

DRAFT
Dec. 22, 2009

Whereas ocean waters and resources are vital to the economy, cultural identity, and daily lives of many Alaskans;

Whereas it is estimated that the seafood industry contributed a total of \$5.8 billion to Alaska's economic output in 2007, including an estimated \$3.6 billion in wholesale value and \$2.2 billion in indirect and induced economic output;¹

Whereas Alaska has 8 of the 20 largest seafood ports in the United States (based on ex-vessel value of product), and in 2007, Alaska accounted for over 62 percent, by volume, of the commercial seafood harvested in the United States;²

Whereas the seafood industry employs more workers than any other industry in Alaska;³

Whereas tourism is also a major economic engine in Alaska, with a direct economic contribution that exceeds \$1.6 billion annually and an induced effect that exceeds \$2 billion;⁴

Whereas tourism is Alaska's third largest private sector employer, with more than 26,000 full-time equivalent jobs;⁵

Whereas recreational fishing, whale watching, and other ocean-related activities are critical aspects of tourism in Alaska;

Whereas coastal residents in Alaska depend on ocean resources for subsistence, recreation, and other uses;

Whereas tourism, fishing, subsistence, and recreation are supported by healthy ocean ecosystems;

Whereas the world's oceans have absorbed more than a quarter of the carbon dioxide released into the atmosphere since the start of the Industrial Revolution;⁶

Whereas the carbon dioxide absorbed by the oceans has altered their chemistry, making ocean surface waters 30% more acidic on average than they were at the start of the Industrial Revolution;⁷

¹ http://www.marineconservationalliance.org/docs/SIAE_Jan09.pdf

² *Id.*

³ *Id.*

⁴ http://www.alaskatourism.org/govtrelations/Tourism_ECON101.asp

⁵ *Id.*

⁶ Sabine, C.L. et al. (2004) The Oceanic Sink for Anthropogenic CO₂, *Science* 305:367-371

⁷ Orr, James C. et al. (2005) Anthropogenic Ocean Acidification Over the Twenty-first Century and its Impact on Calcifying Organisms, *Nature*, 437:681-686

Whereas the acidity of surface waters could rise by another 100 percent by the end of this century if current trends continue;⁸

Whereas ocean acidification will be accelerated in Arctic waters because carbon dioxide is more soluble in colder waters and lower salinity diminishes the capacity of oceans to buffer against acidification,⁹ and there is evidence ocean acidification is likely more severe and is happening more rapidly in Alaska than in tropical waters;¹⁰

Whereas the effects of ocean acidification could create conditions detrimental to marine ecosystems in Alaska within decades,¹¹

Whereas ocean acidification will affect the growth, reproduction, disease resistance, and other biological and physiological processes of many marine organisms;¹²

Whereas ocean acidification threatens carbonate-forming species such as coral, shellfish, and many species of marine plankton, and changes to these species may cause major ripple effects throughout marine ecosystems and food webs, ultimately affecting the largest marine organisms and many commercial fisheries;¹³

Whereas important aspects of Alaska's oceans are at risk of impacts from acidification, including King, tanner and Dungeness crabs; deep-sea coral gardens; pteropods, which are important prey for whales, salmon, and other animals; and other types of plankton that helps form the base of the food web;¹⁴

Whereas the North Pacific Fishery Management Council in its 2007 Aleutian Islands Fishery Ecosystem Plan highlighted ocean acidification as very likely to occur and cause significant ecological and economic impacts;¹⁵ and

Whereas there is a scarcity of relevant data necessary for assessing the potential impacts of ocean acidification in Alaska,¹⁶ and the North Pacific Fishery Management Council has recommended ocean acidification be a research priority;¹⁷

⁸ Caldeira, K. and Wickett, M.E. (2005) Ocean model predictions of chemistry changes from carbon dioxide emissions to the atmosphere and ocean, *Journal of Geophysical Research*, 10:C09S04

⁹ Steinacher, M. et al. (2009) Imminent ocean acidification in the Arctic projected with the NCAR global coupled carbon cycle-climate model. *Biogeosciences*, 6, 515-533

¹⁰ <http://www.sfos.uaf.edu/oa/>

¹¹ Orr, James C. et al. (2005) Anthropogenic Ocean Acidification Over the Twenty-first Century and its Impact on Calcifying Organisms, *Nature*, 437:681-686

¹² *Id.*

¹³ Fabry, Victoria J. et al. (2008) Impacts of Ocean Acidification on Marine Fauna and Ecosystem Processes, *ICES Journal of Marine Science*, 65:414-432; Feely, Richard, et al. (2004) Impacts of Anthropogenic CO₂ on the CaCO₃ System in the Oceans. *Science*, 305:362-366

¹⁴ Orr, James C. et al. (2005) Anthropogenic Ocean Acidification Over the Twenty-first Century and its Impact on Calcifying Organisms, *Nature*, 437:681-686; Fabry, Victoria J. et al. (2008) Impacts of Ocean Acidification on Marine Fauna and Ecosystem Processes, *ICES Journal of Marine Science*, 65:414-432; Aydin, Kerim Y. et al. (2005) Linking ocean food webs to coastal production and growth rates of Pacific Salmon (*Oncorhynchus* spp.), using models on three scales, *Deep Sea Research Part II: tropical Studies in Oceanography*, 52(5-6):757-780

¹⁵ NPFMC AIFEP is available at: http://www.fakr.noaa.gov/npfmc/current_issues/ecosystem/AIFEP12_07.pdf

Therefore be it resolved by the Senate and House Legislature of the State of Alaska, that

Ocean acidification is a threat to Alaska's marine ecosystems, tourism industry, and commercial, recreational and subsistence fisheries; and

Further monitoring and research is necessary to study the impacts of ocean acidification on Alaska's marine ecosystems, determine potential effects on Alaska's economy, and assess opportunities to address the impacts of ocean acidification on Alaska.

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¹⁶ Orr, James C. et al. (2005) Anthropogenic Ocean Acidification Over the Twenty-first Century and its Impact on Calcifying Organisms, *Nature*, 437:681-686

¹⁷ NPFMC 2009 research priorities. Available at: http://www.fakr.noaa.gov/npfmc/Research_priorities09.pdf