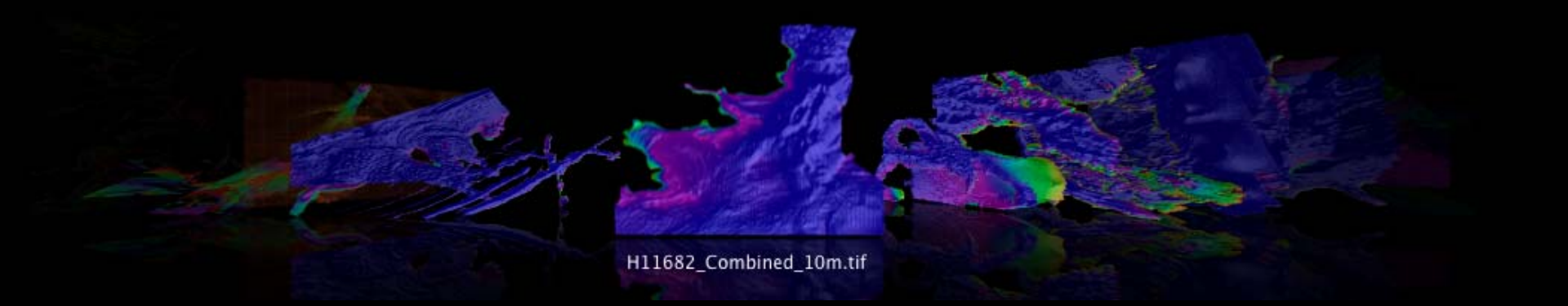
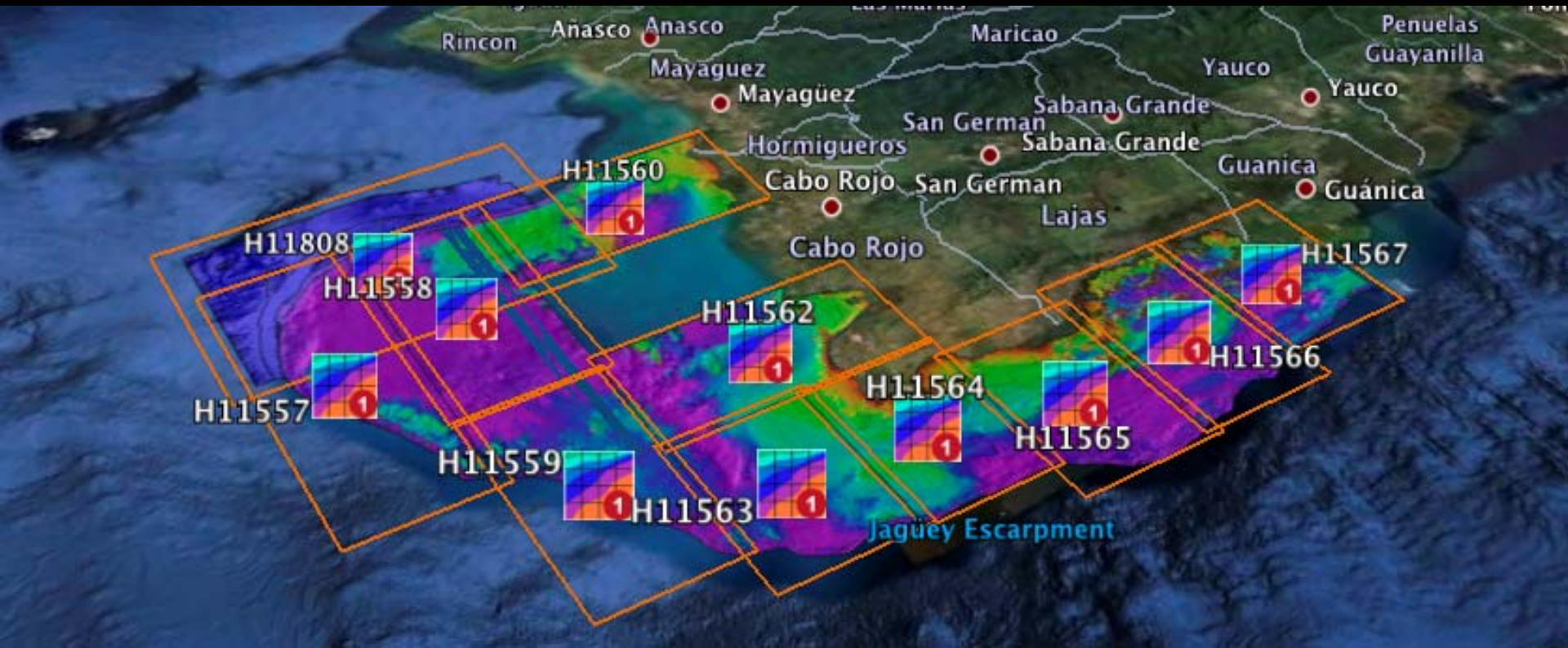


CHC2010 - BAGS in Google Earth

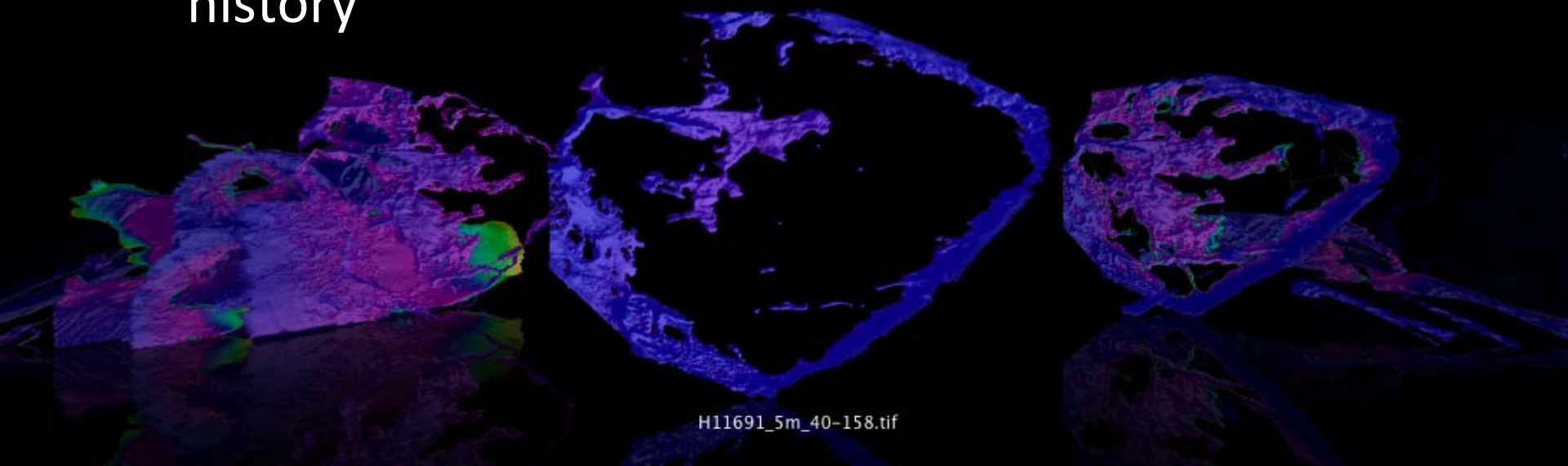
Schwehr, Armstrong, Brennan, Fischman, Sellars, Smith



The last mile / shoulders of many

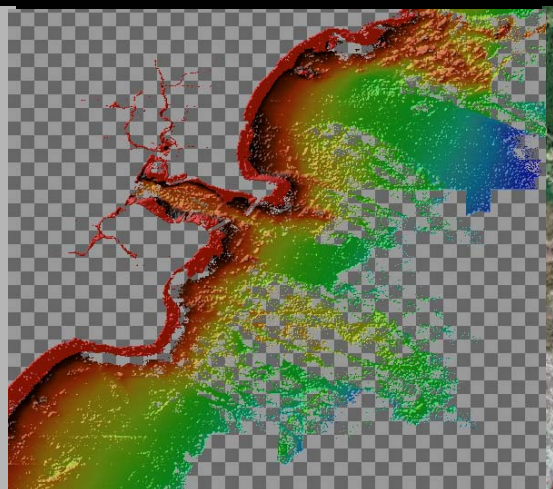
What is a BAG?

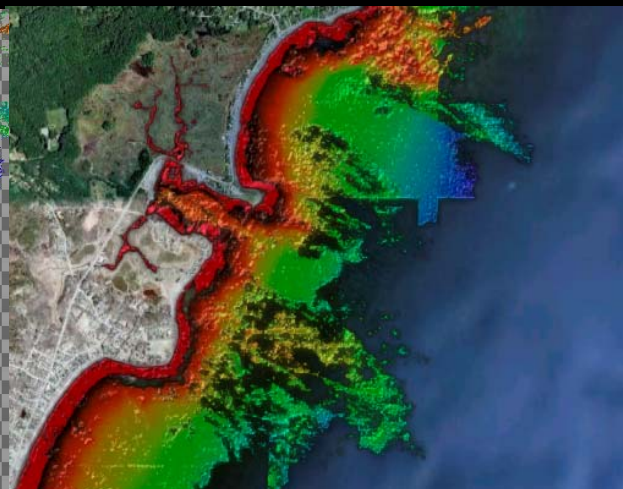
- http://www.opennavsurf.org/
- An “HDF5” file containing
  - Bathymetry
  - Metadata
  - Additional layers e.g. uncertainty & processing history



Goals

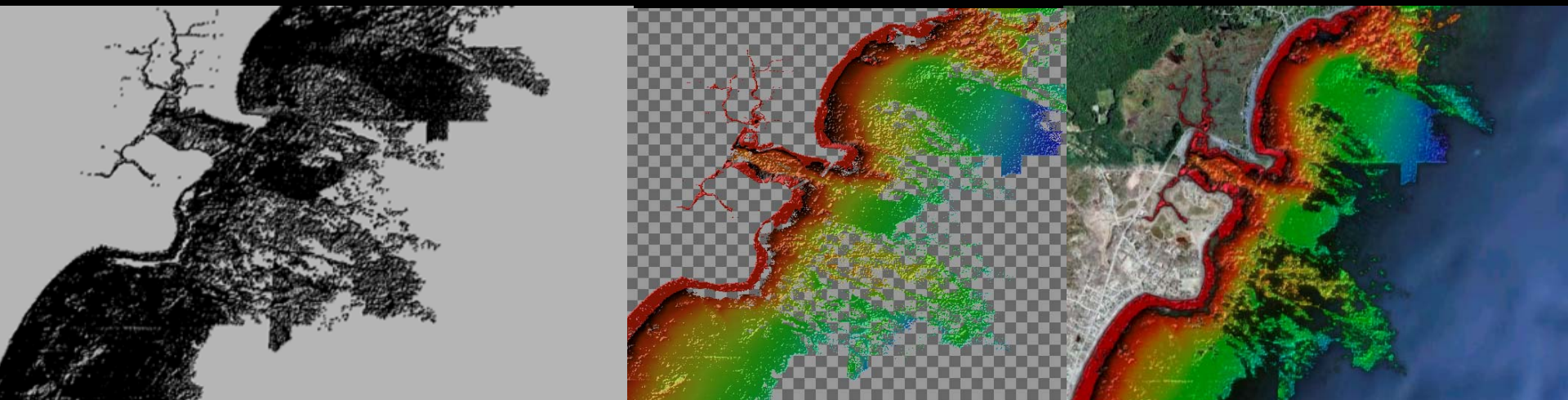
- Document pathways from BAG to Google Earth
- How well is the community doing with producing and consuming BAGs?
- Provide a place to review the bathymetry and metadata





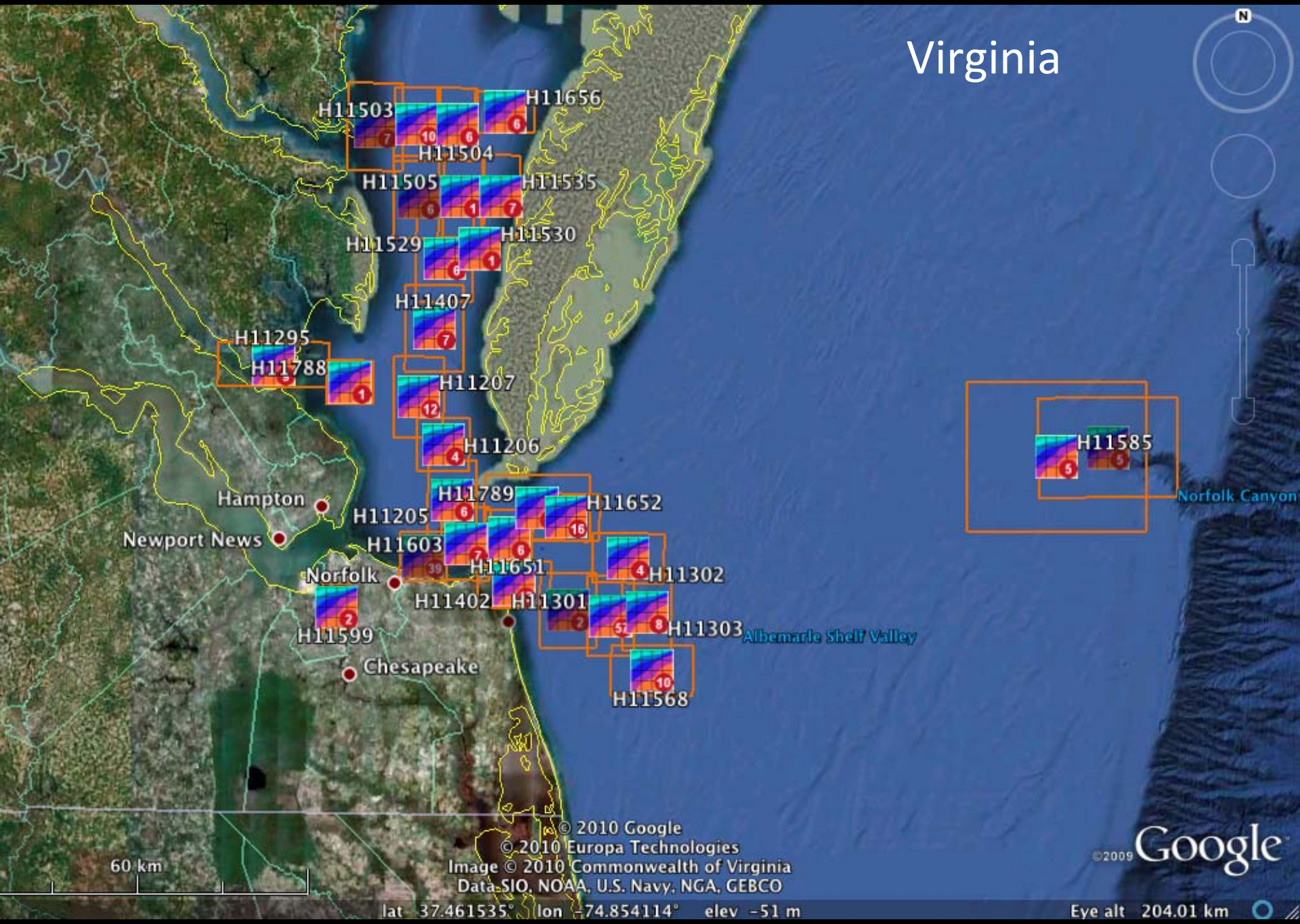
Goals

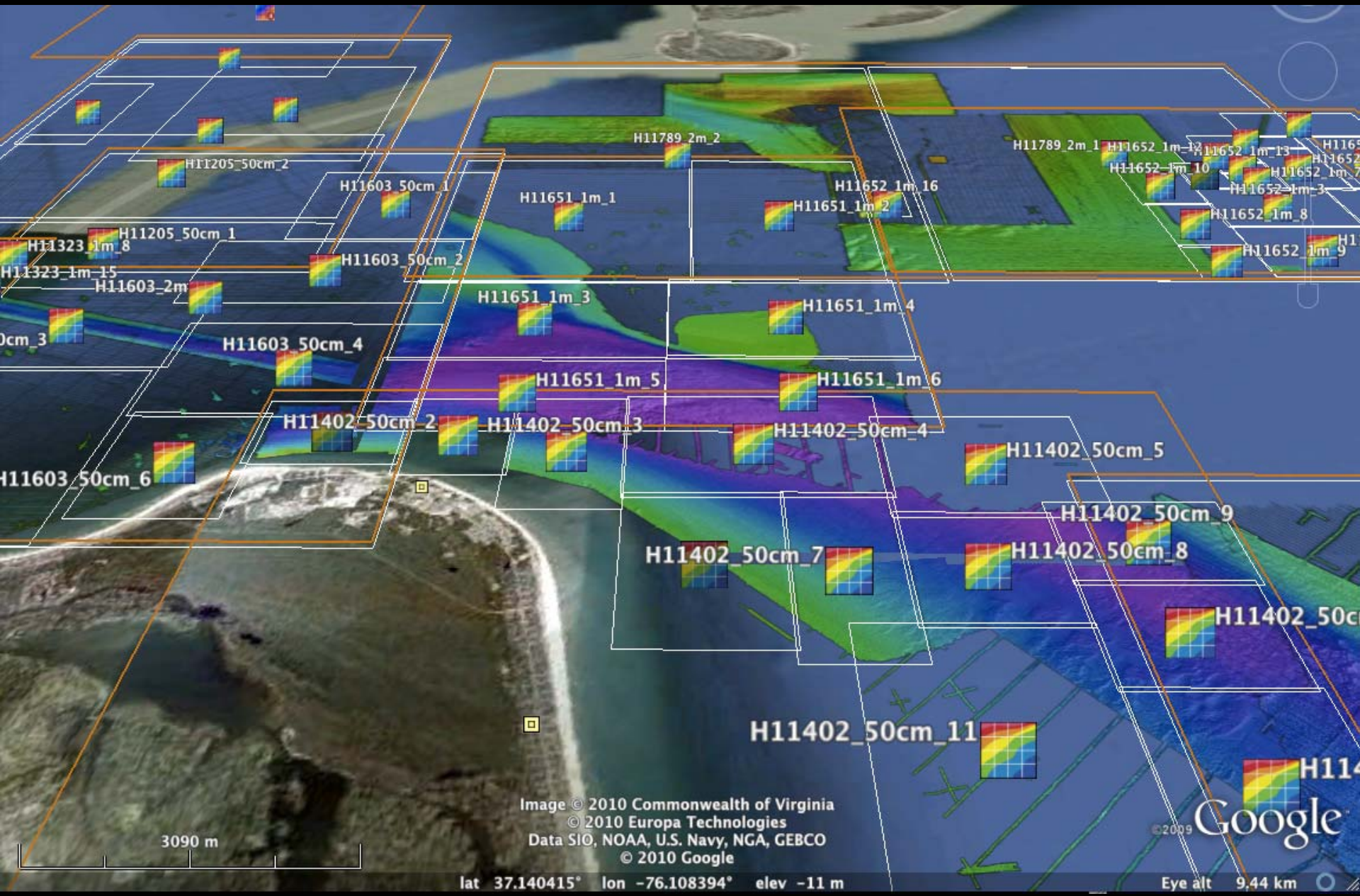
- Document pathways from BAG to Google Earth
- How well is the community doing with producing and consuming BAGs?
- Provide a place to review the bathymetry and metadata
- Increase the reuse of bathymetry products -> discoverability

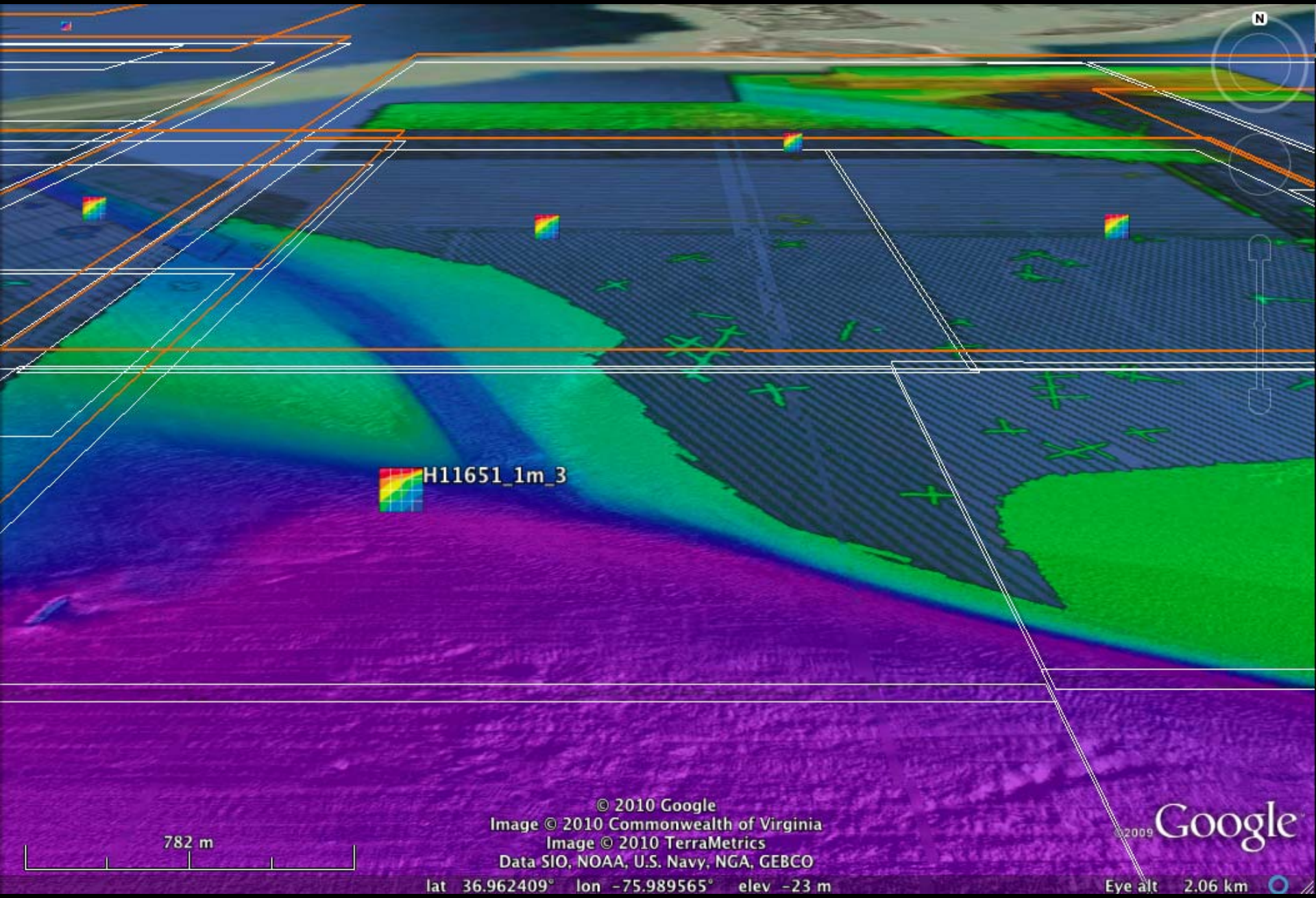


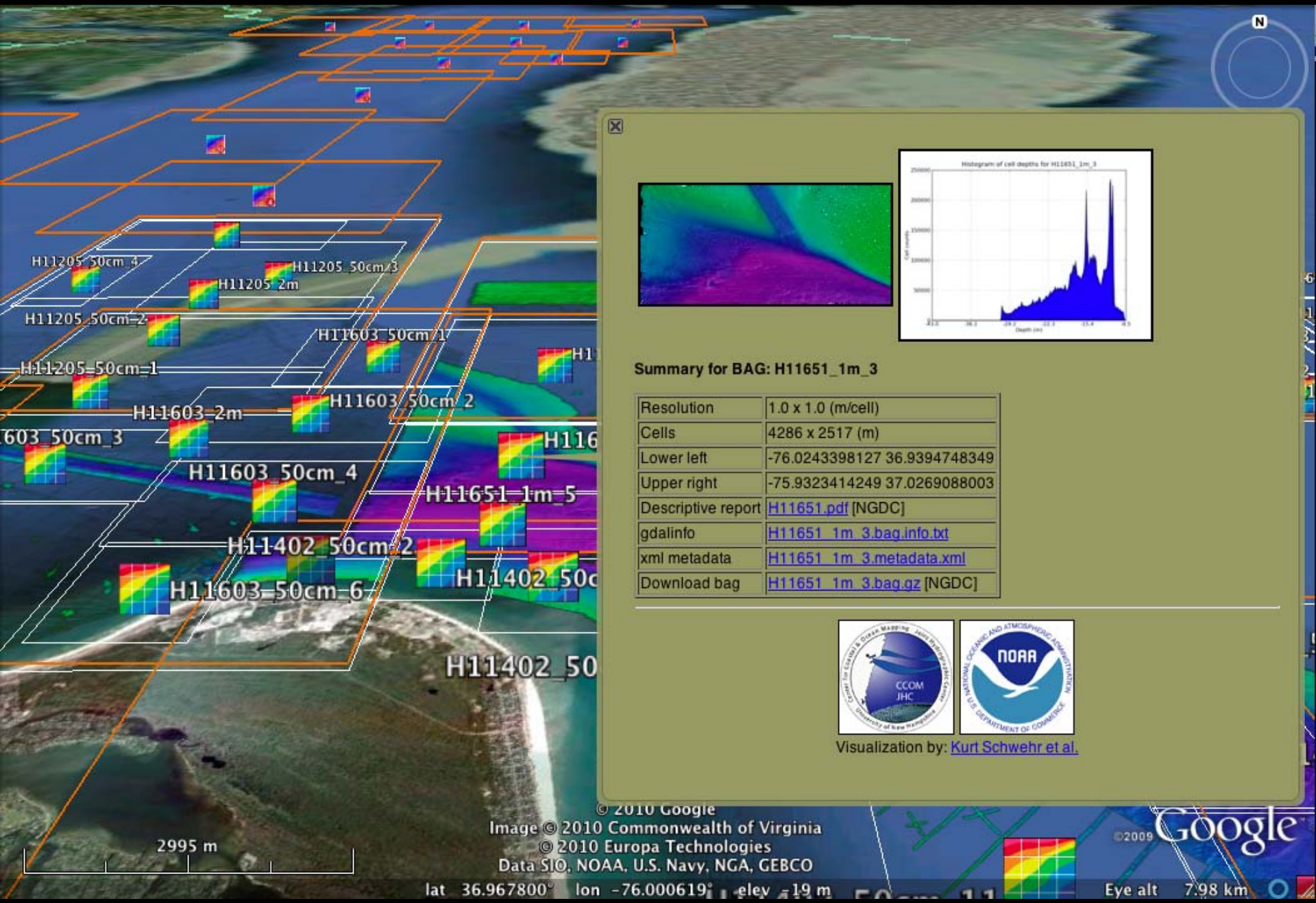
A tour through the Google Earth interface for BAGs

Virginia


H11503
H11656
H11504
H11505
H11535
H11529
H11530
H11407
H11295
H11788
H11207
H11206
H11585
Norfolk Canyon
Hampton
H11789
H11652
H11205
Newport News
H11603
H11651
H11302
Norfolk
H11402
H11301
H11303
Albemarle Shelf Valley
H11599
Chesapeake
H11568
60 km
© 2010 Google
© 2010 Europa Technologies
Image © 2010 Commonwealth of Virginia
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
©2009 Google
lat 37.461535° lon -74.854114° elev -51 m
Eye alt 204.01 km

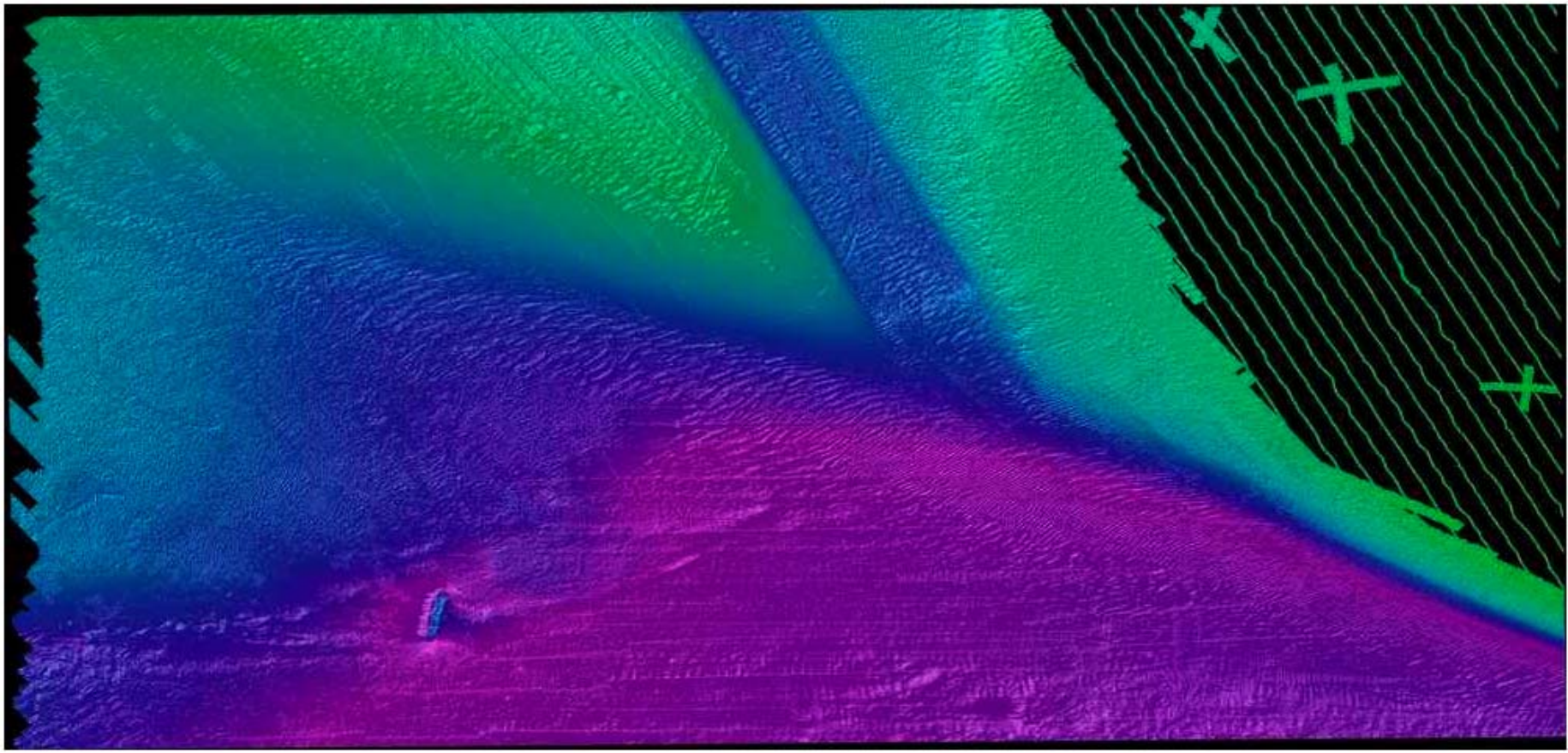

H11789_2m_2
H11789_2m_1
H11652_1m_12
H11652_1m_13
H11652_1m_10
H11652_1m_3
H11652_1m_8
H11652_1m_9
H11205_50cm_2
H11603_50cm_1
H11651_1m_1
H11652_1m_16
H11651_1m_2
H11205_50cm_1
H11323_1m_8
H11323_1m_15
H11603_50cm_2
H11603_2m
H11651_1m_3
H11651_1m_4
H11603_50cm_4
H11651_1m_5
H11651_1m_6
H11402_50cm_2
H11402_50cm_3
H11402_50cm_4
H11402_50cm_5
H11603_50cm_6
H11402_50cm_9
H11402_50cm_7
H11402_50cm_8
H11402_50cm_11
3090 m
Image © 2010 Commonwealth of Virginia
© 2010 Europa Technologies
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2010 Google
Google
lat 37.140415° lon -76.108394° elev -11 m
Eye alt 9.44 km

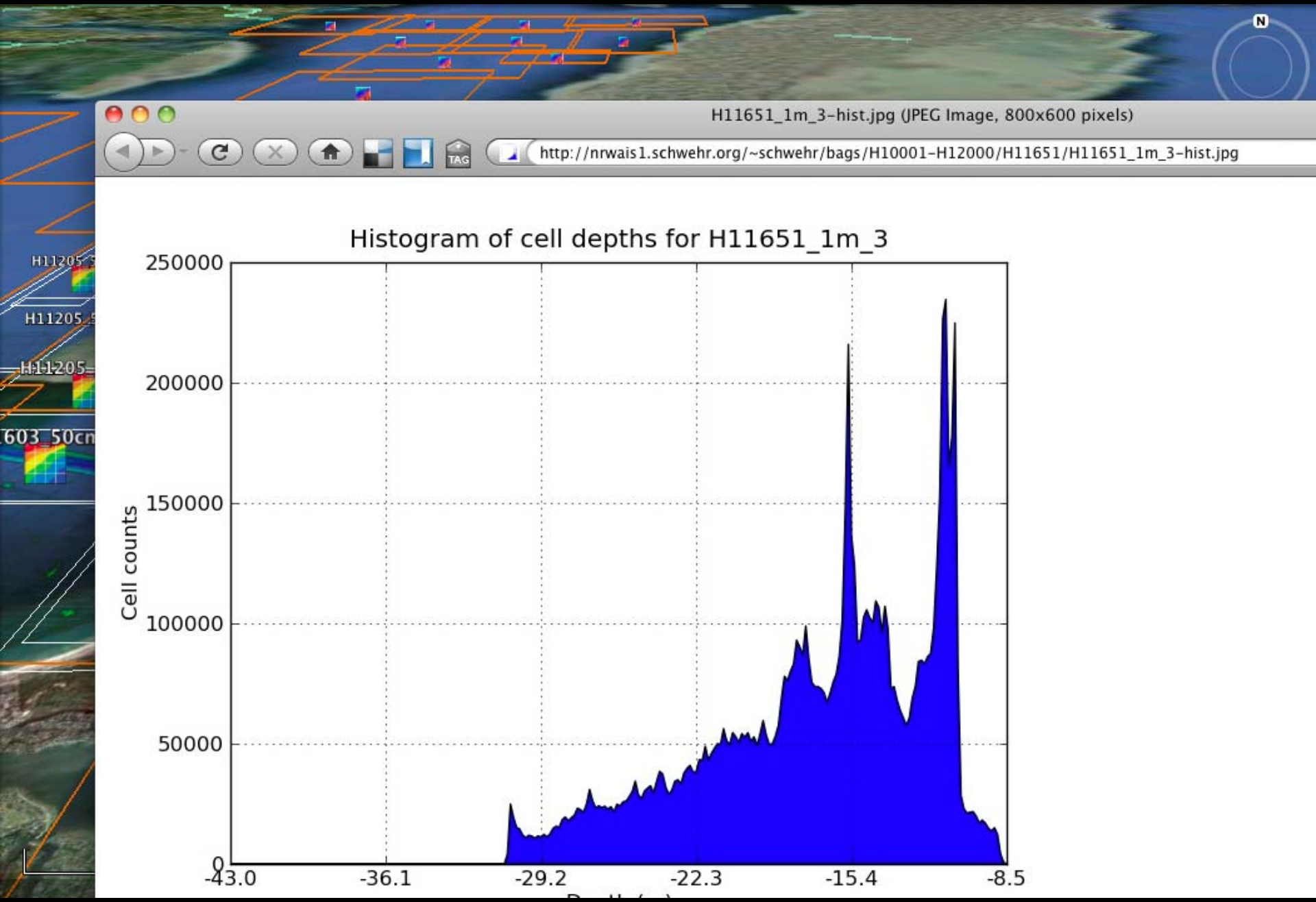

H11651_1m_3
© 2010 Google
Image © 2010 Commonwealth of Virginia
Image © 2010 TerraMetrics
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
782 m
lat 36.962409° lon -75.989565° elev -23 m
Eye alt 2.06 km
Google

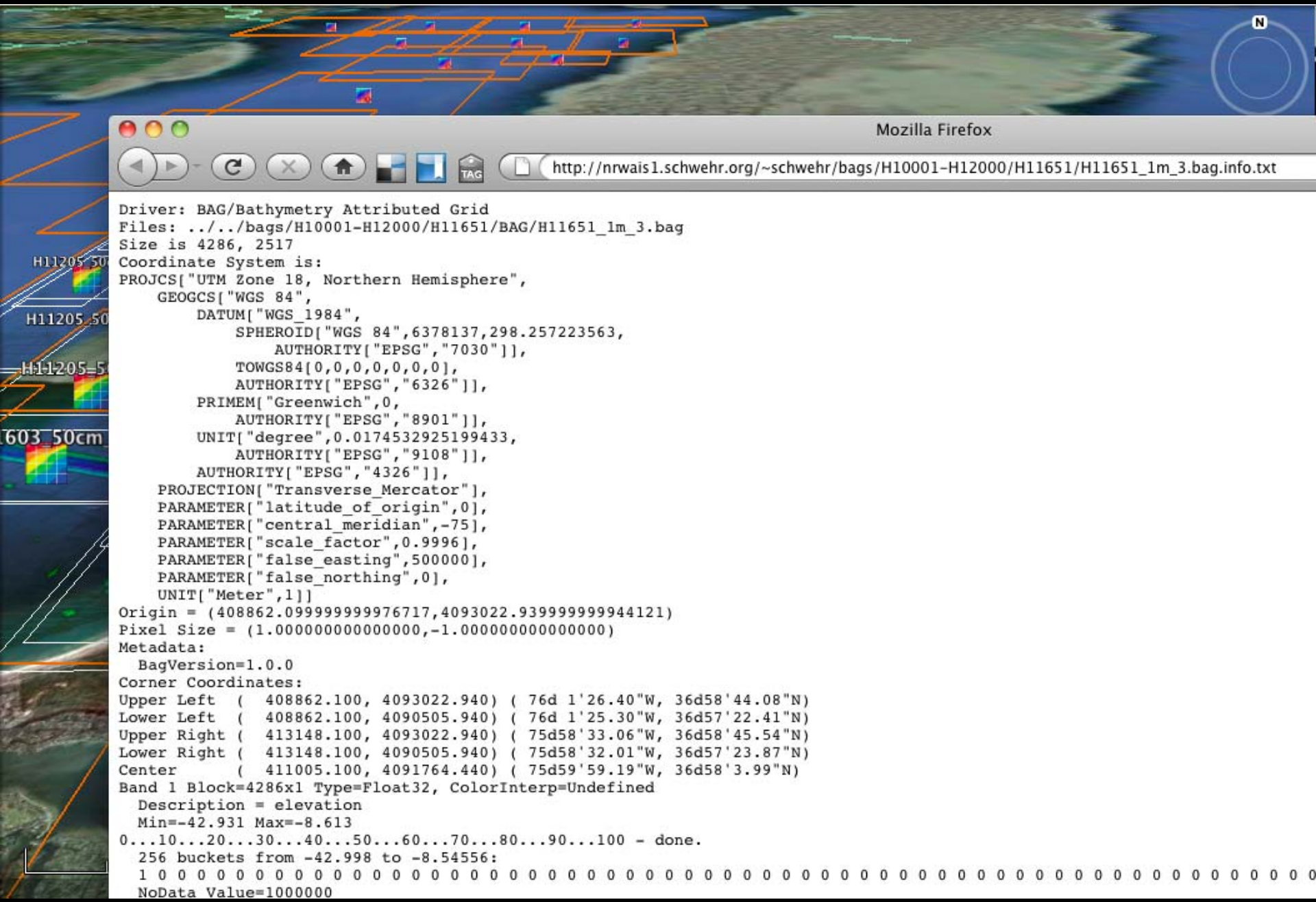

H11205_50cm_4
H11205_50cm_3
H11205_2m
H11205_50cm_2
H11603_50cm_1
H11205_50cm_1
H11603_2m
H11603_50cm_2
H11603_50cm_3
H11603_50cm_4
H11651_1m_5
H11402_50cm_2
H11603_50cm_6
H11402_50
Histogram of cell depths for H11651_1m_3
Summary for BAG: H11651_1m_3
Resolution 1.0 x 1.0 (m/cell)
Cells 4286 x 2517 (m)
Lower left -76.0243398127 36.9394748349
Upper right -75.9323414249 37.0269088003
Descriptive report H11651.pdf [NGDC]
gdalinfo H11651_1m_3.bag.info.txt
xml metadata H11651_1m_3.metadata.xml
Download bag H11651_1m_3.bag.gz [NGDC]
CCOM JHC
NOAA
Visualization by: Kurt Schwehr et al.
2995 m
© 2010 Google
Image © 2010 Commonwealth of Virginia
© 2010 Europa Technologies
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
lat 36.967800° lon -76.000619° elev -19 m
©2009 Google
Eye alt 7.98 km

H11651_1m_3.jpg (JPEG Image, 1000x477 pixels)

http://nrwais1.schwehr.org/~schwehr/bags/H10001-H12000/H11651/H11651_1m_3.jpg

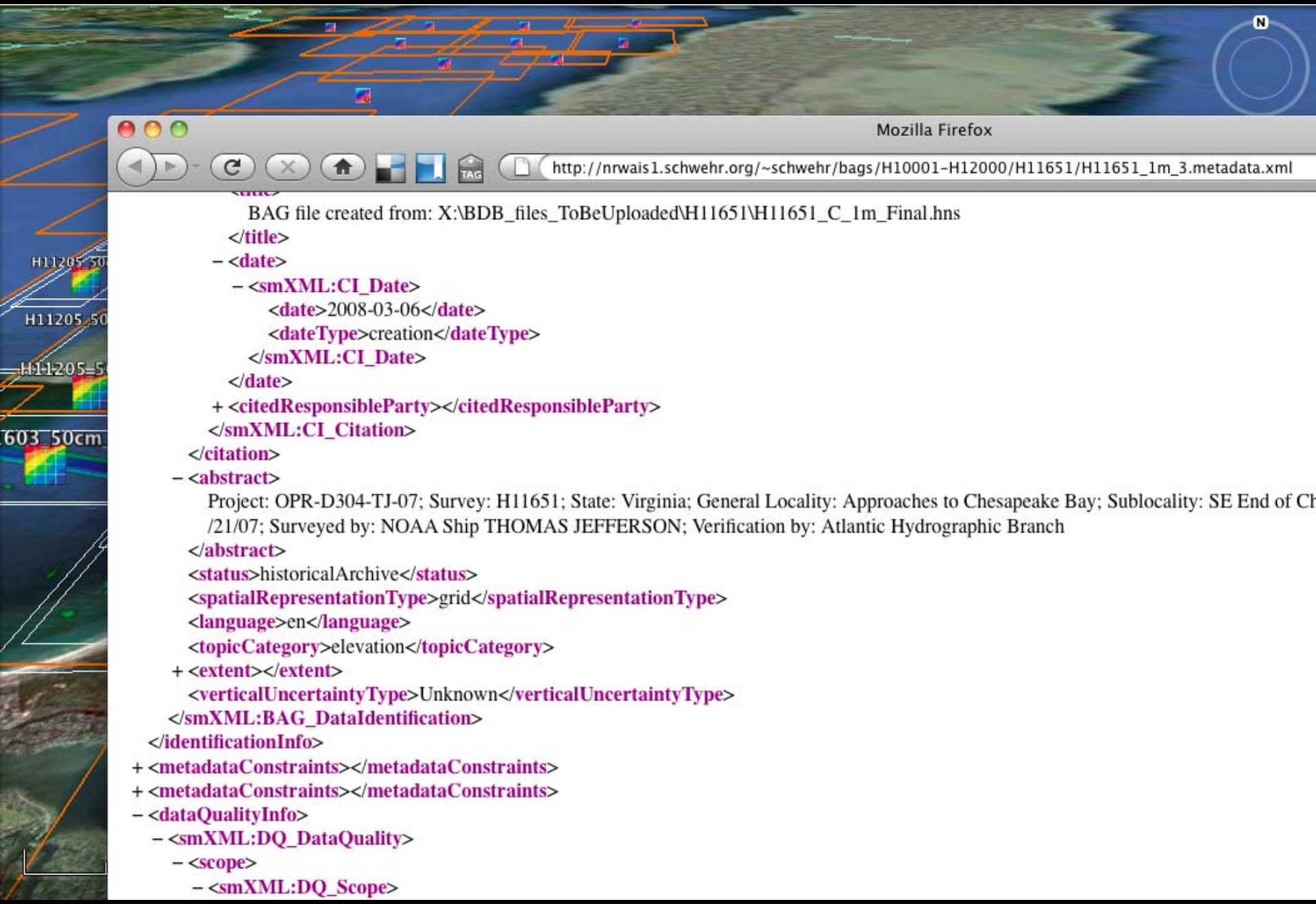


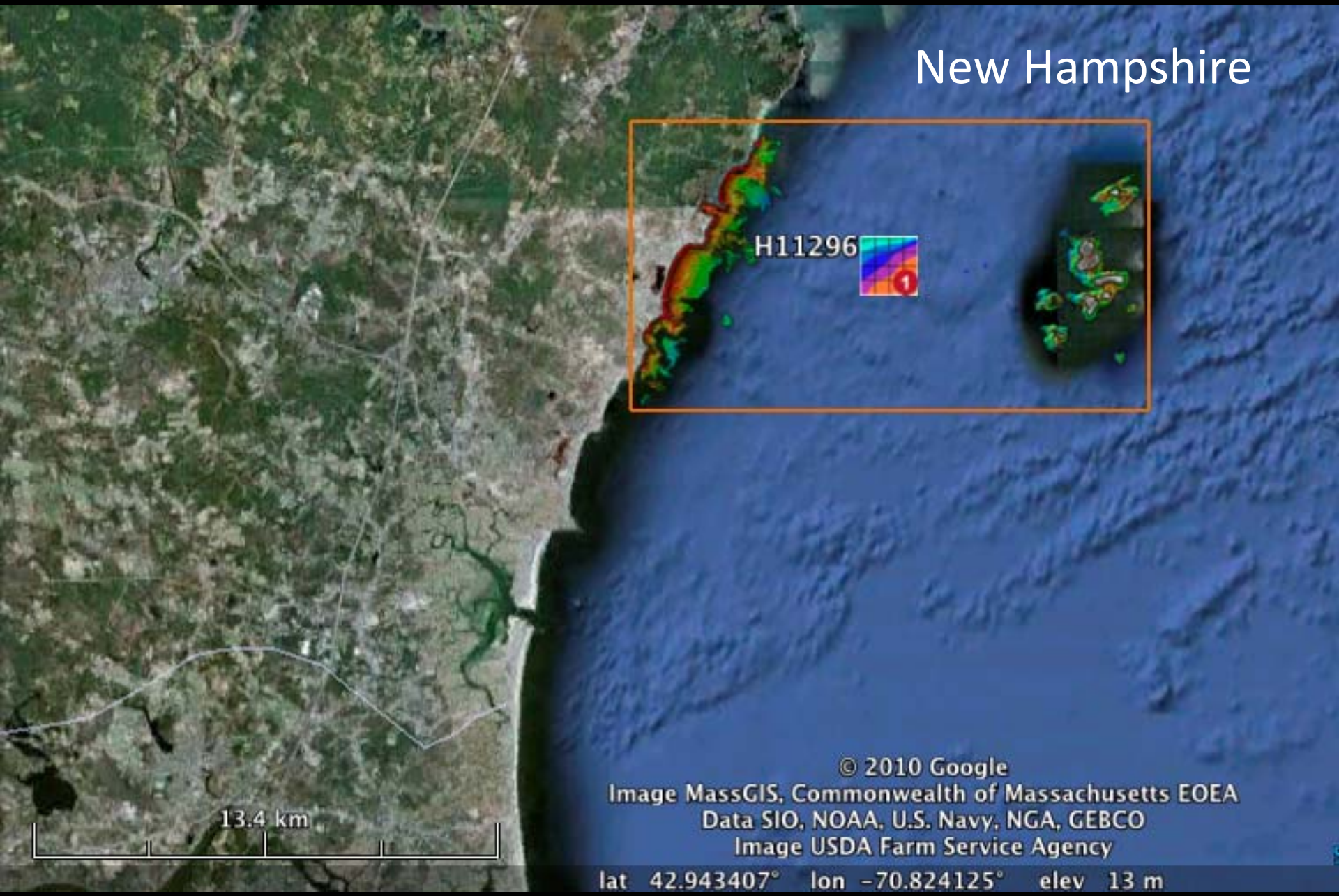

H11651_1m_3-hist.jpg (JPEG Image, 800x600 pixels)
http://nrwais1.schwehr.org/~schwehr/bags/H10001-H12000/H11651/H11651_1m_3-hist.jpg
Histogram of cell depths for H11651_1m_3
Cell counts
250000
200000
150000
100000
50000
0
-43.0
-36.1
-29.2
-22.3
-15.4
-8.5

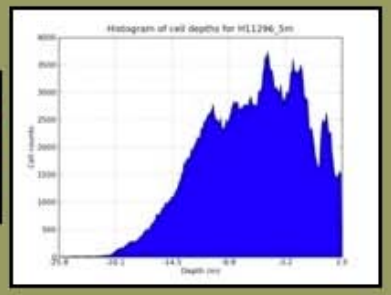


http://nrwais1.schwehr.org/~schwehr/bags/H10001-H12000/H11651/H11651_1m_3.bag.info.txt

```
Driver: BAG/Bathymetry Attributed Grid
Files: ../../bags/H10001-H12000/H11651/BAG/H11651_1m_3.bag
Size is 4286, 2517
Coordinate System is:
PROJCS["UTM Zone 18, Northern Hemisphere",
    GEOGCS["WGS 84",
        DATUM["WGS_1984",
            SPHEROID["WGS 84",6378137,298.257223563,
                AUTHORITY["EPSG","7030"]],
            TOWGS84[0,0,0,0,0,0,0],
            AUTHORITY["EPSG","6326"]],
        PRIMEM["Greenwich",0,
            AUTHORITY["EPSG","8901"]],
        UNIT["degree",0.0174532925199433,
            AUTHORITY["EPSG","9108"]],
        AUTHORITY["EPSG","4326"]],
    PROJECTION["Transverse_Mercator"],
    PARAMETER["latitude_of_origin",0],
    PARAMETER["central_meridian",-75],
    PARAMETER["scale_factor",0.9996],
    PARAMETER["false_easting",500000],
    PARAMETER["false_northing",0],
    UNIT["Meter",1]]
Origin = (408862.099999999976717,4093022.939999999944121)
Pixel Size = (1.000000000000000,-1.000000000000000)
Metadata:
  BagVersion=1.0.0
Corner Coordinates:
Upper Left  (  408862.100, 4093022.940) ( 76d 1'26.40"W, 36d58'44.08"N)
Lower Left  (  408862.100, 4090505.940) ( 76d 1'25.30"W, 36d57'22.41"N)
Upper Right (  413148.100, 4093022.940) ( 75d58'33.06"W, 36d58'45.54"N)
Lower Right (  413148.100, 4090505.940) ( 75d58'32.01"W, 36d57'23.87"N)
Center      (  411005.100, 4091764.440) ( 75d59'59.19"W, 36d58'3.99"N)
Band 1 Block=4286x1 Type=Float32, ColorInterp=Undefined
  Description = elevation
  Min=-42.931 Max=-8.613
0...10...20...30...40...50...60...70...80...90...100 - done.
  256 buckets from -42.998 to -8.54556:
  1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
  NoData Value=1000000
```


Mozilla Firefox
http://nrwais1.schwehr.org/~schwehr/bags/H10001-H12000/H11651/H11651_1m_3.metadata.xml
BAG file created from: X:\BDB_files_ToBeUploaded\H11651\H11651_C_1m_Final.hns
</title>
- <date>
- <smXML:CI_Date>
<date>2008-03-06</date>
<dateType>creation</dateType>
</smXML:CI_Date>
</date>
+ <citedResponsibleParty></citedResponsibleParty>
</smXML:CI_Citation>
</citation>
- <abstract>
Project: OPR-D304-TJ-07; Survey: H11651; State: Virginia; General Locality: Approaches to Chesapeake Bay; Sublocality: SE End of Ch
/21/07; Surveyed by: NOAA Ship THOMAS JEFFERSON; Verification by: Atlantic Hydrographic Branch
</abstract>
<status>historicalArchive</status>
<spatialRepresentationType>grid</spatialRepresentationType>
<language>en</language>
<topicCategory>elevation</topicCategory>
+ <extent></extent>
<verticalUncertaintyType>Unknown</verticalUncertaintyType>
</smXML:BAG_DataIdentification>
</identificationInfo>
+ <metadataConstraints></metadataConstraints>
+ <metadataConstraints></metadataConstraints>
- <dataQualityInfo>
- <smXML:DQ_DataQuality>
- <scope>
- <smXML:DQ_Scope>

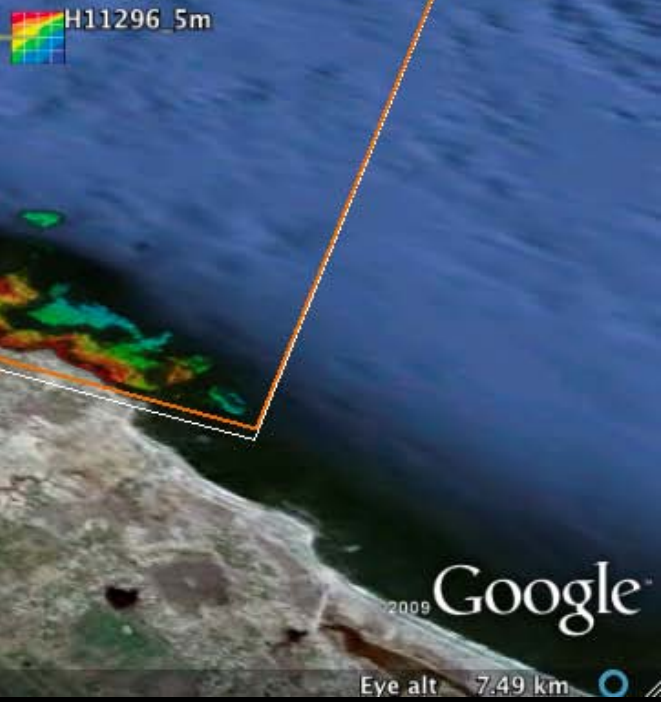

New Hampshire
H11296
1
13.4 km
© 2010 Google
Image MassGIS, Commonwealth of Massachusetts EOEA
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image USDA Farm Service Agency
lat 42.943407° lon -70.824125° elev 13 m

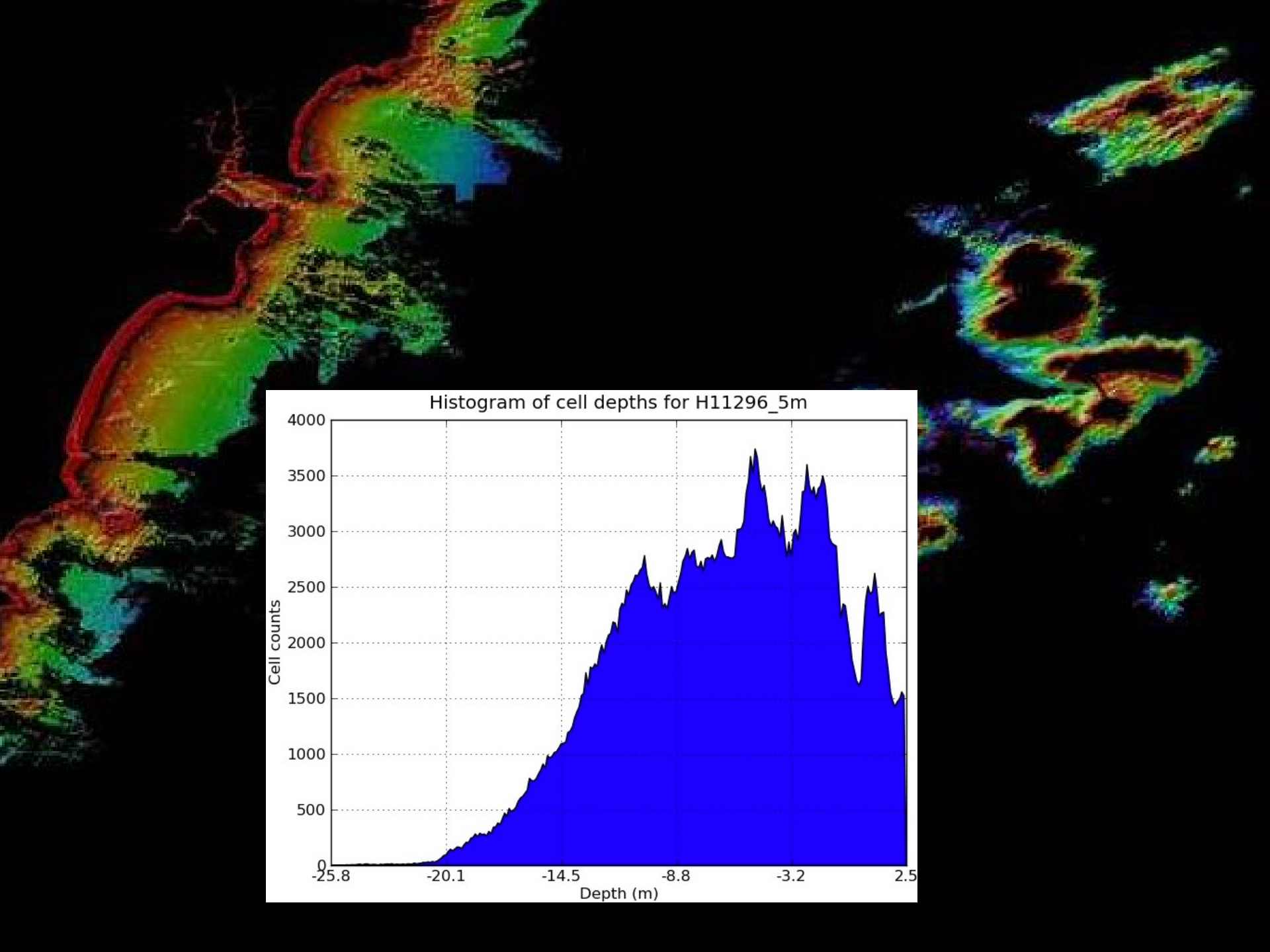


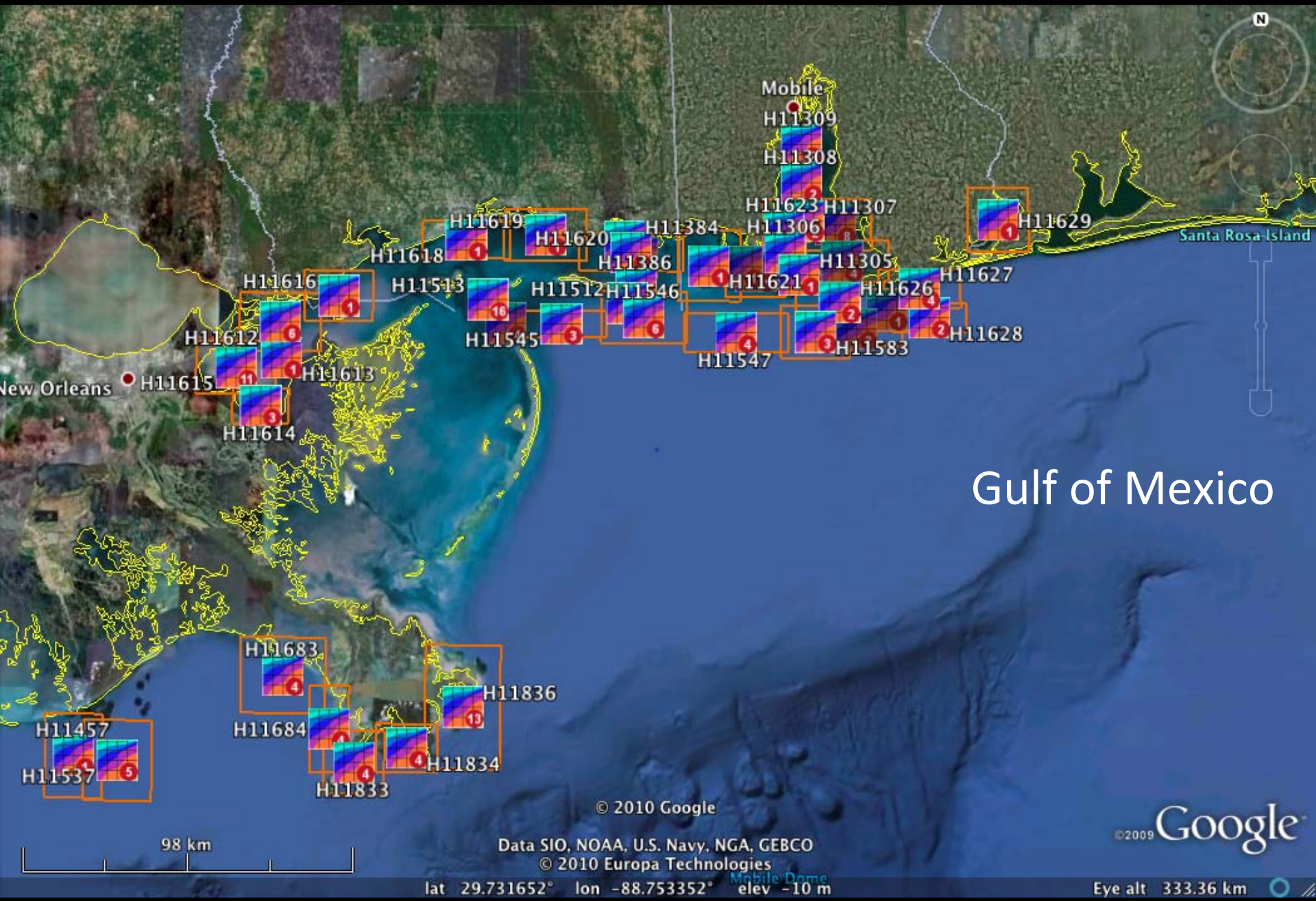
Summary for BAG: H11296_5m

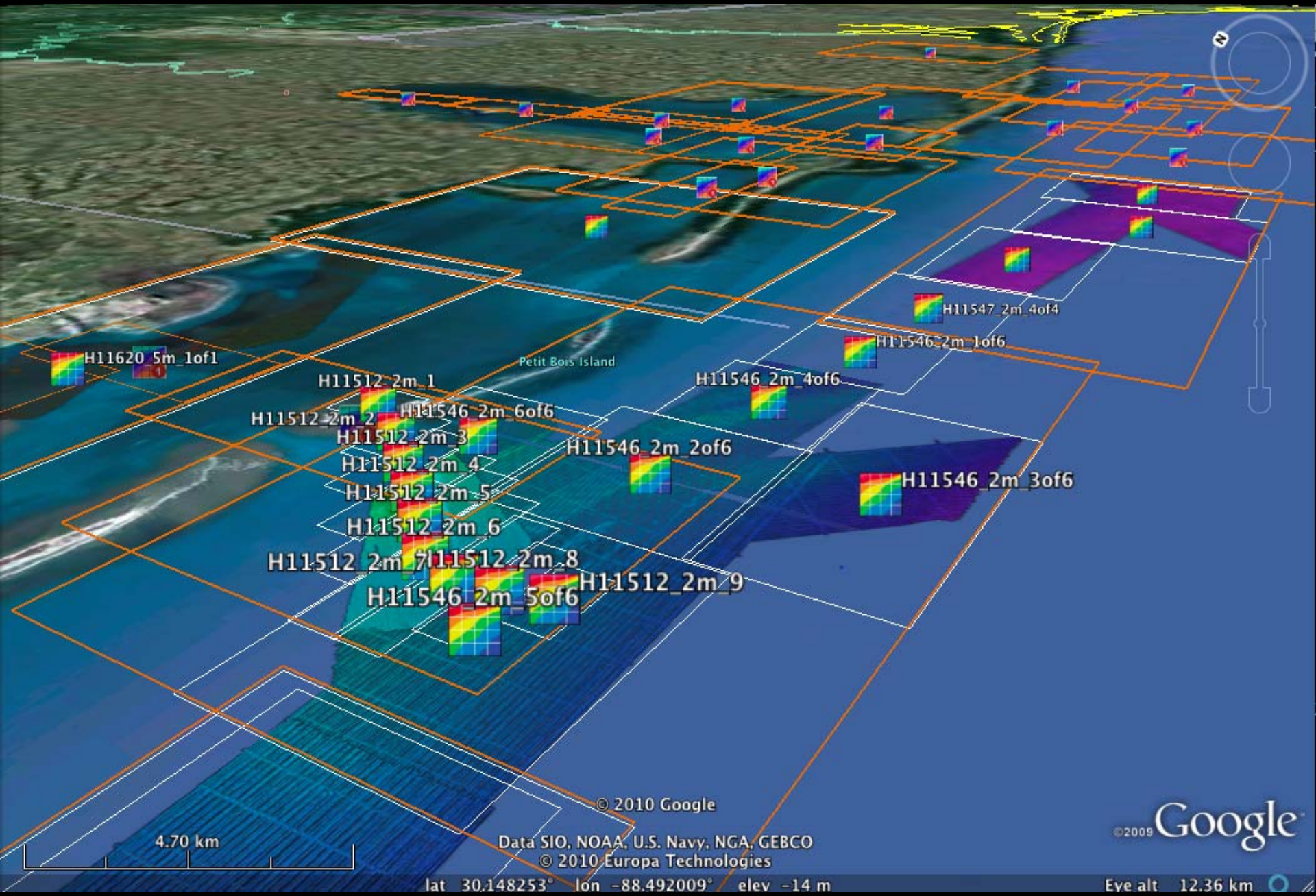
Resolution	5.0 x 5.0 (m/cell)
Cells	3021 x 1597 (m)
Lower left	-70.7760890322 42.9486266248
Upper right	-70.5928700547 43.0232175933
Descriptive report	H11296.pdf [NGDC]
gdalinfo	H11296_5m.bag.info.txt
xml metadata	H11296_5m.metadata.xml
Download bag	H11296_5m.bag.gz [NGDC]

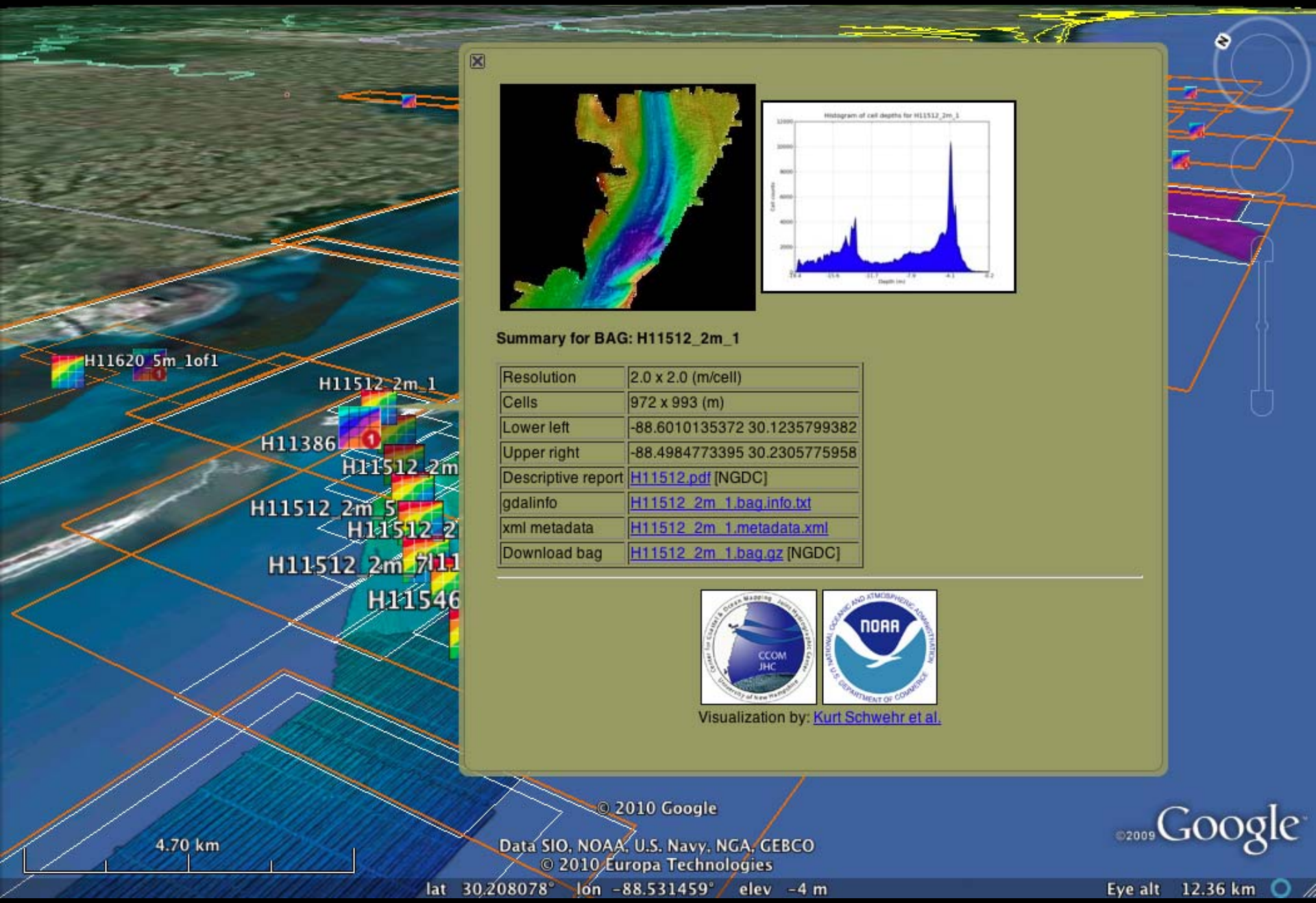
Visualization by: Kurt Schwehr et al.

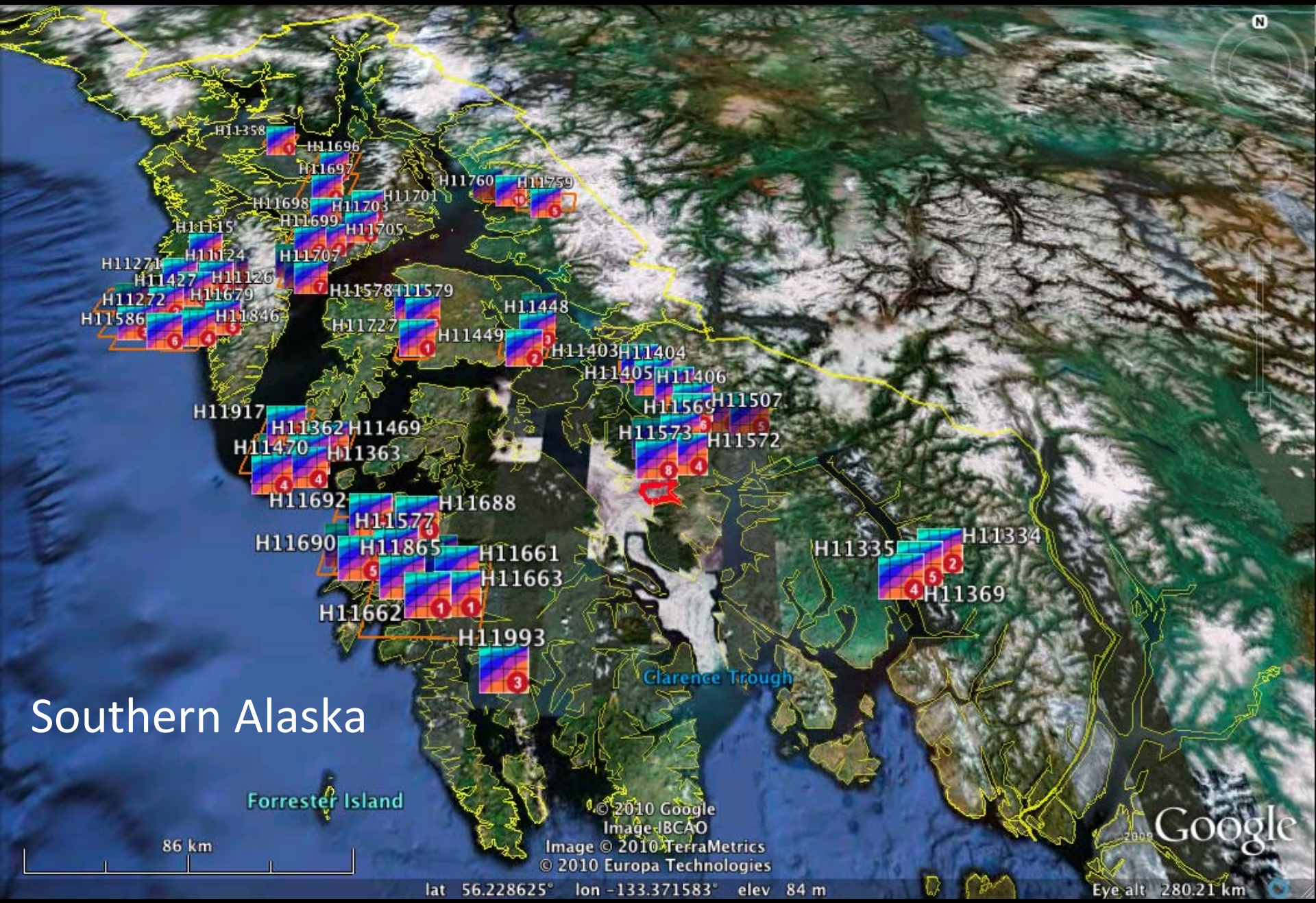


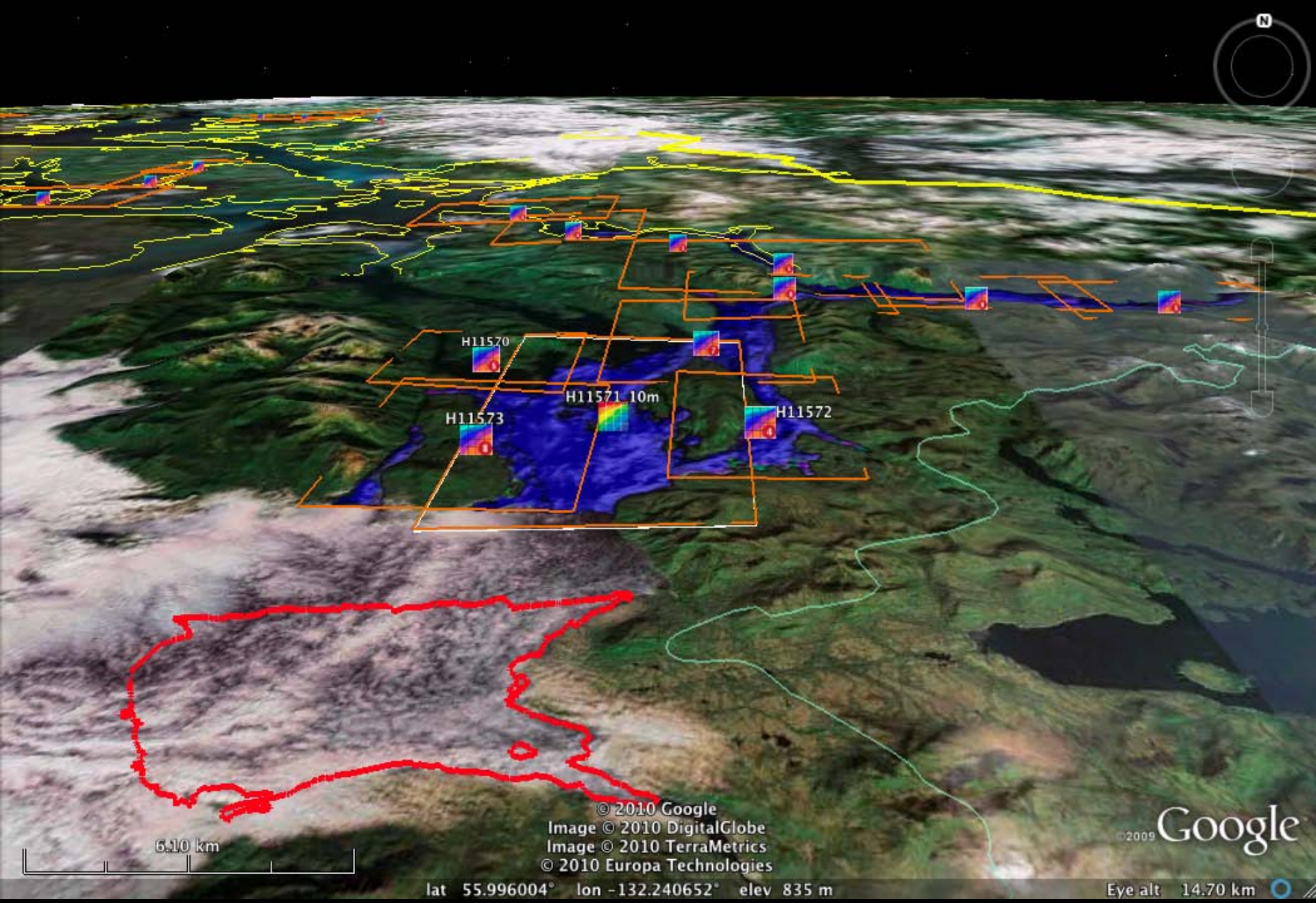

Histogram of cell depths for H11296_5m
Cell counts
4000
3500
3000
2500
2000
1500
1000
500
0
-25.8
-20.1
-14.5
-8.8
-3.2
2.5
Depth (m)

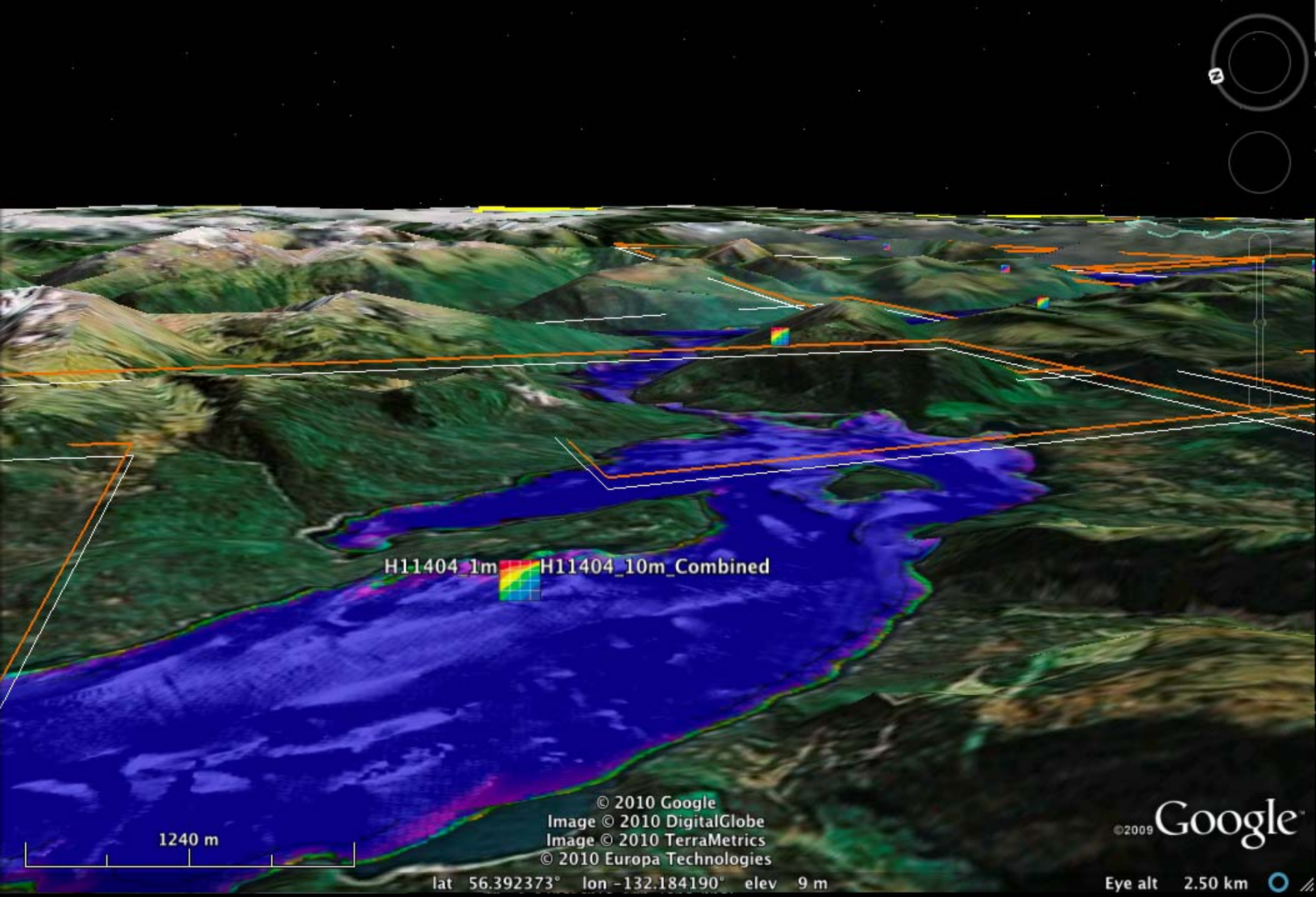

Gulf of Mexico
Mobile
H11309
H11308
H11623
H11307
H11306
H11629
Santa Rosa Island
H11619
H11620
H11384
H11618
H11386
H11305
H11627
H11616
H11513
H11512
H11546
H11621
H11626
H11612
H11545
H11547
H11583
H11628
New Orleans
H11615
H11613
H11614
H11683
H11836
H11457
H11684
H11834
H11537
H11833
98 km
© 2010 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2010 Europa Technologies
lat 29.731652° lon -88.753352° elev -10 m
Eye alt 333.36 km
©2009 Google

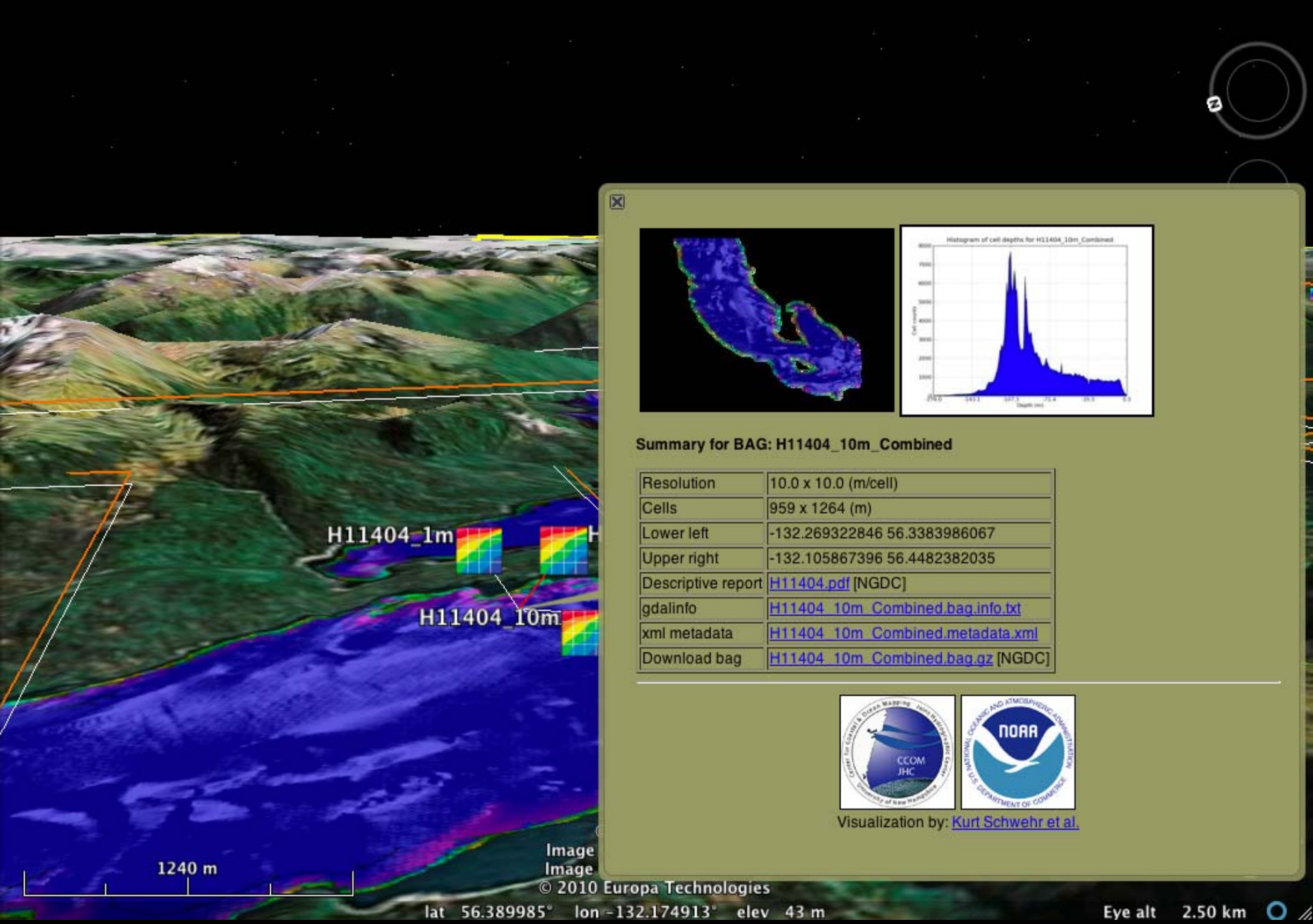

H11620_5m_1of1
Petit Bois Island
H11512_2m_1
H11512_2m_2
H11546_2m_6of6
H11512_2m_3
H11512_2m_4
H11512_2m_5
H11512_2m_6
H11512_2m_7
H11512_2m_8
H11512_2m_9
H11546_2m_5of6
H11546_2m_2of6
H11546_2m_4of6
H11546_2m_3of6
H11546_2m_1of6
H11547_2m_4of4
© 2010 Google
4.70 km
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2010 Europa Technologies
lat 30.148253° lon -88.492009° elev -14 m
©2009 Google
Eye alt 12.36 km

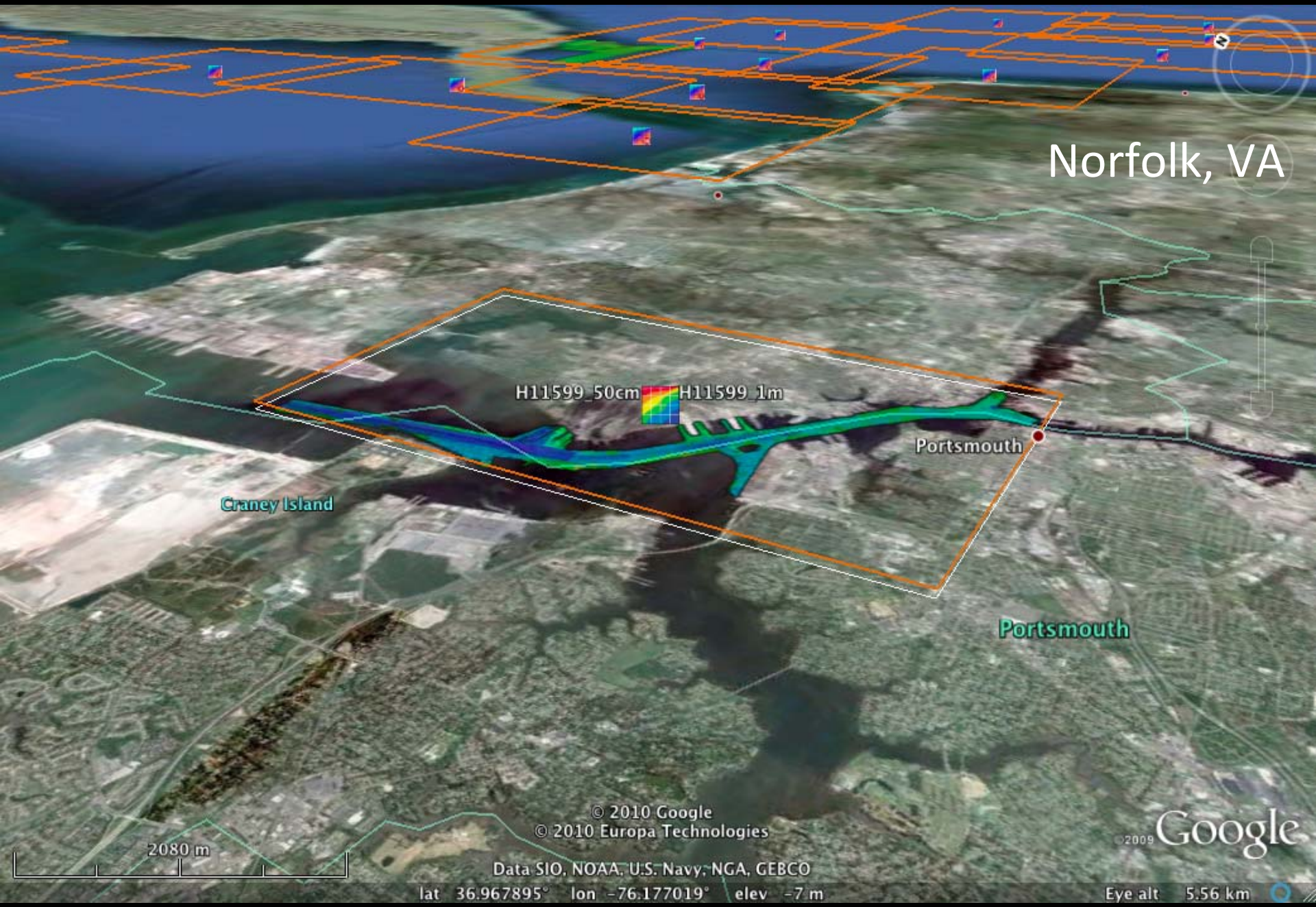

H11620_5m_1of1
H11512_2m_1
H11386
H11512_2m
H11512_2m_5
H11512_2
H11512_2m_711
H11546
Histogram of cell depths for H11512_2m_1
Cell counts
Depth (m)
Summary for BAG: H11512_2m_1
Resolution 2.0 x 2.0 (m/cell)
Cells 972 x 993 (m)
Lower left -88.6010135372 30.1235799382
Upper right -88.4984773395 30.2305775958
Descriptive report H11512.pdf [NGDC]
gdalinfo H11512_2m_1.bag.info.txt
xml metadata H11512_2m_1.metadata.xml
Download bag H11512_2m_1.bag.gz [NGDC]
CCOM JHC
NOAA
Visualization by: Kurt Schwehr et al.
© 2010 Google
4.70 km
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2010 Europa Technologies
lat 30.208078° lon -88.531459° elev -4 m
©2009 Google
Eye alt 12.36 km

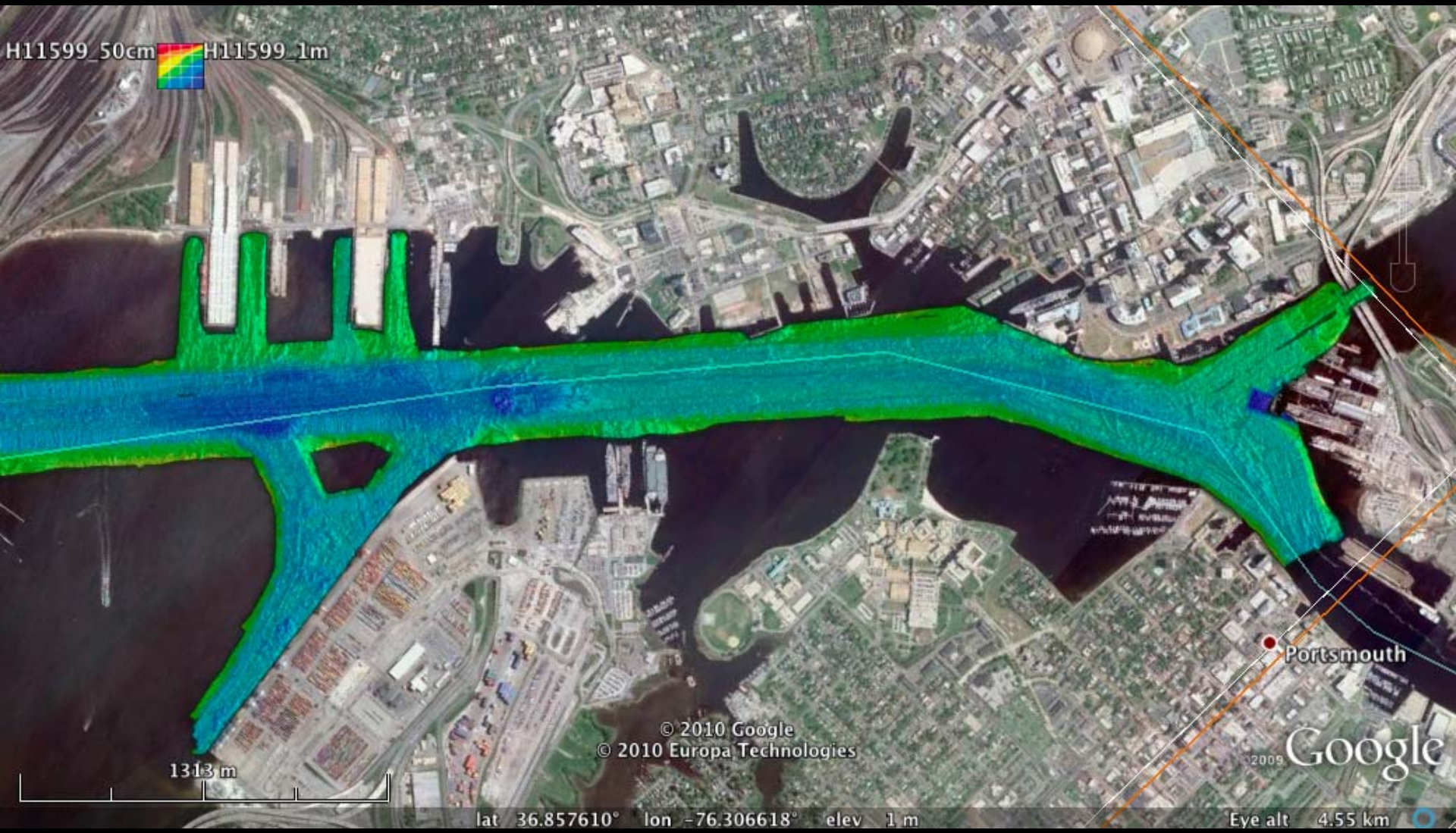

Southern Alaska
H11358
H11696
H11697
H11760
H11759
H11698
H11703
H11701
H11699
H11705
H11115
H11707
H11124
H11271
H11427
H11126
H11679
H11272
H11586
H11846
H11578
H11579
H11727
H11448
H11449
H11403
H11404
H11405
H11406
H11569
H11507
H11573
H11572
H11917
H11362
H11469
H11470
H11363
H11692
H11688
H11577
H11690
H11865
H11661
H11663
H11662
H11993
H11335
H11334
H11369
Clarence Trough
Forrester Island
86 km
© 2010 Google
Image IBCAO
Image © 2010 TerraMetrics
© 2010 Europa Technologies
lat 56.228625° lon -133.371583° elev 84 m
Eye alt 280.21 km
Google


H11570
H11571_10m
H11573
H11572
6.10 km
© 2010 Google
Image © 2010 DigitalGlobe
Image © 2010 TerraMetrics
© 2010 Europa Technologies
©2009 Google
lat 55.996004° lon -132.240652° elev 835 m
Eye alt 14.70 km


H11404_1m
H11404_10m_Combined
1240 m
© 2010 Google
Image © 2010 DigitalGlobe
Image © 2010 TerraMetrics
© 2010 Europa Technologies
lat 56.392373° lon -132.184190° elev 9 m
©2009 Google
Eye alt 2.50 km

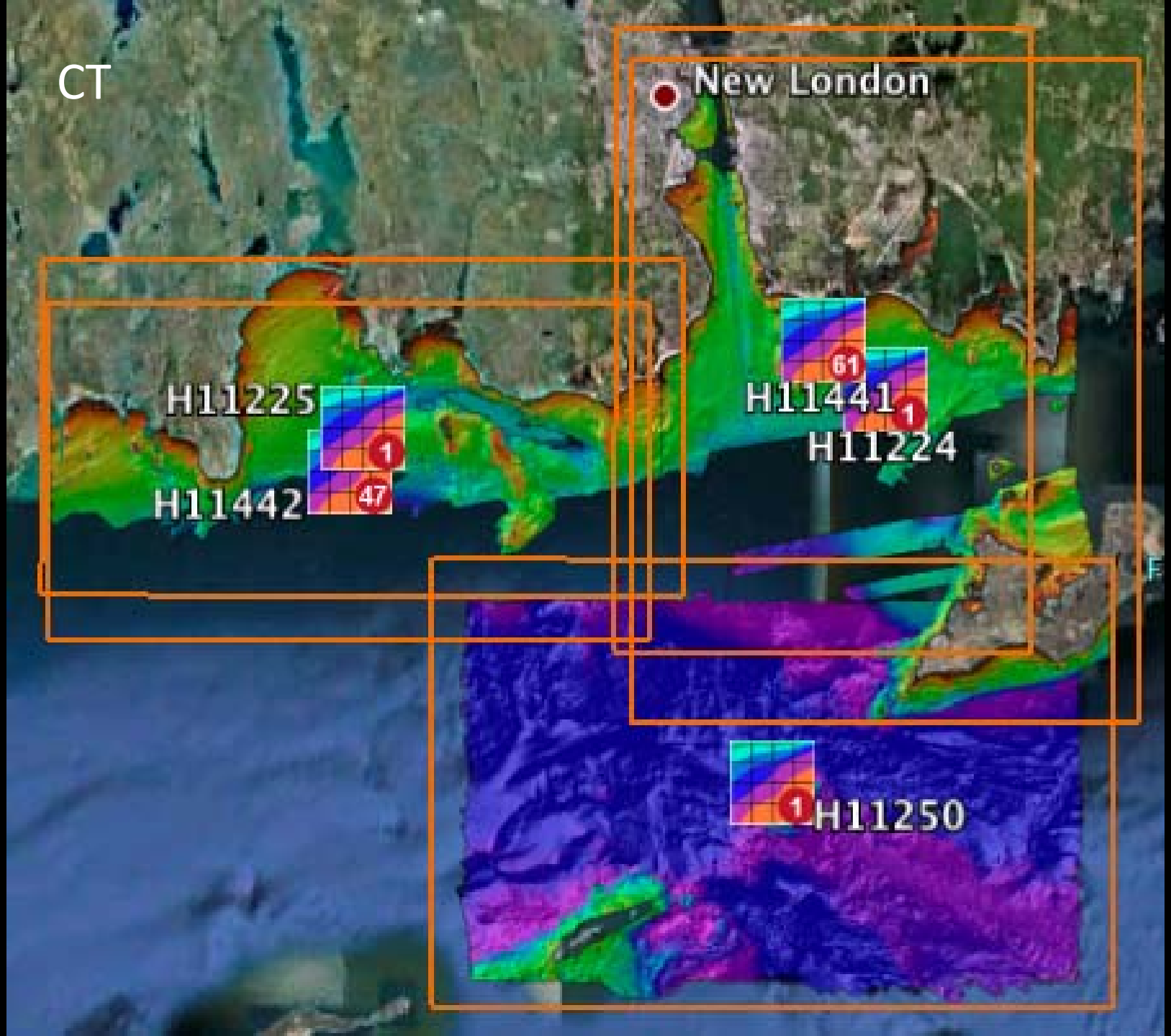

H11404_1m
H11404_10m
1240 m
Image
Image
© 2010 Europa Technologies
lat 56.389985° lon -132.174913° elev 43 m
Eye alt 2.50 km
Histogram of cell depths for H11404_10m_Combined
Summary for BAG: H11404_10m_Combined
Resolution 10.0 x 10.0 (m/cell)
Cells 959 x 1264 (m)
Lower left -132.269322846 56.3383986067
Upper right -132.105867396 56.4482382035
Descriptive report H11404.pdf [NGDC]
gdalinfo H11404_10m_Combined.bag.info.txt
xml metadata H11404_10m_Combined.metadata.xml
Download bag H11404_10m_Combined.bag.gz [NGDC]
CCOM JHC
NOAA
Visualization by: Kurt Schwehr et al.

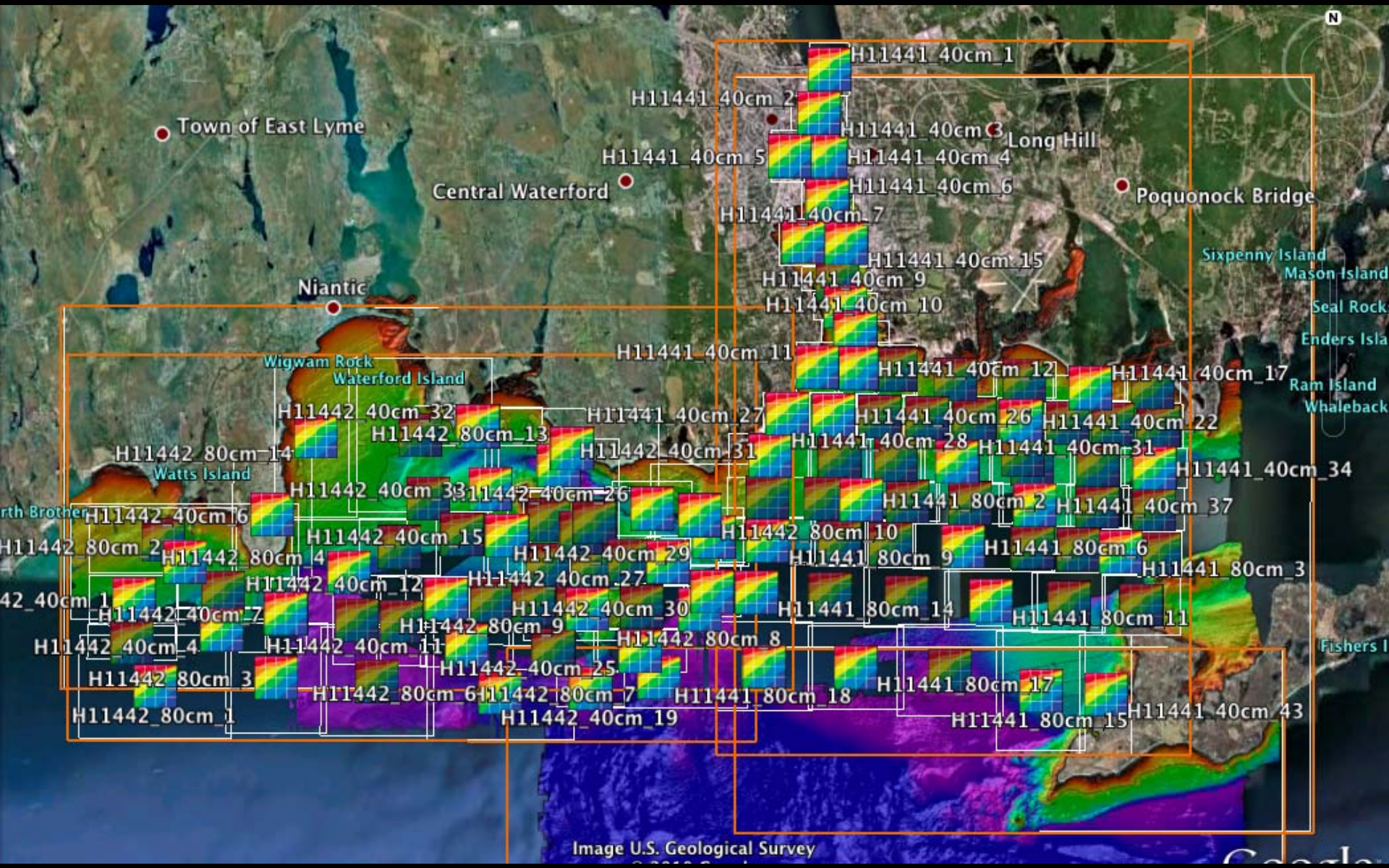

Norfolk, VA
H11599_50cm
H11599_1m
Portsmouth
Craney Island
Portsmouth
© 2010 Google
© 2010 Europa Technologies
2080 m
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
lat 36.967895° lon -76.177019° elev -7 m
Eye alt 5.56 km
Google

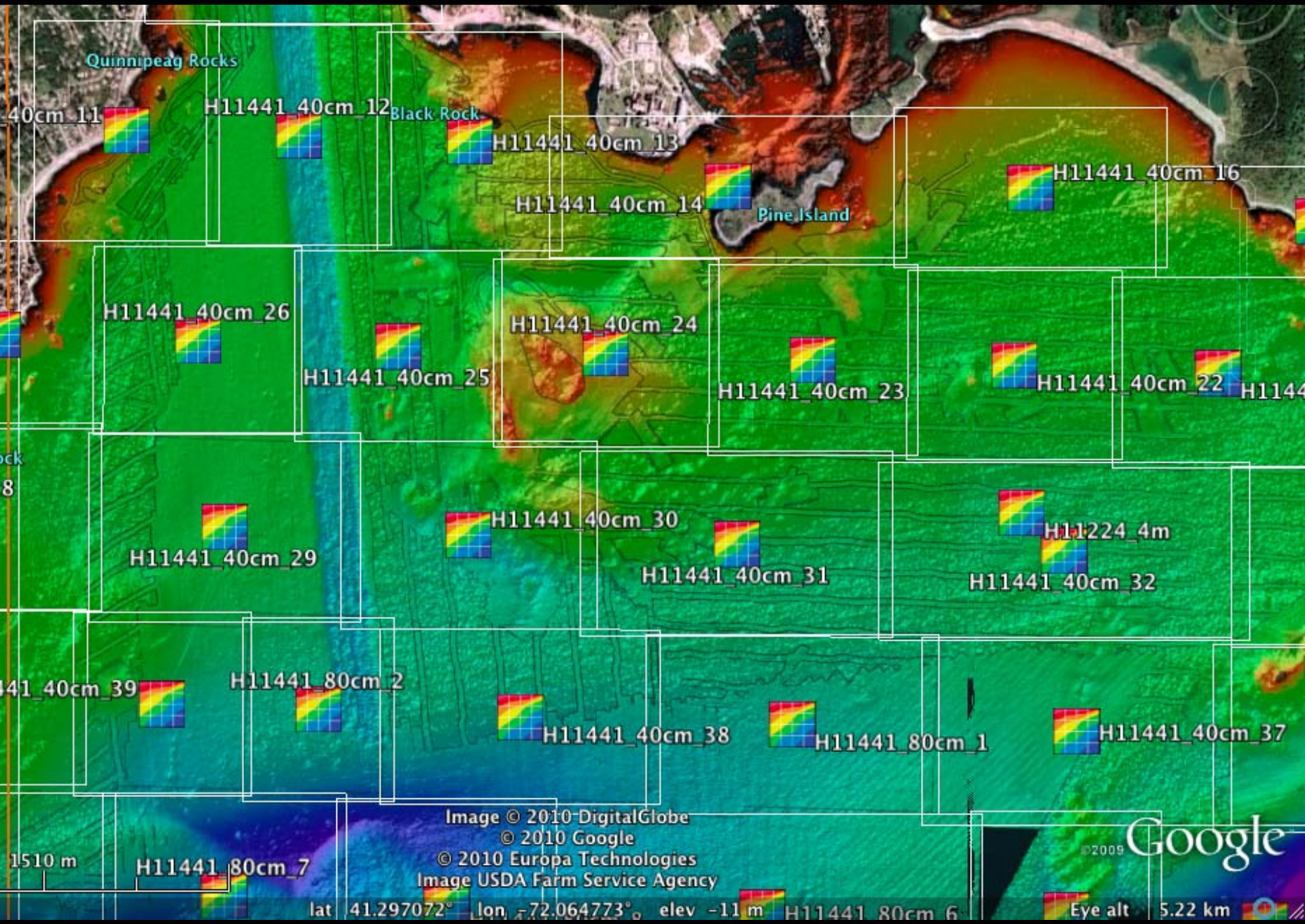

H11599_50cm
H11599_1m
Portsmouth
© 2010 Google
© 2010 Europa Technologies
1313 m
Google
lat 36.857610° lon -76.306618° elev 1 m
Eye alt 4.55 km

EarthNC


Map
Satellite
Terrain
Show labels
NOAA Atlantic Marine Center
Hunter House Victorian Museum
W Bute St
W Freemason St
Freemason Mews
College Pl
Brooke Ave
W Tazewell St
Market St
W City Hall Ave
E City Hall Ave
W Plume St
E Plume St
W Main St
Bank St
Bouse St
Bousch St
Duke St
Granby St
Atlantic St
Monticello Ave
Yarmouth St
Dunmore St
Randolph St
Mathew St
Nauticus
TCC Roper Performing Arts
Cable and Pipeline Area
USS Wisconsin
Hospital Pt
Williamson Dr
River Pl
OWN POINT REACH
4R N "4"
N "2S"
24W Or
C "D" Priv
R "36"
N "34"
Obstn
National
Google

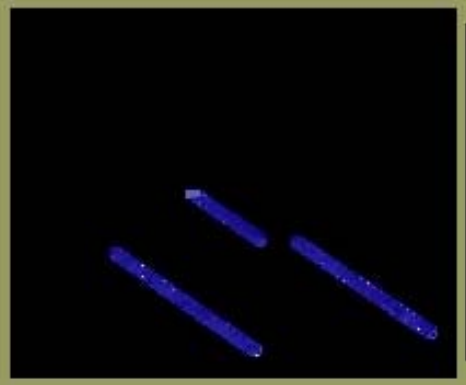

CT
New London
H11225
1
H11442
47
61
H11441
1
H11224
1
H11250

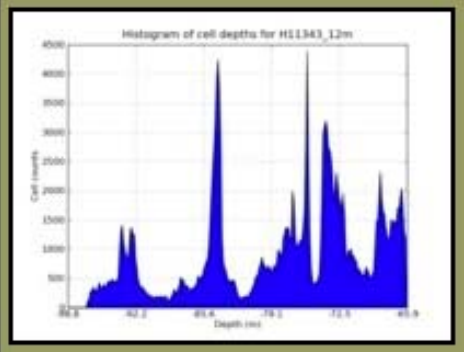

Town of East Lyme
Central Waterford
Niantic
Long Hill
Poquonock Bridge
Sixpenny Island
Mason Island
Seal Rock
Enders Isla
Ram Island
Whaleback
Wigwam Rock
Waterford Island
Watts Island
Fishers I
H11441_40cm_1
H11441_40cm_2
H11441_40cm_3
H11441_40cm_4
H11441_40cm_5
H11441_40cm_6
H11441_40cm_7
H11441_40cm_15
H11441_40cm_9
H11441_40cm_10
H11441_40cm_11
H11441_40cm_12
H11441_40cm_17
H11441_40cm_27
H11441_40cm_26
H11441_40cm_22
H11441_40cm_28
H11441_40cm_31
H11441_40cm_34
H11441_80cm_2
H11441_40cm_37
H11441_80cm_6
H11441_80cm_3
H11441_80cm_9
H11441_80cm_14
H11441_80cm_11
H11441_80cm_17
H11441_80cm_18
H11441_80cm_15
H11441_40cm_43
H11442_40cm_32
H11442_80cm_13
H11442_80cm_14
H11442_40cm_31
H11442_40cm_33
H11442_40cm_26
H11442_40cm_16
H11442_80cm_2
H11442_40cm_15
H11442_80cm_4
H11442_40cm_29
H11442_40cm_12
H11442_40cm_27
H11442_40cm_7
H11442_40cm_30
H11442_80cm_9
H11442_40cm_4
H11442_40cm_11
H11442_80cm_8
H11442_40cm_25
H11442_80cm_3
H11442_80cm_6
H11442_80cm_7
H11442_80cm_1
H11442_40cm_19
Image U.S. Geological Survey


Quinnipeag Rocks
40cm_11
H11441_40cm_12
Black Rock
H11441_40cm_13
H11441_40cm_14
Pine Island
H11441_40cm_16
H11441_40cm_26
H11441_40cm_24
H11441_40cm_25
H11441_40cm_23
H11441_40cm_22
H11441_40cm_29
H11441_40cm_30
H11441_40cm_31
H11224_4m
H11441_40cm_32
H11441_40cm_39
H11441_80cm_2
H11441_40cm_38
H11441_80cm_1
H11441_40cm_37
1510 m
H11441_80cm_7
Image © 2010 DigitalGlobe
© 2010 Google
© 2010 Europa Technologies
Image USDA Farm Service Agency
lat 41.297072° lon -72.064773° elev -11 m
Eye alt 5.22 km
Google

Very large grid files

Clip to Extent

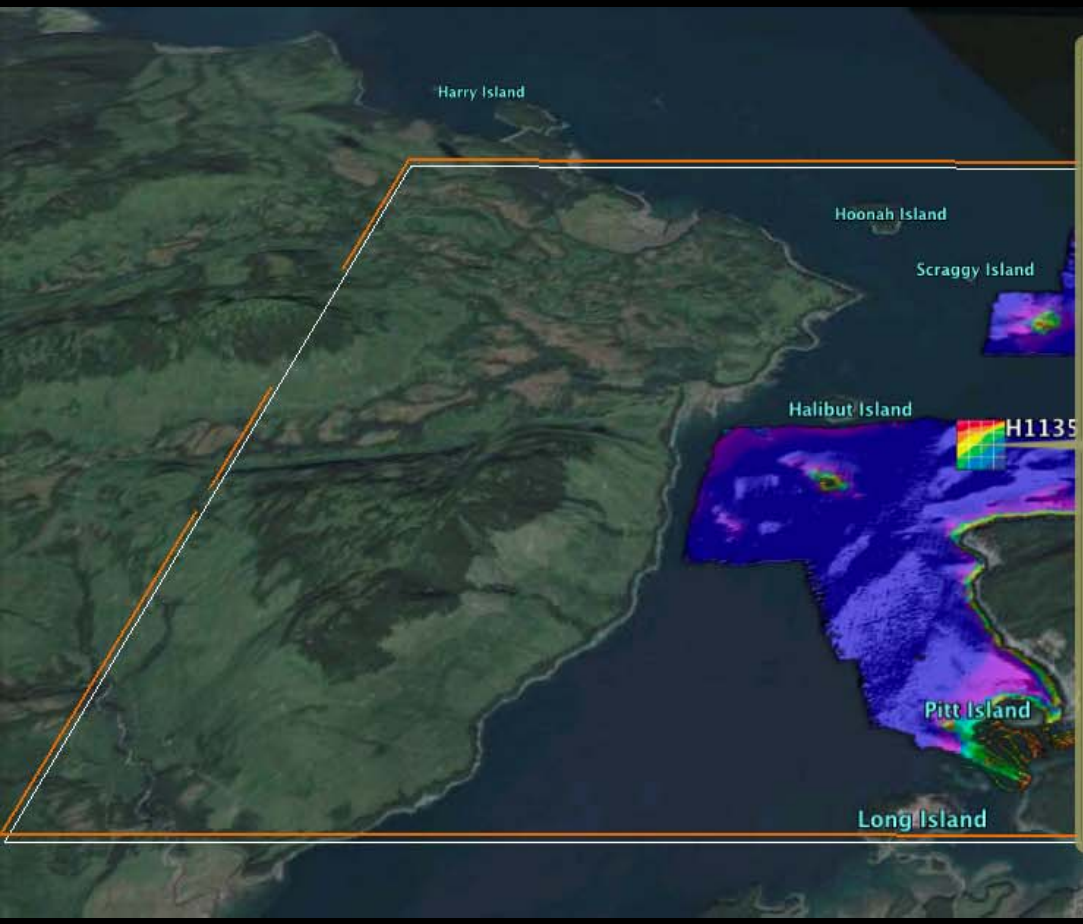


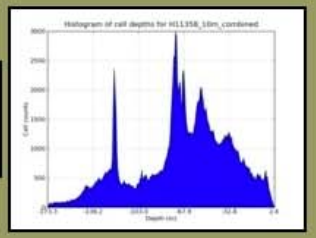


Summary for BAG: H11343_12m

Resolution	12.0 x 12.0 (m/cell)
Cells	5138 x 4775 (m)
Lower left	-94.2953706712 27.9257555355
Upper right	-93.672066154 28.447333855
Descriptive report	H11343.pdf [NGDC]
gdalinfo	H11343_12m.bag.info.txt
xml metadata	H11343_12m.metadata.xml
Download bag	H11343_12m.bag.gz [NGDC]

Visualization by: Kurt Schwehr et al.



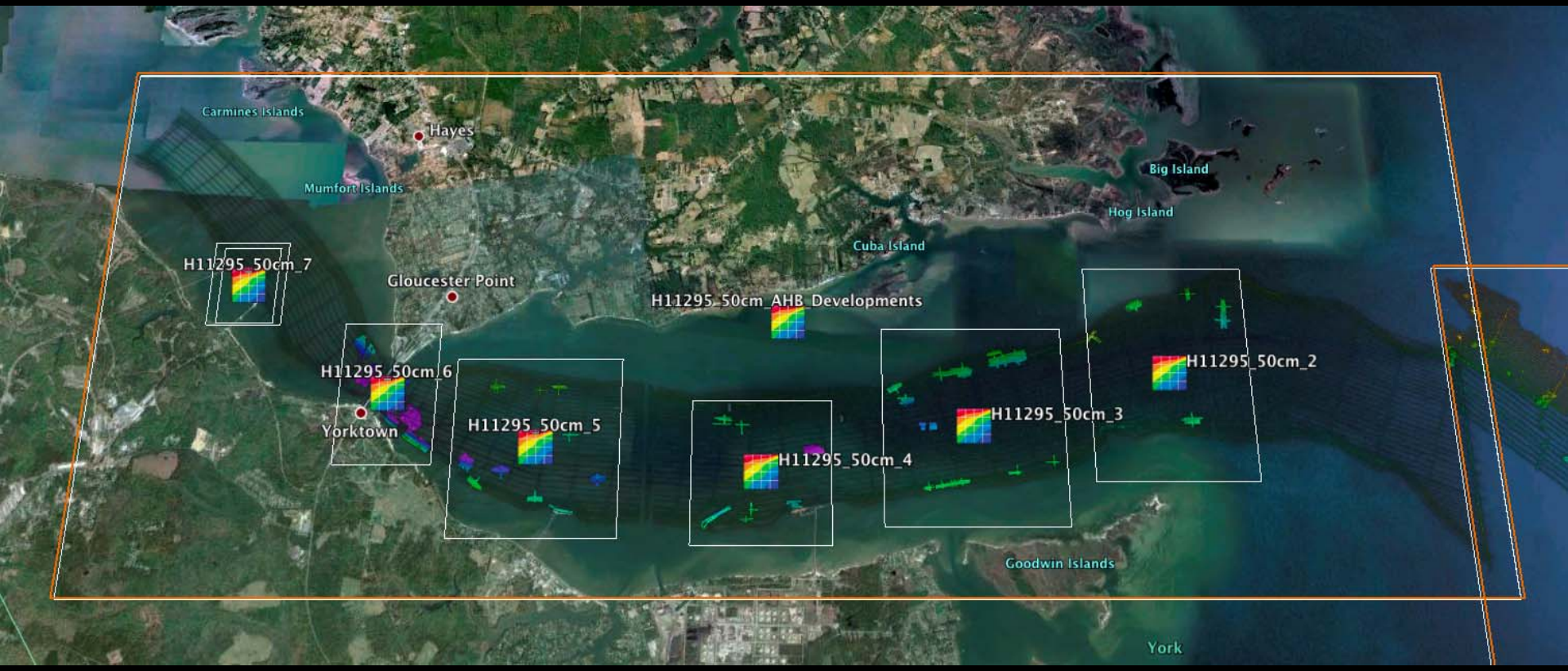


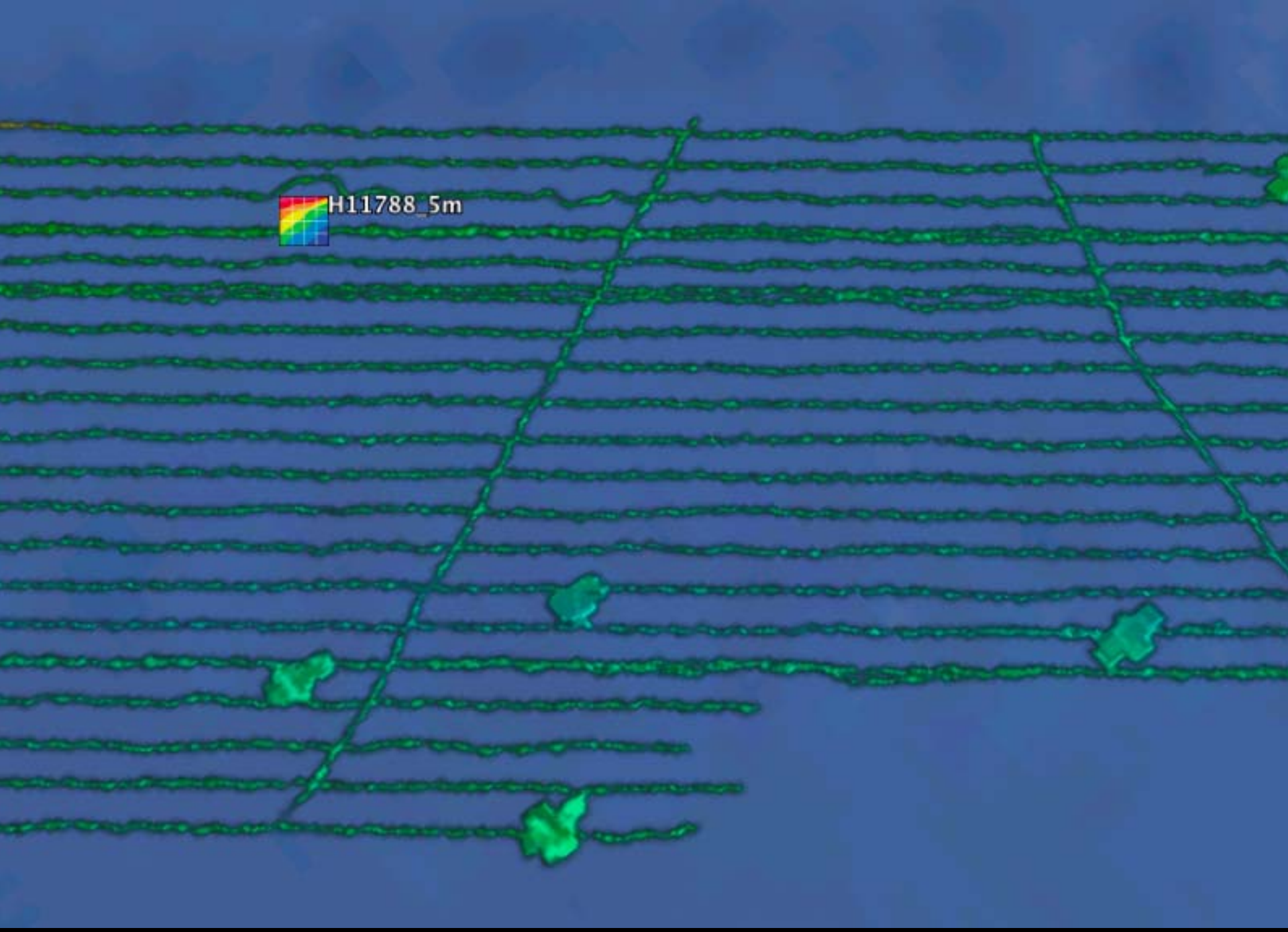
Summary for BAG: H11358_10m_combined

Resolution	10.0 x 10.0 (m/cell)
Cells	1607 x 1144 (m)
Lower left	-135.601536777 58.0930624145
Upper right	-135.330071151 58.1967605566
Descriptive report	H11358.pdf [NGDC]
gdalinfo	H11358_10m_combined.bag.info.txt
xml metadata	H11358_10m_combined.metadata.xml
Download bag	H11358_10m_combined.bag.gz [NGDC]

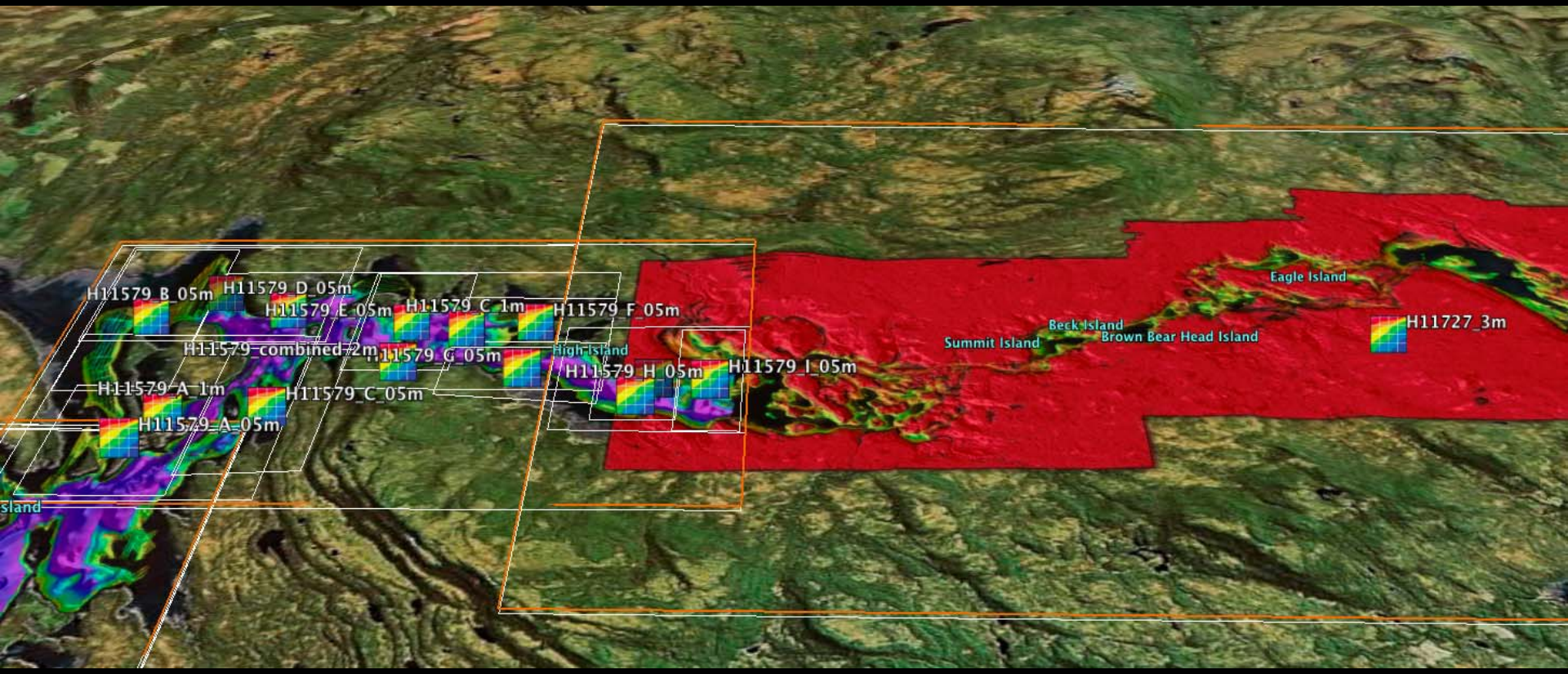
Visualization by: Kurt Schwehr et al.

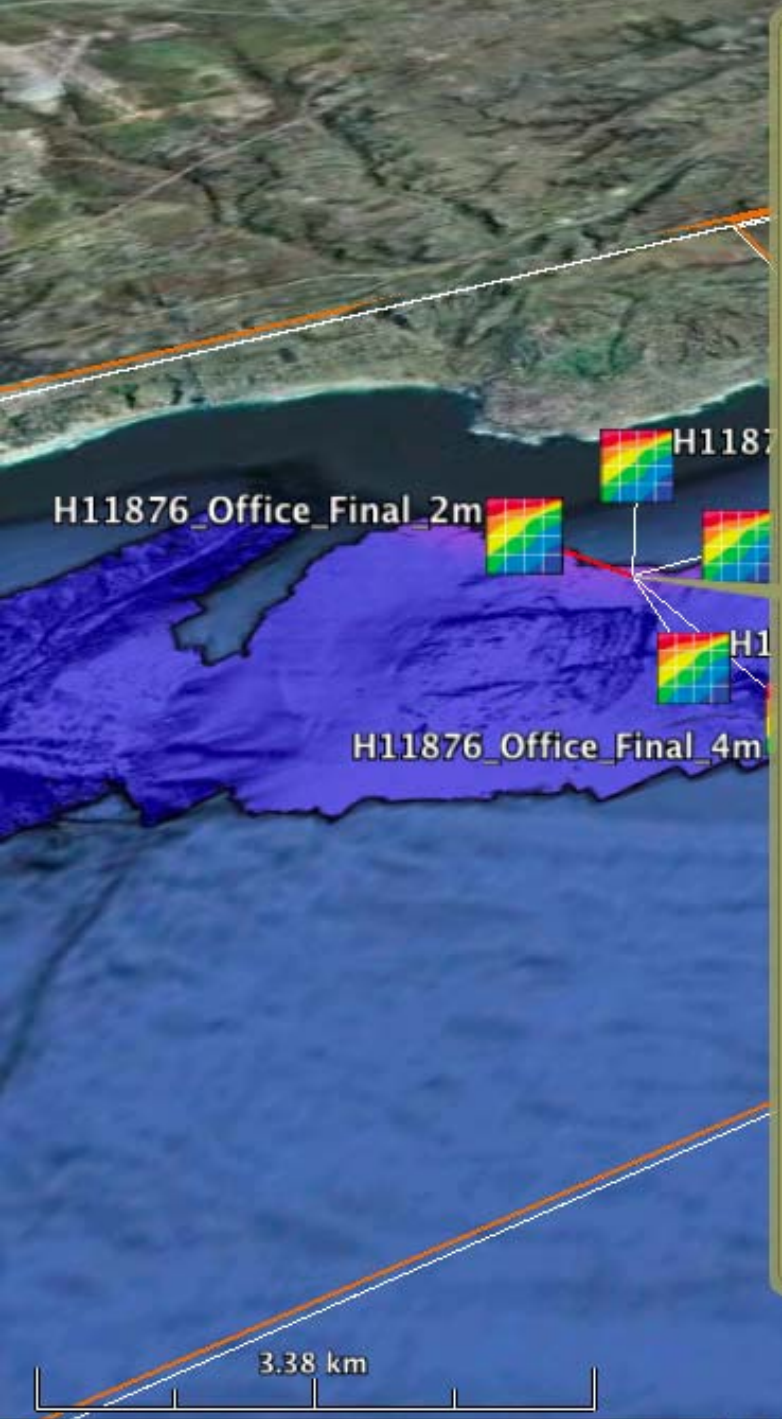
Various types of data

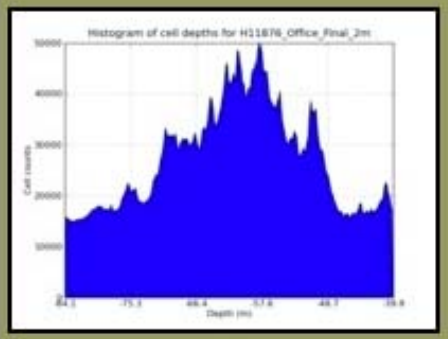



H11788_5m

Topo coverage



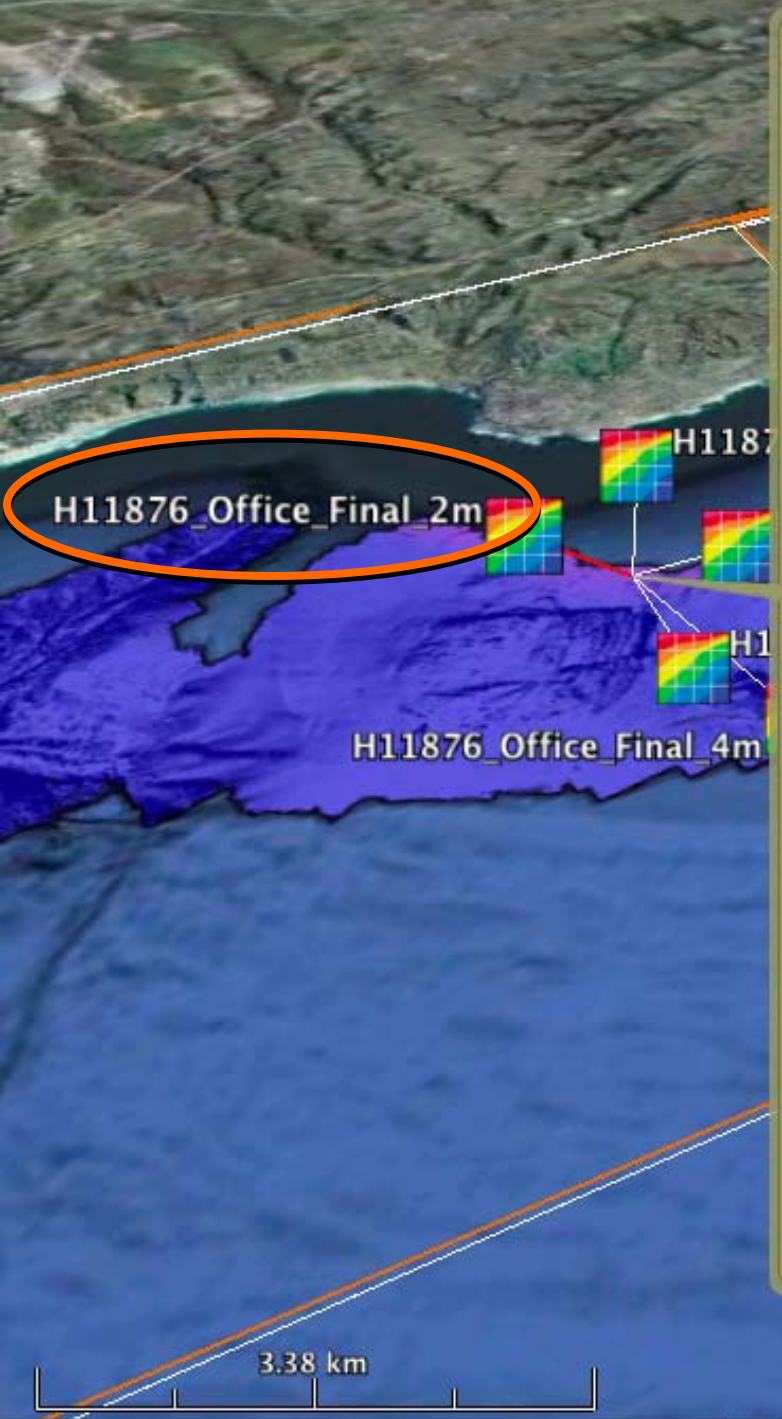


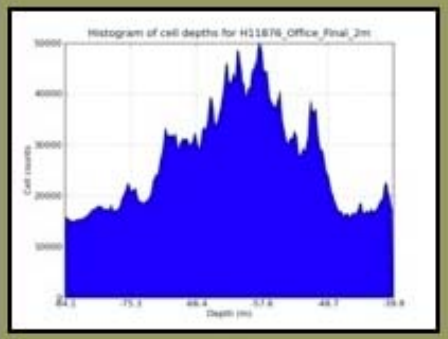


Summary for BAG: H11876_Office_Final_2m

Resolution	2.0 x 2.0 (m/cell)
Cells	6436 x 9384 (m)
Lower left	-117.377716831 32.7618838835
Upper right	-117.240665046 32.9315380872
Descriptive report	H11876.pdf [NGDC]
gdalinfo	H11876_Office_Final_2m.bag.info.txt
xml metadata	H11876_Office_Final_2m.metadata.xml
Download bag	H11876_Office_Final_2m.bag.gz [NGDC]

Visualization by: Kurt Schwehr et al.





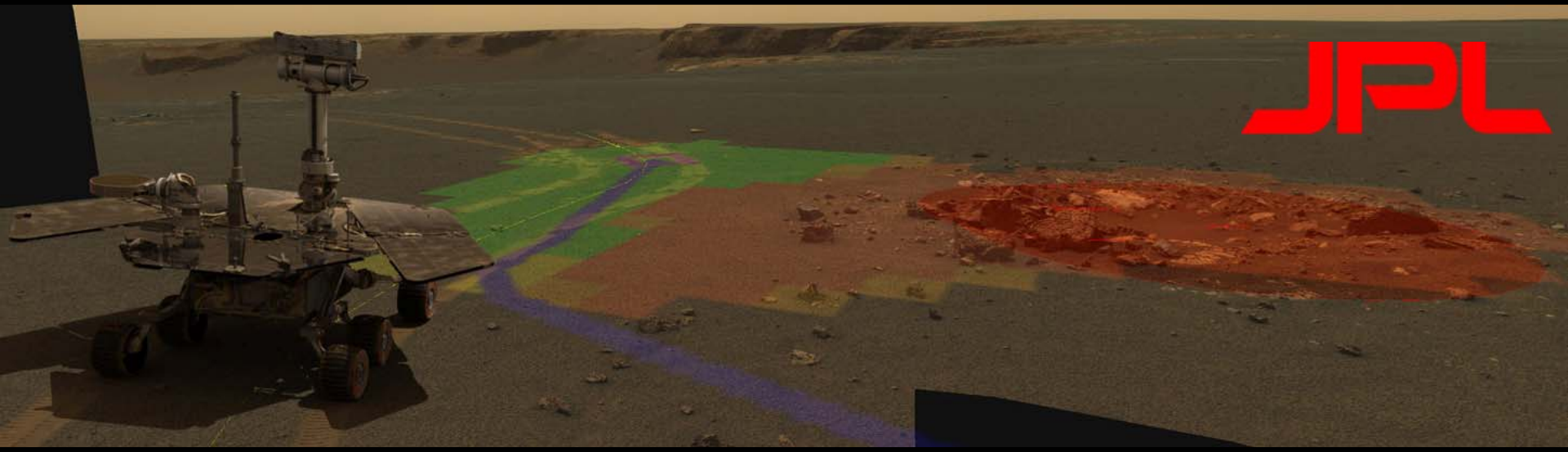
Summary for BAG: H11876_Office_Final_2m

Resolution	2.0 x 2.0 (m/cell)
Cells	6436 x 9384 (m)
Lower left	-117.377716831 32.7618838835
Upper right	-117.240665046 32.9315380872
Descriptive report	H11876.pdf [NGDC]
gdalinfo	H11876_Office_Final_2m.bag.info.txt
xml metadata	H11876_Office_Final_2m.metadata.xml
Download bag	H11876_Office_Final_2m.bag.gz [NGDC]

Visualization by: Kurt Schwehr et al.

File naming conventions

Managing many thousands of files



File naming conventions

inst = (1 alpha character) MER science instrument identifier.

Valid values for MER camera instruments:

"**P**" - Pancam
"**N**" - Navcam
"**F**" - Front Hazcam
"**R**" - Rear Hazcam
"**M**" - Microscopic Imager
"**E**" - Descam

Valid values for MER instruments <u>not</u> described in this SIS:

"**A**" - APXS
"**B**" - Mössbauer
"**T**" - Mini-TES
"**D**" - RAT ("D" for Drill)

sclk = (9 integers) Starting Spacecraft Clock time.

prod = (3 alpha characters) Product Type identifier of input data. Product types are differentiated as having camera-induced distortion removed ("linearized") or not removed (nominal), and, as being Thumbnail-sized or not. Four special flag characters follow:

a) Beginning "**E**" – Type of **E**DR, which are raw with <u>no</u> camera model "linearization"or radiometric correction. If no beginning "E", then it is an RDR.
b) Ending "**T**" – EDR or RDR that is **T**humbnail -sized.
c) Ending "**L**" – If no beginning "E", denotes an RDR that is "**L**inearized", <u>except</u> for Thumbnail sized RDRs.
d) Ending "**N**" – If no beginning "E", denotes an RDR that is Thumb**N**ail-sized <u>and</u> "Li**N**earized".

Valid values for MER camera instrument input data products:

Data Product	Non-linearized (NOMINAL)	Linearized

File naming conventions

2P123456789IOF0103P2210L2C1.IMG	Mission MER-A ("2"), Pancam instrument ("P"), SCLK 123456789 ("123456789"), Radiometrically-corrected RDR calibrated to I/F radiance factor ("IOF"), Site 1 ("01"), Position 3 ("03"), Seq p2210 ("P2210"), left Eye ("L"), Filter position 2 ("2"), produced by Cornell U. ("C"), product version 1 ("1"), PDS-labeled ("IMG").
2M123456789EFF0103P2901M0F2.IMG	Mission MER-A ("2"), Microscopic Imager instrument ("M"), SCLK 123456789 ("123456789"), Full Frame EDR ("EFF"), Site 1 ("01"), Position 3 ("03"), Sequence p2901 ("P2901"), Monoscopic ("M"), no Filter ("0"), produced by USGS/Flagstaff ("F"), product version 2 ("2"), PDS-labeled ("IMG").

http://surveys.ngdc.noaa.gov/mgg/NOS/coast/

- B00001-B02000: Older EEZ surveys
- D00001-D02000: Preliminary surveys
- F00001-F02000: Field edits
- H00001-H02000: Hydrographic Surveys
- H02001-H04000: Hydrographic Surveys
- H04001-H06000: Hydrographic Surveys
- H06001-H08000: Hydrographic Surveys
- H08001-H10000: Hydrographic Surveys
- H10001-H12000: Hydrographic Surveys
- H12001-H14000: Hydrographic Surveys
- L00001-L02000: Lake surveys
- L02001-L04000: Lake surveys
- W00001-W02000: Non-NOS surveys

Firefox File Edit View History Delicious Bookmarks Tools Window Help

Index of /mgg/NOS/coast/H10001-H12000/H11301/BAG

http://surveys.ngdc.noaa.gov/mgg/NOS/coa

Index of /mgg/NOS/coast/H10001-H12000/H11301/BAG

Name	Last modified	Size	Description
Parent Directory		-	
H11301_50cm_1.bag.gz	31-Jul-2009 14:27	10M	
H11301_50cm_2.bag.gz	31-Jul-2009 14:28	11M	
H11301_50cm_3.bag.gz	31-Jul-2009 14:28	12M	
H11301_50cm_4.bag.gz	31-Jul-2009 14:29	14M	
H11301_50cm_5.bag.gz	31-Jul-2009 14:30	1.1M	
H11301_50cm_6.bag.gz	31-Jul-2009 14:31	12M	
H11301_50cm_7.bag.gz	31-Jul-2009 14:31	2.5M	
H11301_50cm_8.bag.gz	31-Jul-2009 14:31	7.6M	
H11301_50cm_9.bag.gz	31-Jul-2009 14:31	608K	
H11301_50cm_10.bag.gz	31-Jul-2009 14:28	21M	
H11301_50cm_11.bag.gz	31-Jul-2009 14:28	19M	
H11301_50cm_12.bag.gz	31-Jul-2009 14:28	15M	
H11301_50cm_13.bag.gz	31-Jul-2009 14:28	15M	
H11301_50cm_14.bag.gz	31-Jul-2009 14:28	1.0M	
H11301_50cm_15.bag.gz	31-Jul-2009 14:28	18M	

What would we like to encode?

- Survey Number
- Region P, A, G, etc., O (Pacific, Atlantic, Gulf of Mexico, Other)
- SUREND – S57 end of survey pings date – Year
- Instrument/Sensor type(s) used to grid
- Grid cell size (already in the name)
- Depth range (broad categories)

File naming conventions
Sensor Type

- **S** = **S**ingle beam sonar
- **M** = **M**ultibeam
- **T** = **T**opo lidar
- **L** = bathy **L**idar
- **G** = predicted from **G**ravity
- **C** = lead line or similar from a **C**able/Chain
- **R** = **R**adar, e.g. SRTM

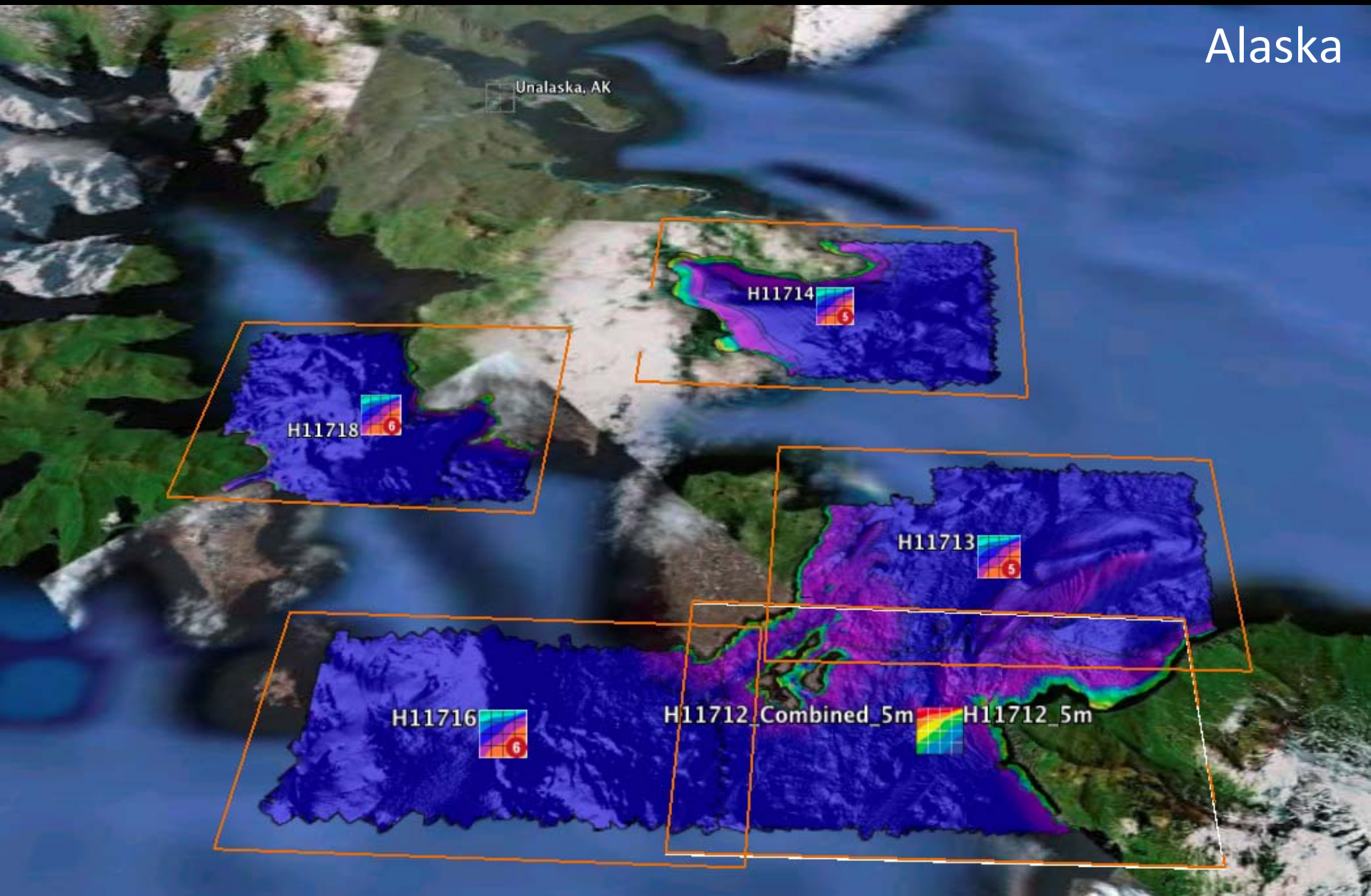
How and when to use the naming convention?

- Must be automatically generated from the metadata inside the BAG
- Must have tools that expand out the name
- Must not loose the embedded metadata!
- Primarily for the NGDC archive website
- *Checksums*, not filenames, should be used to compare if files are the same

Where to next?

- Improve and test the metadata
- Make sure all of our tools can read BAGs
- Add stddev, backscatter and sidescan?
- Deploy a Google Earth visualization to the NGDC web site
- Work on a file naming convention

Fantastic data for other uses



For more info:
http://tinyurl.com/bags-chc2010