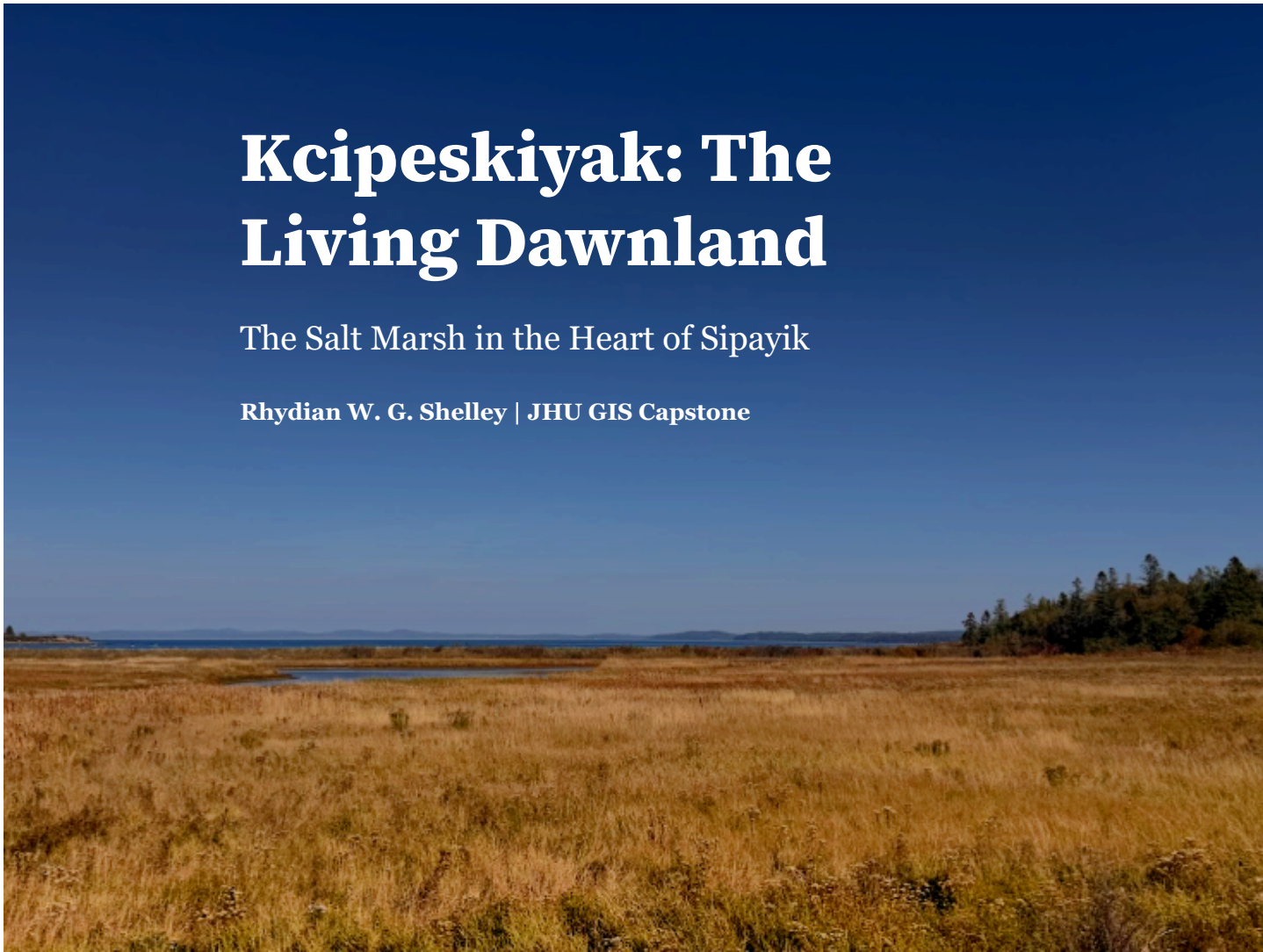
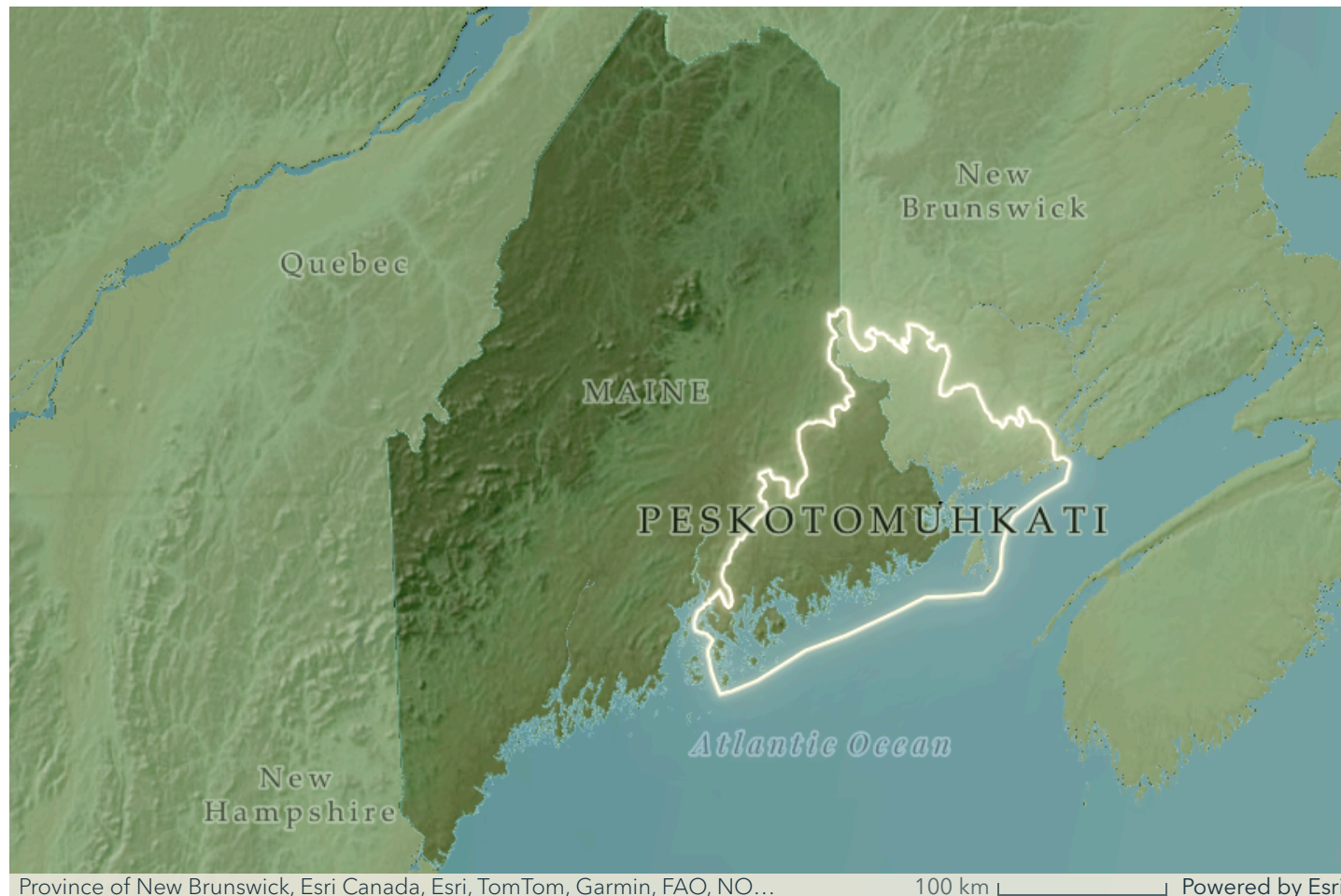


Kcipeskiyak: The Living Dawnland

The Salt Marsh in the Heart of Sipayik

Rhydian W. G. Shelley | JHU GIS Capstone





***Peskotomuhkati* - People Who Spear Pollock**

For more than ten thousand years, the Peskotomuhkati (Passamaquoddy) Tribe have called the rugged North Atlantic coast home – a land where deep, rolling forests meet powerful tides and currents, including the world's largest whirlpool. Across this spectacular landscape, the Peskotomuhkati have harnessed sustenance and strength, especially from the sea – hence the

meaning of their name, *people who spear pollock*. The Peskotomuhkati are one of the five tribes that make up the Waponahki (Wabanaki) Confederacy - alongside the Mi'kmaq, Wolastoqey, Peskotomuhkati, Penobscot and Abenaki, spanning what is now Maine to the Canadian Maritimes.

Nestled along the upper reaches of Downeast Maine's craggy coastline, among archipelagos, coves and the turbulent tides, lies Sipayik (Pleasant Point) Peninsula, home to the Peskotomuhkati Tribe at the Sipayik. As some of the first people to greet the rising sun on the North American continent, the Peskotomuhkati have built a rich heritage and enduring culture rooted in the sea and maritime landscape.



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Sipayik

Fishing remains cornerstone to Peskotomuhkati heritage and way of life; the North Atlantic Pollock, for example, is central to Peskotomuhkati culture. Sipayik is a historically strategic fishing village for the Tribe. The peninsula is carved by the Peskotomuhkati Bay to the north and Kapskuk (Cobscook) Bay to the south. The convergence of the bays upholds interconnected maritime and terrestrial environments that continue to provide sustenance and security for the Sipayik community.

Terrestrially, Sipayik features forests, grasslands, wetlands, marshes and ponds. These habitats host a plethora of diverse flora and fauna, vital to Peskotomuhkati traditions and culture. This includes various indigenous grasses, northern white cedar, bald eagles, foxes, and dragonflies. Together, the peninsula's diverse collection species uphold ecological balance.





Select a button below to view Sipayik's coastal wetland environments

Inland wetlands

Tidal marshes and flats

Coastal marine environments

Kcipeskiyak

Kcipeskiyak Salt Marsh



In the Peskotomuhkati language, Kcipeskiyak means "Great Bend" or "Great Turn," referring to its position where the Peskotomuhkati and Kapskuk Bays converge. The Peskotomuhkati language is

unique in that it is descriptive and deeply rooted and derived from the land and environment.



At one time, the salt marsh was directly connected to both bays – specifically, Gleason Cove on the Peskotomuhkati Bay side, and Half Moon Cove on the Kapskuk Bay side. Today, Kcipeskiyak is settled between State Route 190 and a former railroad track. The Tribe converted the discontinued Maine Central Railroad corridor, which once served the sardine canning industry, into a 1.9 mile paved rail trail in 2004.



Salt marshes are exceptionally productive and critical ecosystems. They serve as natural buffers between land and sea, preventing erosion and absorbing tidal flooding and storm surges. The tides at Sipayik are among the most extreme in the world; the Peskotomuhkati Bay tidal range can reach extremes of 20 to 30 feet, easily flooding Kcipeskiyak and especially during storms and lunar events. Tidal flooding patterns shape salt marshes, with thick vegetation growing up from the water-carved sediment and peat and around tidal ponds.



The dense vegetation and peat composition of salt marshes make them powerful carbon sinks, which is essential for sequestering carbon from the atmosphere and climate regulation. The living network of vegetation, sediments, micro- and macro-organisms sustains regenerative balance, nutrient cycling, coastal food webs, and ecological balance.



Map of Kcipeskiyak and Sipayik Peninsula. Cartographer: Rhydian Shelley, 2025

Kcipeskiyak Plants & Wildlife

Salt marsh ecosystems sustain a complex, dynamic web of life. These transition zones between the sea and land, where freshwater and saltwater mix, provide critical habitat for different species at various stages of life. Every organism holds a critical role in maintaining ecological balance in the salt marsh, from nutrient

decomposition to predation. Presence and balanced diversity are key indicators of salt marsh health – thriving biodiversity signals a resilient, functioning system, while declines or sparsity point to environmental stress and imbalance.



P L A N T S

Kcipeskiyak's vegetation is dense and diverse. Nourished by layers of sediment and peat carved out by tidal waters, salt marsh plants provide sustenance and sanctuary to wildlife and the broader

ecosystem. Vegetation also serves as structural stability (i.e., erosion control) and improves water quality. Furthermore, the Peskotomuhkati rely on various marsh plants for sources of food, home and clothing insulation, and material for baskets and mats.

Pkuwahqiyasq - Cattails

Pkuwahqiyasq - Bulrush

Saltmeadow & Smooth Cordgrass

Sea Lavender

Marsh Elder

Kakskusimus - Northern White Cedar

Olonatoq/Kawatoq - Red & Black Spruce



I N S E C T S

Insects are vital for the regeneration, natural cycles, and balance of Kcipeskiyak. These little – yet powerful – creatures serve as decomposers by breaking down organic matter, food sources, pollinators and indicators of ecosystem health.

Apuciqahak - Dragonflies

Cossuwiyyik - Mosquitoes & Midges

Spiders

Amakehsuwok - Butterflies



BIRDS

Raptors, songbirds, waterfowl and shorebirds are integral to healthy salt marsh. They regulate pests, stimulate growth through foraging and soil fertilization, and help to pollinate and spread seeds. Their sensitivity to environmental changes makes them key indicators of marsh health, providing insights into balance and quality.

Kasqiyik- Blue Herons

Wapsokes - Bald Eagle

Isomeqehs - Osprey

Black Duck Mallard, Green-Winged Teal

Waptoq - Canada Goose

Coskuwehsis - Sandpipers

Wapi-kuhkukhahs - Snowy Owl

Oqim - Loon



M A M M A L S

Mammals maintain salt marshes through foraging and vegetation control, shaping water systems, and are integrated into the food web as both predator and prey. Some mammals pass through and graze, while others burrow or nest into the sediment, grasses, and fringes of the woods.

Kiwhos - Muskrat

Qapit - Beaver

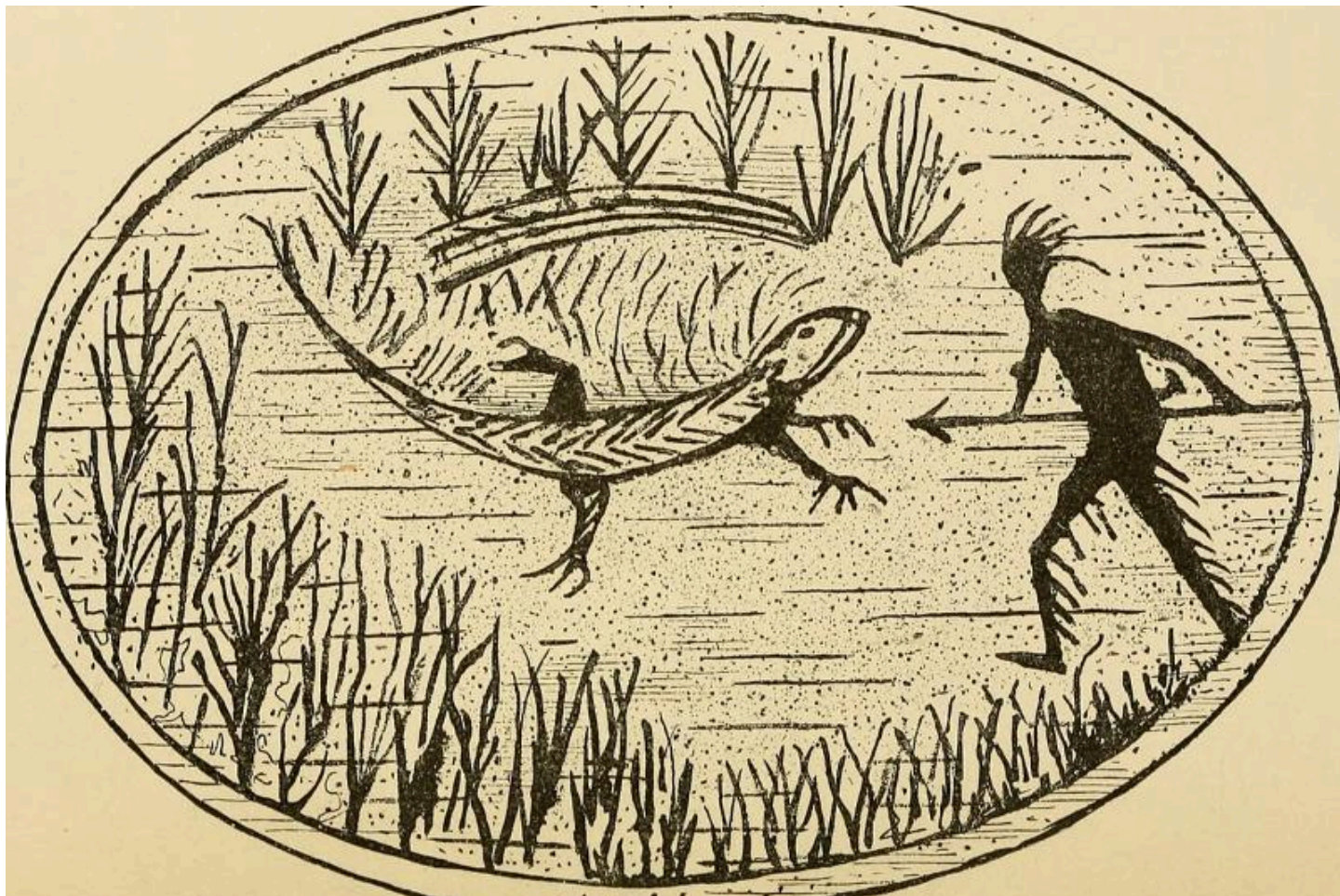
Kiwonik - Otter

Otuhk - White-tailed Deer

Qaqsoos - Red Fox

Espons - Raccoon

Muwin - Black Bear



AMPHIBIANS & REPTILES

Green & Leopard Frogs

Spring Peeper

Spotted Salamander

Garter Snake



F I S H

Fish and eel drive the salt marsh food web, supporting the complex, dynamic layers of life. Fish regulate insects and aquatic invertebrates, while serving mammals, birds, and some amphibians and reptiles as source of food. Their activity and digestion supports nutrient cycling and prevents stagnation, and they carry nutrients to and from different wetland environments. The marsh habitat

provides an ideal, safe nursery for many fish species, who spend their earliest days hatching and developing within the safety of the saltmarsh waters.

Alewife

Mummichog

Flounder

Eel



I N V E R T E B R A T E S

Muscles, shellfish, and other invertebrates are nature's powerful filtering agents. They support natural cycles within the marsh, fortify sediment and prevent erosion by digging and burrowing into the earth, and serve as a source of food for many other species.

Clams

Mussels

Amphipods

Crustaceans

Restoring Ancestral Ecosystems

The Sipayik Environmental Department is making significant strides by integrating Traditional Ecological Knowledge (TEK) and modern science for monitoring and restoring ancestral ecosystems. Tribal-led efforts and partnerships with academic, state and federal researchers are building a comprehensive assessment of Kcipeskiyak salt marsh, and with that, a more thorough understanding of the past, present, and future conditions of this critical ecosystem.

While exceptionally resilient, salt marshes are highly sensitive to both environmental and man-made changes. Rising sea levels and expanding pool sizes reduce carbon sequestration, a natural process critical for climate regulation. Pollutants, like those derived from wastewater and road runoff, man-made barriers like roads and berms, colonial-era ditches and filling, and extreme fluctuations in temperature trigger chemical, biological and structural composition imbalances. These changes impact life



eDNA (credit: Sipayik
Environmental Department)

cycles and food webs and increase vulnerabilities to invasive plant and animal species.

The integration of TEK and modern science is central to the Sipayik Environmental Department's work to understand the past, present, and future of Kcipeskiyak – and the plants and animals that depend on its health and existence. Combining TEK and scientific advancements creates a comprehensive understanding of an environment, balancing data-driven insight with lived and passed-down experiences. While modern science can reveal the unseen – microbial and chemical compositions and organism dynamics – TEK illustrates the interconnections among humans, plants and animals, and the observable impacts

of both natural and anthropogenic change on a highly complex habitat.



Traditional Ecological Knowledge (TEK)

Traditional Ecological Knowledge (TEK) is the accumulation of observations, knowledge and beliefs about the natural environment, developed and passed down through generations. It offers deeply ingrained, proven insights into how ecosystems thrive, function, change, and adapt over time. When environments face unprecedented challenges, TEK offers guidance for Tribes to adapt, restore, and protect. TEK provides solutions and a path forward by looking back to the past, binding historical knowledge

and cultural wisdom to the environment and landscapes that have sustained life through challenges for centuries.



Colonial and urban expansion have significantly restricted Peskotomuhkati access to ancestral lands and culturally vital ecosystems. Today, there is growing recognition for the importance of TEK in restoring and preserving salt marshes and other critical habitats. Recent studies have affirmed that traditional land management practices support the health, stability, and ecological integrity of salt marsh ecosystems like Kcipeskiyak -- a demonstration of deeply rooted, mutualistic relationship between the Peskotomuhkati people and their ancestral landscapes.



Modern Science: eDNA

The Sipayik Environmental Department is applying innovative modern technologies and data-driven methods to gain deeper insights into the past, present, and future trajectory of Kcipeskiyak. One of the techniques being applied in-house with TEK is environmental DNA (eDNA).

eDNA is a non-invasive, comprehensive approach to understanding the historical and current biodiversity of Kcipeskiyak. In collaboration with Dr. Beverly Johnson of Bates College, Dr. John

Woodruff of UMass Amherst, and programs like the Maine Sea Grant, the Sipayik Environmental Department is using eDNA to develop historical timelines and analyze changes in Kcipeskiyak.

This advanced, in-house technology allows the Sipayik Environmental Department to assess genetic traces in the sediment, capturing valuable insights into species presence and biodiversity, the role of micro-organisms, nutrient cycling and decomposition.



eDNA offers more than just insights into biodiversity; in addition to genetic traces, every core sample contributes to a timeline spanning

thousands of years. This timeline reveals carbon storage and sequestration patterns, indications of pollutants, specific historical markers for vegetation and sea level fluctuations, and insights into flooding, tidal patterns, erosion, and storms.

eDNA alone is a remarkable capability, and being able to conduct sampling and analysis on-site gives the Sipayik Environmental Department independence, capacity, and flexibility to prioritize areas of cultural and ecological interest, like Kcipeskiyak. eDNA reveals a comprehensive picture of the salt marsh – from the genetic and microbial scale to the level of plants and animals – without disturbing any present organism.





Select and image for details. These images were provided by the Sipayik Environmental Department.

Conclusion

Kcipeskiyak salt marsh stands as a testament to the enduring relationship between the Peskotomuhkati and their homeland. Kcipeskiyak is a living landscape of the past and a guide to the future – embodying generations of stewardship, survival, and the powerful connection between a culture and a place where the sea and land meet.

Today, as Kcipeskiyak faces challenges from legacies of colonial and urban development, rising seas and invasive species, the Peskotomuhkati continue to lead with resilience and reflection – observing, adapting, and moving forward. Through TEK, community, and scientific advancements like eDNA, the Sipayik Environmental Department is protecting, preserving and restoring ancestral ecosystems in ways that honor culture and ecological

integrity. These efforts reflect the enduring relationship between the Peskotomuhkati and the land and sea that is their home, powerfully grounded in respect and resilience.

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Peskotomuhkati-Wolastoqey Language ...

Click on a letter of the alphabet to start browsing the
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