# National Dredging Quality Management (DQM) Program

## WEDA Midwest Chapter

March 10, 2017
Omaha, NE

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National DQM Center

# Presentation Outline

- Program Status/Advancements
- Current Significant Activities
- Future Objectives

# Program Status

## Since Last Year....

- V2.9 was released
- New Security Access
- Gov Plant Pipeline Monitoring
- Automated Ullage Implementation
- ODESS Program Implementation

# 2017

- Private Pipeline Monitoring
- New Customers/More Customer Service
- ODESS Implementation
- BOEM Dredge Intensity Model
- Dev
  - V2.9, V3.0, Portal, ACS, Desktop tools, Management Tools

# More 2017

- Technical Advancements
  - Cloud, Machine Learning, OSIsoft
- Personnel Changes
- Alaska Analysis
- Hopper Dredge Utilization Study
- DQM, DIS and RMS
- Revising Specs for Non-Nuclear Density Meters

# New V2.9 DQM Viewer

# 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
- Pilot Monitoring USACE Dredging Plants in Summer 2015
- Industry Spec Versions (Currently Recent Addressing Comments)
- March 2016 Headquarters Directed DQM to Implement monitoring on >18”

# 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

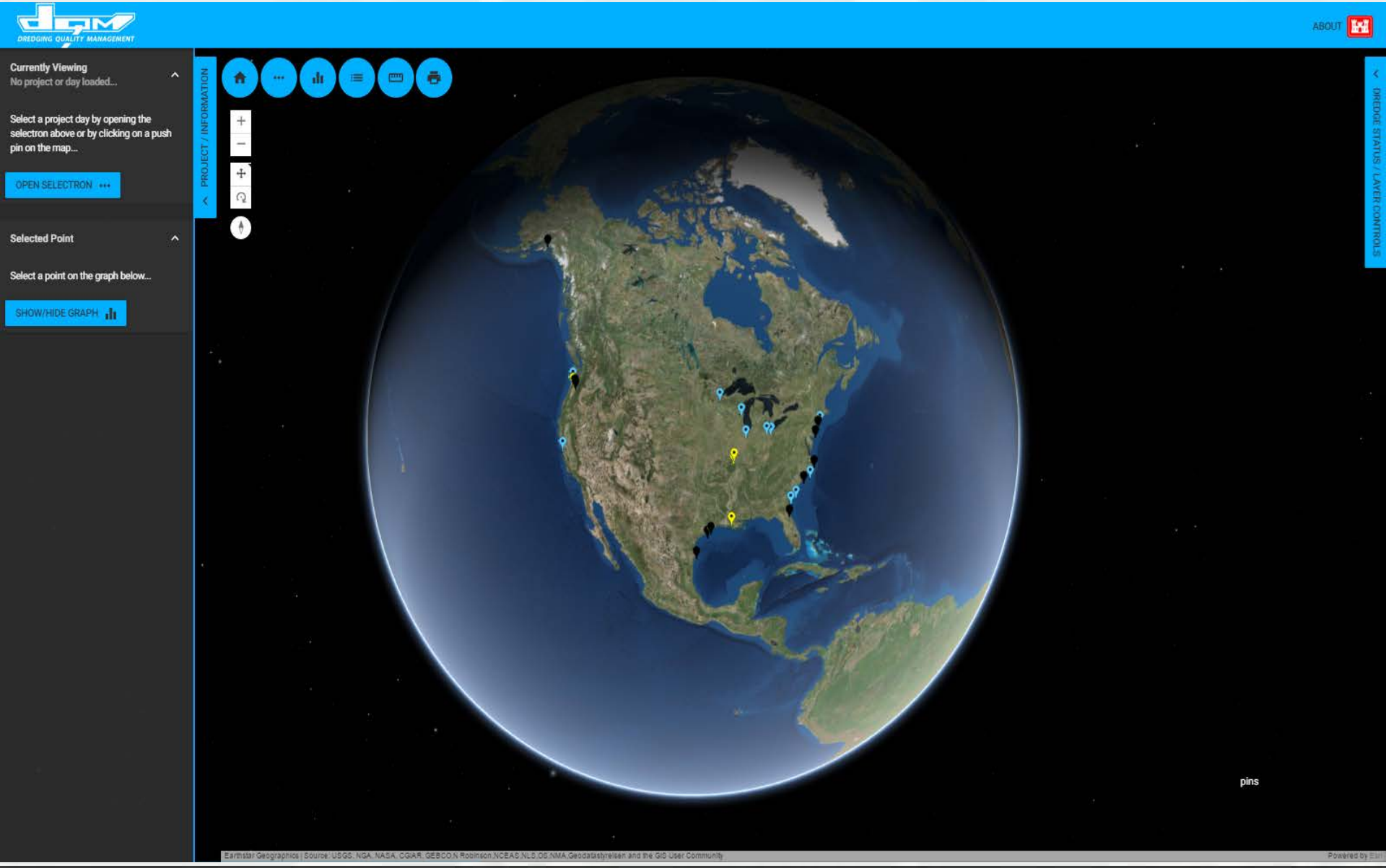
**Notes**

***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)

# New DQM Pipeline Viewer



## 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 |

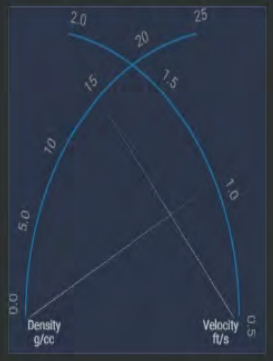
PREV NEXT

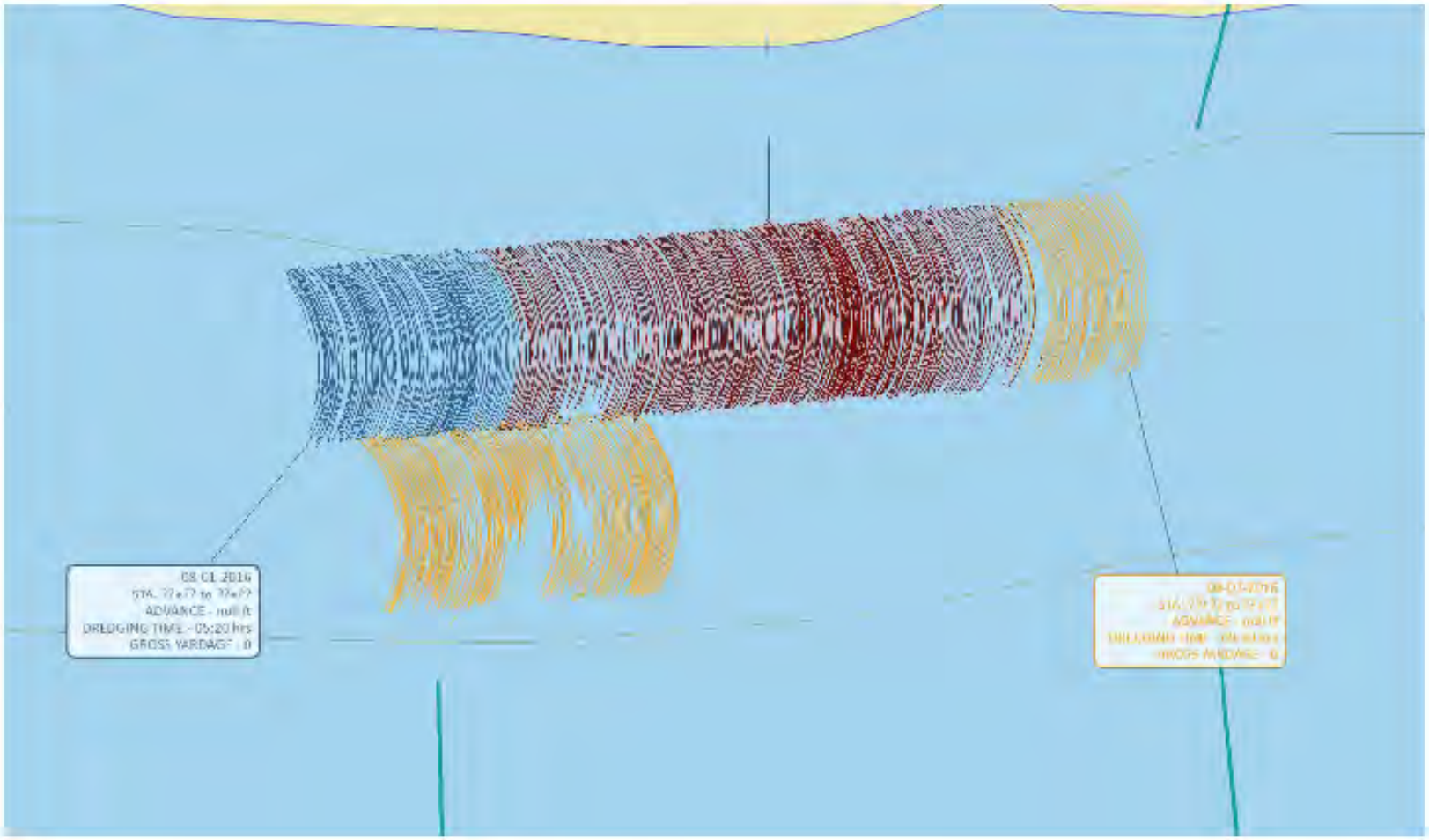
## Selected Point

| | |
|---|---|
| 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 |


## Dredge Status

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





08.01.2016
STA. 77+77 to 77+77
ADVANCE - null ft
DREDGING TIME - 05:20 hrs
GROSS YARDAGE - 0

NATIONAL DREDGING QUALITY MANAGEMENT

DQM

DESS

Operations & Dredging Endangered Species System

# Overview

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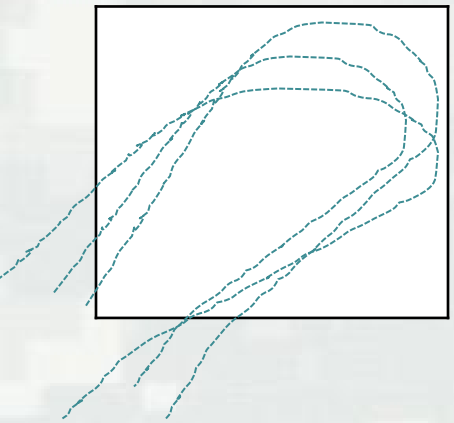
# Dredge Intensity Model

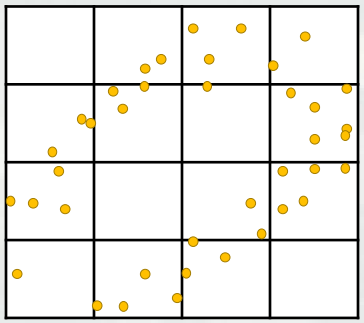
- ✓ Software tool which takes the results of the mathematical model and creates products compatible with prominent GIS applications
- ✓ Vessel transit tracks delineating areas of high traffic use
- ✓ Generation of relevant geospatial metadata for the product including processing history sections

# Data Transformation

Plant's Path



GPS Locations



Time Per-Cell

| | | | |
|---|---|---|---|
| 0 | 20 | 30 | 20 |
| 30 | 30 | 10 | 60 |
| 40 | 0 | 20 | 50 |
| 10 | 40 | 30 | 0 |

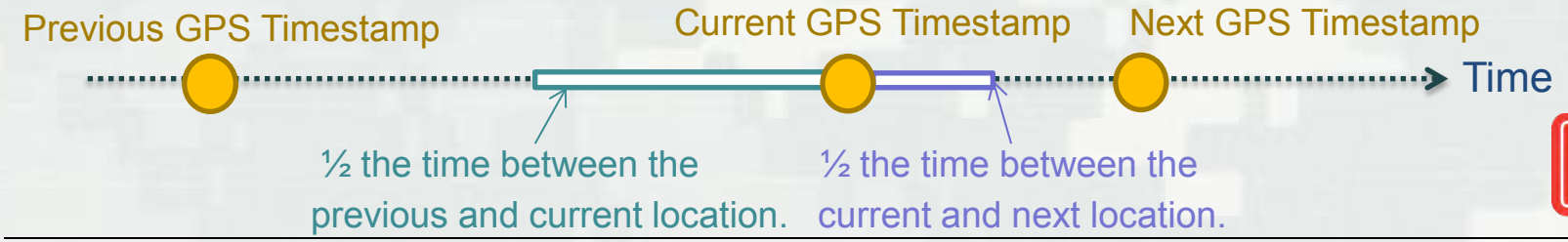
(Intensity)

Normalized Time Per-Cell

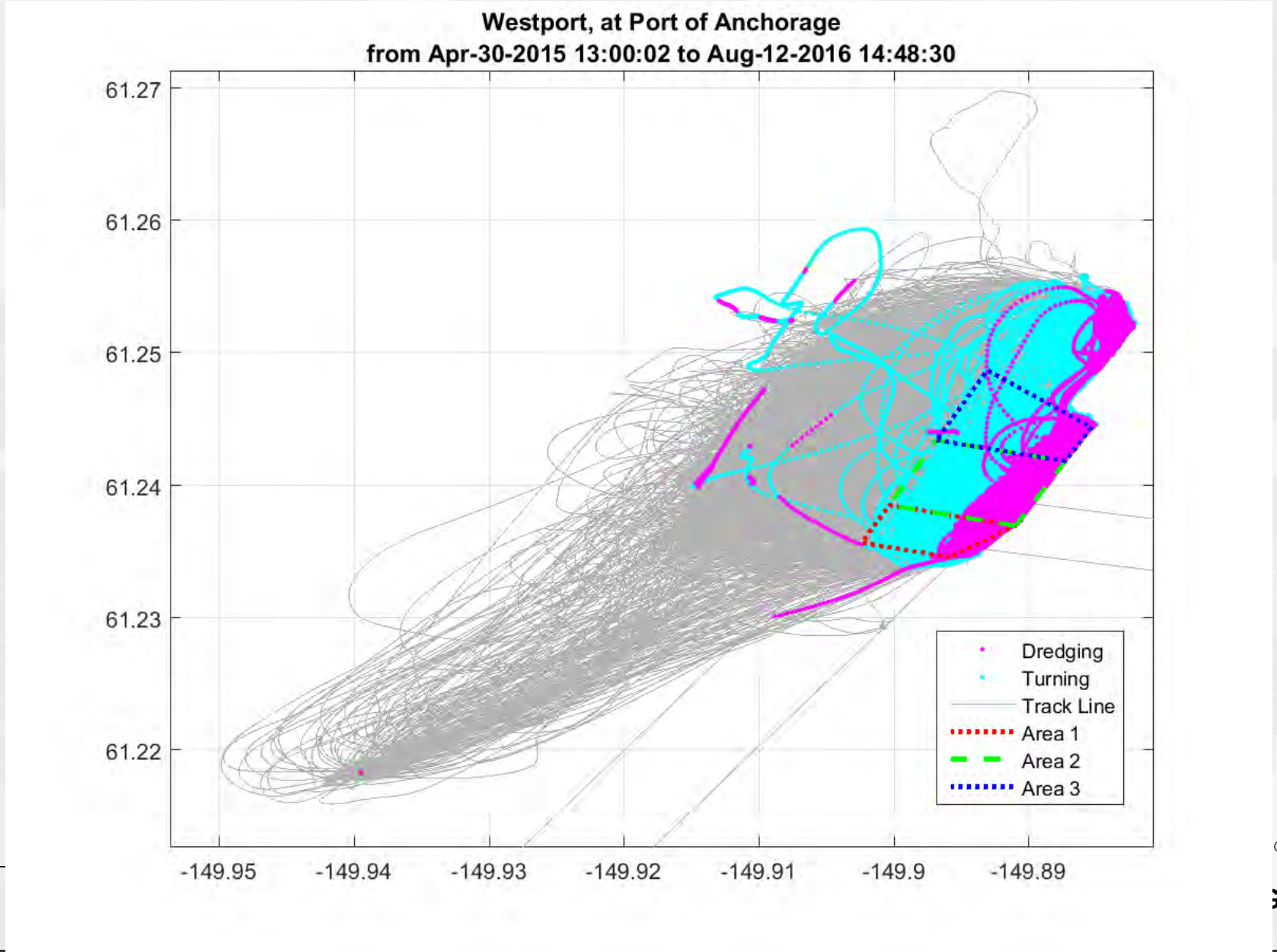
| | | | |
|---|---|---|---|
| 0 | .032 | .048 | .032 |
| .048 | .048 | .016 | .096 |
| .064 | 0 | .032 | .08 |
| .016 | .064 | .048 | 0 |

(Exposure)

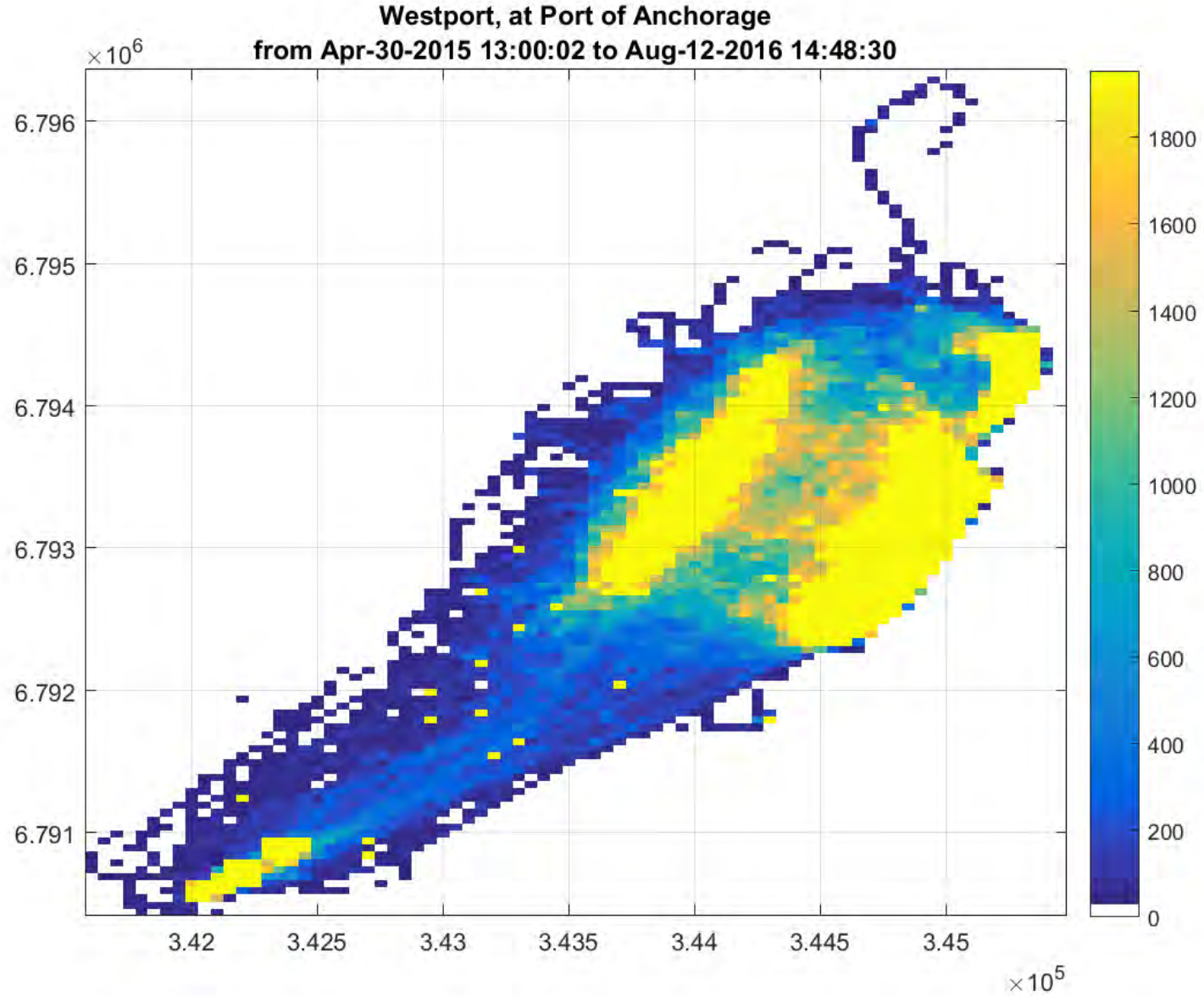
- Time spent at each location is calculated
- GPS locations are converted to UTM, and a grid is constructed
- Time per-location is accumulated within cells of a grid
- Values are normalized based on the cell size, final units are seconds per meter squared.



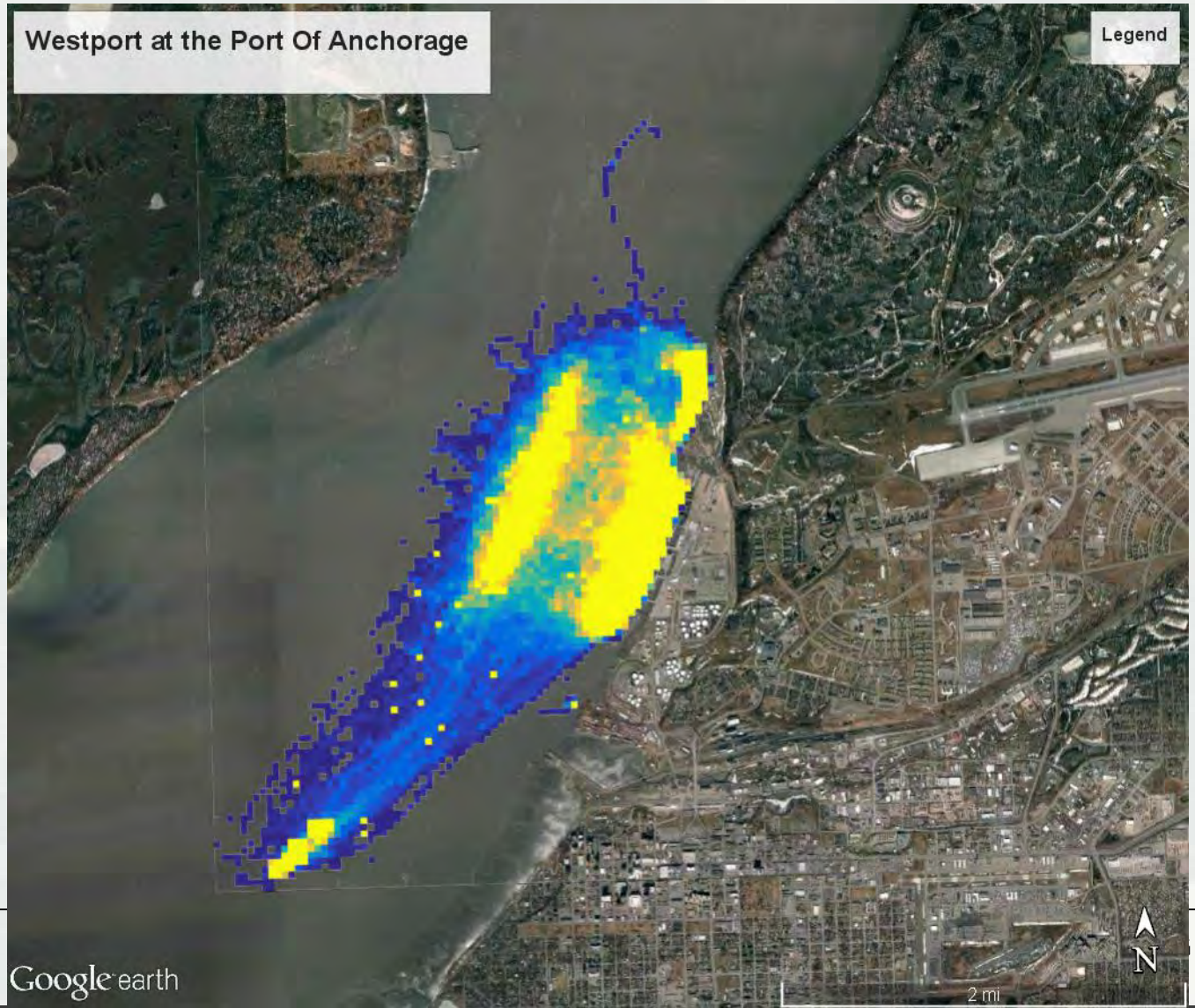
# Westport Tracks & Dredging



# Westport Heat Map



# Google Earth Overlay

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# New DQM Portal

# Question/Comments?

NATIONAL DREDGING QUALITY MANAGEMENT

DQM

# 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.


http://dqm.usace.army.mil

1-877-840-8024