Kaulana Mahina

Hawaiian Lunar Calendar

January 22, 2023 - February 9, 2024

Western Pacific Regional
Fishery Management Council
WPCOUNCIL.ORG

Hoʻolauna Hanalei Introducing Hanalei

"Any project that relates to Aloha ʻĀina must pay attention to place. The names of the winds, the rains, place names, and stories about these places allows us to tap into deeper meanings about the area."

Source: Hanohano Pa-Smith, curriculum developed for the Aloha ʻĀina Project, 2020-2022.

The Project Mālama Ola Aloha ʻĀina (land) curriculum starts with teaching about historically and culturally important people, places and events in Hanalei.

Nani Hanalei
Hanohano Hanalei
I ka ua nui ʻana lā
A me ka wailele aʻo Molokama
Ka makani ʻĀpaʻapaʻa

Beautiful Hanalei
Honored is Hanalei
For her heavy rain
And the waterfall of Molokama
And the ʻĀpaʻapaʻa wind

Source: www.huapala.org

Nā Hiʻohiʻona ʻĀina The Hanalei Landscape

The name Hanalei can be translated as "wreath bay" or "wreath making." This could be in relation to the enormous crescent-shaped bay that spans across the *ahupuaʻa* (land division from mountain to ocean) of Hanalei, Waiʻoli, Waipā and Waikoko. Source: https://hilo.hawaii.edu/wehe

In Hawaiian poetry, Hanalei is famed for its *makani* (winds), *ua* (rain) and *mauna* (mountains). As seen in the song "Nani Hanalei" by Kai Davis, there's a wind called ʻĀpaʻapaʻa which can be translated to "firm, hard or compact" and suggests that this is a strong blowing wind. However, in older *mele* (songs) and *moʻolelo* (stories), it's the Lūhau wind, also called Lūhau-O-Hanalei-Uka, that's more often associated with Hanalei and refers to the scattered dew carried by the wind in Hanalei's uplands.

In the story of Hiʻiaka-i-ka-poli-o-Pele, the goddess Pele's spirit travels to Kauaʻi from Hawaiʻi and meets a young chief named Lohiʻau. During a feast, Pele was taunted by a *moʻo wahine* (female spirit) of Hāʻena which prompted Pele to recite a long, detailed chant that called all of the winds of Kauaʻi which brought a raging storm over the feast. In that chant, she names the Lūhau wind as coming from the uplands of Hanalei. A famous rain of Hanalei is named Lena, meaning "yellow," which could refer to the rain that's tinged yellow by the sunlight shining through it. There are many *mele* that simply describe the rains of Hanalei as *loku*, meaning "downpour," describing the *ahupuaʻa* to have an abundance of rain and therefore fresh water.

Queen Kapiʻolani mentions the rains of Hanalei in her composition "Ka Ipo Lei Manu" to reflect her sadness and longing for her husband, King Kalākaua, during his journey to San Francisco to seek medical care. In a twist of fate, the king never got the chance to hear this *mele* as he passed away before being able to return to his queen. The *mele* reflects the grief of one longing for their loved one that never returned.

Kāʻelo Hilioholo

(Oʻahu) (Kauaʻi)

January 22 - February 19

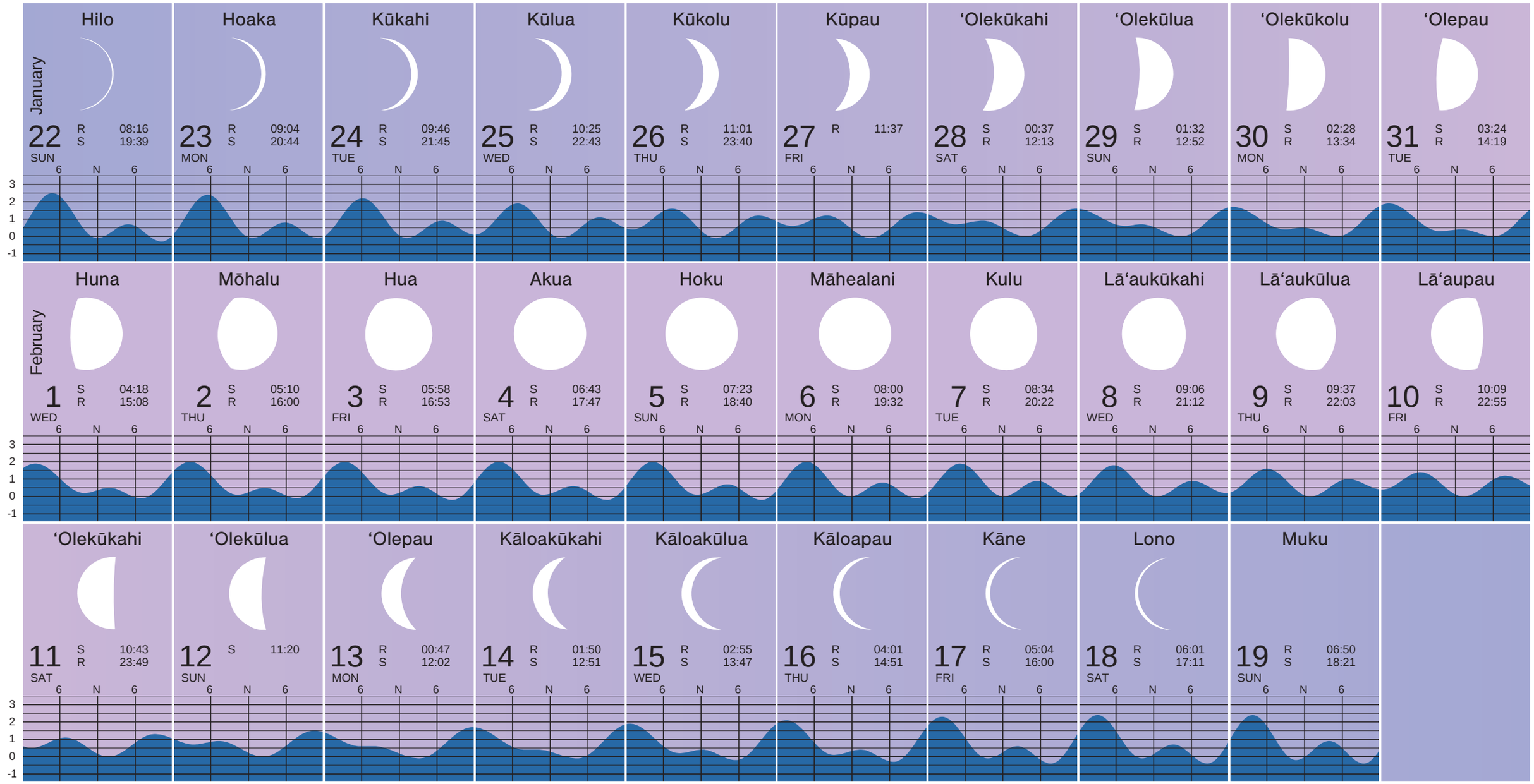
ʻIanuali 22 - Pepeluali 19, 2023

January

Hilo	Hoaka	Kūkahi	Kūlua	Kūkolu	Kūpau	ʻOlekūkahi	ʻOlekūlua	ʻOlekūkolu	ʻOlepau
22 SUN R 08:16 S 19:39	23 MON R 09:04 S 20:44	24 TUE R 09:46 S 21:45	25 WED R 10:25 S 22:43	26 THU R 11:01 S 23:40	27 FRI R 11:37	28 SAT S 00:37 R 12:13	29 SUN S 01:32 R 12:52	30 MON S 02:28 R 13:34	31 TUE S 03:24 R 14:19

February

Huna	Mōhalu	Hua	Akua	Hoku	Māhealani	Kulu	Lāʻaukūkahi	Lāʻaukūlua	Lāʻaupau
1 WED S 04:18 R 15:08	2 THU S 05:10 R 16:00	3 FRI S 05:58 R 16:53	4 SAT S 06:43 R 17:47	5 SUN S 07:23 R 18:40	6 MON S 08:00 R 19:32	7 TUE S 08:34 R 20:22	8 WED S 09:06 R 21:12	9 THU S 09:37 R 22:03	10 FRI S 10:09 R 22:55
ʻOlekūkahi	ʻOlekūlua	ʻOlepau	Kāloakūkahi	Kāloakūlua	Kāloapau	Kāne	Lono	Muku	
11 SAT S 10:43 R 23:49	12 SUN S 11:20	13 MON R 00:47 S 12:02	14 TUE R 01:50 S 12:51	15 WED R 02:55 S 13:47	16 THU R 04:01 S 14:51	17 FRI R 05:04 S 16:00	18 SAT R 06:01 S 17:11	19 SUN R 06:50 S 18:21	



OBSERVATIONS

hoʻonui (waxing) _____

poepoe (full moon) _____

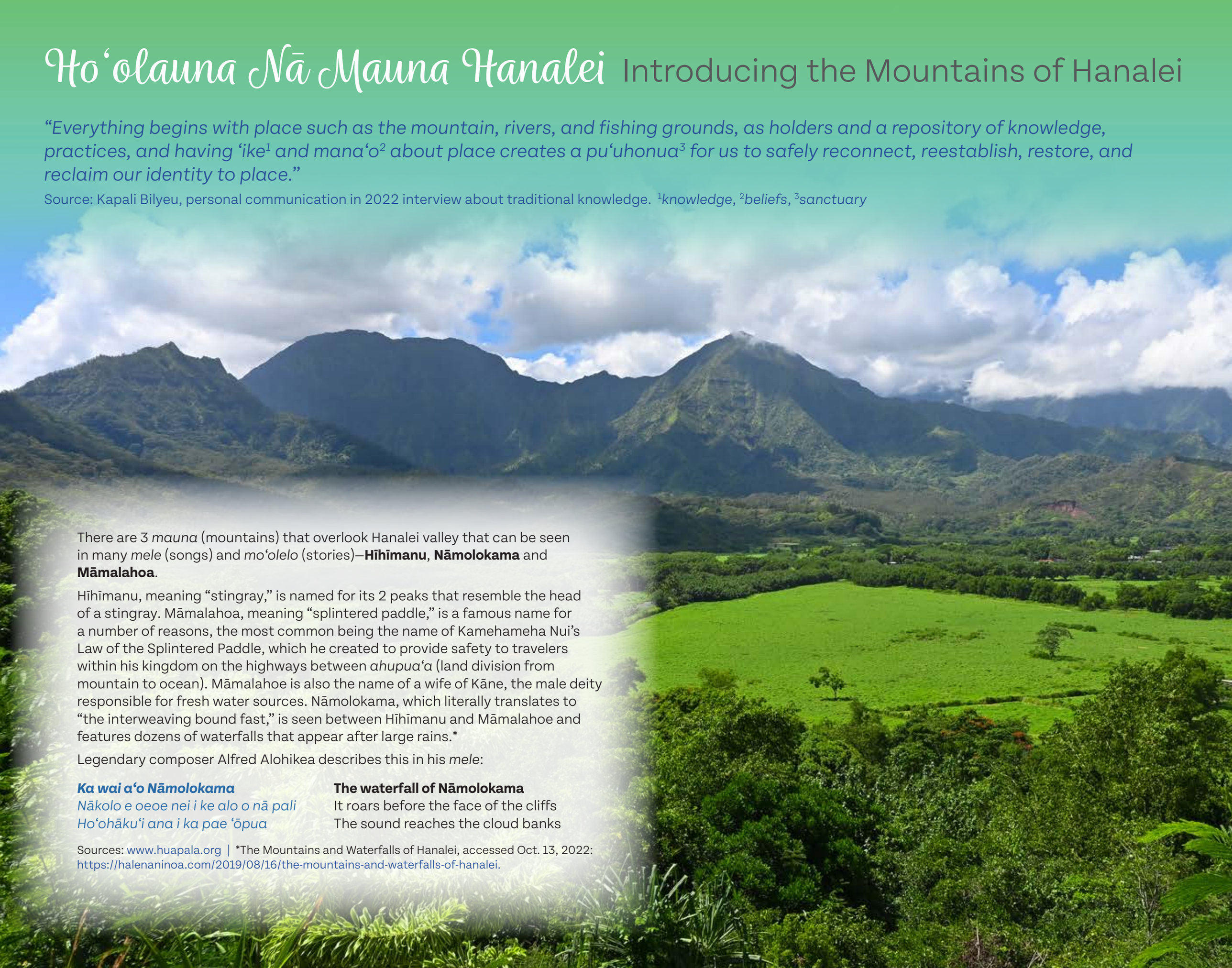
hōʻemi (waning) _____

Western Pacific Regional Fishery Management Council

Hoʻolauna Nā Mauna Hanalei Introducing the Mountains of Hanalei

"Everything begins with place such as the mountain, rivers, and fishing grounds, as holders and a repository of knowledge, practices, and having ʻike[1] and manaʻo[2] about place creates a puʻuhonua[3] for us to safely reconnect, reestablish, restore, and reclaim our identity to place."

Source: Kapali Bilyeu, personal communication in 2022 interview about traditional knowledge. [1]*knowledge*, [2]*beliefs*, [3]*sanctuary*



There are 3 *mauna* (mountains) that overlook Hanalei valley that can be seen in many *mele* (songs) and *moʻolelo* (stories)—**Hīhīmanu**, **Nāmolokama** and **Māmalahoa**.

Hīhīmanu, meaning "stingray," is named for its 2 peaks that resemble the head of a stingray. Māmalahoa, meaning "splintered paddle," is a famous name for a number of reasons, the most common being the name of Kamehameha Nui's Law of the Splintered Paddle, which he created to provide safety to travelers within his kingdom on the highways between *ahupuaʻa* (land division from mountain to ocean). Māmalahoe is also the name of a wife of Kāne, the male deity responsible for fresh water sources. Nāmolokama, which literally translates to "the interweaving bound fast," is seen between Hīhīmanu and Māmalahoe and features dozens of waterfalls that appear after large rains.*

Legendary composer Alfred Alohikea describes this in his *mele*:

Ka wai aʻo Nāmolokama	**The waterfall of Nāmolokama**
Nākolo e oeoe nei i ke alo o nā pali	It roars before the face of the cliffs
Hoʻohākuʻi ana i ka pae ʻōpua	The sound reaches the cloud banks

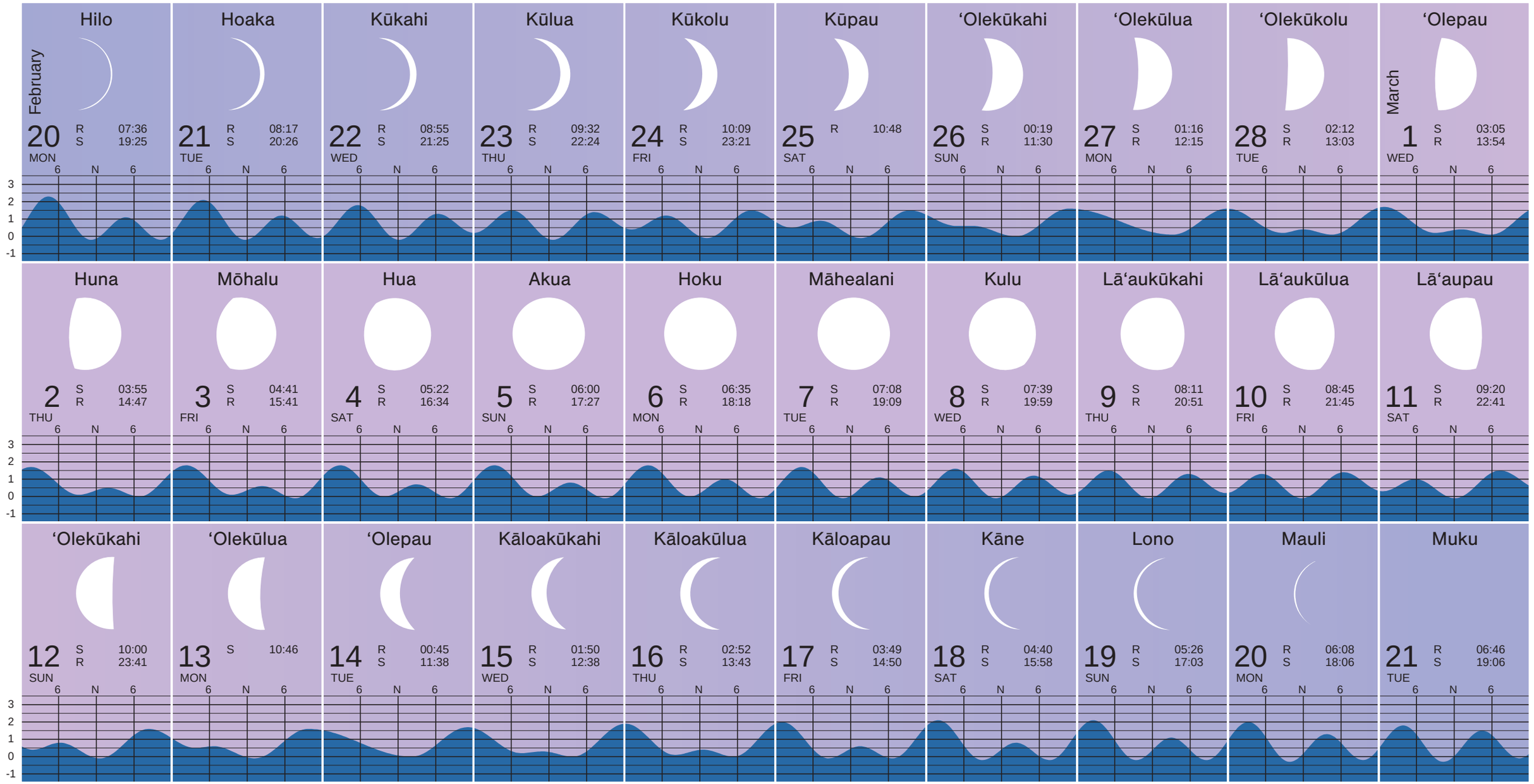
Sources: www.huapala.org | *The Mountains and Waterfalls of Hanalei, accessed Oct. 13, 2022: https://halenaninoa.com/2019/08/16/the-mountains-and-waterfalls-of-hanalei.

Kaulua Hilionalu

(O‘ahu) (Kaua‘i)

February 20 - March 21

Pepeluali 20 - Malaki 21, 2023



OBSERVATIONS

ho‘onui (waxing) _____

poepoe (full moon) _____

hō‘emi (waning) _____

Western Pacific Regional Fishery Management Council

Ho‘olauna Muliwai Introducing the Estuary

According to historical accounts, *“When the ocean was rough for the fishing canoes to go out, the families would catch fish like awa[1], ‘aua[2] and ‘āholehole[3]... The families fished for ‘o‘opu nākea[4] and ‘akua and ‘ōpae[5] in the streams and muliwai[6]; in the muliwai had plenty ‘o‘opu, the head big like this (the size of a fist.)...Young awa[1], ‘ama‘ama[7] were abundant.”*

Source: https://imagesofoldhawaii.com/muliwai [1]*milkfish*, [2]*mackerel scad*, [3]*Hawaiian flagtail*, [4]*Hawaiian goby*, [5]*shrimp*, [6]*estuary*, [7]*striped mullet*

Project Mālama Ola is based on the banks of the *muliwai* of Hanalei River where we host outreach activities. We use the *muliwai* as a place to build participants’ confidence in learning how to *kilo* (observe) *‘ama‘ama* and other native fish in the brackish water. We collect information from our observations to study and learn about the impacts of climate change and other threats to native fish habitat.

The *muliwai* are often referred to as the nurseries of the ocean because many varieties of marine life reproduce and spend the early parts of their lives there. From *kai piha* (high tides) to *kai malo‘o* (low tides), the water depth and conditions change in the *muliwai*, creating a wide range of unique marine habitats. There are places where the water becomes still, allowing food particles to settle to the bottom. These conditions make the *muliwai* an ideal home for plants and animals that feed, grow and reproduce there (www.fisheries.noaa.gov).

Based on conversations with several generational families who *lawai‘a* (fish) or *mālama* (care for) resources along the Hanalei River, they believe there has been a decline in the number of native juvenile fishes such as *‘aholehole* and *‘ama‘ama*. We have also learned through our research that the *muliwai* hosts many different species of fish, birds, plants and other biodiversity, which help to filter the water before it empties into the ocean. It is an important area for certain fish to gather and grow (https://imagesofoldhawaii.com/muliwai).

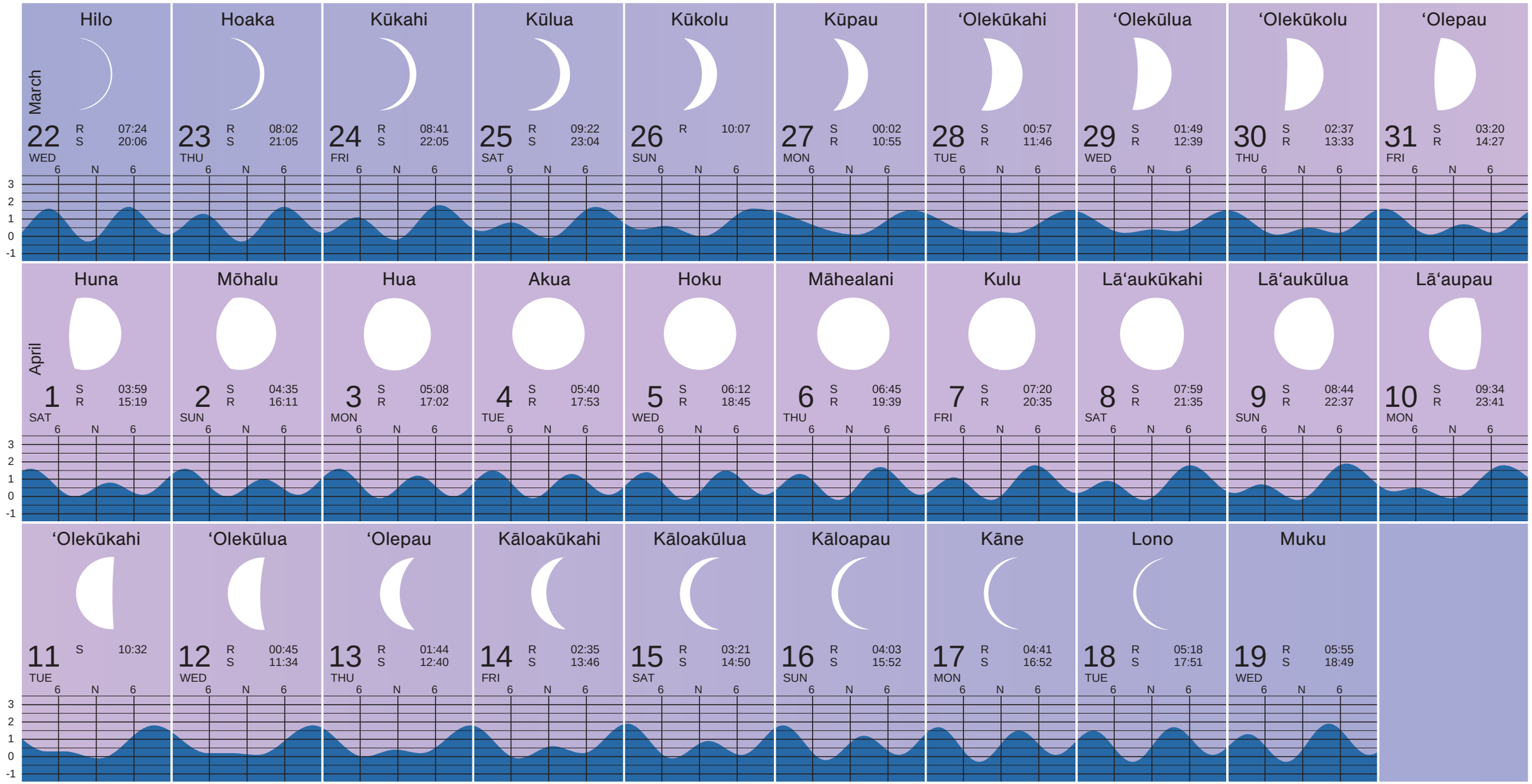
After reviewing old photos of Hanalei River, it is easy to see that much has changed, especially the overgrowth of *hau* bush on the river bank. It appears the stream banks have been damaged by erosion. Erosion and other factors contribute to a decline in fish populations because fish feeding and nesting areas are destroyed. Our *kia‘i* (caretakers) have also reported seeing a few “king tide” events during the months that correspond to Hinaia‘ele‘ele (June-July) when huge amounts of fish were carried to the shoreline. Experts say “estuaries are particularly vulnerable to climate change as sudden, rising sea levels may inundate a *muliwai* with ocean water, which disrupts the balance between fresh and salty water (www.fisheries.noaa.gov).”

Nana Hukipau

(O‘ahu) (Kaua‘i)

March 22 - April 19

Malaki 22 - ‘Apelila 19, 2023



OBSERVATIONS

hoʻonui (waxing) _____

poepoe (full moon) _____

hōʻemi (waning) _____

Western Pacific Regional Fishery Management Council

Ho‘olauna Papahana Inventory and Assessment

“Part of our kuleana[1] as a fisherman is to understand the type and amount of fish we have in the ocean, the streams, and waterways. We have to be careful to not take more than we need. We need to be aware of the kapu[2] season on certain fish. Counting fish, being aware of what resources are on the ‘āina[3] and kai[4], all important stuff to know as a fisherman.”

Source: Cody Kekoa Valpoon, personal communication in 2021 interview about fishing practices. [1]*responsibility*, [2]*forbidden*, [3]*land*, [4]*ocean*

Part of Project Mālama Ola is to inventory and assess resources in the lowland region of the *ahupua‘a* (land division from mountain to ocean), the Wao Kanaka (place where humans reside). We compile and describe important natural and cultural resources in the *muliwai* (estuary) area. This helps us to understand the current state of the *muliwai* and surrounding areas. The vitality and sustainability of natural and cultural resources are important to Native Hawaiians and are an integral part of our personal, family and community well-being. It is also important to know what resources existed in the past so we can appropriately restore cultural practices and native landscape. In the data, we are looking for correlations between declines in native resources as it relates to an increase in unusual weather patterns due to climate change.

According to the ‘Imi ‘Ike (to seek knowledge) curriculum, the Wao Kanaka generally refers to areas in the *ahupua‘a* inhabited and cultivated by humans. The region is characterized as an area that lies between the *makai* (toward the sea) section of the *ahupua‘a*, a “primary” source of food, and the *mauka* (toward the mountain) section of the *ahupua‘a*, which provides materials and places where people grow and cultivate plants to eat. The *muliwai* is a place that is close to manmade fishponds and taro patches. For our purposes, we are inventorying native species in and around this area which includes the *‘ama‘ama* (striped mullet), *niu* (coconut tree) and *hau* bush. There are many more resources that we see in the area such as the *nene* (Hawaiian goose), *‘aku‘u* (heron), tilapia and some nonnative plants.

We also use the **Kumulipo** (Hawaiian Creation Chant) as a resource that illustrates the Native Hawaiian worldview which “understood the universe as a system that was completely interrelated (‘Imi ‘Ike Curriculum 1999, https://ulukau.org). The resources we inventory are found in the Kumulipo and highlight the symbiotic relationship Hawaiians honor between man and nature.

Hau Wā 2, Paukū 4:
‘O kāne iā Wai‘ololi, ‘o ka wahine iā Wai‘olola,
Hānau ka Pāhau noho i kai;
Kia‘i ‘ia e ka Lauhau noho i uka.
He pō uhe‘e i ka wawā
He nuku; he kai ka ‘ai a ka i‘a;
‘O ke Akua ke komo, ‘a‘ole komo kanaka.

Hau Bush, Second Era, Verse 4:
Man by Waiololi, woman by Waiolola,
The Pahau was born in the sea;
Guarded by the Lauhau that grew in the forest.
A night of flight by noises
Through a channel; salt water is life to fish;
So the gods may enter, but not man.

Source: *The Kumulipo: The Complete 1897 Text*, by Queen Lili‘uokalani

Source: Kumulipo A Hawaiian Creation Chant - Kamehameha Schools, accessed Oct. 13, 2022: https://blogs.ksbe.edu/adakina/files/2008/02/kumulipo-text.pdf.

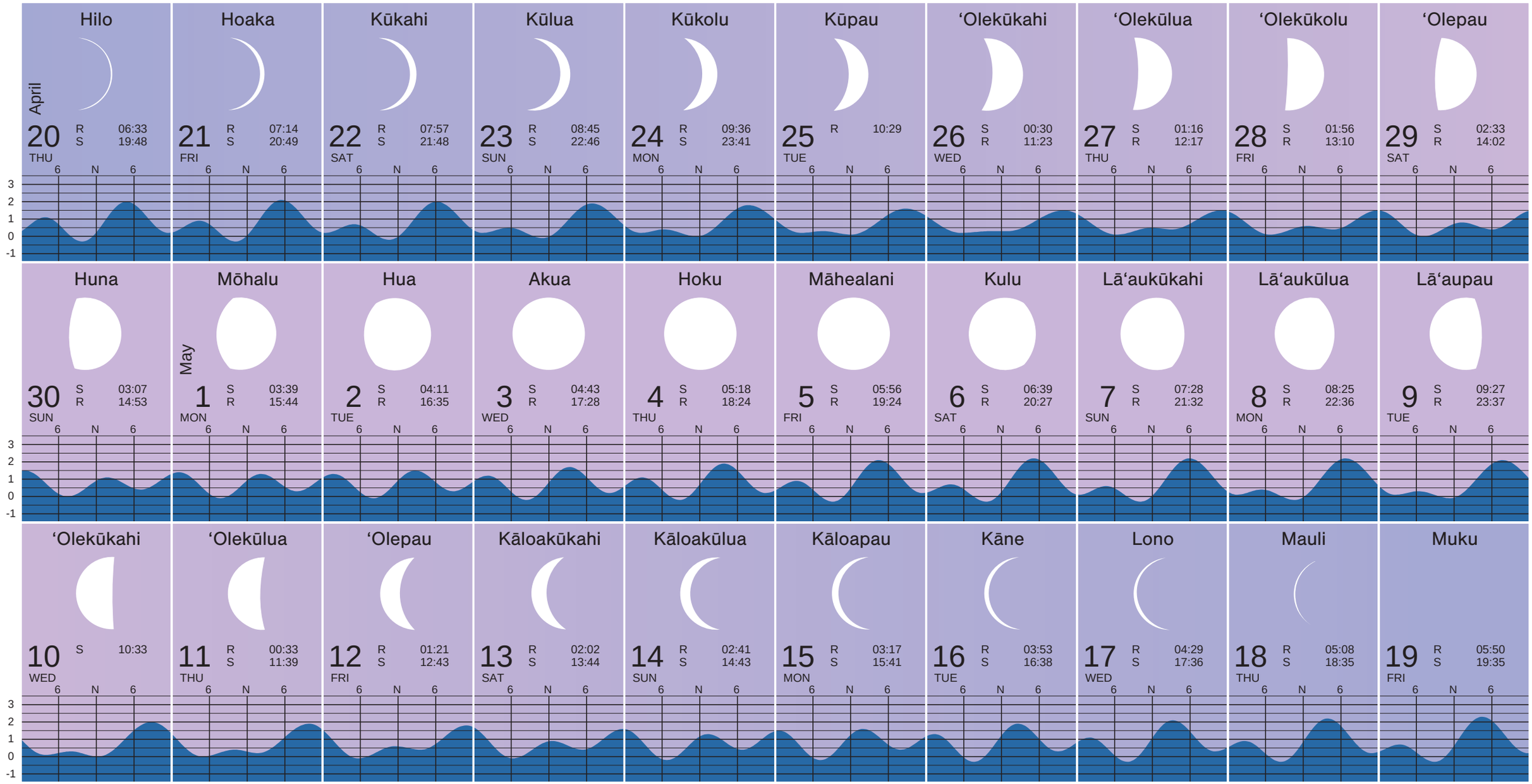
Welo ʻIkuā

(Oʻahu) (Kauaʻi)

April 20 - May 19

ʻApelila 20 - Mei 19, 2023

Hilo	Hoaka	Kūkahi	Kūlua	Kūkolu	Kūpau	ʻOlekūkahi	ʻOlekūlua	ʻOlekūkolu	ʻOlepau
April 20 THU R 06:33 S 19:48	21 FRI R 07:14 S 20:49	22 SAT R 07:57 S 21:48	23 SUN R 08:45 S 22:46	24 MON R 09:36 S 23:41	25 TUE R 10:29	26 WED S 00:30 R 11:23	27 THU S 01:16 R 12:17	28 FRI S 01:56 R 13:10	29 SAT S 02:33 R 14:02
Huna	Mōhalu	Hua	Akua	Hoku	Māhealani	Kulu	Lāʻaukūkahi	Lāʻaukūlua	Lāʻaupau
30 SUN S 03:07 R 14:53	May 1 MON S 03:39 R 15:44	2 TUE S 04:11 R 16:35	3 WED S 04:43 R 17:28	4 THU S 05:18 R 18:24	5 FRI S 05:56 R 19:24	6 SAT S 06:39 R 20:27	7 SUN S 07:28 R 21:32	8 MON S 08:25 R 22:36	9 TUE S 09:27 R 23:37
ʻOlekūkahi	ʻOlekūlua	ʻOlepau	Kāloakūkahi	Kāloakūlua	Kāloapau	Kāne	Lono	Mauli	Muku
10 WED S 10:33	11 THU R 00:33 S 11:39	12 FRI R 01:21 S 12:43	13 SAT R 02:02 S 13:44	14 SUN R 02:41 S 14:43	15 MON R 03:17 S 15:41	16 TUE R 03:53 S 16:38	17 WED R 04:29 S 17:36	18 THU R 05:08 S 18:35	19 FRI R 05:50 S 19:35



OBSERVATIONS

hoʻonui (waxing) _____

poepoe (full moon) _____

hōʻemi (waning) _____

Western Pacific Regional Fishery Management Council

Hoʻolauna Moʻolelo - Ka Wai A Kāne

Introducing the Story of the Waters of Kāne

"Wai (fresh water) is the most important resource for life. As such, wai must be considered a top priority in every aspect of land use and planning. The kānaka maoli[1] word for water is wai and the Hawaiian word for wealth is waiwai, indicating that water is the source of well-being and wealth."

Source: https://imagesofoldhawaii.com/ka-wai-ola-a-kane [1]*native person*

In Project Mālama Ola, we teach about the important role that the *wai* plays in the marine life of *muliwai* (estuary). We teach through learning how to read and then *oli* "Ka Wai a Kāne," a chant about water as a sacred resource. *Wai* is present as a physical element, but also connects us spiritually to the *ʻāina* (land) and the *nā akua* (gods). There are *pule* (prayers) we use when planting and harvesting to ask for favorable rain, winds and other elements helpful for aquaculture and agriculture.

According to Hoʻokuleana LLC, "*Kāne*—the word means 'male' and 'husband'—was the embodiment of male procreative energy in fresh water, flowing on or under the earth in springs, in streams and rivers, and falling as rain (and also as sunshine) which gives life to plants (https://imagesofoldhawaii.com/ka-wai-ola-a-kane). "

In teaching this *mele* (song/poem), we know there is a *kuleana* (responsibility), so we are thorough in our approach to introducing it to participants. The use of this *mele* grounds our project participants in *akeakamai* (native science). It speaks about the different places where water can be found (land, ocean, sky, earth's core). What is particularly helpful is that this chant helps us to understand water usage and volume in traditional times and compare this to water usage and volume today. Our hypothesis is that some of the changes seen over time may be related to climate change.

He Mele No Kāne

He ui, he nīnau
E ui aku ana au iā ʻoe:
Aia i hea ka wai a Kāne?
Aia i ka hikina a ka lā
Puka i Haʻehaʻe
Aia i laila ka wai a Kāne.

E ui aku ana au iā ʻoe:
Aia i hea ka wai a Kāne?
Aia i Kaulanakalā
I ka pae ʻōpua i ke kai
Ea mai ana ma Nihoa
Ma ka mole mai o Lehua
Aia i laila ka wai a Kāne.

A Song for Kāne

A query, a question
I put to you:
Where is the water of Kāne?
At the eastern gate
Where the sun comes in at Haʻehaʻe
There is the water of Kāne.

A question, I ask of you:
Where is the water of Kāne?
Out there at Kaulanakalā
Where cloud forms rest on ocean's breast
Raising their forms at Nihoa
This side of the base of Lehua
There is the water of Kāne.

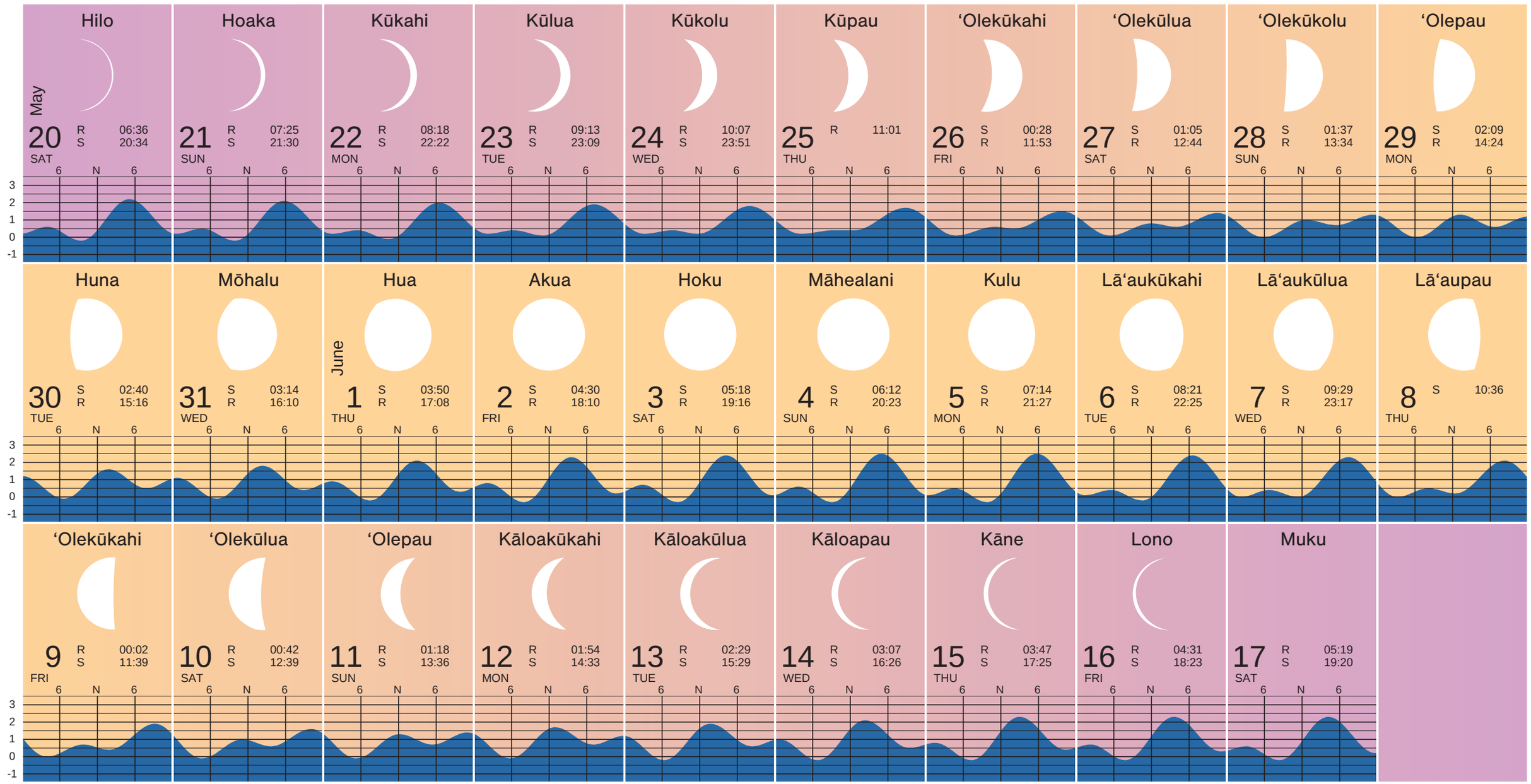
Source: https://kawaikini.com/students/songs-chants

Ikiiki Welehu

(O‘ahu) (Kaua‘i)

May 20 - June 17

Mei 20 - Iune 17, 2023



OBSERVATIONS

ho‘onui (waxing) _____

poepoe (full moon) _____

hō‘emi (waning) _____

Western Pacific Regional Fishery Management Council

Hoʻolauna Mālama ʻĀina

Introducing the River Bank Maintenance Project

Quote from Winter et al. (2018): "*.....a renaissance of cultural awareness in Hawaiʻi, there has been a growing recognition of the ingenuity of the Hawaiian bio-cultural resource management system.*"

Project Mālama Ola was first developed in 2019 as a green waste debris clean-up project to deal with the aftermath of floods that devastated our wetlands and caused long-term damage to the watershed, leaving behind green waste in taro patches, fishponds, irrigation systems, fishing grounds and streams. We came up with the **Mālama Ola Hau Bush Maintenance Project** as an opportunity to use traditional knowledge landscaping practices to address the impacts of floods to the river bank, and to assess critical habitat for endangered species, and native fish habitat and migration. Research indicates that floods have steadily increased over the past decades and from about 2000, Hanalei floods at least 2 to 3 times a wet season (Winter et al., 2018). We used the 2013 Hawaiʻi Department of Land and Natural Resources Kahana Stream Restoration Project on Oʻahu and *kūpuna* (ancestor) knowledge to guide our *hau* bush maintenance project on Hanalei River.

According to a report on the 2013 Hau Bush Removal Project at Kahana State Park on Oʻahu, "The overabundance of hau along the stream corridor has resulted in significant changes to the stream ecosystem. The thick vegetation obstructs stream flow and reduces open channel width forcing floodwaters out of the banks and on to adjacent areas, promoting scour, erosion of secondary channels, and deepening of the main channel...Physical changes to the stream channel and water flow patterns resulting from hau invasion are negatively altering the migration patterns, habitats, and food sources of native aquatic [species]."

We evaluated our *hau* bush maintenance project in 2019 and concluded that we should continue to monitor flood impacts on native fishing grounds, migration patterns and habitats. As we moved forward to "thin" the *hau* on the river, we became acutely aware of the significant *kuleana* (responsibility) we have to maintain the integrity of the history, culture and environment. In addition to the actual maintenance, any research, study or flood mitigation plan developed for this area will also include the historical, cultural, environmental and ecological benefits of maintaining the *hau* bush. We humbly share this *moʻolelo* (story) about the *hau* bush that comes from Kohala, Moku (district) O Keawe.

Source: Winter KB, Beamer K, Vaughan MB, Friedlander AM, Kido MH, Whitehead AN, Akutagawa MKH, Kurashima N, Lucas MP, Nyberg B. 2018. The Moku System: Managing Biocultural Resources for Abundance within Social-Ecological Regions in Hawaiʻi. Sustainability. 10(10):3554. https://doi.org/10.3390/su10103554.

He ʻĀina Hau Kiniki o Kohala
He ʻāina hau kinikini o Kohala,
Naʻu i helu a hoʻokani hau,
I ʻehiku hau keu,
ʻO ke ama hau lā ʻakahi,
ʻO ka ʻiako hau lā ʻalua,
ʻO ka ʻili hau lā ʻakolu,
ʻO ka laʻau hau lā ʻahā,
ʻO ke ʻōpū hau lā ʻalima,
ʻO ka nanana hau lā ʻaono,
ʻO ka hau i ka mauna lā ʻahiku.

A Land of Many Hau Trees is Kohala
A land of many hau trees is Kohala,
Out of a sing hau tree I have counted out,
And found seven hau,
The hau for the outrigger makes one,
The hau for the joining piece makes two,
The hau bark makes three,
The hau wood makes four,
The hau bush makes five,
The hau tree makes six,
The mountain hau makes seven.

Source: Hawaiian Romance of Laieikawai, by Martha Beckwith

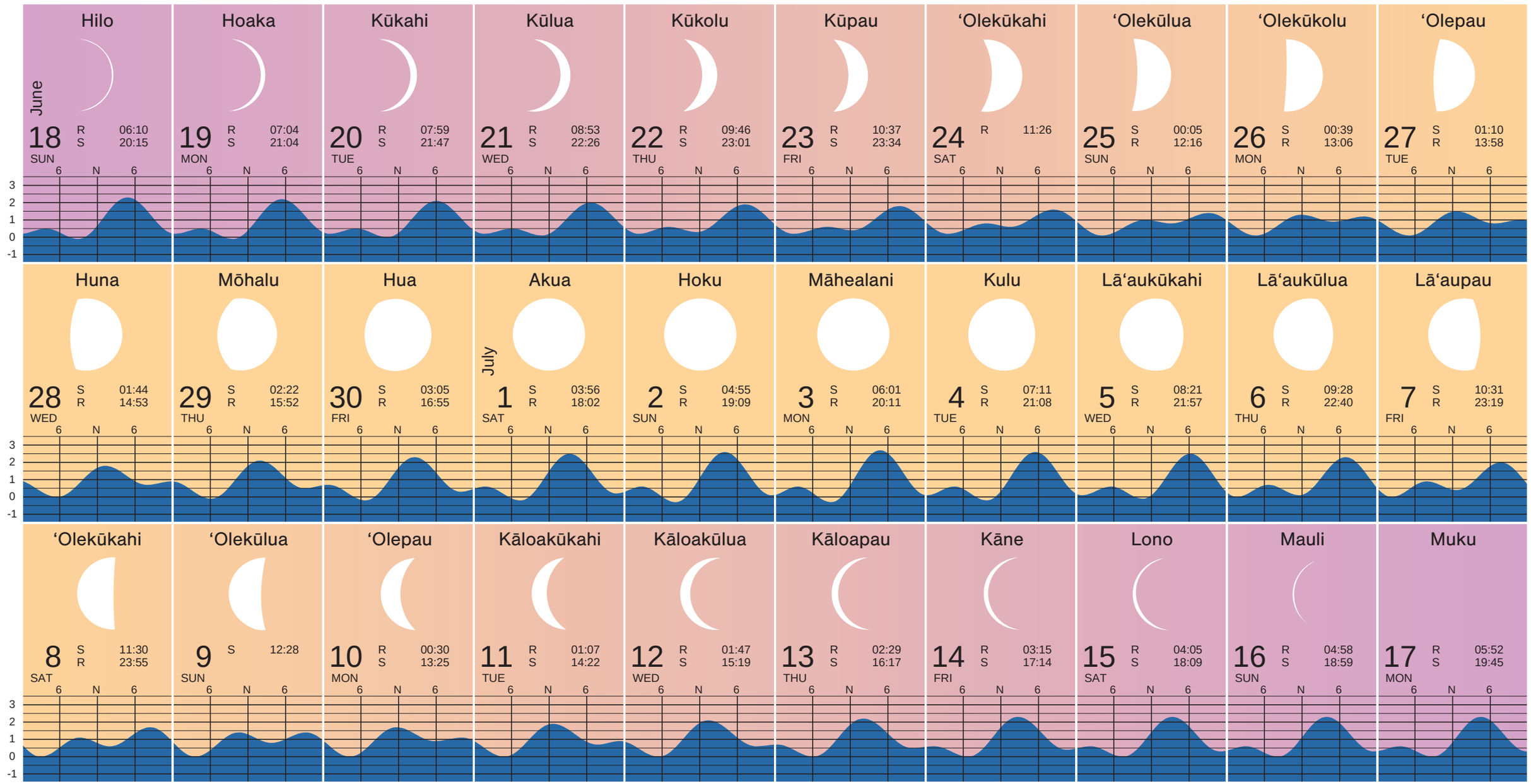
Ka‘aona Kā‘elo

(O‘ahu) (Kaua‘i)

June 18 - July 17

Iune 18 - Iulai 17, 2023

Hilo	Hoaka	Kūkahi	Kūlua	Kūkolu	Kūpau	‘Olekūkahi	‘Olekūlua	‘Olekūkolu	‘Olepau
June 18 SUN R 06:10 S 20:15	19 MON R 07:04 S 21:04	20 TUE R 07:59 S 21:47	21 WED R 08:53 S 22:26	22 THU R 09:46 S 23:01	23 FRI R 10:37 S 23:34	24 SAT R 11:26	25 SUN S 00:05 R 12:16	26 MON S 00:39 R 13:06	27 TUE S 01:10 R 13:58
Huna	Mōhalu	Hua	Akua	Hoku	Māhealani	Kulu	Lā‘aukūkahi	Lā‘aukūlua	Lā‘aupau
28 WED S 01:44 R 14:53	29 THU S 02:22 R 15:52	30 FRI S 03:05 R 16:55	July 1 SAT S 03:56 R 18:02	2 SUN S 04:55 R 19:09	3 MON S 06:01 R 20:11	4 TUE S 07:11 R 21:08	5 WED S 08:21 R 21:57	6 THU S 09:28 R 22:40	7 FRI S 10:31 R 23:19
‘Olekūkahi	‘Olekūlua	‘Olepau	Kāloakūkahi	Kāloakūlua	Kāloapau	Kāne	Lono	Mauli	Muku
8 SAT S 11:30 R 23:55	9 SUN S 12:28	10 MON R 00:30 S 13:25	11 TUE R 01:07 S 14:22	12 WED R 01:47 S 15:19	13 THU R 02:29 S 16:17	14 FRI R 03:15 S 17:14	15 SAT R 04:05 S 18:09	16 SUN R 04:58 S 18:59	17 MON R 05:52 S 19:45



OBSERVATIONS

ho‘onui (waxing) _____

poepoe (full moon) _____

hō‘emi (waning) _____

Western Pacific Regional Fishery Management Council

Hoʻolauna Kaulana Mahina

Introducing the Hawaiian Lunar Calendar

"The moon calendar is a tool that Hawaiians of old developed for holistic understanding of marine and terrestrial environments. The wisdom of the moon calendar is based on lifetimes of observations and experiences by the people of old in their quest for survival."

Source: Edith Kanakaʻole Foundation, 1995

In 2021, we expanded Project Mālama Ola and worked with **Aloha ʻĀina** (cultural) practitioners to develop and implement a meaningful native fish habitat and migration inventory, assessment and monitoring protocol based on traditional knowledge methodology, namely the *kaulana mahina* (Hawaiian lunar calendar) which includes elements of *kapu* (when it is ok and not ok to fish based on fish spawning patterns). In 2022, we focused on the *ʻamaʻama* (striped mullet), a native fish well known to the waters of the *muliwai* (estuary) in Hanalei. Our goal was to capture the wisdom of our *kūpuna* (ancestors) and use it to better guide practices, monitoring and sustainability efforts as we address impacts of climate change, invasive species and pollution.

We also used this opportunity to reestablish an Aloha ʻĀina educational program meant to bring youth, community and stakeholders together to learn and study about the resources in the *ahupuaʻa* (land division from mountain to ocean) from a *kūʻana ʻike* perspective (native worldview). "Nā Po Mahina O Ka Malama" is a *mele* (song/poem) to memorize the different phases of the moon. We recite this *mele* as part of our *piko* (protocol) before we *kilo* (observe) and engage in other outreach activities.

For more information on Hawaiian Moon Phases, go to: https://kohalacenter.org/spawning-guide/culture-and-history/hawaiian-moon-phases or https://archive.hokulea.com/ike/hookele/hawaiian_lunar_month.html

Nā Po Mahina O Ka Malama

(Kāhea) ʻO ka hoʻonui ʻana,
Hilo, Hoaka, Kūkahi, Kūlua, Kūkolu, Kūpau, ʻOlekūkahi,
ʻOlekūlua, ʻOlekūkolu, ʻOlepau,
ʻO ia ka ʻanahulu hoʻonui

(Kāhea) ʻO ka poepoe ʻana,
Huna, Mōhalu, Hua, Akua, Hoku, Māhealani, Kulu,
Lāʻaukūkahi, Lāʻaukūlua, Lāʻaupau,
ʻO ia ka ʻanahulu poepoe

(Kāhea) ʻO ka hoʻemi ʻana
ʻOlekūkahi, ʻOlekūlua, ʻOlepau, Kāloakūkahi, Kāloakūlua,
Kāloapau, Kāne, Lono Mauli, Muku,
ʻO ia ka ʻanahulu hāʻemi

Eia Nā Mahina O Ka Malama

Source: Ka ʻUmeke Kāʻeo Public Charter School, Keaukaha 2008

O Ka Hoonui Ana

1	2	3	4	5	6	7	8	9	10
HILO	HOAKA	KUKAHI	KULUA	KUKOLU	KUPAU	OLEKUKAHI	OLEKULUA	OLEKUKOLU	OLEPAU

O Ka Poepoe Ana

11	12	13	14	15	16	17	18	19	20
HUNA	MOHALU	HUA	AKUA	HOKU	MAHEALANI	KULU	LAAUKUKAHI	LAAUKULUA	LAAUPAU

O Ka Hoemi Ana

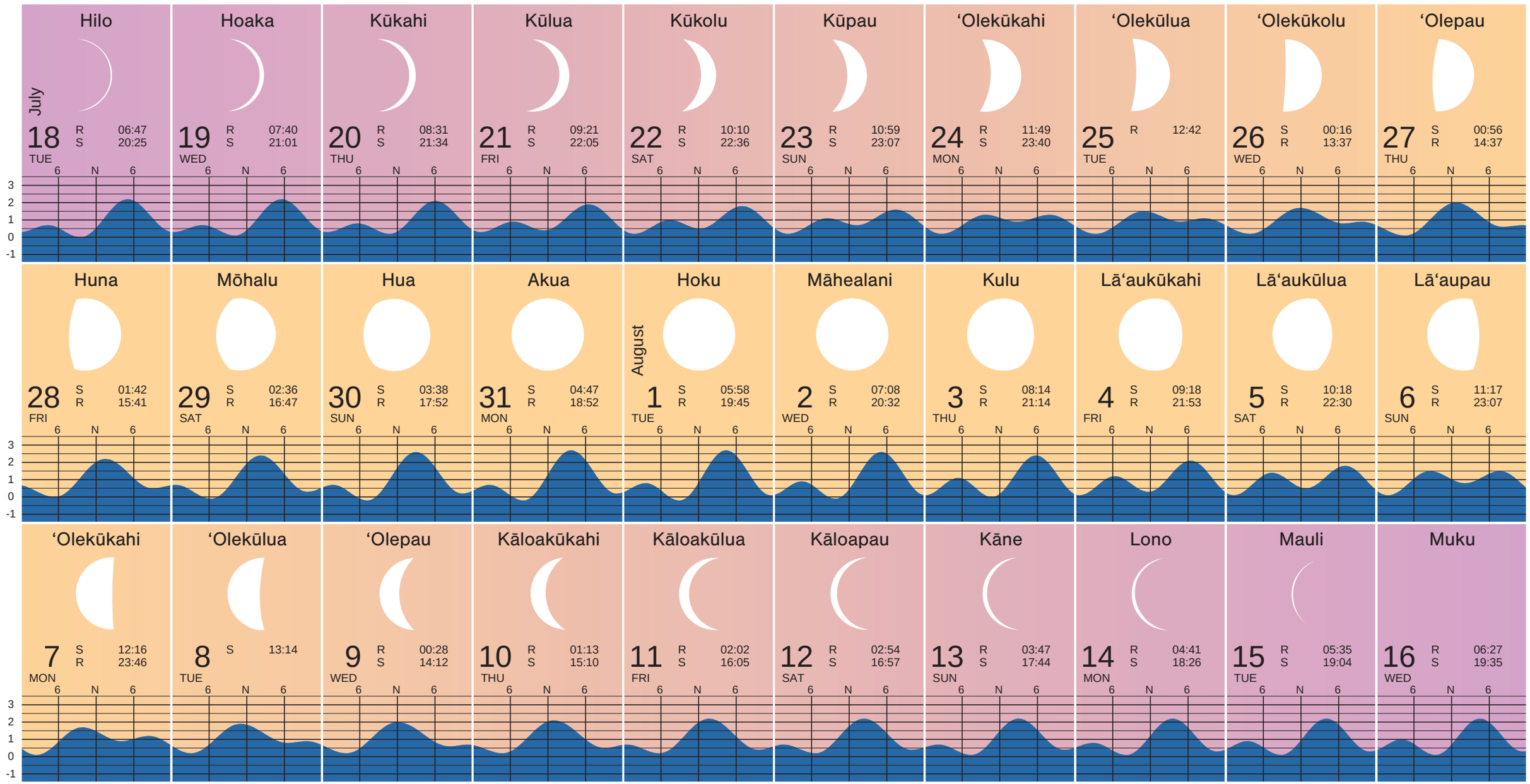
21	22	23	24	25	26	27	28	29	30
OLEKUKAHI	OLEKULUA	OLEPAU	KALOAKUKAHI	KALOKUALUA	KALOAPAU	KANE	LONO	MAULI	MUKU

Hinaia‘ele‘ele Ikiiki

(O‘ahu) (Kaua‘i)

July 18 - August 16

Iulai 18 - ‘Akukake 16, 2023



OBSERVATIONS

ho‘onui (waxing) _____

poepoe (full moon) _____

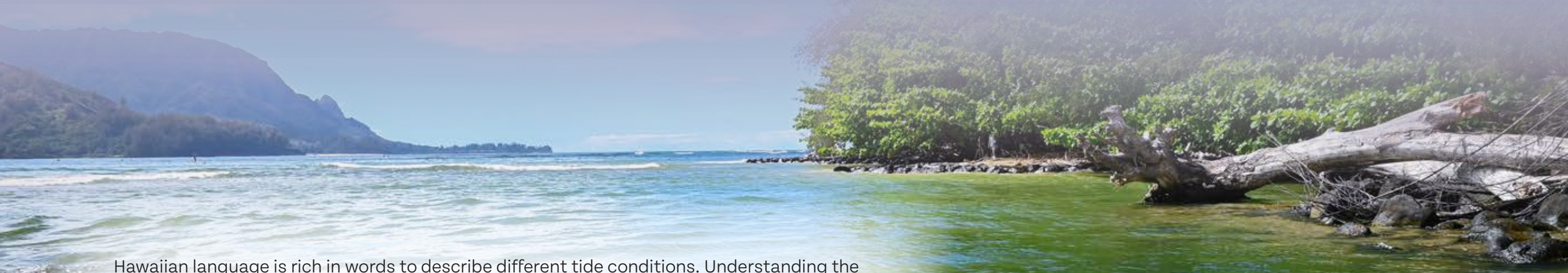
hō‘emi (waning) _____

Western Pacific Regional Fishery Management Council

Hoʻolauna Ke Au O Ka Manawa Introducing the Tides

"Here again is something further. As the sea rises it is called kai holo, or kai piʻi, running or rising sea [tide]. When very full (nui) [high tide], it is called kai nui or kai piha or kai hohonu—big or full or deep sea. When it stops rising [mid tide] it is called kai ku, standing sea, or kai apo, surrounding sea, or kai holuholu, rippling sea. As the sea recedes it is called kai moku, 'cut' sea, or kai emi, ebbing sea, and when the shallow sea floor is exposed (waiho ka papa hohola) it is called kai maloʻo 'dry' sea, or kai make, 'dead' sea; or kai 'aʻaka, 'parched' sea [low tide]. If the sea rises high and then recedes it is a kai hoʻeʻe, 'mounting' sea, and kai mimiki, receding [or sucking] sea, and if the land is covered over by the sea (a i uhi 'ia ka honua e ke kai) it is a kai a ka hulumanu, or kai a kahinaliʻi."

Source: Maly K, Maly O. 2003. *A History of Fishing Practices and Marine Fisheries of the Hawaiian Islands*. Kamehameha Schools. Prepared for The Nature Conservancy. Vol.1.



Hawaiian language is rich in words to describe different tide conditions. Understanding the various Hawaiian words and phrases in the context of *kilo*, observing the *ʻamaʻama* (striped mullet) and other native fish in the *muliwai* (estuary) will acquaint program participants with features of the *kaulana mahina* (Hawaiian lunar calendar) that help to facilitate learning about fish migration, behaviors, and feeding patterns during *kai maloʻo* (low tide), *kai piʻi* (rising tide), *kai piha* (high tide) and *kai moku* (turning tide). As *haumana* (students) become more familiar with tidal movement patterns, they can begin to make their own predictions.

According to 1 of our native fishermen, Nawai Aipa-Rivera, "tides have a huge impact on fish migration." He shares that based on his observations and depending on its stage of growth, fish will get carried out with the tide during *kai moku* to the open ocean and will get carried back into the *muliwai* during *kai piʻi*. Nawai says he uses this *ʻike* (knowledge) with people not familiar with tides, the lunar calendar and fish behavior.

There are scholars such as Dr. Kauaoa Matthew Sam Fraiola, UC Berkeley, who writes that striped mullet have a complex life cycle that involves "movements between marine and freshwater ecosystems. Movements between adjacent ecosystems can provide organisms with many benefits, such as access to abundant food resources or escape from predators and competitors." He points out that "striped mullet is a species of great concern given its important nutritional, economic, and cultural roles (Fraiola, 2015)."

Source: Fraiola KMS. 2015. *Ecology and behavior of juvenile* Mugil cephalus *in Hawaiian streams*. University of California, Berkeley.

Kumu (Teacher) Kamalu Poepoe from Molokaʻi put together a list of pre-lesson discussions questions in the ʻImi ʻIke curriculum when teaching about tides.

1. What causes the tides?
   Gravitational pull of the moon and sun.
2. Is the sun's pull stronger than the moon's?
   No, because the moon is nearer to the earth.
3. What causes high tide?
   When the moon is directly over Hawaiʻi, or on the opposite side of the Earth, the gravitational pull is the strongest, creating high tides.
4. What causes low tide?
   Low tides happen when ocean water withdraws in one area as it is being pulled toward a high tide area elsewhere.

Source: ʻImi Ike Curriculum, 1999

Māhoe Mua Hinaiaʻeleʻele

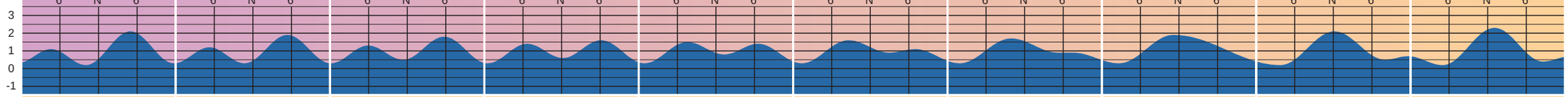
(Oʻahu) (Kauaʻi)

August 17 - September 14

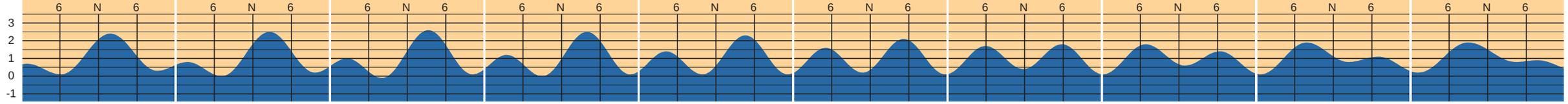
ʻAkukake 17 - Kepakemapa 14, 2023

August

Hilo	Hoaka	Kūkahi	Kūlua	Kūkolu	Kūpau	ʻOlekūkahi	ʻOlekūlua	ʻOlekūkolu	ʻOlepau
17 THU	18 FRI	19 SAT	20 SUN	21 MON	22 TUE	23 WED	24 THU	25 FRI	26 SAT
R 07:18	R 08:07	R 08:56	R 09:45	R 10:36	R 11:29	R 12:26	R 13:27	S 00:26	S 01:20
S 20:07	S 20:38	S 21:08	S 21:40	S 22:14	S 22:52	S 23:36		R 14:30	R 15:33

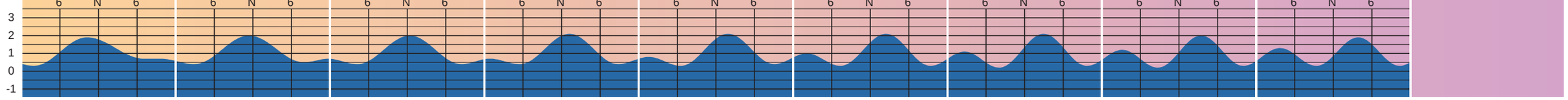


Huna	Mōhalu	Hua	Akua	Hoku	Māhealani	Kulu	Lāʻaukūkahi	Lāʻaukūlua	Lāʻaupau
27 SUN	28 MON	29 TUE	30 WED	31 THU	1 FRI	2 SAT	3 SUN	4 MON	5 TUE
S 02:24	S 03:33	S 04:43	S 05:52	S 06:57	S 08:01	S 09:02	S 10:03	S 11:03	S 12:04
R 16:34	R 17:30	R 18:20	R 19:04	R 19:45	R 20:24	R 21:02	R 21:41	R 22:23	R 23:08



September

ʻOlekūkahi	ʻOlekūlua	ʻOlepau	Kāloakūkahi	Kāloakūlua	Kāloapau	Kāne	Lono	Muku
6 WED	7 THU	8 FRI	9 SAT	10 SUN	11 MON	12 TUE	13 WED	14 THU
S 13:03	S 14:00	R 00:49	R 01:42	R 02:36	R 03:30	R 04:22	R 05:13	R 06:02
R 23:56		S 14:53	S 15:42	S 16:26	S 17:05	S 17:40	S 18:13	S 18:44



OBSERVATIONS

hoʻonui (waxing) _____

poepoe (full moon) _____

hōʻemi (waning) _____

Western Pacific Regional Fishery Management Council

Ho‘olauna Kilo Introducing Observation

“Indigenous knowledge thus makes an important contribution to climate change policy, and on climate action; by observing changing climates, adapting to impacts and contributing to global mitigation efforts.”

Source: www.unesco.org/en

Wahi Kilo (Observation Location): _____

Ke ‘Ano I‘a (Type of Fish): _____

_____

Na Limahana (Observers): _____

Ka La (Date): _____

Ka Manawa (Time): _____

Ka Malama (Lunar Month): _____

Ke Anahulu (10-day Period): _____

Ke Pō Mahina (Moon Phase): _____

Wahi Pō Mahina (Moon Location): _____

Ke Au (Tides): _____

Ke Anila (Ua, Makani, Aopua) (Rains, Winds, Clouds):

_____

Ka Helu I‘a (Number of Fish in Each School):

_____

Ka Lawena I‘a (Fish Behavior): _____

_____

Ke ‘Ano Wai (Water Characteristics): _____

_____

The Hawaiian moon calendar was developed over the centuries by our *kūpuna* (ancestors), whose lives literally depended on their ability to catch fish. Our ancestors discovered that the biological clocks of all life forms resonate in predictable relationships with the earth, sun and moon and they were able to forecast the times of heightened activity for all forms of sea life wherever they were (Rothery, 2007). It was the duty of the *kilo lani* (astronomers) to keep the annual calendar and watch the moon to determine when certain *kapu* (restrictions) should be placed on the fish or land. Some say that the *kilo lani* knew when to add extra days or an extra month to the moon calendar at the end of the Makahiki so that the seasons would correspond with the sun. *Kilo lani* on the different Islands and the different *moku* (districts) had various methods of adjusting, as the names of the lunar months vary on each Island (Taylor, 1995).

The Hawaiian time frame for a day included the period from sunset to sunset rather than from sunrise to sunrise, and a day might not be a full 24 hours. The moon calendar actually alternated months of 30 days with months of 29 days. Having established 30 days (1 of them half as long as the other 29), the monthly calendar was further divided into 3 lunar phases of 10 days (Richards, 1999).

To the Hawaiians, the 3 phases marking the moon’s increase or decrease in size were: 1) the first appearance of the new moon in the west in the evening; 2) the time of the full moon when it stood directly over the Islands at midnight; and 3) the period when the moon was waning or decreasing and showed itself in the east late at night. It was with reference to these 3 phases of the moon that names were given to the nights that made up the month (Malo, 1951).

In this setting, we *kilo* (observe) simply by becoming familiar with the winds, rains, landscape, plants, birds, animals, fish and other resources that make up the *ahupua‘a* or land area we *mālama* (care for). Project Mālama Ola participants collect the information above and learn to *kilo* fish habitat and migration patterns of *‘ama‘ama* (striped mullet) at the *muliwai* (estuary) in Hanalei River.

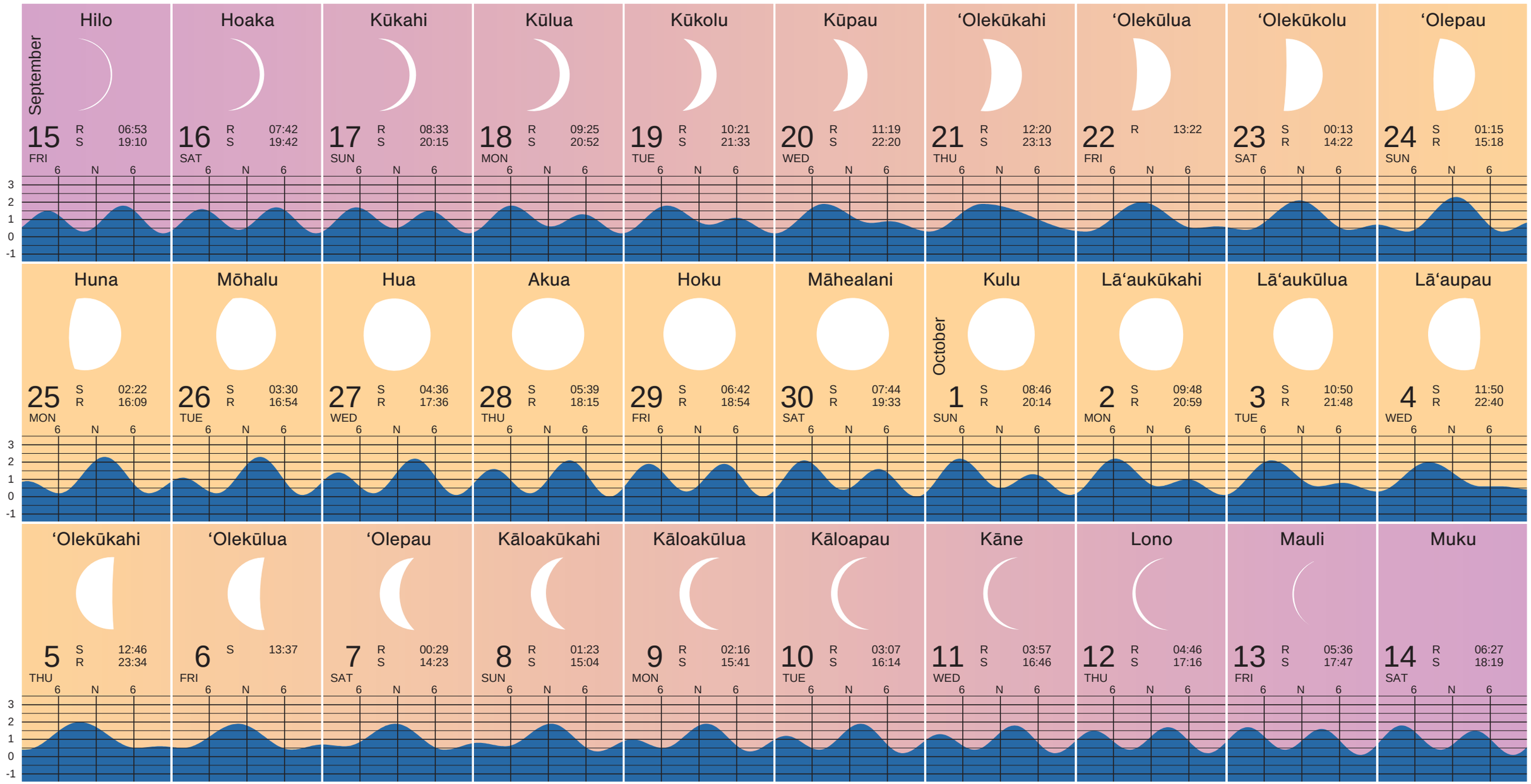
Sources: Malo, D. 1951. *Hawaiian Antiquities*. Bernice P. Bishop Museum, Spec. Pub. 2, Second Ed. Bishop Museum. Honolulu, HI. | Richards M. 1999. *The Development of a Calendar Through Oral Tradition: The Hawaiian Kumulipo*. | Rothery N. 2007. *Outdoor Life. September Maori Chart*. accessed Oct. 13, 2022: www.outdoorlife.com/articles/hunting/2007/09/september-maori-chart. | Taylor C. 1995. *Hawaiian Almanac*. Mutual Publishing. Honolulu, HI.

Māhoe Hope Māhoe Mua

(Oʻahu) (Kauaʻi)

September 15 - October 14

Kepakemapa 15 - ʻOkakopa 14, 2023



OBSERVATIONS

hoʻonui (waxing) _____

poepoe (full moon) _____

hōʻemi (waning) _____

Western Pacific Regional Fishery Management Council

Oli Malama Lunar Month Chant

"Our people use storytelling as a way to pass on information from the past. One of the most commons ways to do this was through oli[1]. They contain ʻike kūpuna[2] and other lessons that help the learner to the subtle differences each night and each season."

Source: Lā Howard, personal communication during 2022 interview on fishing practices in Hanalei and other river mouths. [1]*chants*, [2]*ancentral knowledge*

When Project Mālama Ola teaches *haumana* (students) to *kilo* (observe), we incorporate understanding impacts the different *pō mahina* (moon phases) have on fish and other marine life. We also teach about the subtle changes in weather patterns based on the *malama* (lunar month). We reinforce these understandings through *mele* (poem/song) and *moʻolelo* (stories).

Seasons, Weather and Fishing in Hawaiʻi

The yearly *kaulana mahina* (Hawaiian lunar calendar) was divided into 12 and sometimes 13 months. Fishing seasons were carefully woven into the calendar with accompanying religious rituals. According to some *kūpuna* (ancestors) and confirmed through resources, particular religious rites were made for specific type of fish. It was *kapu* (taboo) to catch fish out of the proper season (Handy et al., 1991). Scientific studies show that fish are more active for 4 days leading up to the full moon and for 4 days after the new moon. There are many other variables to take into consideration in addition to the moon phases, such as water temperature/color, the presence of baitfish/food items, cloud cover, bird activity and ocean current speed/direction (Project Kūhea Loko Currriulum, 2003).

"Oli Malama" is the *oli* that we use as a foundation to teach about the different weather patterns associated with each lunar month. The lunar months we use for this chant come from the Kauaʻi lunar calendar. In this chant we honor Lono, the Hawaiian god of agriculture.

Oli Malama

(Kāhea) Nā Malama O Ka Makahiki

ʻO Hilinamā, Hilinehu
Puka mai ʻo Makaliʻi,

Hilioholo a Nalu
Hukipau a Kaiāulu

ʻO Ikua, Welehu
Laʻaulu o ka ʻāina

Kāʻelo, Ikiiki
Hinaiaʻeleʻele

Mahoemua a Hope
O ia Lono, Pono ka ʻāina
(Kāhea) Nā Malama O Ka Makahiki

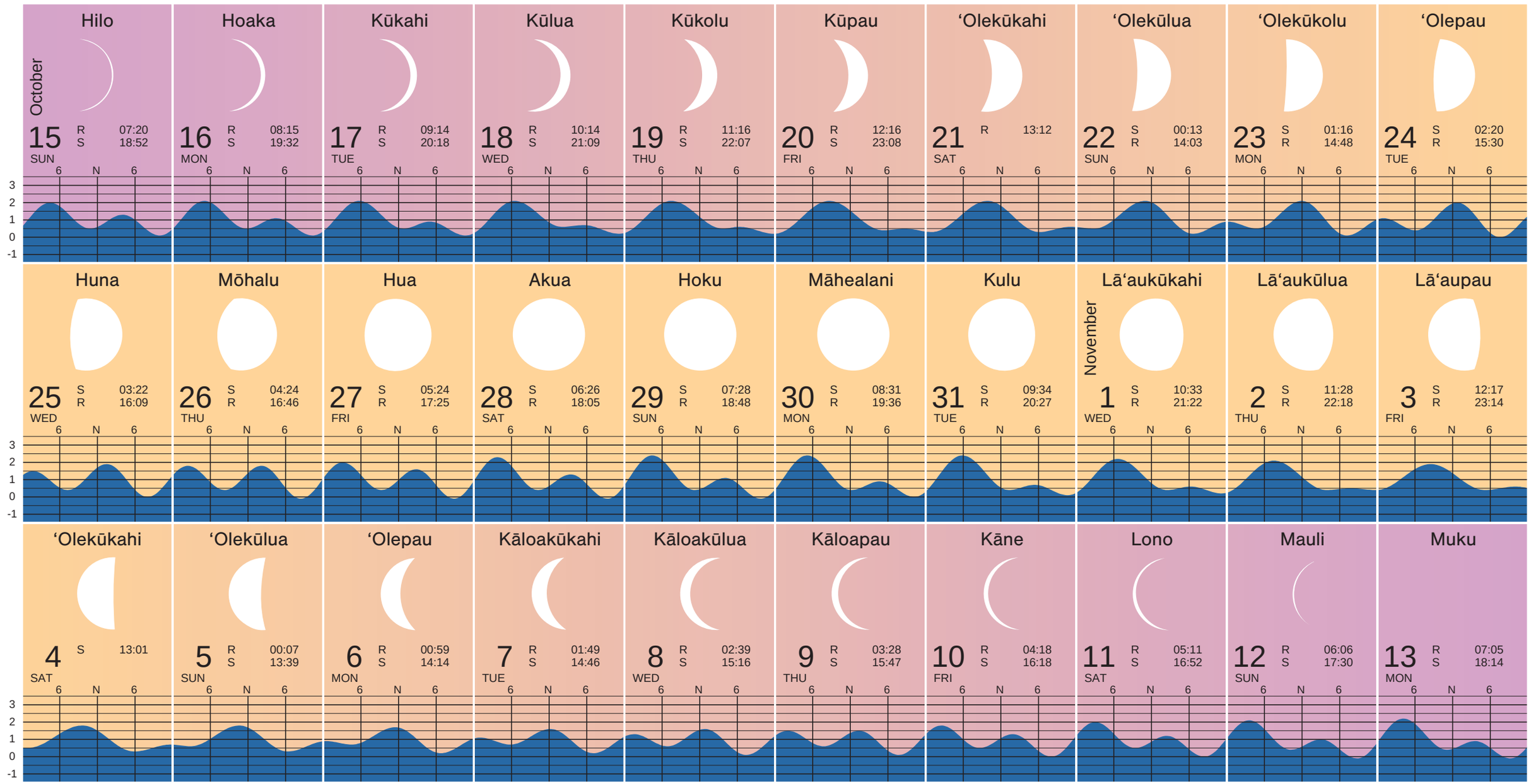
Sources: Kaiāulu Papaloa After School Program, 2016 | Handy ESC, Handy EG, Kawena Pukui MK. 1991. *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. Revised Edition. Bernice P. Bishop Museum Bulletin 233, Bishop Museum Press. Honolulu, HI.

ʻIkuwā Māhoe Hope

(Oʻahu) (Kauaʻi)

October 15 - November 13

ʻOkakopa 15 - Nowemapa 13, 2023



OBSERVATIONS

hoʻonui (waxing) _____

poepoe (full moon) _____

hōʻemi (waning) _____

Western Pacific Regional Fishery Management Council

Hoʻolauna ʻAmaʻama Introducing the Striped Mullet

Hānau ka ʻAmaʻama — *The ʻAmaʻama, mullet, was born*
Hānau ka ʻAnae — *The ʻAnae, large kind, was born*
i ke kai a holo — *in the sea and swam*

Source: *The Kumulipo: The Complete 1897 Text*, by Queen Liliʻuokalani

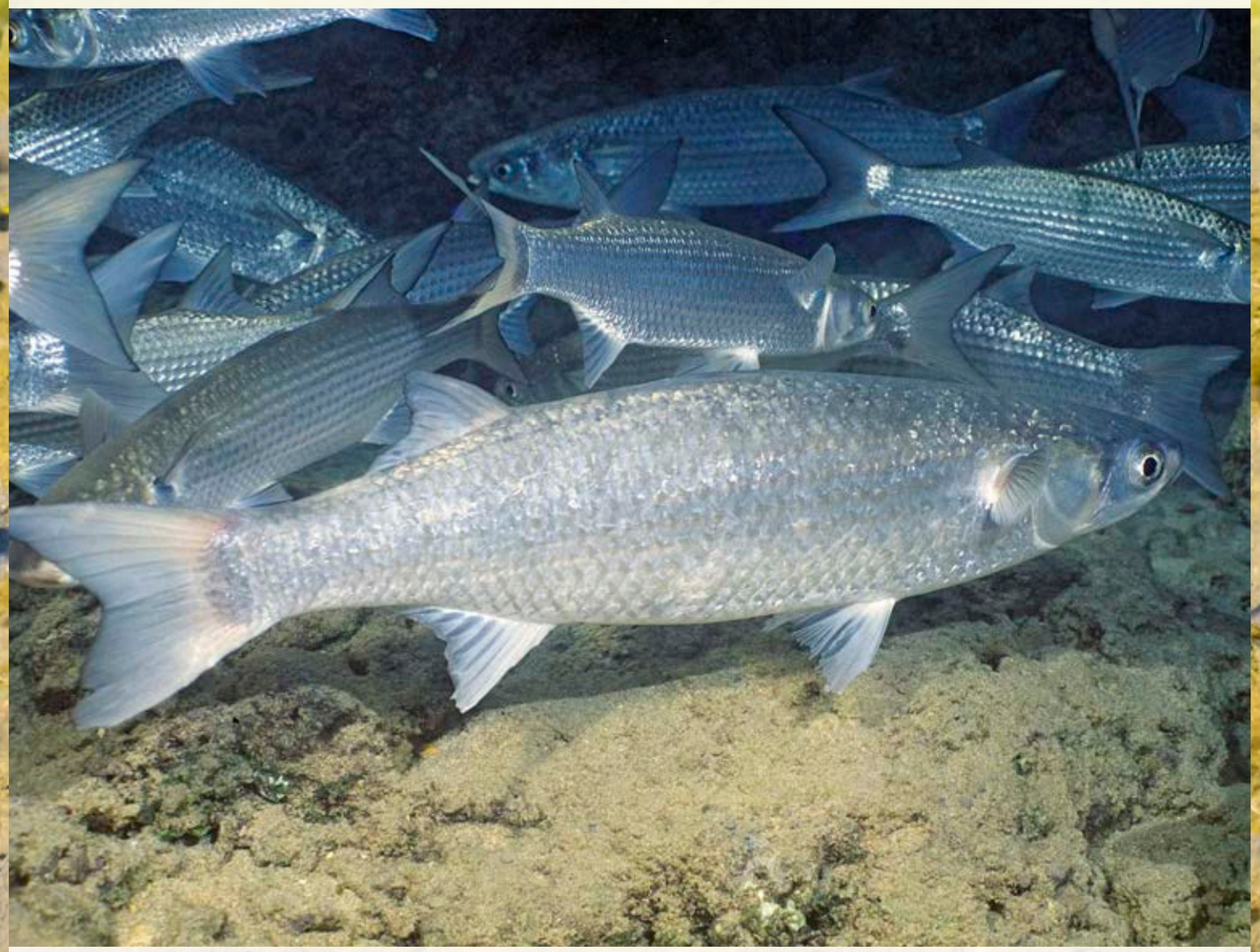


Photo: Keoki Stender

The **Kumulipo** is the oldest and longest Hawaiian Creation Chant ever known, and is a primary source to the history of the beginning of the world. The text at the beginning of this lesson is taken from Wā ʻAlua, the Second Era of the chant. The fact that the *ʻamaʻama* is named in the Kumulipo shows that it's an ancient species that remains a very important resource within Hawaiian culture.

The *ʻamaʻama* was often used in the ʻAhaʻaina Māwaewae ceremony to honor the first-born child of a couple. Within 24 hours of the child's birth, special foods were gathered and prepared from the land and sea. Each type of food was a symbol of Lono, the male deity responsible for fertility, who would be asked to give protection to the child as they grow. Among the most important seafood was the *ʻamaʻama*; it would be added to or even substituted for *puaʻa* (pig), the land creature *kinolau* (physical form) of Lono (Handy and Pukui, 1958).

The *ʻamaʻama* was a greatly valued resource in ancient Hawaiʻi by both the royal and commoner classes, as seen in the multiple *moʻolelo* (stories) and *mele* (song/poem) in which they are named. The *kānaka maoli* (Native Hawaiians) usually raised *ʻamaʻama* in manmade *loko iʻa* (fishponds), carefully managing their numbers so that the community and *aliʻi* (royalty) always had as much as they needed for food and ceremony.

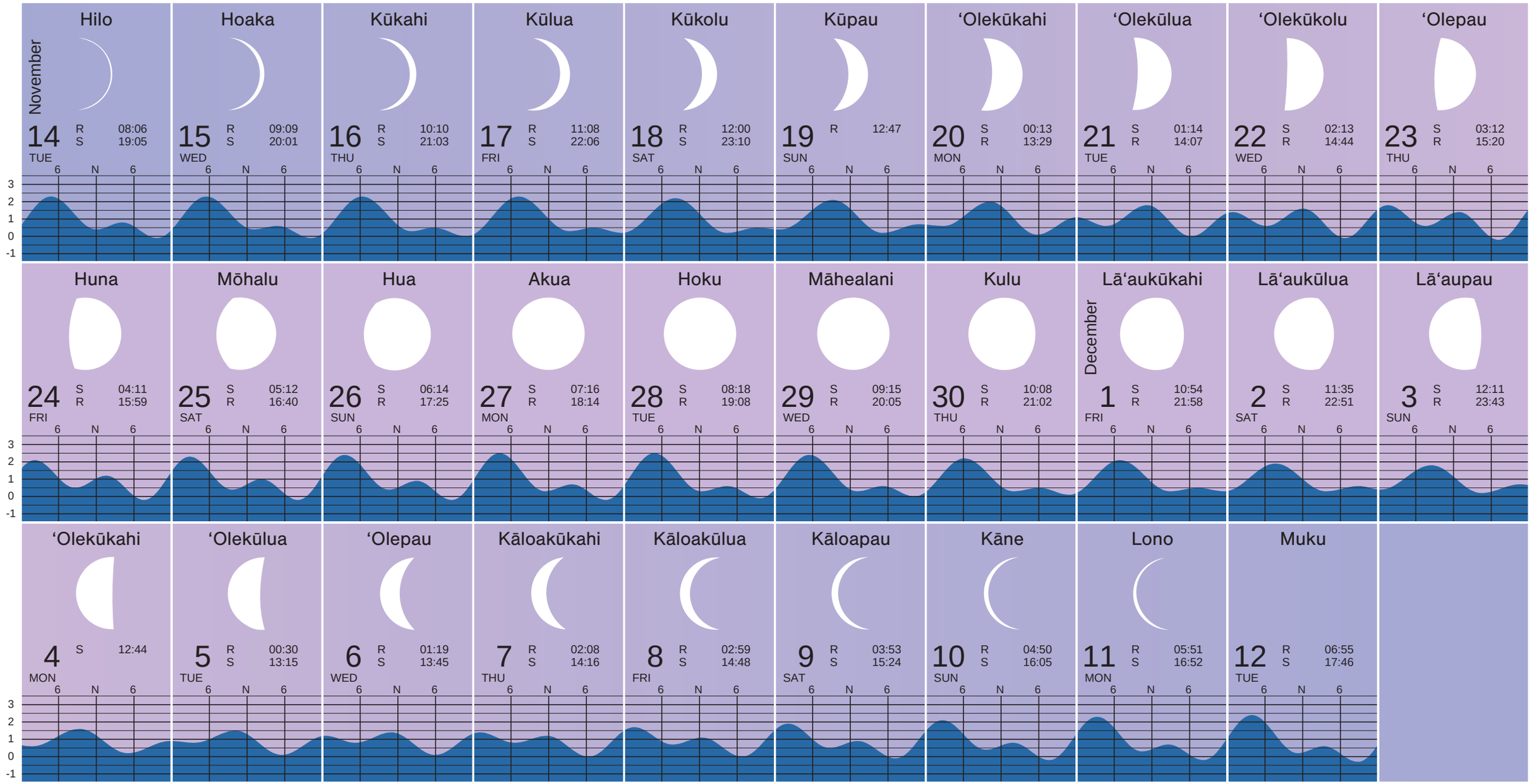
Source: Handy ESC, Pukui MK. 1958. *The Polynesian family system in Ka-ʻu, Hawaiʻi*. Polynesian Society.

Welehu Hilinamā

(Oʻahu) (Kauaʻi)

November 14 - December 12

Nowemapa 14 - Kēkēmapa 12, 2023



OBSERVATIONS

hoʻonui (waxing) _____

poepoe (full moon) _____

hōʻemi (waning) _____

Western Pacific Regional Fishery Management Council

He Pō‘aiapuni Ola The Life Cycle of the Striped Mullet

To take proper care of any living thing, you must know how it grows so that you can provide the things needed for its survival at every stage of growth.

Source: www.ksbe.edu and Hale Kuamo‘o

Project Mālama Ola honors the work of Kamehameha Schools and other indigenous educational institutions in Hawai‘i that provide information about Kū‘ana ‘Ike Hawai‘i (native ways of knowing) through their online curriculum, articles and educational materials.

The *‘ama‘ama* (striped mullet) is a great example of how the *kānaka maoli* (Native Hawaiians) observed and cared for their marine resources in a *loko i‘a* (fishpond) to make sure they would be available to their descendants for years to come. *Loko i‘a* provided *kānaka maoli* with a regular supply of *i‘a* (fish) when ocean fishing was not possible or catch was not sufficient to meet the needs of the community.

The egg stage is called ***kowaū***, which is very small, like a tiny dot on your finger. The eggs are laid in the *kai* (sea), outside of the *loko i‘a*.

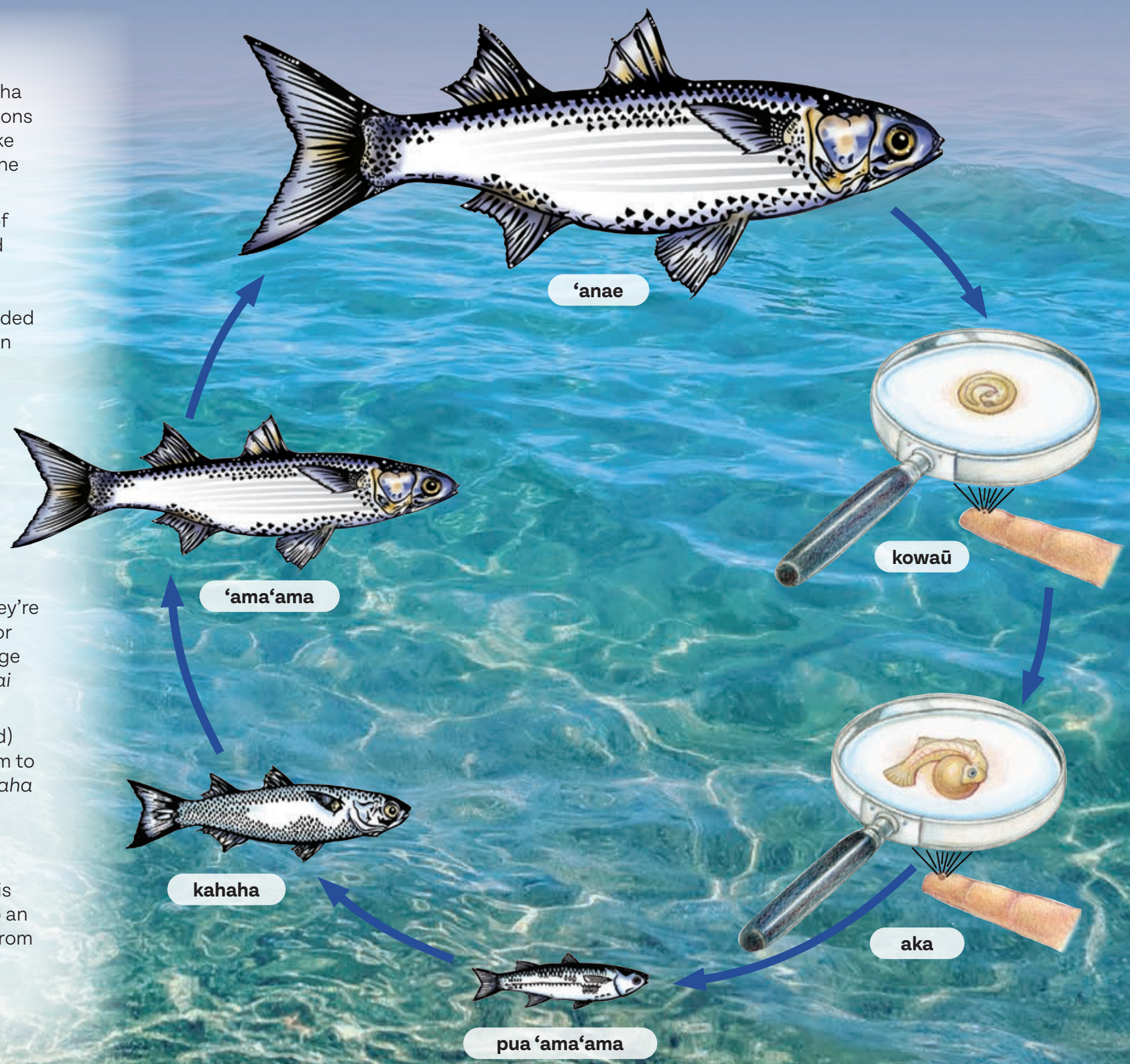
When eggs hatch, the newborns are called ***aka***. They’re still very small and aren’t able to swim yet, so they continue to grow in the *kai*, outside of the *loko i‘a*.

Once the newborns are strong enough to swim, they’re called ***pua ‘ama‘ama***. Their size is around 1 *poho*, or the length of your pointer finger. This is the 1st stage when the *i‘a* are large enough to swim to the *wai kai* (brackish water) of the *loko i‘a*.

When the pua *‘ama‘ama* eat enough *limu* (seaweed) to reach a *pī‘ā* length, from the bottom of your palm to the top of your fingers, they’re called ***kahaha***. *Kahaha* are too large to fit through the *mākāhā* (fishpond gate).

The *kahaha* grows until it is 2 *pī‘ā* lengths; that’s when it is called an ***‘ama‘ama***. This is when the *i‘a* is harvested for food, or left alone to grow larger into an ***‘anae***. This last growth stage is a *ha‘ilima* length, from the tip of your middle finger to your elbow.

Source: “The Growth Stages of the ‘Ama‘ama” published by Kamehameha Schools and Hale Kuamo‘o

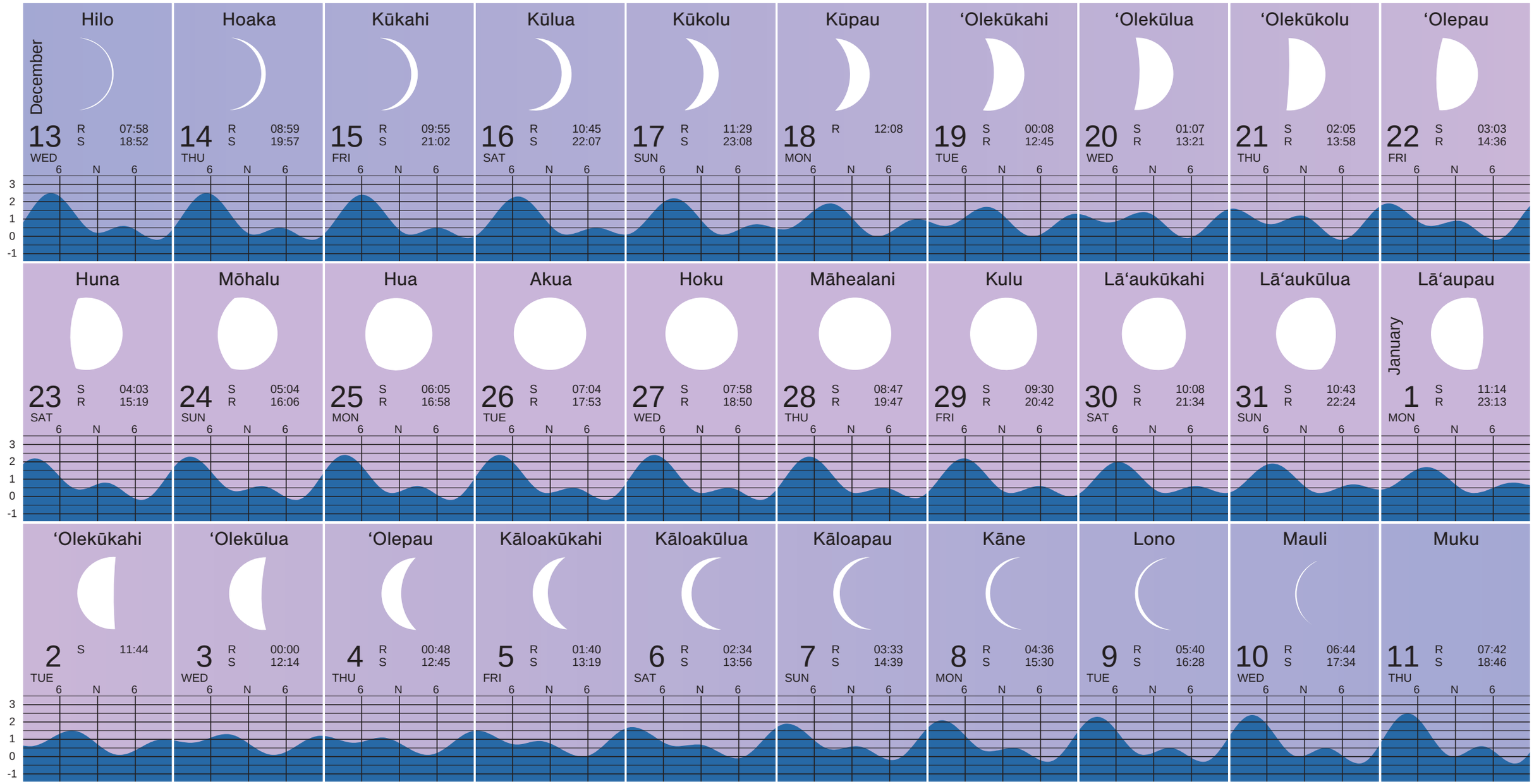


Makali‘i Hilinehu

(O‘ahu) (Kaua‘i)

December 13, 2023 - January 11, 2024

Kēkēmapa 13, 2023 - ‘Ianuali 11, 2024



OBSERVATIONS

hoʻonui (waxing) _____

poepoe (full moon) _____

hōʻemi (waning) _____

Western Pacific Regional Fishery Management Council

Hoʻolauna ʻOhana Lawaiʻa Introducing Fishing Families

"Today, the spirit of Kūʻula[1] is being revived in a growing movement to restore fishponds across the islands. Fishpond practitioners are combining Western science with traditional culture and knowledge to develop fishpond practices that are adaptable to today's sustainability challenges." Source: McDaniel, 2018 [1]*name of fishing god*

We introduce 2 young *kanaka lawaiʻa* (fishermen) who are familiar with the waters from Anahola (Koʻolau Moku) to Keʻe (Haleleʻa Moku). Both *ʻohana* (families), the Aipa-Riveras from Kapahi and Valpoons from Anahola, were instrumental in helping the Project Mālama Ola team get organized to offer outreach classes at the *muliwai* (estuary) in Hanalei. They are both generational fishermen with knowledge that comes from spending time with their *tūtū-man* and *wahine* (grandparents), as well as other *ʻohana* in the *ahupuaʻa* (land division from mountains to ocean) and *moku* (district) who lent their time and expertise to mentor these 2 young fathers to become *kanaka lawaiʻa*. Project Mālama Ola *mahalos* (thanks) them for their time and ability to connect with our outreach program to a new generation of aspiring fishermen and Aloha ʻĀina (land) practitioners.

Nawai Aipa-Rivera started fishing when he was 8 years old. In his formative years, he spent time with his Uncle Palani Kaʻauwai-Rivera and others who taught him how to throw net, bottomfish for *ʻopelu* (mackerel scad), and dive for *ula* (Hawaiian spiny lobster), and gather *limu* (seaweed) and *ʻopihi* (limpet). As for climate change, he believes that consistent culture-based monitoring for the *muliwai* in Hanalei is important as well as restoring the 2 dormant fishponds in Hanalei, the Kanoa and the Kamoʻomaikaʻi.

Josh McDaniel says in the 2018 Hawaiʻi Sea Grant *Ka Pili Kai* magazine, "The kiaʻi loko, or caretaker of the fishpond, lived at the pond and was responsible for closely monitoring and protecting the stocks from poachers. At the konohiki's [head of the ahupuaʻa] request, the kiaʻi loko harvested fish from the pond. Beyond the management of the fish stocks, accumulation of silt was a perpetual challenge. When sediment became a problem, the kiaʻi loko would organize members of the ahupuaʻa to rake the pond bottom and move the silt and sediment near the mākāhā where it could be flushed out with outgoing tides. A person had to be immensely knowledgeable about a wide range of important matters to be given the position of kiaʻi loko."

It is Nawai's goal to restore the *konohiki* system in Hanalei and other *muliwai* environments. It is not just a job, but a *kuleana* (responsibility) that was passed on to them from their *kūpuna* (ancestors).

Cody Kekoa Valpoon fishes the waters from Anahola to Hanalei, sometimes beyond. This young father of 4 is familiar with all kinds of fishing techniques including pole fishing, throw net, and actively uses the *koʻa* (fish houses) in waters he is familiar with to go diving and gather in the *kai papaʻu* (reef areas). He is also a hunter; his time is spent between working, hunting and fishing to provide for his *ʻohana* (family).

He is actively teaching his *keiki kane* (boys), 10, 6 and 1 year old how to read the *hoʻailona* (signs) to fish, and at some point, he will start teaching them how to hunt. He truly is a kindred spirit and tries his best to live a life where he can provide his *ʻohana* with healthy foods, training to know and practice the "old ways," and to get *maʻa* (accustomed) to catching, gathering, hunting and fishing for food that comes from the *ʻāina* (land) and *kai* (ocean).

Cody acknowledges that climate change is real and says, "There is less brackish water which impacts the growth of microalgae for fish in the stream, which in turn impacts the entire chain of fish." Further, he asserts that water diversions in Anahola and Hanalei might also impact the amount of water needed for the entire fish cycle to be *pono* (made whole). He provides Project Mālama Ola with regular updates and collects data on fishing, hunting and gathering, incorporating the principles of *kaulana mahina* (Hawaiian lunar calendar).

Source: McDaniel J. 2018. *The Return of Kūʻula, Restoration of Hawaiian Fishponds*. Ka Pili Kai, 1, issue 1, p. 1-8.

Kāʻelo Hilioholo

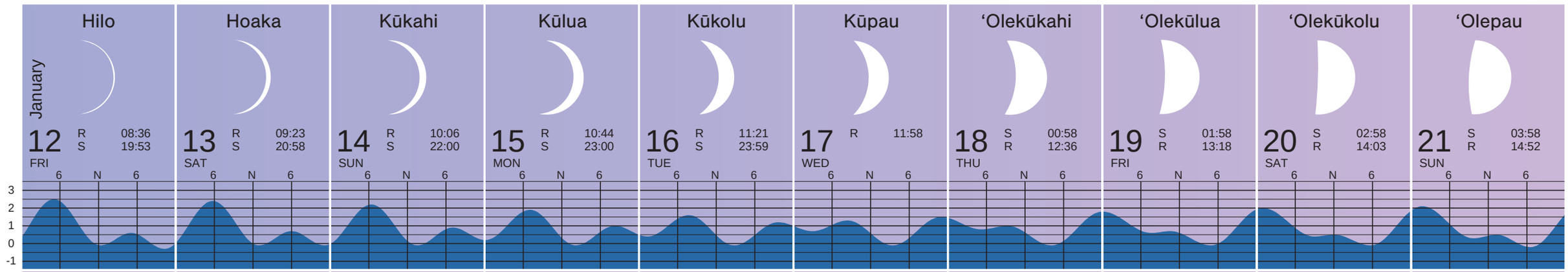
(Oʻahu) (Kauaʻi)

January 12 - February 9

ʻIanuali 12 - Pepeluali 9, 2024

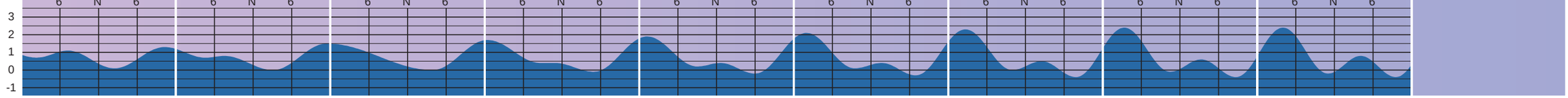
January

Hilo	Hoaka	Kūkahi	Kūlua	Kūkolu	Kūpau	ʻOlekūkahi	ʻOlekūlua	ʻOlekūkolu	ʻOlepau
12 FRI R 08:36 S 19:53	13 SAT R 09:23 S 20:58	14 SUN R 10:06 S 22:00	15 MON R 10:44 S 23:00	16 TUE R 11:21 S 23:59	17 WED R 11:58	18 THU S 00:58 R 12:36	19 FRI S 01:58 R 13:18	20 SAT S 02:58 R 14:03	21 SUN S 03:58 R 14:52
Huna	Mōhalu	Hua	Akua	Hoku	Māhealani	Kulu	Lāʻaukūkahi	Lāʻaukūlua	Lāʻaupau
22 MON S 04:56 R 15:45	23 TUE S 05:52 R 16:41	24 WED S 06:42 R 17:38	25 THU S 07:27 R 18:33	26 FRI S 08:06 R 19:27	27 SAT S 08:42 R 20:18	28 SUN S 09:14 R 21:07	29 MON S 09:45 R 21:56	30 TUE S 10:14 R 22:44	31 WED S 10:44 R 23:33



February

ʻOlekūkahi	ʻOlekūlua	ʻOlepau	Kāloakūkahi	Kāloakūlua	Kāloapau	Kāne	Lono	Muku
1 THU S 11:16	2 FRI R 00:24 S 11:51	3 SAT R 01:19 S 12:30	4 SUN R 02:18 S 13:16	5 MON R 03:20 S 14:09	6 TUE R 04:24 S 15:10	7 WED R 05:25 S 16:17	8 THU R 06:21 S 17:27	9 FRI R 07:11 S 18:37



OBSERVATIONS

hoʻonui (waxing) _____

poepoe (full moon) _____

hōʻemi (waning) _____

Western Pacific Regional Fishery Management Council

About This Calendar

Kū I Ka Mālie (Calm Resistance)

"Native Hawaiians are genealogically connected to ka pae ʻāina Hawaiʻi as both the ancestral homeland and the elder sibling of Hawaiian aboriginals in traditional belief systems. This relationship is integral to Native Hawaiian identity and is distinctive from that of other groups who live and work in the Hawaiian Islands." Source: Kanaʻiaupuni and Malone, 2006.

This *2023 Kaulana Mahina* (Hawaiian Lunar Calendar) is a partnership between the Western Pacific Regional Fishery Management Council and the Hanalei River Heritage Foundation (HRHF). This calendar features information from Project Mālama Ola (taking care of the life of the natural resources), a 1.5-year grant funded by the U.S. Fish and Wildlife in partnership with the Department of Interior, Office of Native Hawaiian Relations.

The overarching goal of this year's calendar is to introduce lessons from HRHF's community outreach program. Through *moʻolelo* (story), *oli* (chant), *mele* (song/poem) and other native ways of knowing, we explore, collect data and analyze the potential impacts of climate change and other threats to the native natural and cultural resources in the *muliwai* (estuary) area of the Hanalei River.

What is climate change? According to the United Nations, "Climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle. But since the 1800s, **human activities have been the main driver of climate change,** primarily due to burning fossil fuels like coal, oil and gas...The **consequences of climate change** now include, among others, intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity (www.un.org/en/climatechange/what-is-climate-change)."

The Hanalei *muliwai*, along with the *kai* (ocean), *kahawai* (river), etc., were at one time, not so long ago, primary food sources for Native Hawaiians. The Foundation also wants to examine the impacts of climate change to our traditional knowledge resource management practices. There is an increasing call to "draw upon indigenous knowledge and principles" to "assess the conservation and restoration potential of indigenous (agricultural) systems as tools to improve community and landscape reliance in the face of climate change (Kurashima et al., 2019)."

We *mahalo* (thank) composer Eleanor Kekoaohiwaikalani Wright Prendergast for "Kaulana Nā Pua." Over the years, this *mele* has been used in the Hawaiian movement to bring our people and supporters together on issues related to politics, education, health, the economy and the environment among other important issues to our people. We ask for grace and understanding as we incorporate the spirit of this *mele* as a *kāhea* (call) for *kiaʻi* (caretakers) to come to the *kai*, *muliwai* and *kahawai* regions of every *ahupuaʻa* (land division from mountain to ocean), to reestablish *kūpuna* (ancestor) knowledge in these areas as a resource to address the impacts of modern day environmental problems such as climate change.

Kaulana Nā Pua
Kaulana nā pua aʻo Hawaiʻi
Kūpaʻa ma hope o ka ʻāina
Hiki mai ka ʻelele o ka loko ʻino
Palapala ʻānunu me ka pākaha

Source: www.huapala.org

Famous Are The Flowers
Famous are the children of Hawai'i
Ever loyal to the land
When the evil-hearted messenger comes
With his greedy document of extortion

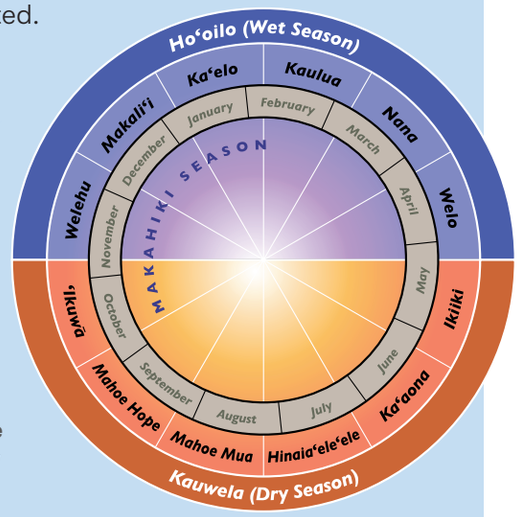
Traditionally, *nā pō mahina* (lunar phases) are used to determine when specific activities should take place, such as fishing times and spawning times when harvesting of some species was limited. Moon phase and *malama* (month) names could vary by island and *moku* (district). This calendar uses the moon phases for Oʻahu listed in the Hawaiian Almanac by Clarice Taylor (1995. Honolulu: Mutual Publishing). *Malama* names are given for both Oʻahu and Kauaʻi. The tide charts for Honolulu, Oʻahu with moon rise and set times were provided by OceanFun Publishing, NZ. Subtract about 1.5 hours to estimate the predicted tide times for Hanalei Bay on Kauaʻi. A space is provided to record personal observations for each *anahulu* (10-day period) for each *malama*.

All images provided by Hanalei River Heritage Foundation unless otherwise noted.

For an electronic version of this calendar, go to www.wpcouncil.org/educational-resources/lunar calendars.

Sources: Kanaʻiaupuni SM, Malone N. 2006. Multidisciplinary Research on Hawaiian Well-Being. Hūlili: Vol.3 No.1. | Kurashima N, Fortini L, Ticktin T. 2019. The potential of indigenous agricultural food production under climate change in Hawaiʻi. Nature Sustainability, 2, issue 3, p. 191-199.

The days of the wet season months are colored purple to lavender, and the dry season months are pink to orange.



The Western Pacific Regional Fishery Management Council has worked with communities in Hawaiʻi, American Samoa, Guam and the Commonwealth of the Northern Mariana Islands since 2006 to produce traditional lunar calendars to promote ecosystem-based fisheries management, support indigenous fishing and management practices, and enhance community involvement in the fisheries management decision-making process. In Hawaiʻi, the Council strongly supports the traditional *ʻaha moku* system of natural resource management, which recognizes the traditional *moku* as a basis for cultural and community consultation, adaptive management, education, general knowledge and a code of conduct. More information and the *ʻaha moku* system can be found at www.wpcouncil.org and www.ahamoku.org.

The Hanalei River Heritage Foundation partners with the community to increase the use of Hawaiian language, literature, traditional practices as the foundation of stewardship on the island of Kauaʻi. This same foundation is used to develop educational materials and teach environmental stewardship and to address the impacts of climate change and other threats to island environments. In doing so, the Foundation perpetuates the use of traditional practices and knowledge to improve the overall management of natural and cultural resources in a modern day context. https://hanaleiriverheritagefoundation.org

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Front cover: Aerial view of Hanalei River on the north shore of Kauaʻi, Hawaiʻi.