

**INDIGENOUS KNOWLEDGE & USE
OF BERING STRAIT REGION**

OCEAN CURRENTS



Social Science Program • Natural Resources Division • Kawerak, Inc.

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Some of the participants in Kawerak's Traditional and Western Knowledge of Ocean Currents Workshop. (Photo: Julie Raymond-Yakoubian)



Detailed knowledge of ocean currents and how they impact subsistence food harvest has developed over centuries among the indigenous people of the Bering Strait region. **Top:** Salmon harvest. (Photo: Julie Raymond-Yakoubian) **Above:** Hunting walrus on the ice near Diomedé. (Photo: Kawerak Eskimo Heritage Program) **Right:** Products of a successful seal hunt (Photo: Julie Raymond-Yakoubian)



PREFACE

Over the span of thousands of years, the ancestors of the indigenous people of the Bering Strait region acquired a vast and complex understanding of the environment around them. We all share the responsibility of safeguarding this collective knowledge as it has been passed down from generation to generation, from elders to youth, to arm future generations with the tools they need to survive in an often harsh climate.

Knowledge of ocean currents is critical to cultural continuity and cultural identity. Indigenous people of this region have developed a close-knit relationship to the land and a strong sense of stewardship and responsibility for the environment that has fed and nurtured us since time immemorial. Without this traditional knowledge related to ocean currents, an integral part of our way of life is missing.

For many of the communities in the Bering Strait, the ocean provides a significant portion of subsistence

foods. In order to harvest these resources, an intricate knowledge of the Strait is required, including ocean currents and how these interact with ice, wind and other weather conditions, as well as how these ultimately affect the animals our communities rely on for physical, cultural and spiritual nourishment.



Seal meat hangs to dry on a driftwood rack in Diomedea. Intimate knowledge of ocean currents is required for hunters to be successful. (Photo: Kawerak Eskimo Heritage Program)



Hunters of Little Diomedede, in the center of Bering Strait, must learn to understand the complex currents flowing around their island. (Photo: Kawerak Eskimo Heritage Program)

In the face of drastic climate changes, hunters are carefully observing their environment in order to learn how to adapt historic knowledge to fit their needs today. New technologies and methods of hunting are also utilized in this process. Our core values and ways of thinking and being remain the same, but the ingenuity of our ancestors and of indigenous people today proves culture is not static, and is always changing to meet the needs of individuals and communities.

***Meghan Sigvanna Topkok, Intern,
Social Science Program, Kawerak, Inc.***

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Fairway Rock, navigation and weather-forecasting aid for people of Wales and Little Diomedé. (Photo: Meghan Topkok)



Above: A community meeting in Shishmaref was part of the process of gathering knowledge for the “Indigenous Knowledge and Use of Bering Strait Region Ocean Currents” project.

(Photo: Meghan Topkok)

Right: Winton Weyapuk Jr. of Wales was one of many experts in three villages who shared their knowledge of where ocean currents are located.

(Photo: Julie Raymond-Yakoubian)



INTRODUCTION

This is a way of life. Learning these things [about ocean currents] young, will feed you and your family for the rest of your life.—**Gilbert Oxereok, Wales**

The knowledge gathered in this book is the result of the Kawerak Social Science project “Indigenous Knowledge and Use of Bering Strait Region Ocean Currents.” Objectives of this project included:

- ▶ documenting knowledge related to and uses of ocean currents;
- ▶ documenting physical changes to ocean currents over time;
- ▶ documenting indigenous words and phrases related to ocean currents;
- ▶ mapping spatial information regarding ocean currents; and
- ▶ promoting the exchange of this information within communities, as well as between indigenous communities in Russia and Alaska and Western science researchers.

The information contained in this book and in the final project report¹ was documented through interviews with local ocean currents experts and through community meetings, tribal council meetings, and a workshop, and has undergone an extensive review process by local experts and tribal councils. Local experts are individuals who have lived in the area for an extended period of time and who are recognized by their community and their peers as being intimately familiar with ocean currents, the marine environment, and boating on the ocean. Interviews with experts also included a mapping component during which ocean currents and other marine features

¹Raymond-Yakoubian, J., Y. Khokhlov and A. Yarzutkina. 2014. *Indigenous Knowledge and Use of Ocean Currents in the Bering Strait Region*. Report to the National Park Service, Shared Beringian Heritage Program for Cooperative Agreement H99111100026. Kawerak, Inc., Social Science Program: Nome, AK. Available at: <http://www.kawerak.org/socialsci.html>.

were drawn onto NOAA marine charts. This spatial information was later digitized and is included in the map found inside the back cover of this book.

All information in this book is from participants in this project. Direct quotes are italicized and attributed to individuals. Other information has been summarized from multiple individuals.

Kawerak partnered with the Chukotka Branch of Pacific Scientific Research Fisheries Center in Anadyr, Russia. In Chukotka, Yury Khokhlov and staff worked with four communities (Neshkan, Inchoun, Lavrentia and Lorino) to document the knowledge of their local experts. For more information from the Russian portion of the project, please see the final report.

A strong theme throughout interviews with local experts was that transmission of this knowledge to youth is vital. While this book is not a substitute for one-on-one sharing of this information nor a comprehensive resource on the topic of ocean currents, we hope it will help with the exchange of knowledge and prompt youth to approach hunters and elders to learn more.

The knowledge shared with the Kawerak Social Science Program and contained within these pages is specific to the Alaska communities that participated: Diomedes, Shishmaref and Wales. Talk with local elders and hunters in your community to learn more about ocean currents in your geographical area and how that information may compare to the knowledge shared in this book.

OCEAN CURRENTS

I feel confident on the ice because I know the current. I know how far to go out on the ice.—**Edward Soolook, Diomedede**

Interviews with experts in the three communities participating in this project revealed a vast and complex system of ocean currents that operate throughout the Bering Strait region. Each current, in a way, has its own personality and characteristics.

Some currents extend for hundreds of miles, while others are smaller and more localized. Some currents are impacted by tides, either temporarily switching direction (as do currents in channels leading into inlets) or changing in speed (become slower or weaker at high tide). There are also seasonal

currents, which appear during certain times of the year and under certain environmental conditions (for example, see Map #14).

The speed of a current can also vary at different points along the current's course, though this is not always predictable. Therefore, it is important that boat captains be able to visually judge the speed of a current by watching debris or chunks of ice, or by using a GPS unit. Certain currents are known for being swift and dangerous, and are avoided as much as possible by hunters.



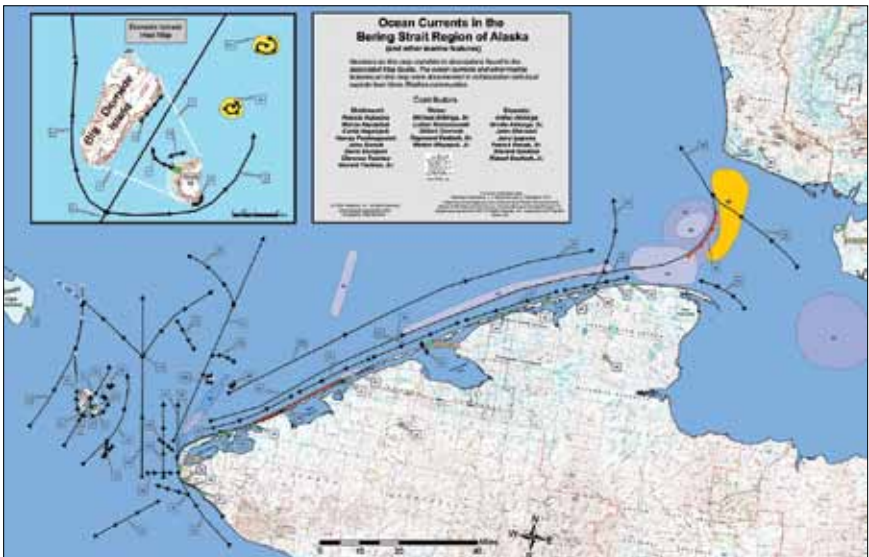
Little Diomedede hunters keep a close eye on currents between their island and Big Diomedede. Visible above is the ocean current in front of the Diomedede helicopter pad (Map #7). (Photo: Julie Raymond-Yakoubian)

ságvaaq: ocean or river current (Shishmaref and Wales dialects).

ságvaiq: for a current to stop flowing (Wales dialect).

Under certain conditions, currents can even reverse direction. This temporary change is caused by sustained wind, usually from a northern direction. Most often, this decrease in current speed or reversal of direction happens between November and January.

Taking all of these factors into account, most boat captains have a very respectful attitude towards currents. Many hunters who have witnessed first-hand the strength of currents can attest to their power and the importance of understanding currents when out hunting or traveling. You can study a map showing the currents documented through this project inside the back cover of this book, and see the map guide on pages 37-43.



A larger, folded version of this map is inserted in a pocket in the back cover of this book. The numbered areas on this map reflect expert knowledge of ocean currents and other marine features in the Bering Strait.

ANIMALS AND OTHER RESOURCES

Animals, like humans, use ocean currents for a variety of reasons. Currents are a source of food for animals as they may contain a wide variety of fish and plankton. Currents that move plankton around the Strait can bring whales close to communities, such as Diomede and Wales (see Map #15). Residents of Diomede also observe more animals in currents when they are running more swiftly, making this is a good time to go crabbing or ice fishing in the winter.

Animals also use currents for travel. The Bering Strait is a bottleneck for an assortment of marine mammal migration paths. Ice carried on currents is vital for ice-dependent species such as walrus, as well as ringed, bearded, spotted and ribbon seals. These animals pup, calve and rest on ice, and use ice as a platform to escape predators. Walrus have also been known to inflate their air sacs while drifting in currents.

The sea mammals, they use it [currents] very well. Like walrus and ugruk, and even spotted seal, common seal... they know they will be safe. 'Cause they're heading north anyway, that walrus will stay on ice for up to one week, just sleep. And they know that predominant current will take them up.—**Morris Kiyutelluk, Shishmaref**



Knowledge of currents is critical to successful walrus hunting. (Photo: Joel Garlich-Miller, USFWS)

Umiivik: "place to build skin boats" (Wales dialect, see Map #18).

Experts have even observed different age classes of animals using different currents. For example, young seals may stay in currents closer to shore, while stronger, older animals use currents further off shore. Animals such as seals have also been seen enjoying and playing in and around currents and inlets.

OTHER RESOURCES

Driftwood and clams are also important resources linked to ocean currents. Understanding currents can help individuals know where to look for these, particularly after storms that may wash them ashore.

Climate change, however, is impacting availability of and access to these resources. Changing weather and ocean currents have altered the off-shore sea floor, sometimes creating large dips where clams, for instance, become trapped and therefore do not wash ashore in as large numbers as in the past.

Traditionally, driftwood was a critical resource for communities. It was used in many ways, including the construction



Clams wash ashore less frequently in places where changing weather and ocean currents have created dips in the sea floor that trap the clams. (Photo: Brenden Raymond-Yakoubian)

of homes, fish racks, utensils, hunting equipment and umiat. Knowing where driftwood accumulated was valuable information and driftwood remains an important resource today.

[Driftwood was] a real treasure for people here, because they use the logs. Nowadays, we don't really use the logs anymore. They were used for meat racks, skin racks [for] drying, for holding up their house, anything.—Edward Soolook, Diomede

When out boating it is important for hunters to be aware of driftwood floating in currents as it can cause considerable damage to equipment.

Trash, while not a subsistence resource, is something else that ocean currents bring to the shoreline in the vicinity of Bering Strait communities. Trash, like any other form of pollution, is a concern for communities because of its potential impact on subsistence resources like marine mammals, birds and fish. Experts expressed concern about increased vessel traffic through the Bering Strait, and the possibility of not only trash but also other discharges such as “grey water,” or spills of hazardous materials, being transported to their communities by ocean currents.

nagunaq: type of clam
(Shishmaref dialect).

qagitaq (singular); **qagitat**
(plural): piled driftwood
(Shishmaref dialect).



Yeah, we see debris like from Siberia side or mainland, our side. See different types of debris—plastic bottles, cans, trash bags, wood, plywood, logs, any kind of debris, even dead animals sometimes, like whale.—Michael Ahkinga Sr., Wales (and Diomede)

A Wales storage platform and drying rack constructed of driftwood. (Photo: Julie Raymond-Yakoubian)



Top: Wooden umiat frames can be seen in most villages of the Bering Strait region.

(Photo: Meghan Topkok)

These skin boats were commonly used in the not-so-distant past, prized for their smooth ride, carrying capacity, and other advantages. **Above:** A skin boat full of Diomedea passengers.

(Photo: Kawerak Eskimo Heritage Program)

Right: Shishmaref hunters in skin boat.

(Photo: Kawerak Eskimo Heritage Program)



BOATS AND TRAVEL

Today, most hunters and crew use aluminum boats for travel and hunting. However, traditionally communities relied on umiat—skin boats constructed of walrus hides and driftwood. Each type of boat has its advantages and disadvantages, but many experts we interviewed expressed a preference for skin boats despite the prevalence of modern aluminum boats in communities today. The wooden frames of umiat can be seen in most villages of the Bering Strait region.

Nothing beats skin boats.—**Patrick Omiak Sr., Diomede**

On the following page is a table listing advantages and disadvantages of skin boats and aluminum boats as described by local experts.

umiaq (singular), **umiat** (plural): boat, whether modern aluminum boat or a traditional skin boat.

umiaqpiaq: “real boat,” specifically a skin boat; literal translation = **umiaq** + **piaq**, noun “boat” + ending indicating “real” or “original” (all dialects of Iñupiaq).

qulutaaq: “splash guard” most often used on skin boats when going through rough water; also used on modern aluminum boats by some hunters (Diomede dialect).



Aluminum boats, commonly used today, are viewed as faster and more maneuverable than skin boats. (Photo: Julie Raymond-Yakoubian)

SKIN BOAT

ADVANTAGES

Smooth ride due to flexible frame and skin cover.

Narrow bow cuts through waves.

Greater capacity, can carry more people and animals.

Because of large capacity, hunters can stay out longer.

Considered safer by some experts.

Easy to patch if it gets a hole while boating and easier to repair in general.

Lighter than an aluminum boat; easier to pull over the ice, easier to carry.

Handles high wind and wind gusts better than aluminum boats (rests lower in the water).

Can easily accommodate a sail.

Quieter when approaching animals.

Can easily be used as a shelter.

DISADVANTAGES

Have to search for appropriate hard woods to use in frame construction.

Usually takes longer to travel same distance as in an aluminum boat.

Walrus skins used for the cover require a lot of labor to produce.

More work to maintain than aluminum boats.

Have to be stored on racks to protect the skins.

ALUMINUM BOAT

ADVANTAGES

Have high powered motors, travel fast.

Can generally go further than skin boats in search of animals.

Not dependent on walrus harvest to maintain (does not need skins for a cover).

More convenient after a hunting or boating trip (boat does not have to be put up on a rack, etc.).

More maneuverable than a skin boat.

DISADVANTAGES

Rougher, bumpier ride than skin boats, especially older aluminum boats (ones that do not have a narrow bow to cut through waves).

Smaller than skin boats, cannot carry as much of a load.

Become leaky over time as parts become loose.

More difficult to repair, need special equipment for some tasks.

Harder to handle in rough water, especially with a heavy load.

Expensive to buy.

Difficult to move on sand.

WEATHER, ICE AND OCEAN CURRENTS

The interaction of weather, ice and ocean currents is particularly complex. In order to make informed decisions on how to proceed or where to go hunting, hunters and travelers must pay close attention to their surroundings and be aware at all times. One elder stated that ice and currents cannot be separated from one another as “the currents ... operate the ice.” Changing weather conditions also need to be carefully accounted for, as these affect what kind of ice will form and how currents will be impacted. In particular, warmer weather coupled with shorter winters causes ice in some areas to be thinner. Being able to read weather patterns, predict weather based on signs in the environment, and understand how these weather patterns will affect ice and ocean currents are skills critical to survival.

His dad [Gene Angnaboogok's], I was surprised that he would be able to tell me what's happening a day, day and a half ahead. I



Ice conditions in the Bering Strait, January 2014. Wind effects can be seen on the surface of the water. (Photo: Julie Raymond-Yakoubian)

always wondered how he did that. And he used to watch the water and currents. He'd sit up on that rock behind his house and just watch. Every once and a while I'd ask him, "What are you looking at?" He'd say, "Nothing." ... You gotta be observant. You gotta watch the ice, how it moves, direction, wind, coloration of the water, depth. And just the way the waves move. You have to observe and watch

uuniq: large pile of ice
(Shishmaref dialect).

uinniq: open lead in ice; non land-locked ice (Shishmaref dialect).

tuluqtitaaq singular: ice that is pushed over the shore ice or on the beach by strong winds or currents (Shishmaref dialect).

and notice the slight changes, otherwise you're putting everybody else in danger and when you see that you gotta let the people know around you what's happening 'cause they might know something you don't. So it's a sharing of information.—Gilbert Oxereok, Wales

Knowing where currents are is also vital when traveling out on the ice, since cracks may form in areas of currents. These cracks can open

and close and may only be as wide as a few inches. Currents alone, as well as currents in combination with wind, can form pressure ridges of ice in shallower waters along the shoreline, on shoals, or in other shallow areas. Under the right circumstances, ice can pile very quickly and very high. Experts have reported pressure ridges up to 100 feet tall.

Thinner ice can also result in “crumbled” ice; thin ice is more easily pushed around by currents and wind resulting in the ice piling up and becoming jumbled. Diomedede residents in particular report thinner ice in front of the village resulting in crumbled ice, rather than a smooth pan of ice. The condition of the ice, particularly thin ice, can have huge impacts on subsistence activities.

...when I was young you could crab anywhere along this island, I could see snowmachines coming home like [in] a row; they crab until it's dark. You don't see that anymore. ... 'Cause the currents and the



Young ice is unsafe for people to walk on. (Photo: Meghan Topkok)

wind we always get storms and it always piles it up [the ice].—Jerry Iyapana, Diomede

Eddies pull in ice, floating debris, animals and boats that come too close, and can be very dangerous. Those who become trapped in eddies can be stranded for days or even longer. There are several well-known and generally avoided eddies in the Bering Strait as noted on the map (see map numbers 6A, 6B, 28A and 28B).

They always caution us of that one that goes around, the ice, I mean the eddy. Get caught in the eddy, you'll be in the middle (chuckles).

You have to just wait it out. And when it gets caught in there, they say it's like maybe a day, just sitting there, until you actually get out on the outer rim of the ice floe.—Luther Komonaseak, Wales

sagvaluk – eddy or weak current (Diomede dialect).

qamaiyaq – name of an eddy near Wales (Wales dialect).

Wind from certain directions can cause large swells on the ocean, particularly when the direction of the current and the direction of the

wind are not the same. For example, in the Shishmaref area, west and northwest winds are unfavorable for ocean travel while a south wind generally means that there will not be a lot of animals close by. North winds, in the Shishmaref area, can be good for boating.

Ocean currents can also be impacted by tides. For example, at Diomede, the current that runs out from the village helicopter pad (see Map #7) sometimes “goes away” or slows down when the tide is high. Experts also noted that when stronger than a current, winds can shift the direction, location, and speed of that current. Even main, stronger currents—like those between Big and Little Diomede

and between Wales and Diomede, which flow north the majority of the year—can dramatically slow, temporarily stop flowing, or switch direction to flow south under the right wind conditions (typically a strong wind from the north that blows consistently). Currents are typically weaker during the winter, making wind a strong factor in which direction ice moves.



Harvey Pootoogooluk, Shishmaref (Photo: Julie Raymond-Yakoubian)

West wind is—you can't go in—and it's dangerous, the west wind in the summer time. And after break-up, the ice, dangerous [to have] west wind like that.

—Harvey Pootoogooluk, Shishmaref

*When it's northwest wind, that's a bad one, northwest wind or west wind. When there's ice, northwest wind, you get trapped out there if you don't be careful The northwest wind bring ice and STRONG current. That's dangerous.... That's a waknaluk, that's a bad one, west wind, mmhm.—**Vincent Tocktoo Sr., Shishmaref***

LANDMARKS AND WEATHER SIGNS

Landmarks are important not only for navigation but are also used by experts to predict weather. For instance, when weather is clear, experts in Diomede and Wales look to a specific valley on Cape Dezhneva to predict weather (see Map #1). If fog is forming in this valley it is a sign to head home and get off the water.

... Fairway Rock is the same way, this is our early warning system.

—**John Ahkvaluk, Diomede**

Fairway Rock, between Diomede and Wales, is another important feature used to monitor and understand weather conditions. When a “cap” of clouds forms on Fairway Rock, the Diomede Islands, or other tall mountains, boaters should head to shore because rough weather is coming. Other landmarks include Cape Mountain (Map #19), Ear Mountain (Map #41), Devil’s Mountain (Map #48), mountains behind Sisualik (across from Kotzebue, Map #59) and other tall peaks that are visible. Boat captains may also climb high peaks to observe weather, water and ice conditions prior to going out boating.

Ugiyaq: name for Fairway Rock, “place where someone spent the winter” (Wales dialect).

That wind changes anywhere, anytime. You can’t play around with Mother Nature. I mean you can’t beat it, when you have to, you have to go.—**Raymond Seetook Sr., Wales**

Mirages are another indicator experts use to judge and predict weather. When an island or the mainland appears to be “floating” or is heightened to appear taller than it actually is, this is a sign that the weather is very calm. However, if you notice a mirage starting to sink

(become shorter), this indicates weather is changing. Ear Mountain is frequently used by Shishmaref residents to determine weather.

Sudden appearances of cloud formations or fog banks in the distance are signs of an imminent weather change. Clouds that look like “waves” indicate windy weather is coming. On calm days, impending bad weather and a north wind can be predicted if small-amplitude, long waves start appearing. Experts observe foam in water along the shore to determine the predominant wind direction.

In addition to landscape features, experts observe currents to predict weather conditions. A current that runs along the northeast portion of Big Diomed Island is observed closely by Little Diomed boat captains planning to travel east of the island, between Little



A seal meat drying rack constructed from driftwood at Shishmaref. Injigagik, or Ear Mountain, visible in the distance, helps experts predict the weather. (Photo: Julie Raymond-Yakoubian)

Diomed and the mainland. This current northeast of Big Diomed is similar to currents on the east side of Little Diomed. If, for example, the Big Diomed current is rough and choppy, or flat and calm, the same conditions will appear to the

east of Little Diomed Island. If the color of water changes and appears siltier, it means the wind is picking up and the current may change in direction, strength or some other manner.

Today, boat captains can also consult the Internet for weather forecasts, information about sea ice, and satellite images. However, experts emphasized that these are only small pieces of a large



Atmospheric phenomena such as sun dogs are used by experts to understand and predict weather conditions. (Photo: Julie Raymond-Yakoubian)

puzzle and should be consulted with caution. Weather is in general described as very unpredictable and highly changeable. Experts have noted that weather can change radically and sometimes often over the course of a day. This is a striking difference from the past, when long stretches of good weather could be depended upon.

*I mean it's my main planning [satellite imagery]. ... [I use] GINA. They got nice satellite pictures. And the NOAA, their forecasting. So you combine it, see what's happening next few days in planning trips or anything. ... It's a planning tool. You can't bank on it. Things happen out there, especially with the current and ocean. ... You could argue [that a] lot of these forecasts you hear, they don't either happen or they are day ahead. They'll be there sooner or they don't come at all. You have to still gauge things out there by the actual weather pattern.—**Curtis Nayokpuk, Shishmaref***



Above: For millennia, the indigenous people of the Bering Strait region have passed knowledge of ocean currents and other important hunting information from generation to generation. (Photo: Brandon Ahmasuk)

Right: John Sinnok of Shishmaref was one of many experts in three communities who shared knowledge of ocean currents that appears in this book. (Photo: Julie Raymond-Yakoubian)



LEARNING ABOUT OCEAN CURRENTS

If you don't know, you got to listen to old people, those old people.

Yes.—**Harvey Pootoogooluk, Shishmaref**

Knowledge of ocean currents, as well as the entire marine ecosystem, is crucial for boat captains to operate safely and effectively on the ocean and to be successful in hunting. Experts gained their knowledge of ocean currents over lifetimes of experience and through instruction by their elders. As one expert responded when asked how he learned about currents, “Live with that, live with the current all my life” (Arthur Ahkinga, Diomedea). Young people are expected to learn about ocean currents primarily by watching what is happening around them and listening to elders, as well as through direct experience. Youth are encouraged to be observant, and pay attention when elders bring their attention to specific information such as where a particularly dangerous eddy is located.

*Usually when you're out—as I was growing up, anyway—you always had an elder in the boat. And he brings it down to the next person. Like for instance, if I was hunting with my grandfather's boat, you bring it down to dad, the information to dad, and then dad would bring it to me. ... Nowadays you always see them with maybe hardly any elder or none at all. And they don't know, or they don't ask. We try to give the information as best as we could, when they come around but, yeah, that needs to be brought out more.—**Luther Komonaseak, Wales***

Having an elder or experienced individual in the boat whenever possible is important. This ensures that someone on board is likely to have knowledge and experience to deal with any situation that



The south side of Little Diomedede Island where currents push ice up against and around the island (see Map #3 and 9). It is important to have an elder or experienced hunter in the boat, as this person will likely have knowledge and experience to deal with dangerous currents and other situations. (Photo: Julie Raymond-Yakoubian)

may arise. This practice, however, is not as common today as in the past. While the safety and success of a crew is ultimately the responsibility of the boat captain, all those on board are expected to have knowledge of ocean currents, navigation landmarks and other relevant information.

Yeah, anytime these guys ask me for something I tell them what I know. Encourage them. 'Cause that's what I basically came from, too.—Curtis Nayokpuk, Shishmaref

Usually when I get a crew of different guys, I try to show them whatever knowledge I have. Share my knowledge with them and just good experience for me teaching them. Sometimes I learn from them, too, you know, we all have different styles.—Michael Ahkinga, Wales (and Diomedede)

I point it out. Lots a times I have my boys and my wife hunting with me. ... I point these things out to them. And I tell them, "You

watch Ear Mountain. Watch Ear Mountain when you're out there." Lotta pointers I give to my boys. ... I try to teach what I was taught, too, try to pass it on to these younger guys.—Francis Kakoona, Shishmaref

In the past, instruction often happened in the men's house or kazrghi. While none of the three participating communities have a men's house today, in more traditional times that is where men and boys would gather for various tasks and activities, including rehashing details of recent hunting and boating trips. These critiques of recent events and storytelling sessions were very important for the education of young men.

You know, hunters years ago, they have a gathering place in the qagri. They go there every night, tell stories of today's hunting, and the younger ones learn fast from listening to the elders. Especially do's and don'ts.—Orville Ahkinga Sr., Diomede

Challenges related to passing on hunting-related knowledge to younger generations today include the fact that some are not interested in hunting or traditional activities, or may be reluctant to ask elders

or experienced hunters for advice. Some experts pointed out that when they were growing up they were instructed in Iñupiaq, while today English is predominantly spoken in the village and out in boats.



Curtis Nayokpuk, Fred Tocktoo, Vincent Tocktoo Sr., and Guy Martin discuss a map showing Bering Strait ocean currents.
(Photo: Julie Raymond-Yakoubian)

Conveying information in Iñupiaq is considered superior by most experts because of the complexity and inherent detail embedded in the Iñupiaq language. Experts recognize the importance of passing on this knowledge as well as the importance of younger people listening to what they have to say and asking questions.

kaivsraraqtuq: *the one that spins (an eddy) (Wales dialect).*

kinjigim saġvaa: *Name of a strong current close to Wales (Wales dialect).*

... just about all my instruction when I was growing up [was] in Iñupiaq. All of our communication was in Iñupiaq back then. But now it's all English. Maybe it's a little bit harder trying to teach in English, or tell people in

English, rather than Iñupiaq. ... I don't think our traditional knowledge is being effectively passed on because of the language change. They [youth] do seem to know quite a bit, even if they only speak English. They absorb that knowledge.—Winton Weyapuk Jr., Wales

I think it would have to be second best [English]. [For example,] in our language when we say iluqnausugvak, the people that know

iluqnauq: *large sheet of ice (Shishmaref dialect).*

iluqnausugvak: *very large iluqnauq (Shishmaref dialect).*

the language, they would understand what it is. All the things about how you'd have to go around ... the things that you'd have to make sure you have enough of in order to go around. This way? Or do you go on it toward the left? When you say that, you know where it is, you

learn roughly about how the currents are If you don't know the language, and you're not experienced in hunting, you'll just see a big piece of ice.—John Sinnok, Shishmaref

HUNTING

In order to be successful, hunters must understand animal behavior and how it relates to weather patterns, currents and ice movements. Marine mammal hunting takes place in boats, as well as on foot on the ice. Traditionally, communities and families were highly mobile, dispersing to seal camps and spending days, sometimes longer, on hunting trips. Once they had secured enough meat for the year they would return to more central locations such as present day villages. Hunting crews even slept in their boats during extended hunting trips. Today, however, most hunting trips for seals, walruses, or other marine mammals are day trips and seldom last longer than overnight.

One reason these trips are shorter is due to changes in weather (see also the section on Changes). It is often unsafe to stay out for long periods of time as weather is more changeable and less predictable than in the past. Fuel availability and high cost as well as employment can also constrain hunting activities. Hunters risk becoming stranded



Hunters need to know how to calculate fuel needs, taking into account the weather and ocean currents likely to be encountered. (Photo: Kawerak Eskimo Heritage Program)

unless they know how to calculate fuel needs, including how much more fuel is used when traveling against currents or strong winds and in rough seas.

To save on fuel and for safety reasons, hunters prefer to stay as close as possible to shore or shorefast ice. Seals and walruses are ice-dependent, so hunters rely on ice to find these mammals. However, because climate changes have led to earlier break-up and quicker dispersal of sea ice, the spring hunting season is shorter and often requires hunters to travel further in search of game. This makes understanding local currents, weather and animal behavior extremely important for obtaining food for the community, as well as for economic considerations such as saving fuel.

... one of the main taboo, or practice that elders always passed down, was that when that first crack—uinniq [open lead between shore ice and non-shore ice] is formed, do not cross it. If you can, hunt from this side [shore side], not on that side. ... Sometimes the

anaaġluq: *dirty, sandy ice that is not good for hunting (Shishmaref dialect).*

uazruaq: *ice that doesn't move, stays in one spot (Shishmaref dialect).*

current is more stronger than the wind direction even. And it'll move that ice. And then when someone does that [cross the crack], they call it pizriqtuaq, someone that step

down, like from a step. They're taking a step down, taking a chance. ...they're breaking a precaution.—Morris Kiyutelluk, Shishmaref

In Shishmaref, hunters know that the area near the entrance to Kotzebue Sound is where walruses are often found later in the season because currents pack the ice into the Sound (Map #55 and #56). This is usually the only ice left in the region at that time, so animals will move there. Powerful outboard motors allow hunters to more easily travel to areas such as near Kotzebue Sound when resources are not available close to their communities. However, there are risks associated with traveling further or in certain directions



Walrus in front of the village of Diomedé. Hunters need to understand how ocean currents affect animal behavior. (Photo: Julie Raymond-Yakoubian)

to hunt. For example, currents near Kotzebue Sound can be very strong and pull hunters even further from their community.

Some experts believed that powerful motors are an improvement to the safety of hunters, allowing them to maneuver out of many dangerous situations more quickly. Other experts pointed out that while that may be true, an engine break-down far from shore or one's community could be very dangerous. Either way, hunters and experts pointed out, the broader a hunter's base of knowledge and skills, the safer the hunter and his crew will be. These experts believe it is foolhardy to go hunting or boating without enough experience or without bringing along a more experienced person.

... when you're hunting ugruk, they always mostly hunt where there's an iceberg so it won't move, 'cause it's kinda like an anchor on the shore ice. ... when they sink ugruk, that's when they always know that the ice won't move. So where they sink, they just put markers on them. And then they throw their lines out and pull them in, and they get them. So anything permanent, anchored from big icebergs, that's a good place to hunt when wintertime.—Clarence Tocktoo, Shishmaref

Hunters look for specific types of ice during the winter. Large chunks of ice that are grounded to the sea floor rarely move and are a good place to hunt for seals. Experienced hunters also use the currents to their advantage while hunting. In Diomedes and Wales, hunters prefer to go south when hunting walrus because the current will bring them back north toward their communities.

And when there's a southerly breeze, we usually go out hunting this way [south]. ... And when we catch walrus here, on ice, we butcher them and then the current carries us close to the village.—Winton Weyapuk Jr., Wales

Being a boat captain comes with great responsibility. Captains have both the safety of their crews and the welfare of their communities weighing on them. If they make a mistake, other crews may have to risk their lives to rescue them. If they are not successful finding animals, the community may not have enough subsistence foods. Good boat captains recognize the implications of this and do their best to understand weather and ice conditions, climate changes, crew ability, and all the other factors that must be taken into consideration before heading out on the water.

He's the responsible person. He's the captain, that's his boat. He's the person that is very responsible. He's making sure that no one forgets anything. He's a big man there. He's the man that takes care of everything: food, animal, whatever you need, make sure you are dressed properly and whatnot. He knows the weather. He knows the current. He knows everything. Even in conditions where it gets so bad when we are hunting. He's got to know this stuff, he got to know what to do, what to expect and what not to expect.—Robert Soolook, Diomedes

SAFETY

This is no play time. This is gathering food, or being a fool. You prepare food a certain way. You hunt a certain way—safely. You prepare food so that it's safe. You hunt for food so it's safe for yourself and your people around you. And you give people safe food, the best you have, so you know the food is safe. Safety, safety, safety, all the way through from preparation.—**Gilbert Oxereok, Wales**

Wales

In this section, we share information on safety not already discussed elsewhere in this book. This knowledge is crucial for boaters because it helps keep them, their crew, and their passengers safe. As experts have explained, you will feel more confident and safe out on the ocean as you gain experience, learn to pay close attention to the environment, and

ayaktaq: person that floats away on ice, in a boat, etc. (Shishmaref dialect).



Beware of cracks in non-shorefast ice. Many experts advise not to cross cracks if you are not on shorefast ice. (Photo: Brandon Ahmasuk)

listen to and learn from elders.

Always listen. If elders say something to you about that, you got to pay heed to it. You have to ... always obey, always listen.—**Robert Soolook**

Jr., Diomede

Experts strongly emphasize listening to elders. If elders instruct you about something it is because they are trying to help you and keep you out of danger. It is also important for hunters to share information with other crews when they know something that could improve the safety of others.

Most of all, it is critical to be aware of your surroundings at all times, including weather conditions, ice, currents, animals, other boats, and everything else in your environment. Utilizing multiple sources of information such as elders, other hunters, Internet weather forecasts and satellite imagery, as well your own observations, will help you make informed decisions and prepare for your trip.

- ▶ Experts warned that no one should ever underestimate the power of the environment, especially currents. Hunters should never go out alone. Always tell someone where you are going. Experts recommended that 2-3 boats travel together.
- ▶ Hunters should not go out when angry. This is dangerous for the whole crew and disrespectful to the animals. If you have a reputation as a troublemaker, many boat captains will not want you as part of their boat crew.
- ▶ Always be sure to maintain your equipment, particularly your motor, and bring two motors with you if possible, as well as spare parts. It is beneficial to have mechanical skills for engine repair.
- ▶ Bring extra clothing, water and food. Carry life vests for each person in the boat, as well as flares, a tarp, a radio and paddles. Always bring more gasoline than you need.
- ▶ Always remain calm; if you are calm you will be able to make better decisions.
- ▶ Know where dangerous areas are, such as eddies and channels that lead in and out of lagoons, as ice can move quickly in and out of them. It is also important to know tidal cycles and weather conditions. The Map Guide includes dangerous areas pointed out by hunters.
- ▶ Beware of cracks in non-shorefast ice. Many experts advise not to cross cracks if you are not on shorefast ice.

- ▶ It is ill-advised to cross “chunk ice” that is packed into an area by currents, such as near the entrance to Kotzebue Sound. If you cross from open water through the chunk ice it may shift and trap you, sometimes for a long time.
- ▶ When walking or hunting on the ice, always bring a walking stick to test the ice. If you are going to cross open water or a crack, make sure you test the opposite side before jumping; sometimes the ice appears solid but is not.

unaaq: *hunting tool with an ice tester on one end to make sure ice is solid enough to walk on, and a hook on the other end to pull up catch, such as ugruk (Shishmaref dialect).*

Yes, I miss the old days, I miss the elders. ...

Always there to teach you what to do and what

not to do in the boat. ... And they teach you how to walk on the

ice. You got to always have your walking stick. You don't have your

walking stick, they tell you to go home. Because that walking stick will save your life. If you fall in, it will block you from going all the way in.

...It has a metal tip. ... So it just poke. If it goes through, don't step

*on it. And if it doesn't go through, just step on it [the ice].—**Edward***

Soolook, Diomedé

- ▶ Make a “marker” when hunting on the ice—find a landmark, such as a building or mountain, and memorize its location. Check your marker periodically. If it appears to have shifted, then the ice you are on has moved and may not be safe.
- ▶ If weather patterns change and indicate bad weather is approaching, do not hesitate: return home or seek shelter immediately. Indecisiveness could place you in a dangerous situation.
- ▶ When a boat is pulled out on the ice or elsewhere, it must be secured extremely well. The current is always moving and may carry the boat away if it is not secured properly. On the ice the bow line of the boat can be wrapped around a walking stick that

is firmly pushed into the ice. While all boat crew members should be aware, one person can be assigned to stay with or in the boat in case it needs to be moved quickly or becomes dislodged. Unfortunately, local experts had experienced or knew of situations where hunters had drowned while trying to retrieve a boat.

- ▶ Always bring a compass, and know how to use it. Most boat captains use a GPS today, but in the event the GPS quits working, runs out of battery, is lost or damaged, or becomes useless because cloud cover is too thick, a compass can be used. Some experts use the sun to navigate as well.
- ▶ Another piece of advice from elders is to grow a mustache. The moisture it traps could save you if there is no access to freshwater for drinking.

*And then most of the time, they encourage the hunters, especially in the winter, to grow a mustache. Do not cut your whiskers. They say once in a while when you're caught, and then you go out, you'll get to a place where even the surface snow is salty. You can't quench your throat, your mouth with it. And then when it gets cold, the frost builds right here, by breathing. That's your fresh water.—**Morris Kiyutelluk, Shishmaref***

- ▶ Beware of driftwood and other floating debris while boating. During certain times of the year in certain locations there can be large amounts of current-transported driftwood and debris that can destroy or damage outboard motors and boats.
- ▶ While on the ice butchering an animal try to move quickly. Weather conditions can change unexpectedly and the current is always moving.
- ▶ When ice starts packing in towards the shore ice, head back to shore or you may have to wait a long time before you can navigate through. Areas with large icebergs are safe places to pull up boats when ice starts closing in, as large icebergs are grounded and unlikely to move.

CHANGES

Ocean current experts have observed numerous environmental and social changes over the course of their lifetimes. Many of these changes have altered the way that travel, hunting, and various subsistence activities are carried out in Bering Strait communities.

One major change noted is that weather conditions are far less predictable than in the past. Conditions can change quickly and more often than before. Wind direction can be very unpredictable and changeable, yet some experts have noted patterns. For example, Shishmaref experts have reported that there is more wind in the fall than in the past; that there is more east wind (which pushes ice away and then up north); and that there are stronger west winds.

Communities have also reported stronger storms in recent years. These storms move a lot of water (and ice) around, and appear to also be changing the nearshore sea floor. Wales and Shishmaref report that “dips” and “valleys” have developed offshore from their communities. These changes in the sea floor may impact ice formation, where ice piles, and the availability of clams.

There's not very much right now [clams]. There used to be clams long ago, lots all the time. ... Weather change and ocean change causes clams not to wash up anymore. ... the frequent storms that we have ... take the sand away. Because of real deep dips out there, which were not there before, built by current, strong current from westerly winds. Storms, they cause those dips in the ocean, which cause clams to go in there and not wash up anymore.—Davis Sockpick, Shishmaref

Changes in ice conditions are among the biggest changes noted by local experts. All three communities experience later freeze-up and earlier break-up of ice. The timing of freeze-up and break-up varies from

year to year, but freeze-up appears to happen approximately one month later and break-up one month earlier than it did several decades ago.

When ice breaks up earlier it means the current will quickly move the ice north and the animals with it, resulting in a shorter window of time for hunting. It can also cause problems for the process of drying seal meat; if hunters cannot find seals until late spring and then the weather warms up, flies make it difficult to properly dry the meat.

Experts have also noted that the ice is thinner, which contributes to earlier break-up. Thin ice is more easily crumpled or piled by wind and currents. Piled ice makes hunting more difficult, both on foot and



Experts have observed increasing erosion, resulting in "dirty water," with lots of silt and grasses in it. (Photo: Julie Raymond-Yakoubian)

by boat. When ice conditions allow, the village of Diomedes builds an ice runway on shorefast ice. In some recent years, however, the ice has not been solid or stable enough to allow construction of the runway. This severely restricts the movement of residents, guests and freight items between the island and the mainland.

Another change is the absence of older, thicker ice. Instead, younger, thinner ice, recently formed, is observed. Old ice used to be transported from the north into the region during freeze-up as large icebergs or thick, old pans, but because of reduced Arctic ice

extent, older ice no longer arrives. This affects hunting, as walrus are more likely to haul out—and to haul out in groups—on thick ice. Lack of large, thick ice means it may be more difficult for hunters to find walrus, as they may disperse over a larger area or congregate in an area far from communities.

Other changes that have been reported by experts in the participating communities include:

- ▶ An increase in erosion, particularly in the Shishmaref area but also in the Wales area.
- ▶ More incidents of high water, and “more water” in general.
- ▶ Observations of “dirty water”—water with a lot of silt and grasses or water plants in it, probably as a result of erosion.
- ▶ Fewer belugas have been observed around Shishmaref than in the past.
- ▶ Seals stay closer to shore in the winter in the Shishmaref area, likely because it is easier for them to maintain breathing holes in the thinner ice.
- ▶ Some hunters go out less often because of unpredictable weather.
- ▶ Unusual or unknown animals are appearing. Unknown types of clams, Aleutian skates and a narwhal have washed ashore.
- ▶ Increases in water temperatures.
- ▶ Rising water levels.
- ▶ More frequent flooding at Shishmaref.
- ▶ Extremely long pressure ridges or areas of piled ice, stretching for tens of miles, have formed during some winters.
- ▶ Changes in technology and equipment.
- ▶ Currents are no longer used for travel because of high horsepower outboard motors.



Traditional umiat can carry many people but require more work to maintain than aluminum boats.

Top: A skin boat carries Diomedede passengers.

Right: Covering a skin boat in Wales.

(Photos: Kawerak Eskimo Heritage Program) **Below:** Aluminum boat in new ice (Kawerak Subsistence Resources Program)



EPILOGUE

Quyanna (thank you) to all the local experts and elders who shared their time and expertise, making this book possible. Be sure to consult with local experts and elders if you have questions about the material in this book.

Understanding ocean currents requires a complex body of knowledge, amassed through personal experience and refined through generations of trial and error. Knowledge of ocean currents has become ever more critical to today's hunters, who must extend this knowledge to include current climatic changes, new technologies, and other changes and developments in the region.

Most importantly, this knowledge of ocean currents embodies a way of life that has been practiced since time immemorial and is an integral part of the identity of the indigenous people of the Bering Strait.



Currents control ice movement. Knowledge of ocean currents embodies a way of life that has been practiced since time immemorial. (Photo: Julie Raymond-Yakoubian)



The map included in this book includes knowledge shared by experts in Shishmaref, Wales and Little Diomed. **Top:** Robert Soolook Jr. and Edward Soolook review a draft ocean currents map in Diomed. (Photo: Meghan Topkok) **Above:** Raymond Seetook Sr., Luther Komonaseak, and Gilbert Oxereok, Wales. (Photo: Julie Raymond-Yakoubian) **Right:** Orville Ahkinga Sr., Little Diomed. (Photo: Julie Raymond-Yakoubian)



MAP GUIDE

OCEAN CURRENTS IN THE BERING STRAIT REGION OF ALASKA (AND OTHER MARINE FEATURES)

Each number in this guide corresponds to a numbered feature on the map found in the pocket inside the back cover of this book. Locations on the map are approximate; the map is not meant for navigation. Elders and experienced hunters in your community should be consulted for the most detailed information.

The following individuals contributed to this map and map guide:

Shishmaref: Francis Kakoona, Morris Kiyutelluk, Curtis Nayokpuk, Harvey Pootogooluk, John Sinnok, Davis Sockpick, Clarence Tocktoo and Vincent Tocktoo Sr.; **Wales:** Michael Ahkinga Sr., Luther Komonaseak, Gilbert Oxereok, Raymond Seetook Sr. and Winton Weyapuk Jr.; **Diomede:** Arthur Ahkinga, Orville Ahkinga Sr., John Avahkluk, Jerry Iyapana, Patrick Omiak Sr., Edward Soolook and Robert Soolook Jr.

- 1** Valley on Cape Dezhneva (Russia). This valley is used by Diomede hunters to judge impending weather conditions. The valley is observed to see if clouds are forming in it; if clouds are forming, bad weather is approaching and boaters should head home.
- 2** A current to the west of Big Diomede Island. It flows north and its speed is approximately 6 miles per hour.
- 3** This is the main current between Big and Little Diomede islands. This current originates from the southwest, and when it reaches the islands it splits off to the east and west to go around the islands, as well as continuing north between the islands.

- 4** These two lines are the typical locations of the ice edge between the Big and Little Diomedé islands.
- 5** A very strong, north-flowing current near the northeast corner of Big Diomedé. Little Diomedé hunters watch this area to determine what conditions are like on the east side of Little Diomedé (between Little Diomedé and the mainland) because conditions in both places are often the same. For example, if the current northeast of Big Diomedé is choppy and dangerous, the waters between Little Diomedé and the mainland are likely the same.
- 6A** 6A is a dangerous eddy located north/northeast of Little Diomedé. Exact location unknown, approximately 5 miles north/northeast of the island.
- 6B** 6B is a second located eddy north/northeast of Little Diomedé. Exact location unknown, approximately 15 miles north/northeast of the island.

It is possible that 6A and 6B are one eddy that forms in different locations under different conditions. Note: 6A and 6B are not to scale on the inset map, and are pictured closer to the island than they are in reality for illustration purposes.
- 7** A current that extends westward from the Diomedé helicopter landing pad, over a shallow area. The current extends west toward Big Diomedé, up to 1.5 miles from the helicopter pad. It joins the main northbound current between the islands. This is a very strong current and can slightly shift its location daily based on the tide or other conditions.
- 8** This is a weak eddy generally going south and clockwise, but it can change direction depending on conditions. It is north of the helicopter landing pad current.

- 9 A current on the southeast corner of Little Diomed Island, called *Attu*. This is a very strong current. It goes east, then curves around the island to flow north.
- 10 This current is approximately 18 miles offshore from Wales. It is strongest in the late spring and summer. It can be up to about 1.5 miles wide. Its speed is about 5-10 miles per hour.
- 11 There are strong currents around Fairway Rock which flow around the island and then head north. Sometimes they originate from the southwest, sometimes from the southeast. They go around both sides of Fairway Rock and continue north.
- 12 This current is approximately 9 miles offshore from Wales. It is strongest in the late spring and summer. It can be up to about 1.5 miles wide. Its speed is about 5 miles per hour. It originates from the southwest, in the Saint Lawrence Island area.
- 13 This is where current #12 “splits” to travel in different directions. The exact location of where this “split” occurs varies, but is approximately 25 miles north of Wales. Some of the current flows north, some northwest and some northeast. The northwest portion of this current may join #2 and #3 as well, depending on conditions. See gray arrows on the map.
- 14 This current is present only in the spring.
- 15 This is the general migratory route of bowhead whales.
- 16 Around this approximate location, whales will either join current #18 or turn towards the Diomed Islands
- 17 Place name: *Pularaq* (“place where you move out of sight”). This is the first point in an east-southeast direction from Tin City.
- 18 This location is called *Umiivik* (“place to build skin boats”). It is a place where a lot of driftwood comes ashore, transported on current #23. Wales residents used to travel here to find driftwood to construct their *umiaq* frames.

- 19** Cape Mountain or Wales Mountain. When out on the ocean, hunters use this mountain as a landmark and to help predict impending weather. If a cloud “cap” is forming on the mountain, the weather will get rough and boaters should head home. Hunters may also climb the slopes of this mountain to get a better view of ice and weather conditions in the strait.
- 20** This current is present only in the spring.
- 21** This current is approximately 4 miles offshore from Wales. It is about $\frac{1}{4}$ mile wide.
- 22** Clams are brought in by northwest winds and storms in the fall (around October).
- 23** This current is approximately 4 miles offshore from Wales. It is present year-round.
- 24** This current is present in the spring. It comes from the northwest.
- 25** This current is a continuation of currents that flow between Diomedes and Wales. It flows north in the spring, is very strong (as strong as 20-30 miles per hour), and is approximately 36-50 miles offshore northwest of Shishmaref.
- 26** After passing the shoal, a portion of current #25 will split off and come closer to shore. The location of this split is approximate.
- 27** A current that splits off of current #25. It is not strong. It is present in the spring.
- 28 A and B.** This is an eddy located northeast of Wales, its exact location unknown. This eddy may form on either or both sides (#28A and #28B) of the tip of Prince of Wales Shoal (#30). It is strongest in the spring, especially May.
- 29** Approximate area where big pressure ridges form. This area was previously a good location for polar bear hunting.

-
- 30** This is Prince of Wales Shoal, the shoal (shallow area) that extends north from the Wales area. In Iñupiaq, shoals are called *sizmulniq*.
- 31** This current runs along the beach, mostly in the summer and fall. It goes back and forth with the tides, and the direction of flow changes throughout the day. It can extend from 0-5 miles offshore.
- 32** Place name: *Sinŋauraq* (“small inlet to a lagoon”). This is the first inlet north of Wales.
- 33** Place name: *Aġġuligak* (“the one in the middle”). This is a channel between *Sinŋauraq* and *Miġitaġvik*.
- 34** Place name: *Miġitaġvik* or *Misitaġvik*. This is an inlet and its name refers to a “place to jump across.”
- 35** This is a stretch of shoreline where a lot of driftwood, trash and debris comes ashore, pushed by wind after being transported north by currents. Most of the shoreline from here east to Kotzebue Sound collects such materials.
- 36** Place name: *Sinŋasaut*. It is a very important place: a shelter area, a safe harbor. It is also an area of former reindeer herding camps.
- 37** An area where pressure ridges form. May also include much of the shoreline up to *Sinġik*.
- 38** This current is 2-5 miles offshore. It is strongest in the spring and fall. It always goes northeast, following the coastline. When approaching Kotzebue Sound, it begins to curve north as it joins water flowing out of Kotzebue Sound.
- 39** This is not a specific current, but is an area with general movement of water east into Kotzebue Sound. It is a good area to find animals such as walruses or seals.

- 40** This is an area where ice will get very packed in because of shallow water.
- 41** *Iṛjġaġik*, or Ear Mountain. When out on the ocean, hunters use this mountain as a landmark and to help predict impending weather. If a cloud “cap” is forming on the mountain, the weather will get rough and boaters should head home.
- 42** Ice will move back and forth through this and similar channels with the tidal currents. The same process happens at all inlets and channels. These areas can be dangerous and are avoided by boaters.
- 43** This is where a lead or crack in the ice usually forms during the spring and where people go to *ugruk* hunt. It is usually 5-15 miles offshore, but can be as much as 25 miles offshore.
- 44** Place name: Third Inlet.
- 45** This is Vincent Tocktoo Sr.’s camp, *Inaaqruk* (“big or huge house”).
- 46** This is an area along the shore with little or no current. It has dangerous ice in the spring, and travelers on snowmachines have to be very careful. Ice here may look solid but may be thin or rotten.
- 47** This is an area along the coast where ice can get “stuck” and persist later into the year.
- 48** Devil’s Mountain. This mountain is used as a navigation landmark by hunters. Like other mountains, it is also used to predict weather conditions. If a cloud “cap” forms on top, rough weather is coming and boaters should head home.
- 49** Place name: Northwest Corner. There is a lighthouse here that is used for navigation.
- 50** Place name: *Sijik*. This is an area with a very strong current in the spring. A current flowing north will extend out from this area during the spring.

- 51** This is an area of very rough water and strong current. It is dangerous and is avoided by hunters.
- 52** Water moves out of Kotzebue Sound and meets other currents near Cape Espenberg and creates current #51.
- 53** This area used to freeze in the winter, but is now usually open water.
- 54** Current #38 flows very fast in this area.
- 55** Walruses can be found in this general area in the spring. This is where late-season hunting is done.
- 56** There can be a swirling ice eddy in this area. Ice will spend time in this eddy and then get pulled north by current #51.
- 57** This current comes out of Kotzebue Sound and joins #38 and #54, bringing a lot of ice with it.
- 58** Ice gets very packed into this area because of the opposing forces of powerful current #38 and water flowing out of Kotzebue Sound.
- 59** The tallest mountain near Cape Krusenstern is used as a landmark. Experts were not able to determine exactly which mountain they used based on the topographic map. It is visible when out on the water hunting. Like other mountains, it is used to predict weather conditions. If a cloud “cap” forms on top, rough weather is coming and boaters should head home.



Top: Different types of clouds, and their relationship to landscape features like mountains, can be interpreted by experts to predict weather conditions. (Photo: Julie Raymond-Yakoubian) **Above:** Rotten ice encountered during spring hunting. (Photo: Brandon Ahmasuk)

Front cover photo credit: Julie Raymond-Yakoubian (see page 35)

Back cover photo credits, from top: Meghan Topkok (see page 36); Julie Raymond-Yakoubian (see page 11); Kawerak Eskimo Heritage Program (see page 34); Brenden Raymond-Yakoubian (see page 6); Kawerak Eskimo Heritage Program (see page 23)



OCEAN CURRENTS

Experts from three communities of the Bering Strait region share their knowledge of ocean currents in this book!

For many of the communities in the Bering Strait, the ocean provides a significant portion of subsistence foods. In order to harvest these resources, an intricate knowledge of the Strait is required, including ocean currents and how these interact with ice, wind and other weather conditions, as well as how these ultimately affect the animals our communities rely on for physical, cultural and spiritual nourishment.

—**from the Preface**

This is a way of life. Learning these things [about ocean currents] young, will feed you and your family for the rest of your life.—**Gilbert Oxereok, Wales**

You know, hunters years ago, they have a gathering place in the qagri. They go there every night, tell stories of today's hunting, and the younger ones learn fast from listening to the elders. Especially do's and don'ts.—**Orville Ahkinga Sr., Diomed**



Ocean Currents in the Bering Strait Region of Alaska

(and other marine features)

Numbers on this map correlate to descriptions found in the associated Map Guide. The ocean currents and other marine features on this map were documented in collaboration with local experts from three Alaskan communities.

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For more information see:
Raymond-Yakoubian, J., Y. Khokhlov and A. Yaruskina. 2014.
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