IPHC's Setline Stock Assessment Survey

Objectives,
Design Evolution,
Standardization,
Research platform piggybacks
Proposed modifications

Primary Objectives

- Standardized, fishery independent data for stock assessment
  - CPUE, sex specific length-at-age, age composition
  - Data on juvenile halibut
  - Halibut distribution and abundance trends (changes in sex, length, maturity and age over the grounds)

Secondary Objectives

- Platform for specialized data collection projects
  - Oceanographic data (SeaCat H2O profiler, TDR's)
  - Prior hook injuries (PHI)
  - Marine mammal / Seabird occurrence and interactions
  - Clean otolith sampling techniques
  - Pop-up Archival Transmitting (PAT) tags
  - Amphipod study
  - Species richness (depth, temp, video)

IPHC Research platform piggybacks

In 2011

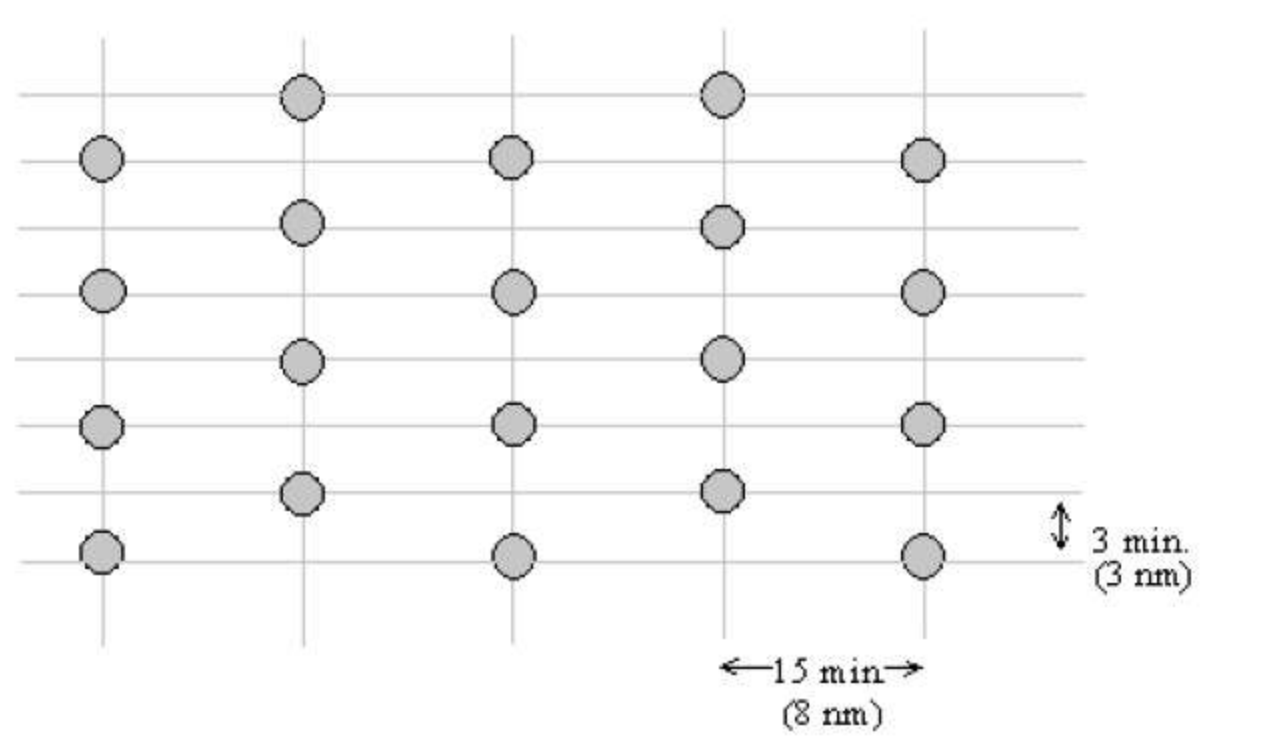
- Rockfish data collection in OR, WA, and B.C. (otoliths, maturity, length, weight, etc) (ODFW, WDFW, DFO)
- Preliminary spiny dogfish sexed lengths (NMFS) over entire survey.
- Pacific cod length frequencies in Area 4 (NMFS)
- Flesh samples for heavy metals and other chemical testing (ADEC)

IPHC Survey History

- Standardized Stock Assessment (SSA) Surveys began in 1963.
  - Survey priorities, designs, and procedures have evolved over time
- 1963 to 1966 and 1976 to 1986
  - 1 to 4 vessels in core areas of Canada and Alaska
  - 25% to 50% of halibut were tagged and released
- 1993 to 1996
  - 2 to 8 vessels in core areas of Canada and Alaska
  - Began bycatch observation
- 1997 to current
  - 12 to 15 vessels covering most offshore habitat
  - Expanded secondary objectives

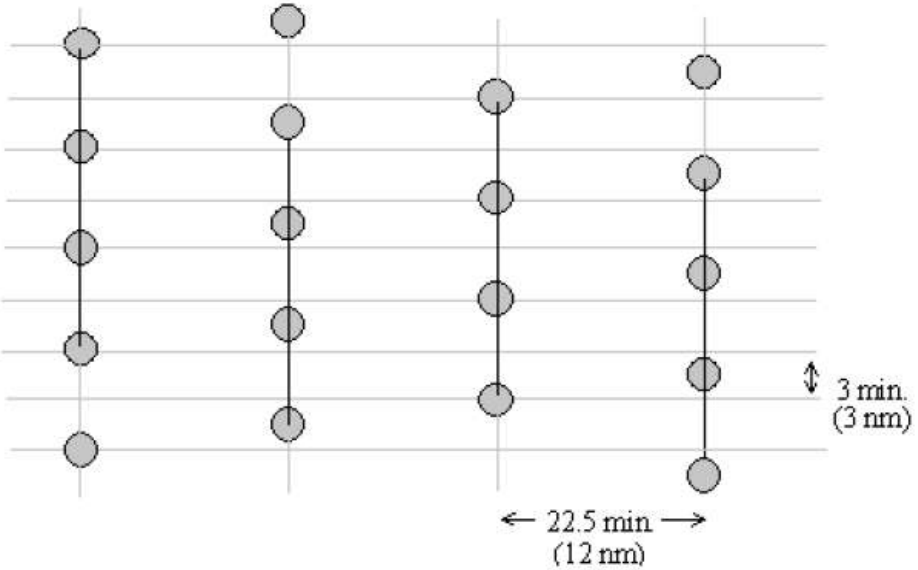
Station layout evolution

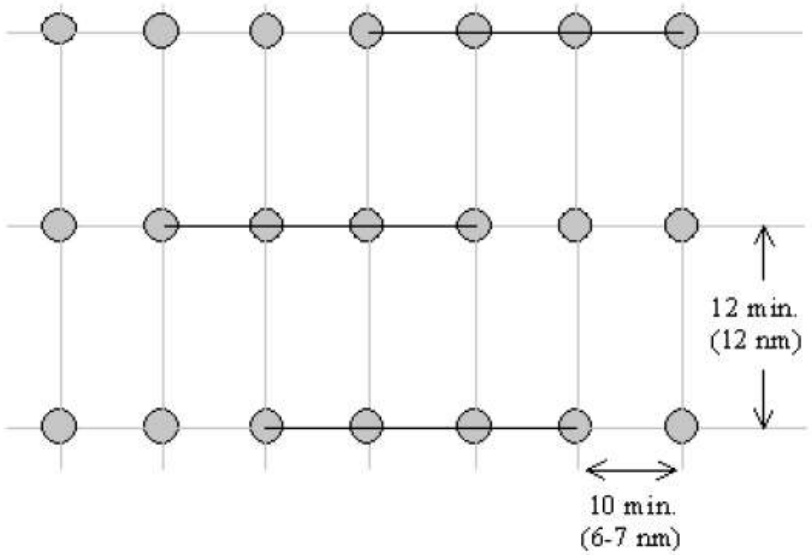
Original grid pattern used for 1961 to 1963 trawl surveys.



Station layout evolution

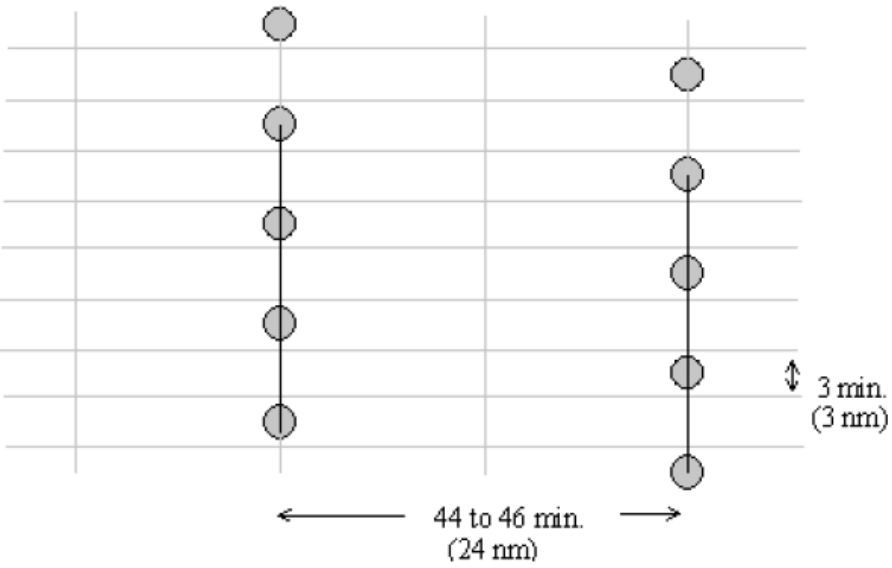
Area 3 (left) and Area 2B (right) grid patterns modified in 1963 and used until 1966.

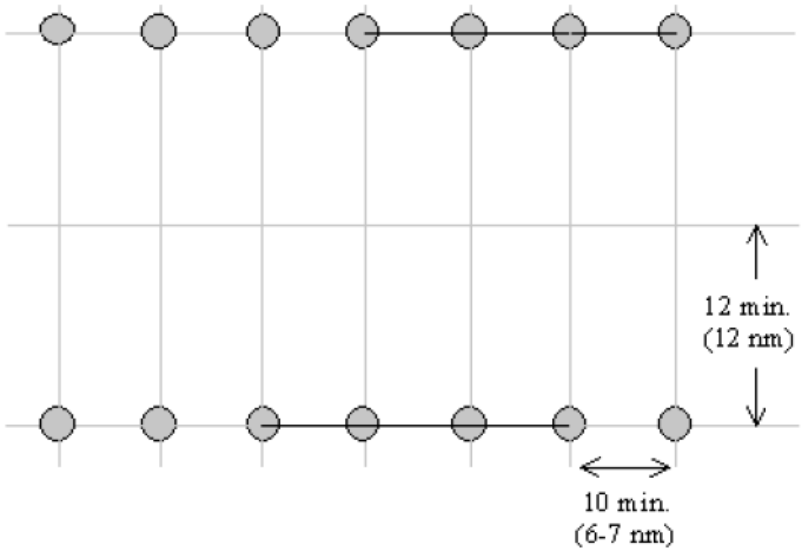




Station layout evolution

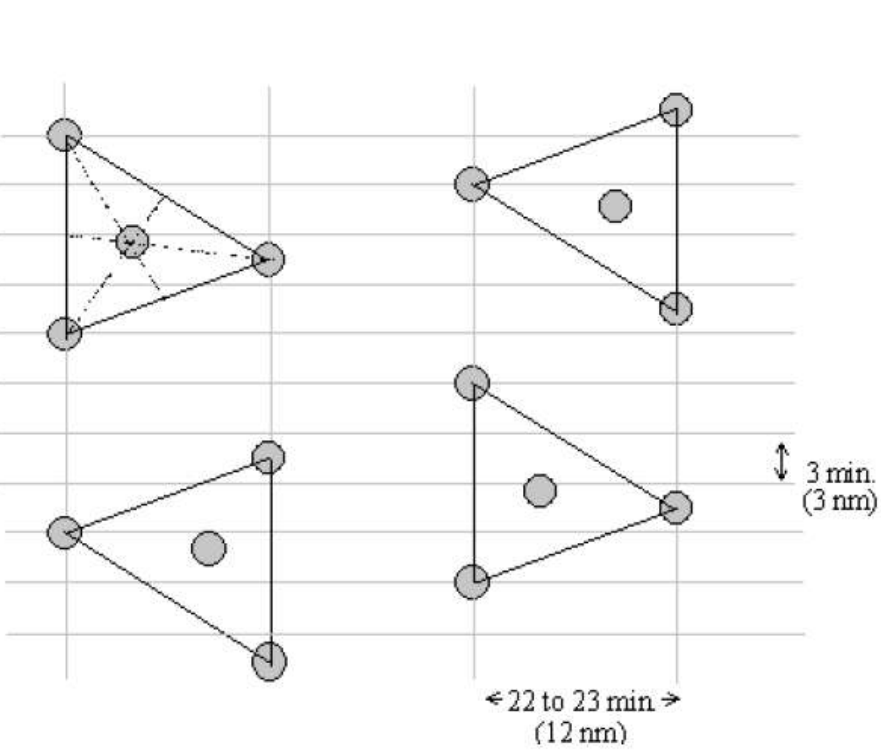
Area 3 (left) and Area 2B (right) grid patterns modified in 1976 and used until 1986.

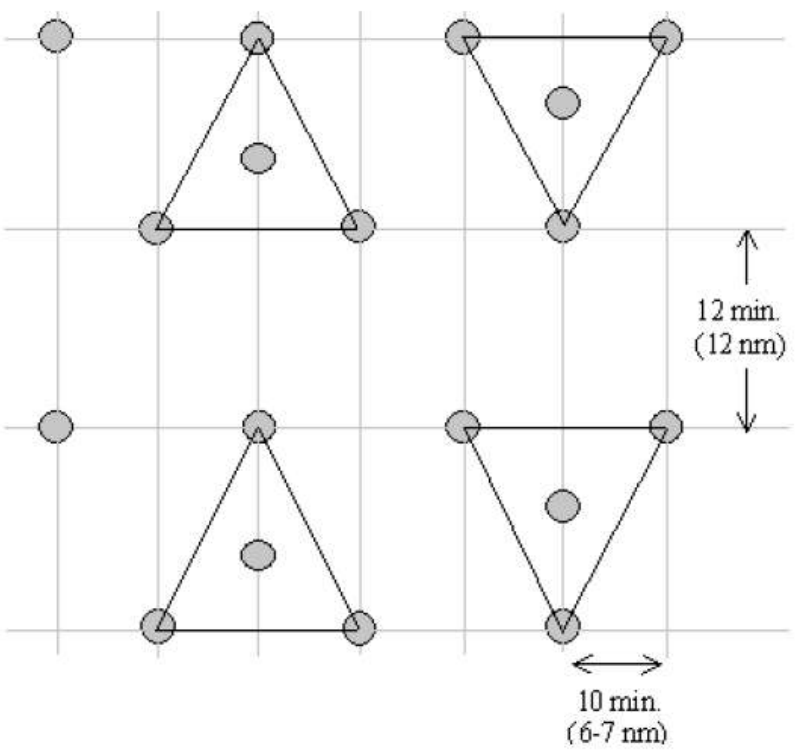




Station layout evolution

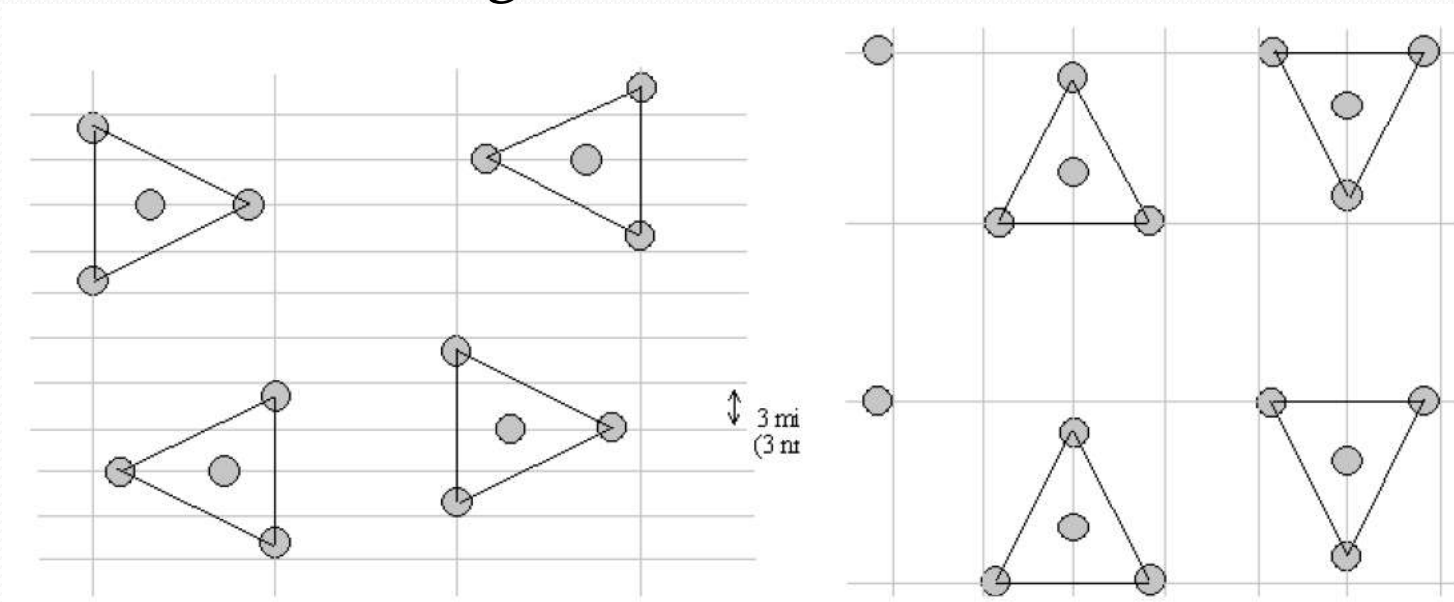
Area 3 (left) and Area 2B (right) grid patterns modified in 1993 and used until 1995





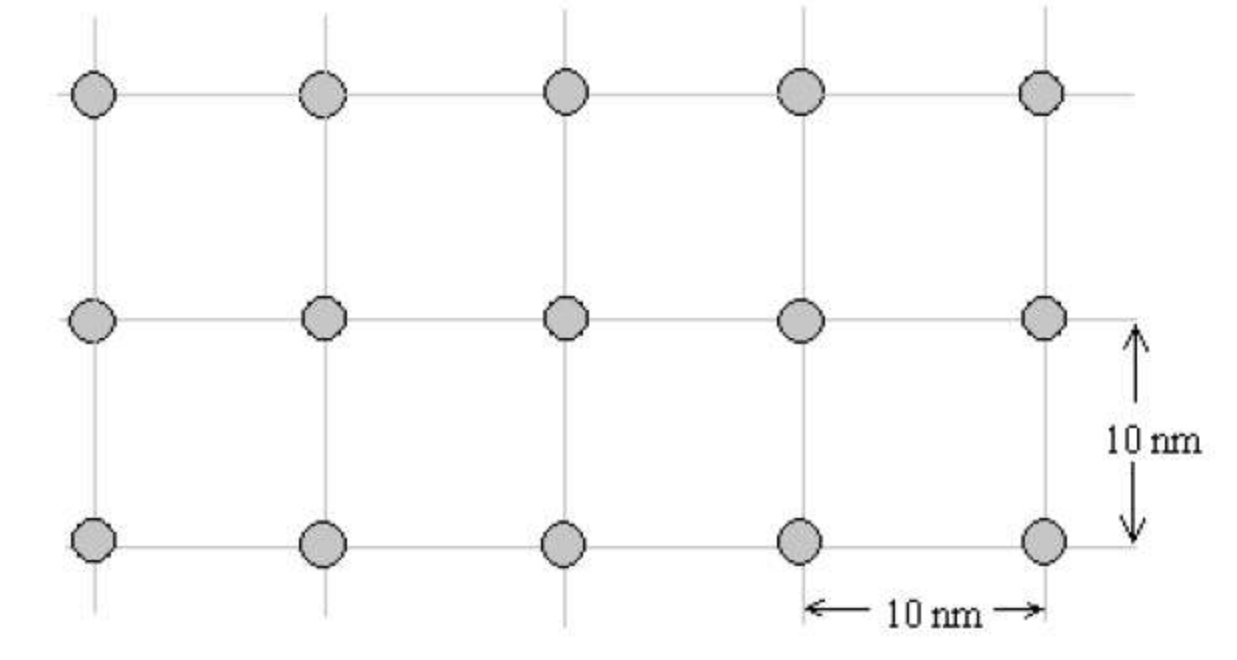
Station layout evolution

In 1996 stations were moved closer together to reduce running. Grid patterns modified during the 1996 survey season and adopted in 1997 for Areas 2C, Area 3, and Area 4 (left) and for 2B (right).

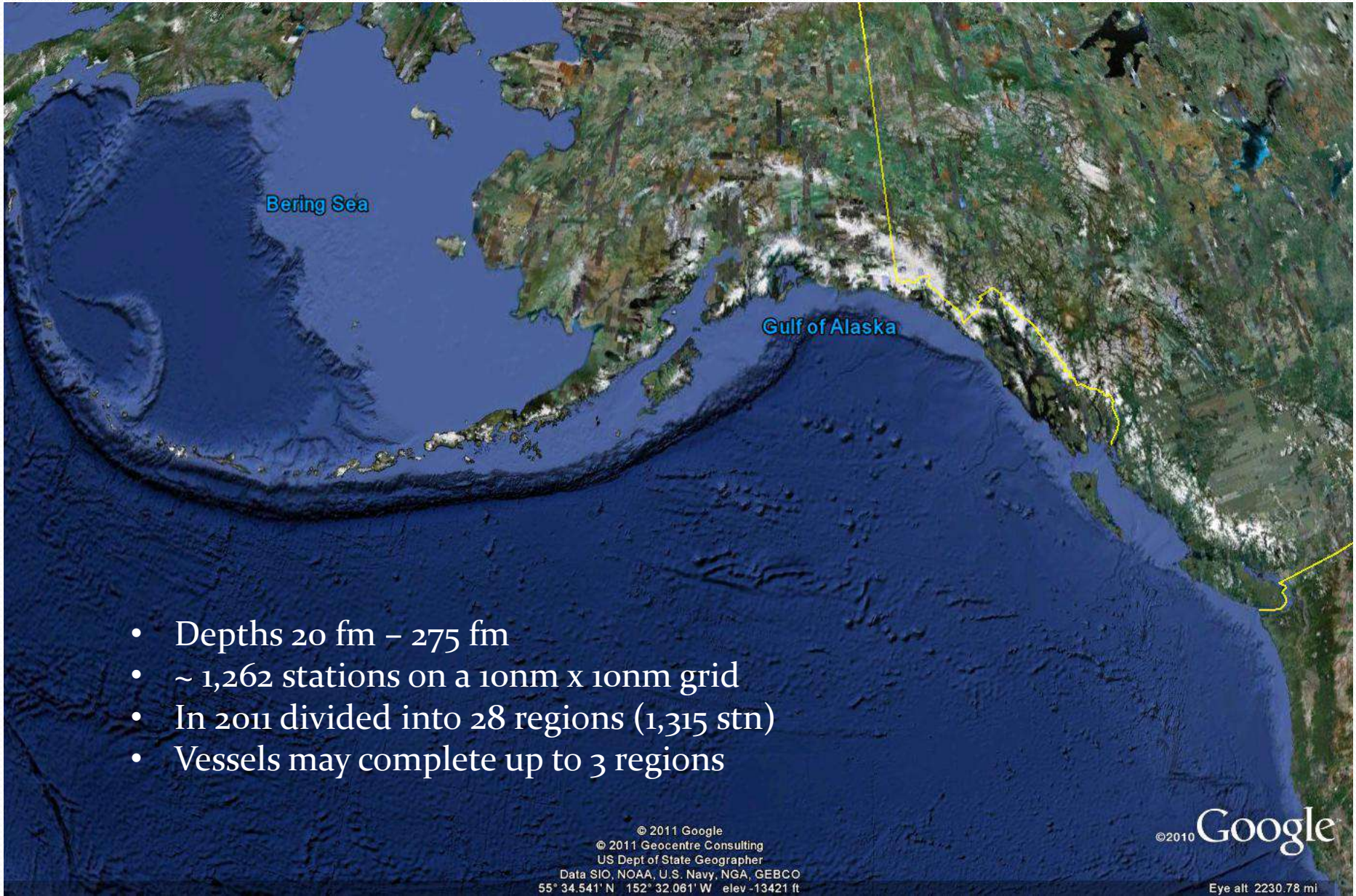


Station layout evolution

- 1998 – 2011 station pattern over entire survey area.

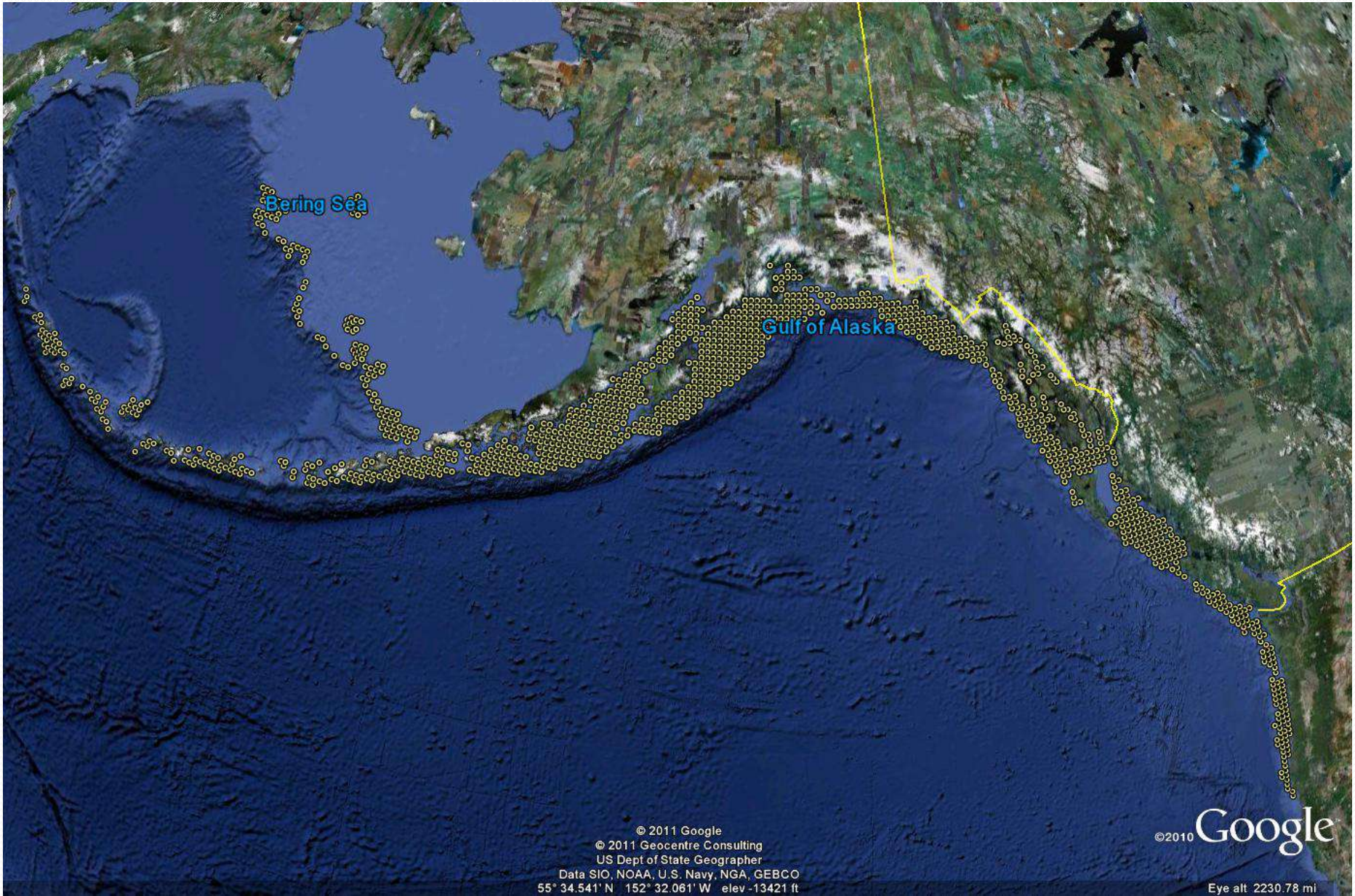


Range

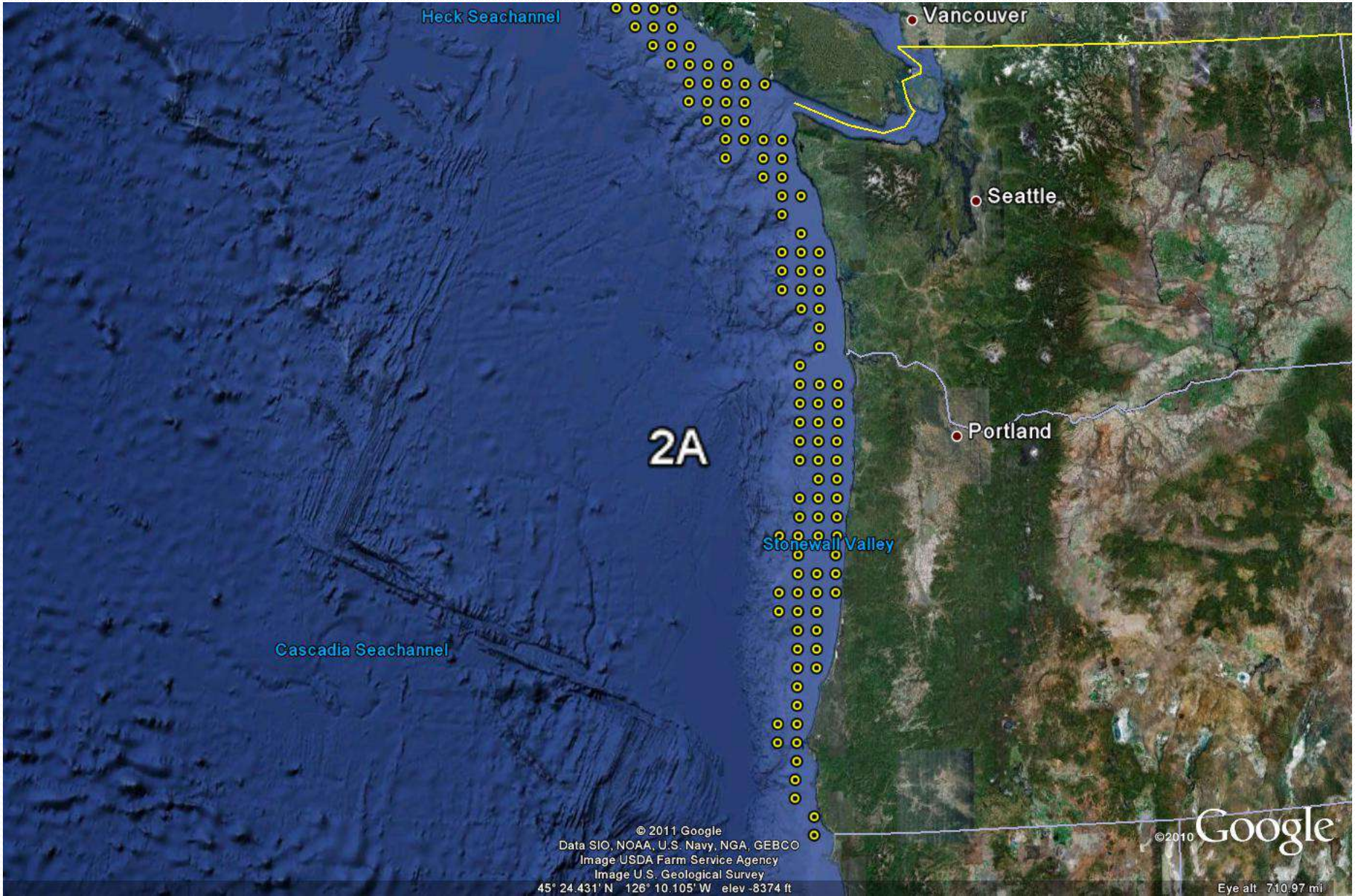


- Depths 20 fm – 275 fm
- ~ 1,262 stations on a 10nm x 10nm grid
- In 2011 divided into 28 regions (1,315 stn)
- Vessels may complete up to 3 regions

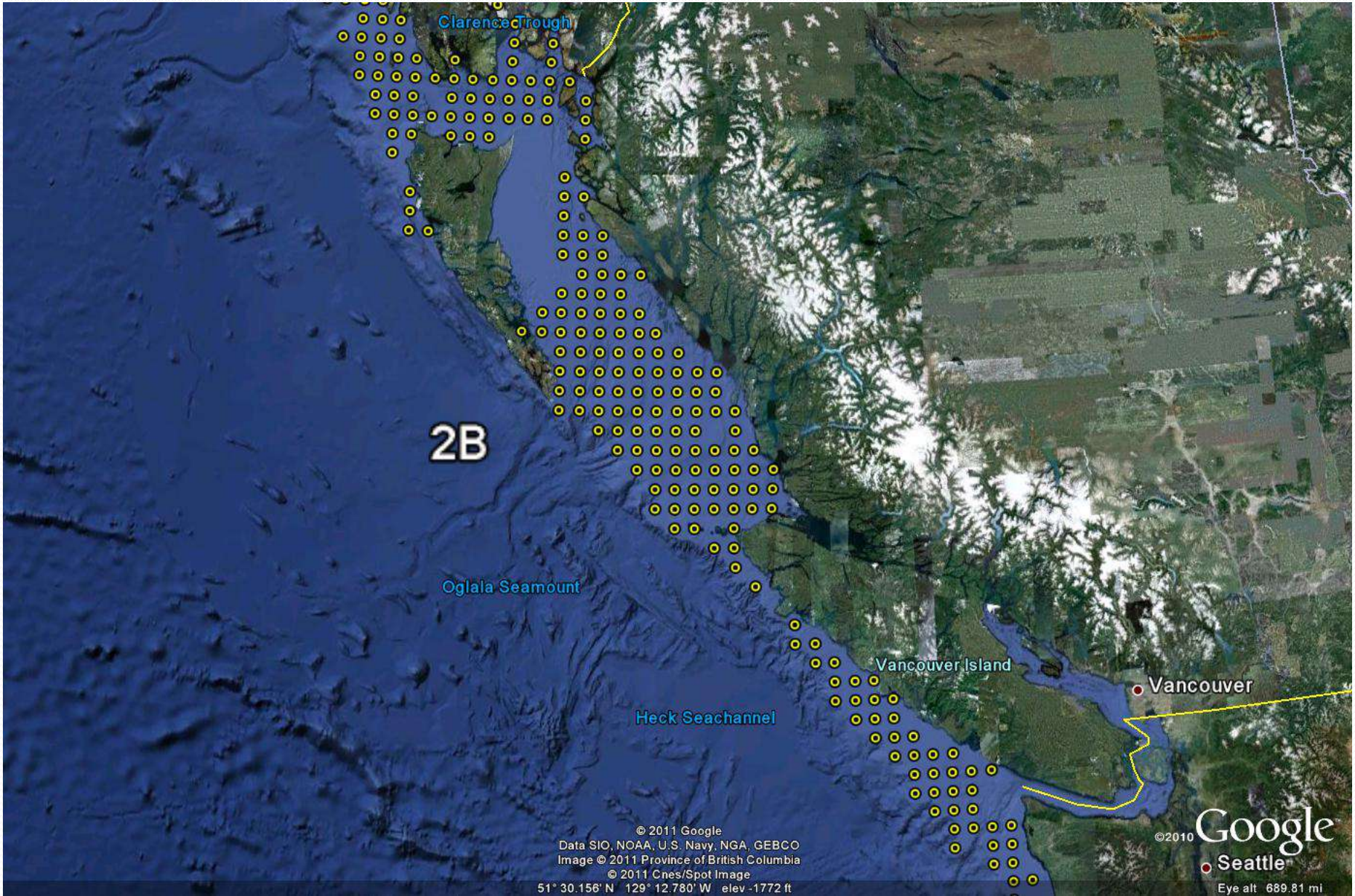
Range


Bering Sea
Gulf of Alaska
© 2011 Google
© 2011 Geocentre Consulting
US Dept of State Geographer
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
55° 34.541' N 152° 32.061' W elev -13421 ft
©2010 Google
Eye alt 2230.78 mi

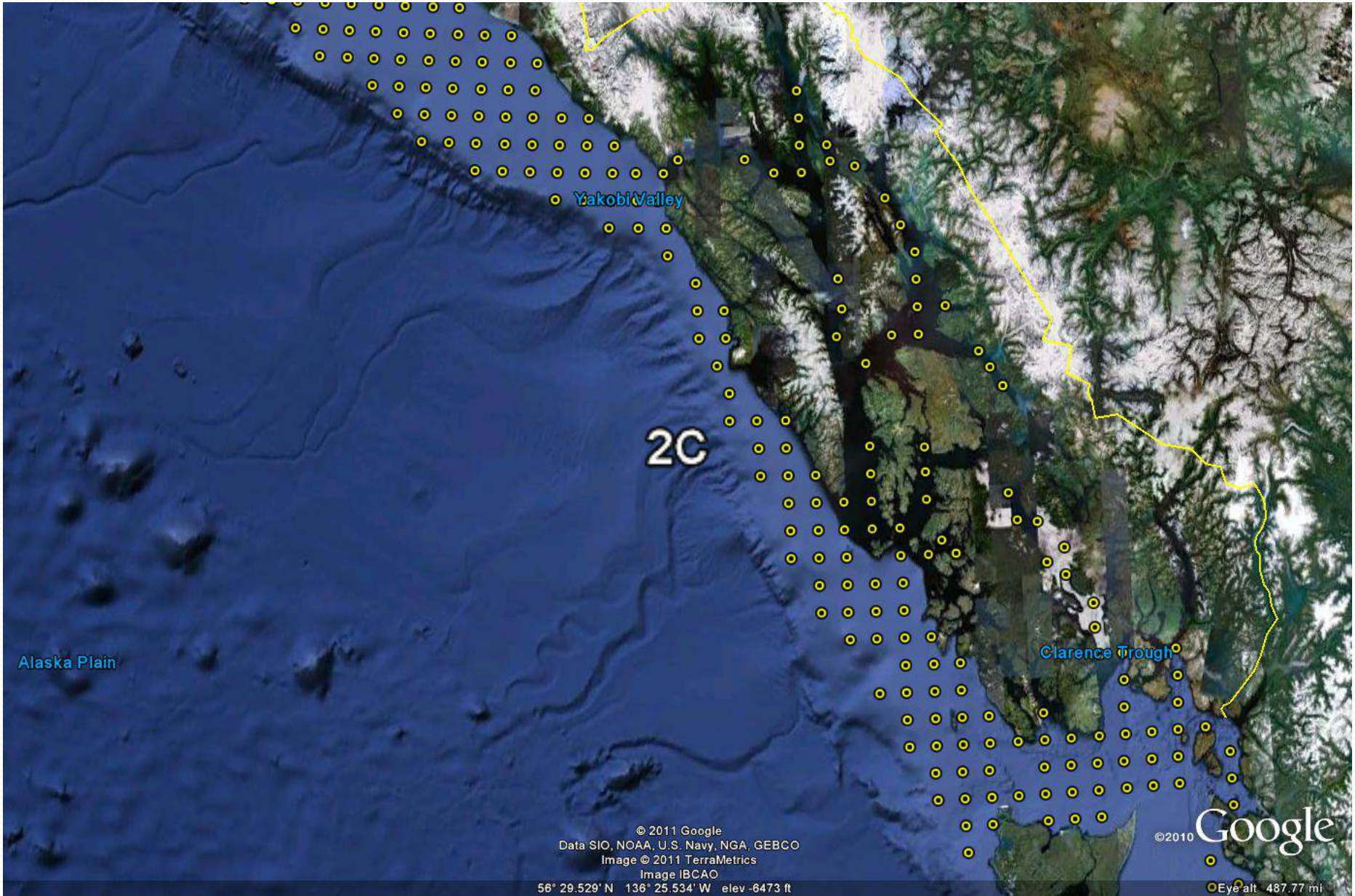
Range


Heck Seachannel
Vancouver
Seattle
Portland
2A
Stonewall Valley
Cascadia Seachannel
© 2011 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image USDA Farm Service Agency
Image U.S. Geological Survey
45° 24.431' N 126° 10.105' W elev -8374 ft
©2010 Google
Eye alt 710.97 mi

Range


Clarence Trough
2B
Oglala Seamount
Vancouver Island
Vancouver
Heck Seachannel
Seattle
© 2011 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2011 Province of British Columbia
© 2011 Cnes/Spot Image
51° 30.156' N 129° 12.780' W elev -1772 ft
©2010 Google
Eye alt 689.81 mi

Range


Yakobi Valley
2C
Alaska Plain
Clarence Trough
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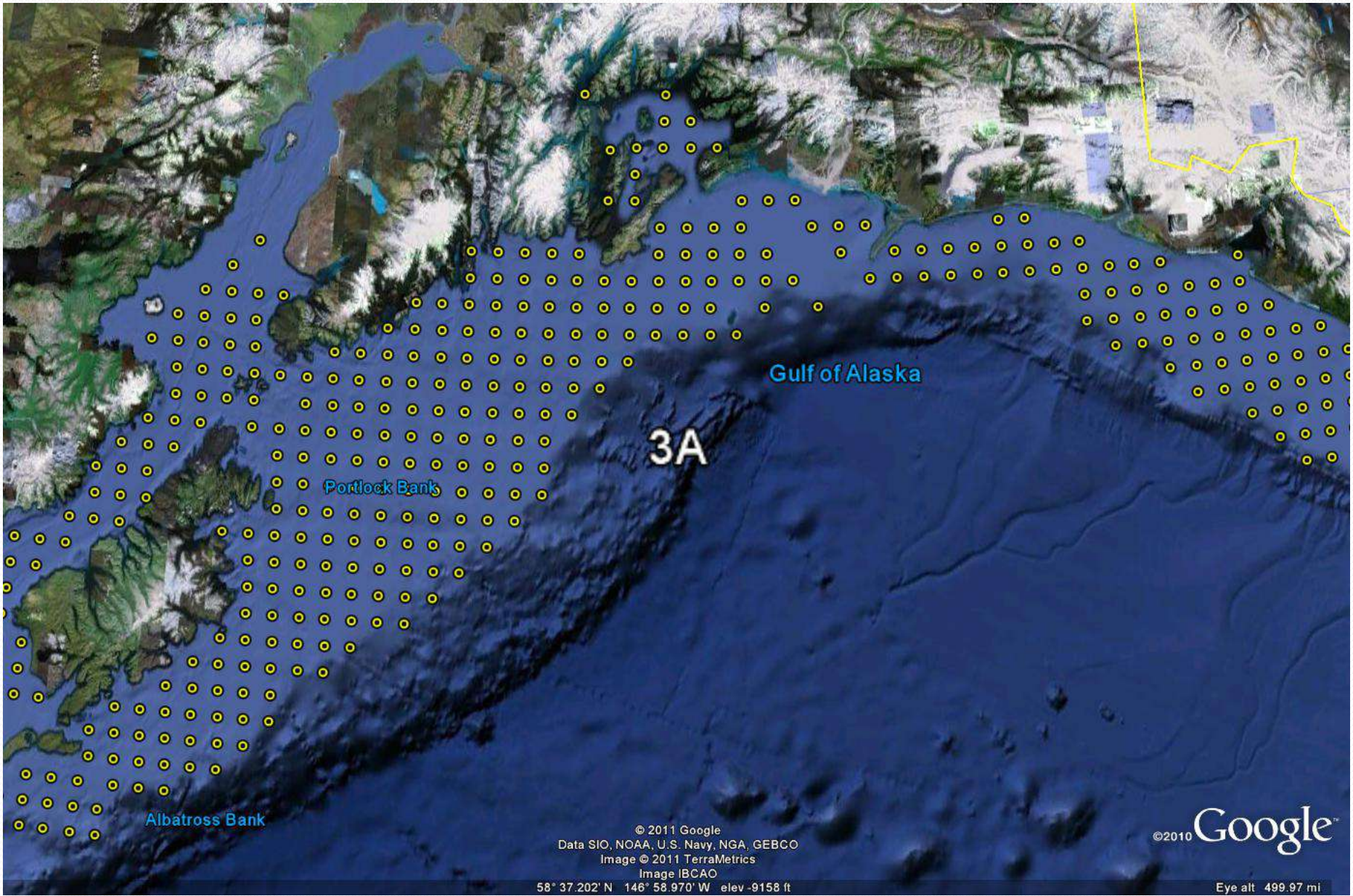
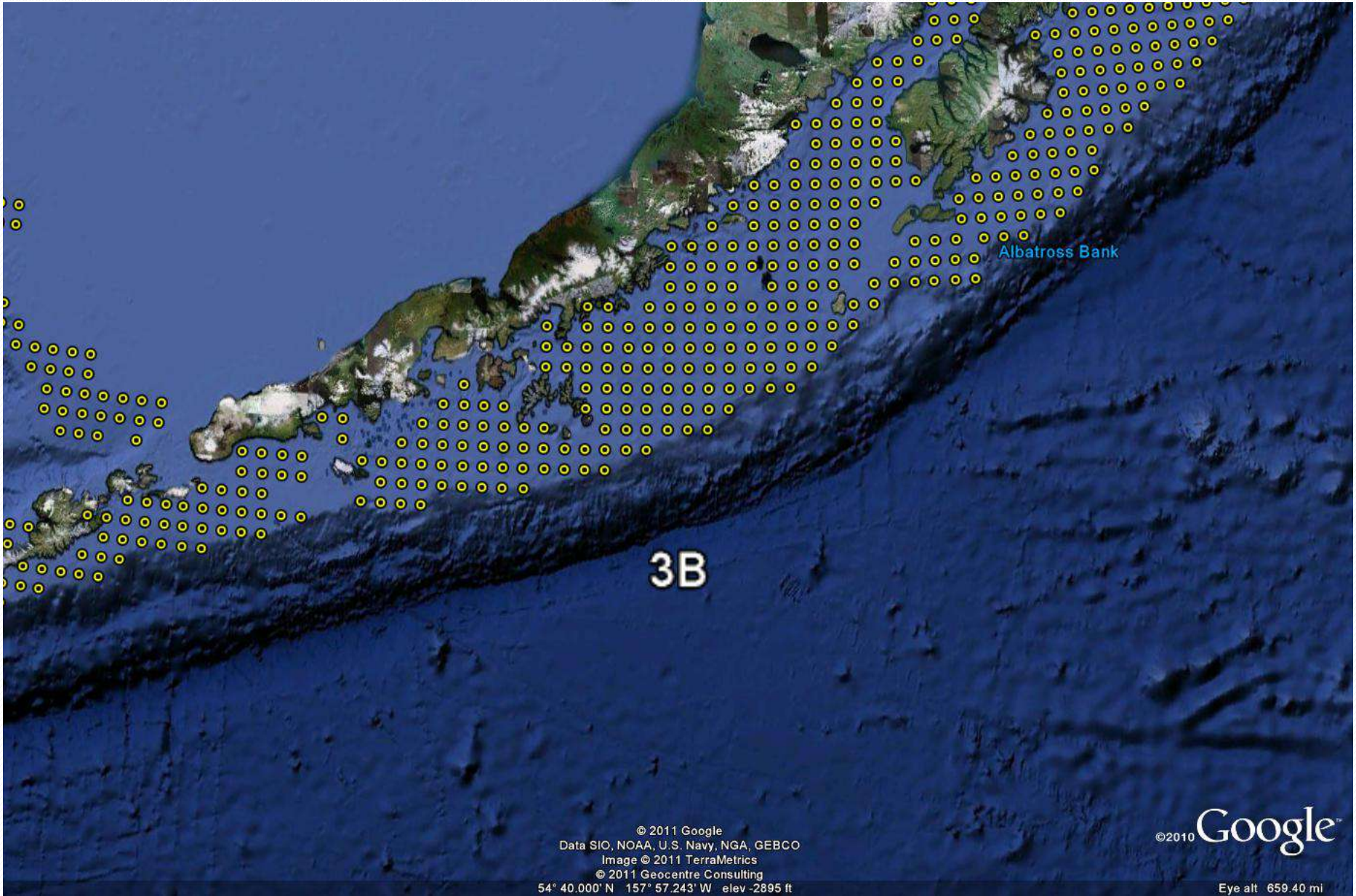
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2011 TerraMetrics
Image IBCAO
56° 29.529' N 136° 25.534' W elev -6473 ft
©2010 Google
Eye alt 487.77 mi

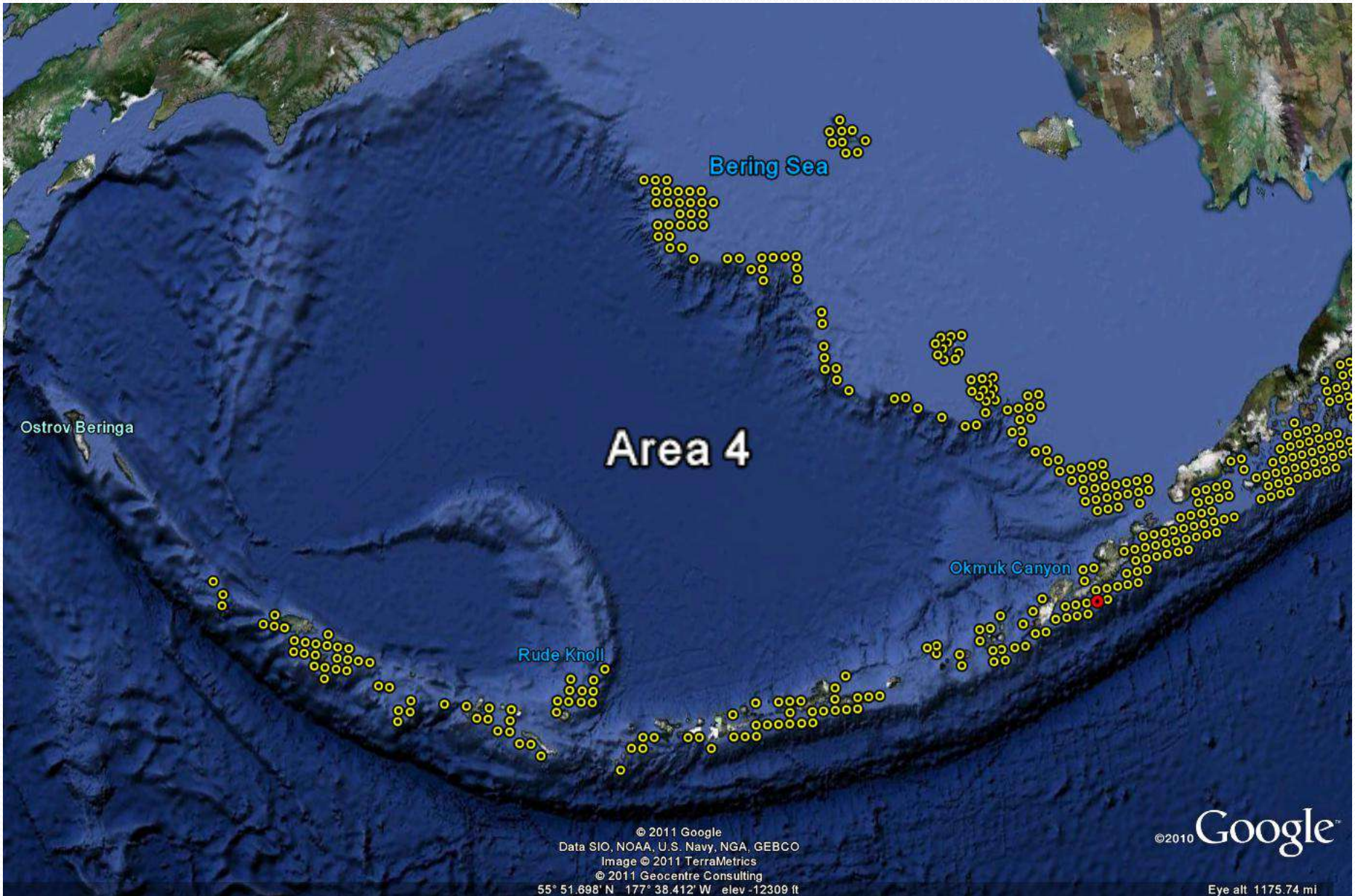
Range


Gulf of Alaska
3A
Portlock Bank
Albatross Bank
© 2011 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2011 TerraMetrics
Image IBCAO
58° 37.202' N 146° 58.970' W elev -9158 ft
©2010 Google
Eye alt 499.97 mi

Range

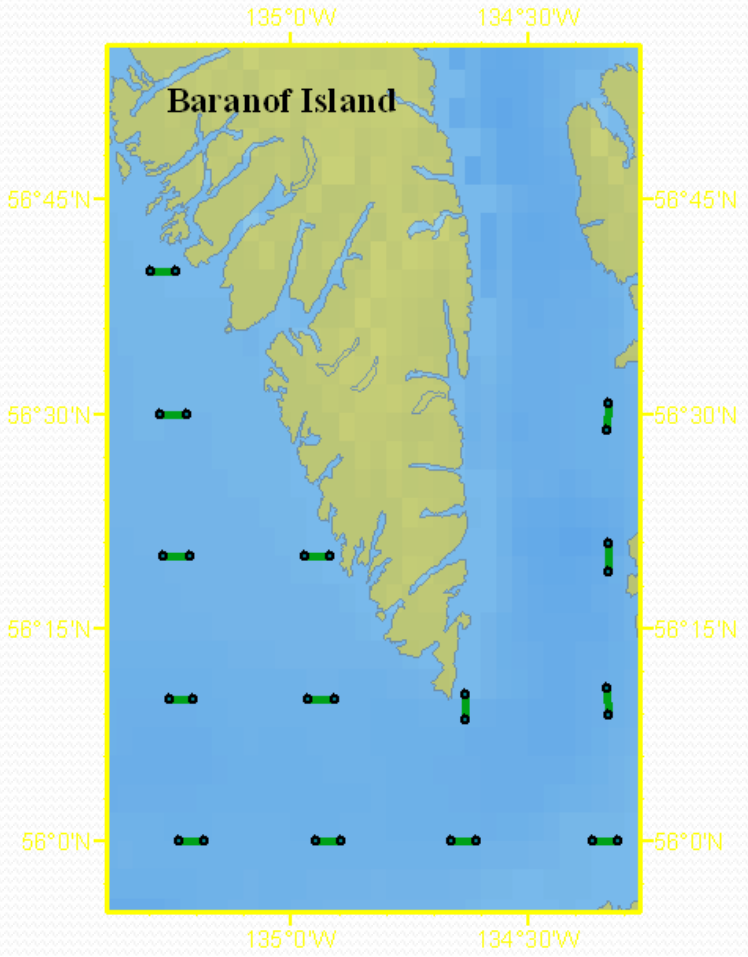

Albatross Bank
3B
© 2011 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2011 TerraMetrics
© 2011 Geocentre Consulting
54° 40.000' N 157° 57.243' W elev -2895 ft
©2010 Google
Eye alt 659.40 mi

Range


Bering Sea
Ostrov Beringa
Area 4
Okmuk Canyon
Rude Knoll
© 2011 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2011 TerraMetrics
© 2011 Geocentre Consulting
55° 51.698' N 177° 38.412' W elev -12309 ft
©2010 Google
Eye alt 1175.74 mi

Standardization (Stn parameters)

- Single coordinate
- Gear to be set through the center of the coordinate in either a N-S or E-W orientation
- Weather, tide or bottom morphology may preclude the direction set.
- Station must be set within 3 nm of coordinate.



Standardization (Gear and Effort)

- Timing
  - Seasonal (last week of May through first week of Sept)
  - Daily (no earlier than 5 am, control # stations per day)
- Gear
  - 1,800 ft skates
  - 18 ft spacing (100 hks/sk – must maintain within 5%)
  - No. 3 (16/0) circle hooks – front threaded
  - 24-48" gangions
  - 5-10lb sash weights
- Bait
  - #2 semi-brite chum salmon (ASMI A-E) (H&G, IQF, 4-9 lb fish)
  - Caught no earlier than June the prior year
  - .25-.3lb per hook

Standardization Parameters (Effectiveness)

Exist for

- Soak time (5 hr min/ 24 max, >14 hr reviewed)
- Position accuracy (center within 3nmi of station)
- Weather (swell and wind max tolerance > 40 kn)
- Gear (loss, snarls, maintenance)
  - >33% snarled
  - <200 hooks retrieved
  - +- 5% hook variation
  - Interference from other actively fishing gear

Standardization Parameters (Effectiveness)

Exist for

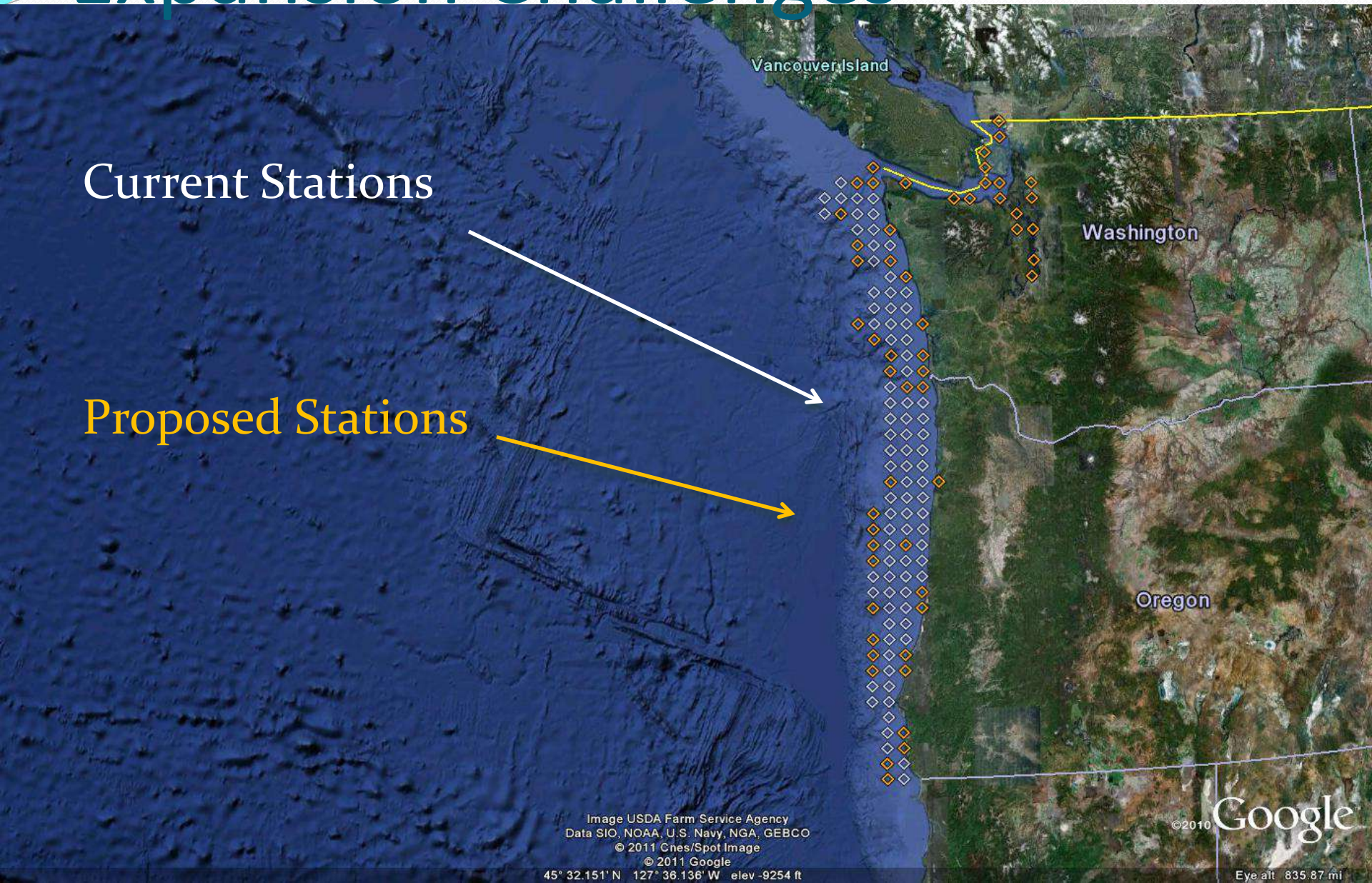
- Depredation:
  - Sharks: sleeper shark present at any point **and** >10% of the gear is damaged (missing or straightened hooks)
  - Whales: whales present during hauling and the **sum** of damaged gear and damaged catch (bites, lips) is >10%
    - Increased data collection pertaining to depredation
  - Pinnipeds/Unknown: pinnipeds present and sum of damaged gear and catch is >10%
  - Sand fleas: severe enough to cause fish to fall of the hooks before breaking the surface

Proposed modifications

- Periodic expansion onto the Bering Sea flats
- Periodic northward expansion to Norton Sound
- Expansion to deeper (275 fm – 400 fm) and shallower (10 fm – 20 fm) depths.
- Establish a connection factor between different bait types, in case current bait type becomes unavailable.

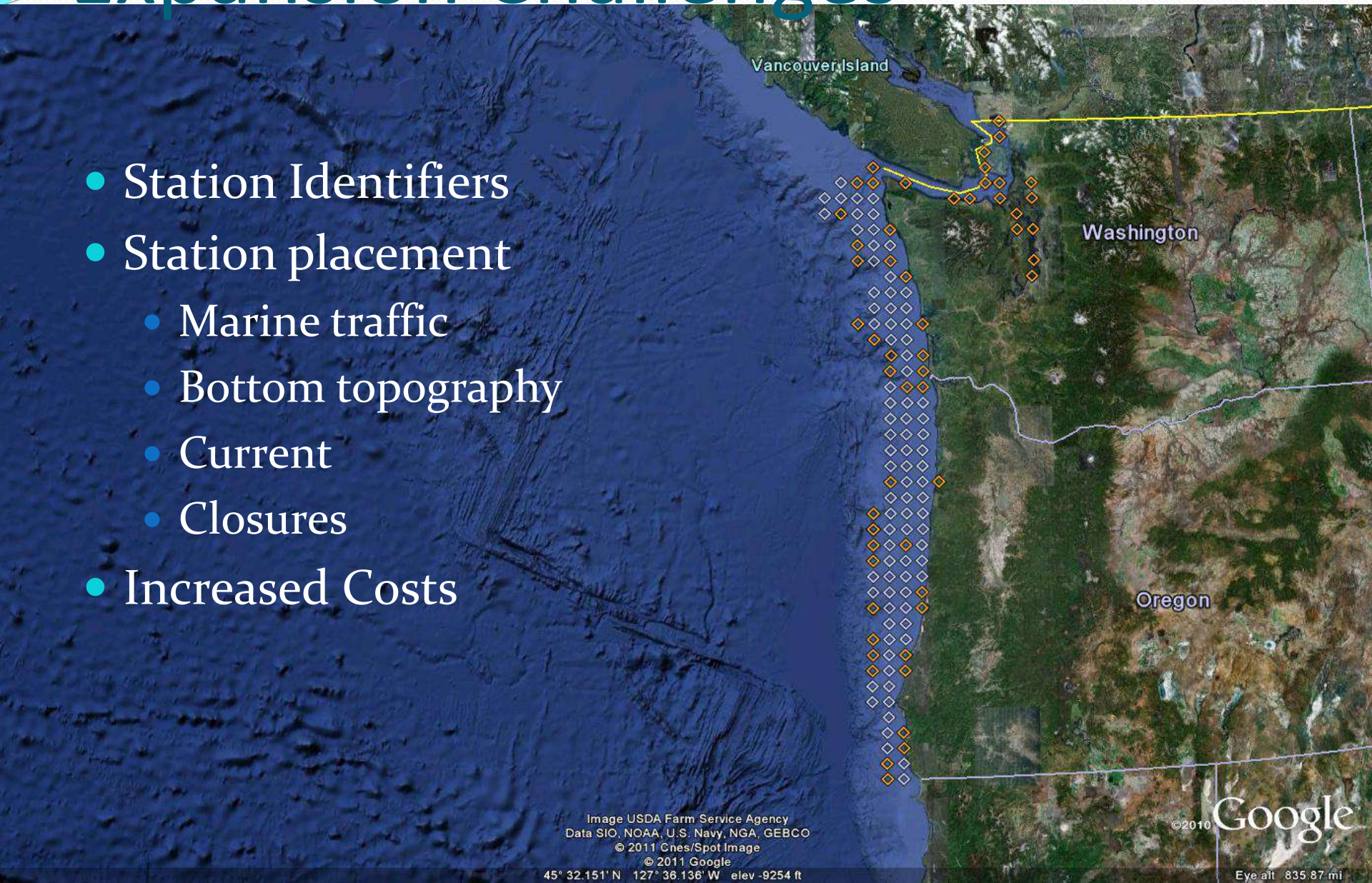
Expansion Challenges

Expansion Challenges



Expansion Challenges

- Station Identifiers
- Station placement
  - Marine traffic
  - Bottom topography
  - Current
  - Closures
- Increased Costs



Contact:

International Pacific Halibut Commission
2320 West Commodore Way
Suite 300
Seattle, WA 98199-1287

Ph: 206.634.1838
Fx: 206.632.2983

www.iphc.int