

STUDENT PROJECT REPORT TO THE UNIVERSITY OF HAWAI'I AT HILO

MARINE OPTION PROGRAM

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## ABSTRACT

Science journalism plays an important role in education by making scientific knowledge available to public audiences outside of the scientific community. News media has traditionally been the main source of scientific information for the public; however, it is scientists and researchers who should be leading science communication with broader audiences. Historically, Indigenous communities and traditional ecological knowledge have been underrepresented in science communication as well as in STEM programs and institutions. Racism, lack of resources for marginalized groups, and disconnection from Indigenous identity have all played a role. Indigenous identity and cultural connection have been linked to science identity, academic success, and professional success in STEM. The Marine Option Program's monthly newsletter, *Seawords*, provides students an opportunity to gain writing and science communication experience and is an accessible channel for young Indigenous STEM students to share different perspectives and gain science journalism experience. This project aimed at increasing the diversity of writers and artists published by *Seawords*, providing a better representation of the student body on our campuses and an opportunity to share Indigenous voices and perspectives. I contributed monthly articles for each *Seawords* issue, including a mini-series for *Seawords*, "*Indigenous Science and Scientists: Our Future*" highlighting other young Indigenous scientists at UH Hilo and their work. This position also involved the promotion of *Seawords* and scientific journalism for UH Hilo MOP students, through listservs, fliers, and social media posts. Another objective of this project was the creation of a combined monthly calendar for *Seawords*, highlighting MOP events at all UH campuses. A total of 28 articles by UHH MOP students were published in *Seawords*, including 24 by me. This project provided me with invaluable science journalism and communication skills, and my first experiences in liaising and advertising. With continued maintenance, this position can provide a better representation of UH MOP students by increasing writer and topic diversity, providing science communication experience for all students.

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## INTRODUCTION

Science journalism makes scientific knowledge available to public audiences outside of the scientific community (Peters 2013, Brownell et al. 2013), playing an important role in education. News media are the main source of scientific information for most people (Compas et al. 2007, Marincola 2006, Thompson-Saud et al. 2018, Peters 2013) however, it is scientists and researchers that must lead science communication with broader audiences (Van Eperen et al. 2010, Hartz & Chappell 2005, Marincola 2006, Leshner 2012, Brownell et al. 2013, Mercer-Mapstone & Kuchel 2015). Science writing and communication skills should be developed by young scientists through undergraduate and graduate STEM courses: Science, Technology, Engineering, and Math (Kuehne et al. 2014, Brownell et al. 2013, Kulgemeyer & Schecker 2013, Mercer-Mapstone & Kuchel 2015). Effective science communication is important as it fosters informed decision-making by the public (Van Eperen et al. 2010), shape government policies (Brownell et al. 2013), and is used to justify funding for various initiatives (Marincola 2006).

Historically, Indigenous communities and traditional knowledge have been excluded from science communication, with researchers urging reform and inclusion (Orthia 2020, Zidny et al. 2020). Part of this is largely due to underrepresentation of Indigenous communities in STEM programs and institutions. Reasons for this underrepresentation include lack of resources for marginalized communities (Flynn et al. 2012), racism, and disconnection from Indigenous identity (Chow-Garcia et al. 2022, Page-Reeves et al. 2017). Indigenous identity and cultural connection have been linked to science identity (Chow-Garcia et al. 2022), academic success (Brazill et al. 2021), and professional success in STEM (Page-Reeves et al. 2017). Many studies have supported policies and programs that support cultural sustenance and development (Chow-

Garcia et al. 2022, Flynn et al. 2012, Shield 2004), as well as provide spaces for Indigenous belonging and community (Brazill et al. 2021, Fong et al. 2021, Page-Reeves et al. 2017).

As an Indigenous-serving institution, the University of Hawai'i at Hilo has several programs directly and indirectly aimed at their Indigenous STEM students. An example of a program directly aimed at Indigenous STEM students on UH Hilo campus is the Keaholoa STEM Scholars Program. Keaholoa is an academic program at UH Hilo, aimed at supporting and increasing the representation of Native Hawaiian and Pacific Islanders in STEM fields. The program provides paid independent research experiences with mentors in related fields, community outreach opportunities, academic support, and various professional development workshops. A program more indirectly aimed at the Indigenous student body is the Marine Option Program (MOP). MOP is a Certificate program available at ten of the UH campuses that provides an opportunity for students, including young Indigenous scientists, to explore research and internship opportunities, with certificates awarded to students who complete an independent Skills Project and required courses.

*Seawords* magazine, the Marine Option Program's monthly newsletter, is entirely student-run and provides students an opportunity to gain writing and science communication experience. For nearly 50 years, *Seawords* has informed readers about MOP and ocean-related news, providing MOP students from all campuses the opportunity to be involved in student journalism (Lugo 2012). The *Seawords* magazine is also an accessible channel for young Indigenous STEM students to share different perspectives and gain science journalism experience while uplifting Indigenous voices. The main objective of this project was to work as the UH Hilo campus liaison for *Seawords*. This project aimed at increasing the diversity of writers and artists published in *Seawords*, providing a better representation of the student body



### Article Writing

A total of 28 articles, written either by me or other UHH MOP students, were published in *Seawords* during this project. I contributed monthly articles to the newsletter beginning in October 2020 (Table 1), most of which were assigned by the *Seawords* editor, except for a three-part series written in 2022 highlighting young Indigenous scientists at UH Hilo. Articles were researched using sources provided by the editor and additional resources through Google Scholar and the database from Edwin H. Mookini library. Most articles involved reporting on recent scientific studies and their findings, including studies on coral bleaching, dimethyl sulfide, ice-shelf microbiomes, and rising deep-sea temperatures. Some articles reported on ocean-related news in Hawai‘i, including news from Papahānaumokuākea Marine National Monument, Olive Ridley hatchlings on Hawai‘i Island, and UH system news. Two articles were written about the creature of the month, profiling two endemic Hawaiian marine species: *Nohu Pinao*, the Hawaiian Turkeyfish, *Pterois sphex*; and *Mūhe‘e*, the Hawaiian bobtail squid, *Euprymna scolopes*. In addition to these articles, I wrote a mini-series profiling three students from the Keaholoa STEM Scholars 2021 cohort, entitled “Indigenous Science and Scientists: Our Future” (Fig. 4). The articles were published in the June, September, and October 2022 editions and focused on the independent research projects carried out during the program. The series aimed at highlighting up and coming Indigenous marine scientists and their work and their perspectives on Indigenous knowledge and spaces in academic institutions and the larger scientific community.

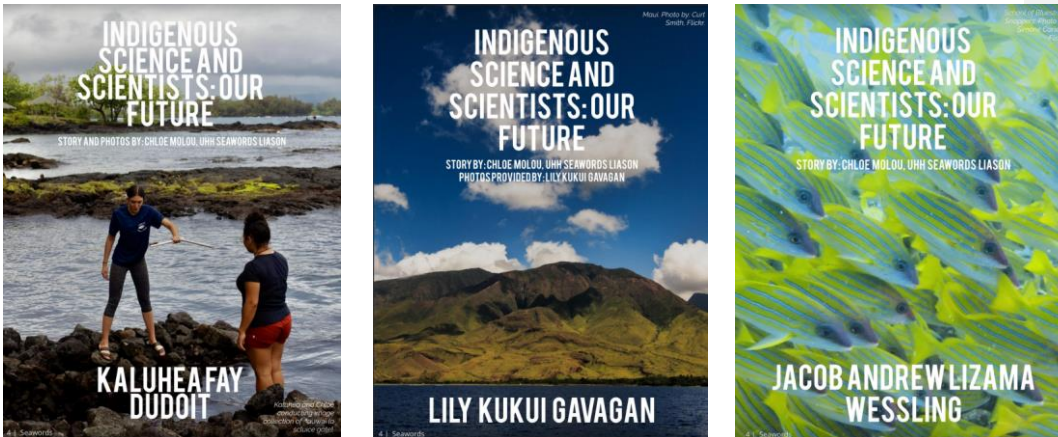


Figure 4: Title pages of the three-part series highlighting young Indigenous scientists.

Table 1: Catalog of 24 articles I wrote for *Seawords* from October 2022 to March 2023.

ARTICLE TITLE	TOPIC	EDITION
Grappling Our Pandemics	Increased plastic pollution during pandemic.	<a href="#">October 2020</a> , pg. 12.
A Cool Commocean	Advancements in combatting heat stress in corals.	<a href="#">November 2020</a> , pg. 8.
Rising in the Deep	Rising deep-sea temperatures measured in the Argentine Basin.	<a href="#">Holidays 2020</a> , pg. 4.
New Blues: Blue Whales located in the Indian Ocean by song	New population of blue whales discovered in Indian Ocean.	<a href="#">February 2021</a> , pg. 24.
Olive Ridley Hatchlings on Hawai'i Island!	Olive Ridley hatchlings found in Ka'u.	<a href="#">March 2021</a> , pg. 4.
DMS: The Zooplankton Perfume	Dimethyl sulfide (DMS) found to be cue for zooplankton predators.	<a href="#">April 2021</a> , pg. 14.



DDT off the California Coast	Toxic dichlorodiphenyltrichloroethane (DDT) leaking along California coast.	<a href="#">May 2021</a> , pg. 20.
Eelgrass: Cracking down on Ocean Acidification	Eelgrass meadows found to buffer ocean acidification.	<a href="#">July 2021</a> , pg. 4.
Invasive Alien Species (IAS)	Marine IAS found to be understudied compared to aquatic and terrestrial IAS.	<a href="#">September 2021</a> , pg. 18.
Deep Sea Mining: Can nodules save the world?	Polymetallic nodule mining.	<a href="#">October 2021</a> , pg. 18.
Creature of the Month	<i>Nohu Pinao</i> , <i>Pterois sphex</i> , the Hawaiian Turkeyfish.	<a href="#">November 2021</a> , pg. 8.
“Jenny” and the Great Pacific Garbage Patch (GPGP)	A clean-up system designed by The Ocean Cleanup, “Jenny,” completed successful trials removing trash from the GPGP.	<a href="#">December 2021</a> , pg. 4.
Night of the Living Dead in London’s River Thames	Wildlife returns to River Thames 50 years after being declared biologically dead.	<a href="#">January 2022</a> , pg. 20.
Improving access to Ocean Data for Indigenous Coastal Communities	Collaboration between Pacific Islands Ocean Observing System (PacIOOS) in UH Mānoa’s School of Ocean and Earth Science and partners in the Pacific Islands, Northwest Pacific and Alaska.	<a href="#">February 2022</a> , pg. 8.
Blooming Squid	Five-fold increase in <i>Doryteuthis opalescens</i> , market squid, along North Pacific coast.	<a href="#">March 2022</a> , pg. 18.
Life Under the Shelf	Microbial community discovered under the Ross Ice Shelf in the Southern Ocean.	<a href="#">April 2022</a> , pg. 14.
Creature of the Month	<i>Mūhe‘e</i> , <i>Euprymna scolopes</i> , the Hawaiian bobtail squid.	<a href="#">May 2022</a> , pg. 12.

Indigenous Science and Scientists: Our Future pt. I	Profile on Kaluhea Dudoit's project for the Keaholoa 2021 cohort.	<a href="#">June 2022</a> , pg 4.
Indigenous Science and Scientists: Our Future pt. II	Profile on Lily Gavagan's project for the Keaholoa 2021 cohort.	<a href="#">September 2022</a> , pg. 4.
Indigenous Science and Scientists: Our Future pt. III	Profile on Jacob Wessling's project for the Keaholoa 2021 cohort.	<a href="#">October 2022</a> , pg. 4.
Phytoplankton and Tonga's Hunga Tonga-Hunga Ha'apai (HTHH) Volcano	Massive phytoplankton bloom following eruption of HTHH submarine volcano.	<a href="#">November 2022</a> , pg. 20.
Spill-over at the Papahānaumokuākea National Monument	High tuna catch rates outside of the monument provide evidence for spill-over effect of MPAs.	<a href="#">December 2022</a> , pg. 4.
Coastal Tourism and Coral Reef Degradation in Hawai'i	Coral degradation in Hawai'i linked to increased coastal tourism.	<a href="#">February 2023</a> , pg. 16.
Beaked Whale Circovirus	Novel cetacean virus discovered by UH Health and Stranding Lab.	<a href="#">March 2023</a> , pg 10.

### Promotion of *Seawords* and Student Recruitment

The initial promotion of *Seawords* and student writing opportunities was carried out online through posts on the UH Hilo MOP Instagram account, posts to the UH Hilo app, and emails to the UH Hilo MOP and Marine Science Department listservs. An original flier was created in January 2021, by a UH Hilo MOP student and was posted at locations around the UH Hilo campus, as well as online. The listservs were used for monthly *Seawords* promotions to notify the release of the latest edition and special note was made when UH Hilo students contributed articles or artwork. In two years, one UHH MOP student, Jastine Honea, submitted original ocean-themed artwork for the [November 2020](#) edition of *Seawords* (Fig. 2), and two other students contributed articles. Emma Files wrote an article about her MOP project entitled,

“Kōlea Count,” in the [February 2021](#) edition (pg. 7), and Caitlin Tsuchiya wrote articles in three editions: “Sea Urchin Hatchery Celebrates 10 Years,” in [April 2021](#) (pg. 10), “Fresh Water Plumes at Sea,” in [May 2021](#) (pg. 12), “Creature of the Month: Slate Pencil Urchin,” in [July 2021](#) (pg. 10).



Figure 2: Original artwork by UH Hilo MOP student published in *Seawords* Nov. 2020 edition.

### Compiled UH MOP Calendar

Monthly calendars (Fig. 3) were created for *Seawords* using Marq, an online publishing software, compiling the activities planned at each of the MOP campuses. Activity dates were collected at the beginning of each semester through correspondence with MOP coordinators and/or using online calendars, like that posted for UH Hilo MOP activities. The Marq account was shared with the *Seawords* editor so the calendars could be easily exported each month for publishing.

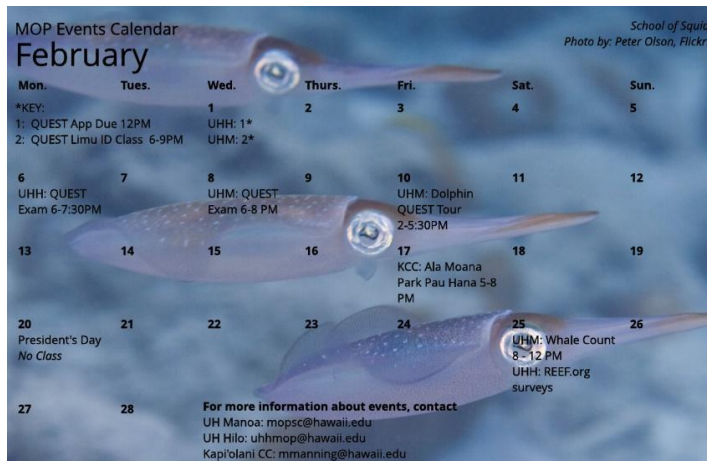


Figure 3: February 2023 Seawords calendar.

## DISCUSSION

Over nearly two and half years of writing for *Seawords*, I wrote a total of 24 articles covering a range of topics in ocean science, including a three-part series highlighting Indigenous scientists. This position provided me with invaluable science journalism and communication skills, and my first experiences in liaising and advertising. Carrying out this project provided me with skills in problem-solving, meeting or modifying deliverables, and measuring success.

I created the mini-series “Indigenous Science and Scientists: Our Future,” to increase the representation of young Indigenous scientists and their research involving traditional knowledge. I selected proud native marine science students, including Kānaka Maoli and Chamorro, to profile in this series to highlight how integral native identity and knowledge are to Indigenous scientists and their work. These students have helped my own sense of belonging as an Indigenous scientist and I used the articles on their stories as an opportunity to return the favor

while promoting their work and experiences. Indigenous identity and belonging for STEM students has been linked to peer interactions and support (Brazill et al. 2021, Chow-Garcia et al. 2022, Page-Reeves et al. 2017), emphasizing the need for institutions to create spaces that provide comfort and validation for Indigenous students (Brazill et al. 2021, Fong et al. 2021). These findings support the creation and continuation of projects such as mine, that help to provide a sense of Indigenous belonging and support through different media like writing and storytelling.

The combined calendar posed challenges early in its creation, as the project was started during the COVID-19 pandemic which meant that many of the MOP campuses had activities modified and regulated did not have activities. Once UH campuses returned to in-person activities, event dates or calendars were collected from MOP coordinators at the beginning of each semester, with the need for some follow up during the semester as more activities were planned and/or finalized.

This project was successful in increasing the presence of UHH MOP writers in *Seawords*, adding 28 articles to the catalog of articles written by UHH MOP students, and the creation of a compiled monthly calendar for the newsletter. The UHH *Seawords* liaison position now provides an opportunity for future MOP students to enhance and innovate the role, improving some of the current structures. With continued maintenance, this position can provide a better representation of UH MOP students by increasing writer and topic diversity, providing science communication experience for all students.

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Books and book chapters  
Here are examples of references for authored and edited books as well as book chapters.

An authored book  
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de Magistris M (2016) *Circuiti: Fondamenti di circuiti per l'Ingegneria*, 2a ed. 2016. Miano G (ed) Springer, Milano.

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