State Greenhouse Gas Sequestration Task Force

MINUTES

Wednesday, January 12, 2022
1:30 PM
Zoom Virtual Meeting Room

ATTENDANCE

Members Present (11):

1. Mary Alice Evans, Director, Office of Planning and Sustainable Development as Chair of the Greenhouse Gas Sequestration Task Force
2. Earl Yamamoto, Department of Agriculture on behalf of the Chair, Board of Agriculture
3. Pradip Pant, Statewide Transportation Planning Office on behalf of the Director, Department of Transportation
4. Michael Madsen, DOH Clean Air Branch on behalf of Deputy Director, Department of Health, Environmental Health Administration
5. Danielle Bass, State Sustainability Coordinator
6. David Forman, Director, Environmental Law Program, University of Hawai‘i at Mānoa, WSR School of Law
7. Leah Laramee on behalf of Administrator, Division of Forestry and Wildlife, DLNR
8. Justine Nihipali as a Member of the Hawai‘i Climate Change Mitigation and Adaptation Commission
9. Susan Crow as researcher from College of Tropical Agriculture and Human Resources, University of Hawai‘i at Mānoa
10. Ashley Lukens of the Frost Family Foundation as the Legislative Representative, Environmental Non-Profit
11. Alan Gottlieb of the Hawai‘i Cattlemen’s Council as the Legislative Representative, Agriculture/Ranching Association

Members Absent (8):

1. Christian Giardina, U.S. Forest Service on behalf of the Chair, Board of Land and Natural Resources
2. Jonathan Deenik as extension agent from College of Tropical Agriculture and Human Resources, University of Hawai‘i at Mānoa
3. Benjamin Sullivan as the Mayor’s Representative, City and County of Honolulu
4. Riley Saito /or/ Michelle Abgigay as the Mayor’s Representative, County of Hawai‘i
5. Vacant, Mayor’s Representative, County of Kaua‘i
6. Vacant, Mayor’s Representative, County of Maui
7. Melissa Miyashiro of the Blue Planet Foundation as the Legislative Representative, Environmental Non-Profit
8. Bobby Farias of Hawai‘i Meats as the Legislative Representative, Agriculture/Ranching Association

Office of Planning and Sustainable Development Staff Present (6): Brittaney Key, Marine and Coastal Zone Advocacy Council administrative assistant; Keelan Barcina, Coastal Zone Management (CZM) Program project analyst; Sarah Chang, CZM Program project analyst; Josh Hekekia, CZM Program planner; Shichao Li, CZM Program planning and policy analyst; Lisa Webster, CZM Program project analyst.

Public Attendees (23):

Alison Kato, State of Hawai‘i Department of the Attorney General; Michael Greenough, Office of Hawai‘i State Senator Mike Gabbard; Christopher Sabine, UH Mānoa School of Ocean and Earth Science and Technology; Meredith Stevenson, Center for Food Safety; Paul Bernstein, Citizens' Climate Lobby; Henry Curtis, Life of the Land; Robert DeRobles, Maui County Department of Water Supply; Jill Edelman, architect in private practice; Mark Fox, National Oceanic and Atmospheric Administration (NOAA) Fisheries; Tori Spence McConnell, NOAA Fisheries; Naomi Kukac, Simonpietri Enterprises, LLC; Joelle Simonpietri, Simonpietri Enterprises, LLC; Gordon Labedz, Surfrider Foundation Kaua‘i Chapter; Todd Low, State of Hawai‘i Department of Agriculture Aquaculture Development Program; Kalisi Mausio, Hawai‘i Farm Trails; Kayla Palmer, State of Hawai‘i Department of Transportation AmeriCorps VISTA; Matt Ramsey, Conservation International Hawai‘i; Karlotta Rieve, HATCH; Neil Sims, Ocean Era, Inc.; Kimberly Willis, Our Children's Trust; Ulalia Woodside, The Nature Conservancy Hawai‘i and Palmyra Program; Julie Yunker, Hawai‘i Gas

Distributed Material:

- Greenhouse Gas Sequestration Task Force (GHGSTF) meeting agenda for January 12, 2022
- Draft minutes for November 17, 2021 GHGSTF meeting
- "Accessing an Online Zoom Meeting" (instructions for downloading and using Zoom)
- Center for Food Safety memorandum
- UH Mānoa School of Ocean and Earth Science and Technology presentation slides

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I. Call to order, public notice, quorum

Chair Mary Alice Evans, Director of the Office of Planning and Sustainable Development (OPSD), called the meeting to order at 1:34pm. The Task Force's January 12, 2022 meeting notice was published on January 6, 2022. A quorum of 11 members was present of this 19-member task force.

Chair Evans reviewed new Sunshine Law requirements under Act 220, Session Laws of Hawai'i 2021 that went into effect on January 1, 2022. Task Force members and members of the public were verbally introduced.

Task Force member Danielle Bass informed the GHGSTF that Governor David Ige approved the addition of a greenhouse gas sequestration specialist position in the Governor's State budget proposal within OPSD's Statewide Sustainability Branch to assist the GHGSTF.

Task Force member and Coastal Zone Management Program manager Justine Nihipali re-introduced Brittaney Key to the GHGSTF. Ms. Key previously provided staff support to the GHGSTF and although she now serves as the Marine and Coastal Zone Advocacy Council's project administrative assistant, she agreed to continue providing staff support to the GHGSTF until permanent staffing could be secured.

Ms. Key reminded attendees of Zoom best practices before the meeting continued. A link to instructions for using Zoom is available on the GHGSTF's website, and the document was distributed via the Zoom chat. Ms. Key also informed those in attendance that they could direct message her or Task Force member Bass on Zoom if technical assistance was needed.

The procedure for public comments was announced: Chair Evans would ask Task Force members for questions or comments first, and then discussion would be opened to comment from the public for each agenda item.

II. Review and approval of November 17, 2021 meeting minutes

The minutes were approved as circulated.

III. Presentations

A. Presentation by Meredith Stevenson representing the Center for Food Safety

The Task Force welcomed Meredith Stevenson, an associate attorney with the Center for Food Safety (CFS), to review its Memorandum on Climate Vulnerability and Impacts of Offshore Aquaculture to the GHGSTF that was circulated to GHGSTF members and posted to the GHGSTF website prior to the meeting. A link to the document was provided in the Zoom chat. Task Force member Ashley Lukens also serves with the Center for Food Safety. CFS's website is www.centerforfoodsafety.org and its contact is office@centerforfoodsafety.org.

Ms. Stevenson summarized the contents of the memo, including CFS's concerns on the vulnerability of industrial offshore aquaculture to climate change impacts (e.g., extreme weather) and the ecosystem impacts of events like fish escapes that can occur as a result of these vulnerabilities. Ms. Stevenson also summarized CFS's position that industrial

aquaculture should not be considered part of a climate-friendly ocean management plan. Task Force member Lukens noted that the GHGSTF should monitor the evolving changes to aquaculture regulations as litigation in other states proceeds, and potential regulatory changes for Hawai‘i’s marine areas could inform what aquaculture recommendations, if any, the GHGSTF includes in its preliminary report. Task Force member Lukens further added that industrial aquaculture is very plastic- and infrastructure-intensive and cast doubt on aquaculture’s potential as a major contributor to local diets.

Chair Evans thanked Ms. Stevenson and Task Force member Lukens for their presentation and opened the floor to questions. Task Force member Mike Madsen commented that onshore aquaculture would avoid some of the cited negative impacts of offshore aquaculture but also pointed out that aquaculture is a source of nitrous oxide emissions. Task Force member Lukens responded that she had previously reached out to several Native Hawaiian fishpond operations to see if they were tracking greenhouse gas sequestration-related data and found there is a capacity deficiency for tracking this information. She also noted that Hawai‘i’s challenge in general is scale, and given the state’s land area constraints, it would be unlikely for any onshore aquaculture operation to contribute significantly to greenhouse gas sequestration.

Task Force member Madsen remarked that he had found scientific literature showing bivalve aquaculture can sequester greenhouse gases. Christopher Sabine responded later in the meeting that the production of calcium carbonate in organisms like bivalves and corals actually releases carbon dioxide into the atmosphere, while the dissolution of calcium carbonate sequesters carbon dioxide.

Task Force member Bass reminded the Task Force that in addition to the GHGSTF’s mandate in Hawai‘i Revised Statutes §225P-4 to investigate sequestration opportunities within aquaculture, the State is also required by Act 151, SLH 2019 to double local food production by 2030, and aquaculture is included in this increased food production strategy. She acknowledged the challenges raised by CFS and asked if CFS had any recommendations for next steps for the State given its policy mandates. Task Force member Lukens said that small-scaled, diversified agriculture has been shown to have the smallest climate impact while industrial-scale operations tend to work against the State’s climate goals and under-contribute proportionately to food production. Ultimately, Task Force member Lukens recommended thoughtful and patient evaluation by the GHGSTF to navigate these sustainability challenges as there was no single or easy answer to solving them.

Joelle Simonpietri raised concerns verbally and in the chat that CFS’s presentation did not appear to consider benefits of aquaculture (such as reducing the greenhouse gas emissions of open-water fishing) or traditional aquaculture’s cultural role in Hawai‘i. Ms. Simonpietri recommended transparent rules governing industrial aquaculture to allow for ethical food production instead of dismissing industrial operations as a whole. Task Force member Lukens responded in the chat that CFS is not villainizing aquaculture but rather has concerns about the environmental implications of industrial scale operations. She agreed that the focus needs to be on clear rules that protect the environment and public health.

Tori Spence McConnell offered to provide the GHGSTF a briefing on the National Oceanic and Atmospheric Administration's draft programmatic Environmental Impact Statement (EIS) on aquaculture around US Pacific islands which was referenced in CFS's memo on page 1. She noted that the draft programmatic EIS is still in its early stages with continued opportunities for public input. Chair Evans thanked Ms. Spence McConnell for her offer. Neil Sims also offered in the chat to present at a future GHGSTF meeting on aquaculture and was acknowledged for his offer.

No further questions were raised.

B. Presentation by Christopher Sabine representing UH Mānoa School of Ocean and Earth Science and Technology

The Task Force welcomed Christopher Sabine, professor of oceanography at UH Mānoa School of Ocean and Earth Science and Technology, for its next presentation. Prof. Sabine's faculty profile is http://www.soest.hawaii.edu/oceanography/faculty/Sabine.html and his email is csabine@hawaii.edu.

Prof. Sabine was asked to present to the GHGSTF on the concept of blue carbon, marine sequestration opportunities, and the impacts of ocean acidification. A copy of the presentation slides was posted to the GHGSTF website and distributed electronically to members. The slides were also linked in the chat.

Prof. Sabine began with an overview of global historic carbon dioxide emissions. The ocean currently absorbs about 25% of anthropogenic emissions but does not absorb it evenly across global waters. Furthermore, as the ocean has stored increasing amounts of carbon dioxide over the decades, it has become less efficient at absorbing additional atmospheric carbon dioxide.

Prof. Sabine summarized the origin of political interest in the ocean's capacity to store carbon. Currently, non-governmental organizations promote it as a way to sequester carbon while protecting important marine ecosystems and wetlands. While there is insufficient evidence to show these ecosystems have increased their carbon dioxide uptake as atmospheric carbon has increased, wetlands and other coastal marine ecosystems provide other vital ecosystem services, and in the face of especially high rates of habitat loss, protecting these carbon sinks and ecosystem services is important.

The open ocean has been sidelined in sequestration and blue carbon discussions, but recent research provides three basic categories of sequestering carbon in the ocean. These are summarized on Slide 9. With method 2, enhanced biological uptake, the drawback of increasing plant and other biological uptake of carbon dioxide is that providing additional nutrients to increase growth often comes with other undesirable environmental and greenhouse gas impacts. Furthermore, the organic matter has to be preserved to prevent decay and re-release of the absorbed carbon.

Prof. Sabine focused on method 3, alkalinity enhancement. Dissolving alkalizing minerals

like calcium carbonate sequesters carbon while reducing ocean acidification (increasing alkalinity). This is beneficial because ocean acidification has many negative impacts (summarized on Slide 11). Slide 12 shows how optimal coral growing conditions have deteriorated with increased atmospheric carbon dioxide concentration and ocean acidification, which leaves them vulnerable to other stressors such as storms.

Task Force member Bass asked Prof. Sabine if he had any suggestions for marine use projects or policies that the Task Force could recommend in its report to the Legislature. Prof. Sabine felt that alkalinity enhancement was the most promising of the three methods covered. Using olivine (green sand) for this process shows particular promise in research because it sequesters four times more carbon dioxide than using calcium carbonate (white sand). Task Force member Bass asked for clarification on this process and the role of Hawai'i's beaches in it. Prof. Sabine responded that Hawai'i's waters are supersaturated with dissolved calcium carbonate until depths of ~500-600m, so exporting white sand into these deep waters to dissolve there would naturally sequester carbon. Conversely, dissolved olivine is undersaturated even at surface depths and can be dissolved right on the beach. However, the process of olivine dissolution, its secondary reactions, and net sequestration effect is not fully understood yet and requires further research.

Task Force member Susan Crow commented on the importance of understanding a given action in both its local and global contexts and its trade-offs and asked if mining Hawai'i's olivine to dissolve for carbon sequestration would make an impact on a global scale. Prof. Sabine agreed on the importance of anticipating unintended consequences and trade-offs. He said that alkalinity enhancement is favored as a sequestration method because of its relatively lower impacts on marine ecology, but despite Hawai'i's large olivine deposits, the scale of global greenhouse gas emissions is magnitudes above the contribution that Hawai'i's olivine could make.

Task Force member Nihipali asked about the comparative potential of land-based sequestration efforts versus marine-based sequestration. Prof. Sabine gave two responses. One position is that the scale of the climate crisis requires using the magnitude of the oceans to address it. The challenge is doing so in an economically and environmentally feasible manner, which has proven difficult to address. Thus, there is a focus instead to prioritize the most cost-effective strategies, such as carbon capture technology (although this method has limited utility in Hawai'i). The second position is that the scale of the climate crisis is such that every strategy must be considered even if its relative global contribution is small. Prof. Sabine later remarked that he believes much more carbon dioxide can be sequestered on land than in the ocean, but regardless, there are ocean sequestration possibilities worth exploring more fully.

Henry Curtis asked what the beaches would be replaced with if all the olivine from Hawai'i's green sand beaches were used for sequestration. Prof. Sabine acknowledged the presumed backlash to losing these beaches but noted the natural dissolution process of olivine on the beach is very slow. Instead, artificially mixing ground olivine with captured carbon dioxide emissions (e.g., from powerplants) and seawater is a more efficient method of sequestering carbon.

Task Force member Bass asked about the relative opportunity for using white sand beaches versus green sand beaches for carbon sequestration. Prof. Sabine referred back to Slide 9 which shows the equations for the dissolution of calcium carbonate and olivine, showing that olivine is four times more efficient at sequestering carbon dioxide than calcium carbonate.

Task Force member Madsen asked about the availability of sequestration data for Hawai‘i’s green and white sand beaches. Prof. Sabine replied that it is a current research interest, but lack of funding has stymied this research and so the data does not exist yet. He noted that if the GHGSTF could advocate for such research funding, it could yield useful information on the current sequestration contributions of Hawai‘i’s beaches.

Jill Edelman remarked that per Prof. Sabine’s earlier assessment, it seems that sequestration through alkalinity enhancement does not contribute a lot on the global scale. She asked if this sequestration method was being offered as a viable solution of scale or as one small part of a climate response. Prof. Sabine clarified that alkalinity enhancement is not a “silver bullet” solution, but it can be one part of a larger mitigation toolset that involves the ocean.

Task Force member Bass asked Prof. Sabine how the GHGSTF could better incentivize ocean-based greenhouse gas sequestration through funding opportunities or other ideas. Prof. Sabine said that while carbon capture is now recognized as a necessary part of the climate response, the scientific community is just beginning to investigate how to sequester efficiently and safely. He reiterated that funding for this research is needed and cautioned against promoting any industrial sequestration technique that could be exploited by carbon markets to negative effect before the technique is fully understood.

Ms. Key raised Shichao Li’s question in the chat about how to identify the contributions of acidification from runoff and carbon dioxide in nearshore waters, and added an additional question regarding potential co-benefits between alkalinity enhancement and mitigating ocean acidification impacts on coral reefs. Prof. Sabine confirmed that the two topics are connected. He also said that watershed runoff impacts marine ecosystem health, including its ability to manage carbon, and that coastal management efforts need to be considered mauka-makai to avoid unintended consequences. Furthermore, preserving existing carbon sequestration mechanisms (like wetlands) is important in addition to finding new, additional methods.

In the chat, Ms. Simonpietri noted that olivine is common to igneous and basaltic rock, both of which are mined regularly in Hawai‘i for concrete and roadbed, and that sequestering carbon in concrete is a well-known reaction. She asked if the GHGSTF had investigated this process. Task Force member Crow agreed in the chat that sustainable building material and the urban interface would make a good future topic for a GHGSTF meeting. Task Force member Bass responded in the chat that the GHGSTF was previously informed about sequestering carbon in concrete thanks to a presentation from Task Force member Pradip Pant on the Hawai‘i Department of Transportation's leadership in that effort.

No further questions were raised.

IV. 2023 GHGSTF preliminary report to the State Legislature

A. Permitted Interaction Group formations to begin outlining preliminary report sections

Chair Evans reminded the Task Force that it is mandated by HRS §225P-4 to provide the State Legislature with a preliminary report no later than 20 days before the 2023 legislative session. Noting that the Task Force has not received funding to hire a consultant for the report, Chair Evans acknowledged that the Task Force would instead need to rely on members' assistance via a Permitted Interaction Group (PIG) to outline the report sections. Mr. Curtis expressed his desire that any PIG would operate transparently even though they are not held to the same Sunshine Law requirements as standard boards. Chair Evans summarized the Sunshine Law requirements that PIGs are beholden to under HRS §92-2.5(b).

No motion was made to form a PIG for this task, so the item was deferred to the March agenda.

V. Announcements

A. Next GHGSTF meeting

The next GHGSTF meeting will be on March 16, 2022 at 1:30pm. The location is to be determined and will be announced closer to the date.

Task Force member Leah Laramee inquired about the possibility of creating a policy PIG at the March meeting. Chair Evans expressed logistical concerns due to the timeline requirement for PIGs that would make its purpose moot for the 2022 legislative session.

VI. Adjournment

The meeting adjourned at 3:18pm.