February 22, 2022

The Honorable Luz Rivas
California State Assembly
State Capitol, Room 6140
Sacramento, CA 95814

RE: Support for Assembly Bill 1832 California Seabed Mining Prevention Act

Dear Assemblymember Rivas,

Monterey Bay Aquarium and Surfrider Foundation are pleased to co-sponsor Assembly Bill 1832 to prevent seabed mining in California marine waters. We are proud to join you in proactively protecting California from the impacts of seabed mining and thank you for your leadership in this important effort.

Monterey Bay Aquarium's mission is to inspire conservation of the ocean and we take action to protect California's ocean wildlife and ecosystems against significant threats. The Surfrider Foundation (Surfrider) is dedicated to the protection and enjoyment of our ocean and we activate our grassroots network in meaningful efforts to protect California's marine environment.

Monterey Bay Aquarium and Surfrider support this bill in recognition of the broad threats posed by seabed mining and the need to take a proactive approach to safeguarding California's seafloor and deep sea. With 1,100 miles of coastline and 5,500 square miles of waters extending three nautical miles offshore, our state waters are home to some of the world's most biodiverse ecosystems.

California's Valuable Ocean
California boasts the largest ocean-based economy in the United States.[1] Valued at $45 billion annually, the ocean employs over half a million people and supports a vast diversity of marine life as well as fishing communities that depend on fish, shellfish and seaweeds for their livelihoods.[2] Our productive fisheries support 19,750 recreational fishing jobs (as of 2017), with

[1] Sievanen, Leila, Phillips, Jennifer, Charlie Colgan, Gary Griggs, Juliette Finzi Hart, Eric Hartge, Tessa Hill, Raphael Kudela, Nathan Mantua, Karina Nielsen, Liz Whiteman. (2018). *California's Coast and Ocean Summary Report.* Publication number: SUMCCC4A-2018-011.
[2] Ibid., 12.

the commercial fishing and seafood industry generating 155,258 jobs and $28.8 billion in sales in 2017.[3]

Coastal tourism and recreation industries in California are valued at approximately $27 billion annually.[4] California's marine wildlife – including whales, dolphins, and the threatened southern sea otter – attract millions of visitors a year to our coastline. California's coastline counties are home to 68 percent of the state, and millions of people visit California coastal state parks every year.[5]

Only 20% of the seafloor has been mapped at high resolution and we have only just begun to understand the resources of this environment.[6] Approximately 2,000 new species of ocean life are discovered every year,[7] which does not include the myriad microorganisms that enable ocean ecosystems to store carbon from the atmosphere and support global fisheries. In California, scientists and engineers at the Monterey Bay Aquarium Research Institute have found incredible forests of ancient cold-water corals, nurseries where deep-sea octopuses breed and care for their young, and rich, rocky habitats that support populations of commercially and environmentally important fisheries.

Seabed Mining Presents a Large Scale Threat to the Ocean

Seabed mining can destroy whole communities of plants and animals on the seafloor, leaving behind habitat that may never recover due in part to the slow growth times that characterize life in the deep sea.[8] Some types of mining occur on seamounts and hydrothermal vents, which are now well known to host an abundance of life including chemosynthetic life (life that does not rely on carbon for energy).[9] Scientists also expect that even seemingly sparse stretches of seafloor can be home to a high level of biodiversity, often in the form of microscopic life that serves key roles in the food web.[10] With more than 80 percent of the ocean yet to be explored,[11] the deep sea is a frontier for discovery. Mounting evidence even suggests that mineable minerals themselves provide a ground for species such as sponges to establish and nurse their

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[3] National Marine Fisheries Service. (2017). *Fisheries Economics of the United States.* U.S. Dept. of Commerce. NOAA Technical Memorandum. NMFS-F/SPO-219.

[4] National Ocean Economics Program. (2020). Ocean Economy Data. Retrieved February 18, 2022 from https://www.oceaneconomics.org/Market/ocean/oceanEcon.asp

[5]National Ocean Economics Program. (2020). Ocean Economy Data. Retrieved February 18, 2022 from https://www.oceaneconomics.org/Market/ocean/oceanEcon.asp

[6] Amos, J. (2021). *Mapping quest edges past 20% of global ocean floor*. BBC News. Retrieved February 18, 2022, from https://www.bbc.com/news/science-environment-57530394.

[7] UNESCO. (2012). *Ocean life: The marine age of Discovery*. UNESCO. Retrieved February 18, 2022, from Ocean life: the marine Age of Discovery.

[8] Chin, A and Hari, K. (2020). *Predicting the impacts of mining of deep sea polymetallic nodules in the Pacific Ocean: A review of Scientific literature*. Deep Sea Mining Campaign and MiningWatch Canada. https://miningwatch.ca/sites/default/files/nodule_mining_in_the_pacific_ocean.pdf.

[9] Ibid., 12

[10] Paulus, Eva. (2021). Shedding Light on Deep-Sea Biodiversity—A Highly Vulnerable Habitat in the Face of Anthropogenic Change. *Front. Mar. Sci.* 8:667048. doi: 10.3389/fmars.2021.667048

[11] NOAA. (2021). *How much of the ocean have we explored?*. National Ocean Service website. Retrieved February 18, 2022 from https://oceanservice.noaa.gov/facts/exploration.html

eggs.[12] Seabed mining can destroy large swaths of the many kinds of habitats on the seafloor that foster life.

The seafloor is not the only area of the ocean vulnerable to seabed mining operations. Seabed mining operations offload unwanted sediment and metals that have been scraped off the seafloor in large toxic sediment plumes that are likely to have extensive ecological effects in deep midwaters where the majority of the ocean's fish biomass is contained.[13] One study suggested that these toxic plumes could be up to 180 feet long and disperse fine grain sediments for tens of thousands of kilometers before resettling[14]. The full impact of these plumes is unknown, however suspended materials can interfere with migratory, feeding and reproduction patterns, as well as overall health of species in the midwater zone, which is the largest biosphere in the ocean. Toxic metals have the potential to bioaccumulate in longer-lived and commercially fished species and have repercussions on their reproduction and health.[15] Mining operations also result in noise, light, and thermal pollution that disrupt marine communities.[16/17/18]

Mining may also increase California's carbon footprint. Scientists at the Scripps Institution of Oceanography contributed to a policy brief issued by the Deep-Ocean Stewardship Initiative in 2019 that detailed the potential climate impact that could be caused by seabed mining. By disturbing deep sea microbes and animals, the brief explains, seafloor impacts could combine with temperature and oxygen impacts caused by sediment plumes. This could alter midwater carbon transport and sediment sinks which essentially remove carbon from the biosphere.[19] It is clear that research and study into the potential impacts of seabed mining is warranted.

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[12]Paulus, Eva. (2021). Shedding Light on Deep-Sea Biodiversity—A Highly Vulnerable Habitat in the Face of Anthropogenic Change. *Front. Mar. Sci.* 8:667048. doi: 10.3389/fmars.2021.667048

[13] Drazen, J., Smith, C., Gjerde, K., Haddock, S., Carter, G., Choy, A., Clark, M., Dutrieux, P., Goetze, E., Hauton, C., Hatta, M., Koslow, A., Leitner, A., Pacini, A., Perelman, J., Peacock, T., Sutton, T., Watling, L., & Yamamoto, H. (2022). Midwater ecosystems must be considered when evaluating environmental risks of deep-sea mining. *Proceedings of the National Academy of Sciences of the United States of America*. DOI: 10.1073/pnas.2011914117

[14] Drazen, J., Smith, C., Gjerde, K., Haddock, S., Carter, G., Choy, A., Clark, M., Dutrieux, P., Goetze, E., Hauton, C., Hatta, M., Koslow, A., Leitner, A., Pacini, A., Perelman, J., Peacock, T., Sutton, T., Watling, L., & Yamamoto, H. (2022). Midwater ecosystems must be considered when evaluating environmental risks of deep-sea mining. *Proceedings of the National Academy of Sciences of the United States of America*. DOI: 10.1073/pnas.2011914117

[15] Chin, A and Hari, K. (2020). *Predicting the impacts of mining of deep sea polymetallic nodules in the Pacific Ocean: A review of Scientific literature*. Deep Sea Mining Campaign and MiningWatch Canada. https://miningwatch.ca/sites/default/files/nodule_mining_in_the_pacific_ocean.pdf.

[16] Miller et. al., "*An Overview of Seabed Mining Including the Current State of Development, Environmental Impact, and Knowledge Gaps*", Frontiers in Marine Science Volume 4 Article 418, January 2013.

[17] Vare et. al. "*Scientific Considerations for the Assessment and Management of Mine Tailings Disposal in the Deep Sea"*, Frontiers in Marine Science Volume 5 Article 17, February 2018

[18]Levin and Sibuet, "*Understanding Continental Margin Biodiversity: A New Imperative"*, Annual Review of Marine Science 4:79-112, 2012

[19] Levin, L., Wei, C., Dunn, D., Amon, D., Ashford, O., Cheung, W., Colaco, A., Escobar, E., Guilloux, B., Harden-Davies, H., Drazen, J., Gjerde, K., Ismail, K., Jones, D., Johnson, D., Le, J., Lejzerowicz, F., Mitarai, S., Morato, T., & Yasuhara, M. (2019). *Climate Change Considerations are Fundamental to Sustainable Management of Deep-Seabed Mining.* Deep Ocean Stewardship Initiative.

We Must Support a Precautionary Approach for Protecting Against Mining

There will never be a better time to prevent seabed mining. The California State Lands Commission is currently able to authorize leases for mining operations on a case-by-case basis, and there are currently no prospectors in California. However, this extractive industry is growing worldwide and California cannot be too cautious. Industry is increasingly focused on areas of the deep sea as new sources of certain metals and minerals. Companies state that this is based on an increased demand for these metals and minerals for use in batteries for cell phones, electric vehicles, and energy storage and other applications.

Much of the industry focus right now is on the Clarion Clipperton Zone in the Pacific and the nodules found there that contain cobalt, nickel and other metals. There is currently more investment than ever before in technologies to extract these resources. There are potentially valuable hard mineral resources in and near California's state waters including phosphorite and precious metals.[20/21] The absence of prospective development presents an opportunity for the State of California to address an emerging issue without the immediate pressure imposed by active interest or the need to consider existing investments.

Seabed mining has potentially devastating impacts on the ocean environment and the vital services the ocean contributes to all life on Earth. For this reason, and because of the value of California's marine wildlife and ecosystems, we support a strong, precautionary approach to safeguarding California's marine waters.

There is precedent for this type of protection: mining state waters for hard minerals has been prohibited in Oregon since 1991 and Washington passed similar legislation just last year with overwhelming bipartisan support. What's more, Washington state agencies estimated no state fiscal impact associated with a seabed mining ban. Now is the time to protect our waters and the seabed.[22]

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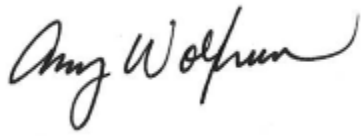
[20] Mero, John, California Division of Mines and Geology Mineral Information Service, Sea Floor Phosphorite, 1961, at pp. 7-8 See also U.S. Congress, Office of Technology Assessment, Marine Minerals: Exploring Our New Ocean Frontier, OTA-O-342 (Washington, DC: U.S. Government Printing Office, July1987), at p.61

[21] U.S. Congress, Office of Technology Assessment, *Marine Minerals: Exploring Our New Ocean Frontier, OTA-O-342* (Washington, DC: U.S. Government Printing Office, July1987), at pp.58, 60

[22] Washington State Office of Financial Management. (2021). *Multiple Agency Fiscal Note Summary: 5145 SB, seabed mining/hard minerals*

Thank you for your leadership to protect our ocean. We stand ready to assist and support your efforts to pass this important legislation.

Sincerely,



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cc: Members, Assembly Natural Resources Committee
Commissioners and Staff, California State Lands Commission