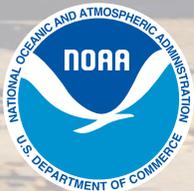


# Hanalei Moon and Tide Calendar 2013



Hanalei Watershed Hui



This calendar was developed through a partnership between the Hanalei Watershed Hui, Papahānaumokuākea Marine National Monument, the Hawaiian Islands Humpback Whale National Marine Sanctuary, and the Hanalei community, to raise awareness about the connections between different environmental processes in Hanalei. The calendar demonstrates the lunar cycle and the tides which follow the moon. Traditional Hawaiian knowledge about fish spawning was often based on lunar cycles and seasonal changes, so a portion of the calendar also explains how to observe and determine the spawning season for fish.



### Terms Used In the Calendar

In each month, there is a summary of seasonal fishing regulations administered by the State of Hawai'i through the Department of Land and Natural Resources, Division of Aquatic Resources (DAR). There are additional regulations which apply year-round, such as size or gear restrictions. These year-round regulations are not displayed in the calendar, so for more information, see the DAR website at <http://hawaii.gov/dlnr/dar/index.html>

### Closed Season

These periods are based on current seasonal regulations administered by the State of Hawai'i through the Department of Land and Natural Resources, Division of Aquatic Resources (rules can be found at <http://hawaii.gov/dlnr/dar/rules/ch95.pdf>). During a closed season for a given species, there is a ban on taking, possessing, or selling that species. For example, there is a closed season for mullet (*Mugil cephalus*) from December through March.

### Limited Harvest

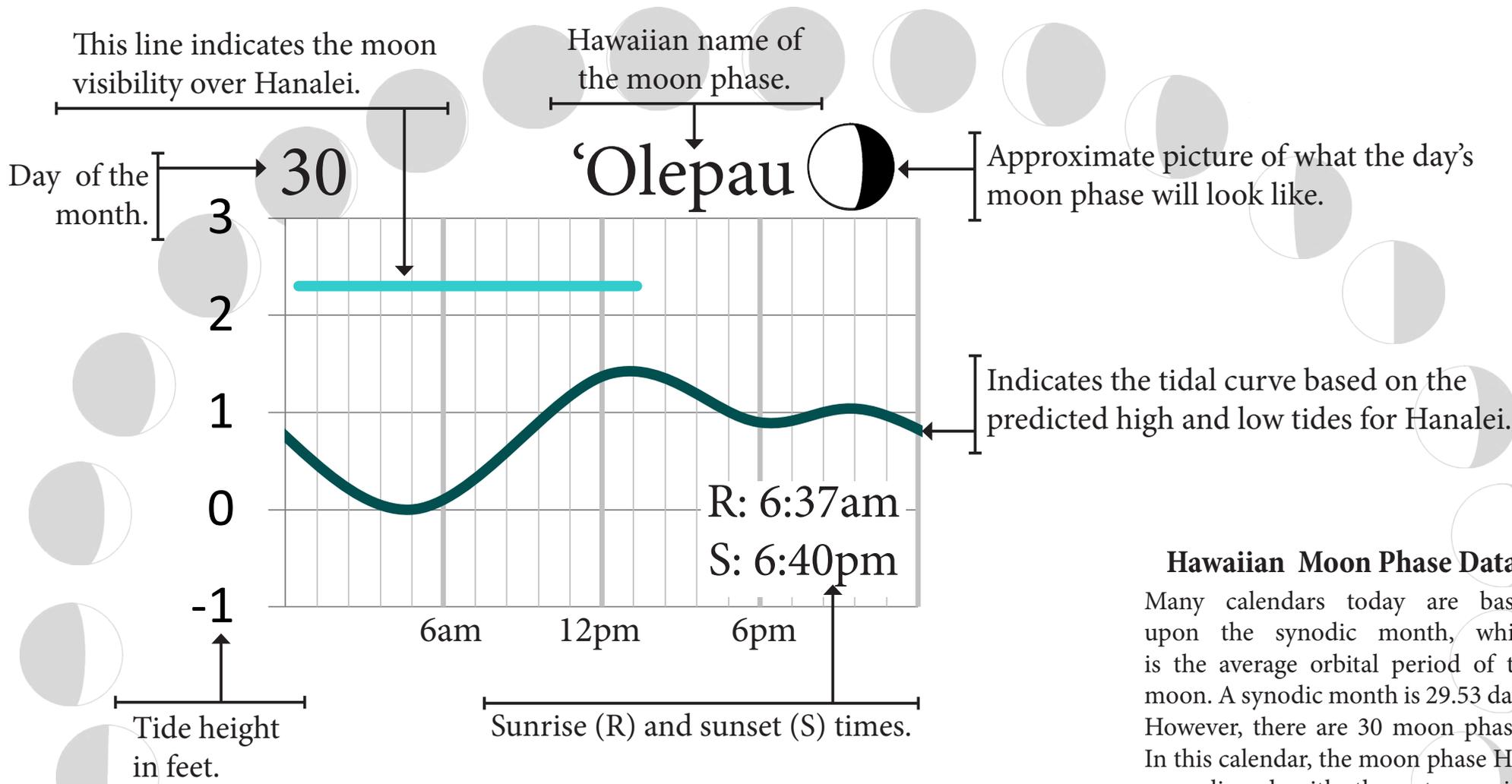
While a closed season is a complete harvest restriction during certain months, some species have limited harvest periods alone, or in addition to, closed season periods. Limited harvest can regulate fishing technique (e.g., use of net), number of fish harvested, size of fish harvested, or total weight of harvest. For example, there is a closed season for moi (*Polydactylus sexfilis*) from June through August, but from September through May there is a limited harvest of fifteen moi per day.

### Suggested Limited Harvest

These periods are based upon observations and gonad data of fish that were caught in the Hanalei area. Limited harvest is suggested during the peak spawning months so fish may reproduce undisturbed. Suggested Limited Harvest is not a part of any State of Hawai'i or Federal regulations, see January page for more information.

This box will appear for every month, and it displays both the Hawaiian months and Gregorian months. The Hawaiian months coincide with the 30 phases of the moon. Each month begins with the moon phase named Hilo (new moon) and finishes with Maui or Muku. The Gregorian months are the standard months that are most widely accepted and used internationally.

January	February	March	April	May	June	July	August	September	October	November	December
Jan. 11 - Feb. 9	Feb. 10 - Mar. 10	Mar. 11 - Apr. 9	Apr. 10 - May 9	May 10 - Jun. 7	Jun. 8 - Jul. 7	Jul. 8 - Aug. 5	Aug. 6 - Sept. 4	Sept. 5 - Oct. 4	Oct. 4 - Nov. 2	Nov. 3 - Dec. 2	Dec. 3 - Dec. 31
Hilioholo	Hilionalu	Hukipau	ʻIkuwā	Welehu	Kāʻelo	Ikiiki	Hinaiāʻeleʻele	Māhoe Mūa	Māhoe Hope	Hilinamā	Hilinehu



### Hawaiian Moon Phase Data

Many calendars today are based upon the synodic month, which is the average orbital period of the moon. A synodic month is 29.53 days. However, there are 30 moon phases. In this calendar, the moon phase Hilo was aligned with the astronomical new moon according to the US Naval Observatory ([http://aa.usno.navy.mil/cgi-bin/aa\\_moonphases.pl?year=2013&ZZZ=END](http://aa.usno.navy.mil/cgi-bin/aa_moonphases.pl?year=2013&ZZZ=END)). The days and times are based on Universal Time which was converted to Hawai'i Standard Time for this calendar. The rest of the moon phases are laid out accordingly. The moon phase Muku is omitted for months where the next new moon occurs 29 days after the current months' new moon.

### Tidal Correction Chart

Tidal predictions in this calendar are based on Nawiliwili Bay. Therefore, the tide correction chart should be used to approximate tides for Hanalei, Waimea, Hanapepe, and Hanamaulu Bay. You will need to multiply (\*), add, or subtract to calculate the differences at each site. The adjustments provided do not represent the official NOAA predictions for these locations, and should not be used for navigation or where the use of the predictions may result in harm to people or property.

	Time		Height	
	H	L	H	L
Hanalei Bay	-1.01	-1.22	*1.07	*0.91
Waimea Bay	+0.07	+0.18	*0.86	*0.91
Hanapepe Bay	-0.15	-0.10	*1.01	*1.00
Hanamaulu Bay	+0.10	+0.04	*1.00	*0.91



# Ianuali

# January

Lāpule  
Sunday

Pō'akahi  
Monday

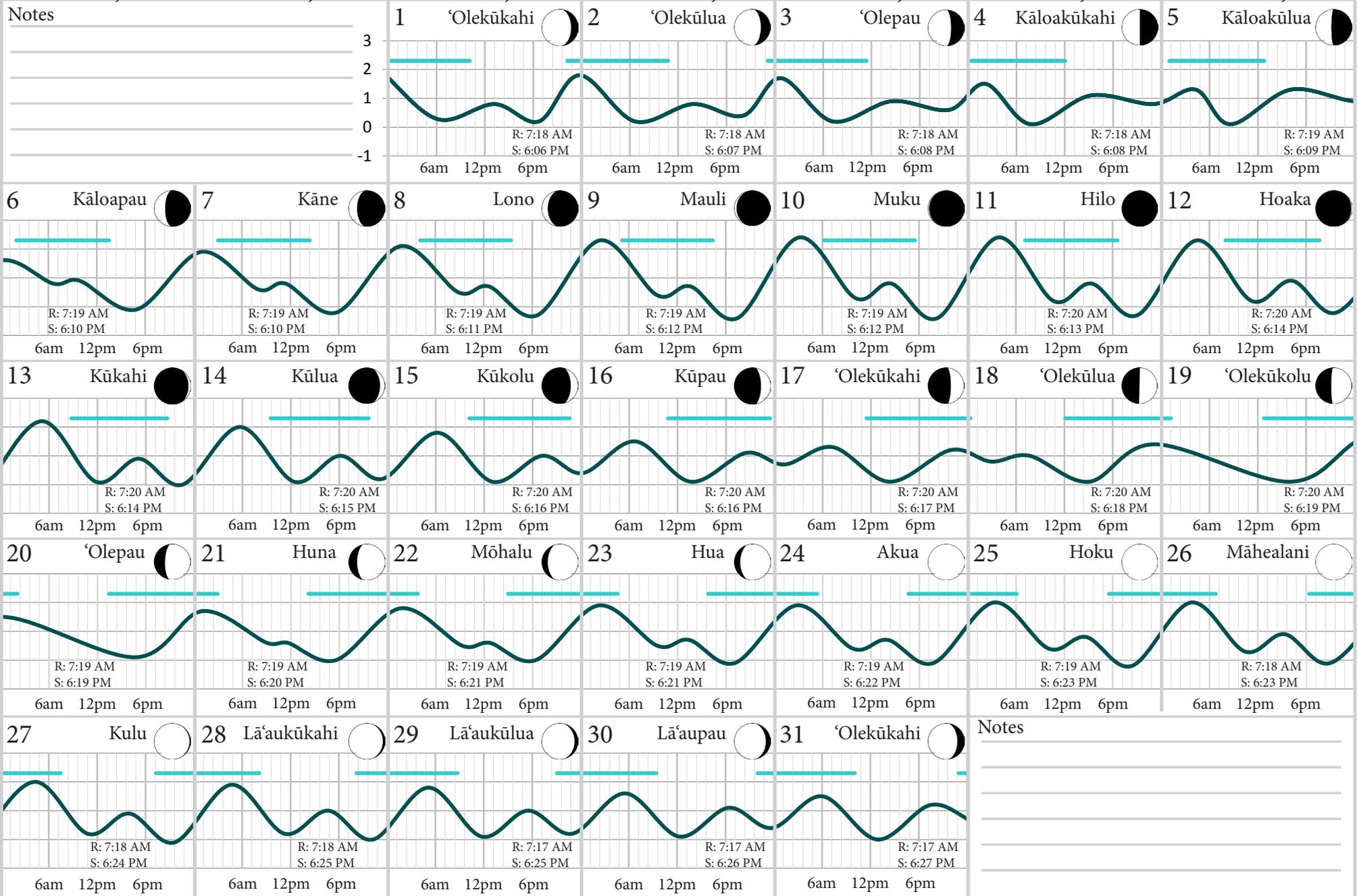
Pō'aluā  
Tuesday

Pō'akolu  
Wednesday

Pō'ahā  
Thursday

Pō'alima  
Friday

Pō'aono  
Saturday





# Pepeleuali

# February

Lāpule  
Sunday

Pōākahi  
Monday

Pōʻālua  
Tuesday

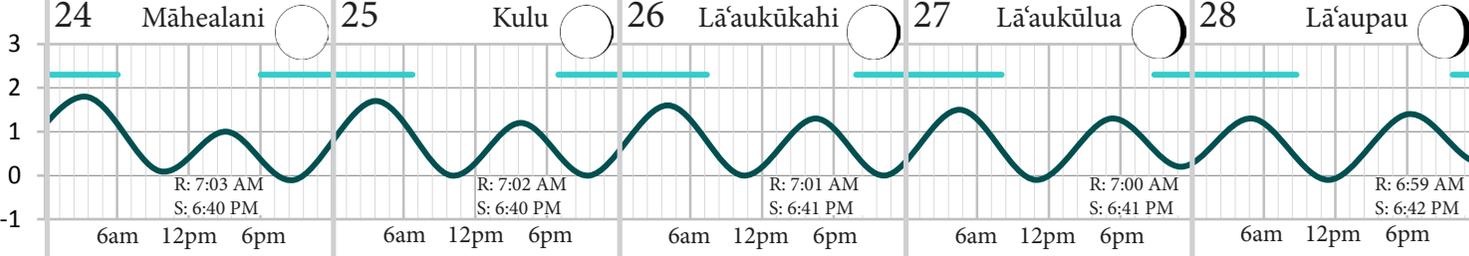
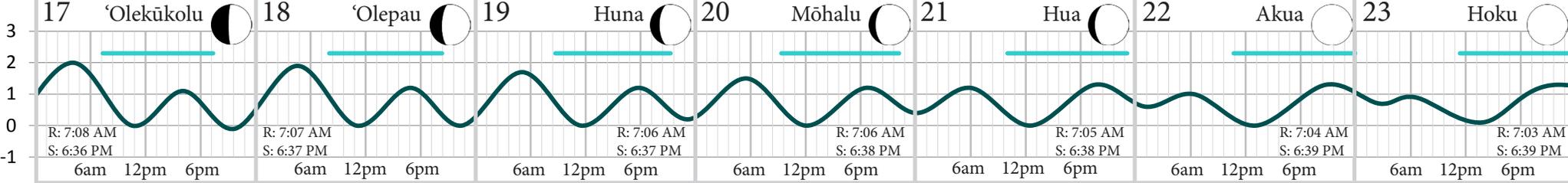
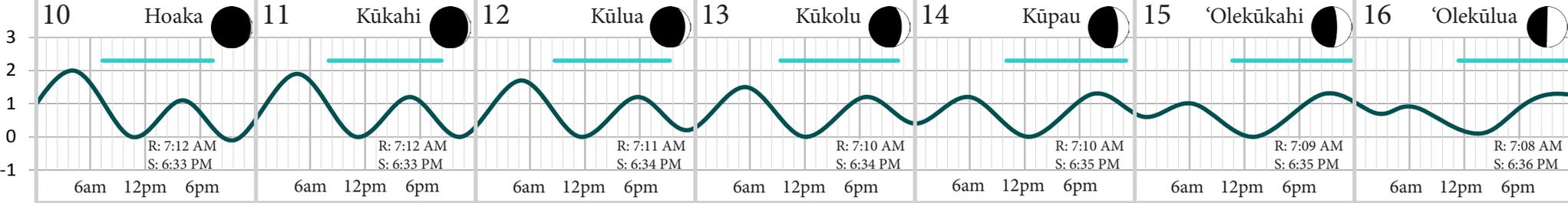
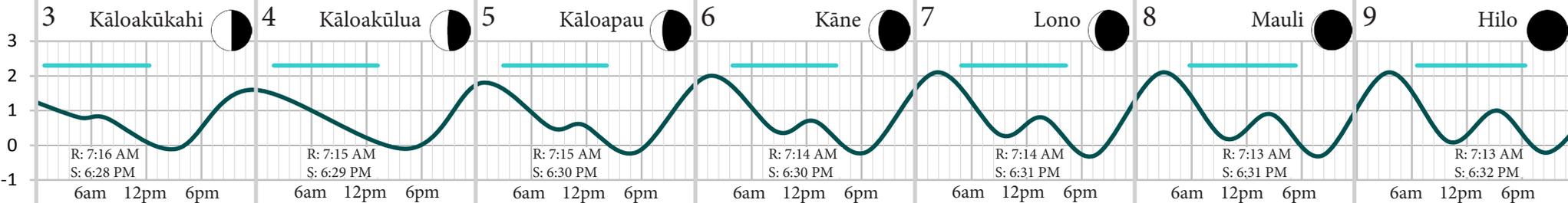
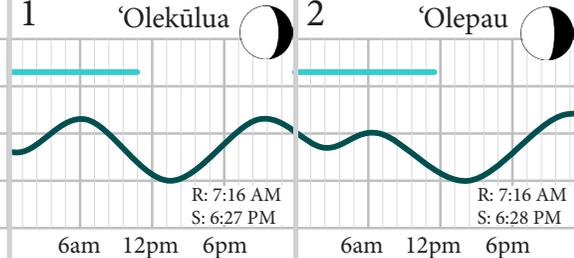
Pōʻakolu  
Wednesday

Pōʻahā  
Thursday

Pōʻālima  
Friday

Pōʻāono  
Saturday

Notes



Notes

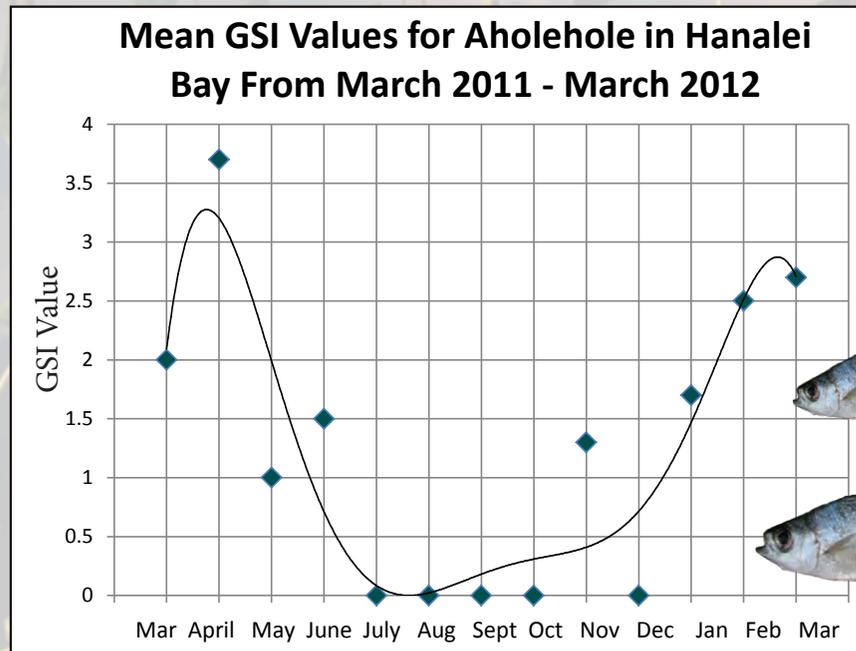
# Determining Spawning Cycles

Each month, data on fork length, weight, and gonad weight was recorded from several adult fish in Hanalei. The gonadosomatic index (GSI) is a ratio of the gonad weight to the weight of the fish. This value provides a way to compare the amount of sperm or eggs in fishes during different months.

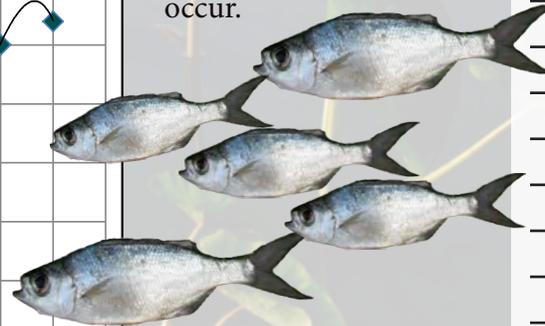
$$\text{GSI} = \frac{\text{Gonad Weight}}{\text{Somatic Weight}} \times 100$$

$$\text{Somatic Weight} = \text{Total Weight} - \text{Gonad Weight}$$

The resulting GSI data is then plotted on a graph to show when gonad weight, and therefore spawning, has reached its peak for each species. The following is the GSI graph produced for āholehole (*Kuhlia xenura*).



Based on GSI data, predictions can be made for 2013, although variations in the peak spawning months are likely to occur.



## Closed Season



'Ama'ama (Mullet)

## Limited Harvest



Moi (15 per day)

## Suggested Limited Harvest

Āholehole



Manini

Notes

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January	February	March	April	May	June	July	August	September	October	November	December
	Feb. 10 - Mar. 10	Mar. 11 - Apr. 9									
Hilioholo	Hilionalu	Hukipau	'Ikuwā	Welehu	Kā'elo	Ikiiki	Hinaiā'ele'ele	Māhoe Mua	Māhoe Hope	Hilinamā	Hilinehu

# Malaki

# March

Lāpule  
Sunday

Pōākahi  
Monday

Pōʻalua  
Tuesday

Pōʻakolu  
Wednesday

Pōʻahā  
Thursday

Pōʻalima  
Friday

Pōʻaono  
Saturday

Notes

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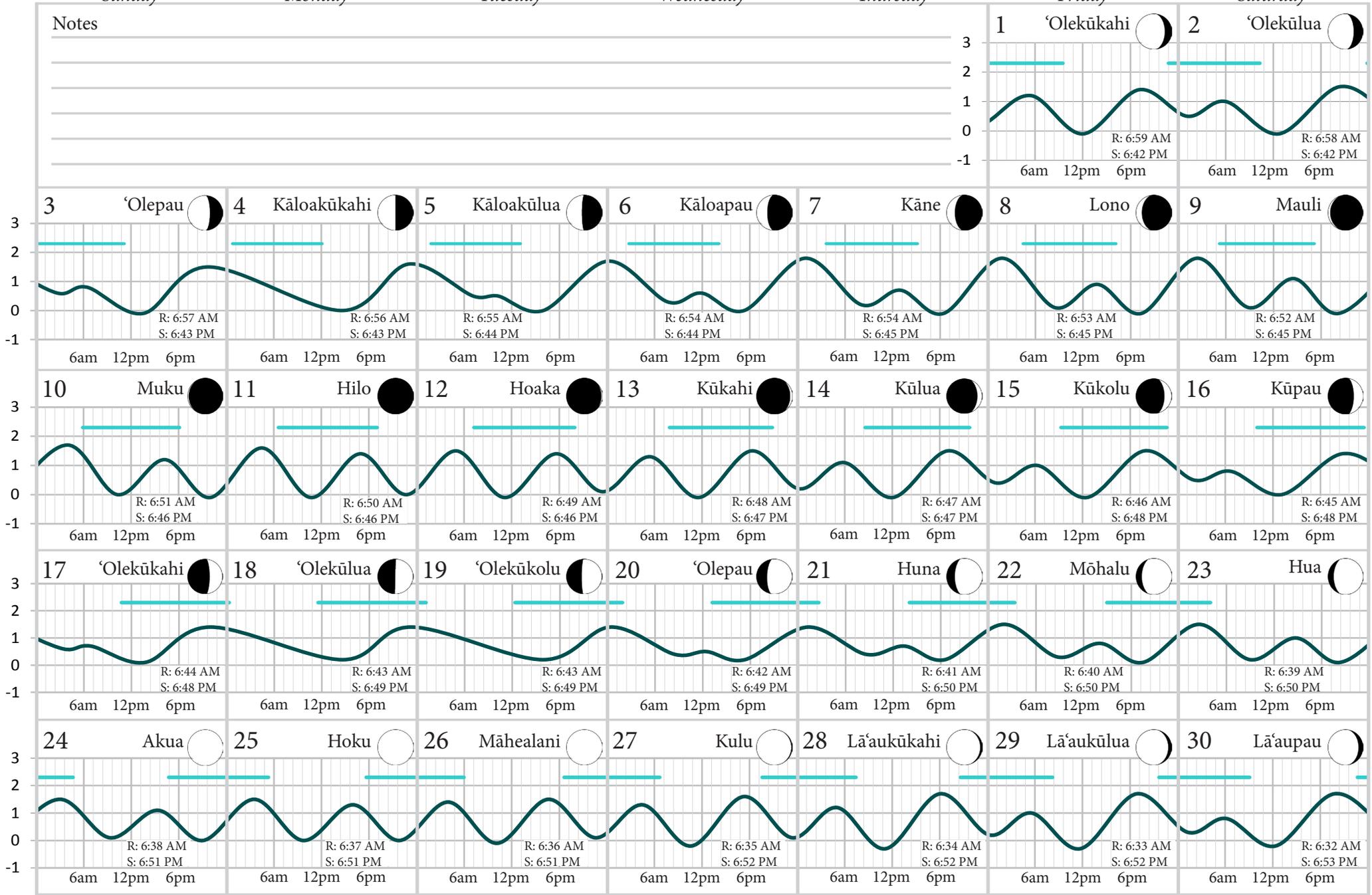
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# Names of Hanalei

**Kauloku o Hanalei** is the soaking rain of Hanalei.

**Kauahā'ao** is a gentle rain that falls over **Hihīmanu**, and its showers follow one another in a way that is similar to the divisions in a chief's procession.

The **Hehipuahala** (stepping upon hala) rain is associated with Po'okū because the plains were once covered with hala.

**Lena** is a yellow-tinted rain, describing its occurrence in sunshine.

**Kū'ula o 'Anini** (red Kū of 'Anini) is a rain favored by fishermen.

**Waikoko, Waipā, Wai'oli, and Hanalei** are the four ahupua'a in the Hanalei Bay area.

The dominant peak in Hanalei is named **Māmalahoa**, named after the wife of Kāne.

**Hihīmanu** is the double-peaked mountain, named for the abundant rays along the Nāpali Coast.

The massif between Māmalahoa and Hihīmanu is named **Nāmolokama** (interweaving bound fast), where over twenty waterfalls cascade down its face after heavy rains.

**Hauka'ē'e o Hanaleiiki** (dried up dews of Hanaleiiki) is the name of the wind that blows just above the river mouth.

**Haumu** (silent dew), **Hau'ōma'ō** (green dew), and **Lūhau o Hanaleiuka** (scattered dews of upland Hanalei) are also winds in Hanalei.

There are also rougher winds of Hanalei; **'Ōauniu o Pu'ūpoa** (coconut leaf piercing wind of Pu'ūpoa) and **Paehahiokaiholena** (row of trampled iholena banana trees).

Wichman, Frederick B. 1998. Kauai: Ancient place-names and their stories. University of Hawaii Press, Honolulu.

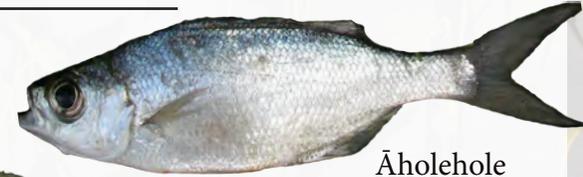
Wichman, Frederick B. 2006. Touring the legends of the North Shore. Kauai Historical Society, Lihū'e.

## Limited Harvest



Moi (15 per day)

## Suggested Limited Harvest



Manini

Āholehole



Akule



'Ōmilu



'Ōpelu

## Notes

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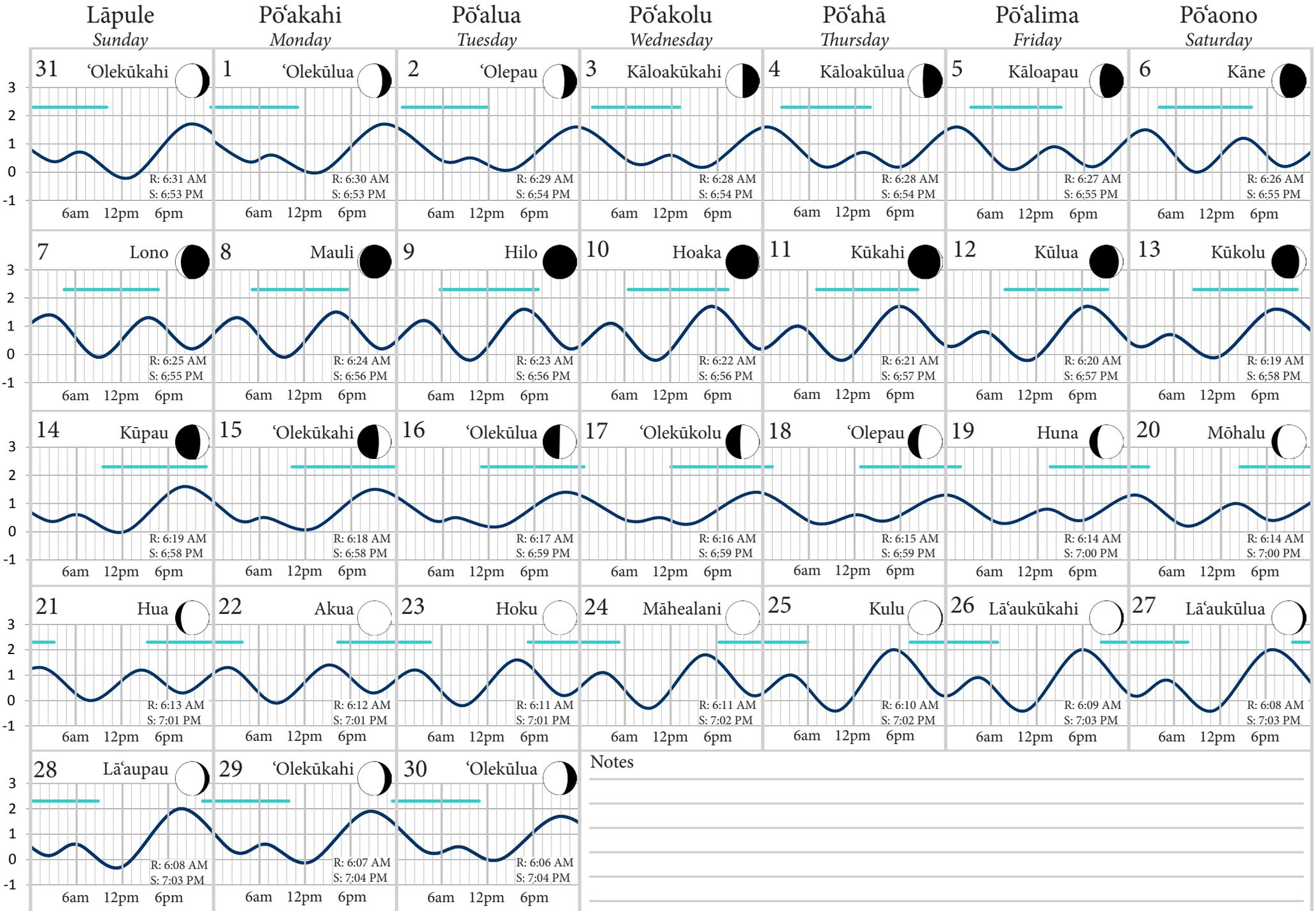
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January February March April May June July August September October November December

Hilioholo Hilionalu *Mar. 11 - Apr. 9* Hukipau *Apr. 10 - May 9* 'Ikuwā Welehu Kā'elo Ikiiki Hinaiā'ele'ele Māhoe Mua Māhoe Hope Hilinamā Hilinehu

# ‘Apelila

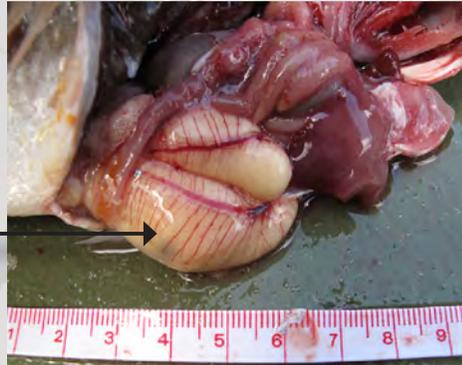
# April



# 3 Steps to Track Fish Gonad Development

**Observe:** When cleaning your fish, pay attention to the presence and size of gonads (eggs or sperm).

Developed eggs are usually yellowish in color with bright red blood vessels very apparent.



**Measure:** Weighing gonads on a digital scale is the best way to track their development, however, if you don't have access to a good scale, you can measure the length of the gonads.

Remove gonads and weigh in appropriate units.



**Record:** Keep track of gonad development over the months to find the peak spawning period of the fish you routinely harvest. Avoid catching them when gonads are developed.

Fish	Date of Catch (M/DD/YY)	Weight (Ounces)	Fork Length (Inches)	Sex (M/F)	State of Gonads (Ripe, Developed, Under Developed, Not Present)	Weight of Gonads (Grams)	Picture (file name)
Aholehole	3/22/12	6.2	8.75	F	Developed	5	
		6.2	8.75	M	Developed	6	
		6.5	9.0	F	Developed	3	
		5.2	8.25	M	Developed	5	
		6.0	8.5	F	Ripe	7	IMa_1029
		5.6	8.25	F	Developed	3	

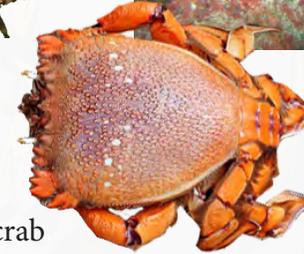
## Closed Season



Ula Papapa (slipper lobster)



Ula (spiny lobster)



Kona crab

## Limited Harvest



Moi (15 per day)

## Suggested Limited Harvest



Manini



'Ōmilu



Akule



'Ōpelu

January	February	March	April	May	June	July	August	September	October	November	December
Hiliohola	Hilionalu	Hukipau	Apr. 10 - May 9 'Ikuwā	May 10 - Jun. 7 Welehu	Kā'elo	Ikiiki	Hinaiā'ele'ele	Māhoe Mua	Māhoe Hope	Hilinamā	Hilinehu

# Mei

# May

Lāpule  
Sunday

Pō'akahi  
Monday

Pō'ālua  
Tuesday

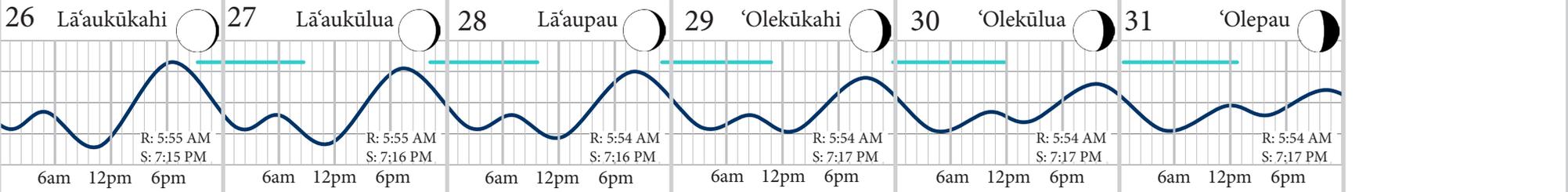
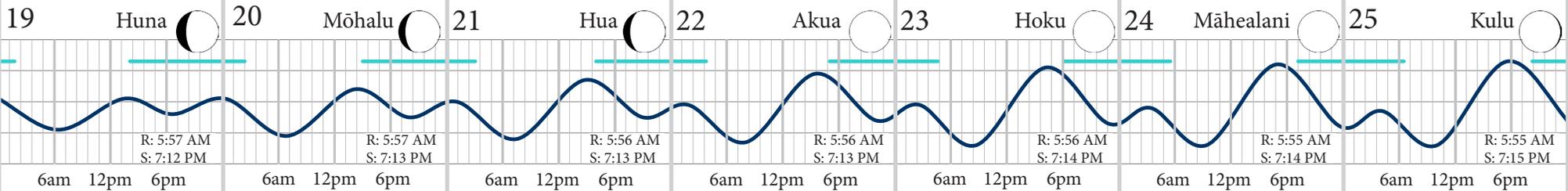
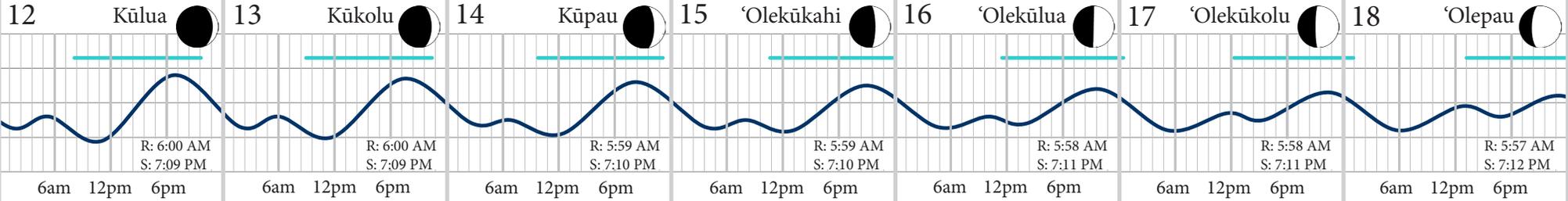
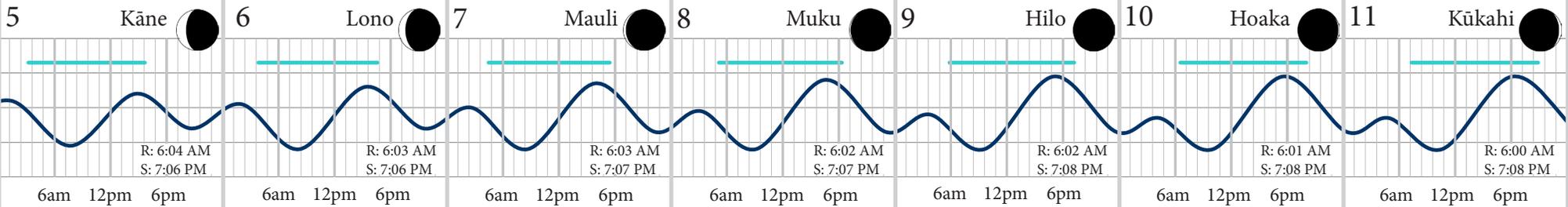
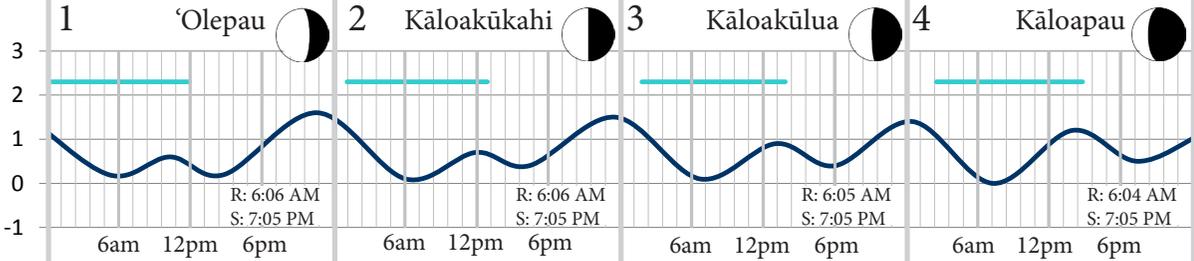
Pō'akolu  
Wednesday

Pō'ahā  
Thursday

Pō'alima  
Friday

Pō'aono  
Saturday

Notes



# Divisions of the Year

The Hawaiian names and seasons of the year can differ from island to island and also within one island. The year was divided into either two or three seasons (Kau, **Hō'oilō**, **Makali'i**), and twelve months. Below are some of the recorded names and seasons. The months are numbered from 1 through 12; these numbers also represent the approximate Gregorian calendar months (Jan. Feb. Mar., etc) when the Hawaiian month occurs.

## Hawai'i

1. Kā'elo
2. Kaulua
3. Nana
4. Welo
5. Ikiiki
6. Ka'aona
7. Hinaiāeleele
8. Māhoe Mua
9. Māhoe Hope
10. 'Ikuwā
11. Welehu
12. Makali'i

## Moloka'i

1. 'Ikuwā
2. Hinaiā eleele
3. Welo
4. Makali'i
5. Kā'elo
6. Kaulua
7. Nana
8. Ikiiki
9. Ka'aona
10. Hilinaehu
11. Hilinamā
12. Welehu

## Kaua'i

1. Hilioholo
2. Hilionalu
3. Hukipau
4. 'Ikuwā
5. Welehu
6. Kā'elo
7. Ikiiki
8. Hinaiāeleele
9. Māhoe Mua
10. Māhoe Hope
11. Hilinamā
12. Hilinaehu

## Maui

1. 'Ikuwā
2. Welehu
3. Makali'i
4. Kā'elo
5. Kaulua
6. Nana
7. Welo
8. Ikiiki
9. Ka'aona
10. Hinaiāeleele
11. Hilinehu
12. Hilinamā

## O'ahu

1. Nana
2. Welo
3. Ikiiki
4. Ka'aona
5. Hinaiāeleele
6. Māhoe Mua
7. Māhoe Hope
8. 'Ikuwā
9. Welehu
10. Makali'i
11. Kā'elo
12. Kaulua

### Closed Season



Ula Papapa  
(slipper lobster)



Ula (spiny lobster)



Kona crab



Moi

### Suggested Limited Harvest



Manini



'Ōmilu



Akule



'Ōpelu

Malo, D., and N. B. Emerson. Hawaiian Antiquities. Honolulu: Bishop Museum, 1951. Print.

January	February	March	April	May	June	July	August	September	October	November	December
Hilioholo	Hilionalu	Hukipau	'Ikuwā	May 10 - Jun. 7 Welehu	Jun. 8 - Jul. 7 Kā'elo	Ikiiki	Hinaiā'ele'ele	Māhoe Mua	Māhoe Hope	Hilinamā	Hilinehu

# June

# June

Lāpule  
Sunday

Pō'akahi  
Monday

Pō'ālua  
Tuesday

Pō'akolu  
Wednesday

Pō'ahā  
Thursday

Pō'alima  
Friday

Pō'aono  
Saturday

Notes

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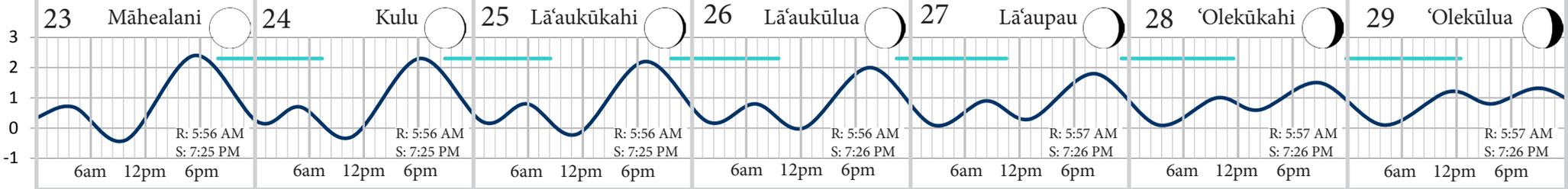
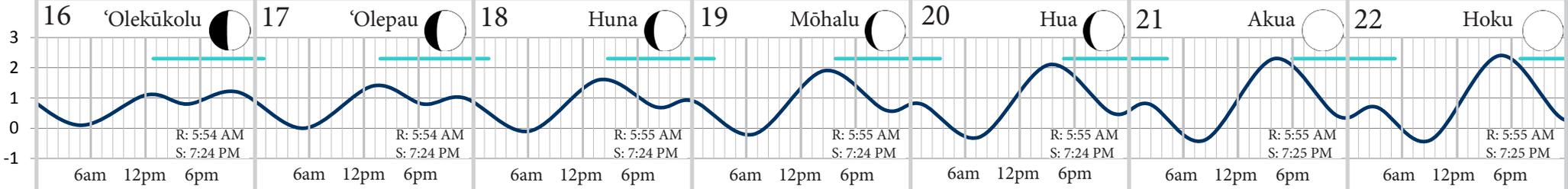
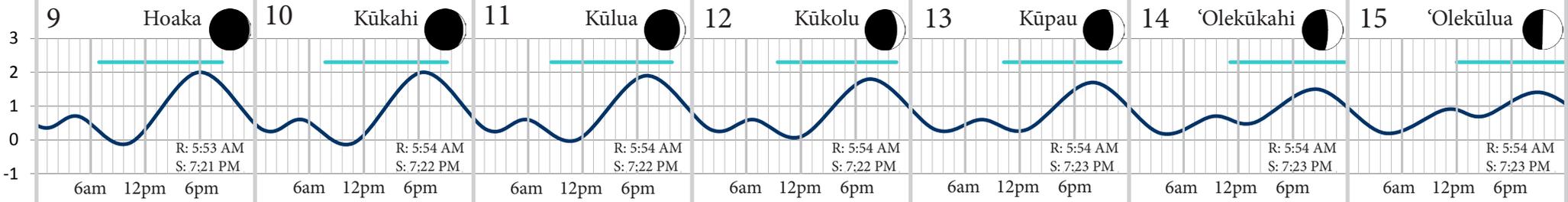
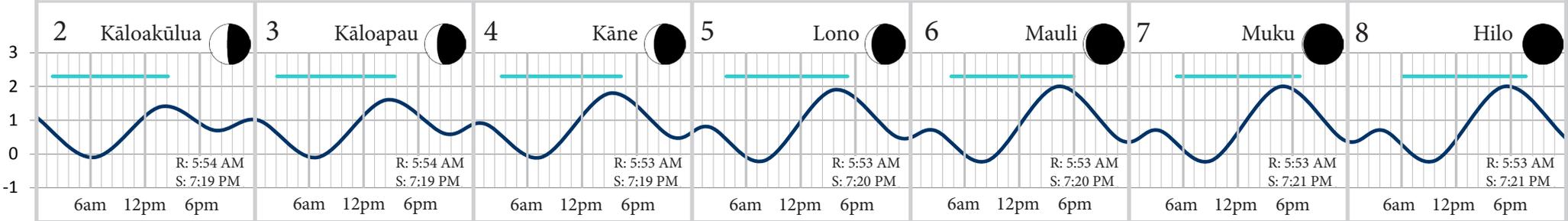
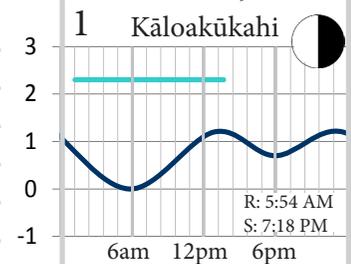
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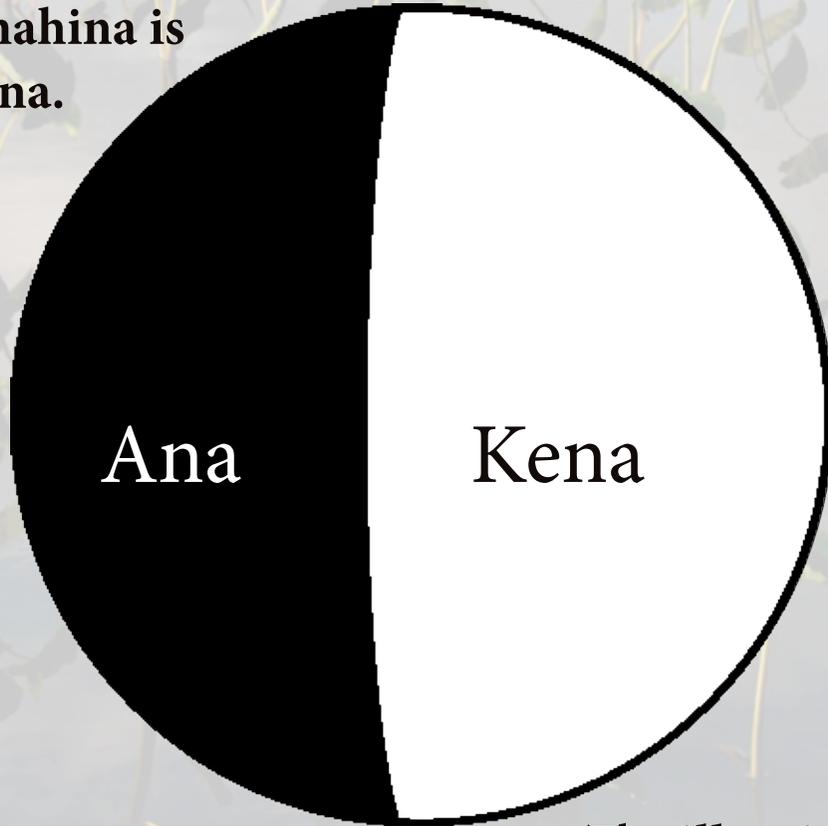
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# He Ana a he Kena

Dark and Light

The dark part of the mahina is called ana.



The illuminated side of the mahina is called kena.

## Closed Season



Ula Papapa (slipper lobster)



Ula (spiny lobster)

Kona crab



Moi



## Limited Harvest

Halalū



## Suggested Limited Harvest

‘Ōmilu



‘Ōpelu



Akule

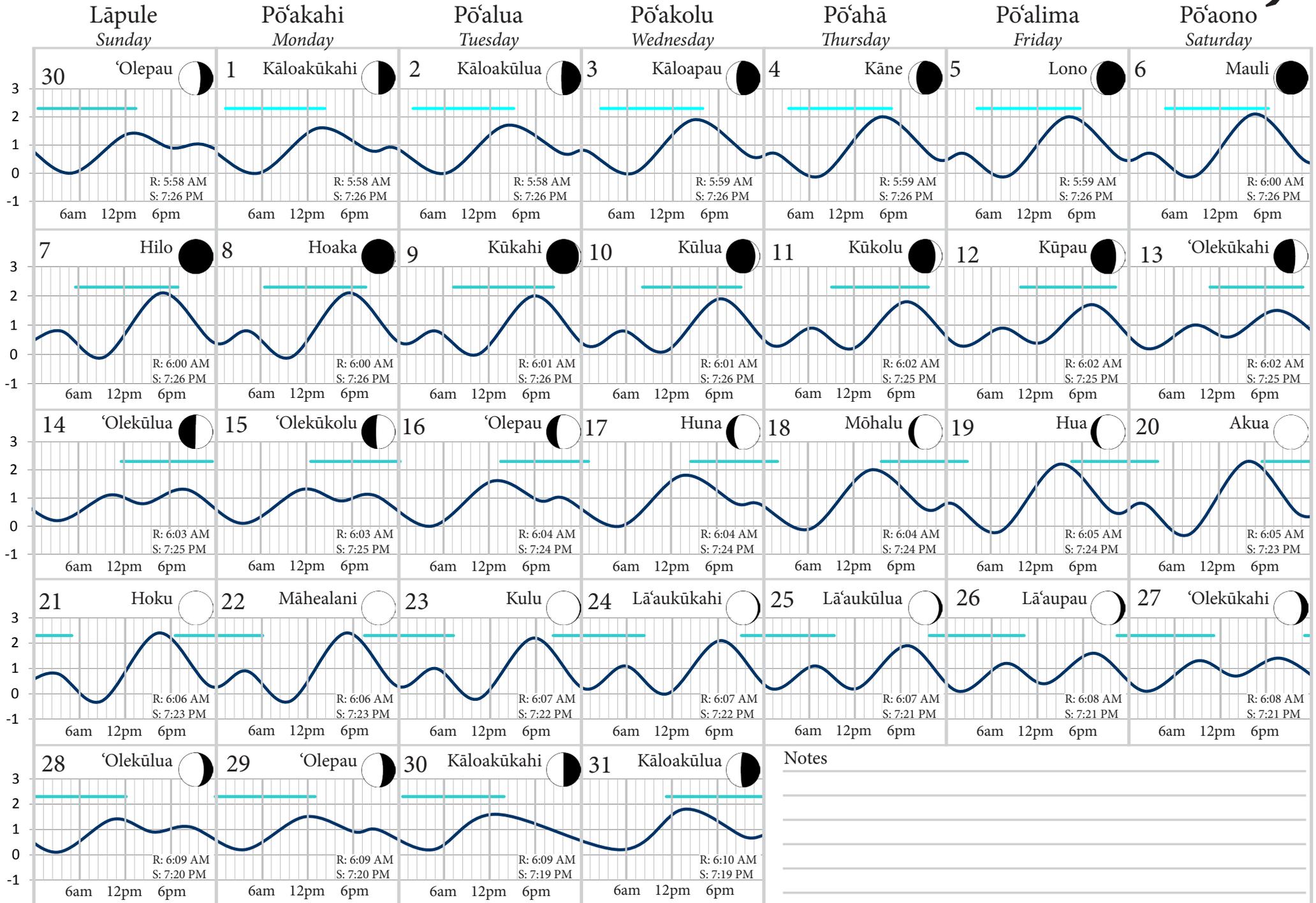


Kanaka’ole Kanahale, Pualani, Huihui Kanahale-Mossman, Kalei Nu’uhiwa, and Ku’ulei Higashi Kanahale. Mahina. Hawai’i: Edith K. Kanaka’ole Foundation, 2011. Print

January	February	March	April	May	June	July	August	September	October	November	December
Hiliohola	Hilionalu	Hukipau	‘Ikuwā	Welehu	Jun. 8 - Jul. 7 Kā’elo	Jul. 8 - Aug. 5 Ikiiki	Hinaiā’ele’ele	Māhoe Mua	Māhoe Hope	Hilinamā	Hilinehu

# Iulai

# July



# Hanalei Bay Ocean Rules

There are some boating and recreation rules that are specific to Hanalei Bay. There are some state boating and recreation rules that are specific to Hanalei Bay ocean waters (confined by the straight line between the northernmost tip of Makahoa Point and Pu'u Poa Point).

**THIS LIST IS A SIMPLE SUMMARY AND NOT A LEGAL DOCUMENT.** The complete version of these rules can be found at <http://hawaii.gov/dlnr/dbor/rules/Amendment%2013-256.pdf>

- Operate at “slow-no-wake” within 500 feet of the shoreline, Ingress/Egress zones (described below), designated mooring areas (described below), or on the Hanalei River.
- No motorboat operation within 300 feet of a diver’s flag or designated swimming area.
- No anchoring or mooring except within the designated mooring area.
- On vessels 30 feet or longer, no fishing except by pole and line.
- Commercial vessels cannot load or unload passengers without a permit.
- Guided kayak tours, launching from Hanalei ramp, require a permit.
- Commercial uses in Hanalei Bay generally require permits from DLNR.
- Swimming zones include the water 300 feet seaward of the low water mark and 300 feet on each side of Hanalei Pier (Zone B-1) and 300 feet seaward of the low water mark and between the county park extended boundary containing the beach pavilion (Zone B-2). These zones are designated for bathing and swimming, but Hawaiian outrigger canoes, small-scale surround net fishing without motors, fishing, or crabbing from shore are allowed.
- The designated mooring area is described in detail and on a map at <http://hawaii.gov/dlnr/dbor/rules/Amendment%2013-256.pdf>. All watercraft should only moor or anchor in the designated area. No permanent mooring should be installed except with a permit.
- Both commercial and recreational vessels should access the beach solely in these two Ingress/Egress zones: (1) southern boundary of County Park pavilion parcel, 300 feet southwest along the shoreline, then seaward to the designated mooring area, (2) north bank of Hanalei River, cross the river mouth to the northern boundary of Black Pot Park, then seaward to the designated mooring area.

## Closed Season



Ula Papapa  
(slipper lobster)



Ula (spiny lobster)

Kona crab



Moi



## Limited Harvest

Halalū



## Suggested Limited Harvest

‘Ōpelu



Akule



January	February	March	April	May	June	July	August	September	October	November	December
Hiliohola	Hilionalu	Hukipau	‘Ikuwā	Welehu	Kā‘elo	Jul. 8 - Aug. 5 Ikiiki	Aug. 6 - Sept. 4 Hinaiā‘ele‘ele	Māhoe Mua	Māhoe Hope	Hilinamā	Hilinehu

# 'Aukake

# August

Lāpule  
Sunday

Pō'akahi  
Monday

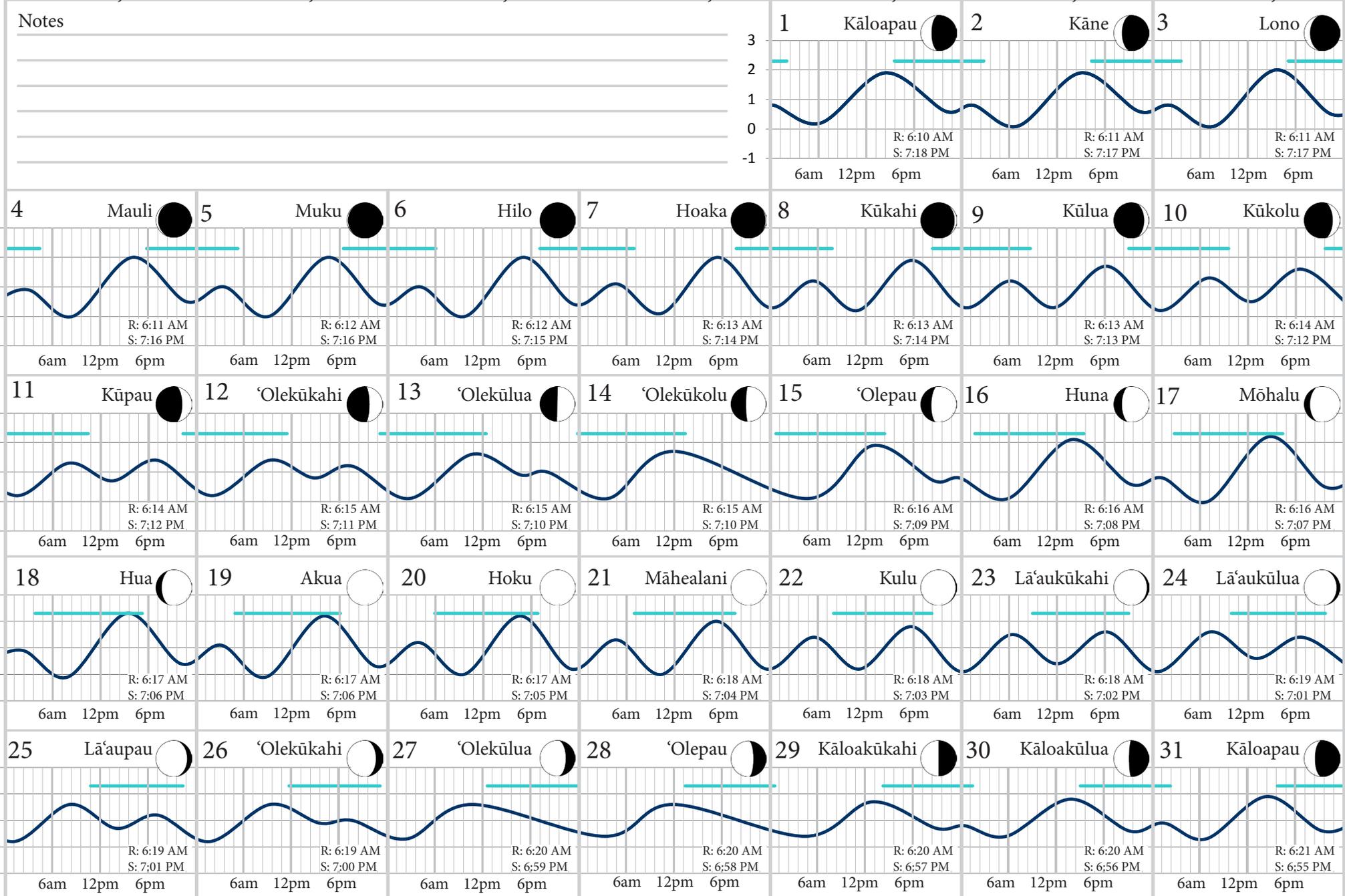
Pō'aluā  
Tuesday

Pō'akolu  
Wednesday

Pō'ahā  
Thursday

Pō'alima  
Friday

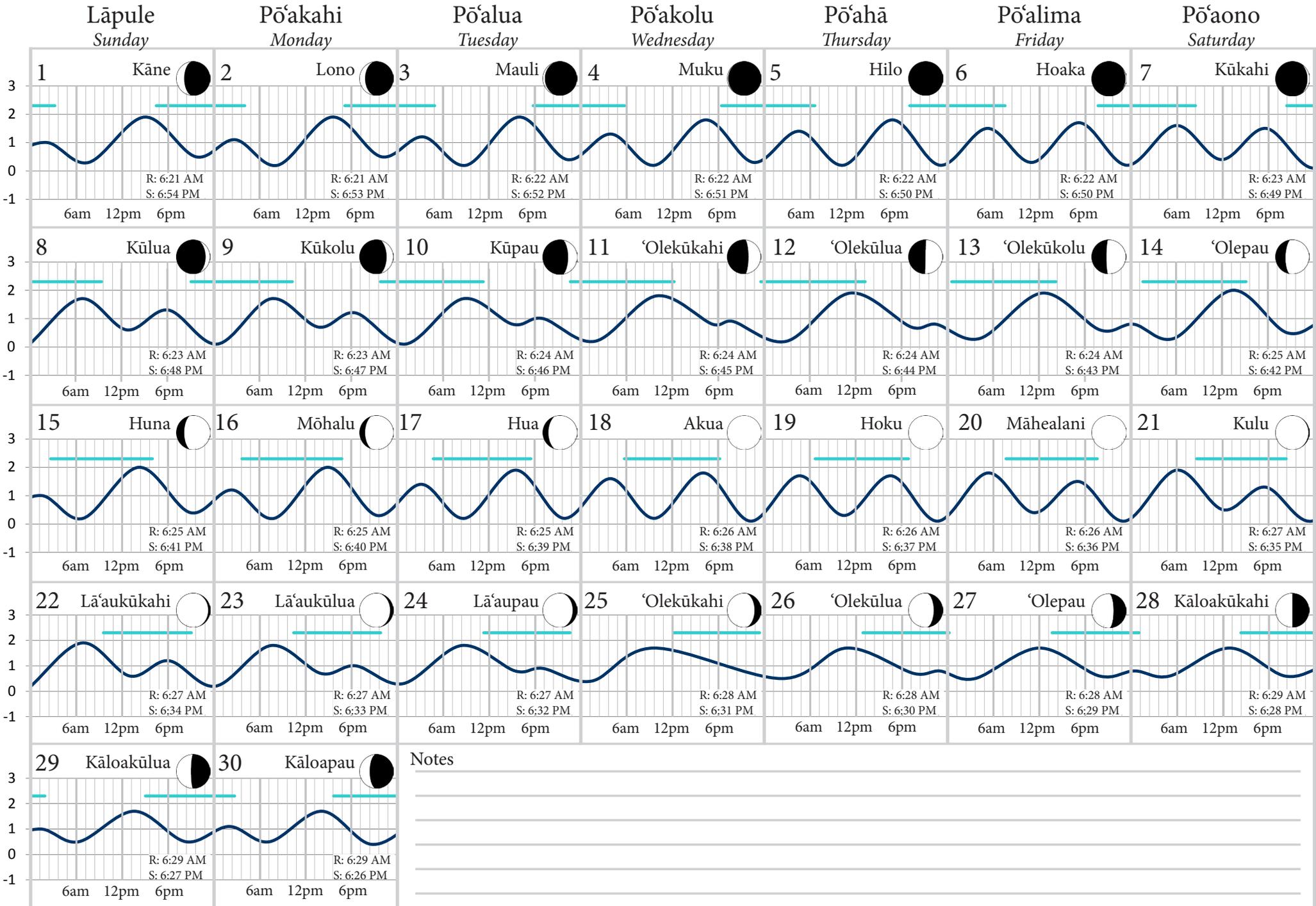
Pō'aono  
Saturday





# Kepakemapa

# September





# 'Okakopa

# October

Lāpule  
Sunday

Pō'akahi  
Monday

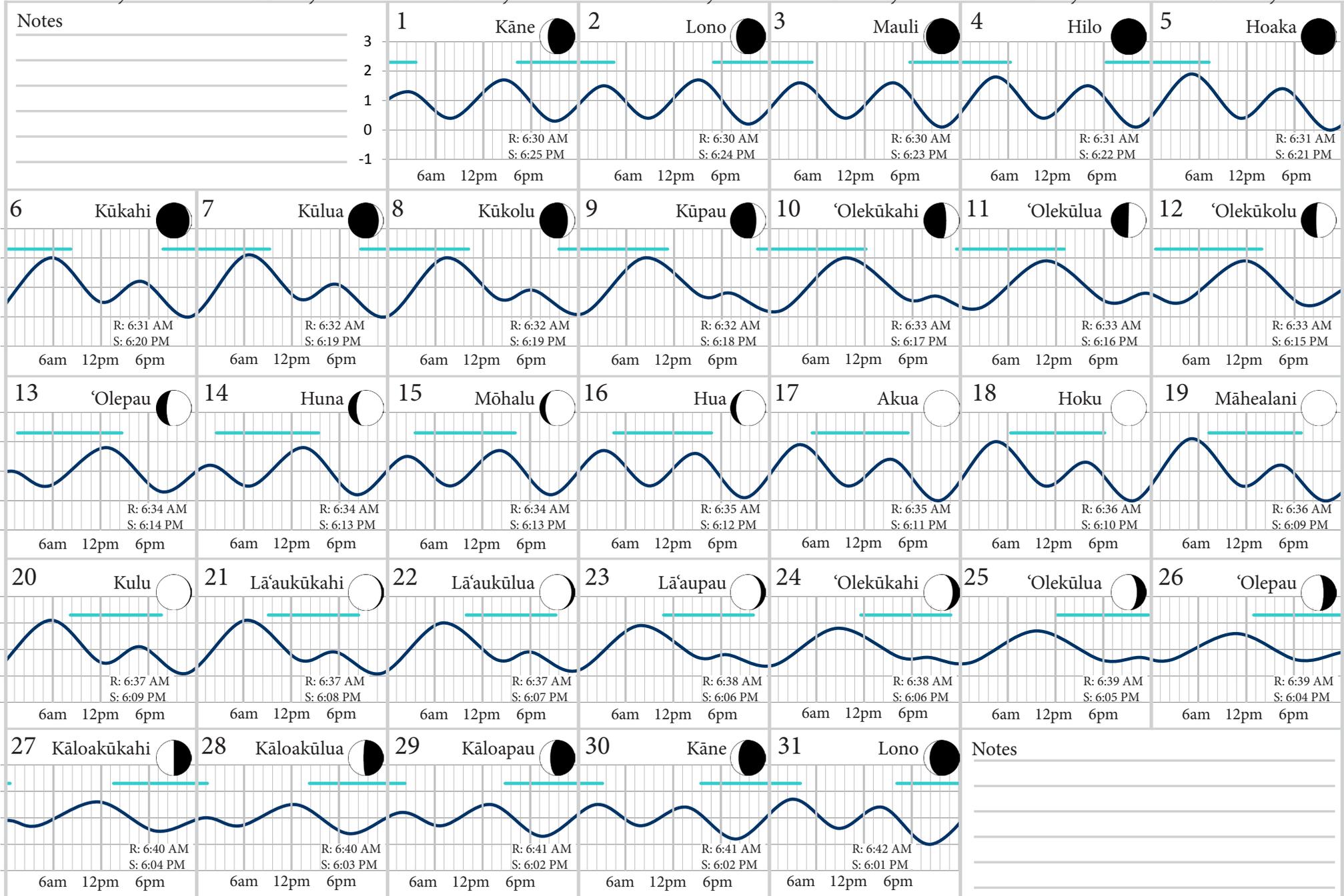
Pō'aluā  
Tuesday

Pō'akolu  
Wednesday

Pō'ahā  
Thursday

Pō'alima  
Friday

Pō'aono  
Saturday



# Nā Ao - Clouds

Local weather conditions can influence fish movement and behavior, and even spawning, so fishermen should always be observant of patterns in their areas. Cloud observation is one way to predict conditions in the weather, which sometimes indicate good or bad times to fish.

## Noho nō ke kanaka a ka lā mālie,

### kau ka ipu hōkeo a ka lawai'a, nānā ana i ka 'ōpua

A person waits for a clear day, sets up the gourd that holds the fisherman's paraphernalia, and observes the clouds (to a fisherman, a clear day, his tools, and the signs and omens seen in the clouds are important).

## Kūkulu ka 'ike i ka 'ōpua

Knowledge is set up in the clouds. Clouds are observed for signs and omens.

## Nā maka o ka makani

Eyes of the wind. Clouds, which show the direction of the wind.

## Kaka'i ka puapua'a i ka mālie, he 'ino

When the piglets follow one after the other in the calm, it is a sign of bad weather. When the clouds called ao puapua'a, or pua'a, "pig" clouds, follow one after the other on the mountaintops in calm weather, bad weather is to be expected.

## Limited Harvest



Moi (15 per day)

Notes

Lined area for taking notes.

January	February	March	April	May	June	July	August	September	October	November	December
Hiliohola	Hilionalu	Hukipau	'Ikuwā	Welehu	Kā'elo	Ikiiki	Hinaiā'ele'ele	Māhoe Mua	Oct. 4 - Nov. 2 Māhoe Hope	Nov. 3 - Dec. 2 Hilinamā	Hilinehu

# Nowemapa

# November

Lāpule  
Sunday

Pō'akahi  
Monday

Pō'aluā  
Tuesday

Pō'akolu  
Wednesday

Pō'ahā  
Thursday

Pō'alima  
Friday

Pō'aono  
Saturday

Notes

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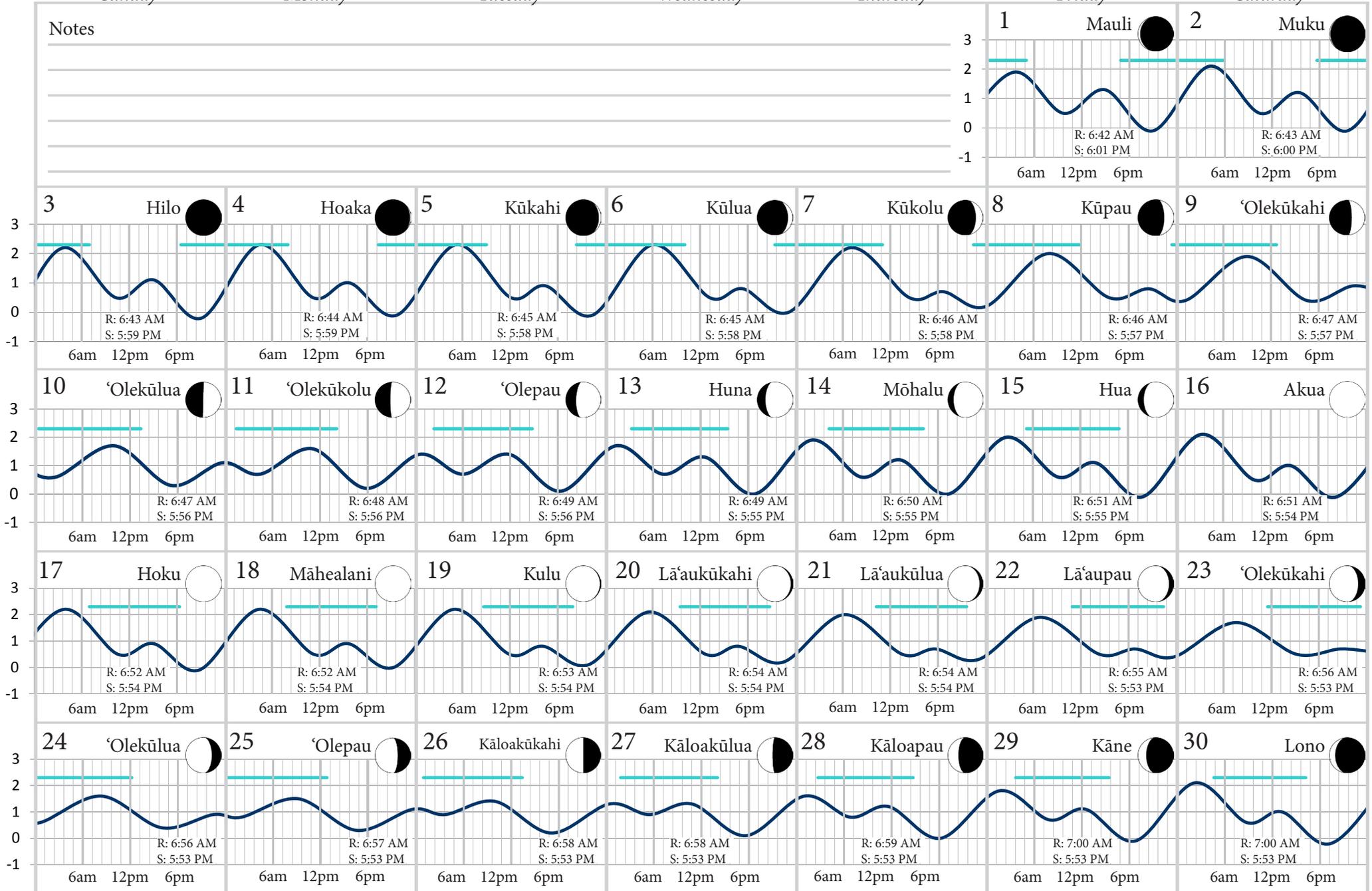
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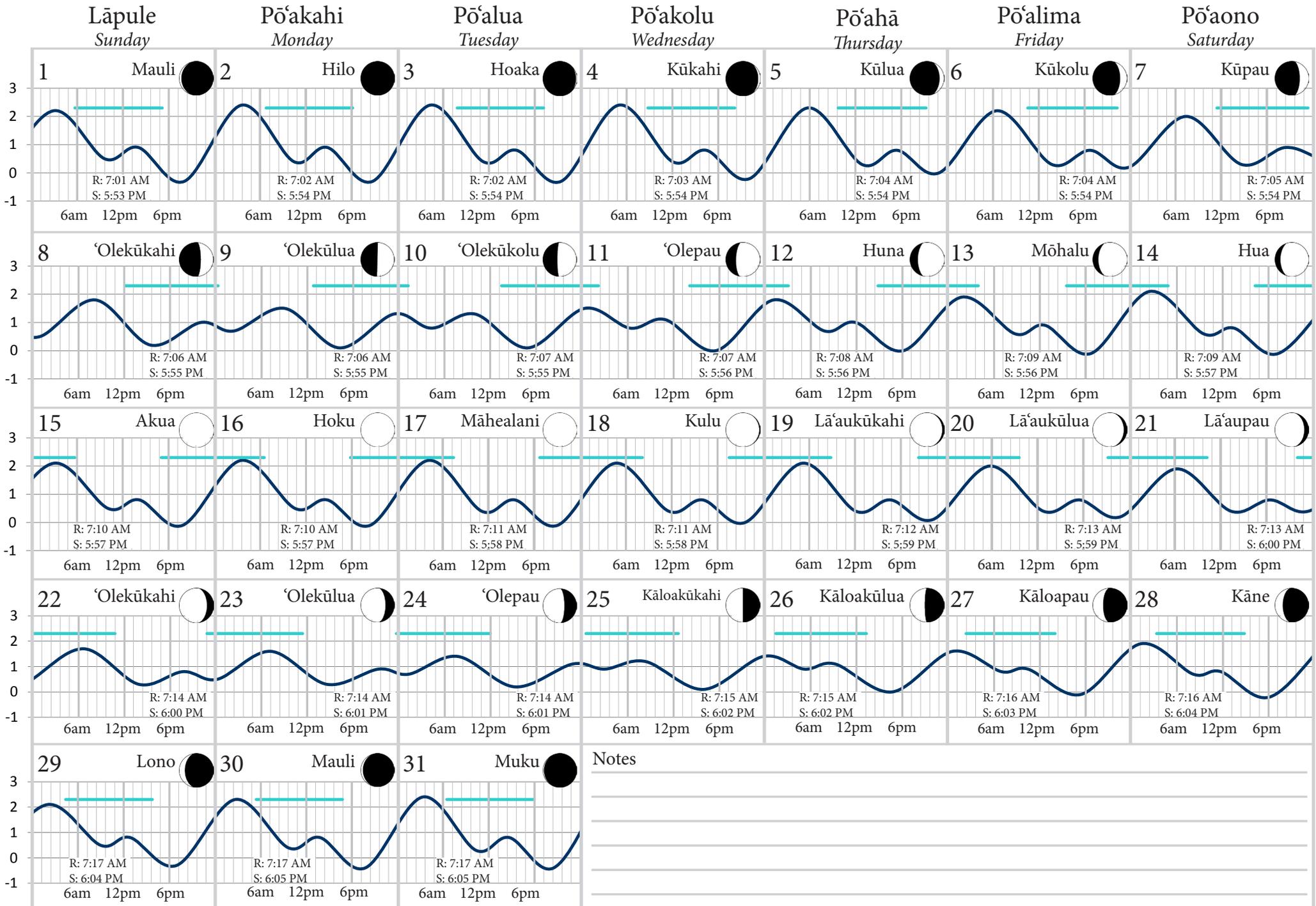
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# Kekemapa

# December



The proceeds from this calendar  
will directly support activities of the  
**Hanalei Watershed Hui**

[www.hanaleiwatershedhui.org](http://www.hanaleiwatershedhui.org)

If you are interested in learning how you can help  
contribute information to this and other projects,  
please contact the Hanalei Watershed Hui.  
(808) 826-1985 or [hanaleiriver@hawaiian.net](mailto:hanaleiriver@hawaiian.net)

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Hanalei Watershed Hui

Joel Guy (cover photo)

Hawaiian Islands Humpback Whale National Marine Sanctuary  
Papahānaumokuākea Marine National Monument



Hanalei Watershed Hui

