A Teacher’s Guide to Navigating Change

Grades 4 - 5
Second Edition

June 2008
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The Navigating Change Teacher’s Guide is dedicated to the Polynesian Voyaging Society, the inspiration for the “Navigating Change” vision.

**Acknowledgements**

**Funded and produced by:**
Bishop Museum
The Co-Trustees of the Papahānaumokuākea Marine National Monument
Polynesian Voyaging Society

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As Co-Trustees of the Papahānaumokuākea Marine National Monument: Troy Antonelis: State of Hawai‘i, Department of Land and Natural Resources/Division of Aquatic Resources; Ann Bell: U.S. Fish and Wildlife Service; Andy Collins, Kaliko Amona, and Matthew Limtiaco: National Oceanic and Atmospheric Administration
Tom Cummings: Bishop Museum
Laura Thompson, Nainoa Thompson, and Ka‘iulani Murphy: Polynesian Voyaging Society
Jennifer Barrett, Carlie Wiener, Hawai‘i Institute of Marine Biology

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Patty Miller: Special Assistance

A special mahalo to the following individuals, non-governmental institutions, and accompanying students who volunteered their time during the filming of the video modules:
Louis “Buzzy” Agard
Hawaii’s Thousand Friends and Pacific Islands Land Institute: Malama Souza
Kalihi Community: Deborah Taamu
Ke Kula ‘o Samuel M. Kamakau Laboratory Public Charter School: Keakai Irwin
Lanikai Elementary Public Charter School: Donna Therrien
Polynesian Voyaging Society: Nainoa Thompson, Ka‘iulani Murphy
University of Hawai‘i, Kamakakuokalani Center for Hawaiian Studies: Dr. Carlos Andrade, Scott Kekuewa Kikiloi; Department of Zoology: Sheldon Plentovich
YMCA Leeward Branch: Brandy Hiu Antonelis
Photo Credits for Guide and Photo CD:

Bishop Museum
Polynesian Voyaging Society: Na'alehu Anthony, Monte Costa, and Ka'uilani Murphy
U.S. Fish and Wildlife Service: Beth Flint, Phyllis Ha, Ian Jones, Eugene Kridler, Gerald Ludwig,
Mark MacDonald, Barbara Maxfield, Mark Rauzon Robert J. Shallenberger, Alex Wegmann,
Mike Yamamoto, and volunteer Katie Laing
Volunteers: Liam Mueller and Sandra Webb (organized photos)
www.oceanstock.com: James Watt

Contributing Educational Materials:

Kathy Batha, Rebecca Himschoot, and Valarie Sloane: U.S. Fish and Wildlife Service
Reni Bello: Waipahu High School and Waipahu Intermediate School
Coby Doi: Hawai'i Preparatory Academy
Alan Golden, Shannon Essler: Jarrett Middle School
Mark Heckman: Waikiki Aquarium
Haunani Seward: Ele'ele School
Vicky Villegas: Lanikai Public Charter School
Kathryn Wilder: Hawai'ı Outdoor Education
‘Ōhi'a Project: Bishop Museum/Moanalua Gardens Foundation
Pacific Resources for Education and Learning (PREL)
Aloha ‘Āina: Pacific American Foundation (PAF)
Bishop Museum Press
Carlie Wiener: Hawai'i Institute of Marine Biology

Consultants:

Beth Flint
Scott Kekuewa Kikiloi
Randall Kosaki
Keoni Kuoha
Susan Lebo
Carol Silva

Mahalo to the following organizations and individuals who keep Navigating Change alive
and growing in the minds and hearts of Hawai'i’s keiki by providing:

Endless support, encouragement, and guidance:

Athline Clark and David Smith: State of Hawai'i, Department of Land and Natural Resources
Barbara Maxfield, Don Palawski, and Barry Stieglitz: U.S. Fish and Wildlife Service
Laura Thompson, Nainoa Thompson, and Ka'uilani Murphy: Polynesian Voyaging Society
Patty Miller: Hawai'i State Department of Education/Teleschool “KidScience” Programming
Mike Shanahan and Betty Tatar: Bishop Museum
‘Aulani Wilhelm: Papahānaumokuākea Marine National Monument
Terry George: Harold K.L. Castle Foundation
Alyssa Miller: Mālama Maunalua

Feedback and careful review of the Guide’s activities:

Lauren Apiki: LET Academy
Scott Bowling: Hongwanji Mission School
Terri Cadelago: St. Theresa School
Coby Doi: Hawai'i Preparatory Academy
Kristen Garcia: Lanikai Elementary Public Charter School
Allen Golden: Jarrett Middle School
Lorie Ines: Ka'elepulu Elementary School
Behind-the-scenes development and support for the other Navigating Change projects that molded the foundation for this guide (projects include statewide sails, satellite teleconferencing, museum exhibit, websites, video bursts from the NWHI, teacher workshops, and “KidScience” Department of Education/Teleschool programming).

- Bishop Museum: Brad Evans, Cindy Hodick, Susan Lebo, Lokelani Kenolio, Kealoha Kelekolio, Holger Schramm, Hi’ilani Shibata, Jacey Waterhouse, and Larry Wiss
- Chugach Corporation: John Hanna
- Epiphany School: Cindy McFarlane
- Hālau Ku Mana Public Charter School: Bonnie Kahapea
- Hawai‘i Maritime Center: Junior Coleman, Karla Grace, and Robert Moore
- Hawai‘i Undersea Research Laboratory: Eric Conklin, Chris Kelly, Terry Kirby, and Rachel Shackelford
- Hawai‘i Institute for Marine Biology: Malia Chow, JoAnn Leong, and Malia Rivera
- Independent workshop speaker: Mark Rauzon
- Kaneohe Marine Corp Base: Michelle Chang, Gunnery Sergeant Norris, Gordon Olayvar, and Corpsman M.D. Powell
- National Aeronautical and Space Administration: NASA provided funds for an interactive exhibit, a week-long teacher’s workshop, and remote delivery of video vignettes from the NWHI
- National Marine Fisheries Service: Suzanne Canja and Karen Holman
- Papahānaumokuākea Marine National Monument: Randy Kosaki and Moani Pai
- Polynesian Voyaging Society: Na‘alehu Anthony, Bruce Blankenfeld, Lita Blankenfeld, Brad Cooper, Monte Costa, Leimomi Kekina-Dierks, Keoni Kuoha, Carol Moen, Ka‘iulani Murphy, Ramona Ontiveros, Nainoa Thompson, Elisa Yadao, 2001-2004 Hōkūle‘a crewmembers along with crewmembers aboard escort vessel Kamahele and all the voyaging support ‘ohana.
- State of Hawai‘i, Department of Education: Hilary Apana-McKee, Patty Miller
- State of Hawai‘i, Department of Land and Natural Resources: Greta Aeby, Melissa Bos, Dave Gulko, Ethan Shinioki, David Smith, and Cynthia Vanderlip
- University of Hawai‘i, Kamakakuokalani Center for Hawaiian Studies: Scott Kekuewa Kikiloi
- U.S. Geological Survey: Michelle Reynolds
- U.S. Fish and Wildlife Service: Tim Bodeen, Cari Eggleston, Stefan Kropidlowski, Jerry Leinecke, Barbara Maxfield, Cindy Rehkemper, Jennifer Tieten, and Alex Wegmann
- Waikīkī Aquarium: Mark Heckman, Cindy Hunter, and Mary Picket
- Western Pacific Fisheries Management Council: Jim Cook, Cindy Knapman, Sean Martin, Mark Mitsuyusu, and Tim Timmoney

And to those who have infused Navigating Change with funding and support beyond the voyage and into the future:

- Bishop Museum: Mike Shanahan
- Harold K. L. Castle Foundation: Dr. Terry George
- Hawai‘i Institute of Marine Biology: Malia Rivera, Carlie Wiener, and Jennifer Barrett
- University of Hawai‘i, Hawai‘i Networked Learning Communities: Dr. Daniel Suthers
"No longer do we seek only the knowledge of how to voyage between islands. We seek lessons to carry home to our children - ways to inspire the present generation to love and preserve our Earth as a sanctuary for those who will inherit it."
—Nainoa Thompson
Navigator, Hōkūle'a

Navigating Change

Navigating Change is a program of environmental awareness and education envisioned by Nainoa Thompson and the Polynesian Voyaging Society (PVS) and perpetuated by a partnership of private and government organizations. Its mission is to inspire and challenge educators and students to take actions in their classrooms and communities that perpetuate ocean and island health, thereby making Hawai'i a vital and sustainable environment for future generations. We hope to change behaviors by creating an awareness of the ecological problems we face and by demonstrating how decisions we make in our daily lives can help resolve those problems.

Participating partners are:

• Polynesian Voyaging Society (PVS)
• Bishop Museum (BM)
• U.S. Fish & Wildlife Service (FWS)
• National Oceanic and Atmospheric Administration (NOAA)
• Hawai'i State, Department of Land and Natural Resources (DLNR)
• Hawai'i State, Department of Education (DOE)
• Hawai'i Maritime Center (HMC)
• University of Hawai'i, Mānoa
• University of Hawai'i, Hilo (UH-Hilo)
• Harold K. L. Castle Foundation
• The Pacific American Foundation

For more information about Navigating Change educational projects, contact: Matt Limtiaco at matthew.limtiaco@noaa.gov or 271-1048.
To raise awareness of the environmental decline occurring in the main Hawaiian Islands, the Polynesian Voyaging Society (PVS) has sailed the double-hulled canoe Hōkūleʻa throughout the main Hawaiian Islands carrying the Navigating Change message. School children and entire communities were challenged to take responsibility for our natural environment. This statewide sail began in March 2003.

In May 2004, PVS sailed Hōkūleʻa along an ancient exploratory route to the Northwestern Hawaiian Islands (NWHI) to further examine the cultural and biological wonders of this unique and rarely seen coral reef ecosystem. These islands have recently been referred to as our “kūpuna” islands since they are geologically older than the main Hawaiian Islands and there is much we can learn from them. The islands provide a window into our past when our coral reefs were healthy and abundant with life. The “ancestral” leg of our journey took us to the islands of Nihoa and Mokumanamana (Necker), where cultural protocols set the stage for the rest of the voyage. The voyage then continued to the remaining Northwestern Hawaiian Islands. These islands revealed a rare sanctuary of natural beauty symbolized by the tiny coral polyp – the building block of life – according to the Hawaiian Creation Chant, Kumulipo.

Today these islands and surrounding marine ecosystem are now protected as the Papahānaumokuākea Marine National Monument (PNMM). This remote Marine National Monument includes the northern three quarters of the Hawaiian archipelago, a two million-acre ecosystem of coral reefs, atolls, small islands, seamounts, banks, and shoals. It is one of the largest protected marine areas on the planet. Over the course of millions of years, erosion, subsidence, and coral reef growth have transformed once-high volcanic islands into the low-lying coral atolls and small basalt islands found here today. Where land and sea rely on each other for life, millions of seabirds nest, thousands of sea turtle eggs hatch, an abundance of sharks and large predatory fish thrive, thousands of marine species flourish, and endangered flora and fauna such as Laysan ducks and Hawaiian monk seals make their home. Countless numbers of native species, more than one quarter of which exist nowhere else on the planet, rely on this relatively undisturbed terrestrial and marine habitat.

While on the voyage to the NWHI, crew members aboard Hōkūleʻa communicated by satellite phone with students back home. Updates and information about this voyage are posted on www.pvs-hawaii.org and www.hawaiianatolls.org websites.

The goal of Navigating Change is to motivate, encourage, and challenge people to take action to improve the environmental conditions in their own backyards, especially as it pertains to our coral reefs. We want people to take responsibility for the stewardship and sustainability of our islands and our ocean. We are targeting our message to the youth of Hawai‘i because the future is in their hands.
Overview of the *Navigating Change Teacher’s Guide*

This teacher’s guide includes five units that are designed to help students explore their relationships to the environment and ways that they can “navigate change” in their own communities. The instructional activities focus on Hawai‘i DOE science, social studies, math, and language arts standards as well as Nā Honua Mauli Ola, guidelines for culturally healthy and responsive learning environments in Hawai‘i that were developed by the Native Hawaiian Education Council in partnership with the Ka Haka ‘Ula O Ke‘elikōlani, College of Hawaiian Language, UH-Hilo. The videotape that accompanies the guide has five segments, one for each unit of study. In addition, the accompanying CDs contain a wealth of reference material. A multitude of images and video clips are organized by various subject folders for teachers and students to utilize when creating their own presentations. The photo and resources CD also contains a beautiful NWHI slide show synced with Hawaiian music, short video segments highlighting management and research activities in the Papahānaumokuākea Marine National Monument, and a PowerPoint presentation. References to these resources are included in various units where they support the concepts that students are investigating.

The second edition of the teacher’s guide features a new instructional activity to introduce students to the Monument in Unit 1 and new field investigations in Unit 5. All of the units have been updated to include journal pages for students. These pages are designed as a tool for formative assessment to determine how well the students are doing in meeting the Hawai‘i DOE standards. By the end of the units, students will have journals that show their own voyage of discovery and document their ideas and concerns as they work to navigate change.

**Unit 1: The Voyage**

**Hawai‘i DOE Standards:**
- Social Studies 3: History: Pre-Contact Hawai‘i History
- Social Studies 6: Cultural Anthropology: Cultural Systems and Practices
- Social Studies 7: Geography: World in Spatial Terms
- Science 2: The Scientific Process: Nature of Science
- Science 8: Earth and Space Science: Forces That Shape the Earth
- Math 4: Measurement: Fluency with Measurement
- Language Arts 4 - 5: Writing: Conventions and Skills

**Nā Honua Mauli Ola:**
- 1 - 8: Understand and appreciate the importance of Hawaiian cultural traditions, language, history, and values.
- 8 - 4: Apply the cultural and traditional knowledge of the past to the present.

This unit sets the stage by introducing students to the NWHI through a mapping activity. Students create a large wall map of the Hawaiian Islands archipelago and present geographical data about the NWHI to one another. The second instructional activity introduces students to the story of Papahānaumoku and Wākea and why the Papahānaumokuākea Marine National Monument is considered a sacred and significant area. The next activity helps students discover the fascinating story of our island volcanoes—from high islands to low-lying atolls. Students then explore what it would be like to take a voyage to a distant island. Along the way, they discover the feats of navigators and the importance of practicing values such as laulima (working together), kuleana (taking responsibility) and mālama (caring).

A wonderful way to supplement this unit is to take students to the Hawai‘i Maritime Center where there is a full immersion hands-on exhibit about the NWHI. See [http://holoholo.org/maritime/](http://holoholo.org/maritime/) or call the Center at (808)523-6151.
Unit 2: Land to Sea Connections

Hawai‘i DOE Standards:
Science 2: The Scientific Process: Nature of Science
Science 3: Life and Environmental Sciences: Organisms and the Environment
Science 5: Life and Environmental Sciences: Diversity, Genetics, and Evolution
Language Arts 4: Writing: Conventions and Skills
Language Arts 5: Writing: Meaning
Nā Honua Mauli Ola
4 - 2: Acquire in-depth cultural knowledge through interaction with kūpuna.
14 - 8: Reflect on the relationship between the natural environment and people.

Unit 2 stresses the importance of the interconnection between land and sea as essential components of a healthy environment for many species of the NWHI, including ourselves. Students participate in a role-playing game that emphasizes the importance of land and sea to the survival of Hawaiian monk seals and green sea turtles.

Through this activity, students discover the interdependence of organisms for the exchange of oxygen, carbon dioxide, and nutrients; organisms’ responses to a constantly changing environment; and the importance of specific environmental conditions for survival.

Unit 3: Change Over Time

Hawai‘i DOE Standards:
Science 1: The Scientific Process: Scientific Investigation
Science 2: The Scientific Process: Nature of Science
Social Studies 1: History: Historical Understanding
Social Studies 7: Geography: World in Spatial Terms
Language Arts 6: Oral Communication: Conventions and Skills
Math 9: Patterns and Functional Relationships
Math 10: Patterns, Functions, and Algebra: Symbolic Representation
Nā Honua Mauli Ola:
8 - 4: Apply the cultural and traditional knowledge of the past to the present.
8 - 12: Pursue opportunities to observe and listen to expert resources within the community.
15 - 1: Develop a sustainable food production system.

This unit lays the foundation for the last two units. Travel through time is simulated through a comparison between the reefs and islands of the NWHI and the main Hawaiian Islands. Students explore the differences between what the reefs and islands of the main Hawaiian Islands might have been and what they are now. They conduct a fishing demonstration to explore sustainable fishing practices and explore how traditional fishing practices can be applied to our interaction with the ocean today. The unit includes a PowerPoint presentation that provides a baseline for comparing fish populations and sizes, and reef composition in the NWHI and main Hawaiian Islands. Throughout the unit, students are asked to keep track of all the differences they observe and build comparative models to show their understanding of the concept of change over time.
Unit 4: Human Impact

Hawai‘i DOE Standards:
Science 1: The Scientific Process: Scientific Investigation
Science 2: The Scientific Process: Nature of Science
Social Studies 6: Cultural Anthropology: Cultural Systems and Practices
Language Arts 1: Reading: Conventions and Skills
Language Arts 2: Reading: Reading Comprehension
Language Arts 5: Writing: Rhetoric
Language Arts 7: Oral Communication: Rhetoric
Math 1: Numbers and Operations: Number Sense

Nā Honua Mauli Ola:
15 - 3: Teach others about the concept of mālama through example.
15 - 4: Participate in conservation and recycling practices and activities.

This unit challenges students to comprehend both the negative and positive impacts humans have on coral reefs of the main Hawaiian Islands. Students reflect on how our use of tools and materials has changed since the days of old Hawai‘i, and the ways in which our modern lifestyles have an impact on the environment. The way that some of those materials end up as marine debris and the impact of this debris on all wildlife becomes clear to students through a physically active game and through a scientific investigation. Clues about seabirds and their habitat are revealed as students dissect a bolus and discover plastic materials that have ended up in a seabird. Through this scientific investigation, students become aware of the direct impact of human-made debris, particularly plastics, on the survival of seabirds. To culminate the unit, student teams create ways to reduce their impact on the land and sea and share their new knowledge with other classes in the school.

Unit 5: You Make a Difference

Hawai‘i DOE Standards:
Social Studies 6: Cultural Anthropology: Cultural Dynamic/Change and Continuity
Social Studies 7: Geography: World in Spatial terms
Math 12: Data Analysis, Statistics, and Probability
Science 1: The Scientific Process: Nature of Science
Language Arts 5: Writing: Rhetoric
Language Arts 7: Oral Communication: Rhetoric

Nā Honua Mauli Ola
14 - 1: Be keen observers of their natural environment.
5 - 3: Appreciate and respect the diverse views of others.
5 - 8: Become actively involved in local activities and organizations that contribute to the quality of life in their community.

The final unit encourages students to apply what they have learned by undertaking projects to mālama the environment. Field investigations to a Hawaiian fishpond and to a nearshore environment that is impacted by runoff from the land provide opportunities for students to investigate human interactions with the ʻāina and conduct community service. In the culminating activity, students are empowered to be part of the solution by navigating change for a healthier environment in their own ahupua‘a.

Appendix
The Appendix includes additional readings and resources to supplement the units.