



## Restore America's Estuaries Position on Climate Change

### Statement of Policy

*Coastal habitats are being subjected to a range of stresses from climate change and many of these stresses are predicted to increase over the next century. The most significant effects are likely to be from sea-level rise, increased storm and wave intensity, temperature increases, ocean acidification, and changes in precipitation that will alter freshwater delivery. These climate change forces are having dramatic effects on coastal habitats and the species dependent on these ecosystems. Addressing the challenges posed by climate change will require a combination of adaptation and mitigation to the changes that are likely to occur and global reductions of greenhouse gas (GHG) emissions from anthropogenic sources. Most importantly, overcoming these challenges will require dissimilar groups and interests being able to have open, and sometimes difficult, conversations that lead to action.*

Adopted March 2, 2016 by Restore America's Estuaries Board of Directors

### Background

#### Climate Change Impacts

*Coastal habitats and the species dependent on these ecosystems are already being affected by climate change and these effects are expected to increase over the next decades.*

Our estuaries are on the front line in the challenge of climate change. Increasing levels of greenhouse gases (GHG) pose major threats to our estuaries, including: sea-level rise; ocean acidification; shoreline erosion; increased storm frequency and intensity; changes in rainfall and related flooding; saltwater intrusion; increased harmful algal blooms; spread of invasive species; species migration; and habitat loss.

The increasing rate of sea-level rise may be the single most important impact of climate change on coastal habitats. As sea level rises, the frequency and duration of coastal flooding and inundation will increase, severely impacting sensitive coastal resources and adjacent coastal communities. Water temperature increases will affect many aquatic organisms, particularly when the temperature shifts outside of the preferred range of a species or crosses their tolerance thresholds. Rising sea surface temperatures are also expected to increase algal productivity and blooms, causing decreased light and oxygen availability for other species.

The impacts of climate change will exacerbate the already increasing stresses on our sensitive coastal resources. We are already facing rapid population growth, with the coastal zone losing land to development at a pace faster than the rest of the country. Pollution, over-harvesting of resources, and invasive species are major causes of declines in the productivity and health of these systems.

#### Impacts of climate change include:

- **Sea-level rise**
- **ocean acidification**
- **shoreline erosion**
- **increased storm frequency and intensity**
- **saltwater intrusion**
- **increased harmful algal blooms**
- **spread of invasive species**
- **species migration**
- **critical habitat loss**

Climate change has seriously damaging effects on the goods and services provided by coastal ecosystems. Loss of coastal habitat from sea level rise would reduce availability of fish and game species for commercial and recreational users; loss of habitat would reduce storm and flood protection for coastal communities. Low-lying urban areas and small islands along the coasts are particularly vulnerable to climate change.

One of the ways we have addressed these threats to our nation's estuaries is through habitat restoration and protection, and the good news is that these same approaches can also help us counter climate change. Of course, in the absence of a concerted effort to substantially reduce future greenhouse gas emissions, adaptation and mitigation measures may be insufficient to sustainably maintain our estuarine resources.

## Healthy Estuaries Counter Climate Change through Carbon Sequestration

*Restoring salt marshes is an effective method for removing carbon dioxide from the atmosphere, and should be actively pursued as a strategy for carbon sequestration to counter climate change.*

Healthy estuaries help counter climate change by capturing carbon from the atmosphere and storing it long-term, a process called carbon sequestration. The Intergovernmental Panel on Climate Change cited wetland restoration as an important strategy for carbon sequestration. Wetlands have the ability to sequester large amounts of carbon deep in the ground beneath the marsh. Scientists have found that restoring and protecting tidal wetlands is one of the most effective measures for sequestering carbon and preventing emissions. Unlike many freshwater wetlands, tidal wetlands like saltwater marshes release only negligible amounts of methane, so the carbon storage benefits of salt marshes are not reduced by methane production. When these habitats are drained or degraded stored carbon can be released back into the atmosphere, converting this natural carbon sink to a source of emissions. Coastal wetlands are lost at alarming rates (0.7-3% a year globally), therefore it is important to protect these habitats and the ancient carbon stored beneath them. While people often look to planting

**Every acre of salt marsh captures and converts at least 3.2 metric tons of carbon dioxide into plant material and sediment annually—equivalent to the greenhouse gas emissions of driving 7,000 miles.**

trees as a way to take carbon from the atmosphere, salt marsh restoration is more efficient, per unit area, at removing carbon dioxide.

According to scientists, every acre of healthy salt marsh captures and converts at least 3.2 metric tons of carbon dioxide into plant material and sediment annually—equivalent to the greenhouse gas emissions of driving 7,000 miles. Many of our coastal areas once had abundant wetlands, but have been degraded over the years, and could be restored to help mitigate impacts from climate change. Restoring coastal wetlands not only restore carbon sequestration, they also restore all of the other benefits these habitats provide, including increased resiliency to flooding and storms.

## Healthy Estuaries Keep our Coastlines Resilient

*Estuarine restoration and protection are fundamental strategies that should be implemented to strengthen the resilience of our coastlines to withstand and recover from climate change impacts.*

Communities that adequately protect the health of their natural coastal environment will be more resilient to the impacts of climate change. Two key strategies that must be implemented to prepare for climate change impacts are maintaining and restoring healthy coasts and estuaries. This must occur through land use planning and management programs that conserve and restore natural environmental features, such as wetlands, buffer zones, and natural hydrology. Reducing other stresses on estuaries such as pollution and overfishing will also increase ecosystem resilience.

**Healthy estuaries filter pollutants, provide critical habitat for fish and wildlife, stabilize shorelines and buffer against erosion, provide opportunities to recreate, and provide unmistakable economic value to our nation**

Restored salt marshes provide natural flood protection and reduce the need to build seawalls to protect developed shorelines against sea-level rise. As sea level rises, tidal marshes continue to build up to match the rise in water level. Wetlands may be able to migrate with rising sea level if they are not blocked by a hardened shoreline. To enable wetlands to migrate inland as sea level rises, development should be directed away from at risk areas and hardened shorelines should be limited.

Restoring estuaries to mitigate impacts from climate change will have additional ecosystem benefits as well. Healthy estuaries filter pollutants, provide critical habitat for fish and wildlife, stabilize shorelines and buffer against erosion, and provide opportunities for people to recreate and to appreciate and learn about the natural environment. In addition, estuaries provide unmistakable economic value to our nation, with much of the nation's gross domestic product being generated in these narrow ribbons along our nation's coasts.

## **Funding for Restoration will be Critical to Adapt to Climate Change Impacts**

***Significantly increased funding for estuarine restoration and protection is needed to help habitat and wildlife adapt to the impacts from climate change.***

Estuarine protection and restoration will help create the conditions for nature to adapt to the impacts that are already being felt and those that will continue to occur, and additional support and funding for restoration projects will be critical.

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*For additional information, please contact Restore America's Estuaries.*