CALIFORNIA COASTAL COMMISSION
455 MARKET STREET, SUITE 300
SAN FRANCISCO, CA 94105- 2219
VOICE AND TDD (415) 904- 5200
FAX (415) 904- 5400

F12a

CC-0003-21

(OCEAN RAINFOREST, INC.)

OCTOBER 15, 2021

CORRESPONDENCE

HOLDFAST AQUACULTURE

10/8/2021

Re: Public comment on Ocean Rainforest, Inc.'s pending voluntary Consistency Certification (CC-0003-21).

To: Whom it may concern

Thank you for the opportunity to provide a public comment on Ocean Rainforest's pending application for a voluntary Consistency Certification (CC-0003-21).

I'm writing on behalf of the team at Holdfast Aquaculture LLC, an aquaculture seed facility based at Alta Sea in San Pedro, CA, to provide support for Ocean Rainforest's pending application to install and operate an offshore cultivation site for *Macrocystis pyrifera* (giant kelp), an ecologically and commercially important brown seaweed.

Bringing decades of research and commercial experience, the Ocean Forest team is well poised to advance our collective scientific knowledge, inform best practices in kelp mariculture and demonstrate to various stakeholders the environmental, economic and social benefits of seaweed mariculture. Seaweed by its very nature enhances the marine ecosystem as it grows, can buffer the impacts of climate change and ocean acidification, and requires minimal to zero input of critically limited natural resources to cultivate. Combined with its commercial potential, seaweed mariculture has immense potential to benefit the State of CA's marine resources and economy.

The team's monitoring, data collecting and modeling plans ensure a comprehensive assessment of both benefits and risks of seaweed mariculture, filling a critical gap in data and knowledge required to advance seaweed mariculture. Their selection of the offshore farm site is based on an extensive siting analysis and in conversations with the fishing community to minimize impact on existing industries. Indeed, if successful, Ocean Rainforest presents an opportunity that will ultimately enhance the marine industry's economic prospects using an environmentally sustainable ocean crop.

We look forward to providing support as an industry partner to work towards a CA-based seaweed market with our colleagues at Ocean Rainforest and urge the Coastal Commission to approve the application for CC-0003-21.

Sincerely,

Diane Y. Kim, Ph.D.
Co-Founder, Holdfast Aquaculture LLC
holdfastAQ@gmail.com

AQUARIUM OF THE PACIFIC
A non-profit institution

October 6, 2021

Re: October 15 Coastal Commission Meeting, Agenda Item 12a: Ocean Rainforest Consistency Certification

Greetings, California Coastal Commissioners,

We write this letter in support of Ocean Rainforest's ARPA-E MAINER project to demonstrate economic and social opportunities for offshore seaweed aquaculture. Research shows that seaweed aquaculture can play an important role in providing nutritious food in the changing climate with minimal impact to the environment. It may also provide valuable ecosystem benefits, including removing excess nutrients, reducing impacts of acidification, and providing habitat (Alleway et al 2019; Theuerkauf et al 2020). This project will provide valuable insight into how these benefits can be maximized, while minimizing region specific risks in the Southern California Bight.

The Aquarium of the Pacific and its Seafood for the Future program have played a leading role in educating public and stakeholder audiences about the important role responsible marine aquaculture can play in a more sustainable, resilient, and nutritious food supply. As fires, droughts, and floods intensify and become more frequent in the changing climate, producing more food in the ocean to supplement land-based production can help support a more resilient food supply. California has ample area to support a robust marine aquaculture sector that is ecologically and economically sustainable. Seaweed will play an important role in this portfolio.

We strongly support this data-driven approach to demonstrate the efficacy of offshore seaweed aquaculture as a tool to contribute to California's diverse seafood sector and provide more nutritious food, jobs, and economic benefits to local communities.

Sincerely,

Kimberly Thompson
Director, Seafood for the Future
Aquarium of the Pacific

Citations:

Alleway, H. K., Gillies, C. L., Bishop, M. J., Gentry, R. R., Theuerkauf, S. J., & Jones, R. (2019). The Ecosystem Services of Marine Aquaculture: Valuing Benefits to People and Nature. *BioScience*, *69*(1), 59–68. https://doi.org/10.1093/biosci/biy137

Theuerkauf, S. J., Barrett, L. T., Alleway, H. K., Costa-Pierce, B. A., Gelais, A. S., & Jones, R. C. (n.d.). Habitat value of bivalve shellfish and seaweed aquaculture for fish and invertebrates: Pathways, synthesis and next steps. *Reviews in Aquaculture*, *n/a*(n/a). https://doi.org/10.1111/raq.12584

USC Gould
School of Law

Robin Kundis Craig
Robert C. Packard Trustee Chair in Law

California Coastal Commission
455 Market St.
Suite 300
San Francisco, CA 94105

October 8, 2021

RE: For October 15, 2021 Meeting
Agenda Item F12a
CC-0003-21: Ocean Rainforest, Inc. Consistency Certification

Dear Commissioners and Staff:

I write to comment **in favor** of the California Coastal Commission **granting** the Consistency Certification to Ocean Rainforest for its demonstration seaweed cultivation facility in the federal waters off the coast of Santa Barbara, CA.

Marine aquaculture is an increasingly important component of world food security,[1] including for the United States.[2] Both the U.S. Congress and the U.S. Army Corps of Engineers, which permits aquaculture facilities in all ocean waters pursuant to the 1899 Rivers and Harbors Act, have shown increasing interest in promoting marine aquaculture in federal waters. Thus, certification proceedings such as this one are likely to become more common over the next decade. Given the likely increase in this new use of the federal ocean, the California Coastal Commission should use its certification authorities to encourage the more environmentally benign—and even environmentally helpful—forms of marine aquaculture, such as the seaweed cultivation that Ocean Rainforest seeks to pursue through its proposed facility.

Seaweed aquaculture both supports domestic production of low-carbon-footprint foods[3] (notably, Ocean Rainforest's kelp will feed aquacultured abalone) and provides the feedstock for new kinds of biofuels. Perhaps as importantly, however, kelp aquaculture can potentially benefit California's coastal waters environmentally in a number of ways. First, through photosynthesis,

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[1] UNITED NATIONS FOOD & AGRICULTURE ORGANIZATION, THE STATE OF WORLD FISHERIES AND AQUACULTURE: SUSTAINABILITY IN ACTION 2, 3, 4 fig. 1 (2020), *available at* http://www.fao.org/3/ca9229en/ca9229en.pdf.
[2] *U.S. Aquaculture*, NOAA FISHERIES (as updated July 8, 2021), https://www.fisheries.noaa.gov/national/aquaculture/us-aquaculture.
[3] 2020 FAO FISHERIES REPORT, *supra* note 1, at 27.

kelp species extract nutrient pollution from marine environments,[4] improving water quality and helping to prevent harmful algal blooms. Second, kelp photosynthesis also removes carbon dioxide from the water column.[5] While the potential of kelp aquaculture to effectuate relatively permanent carbon sequestration (akin to terrestrial reforestation) is still being evaluated scientifically,[6] that potential is real and warrants further investigation, including in California waters. In the interim, seaweed's ability to absorb carbon dioxide means that seaweed aquaculture can help to buffer the California coast from the effects of ocean acidification.[7] Third, "the canopies of farmed seaweeds, like those of wild seaweeds, dampen wave energy and hence, serve as live coastal protection structures buffering against coastal erosion."[8] Finally, "seaweed farms provide oxygen-rich habitats, providing refugia from hypoxia and declining oxygen levels, further contributing to allow marine organisms to adapt to this component of a warmer ocean."[9]

Seaweed aquaculture also provides one potential pathway for California coastal communities to adapt economically to the increasing impacts of climate change along our coast, most especially in terms of shifting fishery resources and changing marine ecosystems. As the Intergovernmental Panel on Climate Change explained in 2019, range shifting among marine species "has resulted in shifts in species composition, abundance and biomass production of ecosystems, from the equator to the poles. Altered interactions between species have caused cascading impacts on ecosystem structure and functioning … ."[10] A 2018 study of 686 marine species in North America concluded that species along the Pacific Coast could shift ranges as much as 1500 kilometers (more than 930 miles).[11] As one example, California's Dungeness crab fisheries have already suffered because of climate change and events such as the 2014-2016 marine heat wave in the Pacific Ocean; according to the National Oceanic and Atmospheric Administration (NOAA), during this event "71 percent of California Dungeness crab fishing vessels temporarily left the industry and stopped fishing altogether … ."[12] While no adaptation option is a panacea for all fisheries, switching from wild caught fisheries to marine aquaculture will be a viable adaptation strategy for many fishing communities,[13] and facilities like Ocean Rainforest's kelp cultivation operation may thus benefit California communities in multiple ways as climate change progresses.

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[4] *Id*. at 27, 29; Zhibing Jiang et al., *Kelp Cultivation Effectively Improves Water Quality and Regulates Phytoplankton Community in a Turbid, Highly Eutrophic Bay*, 707 SCI. TOTAL ENV'T 135561, at 1, 6-7 (and studies cited therein) (2020), https://doi.org/10.1016/j.scitotenv.2019.135561.

[5] Calvyn F.A. Sondak et al., *Carbon Dioxide Mitigation Potential of Seaweed Aquaculture Beds (SABs)*, 29 J. APPLIED PHYCOLOGY 2363, 2363, 2370-71 (2017).

[6] Ik Kyo Chung, Calvyn F. A. Sondak, & John Beardall, *The Future of Seaweed Aquaculture in a Rapidly Changing World*, 52 EUROPEAN J. PHYCOLOGY 495, 500 (2017).

[7] *Id*. at 501; Xi Xiao et al., *Seaweed Farms Provide Refugia from Ocean Acidification*, 776 SCI. TOTAL ENVT. 145192, at 1 (2021), https://doi.org/10.1016/j.scitotenv.2021.145192.

[8] Carlos M. Duarte, Jiaping Wu, Xi Xiao, Annette Bruhn, & Dorte Krause-Jensen, *Can Seaweed Farming Play a Role in Climate Change Mitigation and Adaptation?,* 4 FRONTIERS MARINE SCI. art.100, at 4 (2017), doi: 10.3389/fmars.2017.00100.

[9] *Id*. at 5.

[10] INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SPECIAL REPORT ON THE OCEAN AND CRYOSPHERE IN A CHANGING CLIMATE 12 (2019).

[11] James W. Morley et al., *Projecting shifts in thermal habitat for 686 species on the North American continental shelf*, 13 PLoS ONE e0196127, at 12 (2018), https://doi.org/10.1371/journal.pone.0196127.

[12] *Dungeness Crab Fishng Industry Response to Climate Shock*, NOAA FISHERIES (Jan. 4, 2021), https://www.fisheries.noaa.gov/feature-story/dungeness-crab-fishing-industry-response-climate-shock.

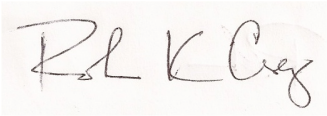
[13] Elena Ojea, Sarah E. Lester, & Diego Salgueiro-Otero, *Adaptation of Fishing Communities to Climate-Driven Shifts in Target Species*, 2 ONE EARTH 544, 553 tbl. 2 (2020), https://doi.org/10.1016/j.oneear.2020.05.012.

As the Commission's staff report acknowledges, a company such as Ocean Rainforest cannot install an 86-acre kelp cultivation facility off the coast of California without risking some impacts to some coastal species and existing users. Nevertheless, I write to urge the Commission to also consider, as it debates Ocean Rainforest's request for a consistency certification, the proposed facility's numerous potential *benefits* to California's coastal waters, marine life, and economy, as well as to the state's ability to cope with climate change and increasing food security issues. Pilot projects such as this one are necessary for the Commission to be able to assess whether California will be able to enjoy the ecological and economic benefits from kelp (and shellfish) aquaculture along its coast, and at what scale.

In short, I urge the Commission to **grant** Ocean Rainforest's consistency certification and to reduce some of the more financially onerous conditions proposed to be put on that certification.

Thank you for your consideration.

Sincerely,



Robin Kundis Craig
Robert C. Packard Trustee Chair in Law
USC Gould School of Law
699 Exposition Blvd.
Los Angeles, CA 90089
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October 8, 2021

To: Steve Padilla
California Coastal Commission Chair
274 Fourth Avenue
Chula Vista, CA 91910
Stephen.Padilla@coastal.ca.gov

From: Annie Lovell
133 E. De La Guerra Street #358
Santa Barbara, CA 93101
a_lovell@ucsb.edu

RE: CC-0003-21 Consistency Certification by Ocean Rainforest, Inc. for installation and operation of 2-year submerged aquaculture facility for cultivation of giant kelp offshore Santa Barbara

I am a second year graduate student at the UCSB Bren School of Environmental Science and Management, specializing in coastal/marine policy and management. Much of my professional and volunteer work has focused on protecting ocean resources by weighing economic opportunity with environmental protection. As resident of California, residing in Santa Barbara County, **I am engaged with and in support of the development of off-shore aquaculture as a promising option for innovative provisioning that provides vital ecosystem services**.

Seaweed cultivation is widely understood to provide a number of benefits, such as carbon sequestration[1], eutrophication mitigation[2], habitat[3], and wave attenuation[4]. In comparison to land-based agriculture, seaweed farming uses no arable land or freshwater and, in most cases, requires no additional fertilizers[5]. For these reasons, seaweed aquaculture has been recognized, at a global level, as among the most environmentally responsible and sustainable forms of biomass production[6].

Seaweed cultivation in offshore environments, represents a particularly novel and recent innovation. Many of the opportunities associated with such a strategy are not well understood by the public and policy makers have been hesitant to move forward with new project proposals. Fears traditionally associated with finfish aquaculture have dampened progress. However, **in order to take bold action on climate change, renewable energy, food security and ocean protection, is critical that policy makers focus on the numerous environmental and social benefits of seaweed cultivation and move forward in approving projects that further explore how aquaculture can best serve our communities.**

The following are the most significant, among many, benefits of offshore seaweed cultivation and Ocean Rainforest's proposed project.

1. Demonstrate the feasibility, sustainability and scalability of giant kelp aquaculture
2. Advance scientific knowledge and advance appropriate aquaculture techniques in the Santa Barbara channel
3. Promote new opportunities for sustainable food production while minimizing impacts relative to conventional agriculture
4. Enhance public knowledge and understanding of this emerging industry
5. Promote diversification of aquaculture practices and reduce national seafood deficit by advancing this new U.S. industry

It is important to note that the proposed project is exclusively research-based and thus, will not compete with existing commercial operations. This project will help inform structural engineering analysis, technoeconomic assessments and other similar studies that are critical to evaluating the feasibility of the seaweed aquaculture industry. Further reason to approve the permit is the fact that the project will work to support environmental protections, including developing marine mammal prevention entanglement programs, gear monitoring and escape plans for the broader aquaculture industry. Lastly, Ocean Rainforest is committed to working with the fishing community to understand how to best site and operate with the least amount of impact to existing marine industry operations.

For the reasons stated above, I am in support of granting the necessary approvals to Ocean Rainforest for the proposed installation and operation of a submerged, offshore aquaculture facility for cultivation of giant kelp in the Santa Barbara Channel.

Respectfully,
Annie Lovell

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[1] Chung, I. K., Oak, J. H., Lee, J. A., Shin, J. A., Kim, J. G., and Park, K.-S. (2013). Installing kelp forests/seaweed beds for mitigation and adaptation against global warming: Korean Project Overview. ICES J. Mar. Sci. 70, 1038–1044. doi: 10.1093/icesjms/fss206
[2] Chung et al. 2013; Duarte et al., 2017; Visch et al., 2020: Yang et al., 2015
[3] Visch, W., Kononets, M., Hall, P. O., Nylund, G. M., & Pavia, H. (2020). Environmental impact of kelp (Saccharina latissima) aquaculture. Marine Pollution Bulletin, 155, 110962.
[4] Hasselström, L., Visch, W., Gröndahl, F., Nylund, G. M., & Pavia, H. (2018). The impact of seaweed cultivation on ecosystem services-a case study from the west coast of Sweden. Marine pollution bulletin, 133, 53-64.
[5] Hasselström, L., Visch, W., Gröndahl, F., Nylund, G. M., & Pavia, H. (2018). The impact of seaweed cultivation on ecosystem services-a case study from the west coast of Sweden. Marine pollution bulletin, 133, 53-64.
[6] Duarte, C. M., Wu, J., Xiao, X., Bruhn, A., & Krause-Jensen, D. (2017). Can seaweed farming play a role in climate change mitigation and adaptation? Frontiers in Marine Science, 4, 100; Rebours, C., Marinho-Soriano, E., Zertuche-González, J. A., Hayashi, L., Vásquez, J. A., Kradolfer, P., ... & Hovelsrud, G. (2014). Seaweeds: an opportunity for wealth and sustainable livelihood for coastal communities. Journal of Applied Phycology, 26(5), 1939-1951.

SOUTHERN CALIFORNIA COASTAL WATER RESEARCH PROJECT
A Public Agency for Environmental Research

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(714)755-3214
www.sccwrp.org

October 8, 2021
Re: October 15, 2021 Meeting, Agenda Item 12a. Ocean Rainforest, Inc.

Dear Commissioners,

I am writing in support of the offshore farming project of Ocean Rainforest. Ocean Rainforest is proposing to install and operate an aquaculture facility for two years for cultivation of giant kelp, *Macrocystis pyrifera*, offshore of Santa Barbara.

While seaweed farming is a nascent industry in California, interest is burgeoning among academics, coastal enthusiasts, climate activists, and aquaculturists in the ecosystem services that accompany seaweed farming. This includes the role that seaweed could play in bioremediation of coastal pollution. As primary producers, seaweed produces new biomass and removes highly bioavailable inorganic nutrients without the need for any additional inputs. The regional setting of the proposed farm, the Southern California Bight, is one of the most populated coastal regions in North America, where primary or secondary treated wastewater from a coastal population of 22 million is discharged via ocean outfalls. This effectively doubles available nitrogen from upwelling. Further, anthropogenic nitrogen pollution is enhancing productivity, acidification, oxygen loss, water turbidity, and increasing risk of toxic HABs in the region.

While, seaweed farming has the potential to mitigate elevated nutrients due to coastal eutrophication in our coastal waters, the lack of real-world farms in the Southern California Bight has hindered scientific progress on quantifying and validating their role in bioremediation. I am in full support of this project as it will lead to great advances in the these knowledge gaps.

Sincerely,

C Frieder

Christina Frieder
Scientist
christinaf@sccwrp.org

Publications in support of above statements

Frieder, C. A., C. Yan, M. Chamecki, D. Dauhajre, J. C. McWilliams, J. Infante, M. McPherson, R. Kudela, F. Kessouri, M. Sutula, I. B. Arzeno-Soltero, K. Davis (In Review) A macroalgal cultivation modeling system (MACMODS): Evaluating the role of physical-biological coupling on nutrients and farm yield. In review at *Frontiers in Marine Science*.

Kessouri, F., McWilliams, J. C., Bianchi, D., Sutula, M., Renault, L., Deutsch, C., . . . Howard, E. M., 2021a. Coastal eutrophication drives acidification, oxygen loss, and ecosystem change in a major oceanic upwelling system. *Proceedings of the National Academy of Sciences* 118(21) doi.org/10.1073/pnas.2018856118.

Lewitus A., Horner R., Caron D., Garcia-Mendoza E., Hickey B., Hunter M., Huppert D., Kudela R., Langlois G., Largier J., Lessard E., RaLonde R., Rensel J., Strutton P., Trainer V., Tweddle J., 2012. Harmful algal blooms along the North American west coast region: History, trends, causes, and impacts. *Harmful Algae* 19: 133-159, doi.org/10.1016/j.hal.2012.06.009.

Smith, J., P. Connell, R. H. Evans, A. G. Gellene, M. D. A. Howard, B. H. Jones, S. Kaveggia, L. Palmer, A. Schnetzer, B. N. Seegers, E. L. Seubert, A. O. Tatters, D. A. Caron, 2018. A decade and a half of *Pseudo-nitzschia* spp. and domoic acid along the coast of southern California. *Harmful Algae* doi.org/10.1016/j.hal.2018.07.007.

Sutula, M., M. Ho, A. Sengupta, F. Kessouri, K. McLaughlin, K. McCune, D. Bianchi, 2021. Dataset of terrestrial fluxes of freshwater, nutrients, carbon, and iron to the Southern California Bight, U.S.A. *Data in Brief* doi.org/10.1016/j.dib.2021.106802.

Monterey Bay Seaweeds
1320 Patch Court
Marina, California, 93933

October 4, 2021

Dear California Coastal Commissioners

We this letter ***Monterey Bay Seaweeds*** endorses the pending voluntary Consistency Certification (CC-0003-21) submitted by ***Ocean Rainforest, Inc***.

I am the owner of Monterey Bay Seaweeds (founded in 2012), the largest land-based for-profit seaweed farm in the continental US, located in Moss Landing, California. We produce sustainable seaweed products for the high-end US culinary market. I am also a professor at San Jose State University/Moss Landing Marine Laboratories (MLML) where I conduct research, teach classes, and advise graduate students on kelp forest ecology, coastal oceanography, and aquaculture. My specific scientific expertise is ecology of California kelp forests, and I am a continuous collaborator, reviewer, and contributor to the discussion of offshore seaweed and shellfish farming in California. Finally, I am the Director of Advancement for the MLML Center of Aquaculture and president-elect to the California Aquaculture Association. I feel that I am experienced enough to discuss the Ocean Rainforest Inc certification with authority.

We are educated, invested, and active proponents of the expansion of aquaculture off the California coast in order to provide a sustainable blue economy to meet the growing needs of an expanding global population. We are specifically excited about non-fed lower trophic level activities like seaweed, that can provide a feedstock for fertilizers, biofuels, animal-feed and the human culinary market. That seaweed aquaculture industry is an excellent candidate for developing commercial activities along our coast, while working within the California regulatory environment, one of the most restrictive yet effective in the world. As such, we view Ocean Rainforest's proposal to conduct a two-year offshore demonstration project in the Santa Barbara Channel as an excellent venture to better understand the potential benefits, opportunities and risks associated with seaweed aquaculture. In the context of our work at Monterey Bay Seaweeds, their project would enhance public knowledge and understanding of sustainable seaweed farming practices, as well as promote diversification of aquaculture practices and reduce the U.S. seafood deficit by creating a new industry. Their work will also support ongoing research efforts to ensure the industry develops in a way that is economically viable, socially responsible and environmentally regenerative. We are aware of the details of their application and the work that they have done to provide a series of monitoring activities that are pro-active and may help to set a precedent for future activities in California.

Given their previous expertise in seeding, infrastructure installation, and offshore cultivation, we believe Ocean Rainforest is well positioned to lead the proposed research and demonstration project. Furthermore, Ocean Rainforest's work could provide critical insight for aquaculture that can be sustainable, maintain minimal environmental impact, and support economic development and diversification, along with a host of other economic, social, and environmental benefits. We applaud Ocean Rainforest's intent to

Monterey Bay Seaweeds
1320 Patch Court
Marina, California, 93933

work within the California regulatory environment, rather than skirt it, in order to get their important work started. This is a watershed moment in the California aquaculture industry.

Thank you in advance for your consideration of their submission.

Best regards,

Signed: 

Print Name: Dr. Michael Graham

Date**:** October 4, 2021

Position: Owner/Founder

Organization: Monterey Bay Seaweeds

OCEAN ERA

October 7th, 2021

TO: California Coastal Commission

Dear Commissioners,

I write this letter to endorse the pending voluntary Consistency Certification (CC-0003-21) submitted by Ocean Rainforest, Inc.

Ocean Era - formerly Kampachi Farms - is committed to advancing healthy, responsible and sustainable mariculture with the goal softening humanity's footprint on the seas. Since 2011, our team has worked to harness commercial incentives to achieve the conservation imperatives for our oceans. We maintain a broad array of skillsets related to sustainable aquaculture, feed production and offshore macroalgae cultivation.

We are familiar with the Ocean Rainforest team, their plans, and their expertise in the emerging space of offshore macroalgae culture. We understand that Ocean Rainforest has proposed to conduct a two-year offshore demonstration project in the Santa Barbara Channel. Their work will advance scientific knowledge and state-of-the-art aquaculture practices through research and innovation. Their proposal will also promote the supply of safe, sustainably produced and locally grown seaweed, while minimizing potential negative environmental impacts. We believe that the experimental plan and the team has a strong likelihood of success in rendering meaningful contributions in these critical areas.

Ocean Rainforest's work helps to move humanity towards more marine-sourced foods – one of the five major recommendations from the United Nations' recent High Level Panel on Climate Change and the Oceans. It should also advance sustainable aquaculture, incur minimal environmental impact, and support economic development and diversification, along with a host of other economic, social, and environmental benefits.

Thank you in advance for your consideration of their submission.

With aloha, sincerely,

Neil Anthony Sims
CEO

P.O. Box 4239, Kailua-Kona, HI 96745-4239, USA · Ph: 808.331.1188 · Fax: 808.331.8689
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Murad Jah
University of Southern California
Los Angeles, CA 90007
Cell: (805) 758-2439
muradjah@usc.edu

Dear Commissioners,

I hope this letter finds you well and safe during these difficult times. I write to you today regarding one of the current items on your October 2021 agenda – F12a, filed 6/4/21 by Ocean Rainforest, Inc. I would like to express my strong support for this submerged temporary demonstration aquaculture facility[1].

After multiple years of studying environmental studies, with an emphasis on our oceans and marine biology, I have grown an ever-increasing interest in aquaculture and the potential service it could provide our global community. When I came across this project and application I felt I had to send a letter detailing my support. One of our biggest obstacles currently facing aquaculture is the lack of information we have on aquaculture. Due to large scale aquaculture systems being relatively new to our society, the errors are highlighted very quickly within the media and the news. A global study conducted in 2017 showed that offshore aquaculture perception was significantly more negative than those of others around the world. This was tested by compiling news headlines from all over the world and separating them into negative, neutral, and positive categories to analyse what global perception was of aquaculture. In the USA almost half of the offshore aquaculture headlines compiled were negative with neutral and positive headlines being the minority[2]. This negative portrayal of aquaculture can hold us back from finding a new and sustainable access to better food security around the world, and more specifically in California. This portrayal highlights how much we would need this temporary demonstration offshore aquaculture facility off the coast of Santa Barbara. Although such depiction has been readily available in the recent past, the issues making the headlines come down to aquaculture related regulations being slightly weaker than they need to be and down to the technologies used being quite new[3]. With further studies being conducted on such facilities, these negative headlines and errors will dissipate over time. The demonstration facility proposed could add to the evidence that offshore aquaculture has great potential in California. The potential for aquaculture around the world is immense, and where better to kick off the realisation of this potential than off our own Southern California coast. According to a global aquaculture mapping study, under a percent of the USA's exclusive economic zone (EEZ) would have to be farmed through aquaculture to meet the entire regions finfish consumption[4]. This

[1] Commission, California Coastal. *F12a*. 2021.
[2] Froehlich, Halley E., et al. "Public Perceptions of Aquaculture: Evaluating Spatiotemporal Patterns of Sentiment around the World." *PLOS ONE*, vol. 12, no. 1, Public Library of Science, Jan. 2017, p. e0169281.
[3] Subasinghe, Rohana, et al. "Global Aquaculture and Its Role in Sustainable Development." *Reviews in Aquaculture*, vol. 1, no. 1, John Wiley & Sons, Ltd, Mar. 2009, pp. 2–9,
[4] Gentry, Rebecca R., et al. "Mapping the Global Potential for Marine Aquaculture." *Nature Ecology & Evolution 2017 1:9*, vol. 1, no. 9, Nature Publishing Group, Aug. 2017, pp. 1317–24,

shows we could completely rely on sustainable aquaculture to provide the USA's finfish needs, lessening the negative impacts fisheries bring our ocean environments.

More specifically kelp aquaculture serves our coasts and our coastal communities a great purpose. Whether we were to use it for biofuel or for food, the variety of uses for macroalgae prove it to be a versatile farmed product. The kelp being farmed in this specific system is Giant kelp, *Macrosystis pyrifera,* native to Southern California. This giant kelp is used for a substance called algin which is one of the primary binders used in cosmetics and foods, such as ice cream[5]. This macroalgae alone shows the versatility of farmable macroalgae by being used in multiple completely different fields. On the back of Ocean Rainforest, Inc (ORI) modifying the proposed location of the system and identifying alternatives/special conditions to the issues raised by the Commission, it poses very low risk to the habitats off the Santa Barbara coast.

Looking forward for the future of food security and aquaculture, demonstration systems such as this one open doors to many other potential systems and give us much needed information to counter the negative perceptions present surrounding aquaculture. Specifically with macroalgae aquaculture, some of the next steps could be using the data from this demonstration to help grow other macroalgae which could be used in different areas. For example, Asparagopsis armata, a red macroalgae, can be farmed and put into cattle diet to reduce methane. If this macroalgae were to be grown on a large scale offshore, it could reduce methane emissions from cows by over 50 percent and reduce the methane emissions of individual cows by up to 67 percent[6]. Moving past the versatility of macroalgae, demonstration kelp farms can help us better understand and organise integrated multi-trophic aquaculture systems (IMTAs). IMTAs could be the future of sustainable food production, farming multiple products at the same time, in the same area. The data gathered from ORI's system would add to the information we already have in making the most effective and efficient IMTA systems possible. Ultimately the proposed system will provide crucial information and data which would serve the future of marine-sourced food security in California and around the world.

I hope that my insights prove to be helpful in making this decision and I look forward to seeing ORI's system implemented off the coast fo Santa Barbara. Aquaculture, whether it be finfish, bivalve, or macroalgae, will protect our coasts and our coastal communities. Thank you for your time and your consideration of my points.

Sincerely,

Murad Jah

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[5] *Giant Kelp | Animals | Monterey Bay Aquarium*. https://www.montereybayaquarium.org/animals/animals-a-to-z/giant-kelp. Accessed 6 Oct. 2021.

[6] Roque, Breanna M., et al. "Inclusion of Asparagopsis Armata in Lactating Dairy Cows' Diet Reduces Enteric Methane Emission by over 50 Percent." *Journal of Cleaner Production*, vol. 234, Elsevier, Oct. 2019, pp. 132–38

10/7/2021

Dear Coastal Commissioners:

Thank you for the opportunity and considering my comments on the installation and operation of a submerged aquaculture facility. The Consistency Certification referenced in this letter is requested by the Ocean Rainforest, Inc. to construct an 86-acre site for the cultivation of giant kelp approximately 4.4 miles offshore Santa Barbara, Santa Barbara Co. (AC-SF) for two years. This project involves activities in the coastal zone which should be evaluated from different environmental, economic, and recreational perspectives.

My main concern is about the consequences of anchoring the cultivation equipment to the seafloor, resulting in disturbance or alteration of seafloor habitats due to the deposition of biological material or marine debris from the region[1]. Furthermore, the anchoring process could cause serious and long-term damages to coral reefs and native aquatic vegetation[2, 3]. I think it is necessary to benefit from the methods that minimize the amount of seafloor anchoring[4] and locate the site in an area with the least possible population of vulnerable coral species. Further, it appears that the anchors, buoys, and cultivation lines used for the proposed project may have considerable conflict with the marine wildlife, especially the whales[5]. Another issue would be the project conflict with the commercial and recreational fishing. The proposed location is a favorite fishing spot for commercial and recreational fishers and hosts hundreds of them every year.

These problems, combined with concerns about proper removal of all equipment after the two-year term, has made this project a complicated case, requiring a wide range of monitoring throughout the construction, cultivation, harvesting and removal phases. On the other hand, a very important point that should be considered is that this is a research project, and I believe it should be behaved differently compared to commercial projects. The outcomes of such research works could be valuable for the coastal community. So, I support this request, but insist on strict monitoring by independent third-party organizations according to the Coastal Act. The aquaculture and marine restoration draft published by the California Coastal Commission in July 2020, provides clear policies that allow for the regulation of development for

aquaculture sites. The following planning and monitoring regulations are the most import ones in my opinion:

1) Constantly monitoring the population of wildlife in and around the site. Any dramatic change must be addressed properly, even if reducing the kelp biomass or removing some equipment is the solution.
2) The construction phase could be the most destructive for the wildlife. It should be planned for seasons when the endangered species are less vulnerable.
3) Construction methods should be evaluated by an independent professional in advance, to make sure the least possible underwater noise is produced.
4) The kelp seeds should be evaluated in an independent lab prior to cultivation in the site, to make sure it is pure and does not include invasive species. It is a very important issue and neglecting it could result in serious long term environmental problems.
5) Comprehensive plan and strict monitoring are required to prevent spilling of any pesticides and hydraulic fluid in the ocean water. Furthermore, there should be predefined policies and ready-to-use equipment in case of any potential spilling.
6) Respecting all stakeholders, including the commercial and recreational fishers, and compensate their loss due to the project.

Thank you for providing us the opportunity to comment on this document.

Sincerely,

Behzad Ebrahimi (Coastal Engineering PhD student at USC)

References:

1) Paul V. R. Snelgrove. “The Importance of Marine Sediment Biodiversity in Ecosystem Processes.” Ambio 26, no. 8 (1997): 578–83. http://www.jstor.org/stable/4314672.

2) Dinsdale, Elizabeth A., and Vicki J. Harriott. "Assessing anchor damage on coral reefs: a case study in selection of environmental indicators." Environmental Management 33, no. 1 (2004): 126-139.

3) Davis, Gary E. "Anchor damage to a coral reef on the coast of Florida." Biological Conservation 11, no. 1 (1977): 29-34.

4) https://greenfins.net/blog/alternatives-to-anchoring/

5) Barrett, Luke T., Stephen E. Swearer, and Tim Dempster. "Impacts of marine and freshwater aquaculture on wildlife: a global meta-analysis." Reviews in Aquaculture 11, no. 4 (2019): 1022-1044.

Scott Lindell
15 Lantern Lane
Falmouth, MA, 02540

October 8, 2021

TO: California Coastal Commission
RE: Ocean Rainforest Lease Application

I'm writing this letter to support the application before you by Ocean Rainforest to conduct pilot scale research of giant kelp farming. This proposal is timely for several reasons. First and foremost we need to find solutions to climate change that kelp farming and ocean based solutions offer. California leads the way globally in policy-making around climate change and this is a perfect opportunity to further demonstrate that. Kelp can be carbon-neutral source of food, animal feed, pharmaceuticals, bioplastics and, some day, biofuels. Second, kelp farms can provide valuable habitat for fisheries, a habitat that is missing with the disappearance of wild kelp species, ironically, due to climate change and associated environmental perturbations. And finally, kelp farming generates good jobs, supports working waterfronts, and creates processing and marketing opportunities downstream for a truly green industry. Ocean Rainforest has already proven itself to be a good steward and honest broker in the environmental, scientific and business communities in Europe, and can lead the way in California.

I write as a native Californian, an alumni of the University of California Berkeley, an environmentalist and as a scientist. I've spent my career of 35 years pioneering aquatic farming research both on land and offshore, most recently as a Research Specialist at the Woods Hole Oceanographic Institution. I successfully negotiated the first shellfish farm permit in Federal waters on the East Coast, and conducted cooperative research with ocean farmers (shellfish and seaweed) for the last 20 years. I've conducted research and environmental monitoring on a 12-acre marine farm site in Alaska with kelp planted much more densely than proposed here. While we haven't been able to measure meaningful differences between the farm and surrounding environment (consistent with Visch et al. 2020 cited in OR's application), the positive impact on jobs and the community have been tremendous. It supports 20 to 30 employees in the harvest and processing season.

Please support the research and development of this new way of farming, and in particular, Ocean Rainforest's lease application. All new uses of the ocean elicit territorial opposition by the old users but that should not stop making change for the greater good. Please have the courage to stand up for the positive future that ocean-based seaweed farming promises.

Sincerely,

California Coastal Commission
Attn: Jack Ainsworth, Executive Director
455 Market Street, Suite 300,
San Francisco, CA 94105

Re: CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)

To Mr. Ainsworth,

Thank you for the opportunity to comment on the consistency determination of Ocean Rainforest' submerged aquaculture facility within an 86-acre site for the cultivation of giant kelp (M. pyrifera) approximately 4.4 miles offshore of Santa Barbara, Santa Barbara Co. I am the senior aquaculture program and partnership manager for Fair Trade USA®, a nonprofit organization and the leading certifier of fair trade products in North America. We protect workers, farmers, and fishers through certification, auditing, and compliance with our standards which grant access to safe environments, and additional capital and resources.

Aquaculture is essential to compliment wild harvest seafood production to meet the increasing demand for local, sustainable, & traceable seafood. California should lead aquaculture expansion efforts to help create new sustainable jobs, spur economic growth in our coastal communities, and ensure our oceans are responsibly managed now and in the future. Projects like the 86-acre demonstration project Ocean Rainforest has proposed can play a pivotal role by proving the feasibility of growing giant kelp in a sustainable and scalable manner while advancing scientific knowledge and state-of-the-art aquaculture practices through research and innovation. The project will provide critical insight on the opportunities and challenges of offshore aquaculture in federal waters proximate to the California coastline.

This research project will expand the knowledge base for virtually every critical area associated with the development of an offshore aquaculture industry:

- Refinement of a comprehensive monitoring and evaluation plan
- Establishment of best management practices for seaweed cultivation in the region
- Crucial data collection to validate models of economic feasibility and structural viability of offshore seaweed farming
- Inform marine mammal prevention entanglement programs and aquaculture gear monitoring and escape plans
- Enhancing public and regulatory knowledge and understanding of sustainable seaweed farming practices

All this, and more, will be accomplished while mitigating the effects of climate change and improving the health of the marine environment by reducing the amount of excess nutrients in the water. Ocean Rainforest has already proven itself to be a good faith partner by engaging local community stakeholders to ensure the demonstration project, as well as future initiatives, minimally impact traditional marine industries.

We fully support this project and others like it to help advance the underdeveloped sector, and therefore feel it's important for Ocean Rainforest to receive approval to proceed to the next stage of regulatory process.

Warm regards,

Blake Stok
Senior Program and Partnership Manager, Seafood
Fair Trade USA
T. 240.543.0994
Email. bstok@fairtradeusa.org
W. FairTradeCertified.org

October 7, 2021

California Coastal Commission
Attn: Jack Ainsworth, Executive Director
455 Market Street, Suite 300,
San Francisco, CA 94105

RE: CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)

Permitting offshore aquaculture projects in CA state waters and adjacent Federal waters is a conundrum. There is general and broad support for projects which perform ecosystem services using low trophic species native to CA ocean waters, but a lack of examples from which to draw informative lessons on potential siting and operational concerns. However if CA is to move into a future where marine aquaculture is able to play a meaningful role in providing equitable employment, a vital working waterfront, a sustainable economy, carbon capture, and trade imbalance offsets, projects must be approved and executed in order to collect that key operational data.

The Ocean Rainforest proposal for an 86 acre demonstration project sited in Federal waters for the purpose of cultivation of *Macrocystis pyrifera* is an opportunity to make tangible progress in this arena. I encourage the Commission to approve the consistency determination and to work closely with the Army Corps of Engineers, NOAA, and NMFS to develop practical monitoring guidelines that will inform the permitting process for future projects. The advancement of this demonstration project will create the ancillary benefit of improved interagency coordination and encourage science based decision making for marine aquaculture projects in general.

My shellfish farm produces CA red abalone in land based tanks. Our farm is committed to a vision of marine aquaculture in which environmental stewardship of the marine resource is compatible with sustainability and a regionally vital ocean based economy. The Ocean Rainforest project fits that intersection of values perfectly, and I encourage the Commission to recognize this opportunity and approve the consistency determination.

Douglas Bush, LLC Managing Member
The Cultured Abalone Farm LLC
Goleta, CA

a. richard
GIBSON

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340 S Lemon Ave
#3232
Walnut, CA 91789
c 518.258.1529

State Of California
Natural Resources Agency
California Coastal Commission
Energy, Ocean Resources
& Federal Consistency
EORFC@coastal.ca.gov

8 Oct 2021

RE: Ocean Rainforest's pending Friday October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)

Via email to California Coastal Commission at EORFC@coastal.ca.gov.

Dear Commissioners,

Thank you for taking the time to review this **letter of support** for the MacroSystems project which is managed by Ocean Rainforest with partners University of California, Hortimare and Primary Ocean and funding from the United States Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E). Implementing a giant kelp research farm is the next step in moving toward our shared goal and need for sustainable energy. The economic impacts cannot be underestimated, for California to develop the future of organic fuels that are carbon neutral or carbon negative, while improving land-based farm yields, and moving away from a petrodollar based on a substance produced outside of California and the United States.

My first contact with this project was in 2017 and via my introduction to Brandon Barney (Founder and Director of Research, *Primary Ocean*). Since that time, I've witnessed this project develop to the state it is today. Primary Ocean's market product, *Organikelp* increased crop yields in a recent trial by 23%. This is a piece of feedback that shows giant kelp-based products have present economic value, which will enable

the growth of the industry via market-based means. This means we get to have a solution to grow more kelp that will lock down more oceanic and atmospheric carbon, via a process that is market-profitable.

In looking toward the feasibility of implementing the stated vision of this Commission, it will be difficult to the point of unlikely to come to fruition, should our coastline become eroded by rising sea levels and unpredictable weather. Therefore, it would be essential to bringing this vision into reality, for this Commission **to do all in its power** to enable entrepreneurship and innovation for those who wish to **literally stem the tide** via implementation of methods that can mitigate carbon while allowing existing economic infrastructure to continue to function on similar sources of energy.

Given the quality and tenacity of the parties involved, please accept this letter as my strong endorsement for the permits needed for this team to execute its next phase. We need a few million miles of seaweed grown to reduce carbon levels; an economic system allows this be self-sustaining. We have a shot at doing that now and teams who are willing to put in the work.

Sincerely yours,

A. Richard Gibson

USC Dornsife
Dana and David Dornsife
College of Letters, Arts and Sciences

Sergey V. Nuzhdin
Biology Professor
Molecular & Computational Program

To whom it may concern, 10/5/2021

This letter is to express my strong support for the application of Ocean Rainforest to permit 86 acre research farm off Santa Barbara for two years. Production of biofuel and human food by ocean primary producers is very attractive as a solution for climate change mitigation. Not only will these crops produce without the expense of fresh water, but they can also remove carbon and access nutrients, making the oceans healthier and reducing global warming threats. The company has extensive expertise of staging alike activities in Europe and in Chile, minimizing potential negative impacts. Moreover, they can bring expertise in the USA that we are falling behind on.

Yours

University of Southern California · 1050 Childs Way 304C, Los Angeles, California 90089 · Tel: 213 740 5773 · snuzhdin@usc.edu

Marine BioEnergy, Inc.

4408 Union Street
La Cañada, CA 91011
818.952.6018
www.marinebiomass.com

October 4, 2021

California Coastal Commission

RE: October 15, 2021 Meeting, Agenda Item 12a. Ocean Rainforest, Inc.

Dear Commissioners,

Ocean Rainforest is proposing critical research to grow seaweed/kelp on farms off the coast of California. The Ocean Rainforest team has a decade of experience growing kelp on farms near the Faroe Islands (Denmark) and has the engineering expertise to design and install the robust equipment needed to be successful in the Santa Barbara Channel.

They will be outplanting locally-sourced Giant Kelp, *Macrocystis pyrifera*, so there is no risk of contamination of native kelp beds by an invasive species. The existing kelp beds in the region are less productive than they were in past decades and this farm system will help provide habitat to local species. The Giant Kelp will further provide bioremediation by absorbing excess CO_2 and harmful artificial nutrients that are flowing into the Channel.

Even though the U.S. has a substantial coastline, the U.S. imports ~29,000 metric tons of seaweed annually (FAO 2018). Based on the focused research led by Ocean Rainforest, more companies will be empowered to grow domestic crops and reduce our dependency on imports – while improving local water quality and minimizing impacts on the ocean floor and view lines. As local seaweed/kelp farms expand, more people in coastal communities will be employed by this sector, helping to restore opportunity and excitement in marine careers.

Ocean Rainforest has the world-class engineering and scientific expertise to implement this project and conduct significant research. Please accept this letter as our strong endorsement for the permits needed for this effort.

Kindest regards,

Cindy Wilcox

Cindy Wilcox
President
cindy.wilcox@marinebiomass.com

October 8, 2021

To: California Coastal Commission

Re: "Public comment on Ocean Rainforest, Inc.'s pending voluntary Consistency Certification (CC-0003-21)."

Oceanium would like to submit our full support for Ocean Rainforest's application CC-0003-21 to assess the feasibility of growing giant kelp in a sustainable manner, whilst executing a comprehensive monitoring plan, engaging with local stakeholders and improving the health of the marine environment thus supporting the fishing industry.

We firmly believe Ocean Rainforest's extensive experience and expertise advancing knowledge and state-of-the-art aquaculture practices through research and innovation; promoting the safety and sustainability of locally grown seaweed, while minimizing potential negative environmental impacts; and engaging with local stakeholders to ensure mutual benefit for all uniquely positions them to meet the objectives of this project.

Oceanium processes sustainably farmed seaweed into valuable and in-demand food ingredients and packaging materials. Our mission is to enable the regenerative and restorative seaweed farming industry to create "blue" job, additional income and livelihoods for fishing community, replace resource intensive food products. We have collaborated with and purchased farmed seaweed from Ocean Rainforest since we launched Oceanium. Olavur Gregersen and the knowledgeable, dedicated and talented team at Ocean Rainforest truly are the leaders in this emerging sustainable seaweed sector and we wholeheartedly support their efforts.

I am more than happy to speak with the commission should you like further information or have questions.

Thank you for your consideration.

Kind regards

Karen Scofield Seal
+44 788 401 3644
CEO
OCEANIUM

From: Robert Greer
1628 Harrison St.
Denver, CO 80204

To: State Of California
Natural Resources Agency
California Coastal Commission
Energy, Ocean Resources & Federal Consistency
EORFC@coastal.ca.gov

Re: “Ocean Rainforest's pending Friday October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)"

To whom it may concern:

I am writing to support the MacroSystems project which is managed by Ocean Rainforest with partners University of California, Hortimare and Primary Ocean and funding from the United States Department of Energy’s Advanced Research Projects Agency-Energy (ARPAE). The 87-acre giant kelp research farm is one step forward towards a blue/green regenerative world.

I admire the California Coastal Commissions advocacy for the environment and the leadership that California has demonstrated on the climate crisis. The challenges we face are dire, and we will need to draw from a diverse set of tools to fully manage them.

There is an urgent need for a shift to renewable energy and fuels such as seaweed biofuels. This is borne out not only by the recent apparent pipeline leak that is befouling Orange County beaches, but also the climate change being caused by burning fuels that do not also quickly draw down carbon as part of their manufacture, as is the case with kelp biofuels. My understanding is that moving this project to the California Coastal Commission’s consent calendar would allow its beneficial impacts to begin sooner, and for that reason I encourage you to do so.

As someone who is heavily involved in regenerative farming in the Denver area, I believe we have a high need for fertilizer that can be largely created in the open sea. This is because these organic-based fertilizers can help increase yields without requiring intensive mining or high-emissions industrial processes, or fertile land for land-based biofuels. These ocean-based fertilizers in turn reduce the land area needed to grow food, leaving our wild lands truly wild.

Seaweed-based biofuels and fertilizer products have great potential to reduce humanity’s footprint on this planet while also enabling more people to have a high quality of life. I encourage you to take whatever steps necessary to advance this project as quickly as reasonably possible.

With gratitude,

Robert Greer

UNIVERSITY OF CALIFORNIA, SANTA BARBARA

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO SANTA BARBARA • SANTA CRUZ

EARTH RESEARCH INSTITUTE

SANTA BARBARA, CA 93106
http://www.eri.ucsb.edu/

October 8, 2021

Dear Members of the California Coastal Commission

My name is Dr. David Siegel. I am a Distinguished Professor of Marine Science at the University of California, Santa Barbara and am a Principal Investigator of another MARINER project funded by the U.S. Department of Energy Advanced Research Projects Agency - Energy (ARPA-E). Our project aims to create and validate remote sensing technologies required to monitor large-scale seaweed farms, such as the MARINER-supported pilot farm proposed by Ocean Rainforest.

There are many reasons why encouraging offshore seaweed cultivation would be good for the nation. Seaweed farms could provide habitat and food for fished species, conduct essential ecosystem services including reducing excess nutrients, provide food, feed and materials for a variety of industries and will in general help grow our blue economy. I believe there are more reasons for encouraging offshore seaweed cultivation…

I am presently serving as a member of a consensus study of the U.S. National Academy of Science, Engineering and Medicine to develop a research strategy for ocean-based approaches for removing and sequestering carbon dioxide (CO_2) from the atmosphere (https://www.nationalacademies.org/our-work/a-research-strategy-for-ocean-carbon-dioxide-removal-and-sequestration). It appears very likely that some form of carbon dioxide removal (CDR) will be needed, in conjunction with greatly reduced fossil fuel emissions, to meet the global goal of limiting warming to below 2 degrees C, as established by the Paris Agreement. Recent studies have suggested that anywhere from 10 to 20 Gigatons of CO_2 per year must be removed from the atmosphere and sequestered somewhere by the year 2050. This amount of CDR required is staggering as it is roughly ½ of our present annual global fossil fuel emissions. This demonstrates the immense scale of the challenges ahead.

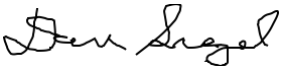
There have been many CDR strategies proposed from growing more forests on fallow pasture land to direct CO_2 capture and storage in geologic reservoirs to altering the chemistry of the oceans to allow more CO_2 to be absorbed to fertilizing regions of the ocean with micronutrients that are limiting. All proposals seem to have issues – whether they can be conducted to scale (i.e., removing massive amounts of CO_2 from the atmosphere) or if they can be conducted economically and safely for both the environment and society. Given this likelihood, it appears likely that a portfolio of CDR approaches will be needed. Large scale seaweed cultivation and the purposeful sequestration of biomass at depth or on the seafloor is one CDR strategy that has been gaining momentum. Again, the scale of the problems is immense and massive farms will be needed if this approach will contribute to help abate atmospheric CO_2 (literally millions of hectares).

The key unknown seaweed cultivation and sequestration CDR is whether we can grow the vast amounts of seaweed biomass needed. The scale of the problem requires the cultivating of seaweeds in offshore waters – not nearshore where nearly all commercial seaweed aquaculture is conducted today. The Ocean Rainforest team is the world's leader in developing and deploying deep water

seaweed cultivation systems. They understand how to perform this work successfully and how to do it safely for all. They are also the only presently supported MARINER project aiming to farm seaweeds in offshore waters, providing a greatly needed research opportunity to see how we can grow massive amounts of seaweed. As ARPA-E's MARINER program is now spinning down, it will be literally years before the next large federal research program will be implemented to bring this kind of critical technology forward. Thus, please support Ocean Rainforest's request. It represents an important of research that may be critically important, enabling the potential and challenges of seaweed cultivation and sequestration CDR to be evaluated soon than later.

Thank you for your consideration.

Sincerely,



Dr. David A. Siegel
Distinguished Professor of Marine Science
Earth Research Institute and Department of Geography
University California, Santa Barbara
Santa Barbara, CA, 93106, USA
Email: david.siegel@ucsb.edu

SUNKEN SEAWEED

October 8, 2021

Dear Commision Staff:

I would like to express my support for the demonstration project Ocean Rainforest has proposed. As a seaweed farmer, my company, Sunken Seaweed, understands the challenges of starting a seaweed farm here in California. It is our hope that this project can help answer the scientific and regulatory questions needed to propel this industry forward. The demonstration project Ocean Rainforest has proposed is exclusively research based and will provide critical insight on the opportunities and challenges of offshore aquaculture. This project will help inform structural engineering analyses, techno-economic assessments and other systems critical to evaluating the feasibility of the industry. Additionally this work will help inform marine mammal entanglement prevention programs and aquaculture gear monitoring and escape plans. Sunken Seaweed has known the researchers at Ocean Rainforest for a number of years and can attest to their integrity as a values-aligned company that puts environmental ethics ahead of profit.

Seaweed cultivation has the potential to provide a domestically grown, zero input food crop, and is also being investigated as a regenerative input for a variety of other products (i.e. animal feed, textiles, bioplastics and biofuels). Marine macroalgal (seaweed) aquaculture is experiencing a global boom yet few regions in the U.S. have seized the opportunity to be a player in this market but those who have (New England, Alaska) have seen major benefits to fishing communities, offering a new or alternative livelihood and or supporting fisheries by creating habitat for marine life. Regrettably, California has lagged behind in this field. California has 1000 miles of coastline as well as major distribution channels and consumer bases. Southern California is even more optimal because of the southern California Bight, which gives a reliable upwelling of nutrients which are necessary for kelp farming, as well as consistent abiotic factors such as sunlight and water temperature. Besides the potential economic value that seaweed cultivation can bring there is also tremendous value in the environmental services it could provide. Because of the aggressive climate change our planet is currently facing, the US must seek innovative approaches to issues such as ocean dead zones, habitat loss and carbon drawdown. Some promising solutions to these environmental threats have been found in the cultivation of macroalgae, kelps in particular. In general seaweed cultivation has the potential to improve the health of the marine environment by reducing the amount of excess nutrients in the

water, locally reduce ocean acidification by capturing Carbon dioxide and increase ecosystem biodiversity by generating habitat.

The project proposed by Ocean Rainforest aims to:

1. Execute a comprehensive monitoring plan that will allow Ocean Rainforest and fellow industry leaders to better understand the potential benefits and risks associated with seaweed aquaculture.
2. Collect data to validate models related to the economic feasibility, social impact and structural viability of offshore seaweed cultivation.
3. Engage members of the local community to ensure the demonstration project, as well as future initiatives,minimally impact traditional marine industries.
4. Evaluate and optimize the seaweed value chain from seed production to harvest methodologies.

We are excited to see what this team can bring to the field, and will close by reiterating our support for this project.

Sincerely,

Torre Polizzi
Co-founder at Sunken Seaweed LLC

From: Andrew Johnson
To: Energy@Coastal
Subject: Agenda Item F12a Staff Report on CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date: Friday, October 8, 2021 4:05:02 PM

Dear Commissioners:

Just a comment about the Ocean Rainforest, Inc. project to install a kelp cultivation structure for two years in federal waters off Santa Barbara. The Commission staff recommends that the Commission conditionally concur with consistency certification CC-0003-21 for this project; however, the risks to marine wildlife associated with placing various lines in the water should require that a removal plan is in place at the outset of the project.

Re: Section 11. Facility Removal

We request that Ocean Rainforest, Inc. (ORI) complete, submit and have approved "a plan for...the timely removal of all seaweed, grow-out structures, anchoring devices, equipment, debris, and materials associated with the cultivation facility" at their 86-acre giant kelp cultivation site *before* the start of the project. Waiting to submit a removal plan until 90 days before the project's expiration or "within 60 days of a written request by the Executive Director" is inadequate, and removal of the facility structures will have implications for California coastal waters and resources. If ORI fails to meet the Special Conditions contained in the Commission staff's recommendation document—for example, through lapses in maintenance or by creating risks to mariners or wildlife—any plan to resolve the issue, up to and including removal of the facility, should commence immediately.

Thank you.

Andy

Andrew Johnson
California Representative

DEFENDERS OF WILDLIFE
762 Laurel Avenue
Pacific Grove, CA 93950
831-402-1851

Join our Sea Otter Facebook Group!
Visit Defenders.org!

From: Daniel Hooft
To: Energy@Coastal
Cc: Caroline Slootweg; Javier Infante; olavur@oceanrainforest.com
Subject: CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.) - Comments CEO Kelp Blue
Date: Wednesday, October 6, 2021 3:58:16 AM

Dear members of the California Coastal Commission, to whom it may concern,

We are writing in respect of Ocean Rainforests' upcoming permit application consideration under agenda item 12 on the October 15th session, specifically to express our strong support and interest in the projects' future and outcomes.

Kelp Blue is a Netherlands, UK, and Namibia-based Group that is engaged in similar activities to Ocean Rainforests' ARPA-E supported project in California.
We are currently also exploring potential activities in the US and Canada.
We have followed Ocean Rainforests' project with great interest and regularly engaged in best practice sharing between us.
We read the California Coastal Commission Report provided with great interest and, as would be expected, see similar concerns and issues raised as we have experienced during our permitting trajectory in Namibia and our early stage engagements with authorities in different countries. It is a very thorough piece of work and highly informative.

We would like to note the following from our work and experience and engagements:

- Marine Wildlife Entanglement – based on our engagements with the NOAA group carrying out marine wildlife (primarily cetacean) entanglement studies – a farm/forest design as proposed by Ocean Rainforest gives very high confidence that this will not be an issue, as marine wildlife entanglement (cetaceans) is primarily an issue with loose ropes and lines. As such we share the view that a semi-taut design as provided, combined with proper inspection and maintenance ensuring no lines come loose and remain loose, gives very high confidence that this will not be an issue. We therefore strongly support the recommendations of the report, and Ocean Rainforests' mitigation and monitoring plans as a result, as being highly responsible and highly adequate.
- Disturbance or alteration of seafloor habitats. Again, we have experienced and addressed similar concerns in our Namibian project. Similarly, our view is that given the water-depth is well beyond the photosynthetic/solar ingress zone, firstly no benthic communities will be disturbed or impacted due to a restriction of their photosynthetic capability. Secondly, though our understanding of the specific context in California is limited, the consensus around our project is that kelp and other organic detritus from the kelp farm/forest will be limited in volume, rapidly dispersed, and most likely form a highly positive addition to the ecological cycles due to the addition of a significant primary producer; this in combination with the undoubtedly positive effect of the kelp farm/forest on local oceanographic geochemistry. We strongly endorse the monitoring proposed as being adequate and of great interest to the industry and the scientific community, and are confident that the outcomes of that monitoring will highlight the very positive effect of kelp farms/forests on local ecologies including those pre-dating the structure.
- Collision of project vessels with marine wildlife – we address similar concerns here in Namibia

(primarily with Ocean Sunfish / Mola Mola) and address them similarly by limiting vessel speeds and consistent monitoring. In our context collisions with marine wildlife are rare to non-existent and we would hope that with the mitigation measures proposed, which seem very sensible, this will also be the case in California.

- Loss of recreational or commercial fishing grounds. We would in fact argue that the trade-off provided is highly positive for the recreational and commercial fishing industries. For the loss of direct access to a very very small acreage, the local and indeed regional pelagic and benthic ecosystem will receive a very significant biodiversity boost, which will almost undoubtedly result in higher levels of fish (and other species) stocks as well as an increase in the diversity of species. Of course this is a hypothesis, however likely, and monitoring of this hypothesis is of great interest to us as we believe proving and quantifying this positive effect will give a much needed boost to this regenerative industry and establish it as one of our most powerful potential nature-based solutions to the twin issues of climate change / oceans acidification, and oceans biodiversity – while at the same time providing much needed jobs to coastal communities, and producing products that directly displace alternatives with very high environmental footprints.
- Loss/damage to fishing gear due to accidental collision. Once again, this is an identical issue that we have also addressed in a similar fashion. Our view is that the proposed mitigation measures in the report and in Ocean Rainforests' plans is more than adequate to address this and we are encouraged to see the level of thought and detail that has gone into this, and have learnt and adapted many of our plans accordingly.

In summary, we would like to express our strong support for Ocean Rainforests' project, our deep interest in the outcomes, and our confidence that Ocean Rainforest is a responsible, professional, and highly reliable partner for the State of California, and at the forefront of what promises to be a very positive development in humanity's ability to ensure that our continued wealth and progress no longer comes at the expense of the natural world, but actively works to restore and improve it, while at the same time creating meaningful sustainable jobs for coastal communities and building a deep centre of excellence in and around seaweed farming operations.

We hope that our input is valuable to you and are more than willing to engage further if that would be of use to you.

Hoping for a positive outcome for Ocean Rainforests' request, and available to support and help wherever needed, we remain respectfully yours,

Daniel Hooft (CEO/Founder) & the entire Kelp Blue team

From: love@lifesci.ucsb.edu
To: Energy@Coastal
Subject: CC-0003-21
Date: Friday, October 8, 2021 9:56:22 AM

Hi Coastal Commission

I just want to weigh in with my support for Ocean Rainforest's Consistency Certification for their offshore kelp farm feasibility project. I will state at the onset that my lab here at UCSB is starting to work with ORI on their nearshore experimental kelp farm, so I am by no means a neutral party. However, I would be in favor of this offshore project even if I did not have this involvement, as I strongly support the expansion of marine aquaculture off California and see ORI's experiment as a worthy effort in this direction.

Thanks.

--
Milton Love
Marine Science Institute
University of California
Santa Barbara, California

From:	Caroline Slootweg
To:	Energy@Coastal
Subject:	Fwd: PUBLIC HEARING NOTICE on Federal Consistency item CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date:	Friday, October 1, 2021 5:39:21 AM
Attachments:	image001.png image001.png

Dear EORFC,

Sorry to trouble you again, but these links don't seem to be working either. I've even forward it to some co-workers and they have also had no luck.

Which leads me to believe it might be a trans-Atlantic thing.

Would it be possible to send the pdf of the staff report?

Many thanks in advance,
Caroline

Caroline Slootweg
Co-founder, CCO
Kelp Blue

Phone +31 6 48 91 73 91
Email caroline.slootweg@kelp.blue

Begin forwarded message:

From: Samantha Deane <Samantha.Deane@kelp.blue>
Subject: Re: PUBLIC HEARING NOTICE on Federal Consistency item CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date: 1 October 2021 at 12:42:27 GMT+2
To: Caroline Slootweg <caroline.slootweg@kelp.blue>

Nope

> On 1 Oct 2021, at 12:18 PM, Caroline Slootweg <caroline.slootweg@kelp.blue> wrote:
>
> Can any of you open this link?
>
> Caroline
>
> Begin forwarded message:
>
> **From:** EORFC@coastal.ca.gov

Date: 1 October 2021 at 00:12:15 CEST
To: Caroline Slootweg <caroline.slootweg@kelp.blue>
Subject: RE: PUBLIC HEARING NOTICE on Federal Consistency item CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)

Caroline. Apologies for the link issue on the notice. You can find the staff report on our public website here:https://documents.coastal.ca.gov/reports/2021/10/F12a/F12a-10-2021-report.pdf

---

From: Caroline Slootweg <caroline.slootweg@kelp.blue>
Sent: Thursday, September 30, 2021 3:56 AM
To: Energy@Coastal <EORFC@coastal.ca.gov>
Subject: Re: PUBLIC HEARING NOTICE on Federal Consistency item CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)

Dear EORFC,

I've tried to access the link in your pdf to the staff reports but the link seems to be broken.

http://www.coastal.ca.gov/mtgcurr.html

Would it be possible to check the link or to send a pdf of the content in the link?

Many thanks,
Caroline

Caroline Slootweg
Co-founder, CCO
Kelp Blue

Phone +31 6 48 91 73 91
Email caroline.slootweg@kelp.blue

<image001.png>

> On 25 Sep 2021, at 00:25, Energy@Coastal <EORFC@coastal.ca.gov> wrote:
>
> <F12a-10-2021 CC-0003-21 Ocean

Rainforest.pdf>

From: Brad Ack
To: Energy@Coastal
Subject: Ocean Rainforest Permit Application
Date: Thursday, October 7, 2021 2:42:34 PM
Attachments: image001.png

Dear Honorable Commissioners: I am writing in support of the permit application referenced above. I am the Executive Director of a nonprofit organization that focuses on research and development of needed solutions to enormous challenges in the ocean-climate nexus.

One of our most critical areas of focus is on *ocean-based carbon dioxide removal*, which is essentially using the power of the ocean to help remove carbon pollution from the air and the water, and safely store it for generations. Carbon removal is critical to our climate strategy going forward and the ocean offers a number of potential approaches to contribute to the suite of different carbon removal options that humanity will need to ameliorate and potentially reverse the climate crisis.

The work that Ocean Rainforest is proposing to do is important to advancing this field, while also having a number of other co-benefits. We need projects that can help answer critical questions around ocean based carbon dioxide removal. Ocean Visions, my organization, has developed a series of technology and policy road maps, available here, that identify many of these critical questions. Much of what Ocean Rainforest proposes will help to answer some of these in the macroalgae map. In particular:

1. Demonstrating the feasibility of growing Giant kelp in a sustainable and scalable manner.
2. Executing a comprehensive monitoring plan that to better understand the potential benefits and risks associated with seaweed aquaculture.
3. Collecting data to validate models related to the economic feasibility, social impact and structural viability of offshore seaweed cultivation.
4. Evaluating and optimizing the seaweed value chain from seed production to harvest methodologies.

Demonstration projects like this proposed by Ocean Rainforest will provide critical insights on the opportunities and challenges of offshore aquaculture; will help inform structural engineering analyses, technoeconomic assessments and other similar systems critical to evaluating the feasibility of the industry; and help inform marine mammal prevention entanglement programs and aquaculture gear monitoring and escape plans.

I urge you to approve the application.

Thank you for your attention to these comments.

Sincerely,

Brad Ack

Brad Ack
Executive Director and Chief

OCEAN VISIONS
Catalyzing Solutions for Ocean Health

Innovation Officer
www.oceanvisions.org

From: Beth Zotter
To: Energy@Coastal
Subject: Ocean Rainforest permit application
Date: Thursday, September 30, 2021 5:22:35 PM

Dear Commission Staff,

I support the application of Ocean Rainforest to build a seaweed farm currently under consideration by the CCC. The project proposes to expand the area of native kelp species, which is one among many environmental benefits of seaweed farming. Offshore seaweed cultivation will create habitat for a variety of marine life and marine organisms. This is why both the Nature Conservancy and World Wildlife Fund have recently supported and promoted seaweed aquaculture as a sustainable industry beneficial for ocean ecosystems. Not only do seaweed farms improve the health of the marine environment by reducing the amount of excess nutrients in the water, but also, by reducing ocean acidification at a local level, seaweeds enable organisms with carbonate-based shells to more easily grow shells - thereby helping restore and protect reefs and critical habitat.

It is important to evaluate not just the risks of this type of project, but also the potential benefits to the natural resources of California. These benefits should be considered when evaluating what is reasonable when placing numerous cost-increasing restrictions on proposed seaweed aquafarming projects.

The CCC has an important role to play in protecting California resources, but it also has the power to use red tape to delay the advancement of sustainable farming practices that are beneficial to those resources. We hope you approve this project, and help it succeed.

Sincerely,
Beth Zotter
President & CEO, Trophic LLC

From: nancy@getinspiredinc.org
To: Energy@Coastal
Subject: October 2021 CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date: Thursday, September 30, 2021 6:40:48 PM

Dear Commissioners,
I studied aquaculture in college, I have been teaching aquaculture for 19 years, and I have been patiently waiting for it "boom" in California for the last 24 years that I have lived here. Although we have many freshwater aquaculture farms in the state, we are REALLY lacking in our ocean aquaculture ventures. With 1100 miles of coastline, we can afford for some to help us produce food and jobs. I implore you to approve the Ocean Rainforest project so that we can utilize our coast to produce food. This project will serve as a model for new industry in California. It will contribute to our blue economy. Not only will the product be valuable but it will provide habitat, clean the water, buffer wave action, and offer nutrition to people!

I grew kelp and restored the kelp forests of Orange County for 10 years. It is the perfect candidate for offshore aquaculture and will pave the way for a whole new model of aquaculture in California. Please approve this project now.

Thank you,

Capt. Nancy L. Caruso
Marine Biologist/Founder
Get Inspired
714-206-5147
Check out our new website www.GetInspiredinc.org

From:	Marta Lukomska
To:	Energy@Coastal
Cc:	Brandon Barney
Subject:	Public Comment on October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date:	Friday, October 8, 2021 3:29:14 PM

Hello-

I wanted to express my support for MacroSystems project which is managed by Ocean Rainforest with partners University of California, Hortimare and Primary Ocean and funding from the United States Department of Energy's Advanced Research Projects Agency-Energy (ARPAE).

Seaweed can play integral role in addressing climate crisis by absorbing carbon emissions and regenerating bionetwork. The giant kelp research farm covering 87-acre can make a significant difference. With a recent oil spill, ongoing water pollution and chemical imbalance leading to algae blooms, seaweed has a potential of effectively absorbing the excess nutrient and balancing out the marine ecosystem.

In addition, I see a lot of potential in the natural, seaweed-based biofuel and fertilizer that can aid in reducing California's footprint and offer healthier, more sustainable solutions that benefit our planet and local economy. I encourage you to take steps necessary to advance this project, focusing on sustainable solutions for today and the future.

Sincerely,

Marta A Lukomska

From: Michael Schuppenhauer
To: Energy@Coastal
Subject: Public Comment on October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date: Friday, September 24, 2021 4:48:04 PM

Giant Kelp (Macrocystis pyrifera) has been known since 1992 to contain and produce bromoform and dibromomethane, as well as other volatile halo-organic compounds (haloforms; Goodwin et al. 1997), These substances are regulated under the Montreal protocol to limit the release of ozone depleting substances, as they destroy the ozone layer, especially when released closer to the equator (Quack and Wallace 2003). While Macrocystis maybe on the lower end of haloform containing and releasing macroalgae (seaweed), nevertheless they do and at scale the amounts are not negligible.
The absence of a suitable monitoring program for volatile halo-organic compounds in that large of a cultivation trial would be disturbing, both, from a research as well as from an environmental impact perspective. The project should be mandated to report on a regular basis the measurement and quantification of the concentration of haloforms in the water, as well as in the atmosphere above it, especially during day time at multiple timepoints, and ideally the flux of any such compounds at the sea-air interface.
Ironically, ORI is advertising on their website that seaweed could contribute to the reduction of greenhouse gases from agriculture (belching cows), the underlying mechanism of which is the use of haloforms in the cow's gut to block the production of methane. It is the very same haloform that is the ozone-depleting substance and being secreted by the seaweed whilst in the growth stage - in the ocean - and vented into the atmosphere.
Again, not putting an environmental (sea & air) measurement program for bromoforms in place would miss a major opportunity to generate real world data at scale as such algae farms are being explored for scale-up, and as they need to be made compliant and compatible for an ever fragile atmosphere, and the real world magnitude of such emissions need to be assessed.

1. Goodwin KD, North WJ, Lidstrom ME. Production of bromoform and dibromomethane by Giant Kelp: Factors affecting release and comparison to anthropogenic bromine sources. *Limnol Oceanogr*. 1997;42(8):1725-1734. doi:10.4319/lo.1997.42.8.1725

3. Quack B, Wallace DWR. Air-sea flux of bromoform: Controls, rates, and implications. *Global Biogeochem Cycles*. 2003;17(1). doi:10.1029/2002GB001890

4. Manley SL. Phytogenesis of halomethanes: A product of selection or a metabolic accident? *Biogeochemistry*. 2002;60(2):163-180. doi:10.1023/A:1019859922489

Dr. Michael R. Schuppenhauer | Principal Investigator & Affiliate | C +1 415 525-6968 | mschuppenhauer@lbl.gov
Lawrence Berkeley National Laboratory, Biological Systems & Engineering Division, 1 Cyclotron Road Mailstop 978, Berkeley, CA 94720

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From:	Jewels Solheim
To:	Energy@Coastal
Subject:	Public Comment on October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date:	Friday, October 8, 2021 3:13:02 PM
Attachments:	a13a1661-893c-4ac2-be4b-c257dfff649b.png bc4fba06-1abc-4e40-8321-abeb4f936463.png

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To: State Of California
Natural Resources Agency
California Coastal Commission
Energy, Ocean Resources & Federal Consistency
EORFC@coastal.ca.gov

Re: “Ocean Rainforest's pending Friday October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)"

To whom it may concern:

I am writing to support the MacroSystems project which is managed by Ocean Rainforest with the partner's University of California, Hortimare, and Primary Ocean, and funding from the United States Department of Energy’s Advanced Research Projects Agency-Energy (ARPA-E). The 87-acre giant kelp research farm is one step forward towards a blue/green regenerative world.

I admire the California Coastal Commissions' advocacy for the environment and the leadership that California has demonstrated on the climate crisis. The challenges we face are dire, and we will need to draw from a diverse set of tools to fully manage them.

I am writing from Greece and as an American living abroad who has lived in Santa Monica, I'm proud that the US government is funding a collaborative project with European companies to address the most serious issues facing the world.

With gratitude,

Jewels

Jewels Solheim-Roe
Project Relevé Guild / Community Outreach
Westside Ballet of Santa Monica
https://westsideballet.com/project-releve-page/

iphone 503 801 8013
jewels@westsideballetcompany.org

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From:	Brittney Gallagher
To:	Energy@Coastal
Subject:	Public Comment on October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date:	Friday, October 8, 2021 1:24:33 PM

To whom it may concern,

I would like to write to support the MacroSystems project which is managed by Ocean Rainforest with partners University of California, Hortimare and Primary Ocean and funding from the United States Department of Energy's Advanced Research Projects Agency-Energy (ARPAE) going forward. As a member of the public (and lover of the CA coast), I believe it's important for clean energy projects to move forward, especially after the recent oil spill off the coast of Huntington Beach.

I admire the California Coastal Commissions advocacy for the environment and look forward to more clean energy projects going forward in the future.

Thank you,
Brittney Gallagher

From:	Loretta Roberson
To:	Energy@Coastal
Subject:	Public Comment on October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date:	Friday, October 8, 2021 11:57:37 AM

To the California Coastal Commission

I am writing in support of the consistency certification request submitted by Ocean Rainforest, Inc. (ORI) regarding seaweed cultivation activities in federal waters off of Santa Barbara. The US is way behind Asia and Europe in developing a seaweed industry, and the highly productive waters off of California would be a logical site for development of those types of activities. I highly recommend approval of this permit. I have done a lot of kelp and fin fish research in CA and the proposed area and it will not be harming any essential habitat, and will actually provide more ecosystem services such as essential fish habitat. Additionally, the Ocean Rainforest team has many years of experience operating kelp farm systems and kelp biology.

All the best,
Loretta

Loretta Roberson
Associate Scientist
The Bell Center
Marine Biological Laboratory
7 MBL Street Woods Hole, MA 02543 USA
(508) 289-7097 lroberson@mbl.edu
http://www.mbl.edu/bell/loretta-roberson/
https://www.mbl.edu/tropical-seaweed/

From:	Tobias Dewhurst
To:	Energy@Coastal
Subject:	Public Comment on October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date:	Friday, October 8, 2021 11:18:52 AM

Dear California Coastal Commission,

The project that Ocean Rainforest, Inc. is proposing off of Santa Barbara is an example of marine aquaculture done correctly.

The public is becoming aware of the many ecological, environmental, and economic benefits of seaweed aquaculture. The Commission may also be aware of the risks posed by poorly located, designed, or maintained structures. As a professional engineer, I have evaluated and designed many marine aquaculture structures and mooring systems in the US and abroad. I have provided expert opinions in legal cases regarding structural failure of aquaculture systems, and have testified in cases involving companies that operated marine farms without proper attention to engineering design and the environmental risk of structural failure.

Ocean Rainforest, unlike some aquaculture companies, has invested the time and resources to locate, plan, and design their farm using the best available resources and national and international design standards to properly mitigate the risks associated with operating in the ocean. The proposed project is the gold standard of the way open ocean aquaculture should be conducted in the USA.

Sincerely,

Tobias Dewhurst, PhD, PE

--
Tobias Dewhurst, PhD, PE
CEO, Kelson Marine Co.
KelsonMarine.com

From:	Clifford Goudey
To:	Energy@Coastal
Subject:	Public Comment on October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date:	Friday, October 8, 2021 5:54:43 AM

To the California Coastal Commission

I am writing in support of the consistency certification request submitted by Ocean Rainforest, Inc. (ORI) regarding a seaweed aquaculture facility in federal waters off Santa Barbara.

I am an engineer and active in the design and development of offshore aquaculture systems associated with finfish, shellfish, and macroalgae. Over the last five years I have led the development of both research and commercial seaweed farms in New England, in Alaska, and in the Caribbean. I have had no involvement in the development of the farm system being proposed by ORI but it is my view that the system design and the planned operations are well thought out and truly state of the art.

I find many of the proposed conditions being imposed on the operation to be overly onerous and more suited to a large construction project where massive ecological disruption is likely or where the net outcome, even in the best case, is harmful to the environment such as an oil production facility. In this case, the project is clearly restorative with the benefits of seaweed forests on the environment being well known and indisputable. While I understand that the farming of seaweeds outside of their natural setting is novel off the coast of California, it is commonplace in many other locations where it has consistently proven to be both economically and ecologically viable.

There is much to be learned about optimal ways to manage such initiatives and it is exciting to see a project of this size being proposed by an applicant such as ORI who has been successful in commercial-scale seaweed farming in Europe. I am hopeful that the project is a success and that ORI is able to transition the site to a permanent commercial operation so that the restorative effects can continue and meaningful economic value can be brought to coastal communities.

I would like to disagree with a point made in the Staff Report related to ORI's choice of anchors. While helical anchors can be advantageous in situations where omnidirectional holding power is needed such as for a boat mooring, in cases where the load is consistent in one direction, drag embedment anchors are always preferred. Helical anchors do not do well in such situations, as under constant horizontal loads their shank either bends or the helical plates rotate with it and their holding power becomes diminished within the disturbed substrate. Furthermore, under such conditions it can become impossible to remove the helical anchor and it must be cut at the mudline and potentially becoming a hang risk if there is any local erosion.

Drag embedment anchors, as proposed by ORI, are the best choice in these settings because of their reliability and their ability to support the sorts of pretension needed by the proposed system. Properly installed and tensioned, the anchor will be fully embedded and can expect a long service life. It is also worth pointing out that while Danforth anchors are a type of drag embedment anchor, it is wrong to use that brand name to describe all drag embedment designs. Danforths are intended as a temporary boat anchor that will eventually catch regardless of how it lands on the seabed. Commercial-grade drag embedment anchors work best when lowered and aligned to the planned direction of pull after which rapid embedment can be assured.

Good luck in your deliberations and thank you for this opportunity to provide comment.

Clifford A. Goudey
C.A. Goudey & Associates
21 Marlboro Street
Newburyport, MA 01950
Mobile: 978-914-1901
Website: http://cagoudey.com/
Email: cliff@cagoudey.com

From: Annie Lovell
To: Energy@Coastal
Subject: Public Comment on October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date: Thursday, October 7, 2021 1:34:59 PM

From:	Megan Reilly Cayten
To:	Energy@Coastal
Subject:	Public Comment on October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date:	Wednesday, October 6, 2021 2:47:08 PM

The purpose of this email is to provide a public statement on behalf of Oceans 2050 and our co-founders, Alexandra Cousteau and Professor Carlos Duarte, supporting Ocean Rainforest's application to deploy in Santa Barbara.

Oceans 2050 is a new initiative, founded in 2020, with the goal of restoring abundance to the oceans by 2050. The science that underpins our work was articulated in a landmark paper, Rebuilding Marine Life (Nature, 2020), by Professor Duarte and colleagues, which identifies a series of recovery wedges or priority areas to focus to achieve our goal of ocean regeneration. Oceans 2050's first project is focused on seaweed farming, because of its significant potential to contribute to climate mitigation and adaptation, and to ocean health. We are leading a global study on five continents to quantify the carbon removal by macroalgae and kelp, and create a new voluntary carbon methodology for seaweed farming. We estimate that if current estimates of carbon removal are confirmed, and if the industry scales up significantly to reach 1.5m km2 by 2050 (a significant increase over the 2,000 km2 that exist today but a fraction of the 48m km2 considered suitable for seaweed farming), seaweed farming could remove 10 GT of CO2 by 2050, making a significant contribution to restoring balance to the global climate. Carbon removal by seaweed farming happens prior to harvest and so is entirely compatible with continuing to harvest and use the biomass, and seaweed farming provides significant additional ecosystem services to the oceans including nutrient remediation, habitat for a variety of marine organisms (supporting fisheries), and localized reductions of temperature and acidification which enhances biodiversity.

We have gotten to know Ocean Rainforest well over the course of the last 12-18 months and are honored to be able to support their proposal today. The purpose of the project they propose is entirely consistent with our mission of catalyzing interventions that can provide restorative benefits to the oceans at scale, and California offers tremendous potential to farm seaweed both to restore its oceans and to provide climate-positive food, feed and materials, while providing good quality jobs to coastal communities. Ocean Rainforest is pioneering and science-led, and the learnings and data that will come from this project will be essential in better understanding and developing the technology and practices needed to grow seaweed in an efficient and regenerative way that will catalyze and guide the development of the industry in California and other areas with similar conditions and species.

We wholeheartedly endorse approval of this project. Please feel free to reach out with any questions or concerns.

Sincerely,

Megan Reilly Cayten
Principal
Oceans 2050
megan@oceans2050.com
+19174785560

From:	Matthew Perkins
To:	Energy@Coastal
Subject:	Public Comment on October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date:	Thursday, September 30, 2021 4:01:51 PM

Dear Sirs,

I am the founder and CEO of Macro Oceans Inc, a California-based seaweed processing company. I am writing to offer my support to Ocean Rainforest's application.

One of the key challenges in developing viable off-shore kelp farms in the State is understanding the impact of kelp farming at scale. This project will make a vital contribution to the State's knowledge base by generating data on the economic, scientific, ecological and societal benefits (and impacts) of large-scale kelp cultivation.

At Macro Oceans, our belief is that large scale kelp cultivation and processing offers the United States a path to carbon-negative bioproducts of the future. We very much hope you will support this important project to help kick start the seaweed industry in California.

Thank you for your consideration.

Sincerely,

Matthew Perkins
Founder, Macro Oceans Inc.
San Francisco, California

+1 415 518 0921
matthew@macro-oceans.com
www.macro-oceans.com

From:	bernard@sbmariculture.com
To:	Energy@Coastal
Subject:	Public Comment on October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date:	Friday, October 8, 2021 4:37:15 PM

Dear Commissioners,

I support this project.

California is operating in a data poor environment for developing it's aquaculture program. Aquaculture has long held a massive stigma. As a proud farmer of shellfish here in Santa Barbara, I welcome Ocean Rainforest as a potential partner and collaborator to inform the people of California that aquaculture does hold importance and relevance to benefit our society.

I have worked with Ocean rainforest growing kelp on my own farm for the past 6 months. They have been good people to work with and I generally like them and wish to keep them around as collaborators and contributors.

Please support your staff's recommendation. Please keep supporting aquaculture here in California.

Regards,

Bernard Friedman

Santa Barbara Mariculture Co.
Bernard Friedman
939 N. Patterson Ave.
Santa Barbara, CA 93111
805 886-1283

From: Alexander Barney
To: Energy@Coastal
Cc: BrandonScottBarney@gmail.com
Subject: Public Comment on October2021 Agenda item Friday 12a-cc-0003-21
Date: Friday, October 8, 2021 2:53:25 PM

I support giant kelp farms project.

Cheers,

Alexander

From:	Anne Usher
To:	Energy@Coastal
Subject:	Public comment on Ocean Rainforest, Inc.'s pending voluntary Consistency Certification (CC-0003-21)
Date:	Friday, October 8, 2021 5:01:27 PM

Oct. 8, 2021

Mr. Dan Carl
Director, North Central Coast and Central Coast
California Coastal Commission
725 Front Street Suite 300
Santa Cruz, CA 95060

Dear Mr. Carl,

I'm writing in support of Ocean Rainforest's proposed offshore seaweed cultivation demonstration project on 86 acres in the Santa Barbara Channel.

After examining the project for the past several months as a consultant for Coastal Environments, a La Jolla-based environmental consulting firm, and as part of my master's degree at Virginia Tech, I have concluded that the farm will pose no risks to the marine environment and the conditions that your staff has imposed as part of its conditional approval will ensure that that monitoring of the farm is regular and rigorous.

The structure itself is the most sound that I have come across after evaluating all published materials and research studies on kelp farming structures worldwide, including those merely proposed in research materials. And it has proven itself for years in real-world, exposed conditions in the Faroe Islands, surviving wave heights of four meters and at least one hurricane. Unlike many past designs, which were highly complex, Ocean Rainforest's is simple: It relies simply on ropes, buoys, and anchors.

The 16-acre design for this two-year demonstration project, which has some small modifications, has also been scrutinized and approved by Kelson Marine, one of the top marine engineering firms. Kelson Marine uses extensive computer modeling to review or design kelp structures to ensure that they will remain intact during "catastrophic" events, such as a 100-year storm. Ocean Rainforest's farming structures are "usually" held down with plow anchors, I've been told. But the engineering report for this project says the company would use 28 drag embedment anchors for this project.

The depth at the demonstration site in the channel is between 246 and 262 feet (75-80 meters). The company's farms in the Faroe Islands have been designed for even deeper waters: up to 150 meters. They have been successfully tested at 100 meters (328 feet). The company's design has also survived the scrutiny of the Department of Energy's ARPA-E MARINER program, which concluded that it had a "high degree" of survivability in offshore conditions.

To minimize potential entanglement risks, all backbone and mooring lines will be tensioned to greater than 2,000 pounds at all times. The company also examined how strong a line could be to both enable the farming structure to be structurally sound and allow a whale to rip the line off. Ocean Rainforest's Eliza Harrison said the grow lines will be about .5 in diameter and maintain a breaking strength of less than 1,700 pounds.

The offshore demonstration farm's siting will not conflict with existing uses or threaten coastal resources. Ocean Rainforest consulted with NOAA to select the farm's proposed location and alternatives and the

agency used a tool with overlays that showed vessel patterns for Naval, commercial, and recreational use (and highlighted areas with heavy traffic). The company took the additional step of consulting with local commercial fishermen to ensure that the farm would not threaten their activities.

As part of a permitting application, Ocean Rainforest also created a rigorous draft monitoring plan. The extensive plan includes, among other actions, recordings by ROV and/or monitoring performed by SCUBA divers. Its crew plans to use its small fishing vessel to inspect the site at least twice a month for evidence of marine mammal entanglement and require a qualified marine wildlife observer to be present during construction activities; the observer will be able to halt activities if marine mammals are observed.

It also plans (at least twice a month) to monitor the kelp itself and environmental conditions of the site, assess the integrity of the structure, survey the project area for potential entanglement risks, and ensure all data monitoring equipment is functioning properly.

The additional requirements in the commission's staff report should further ensure that the farm poses no environmental harm, such as its requirement that an independent, third party conduct its own monitoring once a week for the first month and twice a month thereafter and that Ocean Rainforest evaluate commercial and recreational fishing at and around the site and compile any reports of lost or damaged fishing gear or catch that occurs as a result of contact with the farm.

Ocean Rainforest has also drawn up a plan to monitor sediment and water quality to establish baseline conditions and evaluate changes over time. (Physical, chemical, and biogeochemical sediment characteristics and in benthos assemblage structure at the project demonstration site.)

Rather than posing risks, the farm is an important initiative to prove the value of growing kelp to both store carbon dioxide, help curb coastal erosion, and provide valuable habitat for hundreds of marine species.

Sincerely,
Anne Usher

Usher Consulting & Co.

--
Anne Usher

Cell: 703-362-6991

From: Brad Ack
To: Energy@Coastal
Subject: RE: Ocean Rainforest Permit Application
Date: Thursday, October 7, 2021 2:50:02 PM
Attachments: image001.png

Thank you

From: Energy@Coastal <EORFC@coastal.ca.gov>
Sent: Thursday, October 7, 2021 5:48 PM
To: Brad Ack <brad.ack@oceanvisions.org>
Subject: RE: Ocean Rainforest Permit Application

Thank you for your comments. They will be added to the correspondence packet for this item.

From: Brad Ack <brad.ack@oceanvisions.org>
Sent: Thursday, October 7, 2021 2:42 PM
To: Energy@Coastal <EORFC@coastal.ca.gov>
Subject: Ocean Rainforest Permit Application

Dear Honorable Commissioners: I am writing in support of the permit application referenced above. I am the Executive Director of a nonprofit organization that focuses on research and development of needed solutions to enormous challenges in the ocean-climate nexus.

One of our most critical areas of focus is on *ocean-based carbon dioxide removal*, which is essentially using the power of the ocean to help remove carbon pollution from the air and the water, and safely store it for generations. Carbon removal is critical to our climate strategy going forward and the ocean offers a number of potential approaches to contribute to the suite of different carbon removal options that humanity will need to ameliorate and potentially reverse the climate crisis.

The work that Ocean Rainforest is proposing to do is important to advancing this field, while also having a number of other co-benefits. We need projects that can help answer critical questions around ocean based carbon dioxide removal. Ocean Visions, my organization, has developed a series of technology and policy road maps, available here, that identify many of these critical questions. Much of what Ocean Rainforest proposes will help to answer some of these in the macroalgae map. In particular:

1. Demonstrating the feasibility of growing Giant kelp in a sustainable and scalable manner.
2. Executing a comprehensive monitoring plan that to better understand the potential benefits and risks associated with seaweed aquaculture.
3. Collecting data to validate models related to the economic feasibility, social impact and structural viability of offshore seaweed cultivation.
4. Evaluating and optimizing the seaweed value chain from seed production to harvest methodologies.

Demonstration projects like this proposed by Ocean Rainforest will provide critical insights on the opportunities and challenges of offshore aquaculture; will help inform structural engineering

analyses, technoeconomic assessments and other similar systems critical to evaluating the feasibility of the industry; and help inform marine mammal prevention entanglement programs and aquaculture gear monitoring and escape plans.

I urge you to approve the application.

Thank you for your attention to these comments.

Sincerely,

Brad Ack

Brad Ack
Executive Director and Chief
Innovation Officer
www.oceanvisions.org

From:	Anshul Jain
To:	Energy@Coastal
Subject:	Re: Consistency Certification: CC-0003-21
Date:	Friday, October 8, 2021 2:20:36 PM

AJ Jain
1833 11th St #1
Santa Monica, CA

State Of California
Natural Resources Agency
California Coastal Commission
Energy, Ocean Resources
& Federal Consistency
EORFC@coastal.ca.gov

Re: Consistency Certification: CC-0003-21

This letter is intended to comment on Ocean Rainforest's pending Friday October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)"

I am writing to support the MacroSystems project which is managed by Ocean Rainforest with partners University of California, Hortimare and Primary Ocean and funding from the United States Department of Energy's Advanced Research Projects Agency-Energy (ARPAE). The 87-acre giant kelp research farm is one step forward towards a blue/green regenerative world.

I admire the California Coastal Commissions advocacy for the environment and the leadership that California has demonstrated on the climate crisis. The challenges we face are dire, and we will need to draw from a diverse set of tools to fully manage them.

There is an urgent need for a shift to renewable energy and fuels such as seaweed biofuels. This is borne out not only by the recent apparent pipeline leak that is befouling Orange County beaches, but also the climate change being caused by burning fuels that do not also quickly draw down carbon as part of their manufacture, as is the case with kelp biofuels. My understanding is that moving this project to the California Coastal Commission's consent calendar would allow its beneficial impacts to begin sooner, and for that reason I encourage you to do so.

As someone who is very supportive of regenerative farming, I believe we have a high need for fertilizer that can be largely created in the open sea. This is because these organic-based fertilizers can help increase yields without requiring intensive mining or high-emissions industrial processes, or fertile land for land-based biofuels. These ocean-based

fertilizers in turn reduce the land area needed to grow food, leaving our wild lands truly wild.

Seaweed-based biofuels and fertilizer products have great potential to reduce humanity’s footprint on this planet while also enabling more people to have a high quality of life. I encourage you to take whatever steps necessary to advance this project as quickly as reasonably possible.

I went to college in Santa Barbara and am a resident of Santa Monica. I’m a member of the Silicon Beach startup community and have met Brandon Barney and learned about their environmental biotechnology business and support them. I love California’s coastal communities and the leadership of California on the environment and hope this project moves forward and California continues to lead in the environment. Brandon Barney and his team are huge proponents and innovators who are passionate about supporting the local environment and I think the growth of their project would be a boon to California's ecosystem.

Best,

AJ

From:	Caroline Slootweg
To:	Energy@Coastal
Subject:	Re: PUBLIC HEARING NOTICE on Federal Consistency item CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)
Date:	Thursday, September 30, 2021 3:55:38 AM
Attachments:	image001.png

Dear EORFC,

I've tried to access the link in your pdf to the staff reports but the link seems to be broken.

http://www.coastal.ca.gov/mtgcurr.html

Would it be possible to check the link or to send a pdf of the content in the link?

Many thanks,
Caroline

Caroline Slootweg
Co-founder, CCO
Kelp Blue

Phone +31 6 48 91 73 91
Email caroline.slootweg@kelp.blue

> On 25 Sep 2021, at 00:25, Energy@Coastal <EORFC@coastal.ca.gov> wrote:
>
> <F12a-10-2021 CC-0003-21 Ocean Rainforest.pdf>

From: Michael Graham
To: Energy@Coastal
Subject: Re: Public comment on Ocean Rainforest, Inc. pending voluntary Consistency Certification (CC-0003-21)
Date: Wednesday, October 6, 2021 2:25:50 PM

Thank you

> On Oct 6, 2021, at 2:22 PM, Energy@Coastal <EORFC@coastal.ca.gov> wrote:
>
> Thank you for your comments. It will be added to the correspondence packet for this project.
>
> ---
>
> **From:** Michael Graham <mike@montereybayseaweeds.com>
> **Sent:** Monday, October 4, 2021 2:16 PM
> **To:** Energy@Coastal <EORFC@coastal.ca.gov>
> **Subject:** Public comment on Ocean Rainforest, Inc. pending voluntary Consistency Certification (CC-0003-21)
>
> To whom it may concern
>
> Please accept our written comments in regards to ***Ocean Rainforest, Inc***. pending voluntary Consistency Certification (CC-0003-21).
>
> Best regards
>
> Mike
>
> Dr. Michael Graham
> Founder, President, Aquaculturist
> Monterey Bay Seaweeds (MBS)
> montereybayseaweeds.com
> mike@montereybayseaweeds.com
> (831) 224-3444

From:	duncan@netzeroventures.com
To:	Energy@Coastal
Subject:	"Public Comment on 15th October 2021 Agenda Item Friday 12a - CC-0003-21: (Ocean Rainforest, Inc., Santa Barbara Co.)
Date:	Friday, October 8, 2021 4:08:57 PM

To: State Of California
Natural Resources Agency
California Coastal Commission
Energy, Ocean Resources & Federal Consistency
EORFC@coastal.ca.gov

Re: Ocean Rainforest's pending Friday, 15th October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)

To whom it may concern:

I moved to Santa Monica because it is a city known for environmental leadership. I founded Net Zero Ventures, a company dedicated to reducing carbon emissions by investing in and advising early-stage businesses that are developing hardware solutions to combat climate change. We are one of the investors in Primary Ocean. We also invested in Impossible Foods and we see Primary Ocean as being able to offer transformational carbon savings. They made it clear that the protists (algae) have a lot to offer plants, animals, and humans and therefore the planet and by focusing on the holobiont of the giant kelp, which is 20 million years old and the foundation of the most productive ecosystem, we believe they have a very bright future ahead of them.

I am writing to support the MacroSystems project which is managed by Ocean Rainforest with their partner's University of California, Hortimare, and Primary Ocean, and funding from the United States Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E). The 87-acre giant kelp research farm is one step forward towards a blue/green regenerative world.

While I admire the California Coastal Commissions advocacy for the environment and the leadership that California has demonstrated on the climate crisis, the challenges we face are dire, and we need to draw from a diverse set of tools to fully manage them.

We urgently need to shift to renewable energy and fuels such as seaweed biofuels. This is borne out not only by the recent apparent pipeline leak that is destroying Orange County beaches, but also the climate change caused by burning fuels that do not also quickly draw down carbon as part of their manufacture, as is the case with kelp biofuels. My understanding is that moving this project to the California Coastal Commission's consent calendar would allow its beneficial impacts to begin sooner, and for that reason, I strongly encourage you to do so.

As someone who is deeply passionate about regenerative farming, I believe we have a high need for a fertilizer that can be largely created in the open sea. This is because

these organic-based fertilizers can help increase yields without requiring intensive mining or high-emissions industrial processes, or fertile land for land-based biofuels. These ocean-based fertilizers in turn reduce the land area needed to grow food, leaving our wildlands truly wild. The process is also extremely healing for our precious seas and oceans.

Seaweed-based biofuels and fertilizer products have great potential to reduce humanity's footprint on this planet while also enabling more people to have a high quality of life. I encourage you to take whatever steps necessary to advance this project as quickly as reasonably possible.

Thank you for your time,

Duncan Preston
Net Zero Ventures
https://netzeroventures.com/

From:	Daniel Imberman
To:	Energy@Coastal
Subject:	"Public Comment on October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)"
Date:	Friday, October 8, 2021 3:02:18 PM

From: Daniel Imberman
1834 Stoner Ave, APT 11
Los Angeles, CA, 90025

To: State Of California
Natural Resources Agency
California Coastal Commission
Energy, Ocean Resources & Federal Consistency
EORFC@coastal.ca.gov

Re: “Ocean Rainforest's pending Friday October 2021 Agenda Item Friday 12a - CC-0003-21 (Ocean Rainforest, Inc., Santa Barbara Co.)"

To whom it may concern:

I am writing to support the MacroSystems project which is managed by Ocean Rainforest with partners University of California, Hortimare and Primary Ocean and funding from the United States Department of Energy’s Advanced Research Projects Agency-Energy (ARPAE). The 87-acre giant kelp research farm is one step forward towards a blue/green regenerative world.

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As someone who is deeply passionate about regenerative farming, I believe we have a high need for fertilizer that can be largely created in the open sea. This is because these organic-based fertilizers can help increase yields without requiring intensive mining or high-emissions industrial processes, or fertile land for land-based biofuels. These ocean-based fertilizers in turn reduce the land area needed to grow food, leaving our wild lands truly

wild.

Seaweed-based biofuels and fertilizer products have great potential to reduce humanity's footprint on this planet while also enabling more people to have a high quality of life. I encourage you to take whatever steps necessary to advance this project as quickly as reasonably possible.

Thank you for your time,

Daniel Imberman