

NATIONAL DREDGING QUALITY MANAGEMENT (DQM) PROGRAM

WEDA PACIFIC CHAPTER

**OCTOBER 24, 017
OMAHA, NE**

**VERN GWIN, PROGRAM DIRECTOR
NATIONAL DQM CENTER**



PRESENTATION OUTLINE

- **PROGRAM STATUS/ADVANCEMENTS**
- **CURRENT SIGNIFICANT ACTIVITIES**
- **FUTURE OBJECTIVES**



BUILDING STRONG®

PROGRAM STATUS

SINCE LAST YEAR....

- PIPELINE VIEWER WAS RELEASED (JAVAS)
- NEW SECURITY ACCESS
- GOV PLANT PIPELINE MONITORING
- BOEM DREDGE INTENSITY MODEL
- ODESS PROGRAM IMPLEMENTATION
- CYCLE LOGIC REVISION
- <https://dqm-portal.usace.army.mil/pipelineviewer/>



2018

- Private Pipeline Monitoring
- New Customers/More Customer Service
- ODESS Trawler Implementation
- BOEM Dredge Intensity Model
- Cloud Database/Server Environment
- Dev
 - ▶ V2.9 Parity, V3.0, Portal, Desktop tools, Management Tools



More 2018

- Technical Advancements
 - ▶ Machine Learning, Browser Independent
- Personnel Changes
- Pipeline Data Analysis
- Hopper Dredge Utilization Support
- Revising Specs for Non-Nuclear Density Meters



NEW V2.9 DQM VIEWER



BUILDING STRONG®

SECURITY REQUIREMENTS

- **AS2 REQUIREMENTS FOR DATA WEB SERVICES**
 - ▶ DATA TRANSMITTAL
 - ▶ USER ACCESS
- **SECURITY MATRIX ROLES AND ACCESS**
 - ▶ PASSWORD ACCESS – **CONTRACTOR ACCESS**



PIPELINE IMPLEMENTATION

- HEAD QUARTERS IMPLEMENTATION GUIDANCE APRIL 2014
- GOVERNMENT PLANT PILOT MONITORING 2015-2017
- FINAL SPEC VERSIONS
- FY18 PRIVATE PIPELINE MONITORING (SBA EXEMPT, REQUIRED ON ALL NON-RESTRICTED PROJECTS)



National Dredging Quality Management Program (DQM)

Pipeline Data Flow Sensor-Based Parameters (per Compliance Specification)



Pump Sensors

- Pump Vac
- Pump Press
- Density
- Velocity

Position Sensors

- Position
- Heading
- Vert Correction (Tide)
- CH Depth

Discharge Sensors

- (radio link)
- Discharge Position
- Discharge Elevation
- Discharge Heading

Notes

*Dredge Positioning Computer—Data is compiled and converted to JSON format

**DQM Onboard Computer—Minimum Specifications

CPU: Intel/AMD processor; 3 GHz (non-overclocked) clock speed

Hard Disk: 250 GB; internal

RAM: 2 GB

Ethernet Adapter: 10/100 Mbps internal network card; RJ-45 connector

Video Adapter: Supports 1024x768 resolution at 16-bit color depth

Monitor: 17" viewable display; supports 1024x768 resolution at 16-bit color depth

Keyboard: Standard 101-key

Mouse: Standard 2-button

CD-ROM Drive: 16X read speed/8X write speed

Ports: 2 free serial ports (standard 9-pin connectors); 1 free USB port

Cables: Cat-5 cable; standard RJ-45 plugs connecting the network adapter to the network hub; 1 spare cable

Software: Windows 7 Professional (fully licensed); any necessary manufacturer-provided drivers for the installed hardware



DQM ON-BOARD SOFTWARE (DQMOBS)


The screenshot displays the National Dredging Quality Management Program software. The top navigation bar includes 'Instruments', 'Raw Data Monitor' (selected), and 'Settings'. The main window is divided into several sections:

- Test Hopper B**: Shows real-time data for 1/6/2010 at 3:30:27 AM GMT. Parameters include Latitude (24.220791 deg), Longitude (-90.300305 deg), Heading (94 deg), Course (94 deg), Speed (0 kts), Tide (0 ft), Load # (1), Hull Status (Closed), Draft (20.27 ft), and Ullage (20.27 ft).
- Port Draghead**: Displays parameters such as Latitude (24.220791 deg), Longitude (-90.300305 deg), Depth (0 ft), Elevation (0 ft), Velocity (0.71 ft/s), Density (0.37 g/cc), and Pump RPM (0 rpm).
- Stbd Draghead**: Displays corresponding parameters for the starboard side.
- DQM On-Board Software Version**: .973 beta.
- Data Log**: A scrollable log showing XML-formatted data records, including vessel coordinates, draft, ullage, and pump status.
- Status Bar**: At the bottom, it shows 'Last received: 1525 bytes', 'Idle time: 00:06:00', and 'Points in queue: 0'.




BUILDING STRONG®

New DQM Pipeline Viewer



DREDGING QUALITY MANAGEMENT

ABOUT 


Currently Viewing
No project or day loaded...

Select a project day by opening the selection above or by clicking on a push pin on the map...







OPEN SELECTION ...





Selected Point


Select a point on the graph below...

SHOW/HIDE GRAPH 

PROJECT / INFORMATION







DREDGE STATUS / LAYER CONTROLS

pins

Earthstar Geographics | Source: USGS, NGA, NASA, CGAR, GEBCO, Robinson, NOAA, NLS, OS, NIMA, Geodatasys/Esri and the GIS User Community

Powered by Esri

Currently Viewing

Plant	Bill Holman
Type	Pipeline
Project	Project_Test_Bill_Holman
Contract	CONTRACT_TEST_BILL_
Start Date	05/30/2012
End Date	11/02/2015

[PREV](#)
[NEXT](#)

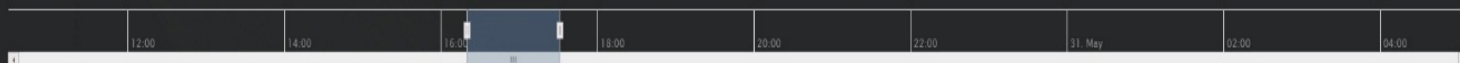
Selected Point

ADVANCE_DAILY	null
ADVANCE_HOURLY	null
ADVANCE_TOTAL	null
CH_DEPTH	-12.29
CH_HEADING	268.60
CH_LATITUDE	37.072012
CH_LONGITUDE	-88.564571
CH_RATE	null
CH_RPM	200.21
CH_SWING	null
MSG_BUNDLE_ID	916206
MSG_STATUS_ID	undefined
MSG_DATE	05/30/2012
MSG_TIME	11:27:06
OUTFALL_ELEVATION	null
OUTFALL_HEADING	-19.90
OUTFALL_LATITUDE	37.074674
OUTFALL_LONGITUDE	-88.562046
PROD_CUMULATIVE	1074.30
PROD_INSTANTANEOUS	11.30
PROD_INTEGRATED	null
SLURRY_DENSITY	1.02
SLURRY_VELOCITY	15.48
SURVEY_DEPTH	null
SWING_CABLE_PSI_PORT	0
SWING_CABLE_PSI_STBD	141.72
TARGET_DEPTH	null
VERT_CORRECTION	302



Zoom: 100% 75% 50% 36% 25%

Zoom: 1 Min 1 Hr 1 D All

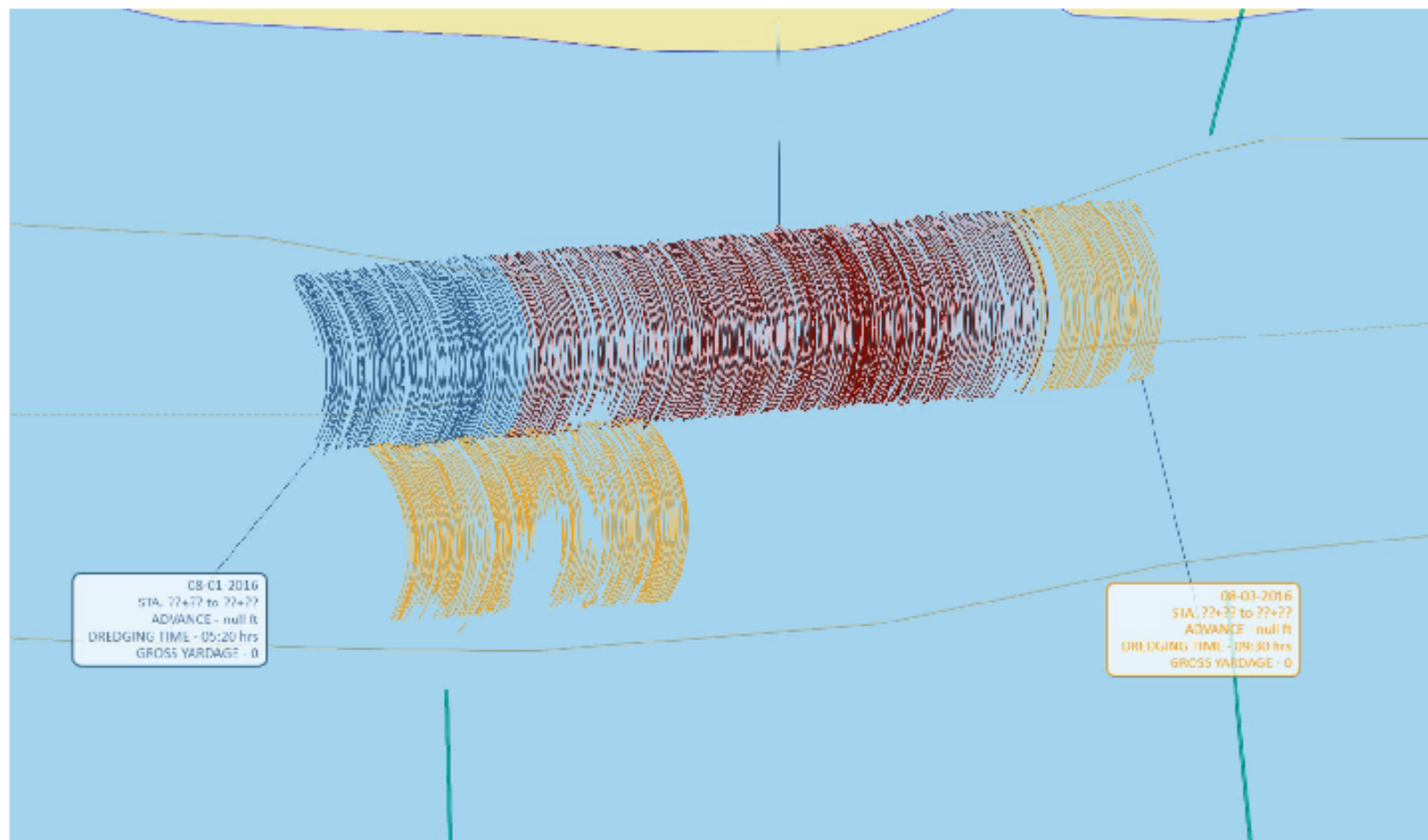


Dredge Status

Pipe Length	[Insufficient Data]
Boosters	[WIP] [Insufficient Data]
Effective Time	[Insufficient Data]
Non-effective Time	[Insufficient Data]



- ADVANCE_DAILY
- ADVANCE_HOURLY
- ADVANCE_TOTAL
- CH_DEPTH
- CH_HEADING
- CH_LATITUDE
- CH_LONGITUDE
- CH_RATE
- CH_RPM
- CH_SWING
- OUTFALL_ELEVATION
- OUTFALL_HEADING
- OUTFALL_LATITUDE
- OUTFALL_LONGITUDE
- PROD_CUMULATIVE
- PROD_INSTANTANEOUS
- SLURRY_DENSITY
- SLURRY_VELOCITY
- SURVEY_DEPTH
- SWING_CABLE_PSI_PORT
- SWING_CABLE_PSI_STBD
- TARGET_DEPTH
- VERT_CORRECTION





Overview

- T&E Species Data Collection and Decision Making Tool in support of Operations and Dredging, starting with sea turtles, sturgeon
- Streamline T&E species data collection, processing, and reporting
- Reduction in premature project shut down
- Pilot Testing complete
- Full Implementation late 2016

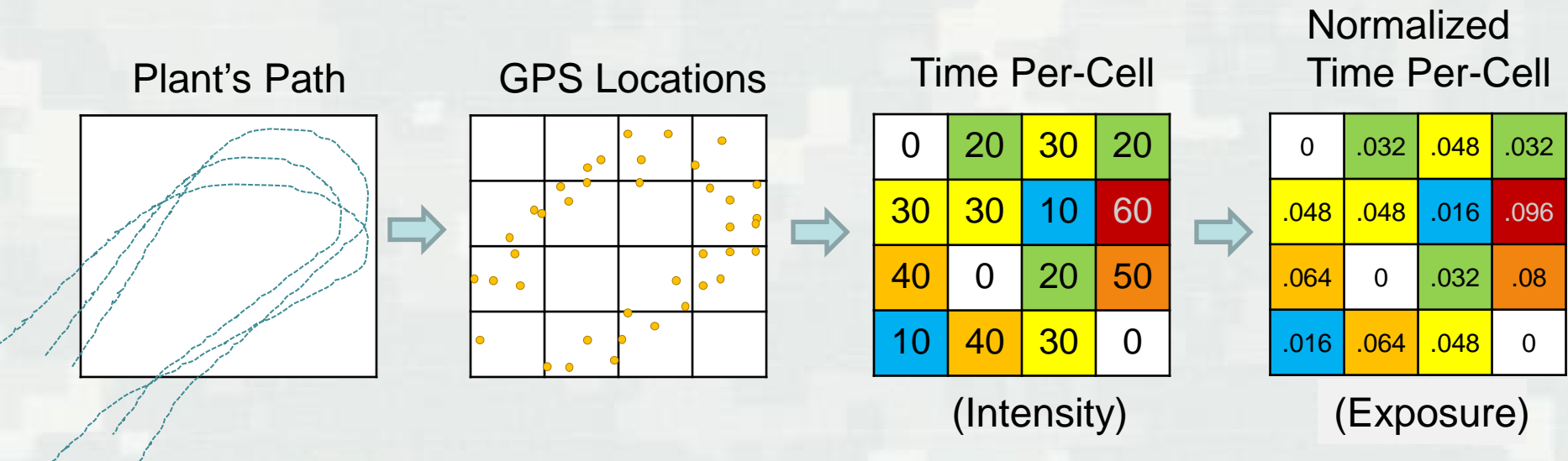


Dredge Intensity Model

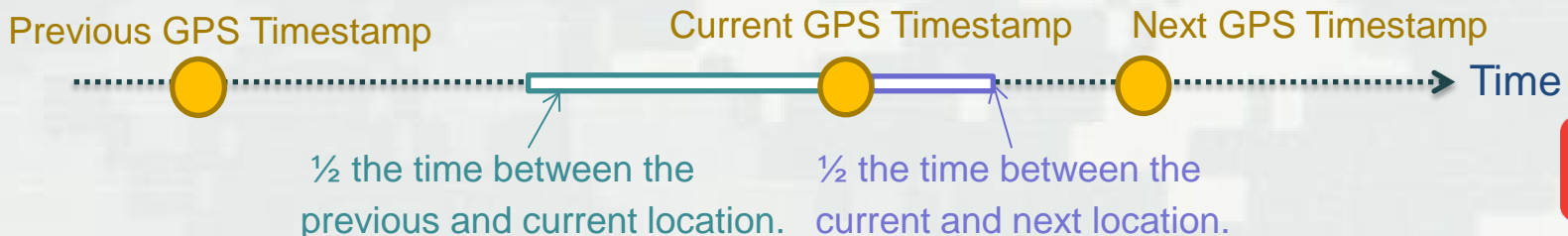
- ✓ Software tool which takes the results of the mathematical model and creates products compatible with prominent GIS applications
- ✓ Vessel transit tracks delineating areas of high traffic use
- ✓ Generation of relevant geospatial metadata for the product including processing history sections



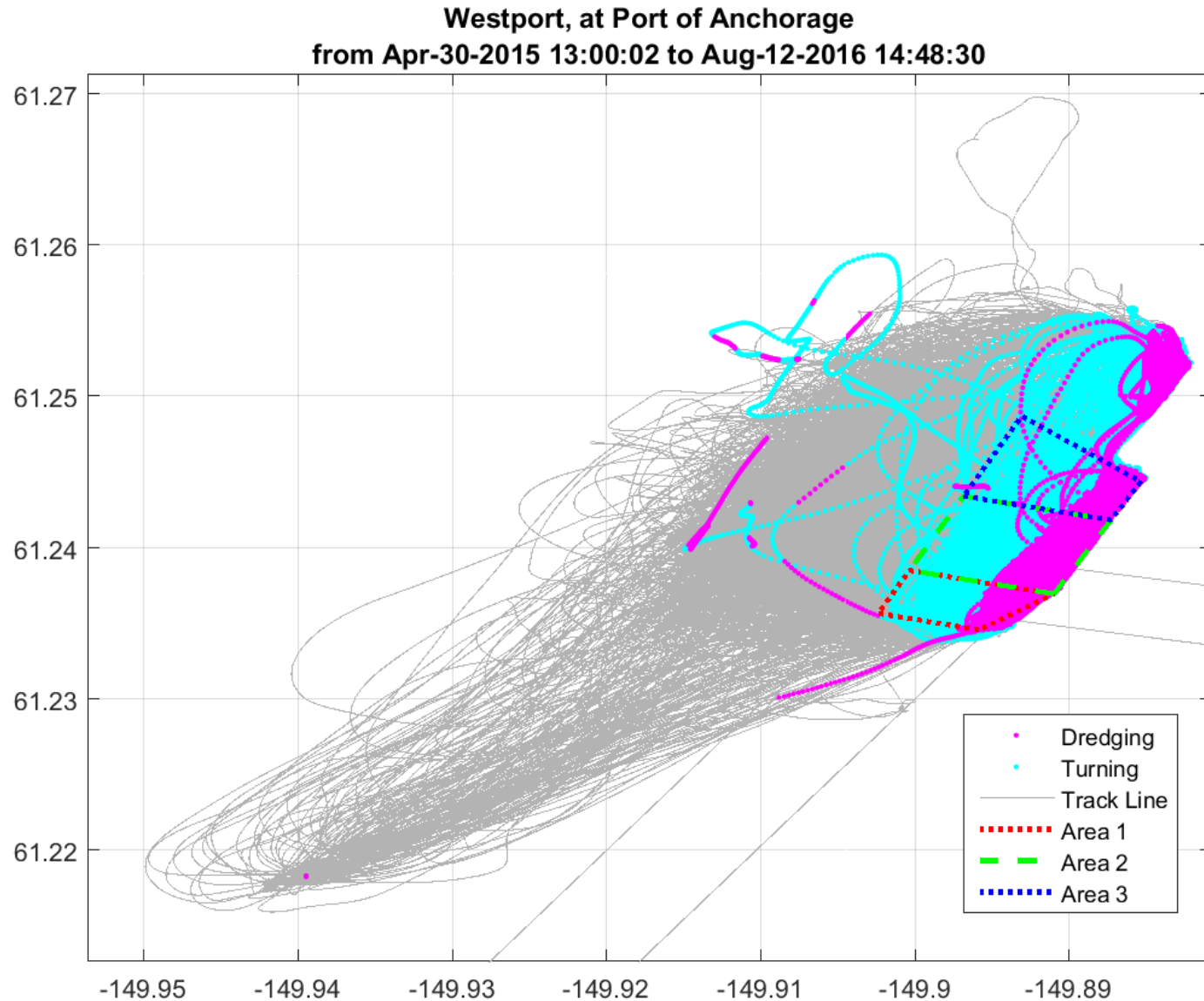
Dredge Intensity Model



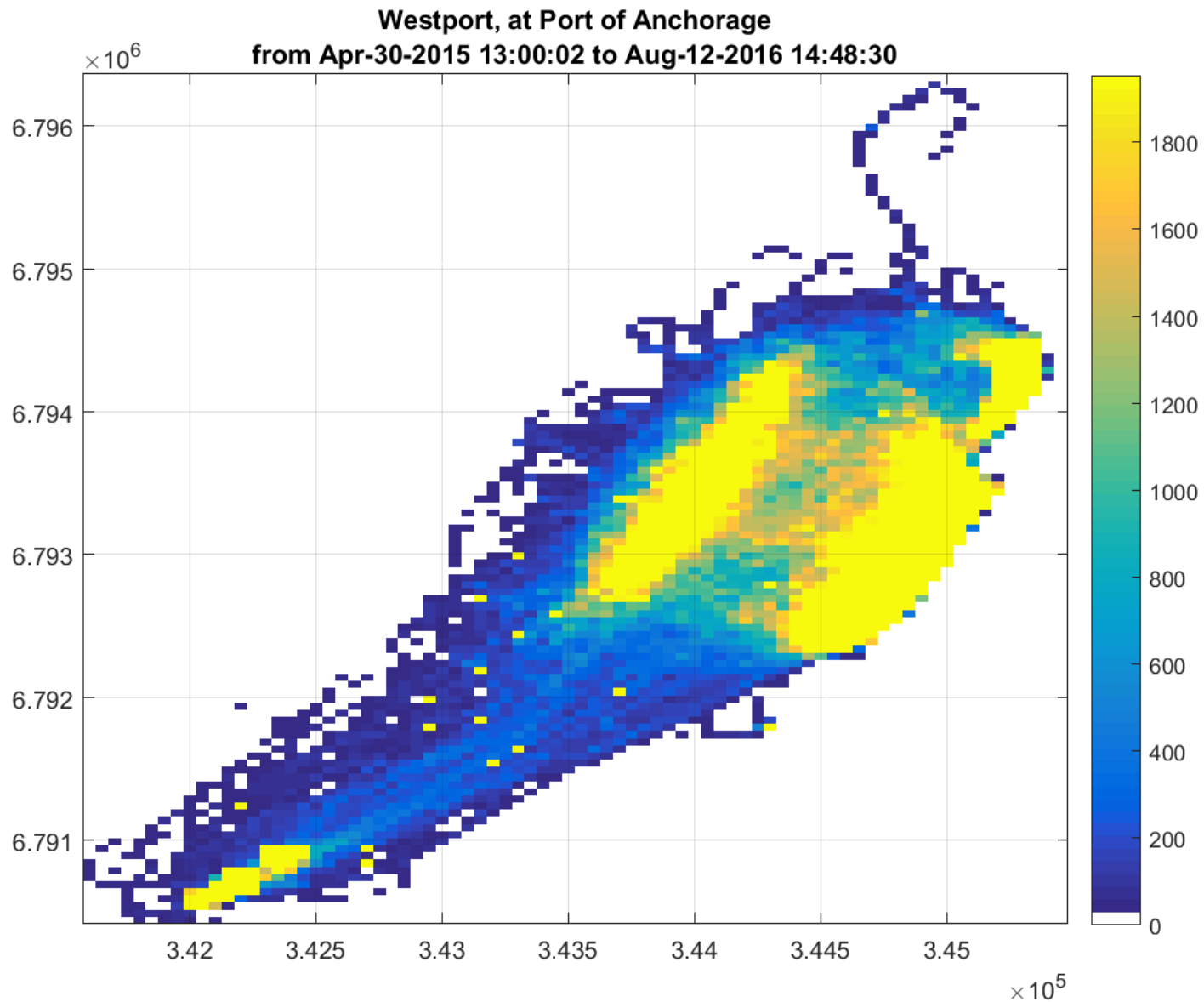
- Time spent at each location is calculated
- GPS locations are converted to UTM, and a grid is constructed
- Time per-location is accumulated within cells of a grid
- Values are normalized based on the cell size, final units are seconds per meter squared.



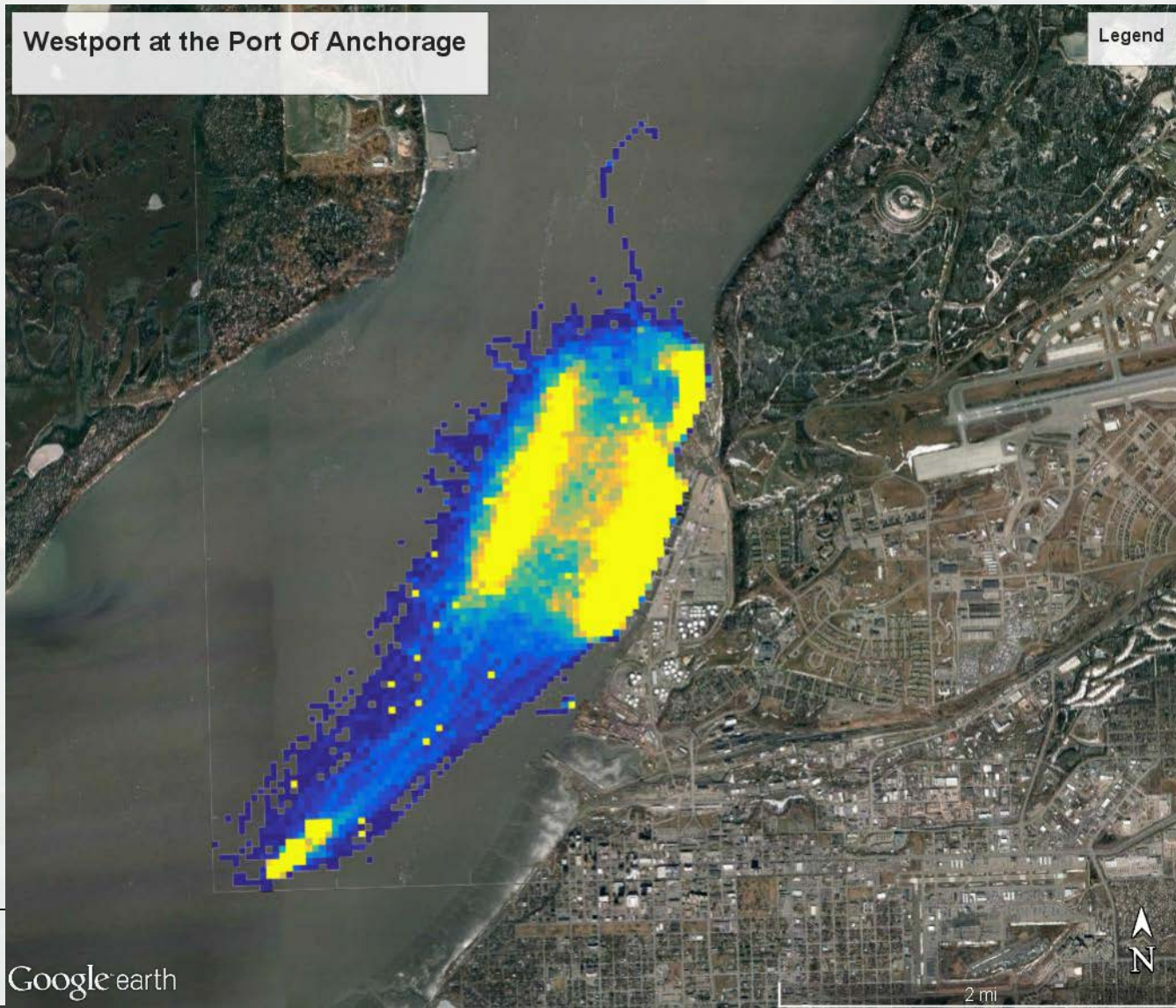
Westport Tracks & Dredging



Westport Heat Map



Google Earth Overlay



NEW NATIONAL DREDGING QUALITY MANAGEMENT DQM PORTAL



Search for Application



Certifications/QA



Administration



Reports



Plots



Export



Dashboard



Payments



DQM Viewer



Training



Tools



DQM Public Website



2018

- Private Pipeline Monitoring
- ODESS Trawler Implementation
- Cloud Database/Server Environment
- Dev
 - ▶ V2.9 Parity, V3.0, Portal, Desktop tools, Management Tools



More 2018

- Technical Advancements
 - ▶ Machine Learning, Browser Independent
- Pipeline Data Analysis
- Revising Specs for Non-Nuclear Density Meters



Question/Comments?



NATIONAL DREDGING QUALITY MANAGEMENT
DQIM



BUILDING STRONG®



THE NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM

The DQM Program is a partnership between the Corps and the dredging industry for automated monitoring of dredge activities.

Onboard sensors provide near-real-time data that allows for immediate response to emerging situations.

Districts can use the web-based DQM software to view, analyze, report on, and export dredging data.

The data can be used to improve business practice, ensure environmental compliance, and increase our understanding of dredging science and technology.

