EMF from Submarine Cables and Oahu-Maui Island Routing Options

September 18, 2013

About This Presentation

The information in this presentation was provided at a community meeting held on Maui on September 18, 2013.

It was referred to for illustration purposes by technical experts at the meeting, and is necessarily incomplete without the context of the experts' explanations.

Cautionary Statements And Risk Factors That May Affect Future Results

Any statements made herein about future operating and/or financial results and/or other future events are forward-looking statements under the Safe Harbor Provisions of the Private Securities Litigation Reform Act of 1995. These forward-looking statements may include, for example, statements regarding anticipated future financial and operating performance and results, including estimates for growth. Actual results may differ materially from such forward-looking statements. A discussion of factors that could cause actual results or events to vary is contained in the Appendix herein and in our Securities and Exchange Commission (SEC) filings.

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Agenda

- Blessing
- Purpose of Tonight's Event
- Overview of NextEra Energy and NextGrid Hawaii
- Existing Submarine Cables in Hawaii
- Preliminary Proposed Cable Route
- Route Alternatives
- Environmental Impact Statement and Permitting Process
- EMF and Thermal Effects
- Marine Species of Concern in Hawaii

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Overview of NextEra Energy and NextGrid Hawaii

NextEra has assembled a strong and diverse group of subject matter experts, including Hawaii-based expertise

Team Introduction

NextEra	Eric Gleason Dan Mayers Mike Pappalardo Michael Sheehan, P.E.
Exponent	William Bailey, Ph.D.
Hogan Lovells	Andy Spielman
Ku‘iwalu	Dawn Chang
Makai	Jose Andres, Ph.D., P.E.
Normandeau	Ann Pembroke
SWCA	Ling Ong, Ph.D.
University of Hawaii	Timothy Tricas, Ph.D.

Note: Green shading indicates Hawaii based firm or team

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NextEra is a one of North America's leading clean energy providers

NextEra Energy, Inc.

- **Leading clean energy provider**
  - Headquartered in Juno Beach, Florida
  - 15,000 employees in 26 U.S. states, 4 Canadian provinces
  - Integrated utility, competitive generator, transmission developer
  - Top-quartile in both reliability and cost
- **Strong balance sheet**
  - $64 B in total assets, strong investment grade credit ratings
- **Extensive track record on major capital projects**
  - $23 B of transmission and renewable/gas generation since 2003

We aspire to be a key player in Hawaii's clean energy transformation

Note: Information as of December 31, 2012, except capital projects data as of September 9, 2013

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NextEra has formed NextEra Energy Hawaii to develop plans for an interisland transmission cable system

NextGrid Hawaii – Maui Island Project Overview

- Bi-directional Oahu-Maui Island "grid-tie"
- 200 MW submarine DC cable system
- $600 MM estimated capital cost*
- 112 miles in length*
- 650 meters maximum depth*
- 2020 potential in-service date
- Flexible, expandable, regulated public utility
- Substantial benefits to electric customers and the State

NextGrid Hawaii is very different from a "Big Wind" cable project

* Based on preliminary proposed route

The NextGrid Hawaii – Maui Island project offers substantial economic, reliability and environmental benefits

Oahu-Maui Island Project Benefits

- ✓ Access to lower cost existing generation
- ✓ Access to lower cost new generation
- ✓ Reduced curtailment
- ✓ Increased system reliability
- ✓ Reduced oil usage and CO_2 emissions
- ✓ Increased flexibility and optionality

Helping build an affordable, reliable, clean energy future

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Our proposed approach incorporates a level of public review that is exceptional for an infrastructure project in Hawaii

Proposed Vetting Process

Prior to the start of construction, project would need to:

(1) Receive favorable Public Utilities Commission (PUC) determinations at three distinct stages;

- Public interest finding
- Initial Certificate of Public Convenience and Necessity (CPCN)
- Final CPCN

(2) Undertake extensive community engagement;

(3) Complete multi-year state and federal environmental reviews; and

(4) Secure dozens of local, state and federal permits

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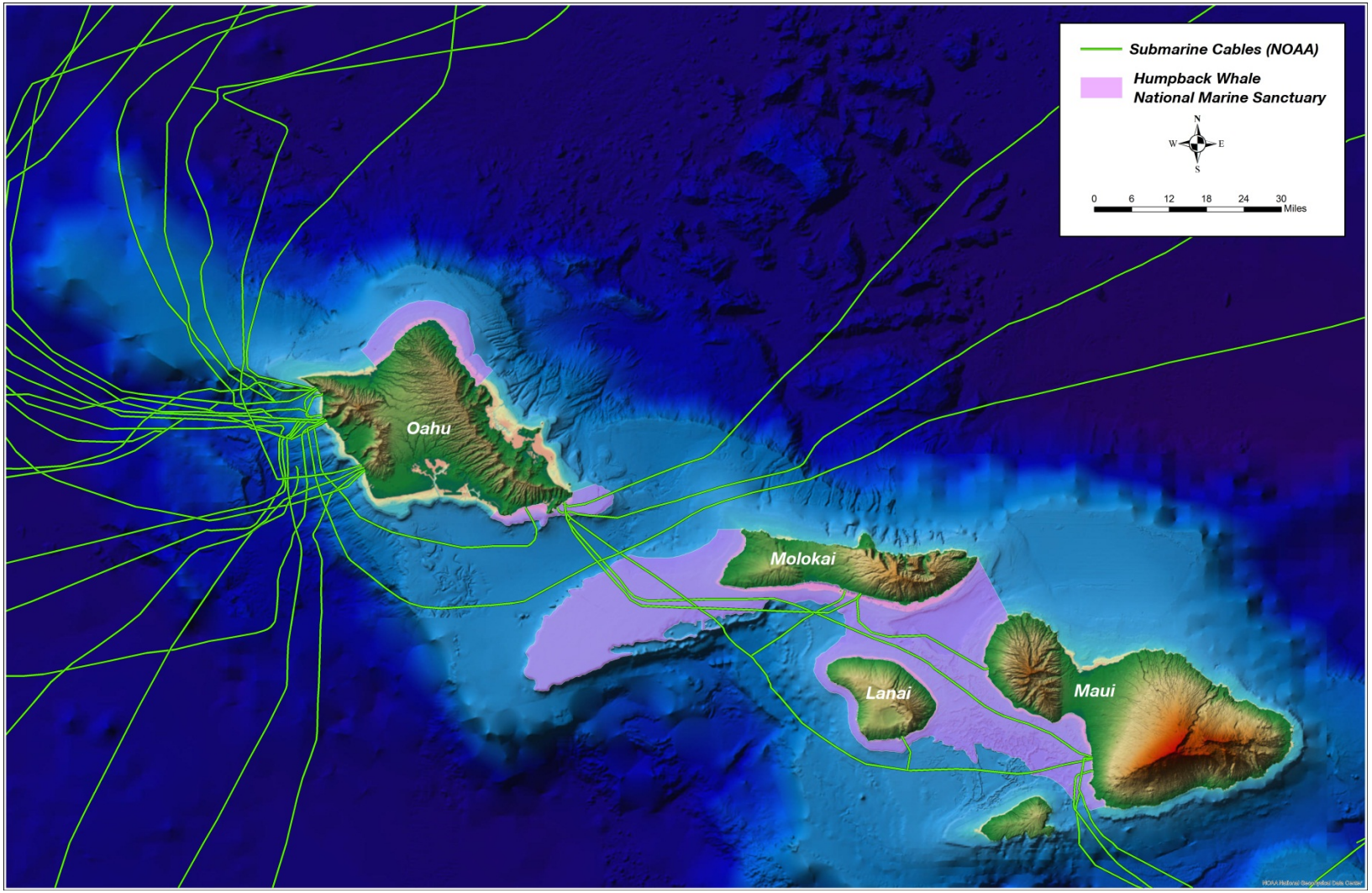
Existing Submarine Cables in Hawaii

Submarine cables are not new in Hawaii, having been in use since the age of the telegraph



Preliminary Proposed Cable Route

The preliminary proposed route is intended to deliver maximum overall benefits at minimum customer cost

Preliminary Proposed Route

- **Drivers of the preliminary proposed route:**
  - Keep total costs as low as possible for the benefit of customers
  - Respect the known route selection constraints (next page)
- **"Preliminary Proposed" does not mean final**
  - Nothing has been finalized
  - Alternatives will be further explored
  - The environmental review process will evaluate alternatives

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The preliminary proposed route is also intended to address known route selection constraints

Primary Route Selection Constraints

- **Seafloor roughness and slope**
  - Geological characteristics and geophysical stability in the area
- **Avoidance or consideration of:**
  - Potential obstructions
  - Environmental and culturally sensitive areas
  - High traffic and recreational zones including anchorages
- **For landing sites:**
  - Proximity and accessibility of transmission lines and substations at robust nodes for power injection and withdrawal
  - Avoidance of sensitive reef formations at horizontal directional drilling (HDD) daylight point
  - Distance offshore and water depth where HDD bore must reach to clear environmentally sensitive areas

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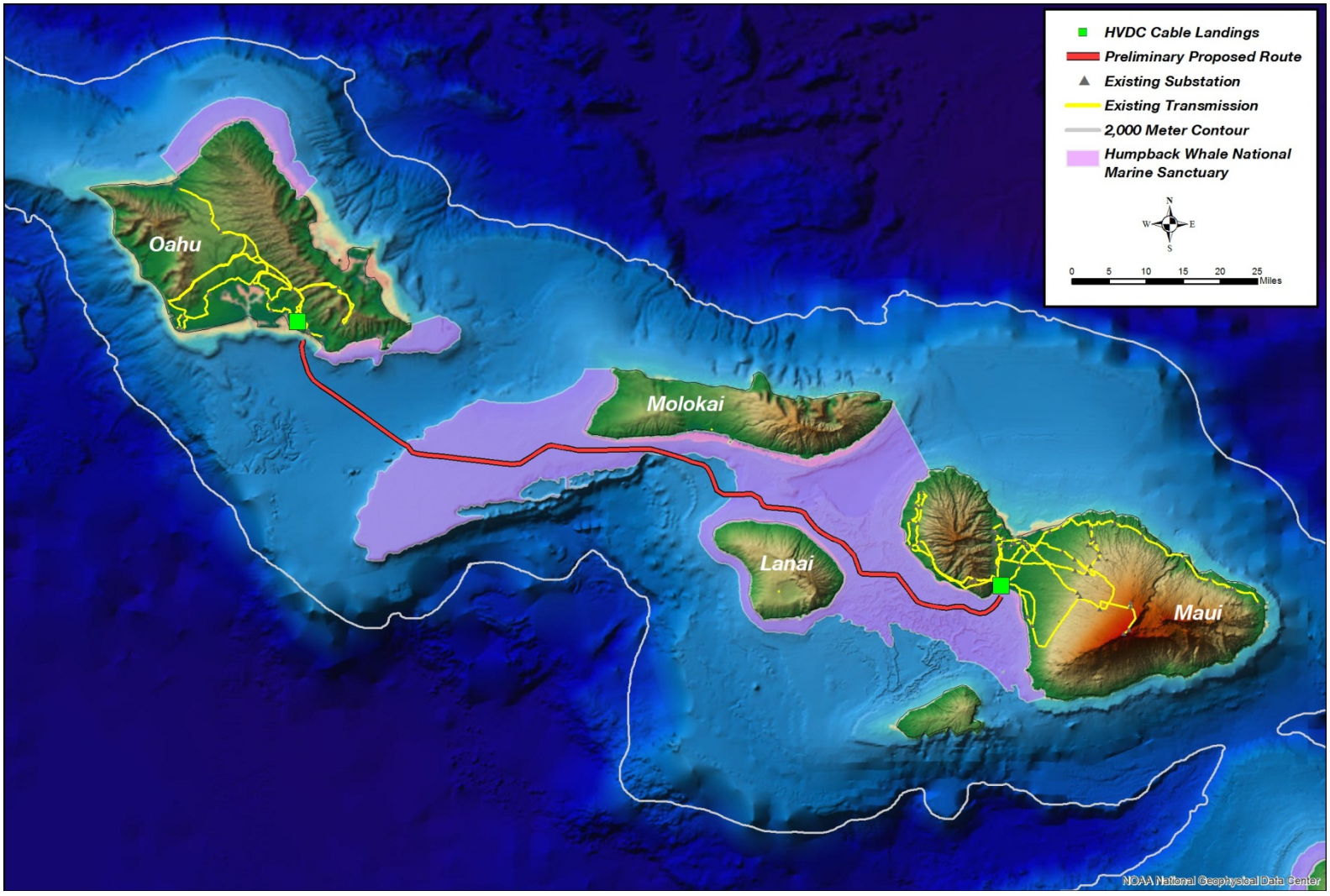
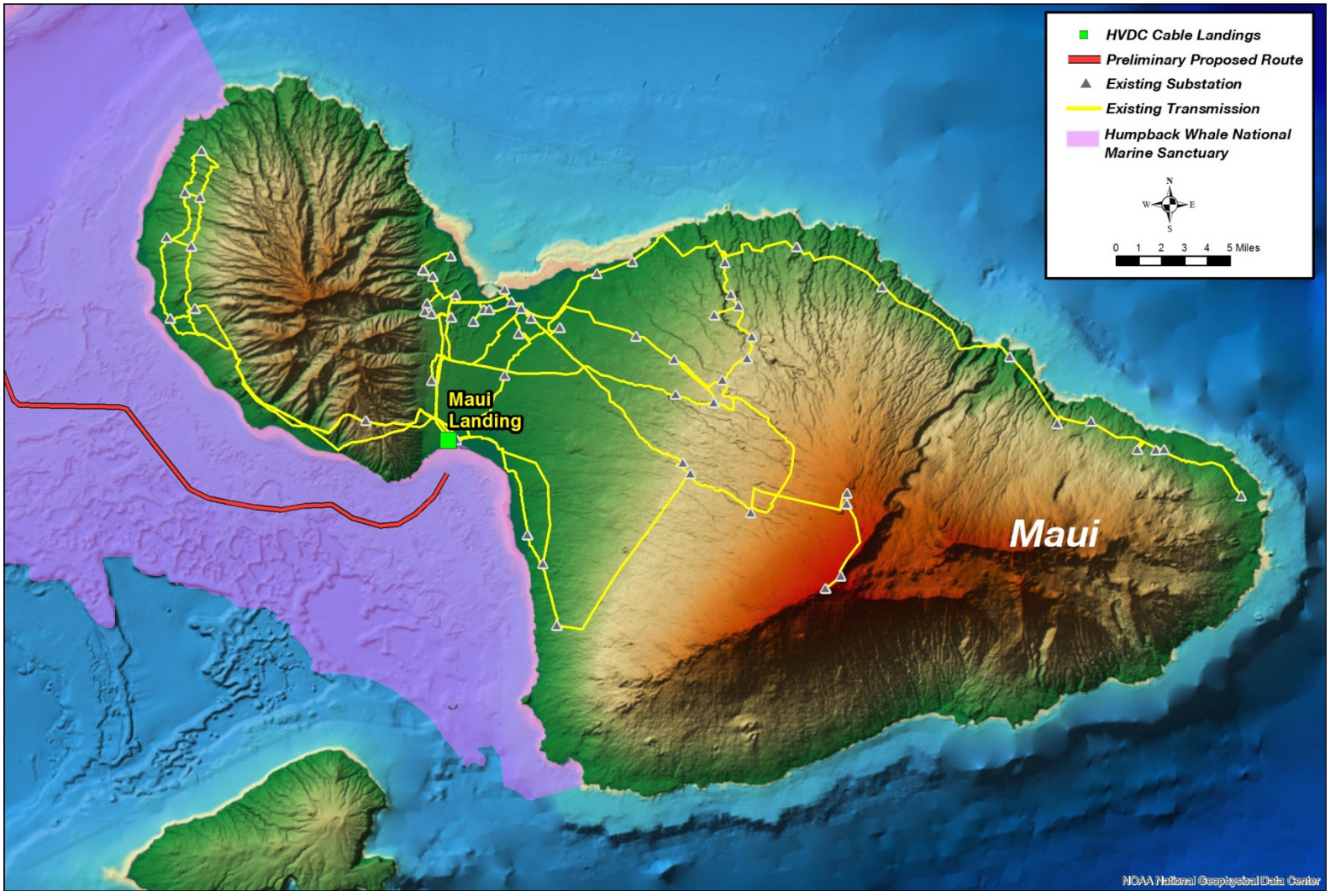
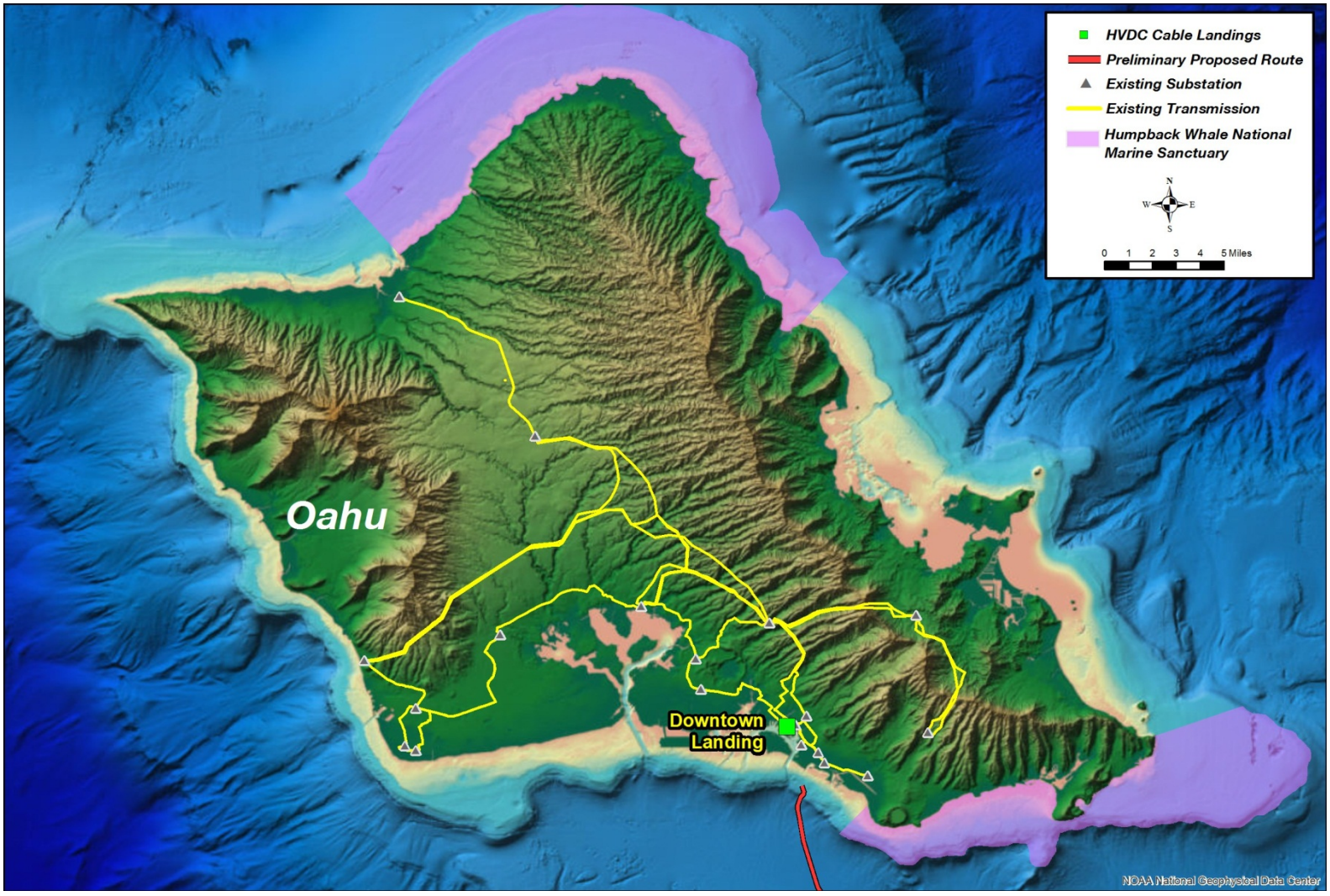
The preliminary proposed route is approximately 112 miles in length with a maximum depth of 650 meters



Potential landing on Maui in the vicinity of Ma‘alaea Bay

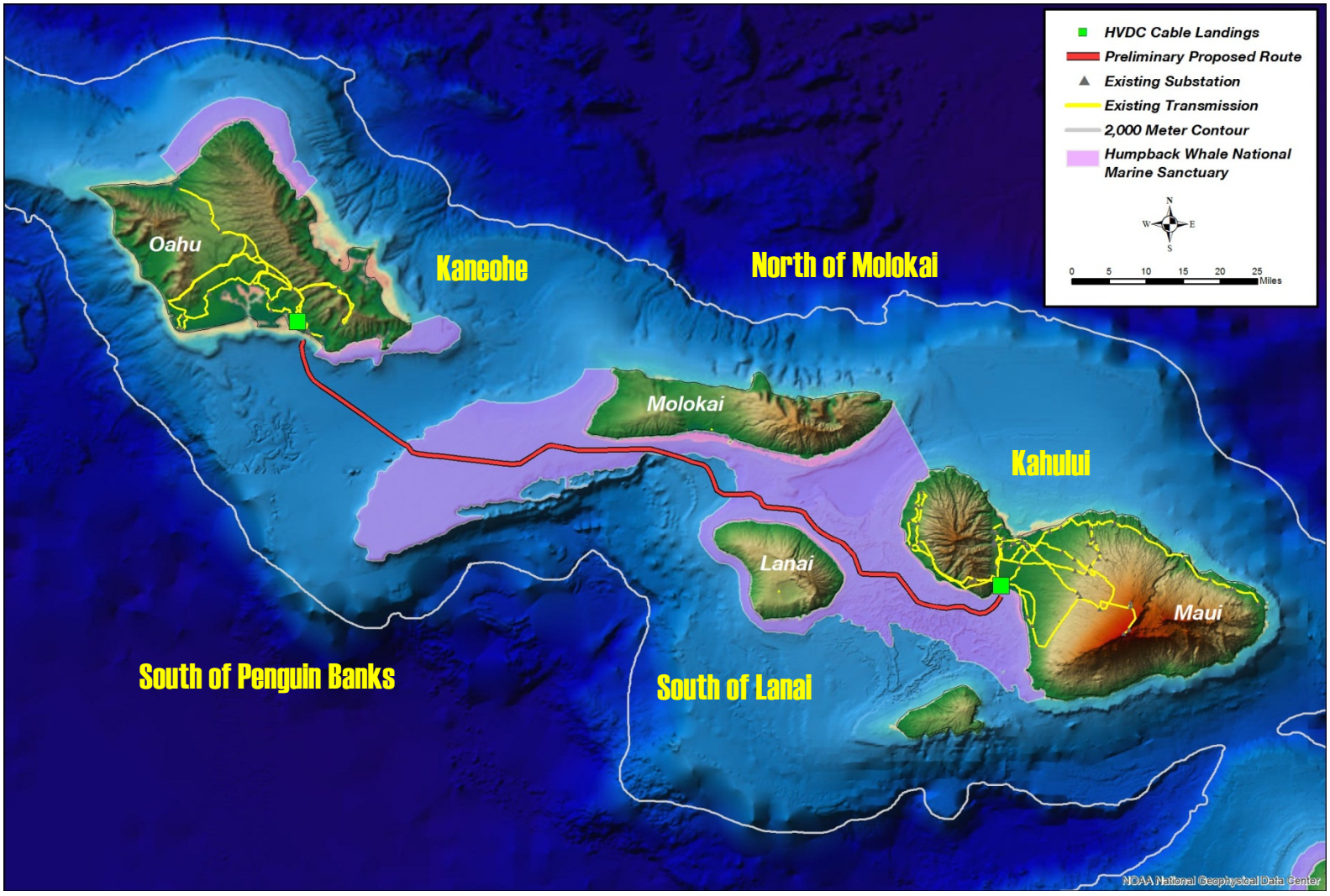


Potential landing on Oahu in the vicinity of Honolulu Harbor

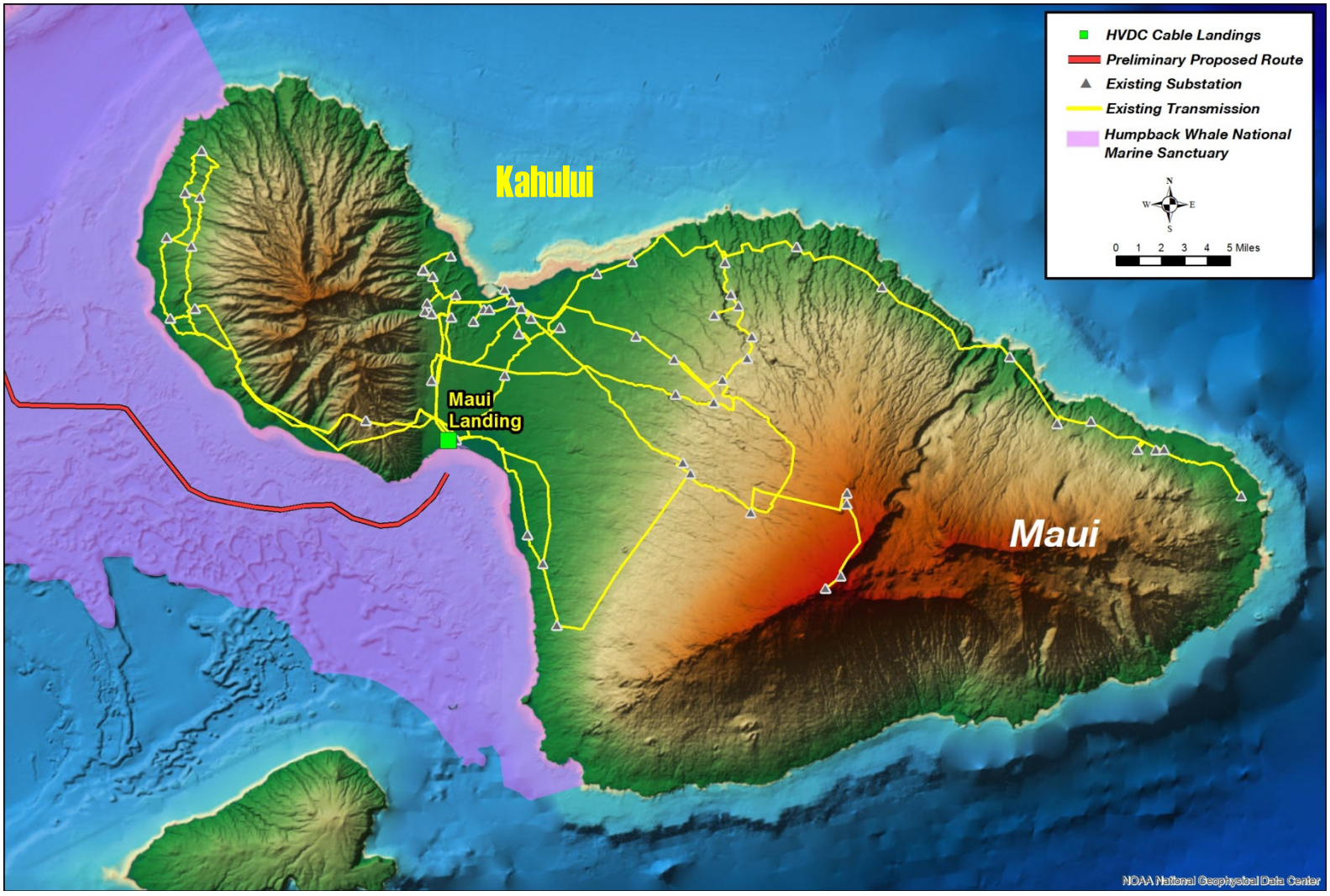


Route Alternatives

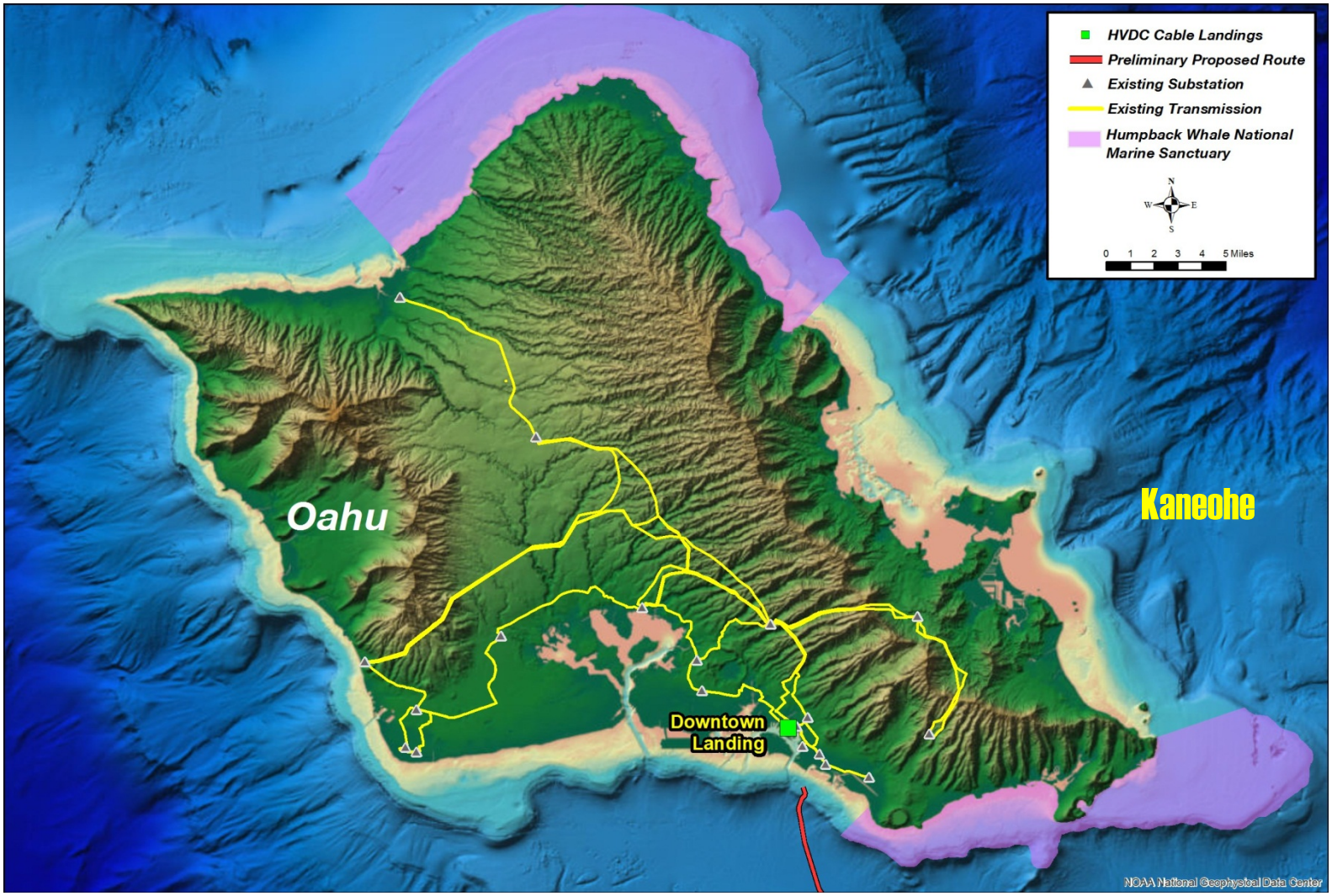
Alternative routes generally involve greater cost and risk to customers, but may offer offsetting benefits



Alternative landing sites on Maui generally involve greater cost to customers, but may offer offsetting benefits



Alternative landing sites on Oahu generally involve greater costs to customers, but may offer offsetting benefits



Environmental Impact Statement and Permitting Process

State and federal agencies will establish the process for developing an Environmental Impact Statement (EIS)

Key Steps in the NEPA / HEPA EIS Process

- **Determination of state and federal lead and cooperating agencies**
  - Joint or Separate EIS process?
- **Right-of-way application filed with state and federal agencies**
- **Begin state and federal EIS process (anticipate up to 2 years to complete)**
  - State HEPA early consultation and preparation of EA
  - Federal NEPA notice of intent and public scoping
  - Develop and publish draft NEPA and HEPA EIS report(s)
  - Public comment period
    - -- Respond to comments
  - Publish final EIS

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Dozens of permits and authorizations ultimately will be required from local, state and federal agencies

Selected Environmental Permits and Authorizations

- **Local**
  - County of Maui
  - City and County of Honolulu
    - -- CUP, Special Use, Zoning, Set-Back, Construction
- **State**
  - DBEDT
    - -- CMZ, Special Use
  - DLNR, SHPD
    - -- Submerged Lands
    - -- Archaeological
    - -- Endangered species consultations (marine and terrestrial)
  - DOH
    - -- Storm Water, Air
  - DOT
    - -- Transportation
- **Federal**
  - BOEM
    - -- Right of Way
  - USACE
    - -- Section 10/404 Clean Water Act
  - NOAA
    - -- ESA Biological Opinion Corals and Marine Species
  - USFWS
    - -- ESA Terrestrial Species
  - Coast Guard, DOD
    - -- Notifications
  - EPA
    - -- Spill Prevention

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EMF and Thermal Effects

What are electric and magnetic fields (EMF)?

Background Information

- **Electric and magnetic fields are produced by natural and man-made sources that surround us in our daily lives**
- **Alternating Current (AC) produces electric and magnetic fields that change direction and intensity 60 times per second – a frequency of 60 Hertz (Hz)**
- **Direct Current (DC) produces *static* magnetic fields, and sometimes electric fields, that do not change rapidly with time**
  - Earth's magnetic field (for compass navigation) is a DC magnetic field
- **The proposed submarine cable transports DC electricity and so is a source of a *static* DC magnetic field**
  - The submarine cable would not directly produce a DC electric field but induced electric fields would be produced by the magnetic field

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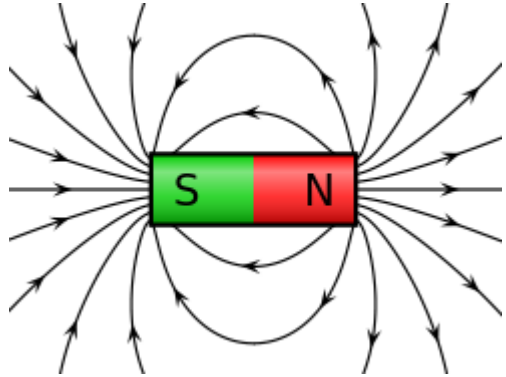
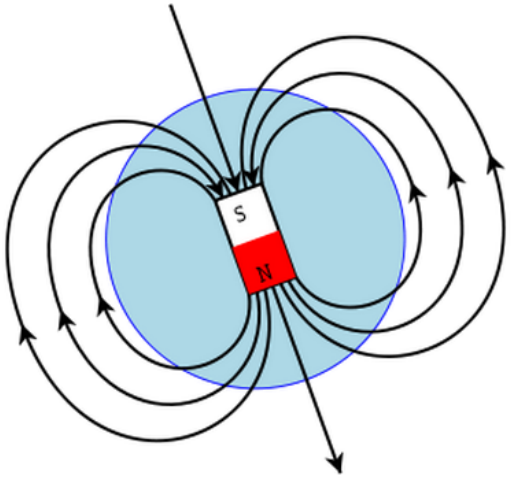
What are electric and magnetic fields (EMF)?

Background Information (continued)

- **Magnetic fields result from electric current flow**
  - Daily, weekly, seasonal variations in current flow
- **Measured in gauss (G) or milligauss (mG). Scientists use microtesla (μT)**
  - 1,000 mG = 1G
  - 10 mG = 1 μT
- **Strength diminishes as you move away from the source**
- **Not shielded by most ordinary objects**
- **Magnetic fields from different sources can interact (e.g., cable and Earth's Geomagnetic fields)**





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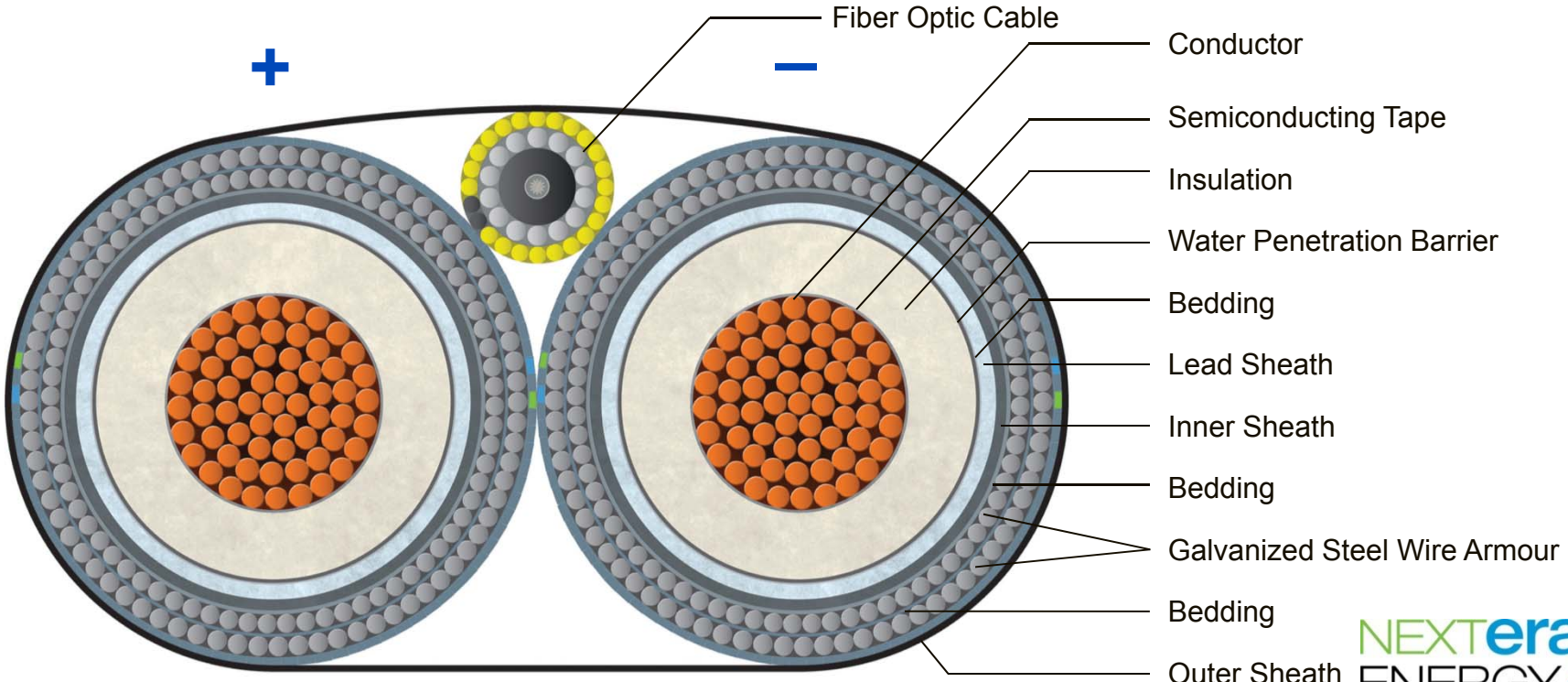
Preliminary configuration for NextGrid Hawaii is a symmetric monopole, one cable is positive and one cable is negative, with respect to ground

Configuration of Submarine Cables

- **Two HVDC submarine electric cables strapped together with a fiber optic cable**
- **Resting on the seafloor**



DC cable system modeling will take into consideration the cable's physical properties, design specifications, expected cable loading, route location and orientation

Magnetic Field Modeling

- **Cables on ocean floor**
  - Two cables strapped together
- **Model Input**
  - Geometry
  - Electrical current magnitude
- **Model Output**
  - DC magnetic field from cables with distance/height above cable
  - Combination of DC field with Earth's magnetic field

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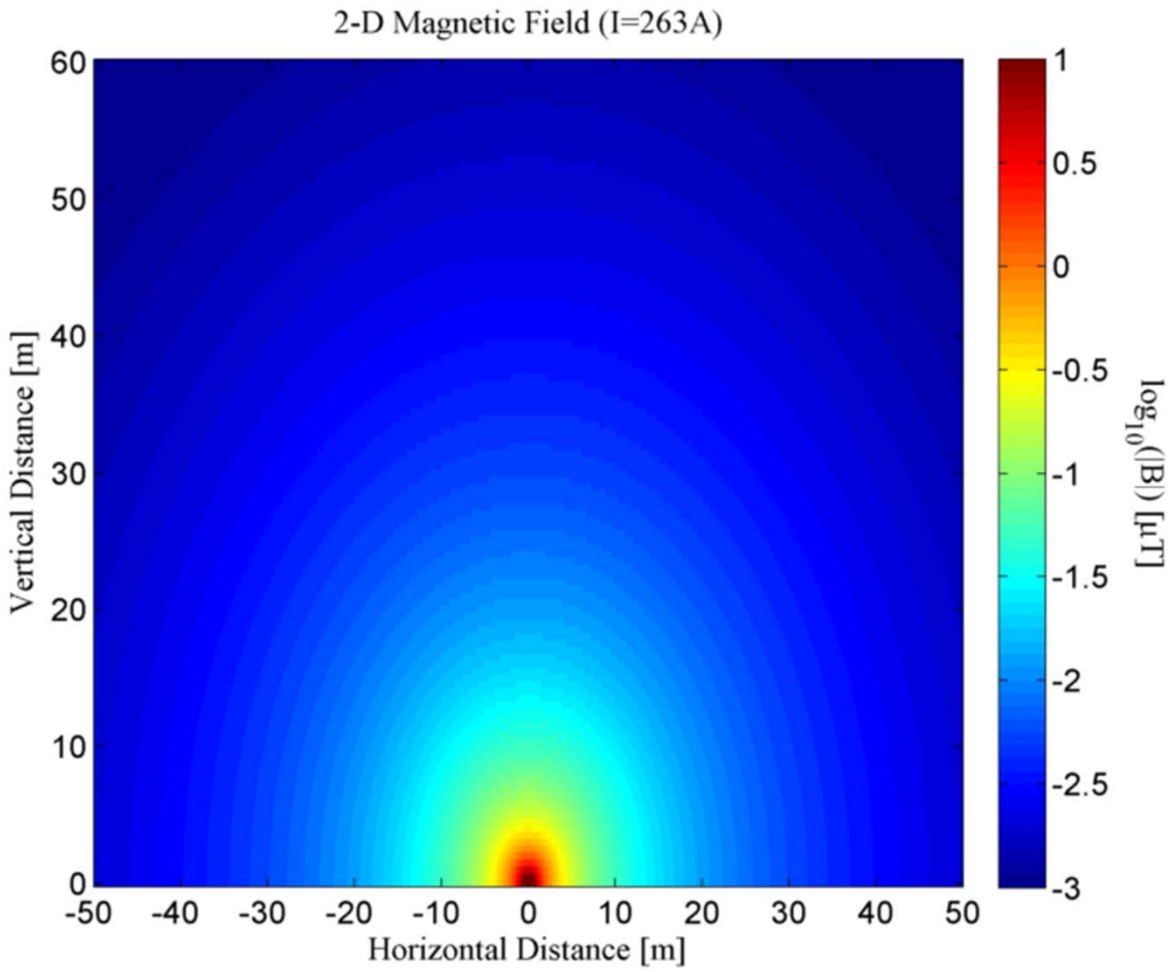
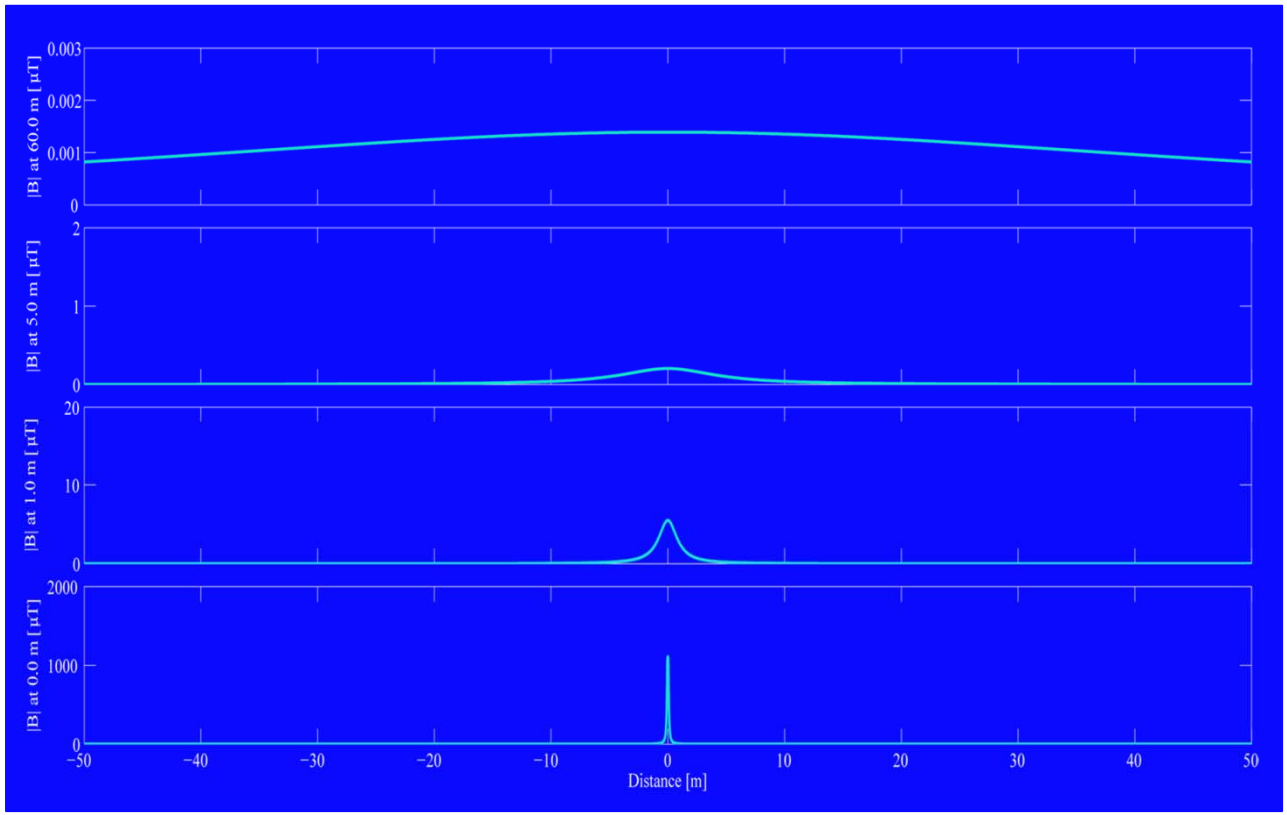
The intensity of the DC magnetic field decreases as the distance (both horizontal and vertical) from the cable increases

2-D View of DC Magnetic Field Intensity



Preliminary DC magnetic field modeling for NextGrid Hawaii under expected average cable loading

DC Magnetic Field at Representative Heights (0, 1, 5, and 60 m) Above Ocean Floor



Ocean Surface
(1,000,000 x less)

5 m (16 ft) above cable
(1,000 x less)

1 m (3.3 ft) above cable
(100 x less)

Directly over cable

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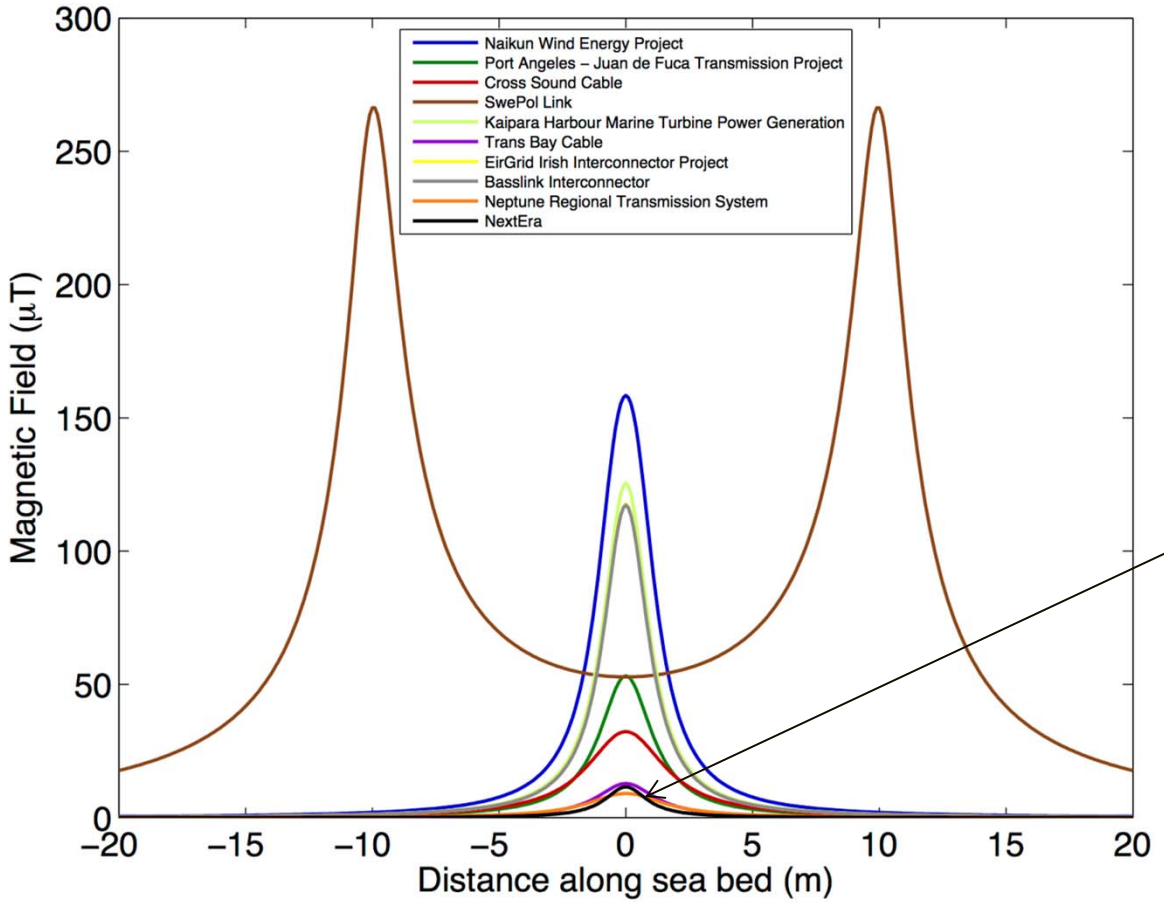
NextGrid Hawaii's preliminary DC magnetic field is at the low end of the comparison cables

Comparison of DC Magnetic Field Profiles of 10 Submarine Cables at 1 m Above the Cable



NextGrid Hawaii
(I = 610 A)

Note that the profiles for the Basslink Interconnector and the EirGrid Irish Interconnector Project almost completely overlap each other. Graph adapted from BOEMRE 2011 report.

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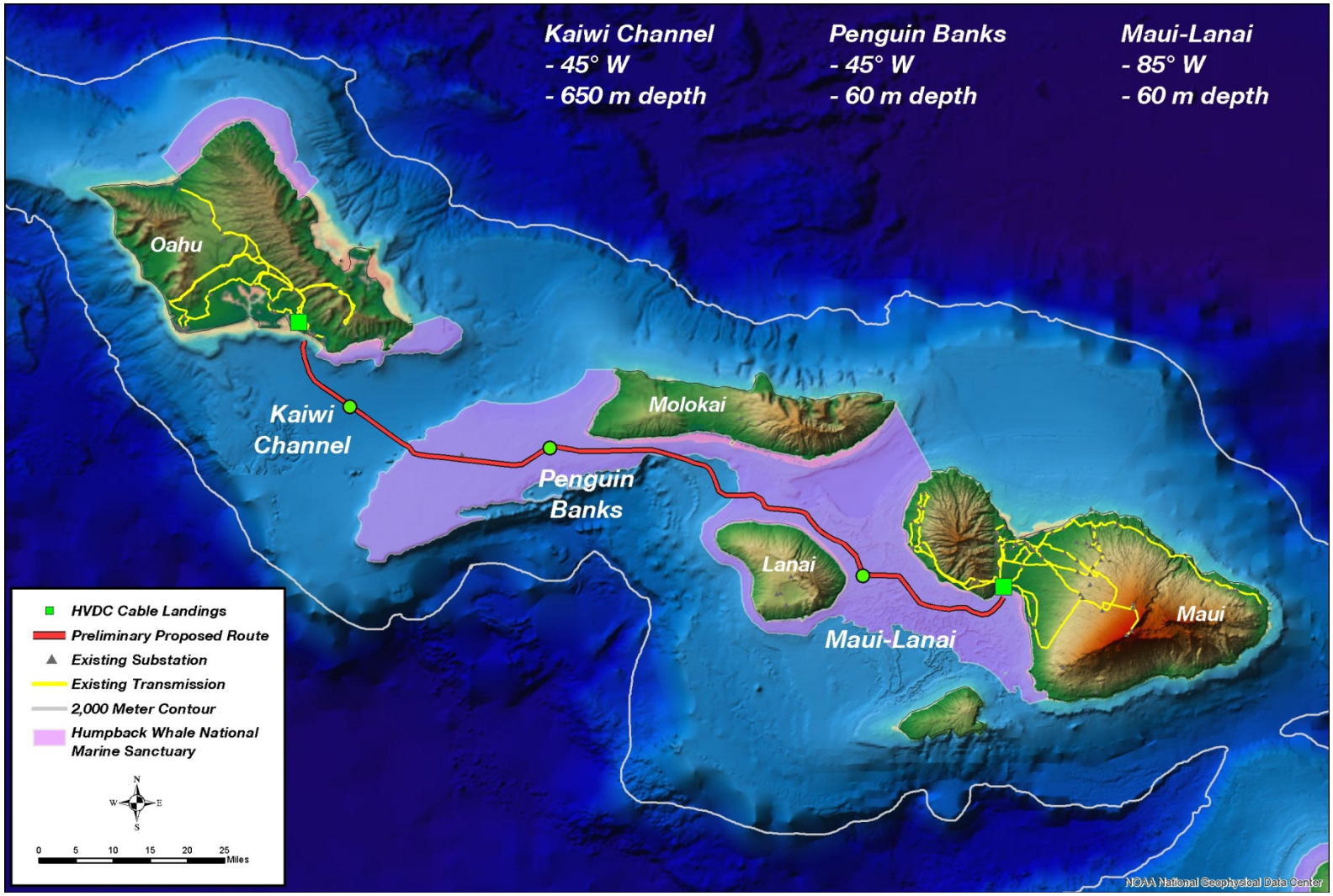
Geographic dependence of interactions of DC cable field and environmental field to be evaluated at 3 locations



Thermal effects generated by electricity flowing through a submarine cable will be modeled

Cable Heating

- **Electricity flowing through a cable generates heat**
- **Heat from cable will transfer into surrounding medium**
  - Seabed soil/silt beneath cable
  - Surrounding water

Thermal modeling will take into consideration the cable's physical properties, design specifications, expected cable loading, and water and seabed properties

Thermal Modeling

- **2 side-by-side DC cables on seabed at two locations**
  - 60 m depth between Maui-Lanai
  - 650 m depth in Kawai Channel
- **2 flow conditions for each location**
  - Stagnant water
  - Ocean current of 5 cm/s
- **610 Amps per cable, producing 15.4 W/m/cable of heat**
- **Heating is slightly greater for 650 m depth**

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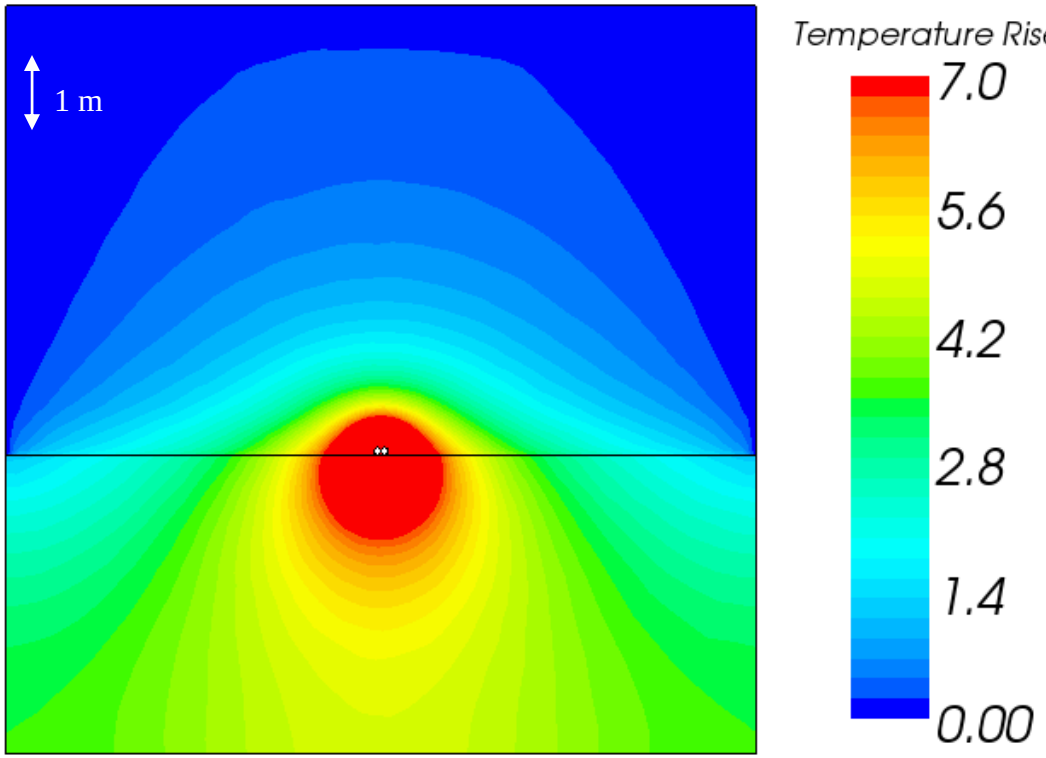
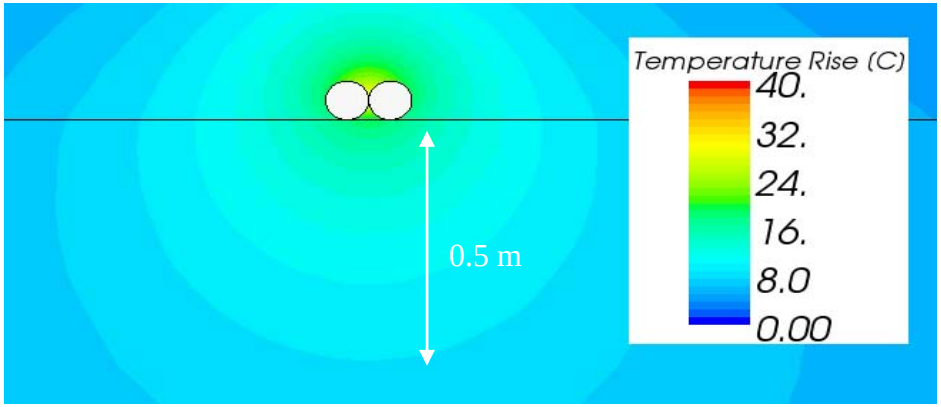
Temperature rise is highly sensitive to ocean currents

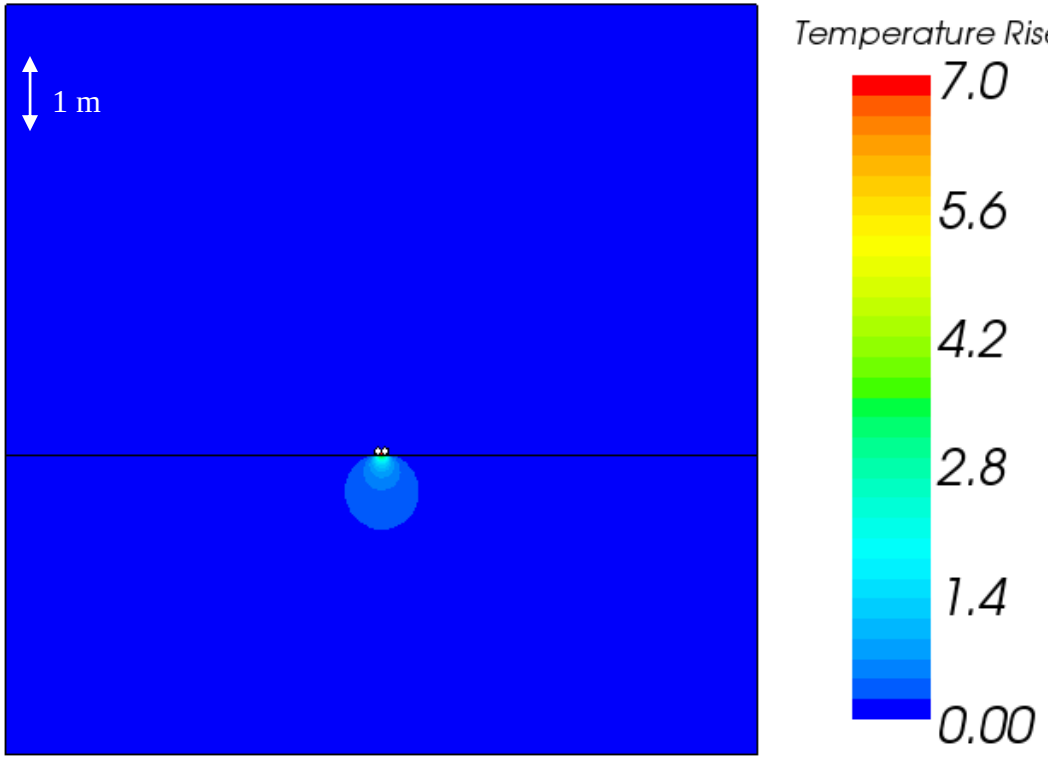
Kaiwi Channel (650 m depth), no flow

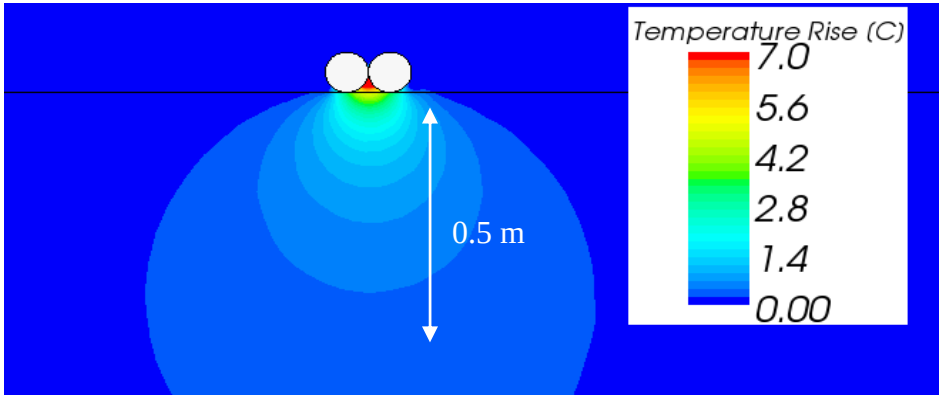




Temperature rise is highly sensitive to ocean currents

Kaiwi Channel (650 m depth), 5 cm/s flow





Marine Species of Concern in Hawaii

Relevance of DC electric fields to species of concern in Hawaii

How Marine Organisms use Electric Fields

- **Sharks and rays**
  - Detect the bioelectric fields produced by prey, mates and predators
  - Use electric fields for orientation and possibly navigation
- **Invertebrates**
  - Freshwater crayfish can detect strong electric fields, but there is very little information on marine species
- **Marine mammals**
  - No evidence
- **Marine turtles**
  - No evidence

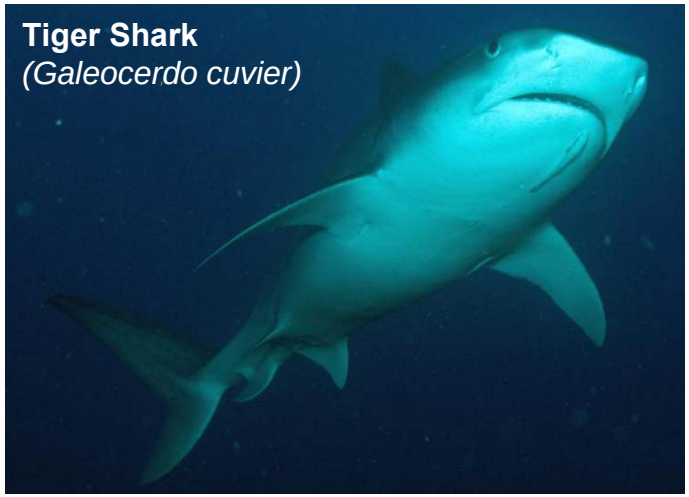


Photo © NOAA

Relevance of DC magnetic fields to species of concern in Hawaii

How Marine Organisms use DC Magnetic Fields

- **Selected marine organisms show behaviors that are associated with large scale magnetic fields**
- **Sea turtles**
  - Adults may use magnetic fields as a guide during migrations between feeding and breeding grounds
  - Juveniles also may use magnetic fields as a compass sense

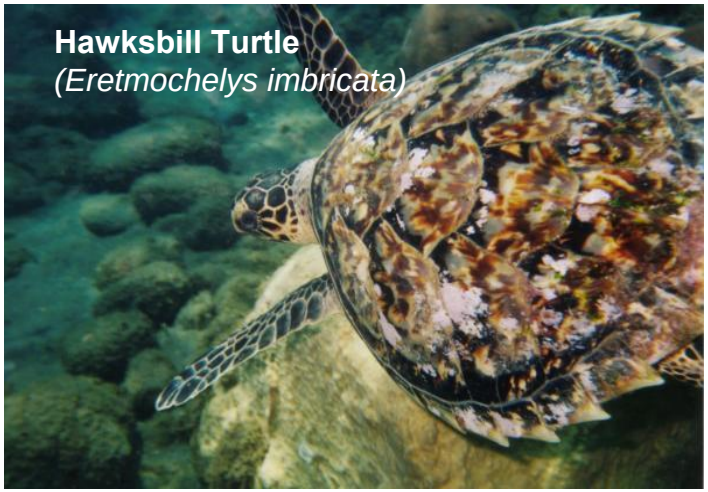


Photo © Johan Chevalier, NOAA

- **Marine mammals (whales and dolphins)**
  - Correlations with associated large scale geomagnetic fields and may reference the earth's magnetic fields for a 'map', not a compass
- **Spiny lobsters**
  - Adult lobsters may use geomagnetic fields to navigate to home areas

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Current state of the science and proposed studies

Marine Organisms and DC Power Cables

- **Existing Studies**
  - Effects of EMFs from Undersea Power Cables on Elasmobranchs and Other Marine Species, published by Bureau of Ocean Energy Management ("BOEM"), May 2011
  - Theoretical models and experiments indicate that a variety of marine species detect DC magnetic fields, but there are few empirical studies on installed power cables
- **Upcoming (Proposed) Studies**
  - Observe the behavior of selected marine fish, turtles and mammals near deployments of large scale power cables

Photo © NOAA

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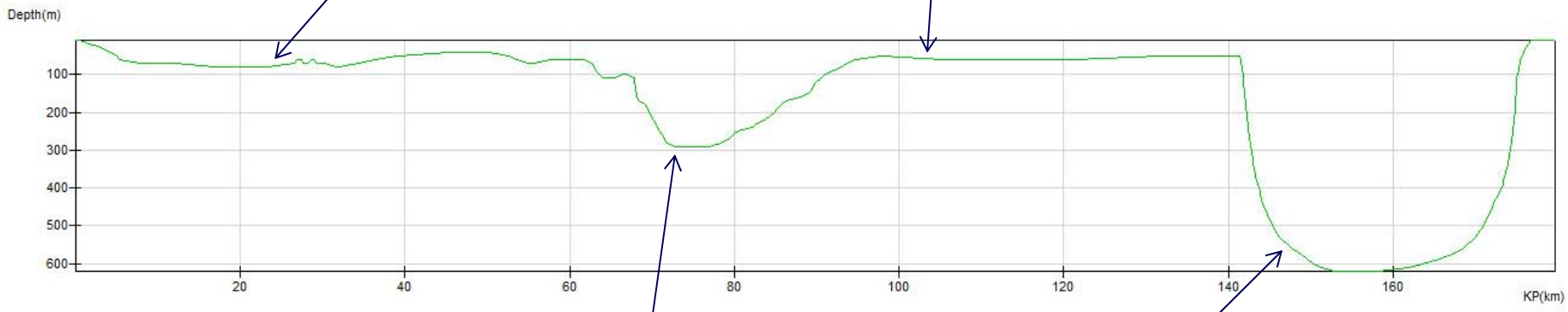
Marine species of concern will vary along the preliminary proposed route

Cable Depths for Preliminary Proposed Route

Shallow sites (~60 m or 200 ft)

Maui

Oahu



Deep sites (~300-600 m or 1,000-2,000 ft)

Marine species of concern will vary along the preliminary proposed route

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Marine Species of Concern in Hawaii (Shallow site ~ 60 m)

- **Elasmobranch fish**
  - Sharks, rays (e.g. tiger sharks, reef sharks, manta rays, stingrays)
  - May swim near the bottom, or in open water dive near the cable
- **Marine mammals**
  - Whales, dolphins (e.g. humpback whales, spinner dolphins, bottlenose dolphins)
  - May swim near the bottom, or in open water dive near the cable
- **Sea turtles**
  - Green turtle, hawksbill
  - May swim near the bottom

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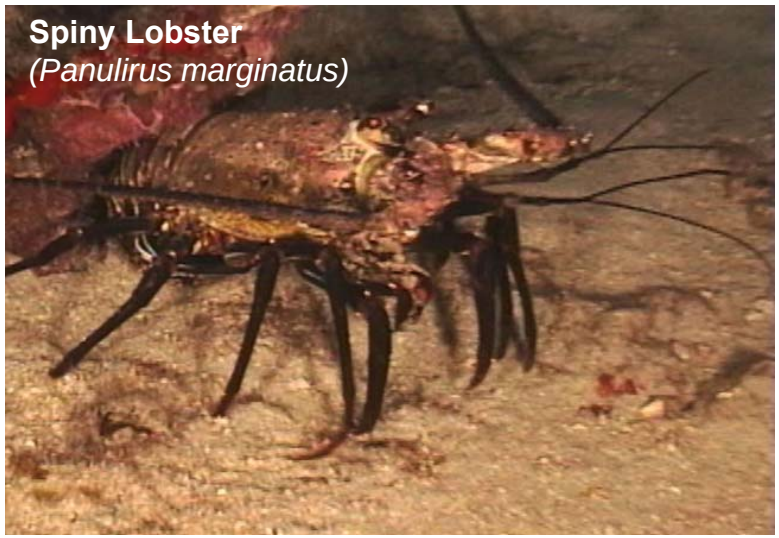
Marine species of concern will vary along the preliminary proposed route

Marine Species of Concern in Hawaii (Shallow site ~ 60m)

- **Benthic Invertebrates**
  - e.g. lobsters and possibly some mollusks
  - Live on the bottom and use magnetic fields for homing, navigation or orientation
- **Pelagic fishes**
  - e.g. tuna (pelagic), may swim near the bottom
- **Bottom dwelling fishes**
  - Scorpionfishes and possibly other species
  - Live on the bottom and use magnetic fields for homing, navigation or orientation



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Marine species of concern will vary along the preliminary proposed route

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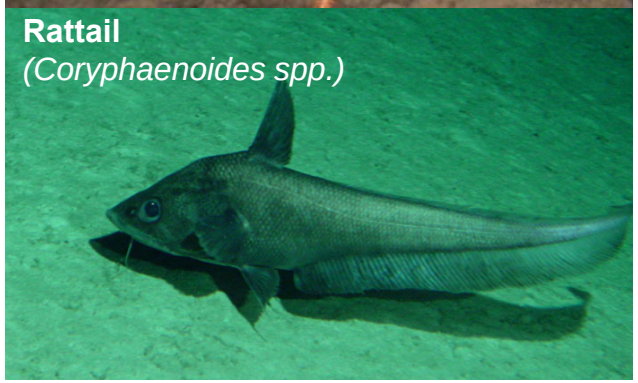

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Marine Species of Concern in Hawaii (Deep site 300 - 650 m)

- **Deep water elasmobranchs**
  - Sharks and rays
  - e.g. deepwater stingray (*Pleisiobatis daviesi*), cowsharks (*Hexanchus* spp.)
- **Deep water invertebrates (unknown effects)**
  - e.g. Squat lobsters (Chyrostylidae), blind "lobsters" (Polychelidae), glass squids (*Lirochanchia spp.)*
- **Deep water bony fishes (unknown effects)**
  - e.g. Grenadiers or rattails (Macrouridae), Armored searobins (Peristediidae); Anglerfishes (Lophiiformes); Conger eels (Congridae)

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Effects of cable EMF will be highly dependent on the configuration of the cable, power levels and the biology/behavior of each species

Possible Effects of Cable EMFs

- **No effect**
  - Animals that can detect the cable EMF may not respond behaviorally to it
- **Attraction**
  - Some animals may aggregate around or along the cable on the seafloor or in the water above
- **Avoidance**
  - Highly sensitive animals may avoid it
- **Spatial movement**
  - May locally alter orientation and related behaviors

Photo © NOAA

Questions?

Website:	**www.NextEraEnergyHawaii.com**
Email:	**NextGridHawaii@NextEraEnergy.com**
Twitter:	**#HINextGrid**

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Mahalo

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Appendix

Cautionary Statement And Risk Factors That May Affect Future Results

This presentation contains “forward-looking statements” within the meaning of the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Forward-looking statements are not statements of historical facts, but instead represent the current expectations of NextEra Energy, Inc. (together with its subsidiaries, NextEra Energy) regarding future operating results and other future events, many of which, by their nature, are inherently uncertain and outside of NextEra Energy's control. Forward-looking statements in this presentation include, among others, statements concerning adjusted earnings per share expectations and future operating performance. In some cases, you can identify the forward-looking statements by words or phrases such as “will,” “will result,” “expect,” “anticipate,” “believe,” “intend,” “plan,” “seek,” “aim,” “potential,” “projection,” “forecast,” “predict,” “goals,” “target,” “outlook,” “should,” “would” or similar words or expressions. You should not place undue reliance on these forward-looking statements, which are not a guarantee of future performance. The future results of NextEra Energy are subject to risks and uncertainties that could cause actual results to differ materially from those expressed or implied in the forward-looking statements. These risks and uncertainties include, but are not limited to, the following: effects of extensive regulation of NextEra Energy's business operations; inability of NextEra Energy to recover in a timely manner any significant amount of costs, a return on certain assets or an appropriate return on capital through base rates, cost recovery clauses, other regulatory mechanisms or otherwise; impact of political, regulatory and economic factors on regulatory decisions important to NextEra Energy; risks of disallowance of cost recovery based on a finding of imprudent use of derivative instruments; effect of any reductions to or elimination of governmental incentives that support renewable energy projects; impact of new or revised laws, regulations or interpretations or other regulatory initiatives on NextEra Energy; effect on NextEra Energy of potential regulatory action to broaden the scope of regulation of over-the-counter (OTC) financial derivatives and to apply such regulation to NextEra Energy; capital expenditures, increased operating costs and various liabilities attributable to environmental laws, regulations and other standards applicable to NextEra Energy; effects on NextEra Energy of federal or state laws or regulations mandating new or additional limits on the production of greenhouse gas emissions; exposure of NextEra Energy to significant and increasing compliance costs and substantial monetary penalties and other sanctions as a result of extensive federal regulation of its operations; effect on NextEra Energy of changes in tax laws and in judgments and estimates used to determine tax-related asset and liability amounts; impact on NextEra Energy of adverse results of litigation; effect on NextEra Energy of failure to proceed with projects under development or inability to complete the construction of (or capital improvements to) electric generation, transmission and distribution facilities, gas infrastructure facilities or other facilities on schedule or within budget; impact on development and operating activities of NextEra Energy resulting from risks related to project siting, financing, construction, permitting, governmental approvals and the negotiation of project development agreements; risks involved in the operation and maintenance of electric generation, transmission and distribution facilities, gas infrastructure facilities and other facilities; effect on NextEra Energy of a lack of growth or slower growth in the number of customers or in customer usage; impact on NextEra Energy of severe weather and other weather conditions; risks associated with threats of terrorism and catastrophic events that could result from terrorism, cyber attacks or other attempts to disrupt NextEra Energy's business or the businesses of third parties; risk of lack of availability of adequate insurance coverage for protection of NextEra Energy against significant losses; risk of increased operating costs resulting from unfavorable supply costs necessary to provide full energy and capacity requirement services; inability or failure to hedge effectively assets or positions against changes in commodity prices, volumes, interest rates, counterparty credit risk or other risk measures; potential volatility of NextEra Energy's results of operations caused by sales of power on the spot market or on a short-term contractual basis; effect of reductions in the liquidity of energy markets on NextEra Energy's ability to manage operational risks; effectiveness of NextEra Energy's hedging and trading procedures and associated risk management tools to protect against significant losses; impact of unavailability or disruption of power transmission or commodity transportation facilities on sale and delivery of power or natural gas; exposure of NextEra Energy to credit and performance risk from customers, hedging counterparties and vendors; risks of failure of counterparties to perform under derivative contracts or of requirement for NextEra Energy to post margin cash collateral under derivative contracts;

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Cautionary Statement And Risk Factors That May Affect Future Results (cont.)

failure or breach of NextEra Energy's information technology systems; risks to NextEra Energy's retail businesses of compromise of sensitive customer data; risks to NextEra Energy of volatility in the market values of derivative instruments and limited liquidity in OTC markets; impact of negative publicity; inability to maintain, negotiate or renegotiate acceptable franchise agreements; increasing costs of health care plans; lack of a qualified workforce or the loss or retirement of key employees; occurrence of work strikes or stoppages and increasing personnel costs; NextEra Energy's ability to successfully identify, complete and integrate acquisitions; environmental, health and financial risks associated with ownership of nuclear generation facilities; liability of NextEra Energy for significant retrospective assessments and/or retrospective insurance premiums in the event of an incident at certain nuclear generation facilities; increased operating and capital expenditures at nuclear generation facilities resulting from orders or new regulations of the Nuclear Regulatory Commission; inability to operate any owned nuclear generation units through the end of their respective operating licenses; liability for increased nuclear licensing or compliance costs resulting from hazards posed to owned nuclear generation facilities; risks associated with outages of owned nuclear units; effect of disruptions, uncertainty or volatility in the credit and capital markets on NextEra Energy's ability to fund its liquidity and capital needs and meet its growth objectives; inability to maintain current credit ratings; risk of impairment of liquidity from inability of creditors to fund their credit commitments or to maintain their current credit ratings; poor market performance and other economic factors that could affect NextEra Energy's defined benefit pension plan's funded status; poor market performance and other risks to the asset values of nuclear decommissioning funds; changes in market value and other risks to certain of NextEra Energy's investments; effect of inability of NextEra Energy subsidiaries to upstream dividends or repay funds to NextEra Energy or of NextEra Energy's performance under guarantees of subsidiary obligations on NextEra Energy's ability to meet its financial obligations and to pay dividends on its common stock; and effect of disruptions, uncertainty or volatility in the credit and capital markets of the market price of NextEra Energy's common stock. NextEra Energy discusses these and other risks and uncertainties in its annual report on Form 10-K for the year ended December 31, 2012 and other SEC filings, and this presentation should be read in conjunction with such SEC filings made through the date of this presentation. The forward-looking statements made in this presentation are made only as of the date of this presentation and NextEra Energy undertakes no obligation to update any forward-looking statements.

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