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A Photographic Exploration of Wigi (currently called Humboldt Bay)

Aldaron Laird

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A PHOTOGRAPHIC EXPLORATION of WIGI

All photographs featured in this book are available for purchase as a custom print.
Please contact the author at aldaronsimages@gmail.com.

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1 Harpst Street
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press@humboldt.edu
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THE PRESS AT CAL POLY HUMBOLDT

A PHOTOGRAPHIC EXPLORATION *of* WIGI

currently called Humboldt Bay

Aldaron Laird

Dedication

I dedicate this, my first book, to my amazing wife Christy. Her support, collaboration, evaluation of photographs, and tireless editing was a selfless contribution to this photographic exploration publication.

Acknowledgments

I would like to express my gratitude to historian and author Jerry Rohde for his unwavering encouragement throughout the book creation process. Jerry introduced me to the Press at Cal Poly Humboldt and assisted me in selecting my top photographs to incorporate.

I will be forever thankful to Marnie Atkins, member of the Wiyot Tribe, for sharing the Tribe's history and reverence for Wigi's waters and lands, and for engaging Lynnika Butler, the Wiyot's linguist, to provide their Soulatluk place names throughout Wigi.

I enjoyed my time on Elk River Spit with poet Jerry Martien and I am grateful to him for inspiring me to see poetry in my images.

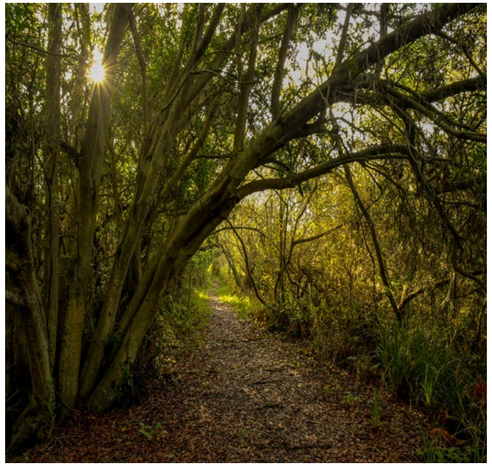
My long-time friend Riley Quarles has accompanied me on many walks along Wigi's shorelines and paddles in its waters, and I valued his critical reviews of my images and reasons for including them.

My thanks to Cal Poly Humboldt's publishing team: Colwyn Delany for her patience working with me on the layout of the book and for her creative use of my photographs, and Kyle Morgan for his editorial enthusiasm, guidance, and knowledge of how to bring a book such as this to press.

I am grateful to Cynthia Hooper, retired College of the Redwoods art professor, who early on in my exploration of Wigi, encouraged me to show my photography of Wigi in an exhibit at the Morris Graves Museum of Art. I also appreciate Humboldt Arts Council Executive Director-Curator Jemima Harr's excitement to host my first photography exhibit in 2014, and to schedule an additional forthcoming exhibit to highlight images in my book: *A Photographic Exploration of Wigi (currently called Humboldt Bay)*.

I am forever indebted to my good friend Larry Hewett for enriching my life when he introduced me to the world of flatwater kayaking, without which this book would not exist.

Exploring Wigi's



lands *waters*

Contents

Enjoying the magic…

…at Arcata Marsh's rising tides observation bench.

Experiencing the surreal…

…in the Liscom Slough wildfire smoke inversion of 2021.

Soulatluk - English Place Names Glossary

Scan the QR code or visit https://qrco.de/bepzvw for more information about the Soulatluk place names in this book, including audio where available.

Baduwa’t	Mad River
Bi’murr	South Spit
Daluwutk	Fields Landing
Dukdoughugu’w	Salmon Creek
Durouk Higuchguk	Buhne Point
Goudi’ni	Arcata
Goukdi’n	Jacoby Creek
Goumayirru’ Daqh	Freshwater Creek/Slough
Hikshari’s River	Elk River/Slough
Hutverroulh	rookery/Tuluwat
Jaroujiji	Eureka
Kvelha’ts	Ryan Slough
Rraloughugu’w	Table Bluff
Shirouk Dumi	mouth of Jacoby Creek
Shou’r	Pacific Ocean
tsoutgish	bird
Tuluwat	formerly known as Indian Island
Tvughuqhu’r	Mad River Slough
Wigi	Humboldt Bay
Wiya’t	Eel River

Foreword Marnie Atkins

As a Wiyot person who has worked in Indian Country for 20+ years, I have held many interesting positions and worked with many interesting people. Many stand out in my mind, some not as much. Aldaron Laird is one of the people who stands out in my memory.

It has been my pleasure to work with and learn from Aldaron over the years. We met and worked together on various projects, both tribal and non-tribally related, in our shared community of Humboldt County, California. Through presentations he gave, I learned about his work. Through collaborations, I learned about his mind. Through meetings together, I learned about his interests. And through this book, I have learned about his passion.

Using his skills as a photographer, Aldaron shares a world few of us see. He hikes, kayaks, and wades into areas to bring us a glimpse of the unseen waterways, flora, and fauna of Wigi (the original and Wiyot people’s name for Humboldt Bay). He uses steps gently, travels lightly, and envelopes heart into each image he takes.

During the development process of this book, Aldaron reached out to me and asked if it would be appropriate to include Soulatluk (the name of the Wiyot people’s language) in the book. I was thrilled by this request!

I am a learner and teacher of Soulatluk and the Wiyot Tribe has been revitalizing, reclaiming, learning, and teaching Soulatluk, officially, for almost 20 years. It is not an easy feat. The Tribe's Linguist, Dr. Lynnika Butler, and her Language Assistant, Nina Lorence-Ganong, along with several Wiyot people, have been working hard to document, digitize, create learning/teaching materials, and provide Soulatluk learning classes. From the early start of learning Soulatluk around the dinner table of families and friends, to community Soulatluk learning classes, into local schools, and now this book, Soulatluk is coming home. And you, Dear Reader, will be able to listen and learn some of the placenames in Wiyot Country by reading this book.

When I first viewed this book, I became acutely aware that someone else saw the world the way my Ancestors saw it, the way I see it. I wished that I had had this book when I was at university, away from my family, my friends, my people, and my homelands. It would have helped ease my homesickness. This book visually centers the Wiyot people's world and Aldaron's lens tells us the story of place and shares the beauty, life, and dynamics of Wigi and surrounding waterways. If you have a family member or friend who has gone away to school or moved away from this area, I highly recommend sending a copy to them (hard copy and digital copy available). It will surely ease their homesickness and remind them to return to you and the shores of Wigi soon.

Whether you live locally or are viewing the book while living far away, you feel Wigi and surrounds in your core. As you sit in quiet contemplation while visiting with this book, you can hear the voices of shore birds, the bark of a sea lion, the light lapping of waves on the banks of Wigi, and you can feel the light mist on your face as the heavy blanket of fog comes to rest on your shoulders. Hou' (Thank you), Aldaron, for sharing this with us.

Wishing you and yours
many Blessings,

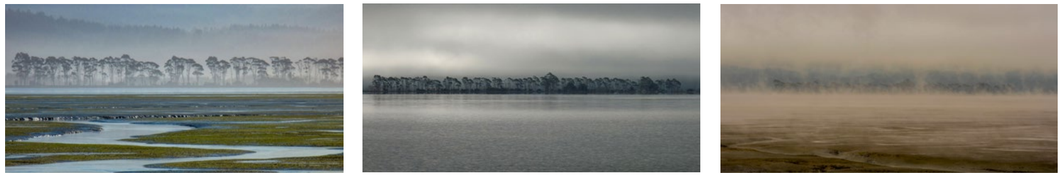
Marnie Atkins, Wiyot

Foreword Jerry Rohde

In *A Photographic Exploration of Wigi*, Aldaron Laird shows us a Humboldt Bay that we've never seen before and that we will never see again.

For decades Aldaron has walked the shores of the bay, climbed its nearby sand dunes, and kayaked its entire periphery, taking over 25,000 photos that reveal the beauty of Wigi as it might appear in some magical, glimmering dream. From those thousands of photos, Aldaron selected 119 for this book. For each photo he kept, he discarded 209 others, which means that of those 25,000 images, he used less than one percent. We might think that taking all those photos required a tremendous amount of work, but it soon becomes clear that Aldaron did not work on this book, he lived and breathed its very essence, so that every photo he did select opens like a window, showing us yet another wonderful facet of Wigi, this place of ten thousand smaller places where land and water so subtly, so strikingly meet.

When Aldaron wasn't exploring and photographing Wigi, he was

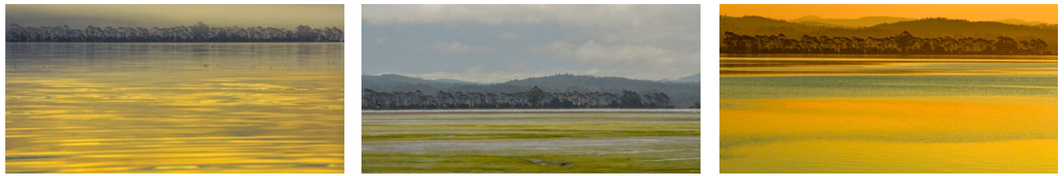


Devoy Eucalyptus Grove at various seasons, times, and tides.

learning as an environmental planner how the bay worked as a hydrological unit. He came to understand the intricate relationship between Wigi and the land that surrounds it. He learned about how the bay had been altered over time by diking, by the construction of roads and railroads, and by residential and commercial developments. And gradually, at an ever-increasing pace, he became aware of the threat posed to Wigi by climate change, and most especially, by sea level rise. For years Aldaron first informed, and then warned, the local community and all the relevant agencies about the cataclysmic effects sea level rise will soon have on the bay. He has done all he can to shine a light on Wigi's fraught future.

And now Aldaron has done something very different. He has saved for us a remarkable record of what Wigi was like in the first quarter of the twenty-first century at a time when we are realizing that in another century it will be a very different place. We of course don't know what the bay will look like in 2123, but thanks to Aldaron's skill with a camera and his love for Wigi, future generations will always be able to see what it was like today.

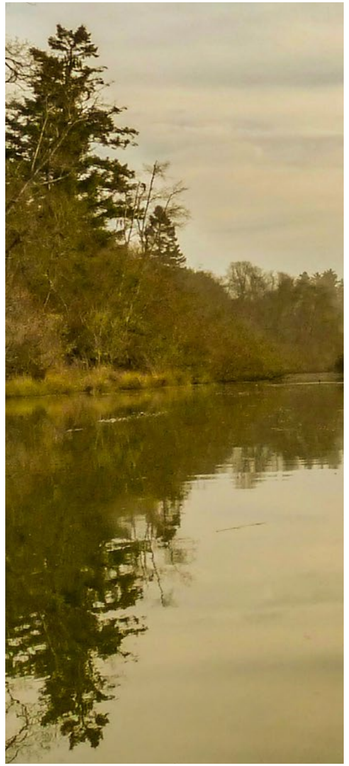
Even within the next few years people will want to be reminded of how the bay appeared in 2023. For example, the row of Devoy Ranch eucalyptus trees that lined part of the Highway 101 traffic corridor has



just been cut down. The trees are not native, having been planted in the 1930s. Nonetheless, like eucalyptus in many other parts of the state, they became an integral part of the bay shore environment, observed by thousands of motorists daily as they drive the bayside stretch of highway. In this book, Aldaron provides a series of six images of the Devoy trees, showing them at different times of the day and in different weather conditions. Most importantly, all six photos were shot from his "Rising Tides Observation Bench" on the shoreline of the bay, so that we see the row of trees as one of three dramatic horizontal planes: first the bay itself, whether filled with shimmering water or as an exposed, ever-changing mudflat; then the trees themselves, sometimes partly obscured by fog, sometimes as a dark band of vegetation absorbing or reflecting the light; and finally, six different versions of the varicolored mountains and sky, an ever-changing mantle of shape and texture spread above the trees and bay.

This sequence alone would make me want to own this book, but there are another 113 images waiting to be seen. As you finish reading this foreword, the next step is simple: start turning the pages—very slowly—and become transfixed by the beauty of Wigi and the artistry of Aldaron Laird.

—Jerry Rohde, 2023



picture this

by Jerry Martien

beneath the harbor
a living body of water

around it marsh
dune and mudflat

beneath its name
older names

a life around us
unacknowledged

on a willow branch
—night heron

under the pine
—manzanita berry

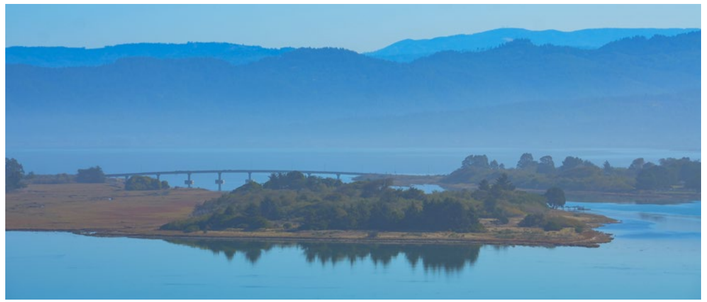
over the tideland
—mist in morning sun

a rising sea
coming our way

a picture of home
coming home

Preface

In 2007, I produced a Historical Atlas of Humboldt Bay and Eel River Delta, documenting over 150 years of physical shoreline changes. This project inspired me, three years later, to undertake mapping the 2010 shoreline of Wigi to assess its vulnerability to sea level rise. For two years, I compiled and studied aerial photographs to define the existing shoreline. I then ground truthed my mapping by walking and kayaking Wigi's entire 102-mile shoreline perimeter. In an article she wrote for the North Coast Journal, reporter Heidi Walters described my endeavor as "Aldaron's Walkabout." It was truly a once-in-a-lifetime experience. I generated thousands of photographs documenting shoreline conditions. This experience had a profound effect on me, and I continue to actively traverse and photograph the kinetic confluences of the natural elements of Wigi's shorelines, waters, wetlands, plants, wildlife, and adjacent lands. I have shared my images of Wigi in hundreds of presentations, in multiple photography exhibits, and now in this book.



I am honored and excited to be collaborating with the Wiyot Tribe in compiling this book and to share the Soulatluk place names and their pronunciation for locations around Wigi.

In several places I revisit the same site during different seasons, times of day, tides and weather conditions to create a fascinating time series for this book. I also included a few visually interesting juxtapositions. Over years of walking along the shores, and kayaking its waters, I have assembled a collection of images that I hope convey the beauty and diversity of Wigi. I am pleased to share my visual experiences capturing the atmospheric moods of Wigi, a truly extraordinary place.

Introduction

In 1850, American invaders in search of gold entered Wigi, and chose to name it Humboldt Bay after a famous naturalist, Alexander von Humboldt. This namesake is curious because in truth, Wigi was never visited by Alexander von Humboldt, and it is not a bay. It is a lagoon; its shallow waters are separated from the open ocean by sand spits.

The newcomers named nearly all the landscape features, but other than the cardinal directions their names often have little meaningful relationship to or understanding of this place known as Wigi. I have chosen to describe my photographic exploration in the spirit of the Wiyot's relationship to this unique and beautiful landscape, as one place that they recognize as Wigi. Wigi encompasses all the tidal waters, inter-tidal wetlands, shorelines, and adjacent lands. Bordering Wigi on the south is Wiya't and to the north Baduwa't; these waters and surrounding lands are the ancestral home of the Wiyot people.

In the following chapters I have assembled a collection of photographs from my explorations of Wigi's unique areas. Wigi is a place that not many people know really well. I hope with my photographs to share the beauty and diversity that I have seen on Wigi.

Wigi has undergone tremendous changes since the invasion of 1850; it is about to experience equally significant changes again, likely during the next 50 years. In the last chapter, I will explain how these changes might unfold on Wigi in response to sea level rise.

Photographic Time Series

A murmuration of shorebirds in flight with Devoy Eucalyptus Grove and ethereal sky as background.

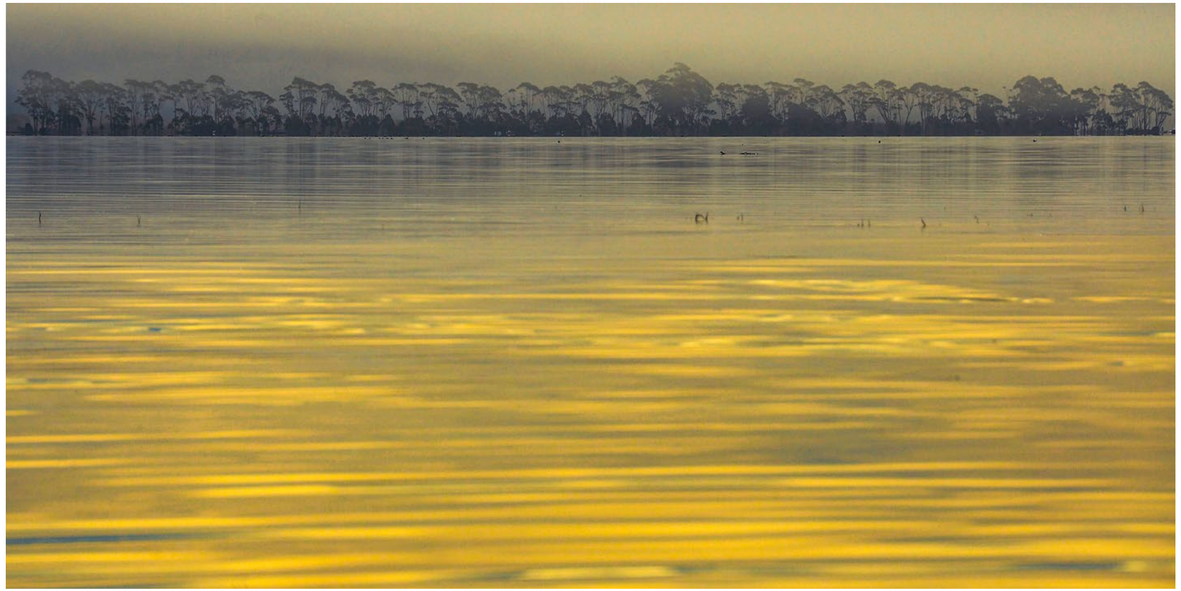
A photographic exploration can involve visiting many areas or entail visiting just a single area/composition multiple times. Wigi is tidal water which is in constant motion. Its tides flood and ebb twice daily, light changes with the time of day and atmospheric conditions, and seasons can bring their own visual elements to a scene.

To illustrate the beauty of this concept I created a time series of the Devoy Eucalyptus Grove on the eastern shore of Wigi between Goudi'ni and Jaroujiji, as viewed and captured from an observational bench at the Arcata Marsh and Wildlife Sanctuary. This photographic series is particularly poignant to me, in that it documents an iconic and historic landscape that is now gone, as unfortunately, these trees had to be cut down in 2023 to make way for the Bay Trail.

Devoy Eucalyptus Grove viewed at low tide across extensive mudflats as the fog burns off.

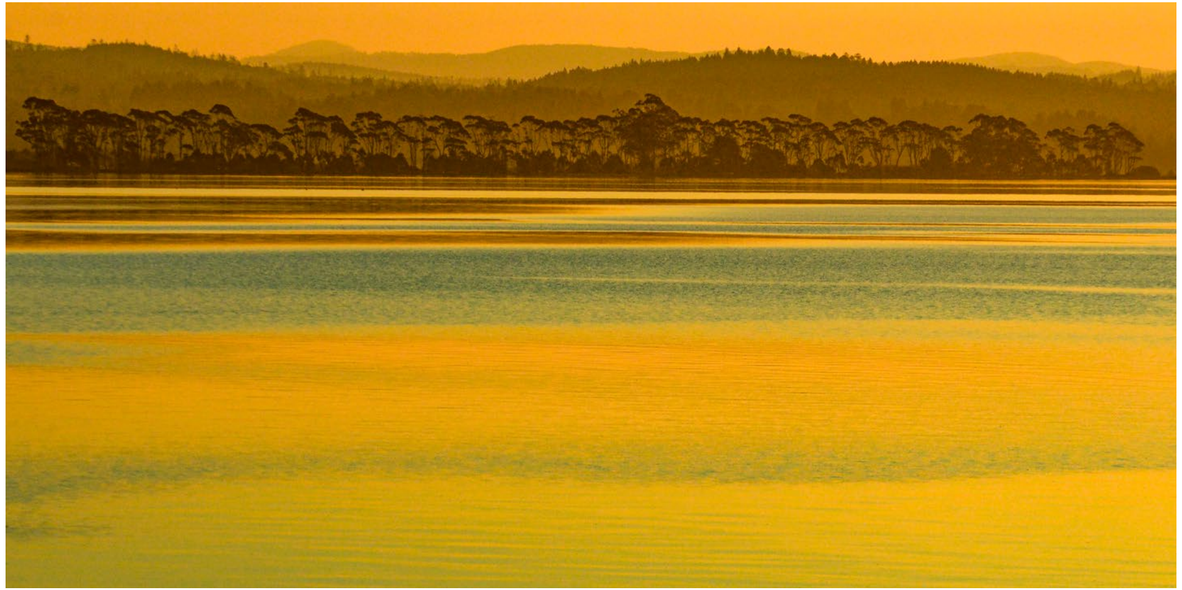
A monochromatic scene of Devoy Eucalyptus Grove at high tide under an overcast sky.

Devoy Eucalyptus Grove at low tide in summer when steam rises from mudflats to merge with evaporating fog.



Ever-changing lighting creating beautiful reflections.

Devoy Grove at low tide during summer when increased daylight creates an algae bloom on mudflats.



Devoy Eucalyptus Grove viewed at high tide during ephemeral late afternoon light.

Photographic Juxtapositions

I am drawn to juxtapositions that I discover during my review of Wigi photographs, such as these six images.

A grove of ghost white snags at Ma-Le'l Dunes on the shore of Tvughuqhu'r that today no longer exist.

In 2011, a fleeting gathering of great white egrets as a rising tide floods the mudflats in front of Bi' murr on Wigi's southern bay.

Salt marsh in spring, during low tide at the end of the Ma-Le'l Dunes' Tsoutsgish Trail.

The same salt marsh in fall, during high tide.

South Jetty rubber tire monument on Bi' murr.

A monument to the Fourth of July on the coast at Ma-Le'l Dunes.

Photographic Exploration

Agricultural pasture on Baduwa’t bottomland.

Wigi is always in motion, its tides flooding or ebbing through lagoon-like bays and sloughs and mixing with freshwater runoff coming down tributaries from forested slopes. Tides enter Wigi through a narrow channel formed by mile-long jetties at the end of two spits. Across from the entrance a sand spit extends out into the navigation channel, sheltering lower Hikshari’s River as it enters tidal waters. This is one of Wigi’s largest streams draining the redwood slopes to the east.

As the tides move north through a deep-water navigation channel fronting Jaroujiji, they move out into a large shallow area with thousands of acres of mudflats exposed during low tide. Further to the north, Wigi’s tides meander up through a large slough called Tvughuqhu’r. Along the west side of the slough is Ma-Le’l and Lanphere Dunes National Natural Landmark, where tall dunes spill through a rare shore pine Sitka spruce forest to intertidal wetlands/salt marsh. To the east of the slough is the largest extent of grazing land on Wigi, on Baduwa’t’s bottomland.

Draining the eastern slopes of northern Wigi from Goudi’ni to Jaroujiji are several freshwater tributaries that in times past flowed into extensive salt marsh plains below redwood forests, but now are diked grazing land. Another large freshwater stream from the eastern redwood slopes, Goumayirru’ Daqh just before Jaroujiji flows through what was once inter-tidal wetlands/salt marsh, but are now sinuous tidal sloughs and diked agricultural land, before it enters the bay.

At the entrance channel, tides also flow into southern Wigi through a wide, shallow lagoon with extensive mudflats at low tide and valuable eel grass habitat. Historically, precipitation falling below an inland ridge would drain downhill in Dukdoughugu'w through forested slopes to alluvial bottoms, conveying freshwater into salt marsh plains to mix with tides in southern Wigi. On the southern shoreline of Wigi is a two-and-a-half-mile-long bluff below Rraloughugu'w, a ridge separating its waters from Wiya't. Wigi's western shoreline is almost four miles long on the bay side of Bi'murr. All this landscape, its waters, and the lands through which they flow, are known as Wigi by the Wiyot.

Generally, as tides move inland, they flood discrete areas above a specific point, such as the entrance of sloughs and bays. There are six such tidal hydrologic areas within Wigi: two wide, shallow lagoon-like bays, one in the north and the other in the south; a narrow deep-water channel between these two shallow bays and Wigi's northern spit; and three areas where tidewater passes through a narrow channel mouth or slough. There are two upland sand spits that separate Wigi from the open ocean, one to the north of the entrance channel and the other to the south.

I have grouped these hydrologic areas into six geographic regions based on shared characteristics:

1. Northern Wigi and Goumayirru' Daqh
2. Goudi'ni marsh and wildlife sanctuary
3. Tvughuqhu'r and Baduwa't bottomland
4. Coastal dunes and shore pine Sitka spruce forest
5 Jaroujiji Channel and Hikshari's River
6. Southern Wigi and Bi'murr

Northern Wigi and Goumayiruu Daqh

Wigi's largest bay is in the north where it has an extensive mudflat area traversed by open water channels. The bay encompasses approximately 8,000 acres with 17 miles of shoreline and nearly 4,500 acres of mudflats. Beginning in 1890, nearly 2,150 acres of salt marsh were diked off from the bay and converted to agricultural uses, but are now mostly grazing land for livestock and geese. Today, this bay is encircled by roadways, dikes, abandoned railroad grade, and the Humboldt Bay Trail. Urban areas in Goudi'ni and residential areas in Manila extend down to the shoreline. Much of the northern and eastern regions of the bay are now protected wildlife areas. The unique urban/wildland interface of the Arcata Marsh and Wildlife Sanctuary occupies the northeast corner of the bay.

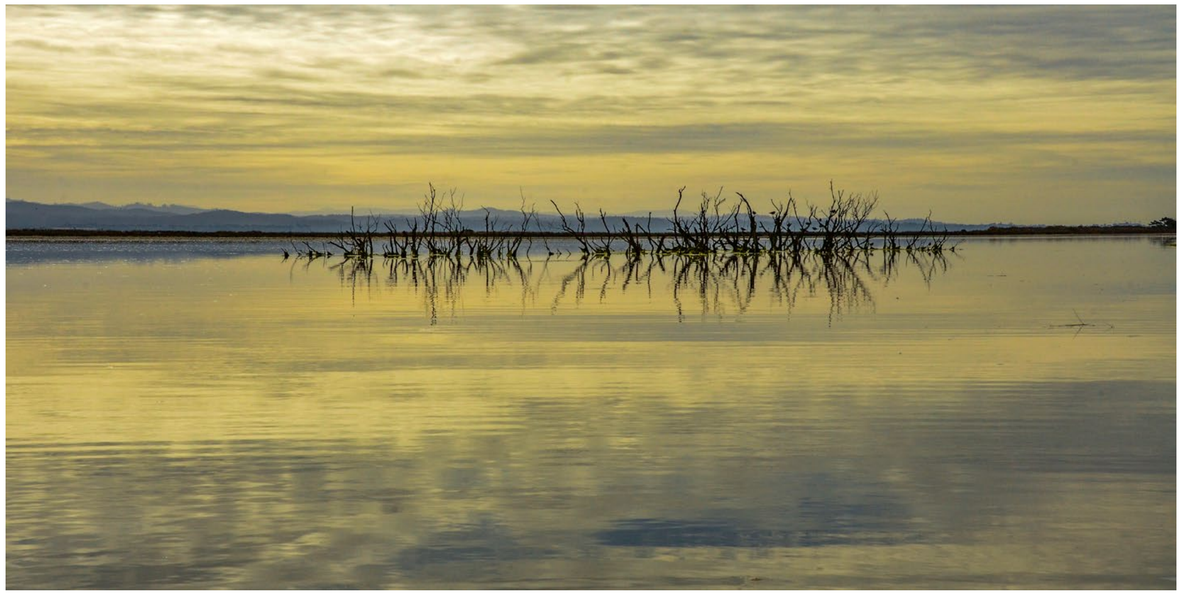
Goumayirru' Daqh encompasses 2,900 acres with 25 miles of shoreline and a network of tributary sloughs: Fay Slough and Kvelha'ts drain to Freshwater Slough, which connects to Wigi's northern bay via a channel currently referred to as Eureka Slough. Historically, nearly 2,640 acres of salt marsh in Freshwater Slough were diked off and converted to agricultural uses.

At the boundary between northern Wigi and the navigation channel on Jaroujiji waterfront is Tuluwat Island, the Wiyot people's Center of the World and Ceremonial Site.

Snow-shrouded mountains as viewed from Wigi's western shore in its northern bay.

Tuluwat Island, photographed here at king tide, is the center of the Wiyot people's world and a sacred site for tribal ceremonies.

Butcher Slough channel traversing northern Wigi's mudflats at low tide.



Tidally restored Daniels Slough area during a king tide on Wigi's northern bay near Arcata Marsh.

Recently restored diked former tidelands on Daniels Slough in Arcata Marsh during a king tide.

Recently restored diked former tidelands off Goukdi'n during a king tide.

Wigi’s reflecting water in its northern bay as viewed from Arcata Marsh.

Rising tide water patterns on Wigi’s northern bay as viewed from Arcata Marsh.

Northern Wigi at low tide with the mesmerizing light of a sun halo formation, viewed from Arcata Marsh.

Blue light of morning on a minus tide channel in northern Wigi.

Orange light of the setting sun on low tide channels draining northern Wigi's mudflats.

During the long days of summer extensive algae “pastures” form on northern Wigi’s mudflats.

Shirouk Dumi on northern Wigi’s eastern shoreline during high tide.

Northern Wigi during summer low tide as steam rises from mudflats to merge with hovering fog.

Lower Goumayirru' Daqh entering northern Wigi during a king tide.

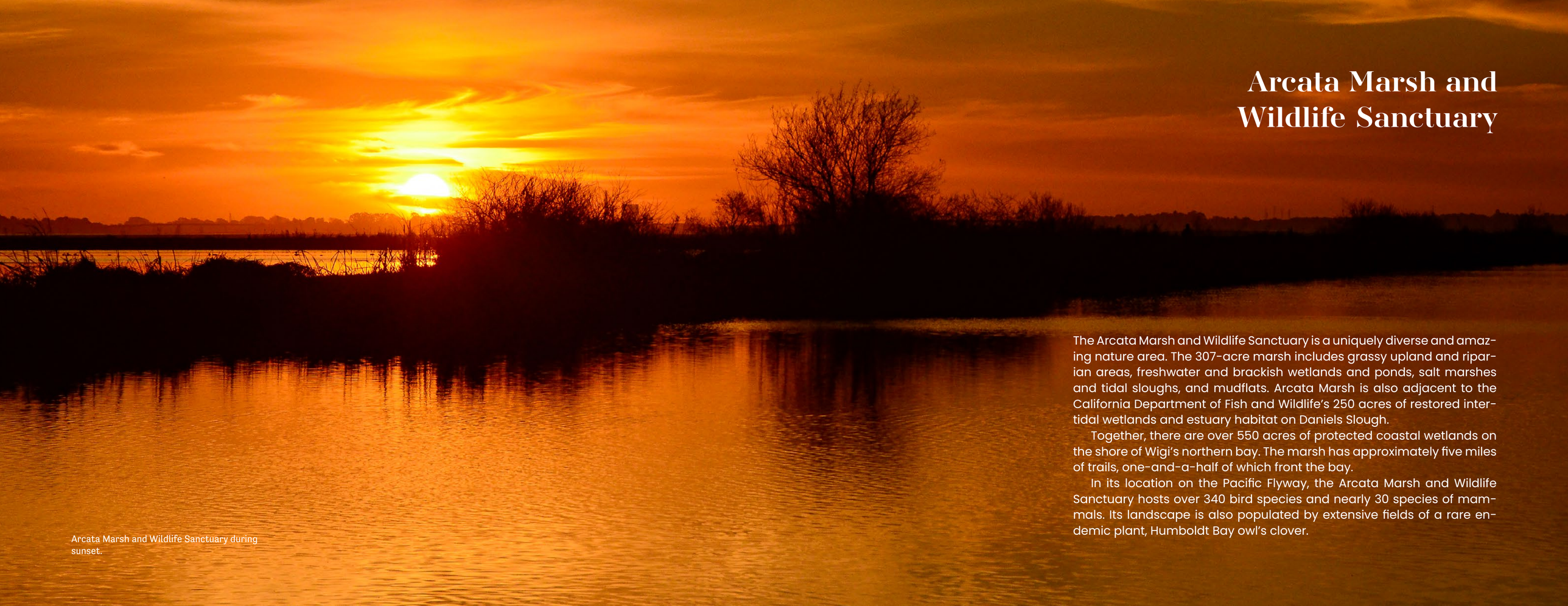
Goumayirru' Daqh traversing the Northcoast Regional Land Trust's Reserve.

The California Department of Fish & Wildlife's Fay Slough Wildlife Reserve on a tributary to Goumayirru' Daqh.

King tide flooding diked former tidelands on Goumayirru' Daqh.

Magical light and atmospheric conditions illuminate Wigi's northern waters.

High tide's reflective surface, looking east across northern Wigi to Goumayirru' Daqh.



Arcata Marsh and Wildlife Sanctuary

The Arcata Marsh and Wildlife Sanctuary is a uniquely diverse and amazing nature area. The 307-acre marsh includes grassy upland and riparian areas, freshwater and brackish wetlands and ponds, salt marshes and tidal sloughs, and mudflats. Arcata Marsh is also adjacent to the California Department of Fish and Wildlife's 250 acres of restored intertidal wetlands and estuary habitat on Daniels Slough.

Together, there are over 550 acres of protected coastal wetlands on the shore of Wigi's northern bay. The marsh has approximately five miles of trails, one-and-a-half of which front the bay.

In its location on the Pacific Flyway, the Arcata Marsh and Wildlife Sanctuary hosts over 340 bird species and nearly 30 species of mammals. Its landscape is also populated by extensive fields of a rare endemic plant, Humboldt Bay owl's clover.

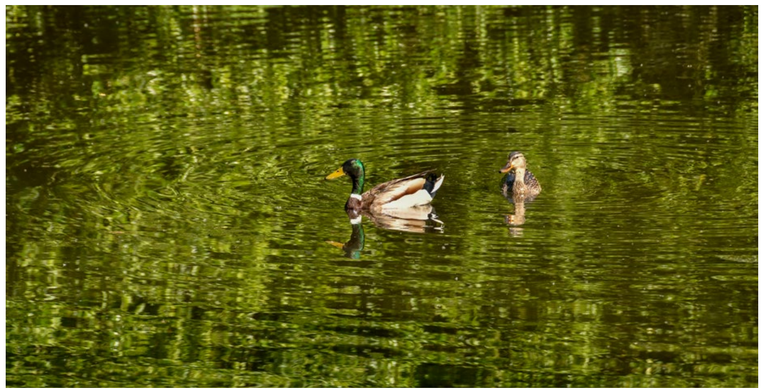
Arcata Marsh and Wildlife Sanctuary during sunset.

A former log pond, wetland, and riparian habitat.

An elegant great white egret taking flight.

An egret's graceful loft.

Green widgeon ducks crossing a line on a pond.



Sparkling emerald water and a pair of mallard ducks on a pond.

Freshwater pond and wetlands.

A field of endemic Humboldt Bay owl's clover.

A scolding marsh wren guards the marsh.

An osprey launching in Daniels Slough Restoration Area.

Mirror reflections of floating posts on Butcher Slough at high tide.

Tvughuqu'r and Baduwa't Bottomland

View west of Liscom Slough meandering toward the shore pine Sitka spruce forest on Tvughuqu'r.

The Tvughuqhu'r, salt marsh, diked former tidelands and Baduwa't bottomland complex covers approximately 2,200 acres with nearly 14 miles of shoreline.

Tvughuqu'r tidal water covers approximately 500 acres and is bounded on the west by an extensive dune ecosystem and the southernmost extent of the shore pine Sitka spruce forest. Much of the dune and forest areas are managed by the Humboldt Bay National Wildlife Refuge. To the east, the diked slough merges with the Baduwa't bottomland to form the largest agricultural and grazing area on Humboldt Bay. The diked areas are also seasonal freshwater wetlands that are heavily grazed by migrating Aleutian geese.

Low tide Tvughuqu'r salt marsh and mudflats, rimmed by shore pine Sitka spruce forest.

Tvughuqhu'r and shore pine Sitka spruce forest at Ma-Le'l Dunes trailhead.

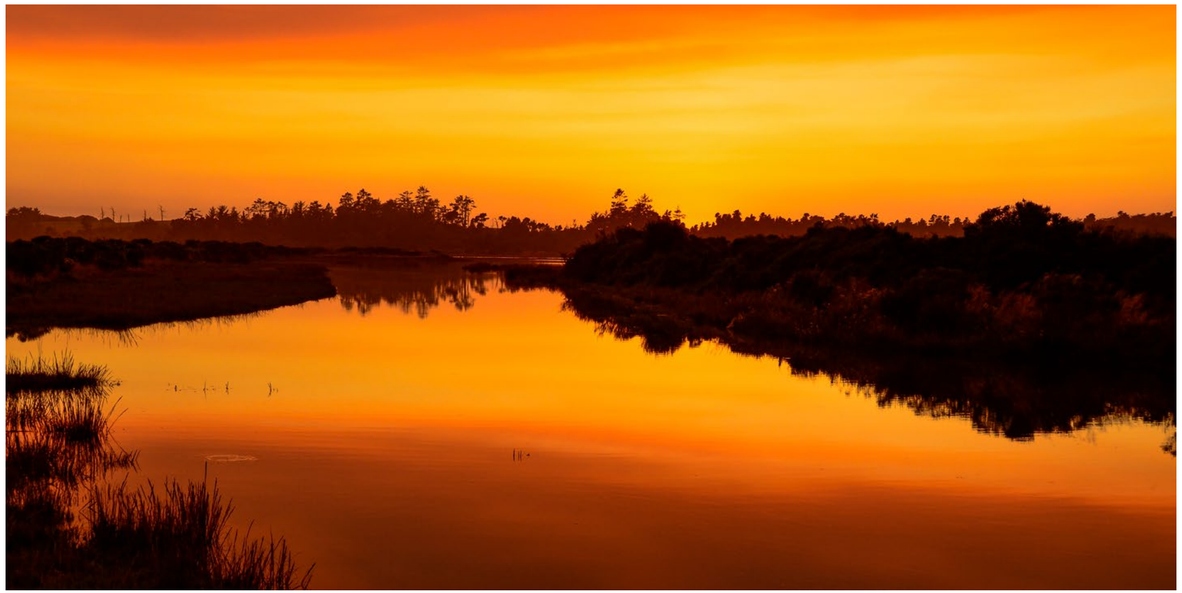
Tvughuqhu'r and the encroaching Ma-Le'l Dunes at the Humboldt Bay National Wildlife Refuge.

Reflecting waters and shore pine Sitka spruce forest on Tvughuqhu'r.

Mad River Slough and shore pine Sitka spruce forest at the Ma-Le'l Unit of the Humboldt Bay National Wildlife Refuge.

Reflection of a graceful great white egret on Tvughuqhu'r at low tide.

Shorebirds escaping the king tide on Tvughuqhu'r.



Ma-Le'l Dunes sunset on Liscom Slough view toward the shore pine Sitka spruce forest.

King tide on agricultural lands along Liscom Slough.

Bewildered cows in a surreal inland wildfire smoke inversion atmosphere in 2021 on Liscom Slough.

Mirrored clouds above Tvughuqhu'r and Baduwa't bottomland looking east toward Kneeland.

Tvughuqhu'r, shore pine Sitka spruce forest, and Humboldt Bay National Wildlife Refuge Lanphere Unit.

Aleutian geese grazing on Tvughuqhu'r diked former tidelands.

A great blue heron on Tvughuqhu'r.

A passing storm on Tvughuqhu’r, salt marsh, mudflats and coastal dunes.

Ma-Le’l Dunes crest ghost forest vista of Tvughuqhu’r and Baduwa’t bottomland.

Coastal Dunes and Shore Pine Sitka Spruce Forest

The Coastal Dunes and Shore Pine Sitka Spruce Forest landscape covers approximately 2,000 acres. The Humboldt Bay National Wildlife Refuge encompasses and manages much of the northern half of this area with the Bureau of Land Management. The Friends of the Dunes and Manila Community Services District manage most of the southern portion of this area.

An extensive dune field and rare coastal shore pine and Sitka spruce forest ecosystem emerges from the open ocean coastline. To the east lies a large inter-tidal slough, a salt marsh system, diked former tidelands, and Baduwa't bottomland transformed into seasonal freshwater wetlands and grazing lands.

The Ma-Le'l and Lanphere Dunes units of the Humboldt Bay National Wildlife Refuge have been designated as National Natural Landmarks. This diverse and dynamic land-waterscape area is a unique and beautiful component of Wigi.

Parabolic dune field at Ma-Le'l Dunes.

Open ocean coast.

Coastal dunes, hollow-willow wetlands, and parabolic dune field and crest.

Otherworldly windswept parabolic dune field at Ma-Le'l Dunes.

Manzanita and ground lichen understory in shore pine Sitka spruce forest.

Ma-Le’l Dunes crest, shore pine Sitka spruce forest, salt marsh slough and Baduwa’t bottomland.

Parabolic dune field at Ma-Le'l Dunes.

Parabolic dune field at Ma-Le'l Dunes.

A unique dune crest vista point, with views of a ghost forest and Baduwa't bottomland.

Ma-Le'l Dunes expansive parabolic dune field.

Ma-Le'l Dunes parabolic dune field crest leading toward shore pine Sitka spruce forest.

Baduwa’t bottomland, slough and salt marsh viewed from a Ma-Le’l Dunes crest.

Ma-le'l Dunes' parabolic dune field crest encroaching on shore pine Sitka spruce forest.

Dune crest and dense shore pine Sitka spruce forest.

Jaroujiji Channel and Hikshari's River

A deep-water harbor channel along Jaroujiji's waterfront connects Wigi's two large bays in the north and south. The waterfront channel encompasses approximately 3,200 acres with 12 miles of shoreline and very few mudflats. Nearly 90% of the shoreline/waterfront has been developed for urban uses. Two marinas serve the commercial fishing fleet and recreational watercraft, including 8 bulk cargo docks. Flanked by the North and South Jetties, the harbor entrance is maintained by the U.S. Army Corps of Engineers, who dredges the harbor's channels annually.

Across from the entrance to the bay is Durouk Higuchguk and a sea wall extending north to the Hikshari's River Spit. The spit is an unusual and recent formation extending into the shipping channel of the harbor. The spit consists of salt marsh and low dunes and an open coastline-like shore break. Hikshari's River flows into the harbor channel just across from the community of Fairhaven. Most of the eastern shoreline of the harbor is developed commercial waterfront with several bulk cargo docks and a public boardwalk. The western shoreline is predominantly sandy from the north spit through Fairhaven, and then becomes an industrial waterfront with bulk cargo docks.

Jaroujiji harbor entrance between the north and south jetties on a rare calm day.

Sea wall receiving the full brunt of the waves funnelled through the north and south jetties on a not so calm day.

Stormwater waves on the North Jetty.

Commercial fishermen returning to a safe harbor.

The U.S. Coast Guard's historical station across from Hikshari's River Spit, and a coast-like wave break.

Open ocean-like shoreline break on Hikshari's River Spit.

Woodley Island Marina.

An unusual vista of islands in the Jaroujiji channel from the top of the former pulp mill tower.

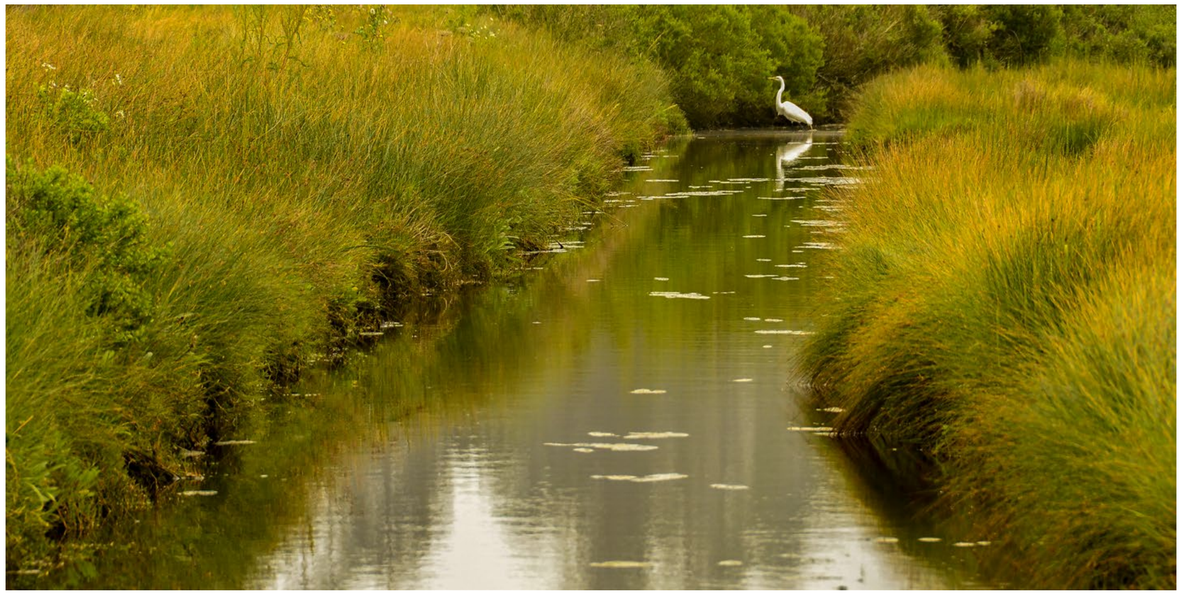
A historic waterfront homestead on the shore of Tuluwat Island.

Hutverroulh during a king tide.

Western view of lower Hikshari's River and a historic redwood shoreline wing deflector.

A heavenly sunset radiates crepuscular rays over Wigi.

At the end of Hikshari's River Spit, a historic piling provides a comfortable roost for a great blue heron.



A great white egret fishing in tidal waters on Hikshari's River.

Sunrise at Woodley Island Marina.

King tide waves overtopping the sea wall at Durouk Higuchguk where nuclear fuel is being stored.

A reflective wave off the sea wall across from the harbor entrance.

Southern Wigi and Bi'murr

Wigi's second largest area of open water is at its southern end, and features an extensive mudflat area traversed by deep open water channels. The bay encompasses 4,600 acres with nearly 23 miles of shoreline, 2,400 acres of mudflats, and the largest eel grass habitat area on Wigi. Approximately 67% of the shoreline consists of artificial structures, such as earthen dikes, abandoned railroad grade, and county road.

On Wigi, Bi'murr is a 4.6-mile-long strand of low dunes to Rraloughugu'w and then extends a total of 9 miles to the mouth of Wiya't. Extending east from the coast, Rraloughugu'w forms one of the only cliff/bluff shorelines on the bay. The bluff ends approximately two miles east where Hookton Slough enters Wigi's southern bay. A shoreline of dikes extends across the southern bay along the Humboldt Bay National Wildlife Refuge's Hookton, Salmon, and White Slough units to the abandoned railroad grade. The Humboldt Bay Trail runs along the railroad from Hikshari's River to White Slough. The communities of Fields Landing and King Salmon reside along the eastern shore of southern Wigi before it terminates at Durouk Higuchguk across from the harbor entrance.

Bi'murr southern view of coastline from the South Jetty.

Breached dikes during a king tide from Rraloughugu'w.

Southern Wigi and Humboldt Bay National Wildlife Refuge from shoreline at Daluwutk.

Bi'murr and southern Wigi's mudflats during the summer in an extensive algae bloom.

Eel grass beds in southern Wigi's mudflat channels.

Hookton Slough on the Humboldt Bay National Wildlife Refuge.

An unusual corrugated water pattern in front of Rraloughugu'w.

Bi'murr and southern Wigi.

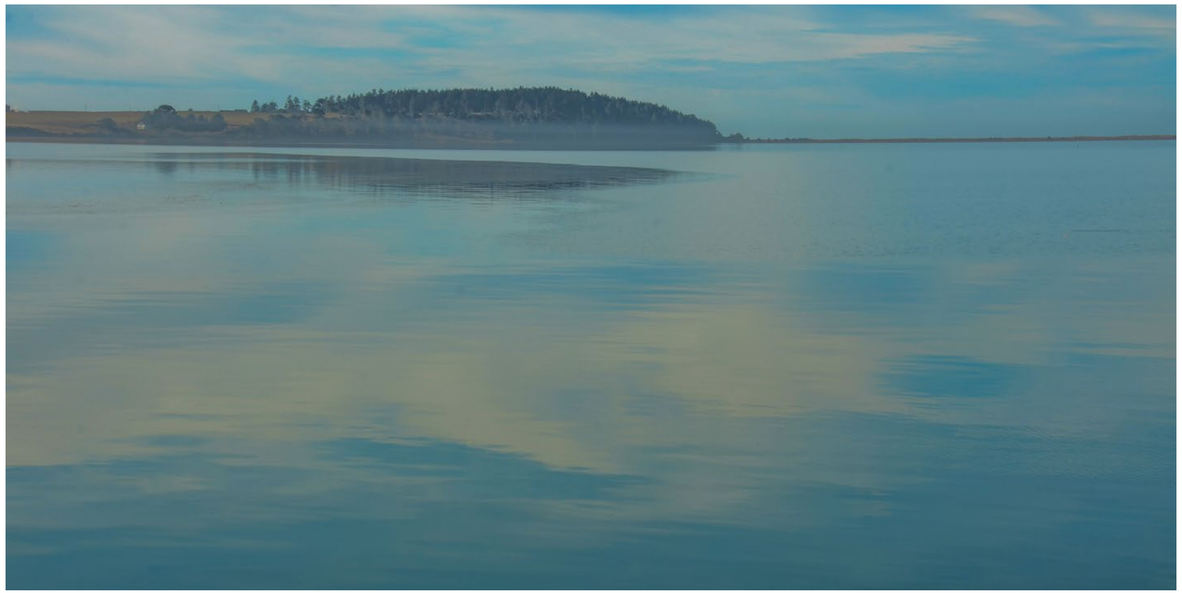
Freshwater wetlands on the Humboldt Bay National Wildlife Refuge.

Humboldt Bay Wildlife Refuge's Dukdoughugu'w Unit's freshwater wetlands.

Wildlife at the Humboldt Bay National Wildlife Refuge.

During a king tide, shorebirds seek high ground on abandoned dikes.

Reflective view from Daluwutk of the south shore.



Southern Wigi and Rraloughugu'w viewed from White Slough in Humboldt Bay National Wildlife Refuge.

Sunset and shoreline wading birds on South Bay viewed from Daluwutk.

Historically Wigi comprised approximately 10,000 acres of salt marsh; circa 1890, 90% was diked for agriculture.
Tvughuqhu'r and Baduwa't bottomland salt marsh in 1870

Transformation of Wigi Over the Next Fifty Years

Wigi has undergone tremendous changes starting with the invasion that began in 1850; it is primed to experience equally significant changes again over the next 50 years. In this chapter, I will show how Wigi's transformation might unfold in response to sea level rise.

Sea level rise is the highest on the west coast as measured on Wigi at the North Spit tide gauge, seeing a difference of 18 inches over the last century. The state of California is projecting as much as a meter of sea level rise on Wigi by 2065. Contributing to the vulnerability of the lands around Wigi is the legacy of nearly 10,000 acres of diked salt marsh, 40% of Wigi's historic footprint, that began in 1890. These earthen dikes are now at risk of being overtopped or breached by extreme tide and storm events, and certainly with just one to two feet of sea level rise. Wigi will reclaim the lands taken away over a century ago, and then its tides will begin to expand and flood new lands.

Roads, underground utilities, and buildings as well as the freshwater habitats and wildlife on these lands are at risk of being tidally flooded over the next 50 years. To illustrate the effect of dikes breaching, I intend to focus on mapping the Tvughuqu'r and Baduwa't bottomlands.

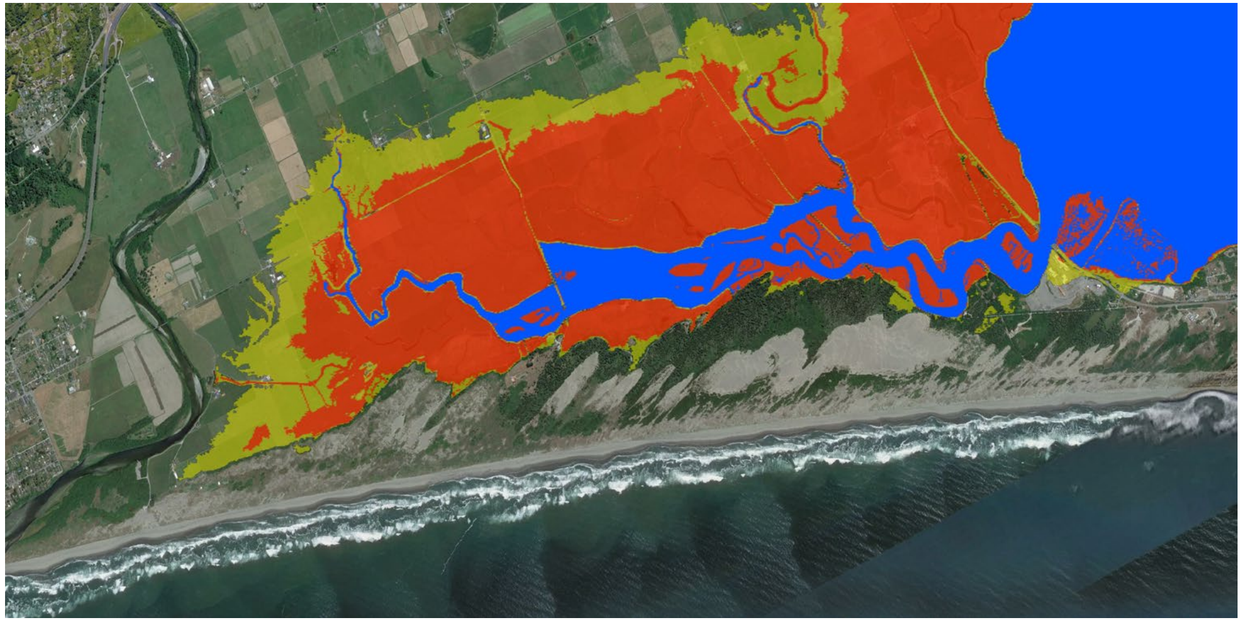
Wigi's salt marsh plains were originally diked off by dredging ditch-

es and piling up the mud to form a tidal barrier or dike at the edges of the salt marsh. After a few years of rain, salt from the former tidelands washed out of the soil creating thousands of acres of agricultural land. Over time, these rare treeless flat lands were transformed by the construction of roads, railroads, highways, and critical utility infrastructure (municipal water lines, sewer lines, gas lines, optical fiber lines, electrical transmission lines, towers, and poles) which now traverse these diked lands.

Unfortunately, most of the transportation and utility infrastructure agencies do not own or maintain the diked shorelines protecting their infrastructure. There are roughly 41 miles of dikes, 26 miles of which are currently at risk of breaching due to erosion or being overtopped by king tides or extreme storm water elevations. Based on the existing elevation of the dikes, just one foot of sea level rise would overtop about 28% of the dikes with today's average king tide; at two feet of sea level rise approximately 57% would be at risk of breaching. In 2005 the governor declared a state of disaster on Humboldt Bay during a king tide and winter storm. The highest water level ever measured at National Oceanic and Atmospheric Agency's North Spit tide gauge was recorded at 9.6 feet, less than one foot higher than the average king tide. Nearly 7,400 acres of diked former tidelands could be reclaimed by Wigi with just two feet of sea level rise. Current state projections recommend planning for 3 feet of sea level rise in the next 30 years.

A Dike Reclamation District rebuilt and rocked almost 5 miles of diked shoreline from Goudi'ni to Liscom Slough. Unfortunately, the District's jurisdiction did not cover the full extent of the Liscom Slough's shoreline which protects the agricultural lands in the District. King tides flow around the end of the rebuilt diked shoreline and overtop the dikes and county roads on Liscom Slough off of Tvughuqhu'r, and flood the District's agricultural fields with salt water. In fact, the rebuilt dikes exacerbate the flooding by forming a dam, backing up the saltwater to form temporary saltwater lakes that remain until the water can drain during low tide through a few tide gates to Wigi's northern bay.

Today there are 24 diked hydrologic sub-units on Wigi. Each sub-unit shares a common diked shoreline. Overtopping or a breach anywhere along the diked shoreline will tidally inundate all the former inter-tidal wetlands be-



Tvughuqhu'r and bottomland areas vulnerable to flooding...
If dikes breach
With one meter of sea level rise

A breached dike at Humboldt Bay Wildlife Refuge's White Slough Unit in South Bay, flooding the area below.

hind that dike including any pasture and development located on those lands.

The Humboldt Bay Wildlife Refuge, however, has been enabling Wigi's reclamation of former salt marsh areas where dikes are vulnerable to breaching, such as in White Slough. When dikes eventually breach and salt water again can flood the former tidelands, the result will not be a full restoration of the salt marsh plain that existed at the time the diked shoreline was constructed. During the intervening century that the tides have been kept off these lands, the areas have subsided and are now too low in elevation to support salt marsh vegetation. Instead, much of the area will become mudflats. The Humboldt Bay National Wildlife Refuge has imported sediment to raise the surface elevations to again support salt marsh vegetation. Unfortunately, importing fill for salt marsh restoration is very expensive and therefore of limited utility for reclaiming thousands of acres of Wigi's diked former tidelands. Hopefully, when these areas are again restored to Wigi's tides, sediment will be deposited naturally on these low-lying areas and salt marsh will eventually return.

The State of California projects that Wigi could see a meter of sea level rise in approximately 40 years. The diked shoreline threshold on the Bay will be crossed with just one to two feet of sea level rise, resulting in thousands of acres of flooding of diked former tidelands areas.

The area that could be inundated with one meter of sea level rise has been locally modeled and mapped for all the lands surrounding Wigi. Three feet of sea level rise will reclaim the lands taken away from Wigi and initiate Wigi's expansion onto new lands. Wigi will continue to grow and change for as long as sea levels continue to rise. We are at the threshold of a new era for Wigi.

Sea level rise also poses a less appreciated impact to the diked former tidelands on Wigi as tidewater penetrates beyond the shoreline beneath the fresh groundwater. As sea levels rise, the denser salt water will push up the underground freshwater until it emerges and floods the low-lying areas. This flooding will occur even if the diked shorelines are continually raised in elevation to prevent sea level rise from overtopping the dikes. Emerging groundwater is a significant threat to development and land use of diked former tidelands. We are seeing evidence of this phenomenon now during king tides.

If dikes remain intact, former tidelands like these on Fay Slough can be flooded by emerging groundwater pushed up by king tides and sea level rise.

A winter storm and king tide driving groundwater upwards, flooding former tidelands in southern Wigi.

Humboldt Bay National Wildlife Refuge's White Slough Unit inter-tidal wetland restoration.

For Decades Aldaron has walked the shores of the bay, climbed its nearby sand dunes, and kayaked its entire periphery, taking over 25,000 photos that reveal the beauty of Wigi as it might appear in some magical, glimmering dream. From those thousands of photos, Aldaron selected 119 for this book. For each photo he kept, he discarded 209 others, which means that of those 25,000 images, he used less than one percent. We might think that taking all those photos required a tremendous amount of work, but it soon becomes clear that Aldaron did not work on this book, he lived and breathed its very essence, so that every photo he did select opens like a window, showing us yet another wonderful facet of Wigi, this place of ten thousand smaller places where land and water so subtly, so strikingly meet.

-Jerry Rohde

I am a newcomer to Wigi, having arrived nearly 50 years ago. Ever since, I have been fascinated with exploring and experiencing my adopted home. As an environmental planner, over decades, I have studied the historical development of Wigi and its adjacent lands. I was availed the opportunity to map and photographically document Wigi's shoreline to facilitate the assessment of its vulnerability to sea level rise. As a photographer, visually embracing compositions, patterns, and lighting, enhanced my perspective and awareness when traversing the lands and waters of Wigi. This book is the result.

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