LOOKING TO THE *KŪPUNA*

EXPEDITION: NIHOA

NAME: _____ **DATE:** _____

Location and Type of Island: _____

Introduction: Scientists participating in the Northwestern Hawaiian Islands Reef Assessment and Monitoring Program (NOWRAMP) expeditions have made some fascinating discoveries. What they have learned about these elder "kūpuna" islands helps us to better understand the main Hawaiian Islands (MHI).

Your Challenge: Find out what scientists participating in the NOWRAMP expeditions discovered about Nihoa. Prepare a 5-minute presentation to share your findings with the class. Complete the following tasks for your report:

- Describe Hawaiian cultural sites on the island and what they tell us about Hawaiian use of this island in the past.

- Summarize the major NOWRAMP expedition findings about the plants and animals on this island. See Terrestrial Studies and Nihoa Island pages in reference 1 below.
  - What natural community that represents its only remaining type in the world is found here? Why might this community no longer exist in the MHI?

  - What endangered palm tree, that was once common in the MHI, grows here?
  - What introduced species threatens the palm and what are scientists doing about it?

Sources of Information:

The following online references have scientists' findings from the NOWRAMP expeditions:

- http://coastalscience.noaa.gov/documents/nowramp.pdf. Coral Reef Ecosystems of the Northwestern Hawaiian Islands Interim Results Emphasizing the 2000 Surveys
- http://www.hawaiianatolls.org (Select Search at the bottom of the left margin and type in the name of the island you are researching.)
- Video clips from the expedition are also provided on the Navigating Change CD.

LOOKING TO THE *KŪPUNA* EXPEDITION: NECKER (MOKUMANAMANA)

NAME: _____ **DATE:**_____

Location and Type of Island: _____

Introduction: Scientists participating in the Northwestern Hawaiian Islands Reef Assessment and Monitoring Program (NOWRAMP) expeditions have made some fascinating discoveries. What they have learned about these elder "kūpuna" islands helps us to better understand the main Hawaiian Islands (MHI).

Your Challenge: Find out what scientists participating in the NOWRAMP expedition discovered about Necker. Prepare a 5-minute presentation to share your findings with the class. Complete the following tasks for your report:

- Describe Hawaiian cultural sites on the island and what they tell us about Hawaiian use of this island in the past.

- Summarize the major NOWRAMP expedition findings about the plants and animals on this island. See Necker Island and Coral pages in reference 1 below.
  - What kinds of invertebrates were common in Shark Bay?

  - Corals: How many different species of stony coral did researchers find here? The island is the most easterly island where what type of coral is found?

  - Table corals (*Acropora* spp.) are not found in the MHI. How do scientists think they got to Necker and other NWHI? And what fish feed on this coral?

SOURCES OF INFORMATION

The following online references have scientists' findings from the NOWRAMP expeditions:

- http://coastalscience.noaa.gov/documents/nowramp.pdf. Coral Reef Ecosystems of the Northwestern Hawaiian Islands Interim Results Emphasizing the 2000 Surveys
- http://www.hawaiianatolls.org/ (Select Search at the bottom of the left margin and type in the name of the island you are researching.)
- Video clips from the expedition are also provided on the Navigating Change CD.

LOOKING TO THE *KŪPUNA* EXPEDITION: FRENCH FRIGATE SHOALS

NAME: _____ **DATE:** _____

Location and Type of Island: _____

Introduction: Scientists participating in the Northwestern Hawaiian Islands Reef Assessment and Monitoring Program (NOWRAMP) expeditions have made some fascinating discoveries. What they have learned about these elder "kūpuna" islands helps us to better understand the main Hawaiian Islands (MHI).

Your Challenge: Find out what scientists participating in the NOWRAMP expedition discovered about French Frigate Shoals. Prepare a 5-minute presentation to share your findings with the class. Complete the following tasks for your report:

- Summarize the major NOWRAMP expedition findings about the plants and animals on this island. See Invertebrate Studies, Protected Marine Species, and French Frigate Shoals Island pages in reference 1 below.
  - Which endangered and threatened animal species rely on the different habitats of this atoll?

  - Invertebrates: What were some of the findings from the unique lagoon habitat of this atoll?

  - Seabirds: Why is this important habitat for seabirds and how do they shape the habitat?

SOURCES OF INFORMATION

The following online references have scientists' findings from the NOWRAMP expeditions:

- http://coastalscience.noaa.gov/documents/nowramp.pdf. Coral Reef Ecosystems of the Northwestern Hawaiian Islands Interim Results Emphasizing the 2000 Surveys
- http://www.hawaiianatolls.org/ (Select Search at the bottom of the left margin and type in the name of the island you are researching.)
- Video clips from the expedition are also provided on the Navigating Change CD.

LOOKING TO THE *KŪPUNA* EXPEDITION: GARDNER PINNACLE

NAME: _____ **DATE:** _____

Location and Type of Island: _____

Introduction: Scientists participating in the Northwestern Hawaiian Islands Reef Assessment and Monitoring Program (NOWRAMP) expeditions have made some fascinating discoveries. What they have learned about these elder "kūpuna" islands helps us to better understand the main Hawaiian Islands (MHI).

Your Challenge: Find out what scientists participating in the NOWRAMP expedition discovered about Gardner Pinnacle. Prepare a 5-minute presentation to share your findings with the class. Complete the following tasks for your report:

- Summarize the major NOWRAMP expedition findings about the coral reefs. See Terrestrial Studies and Gardner Pinnacle Island pages in reference 1 below.
  - What did scientists discover about the number of fish species and fish biomass here?
  - What did the Land Team discover about alien plants?
  - What "giant" invertebrate did scientists find here? And how does this finding compare to the MHI?
  - What did the land team whose members scaled the steep cliffs of this island find?

SOURCES OF INFORMATION

The following online references have scientists' findings from the NOWRAMP expeditions:

- http://coastalscience.noaa.gov/documents/nowramp.pdf. Coral Reef Ecosystems of the Northwestern Hawaiian Islands Interim Results Emphasizing the 2000 Surveys
- http://www.hawaiianatolls.org/ (Select Search at the bottom of the left margin and type in the name of the island you are researching.)
- Video clips from the expedition are also provided on the Navigating Change CD.

LOOKING TO THE KŪPUNA

EXPEDITION: MARO REEF

NAME: _____ **DATE:** _____

Location and Type of Island: _____

Introduction: Scientists participating in the Northwestern Hawaiian Islands Reef Assessment and Monitoring Program (NOWRAMP) expeditions have made some fascinating discoveries. What they have learned about these elder "kūpuna" islands helps us to better understand the main Hawaiian Islands (MHI).

Your Challenge: Find out what scientists participating in the NOWRAMP expedition discovered about Maro Reef. Prepare a 5-minute presentation to share your findings with the class. Complete the following tasks for your report:

- Summarize the major NOWRAMP expedition findings about the coral reefs. See Fish Studies, Coral Studies, and Maro Reef Island pages in reference 1 below.
  - What did scientists discover about the sharks near Maro and the apex predators in general in NWHI?

  - What made the reefs pink or purple at Maro? And how is this species important on the reef?

  - What reef characteristics could lead to the incredible number of fish species and abundance of coral at Maro?

SOURCES OF INFORMATION

The following online references have scientists' findings from the NOWRAMP expeditions:

- http://coastalscience.noaa.gov/documents/nowramp.pdf. Coral Reef Ecosystems of the Northwestern Hawaiian Islands Interim Results Emphasizing the 2000 Surveys
- http://www.hawaiianatolls.org/ (Select Search at the bottom of the left margin and type in the name of the island you are researching.)
- Video clips from the expedition are also provided on the Navigating Change CD.

LOOKING TO THE *KŪPUNA*

EXPEDITION: LAYSAN

NAME: _____ **DATE:** _____

Location and Type of Island: _____

Introduction: Scientists participating in the Northwestern Hawaiian Islands Reef Assessment and Monitoring Program (NOWRAMP) expeditions have made some fascinating discoveries. What they have learned about these elder "kūpuna" islands helps us to better understand the main Hawaiian Islands (MHI).

Your Challenge: Find out what scientists participating in the NOWRAMP expedition discovered about Laysan. Prepare a 5-minute presentation to share your findings with the class. Complete the following tasks for your report:

- Summarize the major NOWRAMP expedition findings about the island. See Protected Marine Species and Laysan Island pages in reference 1 below.
  - What unique habitat is found in the interior of the island and which endangered bird relies on it for habitat?

  - What does fossil bird bone evidence tell us about the distribution of the Laysan duck?

  - How have human activities impacted Laysan in the past and what has been done to help the island recover?

SOURCES OF INFORMATION

The following online references have scientists' findings from the NOWRAMP expeditions:

- http://coastalscience.noaa.gov/documents/nowramp.pdf. Coral Reef Ecosystems of the Northwestern Hawaiian Islands Interim Results Emphasizing the 2000 Surveys
- http://www.hawaiianatolls.org/ (Select Search at the bottom of the left margin and type in the name of the island you are researching.)
- Video clips from the expedition are also provided on the Navigating Change CD.

LOOKING TO THE *KŪPUNA*

EXPEDITION: LISIANSKI

NAME: _____ **DATE:** _____

Location and Type of Island: _____

Introduction: Scientists participating in the Northwestern Hawaiian Islands Reef Assessment and Monitoring Program (NOWRAMP) expeditions have made some fascinating discoveries. What they have learned about these elder "kūpuna" islands helps us to better understand the main Hawaiian Islands (MHI).

Your Challenge: Find out what scientists participating in the NOWRAMP expedition discovered about Lisianski. Also find out what they conclude about the number of apex predators and herbivores in the NWHI compared to the MHI. Prepare a 5-minute presentation to share your findings with the class. Complete the following tasks for your report:

- Summarize the major NOWRAMP expedition findings about the island. See Lisianski Island and Neva Shoal page, and the graph on the page, "A Place Where Large Amounts of Fish Roam Freely" in reference 1 below.
  - What endangered species are frequent visitors to the island?

  - How did the towboard divers describe the eastern reefs of Neva Shoal?

  - Study the graph that shows the biomass of apex predators and herbivores in the NWHI compared to the MHI. Draw at least 3 conclusions from this graph and share them with your classmates.

SOURCES OF INFORMATION

The following online references have scientists' findings from the NOWRAMP expeditions:

- http://coastalscience.noaa.gov/documents/nowramp.pdf. Coral Reef Ecosystems of the Northwestern Hawaiian Islands Interim Results Emphasizing the 2000 Surveys
- http://www.hawaiianatolls.org/ (Select Search at the bottom of the left margin and type in the name of the island you are researching.)
- Video clips from the expedition are also provided on the Navigating Change CD.

LOOKING TO THE *KŪPUNA* EXPEDITION: PEARL AND HERMES

NAME: _____ **DATE:** _____

Location and Type of Island: _____

Introduction: Scientists participating in the Northwestern Hawaiian Islands Reef Assessment and Monitoring Program (NOWRAMP) expeditions have made some fascinating discoveries. What they have learned about these elder "kūpuna" islands helps us to better understand the main Hawaiian Islands (MHI).

Your Challenge: Find out what scientists participating in the NOWRAMP expedition discovered about Pearl and Hermes. Prepare a 5-minute presentation to share your findings with the class. Complete the following tasks for your report:

- Summarize the major NOWRAMP expedition findings about the island. See the Coral Studies, Invertebrate Studies, and Pearl and Hermes Atoll Island pages in reference 1 below.
  - What can you conclude from the graph showing coral species found during the expedition? On which type of islands were most coral species found? Why?

  - Pearl and Hermes, like French Frigate Shoals, has unique lagoon habitats where some rare invertebrates were discovered. What are they?

  - What kinds of animal species inhabit the beaches and lagoon of this atoll? Which are endangered and why is this habitat critical?

SOURCES OF INFORMATION:

The following online references have scientists' findings from the NOWRAMP expeditions:

- http://coastalscience.noaa.gov/documents/nowramp.pdf. Coral Reef Ecosystems of the Northwestern Hawaiian Islands Interim Results Emphasizing the 2000 Surveys
- http://www.hawaiianatolls.org/ (Select Search at the bottom of the left margin and type in the name of the island you are researching.)
- Video clips from the expedition are also provided on the Navigating Change CD.

LOOKING TO THE *KŪPUNA* EXPEDITION: MIDWAY

NAME: _____ **DATE:** _____

Location and Type of Island: _____

Introduction: Scientists participating in the Northwestern Hawaiian Islands Reef Assessment and Monitoring Program (NOWRAMP) expeditions have made some fascinating discoveries. What they have learned about these elder "kūpuna" islands helps us to better understand the main Hawaiian Islands (MHI).

Your Challenge: Find out what scientists participating in the NOWRAMP expedition discovered about Midway. Prepare a 5-minute presentation to share your findings with the class. Complete the following tasks for your report:

- Summarize the major NOWRAMP expedition findings about the island. See Fish Studies and Midway Atoll pages in reference 1 below.
  - What large endemic fish frequently approached and followed divers here? What was unique about the fish's habitat in the NWHI?

  - For the NWHI in general, what did divers notice about the big fish that was different from the MHI? Why do you think there is such a difference?

  - What kinds of species did divers observe in lagoon areas?

  - How have the shallow reefs of the atoll been affected by human activity?

SOURCES OF INFORMATION

The following online references have scientists' findings from the NOWRAMP expeditions:

- http://coastalscience.noaa.gov/documents/nowramp.pdf. Coral Reef Ecosystems of the Northwestern Hawaiian Islands Interim Results Emphasizing the 2000 Surveys
- http://www.hawaiianatolls.org/ (Select Search at the bottom of the left margin and type in the name of the island you are researching.)
- Video clips from the expedition are also provided on the Navigating Change CD.

LOOKING TO THE *KŪPUNA* EXPEDITION: KURE

NAME: _____ **DATE:** _____

Location and Type of Island: _____

Introduction: Scientists participating in the Northwestern Hawaiian Islands Reef Assessment and Monitoring Program (NOWRAMP) expeditions have made some fascinating discoveries. What they have learned about these elder "kūpuna" islands helps us to better understand the main Hawaiian Islands (MHI).

Your Challenge: Find out what scientists participating in the NOWRAMP expedition discovered about Kure. Prepare a 5-minute presentation to share your findings with the class. Complete the following tasks for your report:

- Summarize the major NOWRAMP expedition findings about the island. See Terrestrial Studies and Kure Atoll pages in reference 1 below.
  - What alien species is considered an "ecosystem-buster" on Kure? Why?
  - Which giant fish followed the researchers in the waters of Kure? How do their populations here compare to the MHI?
  - Since Kure is the northernmost atoll, scientists were surprised to find an abundance and diversity of which kind of species here? Why?

SOURCES OF INFORMATION

The following online references have scientists' findings from the NOWRAMP expeditions:

- http://coastalscience.noaa.gov/documents/nowramp.pdf. Coral Reef Ecosystems of the Northwestern Hawaiian Islands Interim Results Emphasizing the 2000 Surveys
- http://www.hawaiianatolls.org/ (Select Search at the bottom of the left margin and type in the name of the island you are researching.)
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LOOKING TO THE *KŪPUNA*

LEARNING LOG - 5

NAME: _____ **DATE:** _____

Write at least one paragraph to summarize your conclusions about how the evidence from the expedition helps us understand what the coral reefs in the Main Hawaiian Islands (MHI) might have been like in the past. Explain how this evidence helps us to revise our understandings about our reefs. Include in your explanation a definition for a shifting baseline for reefs in the MHI.