investments could demonstrate GHG reductions and provide critical adaptation benefits to coastal habitats. As ARB drafts the Updated Scoping Plan, we recognize that it will have to prioritize investments given limited resources. While terrestrial habitats and land-based strategies have received considerable attention, we encourage ARB to be mindful of the co-benefits that ocean projects have to offer the state in meeting its AB32 goals.

³ <http://marineagronomy.org/>

⁴ <http://oceanacidification.net/>

⁵ Wilmers, C. C., Estes, J. A., Edwards, M., Laidre, K. L. and B. Konar. Do trophic cascades affect the storage and flux of atmospheric carbon? An analysis of sea otters and kelp forests. *Front. Ecol. Environ.* 2012. Doi: 10.1890/11076.

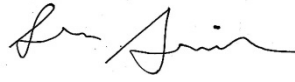
⁶ <http://www.usgs.gov/newsroom/article.asp?ID=3369>

We thank the ARB for considering California's coasts and oceans as resources and opportunities to reduce, mitigate and sequester GHG emissions as well as opportunities to invest in critical adaptation projects.

Sincerely,



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Ocean Conservancy



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c.c. Shelby Livingston, Air Resources Board
c.c. Catherine Kuhlman, Ocean Protection Council
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ⁱ Crooks, S. 2009. Carbon sequestration in tidal wetlands – white paper. Prepared for Resources Legacy Fund. 8pp.