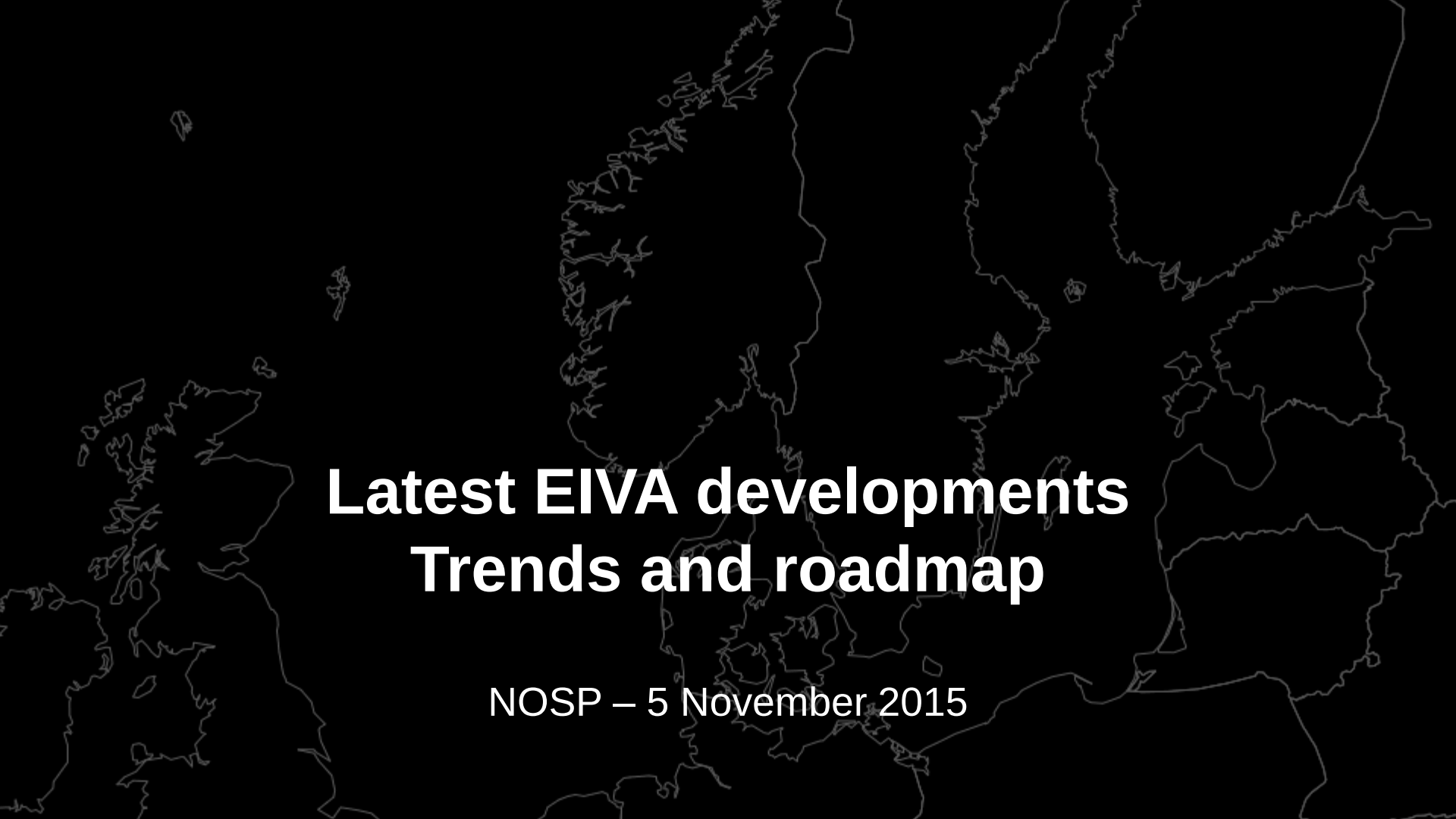


Latest EIVA developments
Trends and roadmap

NOSP – 5 November 2015

Speaker – Ole Kristensen

- Software manager @ EIVA
- Has been with EIVA for 22 years
- Initially, developer of the first NaviScan back in 1993
- Lead programmer in NaviPac since 1997
- Head of software department since 2000
- Master of Science, Computer Science

EIVA
MARINE SURVEY SOLUTIONS

Software

Integrated system solutions

Equipment

Rental

24/7 support

Training

Optimising the businesses
of offshore professionals

EIVA
MARINE SURVEY SOLUTIONS
Headquartered in Denmark • Sales offices in Bremen and Singapore
Founded in 1978 • Privately owned
Financially strong • ISO 9001-certified

Company update

EIVA is doing well – despite the oil & gas recession

- 2014 was not as busy as expected
- 2015 is looking busier than 2014
- EIVA has continued to increase its investment in product development, organisation and competences

We are following an overall strategy:

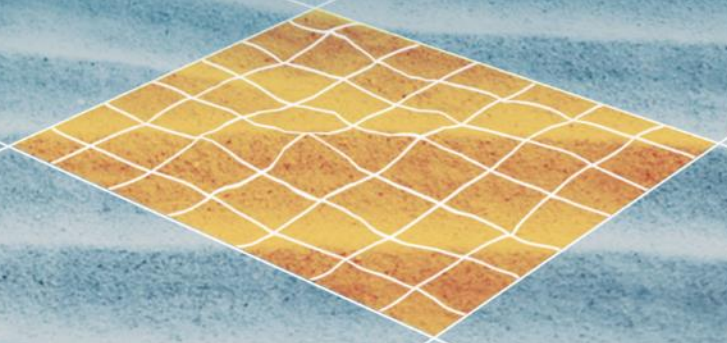
‘High-end **products provider** to marine segments’

We are currently focused on **international presence and growth** and **product portfolio expansion**.

NAVISUITE

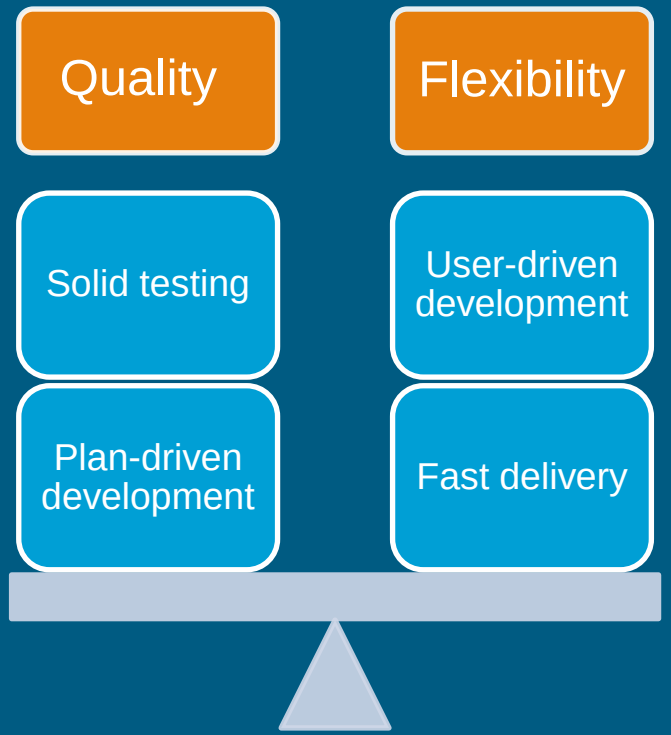
Let’s look at the EIVA solution

- NaviSuite – The name of the entire family
- NaviSuite Nardoa is a name of a specific solution – eg pipeline inspection
- NaviPac is the name of a specific product



Balancing the impossible

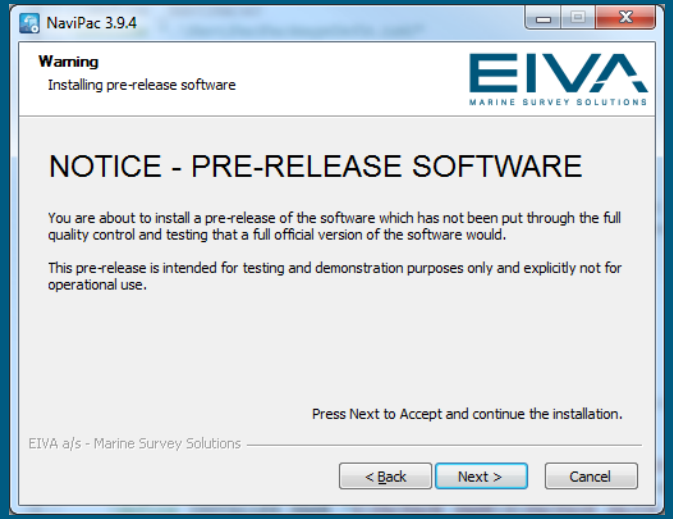
- Most of you want fully tested software
- Most of you want new instruments supported **now**
- Nobody likes frequent updates to vessel installations
- Many of you like being involved when we develop new features
- Many of you are involved in testing of new releases (thank you!)
- A lot of you use non-official versions



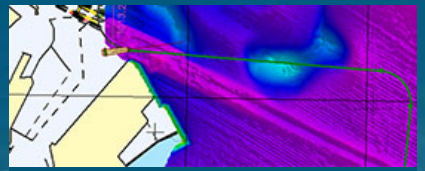
Three different version types

- **Internal (marked INTERNAL)**
  - Straight from the development group and only gets outside to persons involved in the development. You got them from EIVA's development team or from someone who got them from us ... use at your own risk, no real testing has been performed.
  - eg 3.9.7 INTERNAL (don't try to understand the number).
- **Release candidate (marked RC)**
  - Once we start testing for a release, we make RCs available for beta testing – these can be found in a special section on our download site.
  - eg 3.9 RC 4 (the fourth candidate before 3.9).
- **Official release**
  - eg 3.9

- **The type of version is very clear both when you download and install the software**



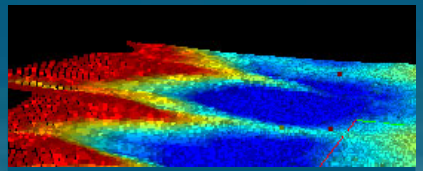
There are several NaviSuite product options



NaviPac 3.10

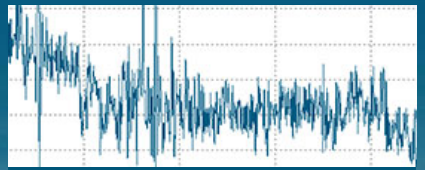
NaviPac Lite
NaviPac Plus
NaviPac Single User
NaviPac Pro

Optional extras
- Catenary
- Barge
- Tug
- Cable lay



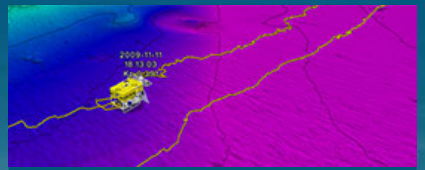
NaviScan 9

NaviScan



NaviEdit 8

NaviEdit Lite
NaviEdit Pro

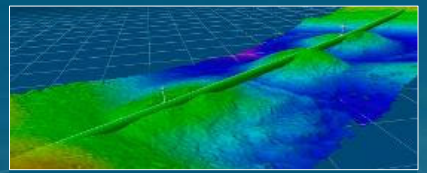


NaviModel 4

NaviModel Free Viewer
NaviModel Analyser
NaviModel Producer

Optional extras
- S-CAN
- 3D pipe

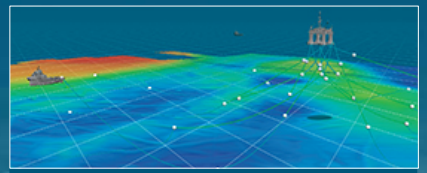
… some of which we have collected in bundles



NaviSuite Nardoa

Advanced 3D pipeline and cable inspection

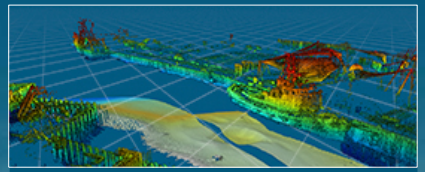
- NaviPac Pro
- NaviScan
- NaviEdit Pro
- NaviModel Producer with 3D pipe & S-CAN optional extras
- NaviPlot



NaviSuite Beka

Anchor handling operation with advanced catenary simulation

- NaviPac Pro with Barge & Catenary optional extras
- Small licence for tugs



NaviSuite Kuda

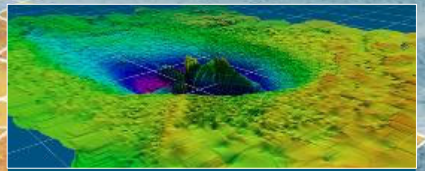
Shallow water surveys

Acquisition
- NaviPac Single User
- NaviScan

Acquistion & post-processing
- NaviPac Single User
- NaviScan
- NaviEdit
- NaviModel Producer

NaviSuite Uca

Excavator 3D display

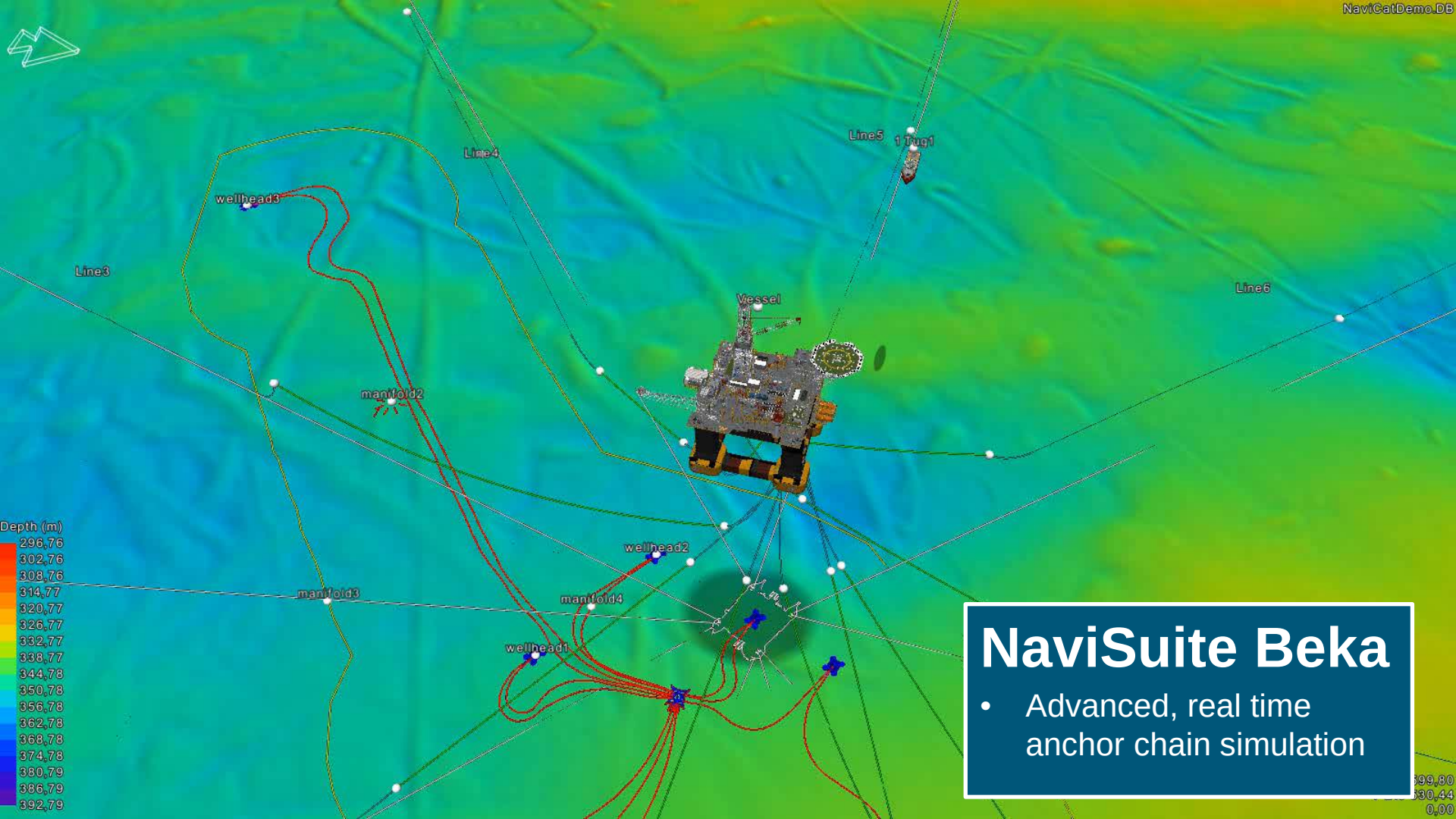


NaviSuite Edulis

Permanent monitoring

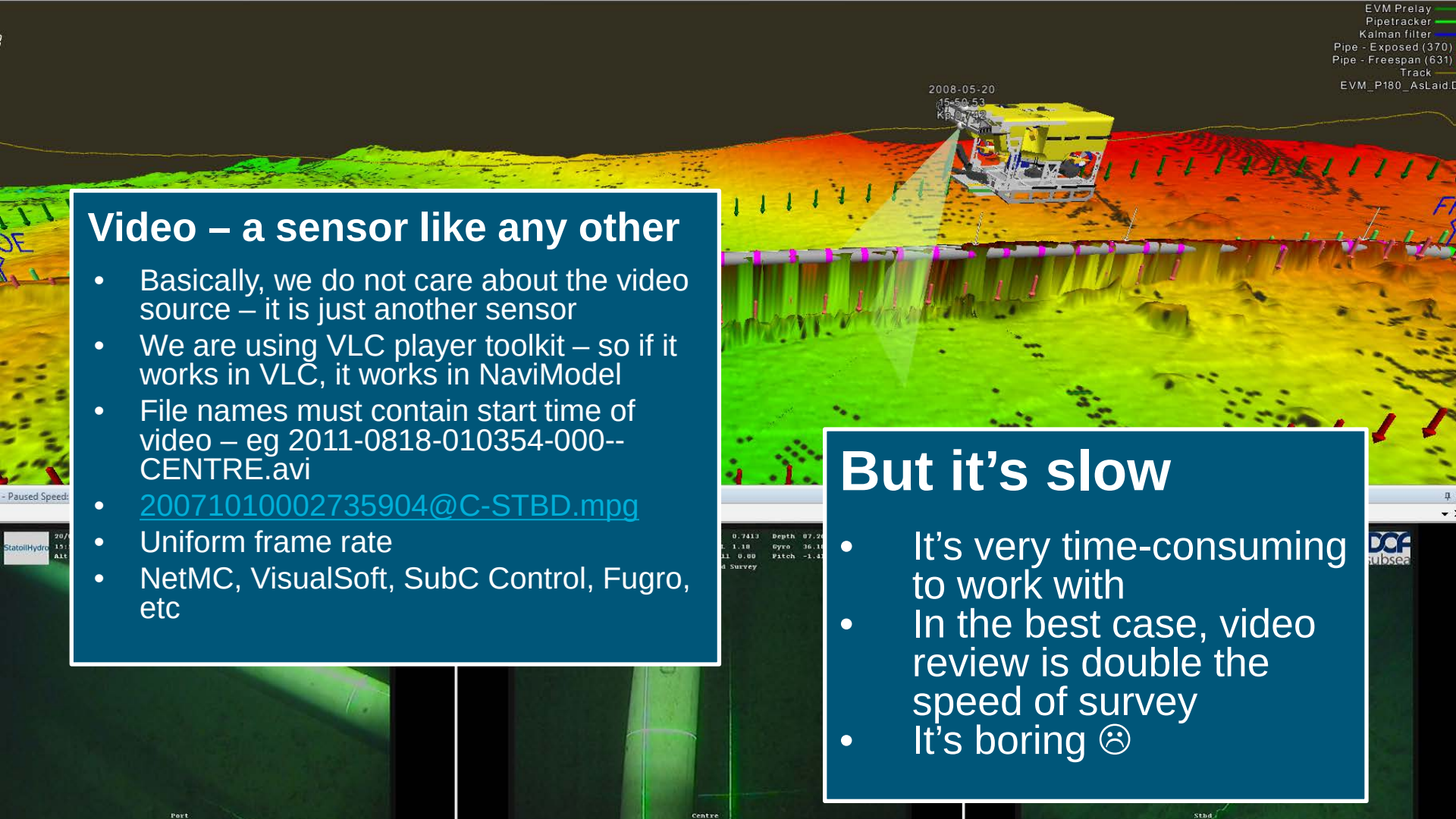
Some new features

- NaviSuite Beka
  Advanced anchor chain simulation – planning and real time
- Video and still photo
  The link between data and video
- Laser – Lidar and subsea for mapping
- Laser for navigation
- eLearning



NaviSuite Beka

- Advanced, real time anchor chain simulation

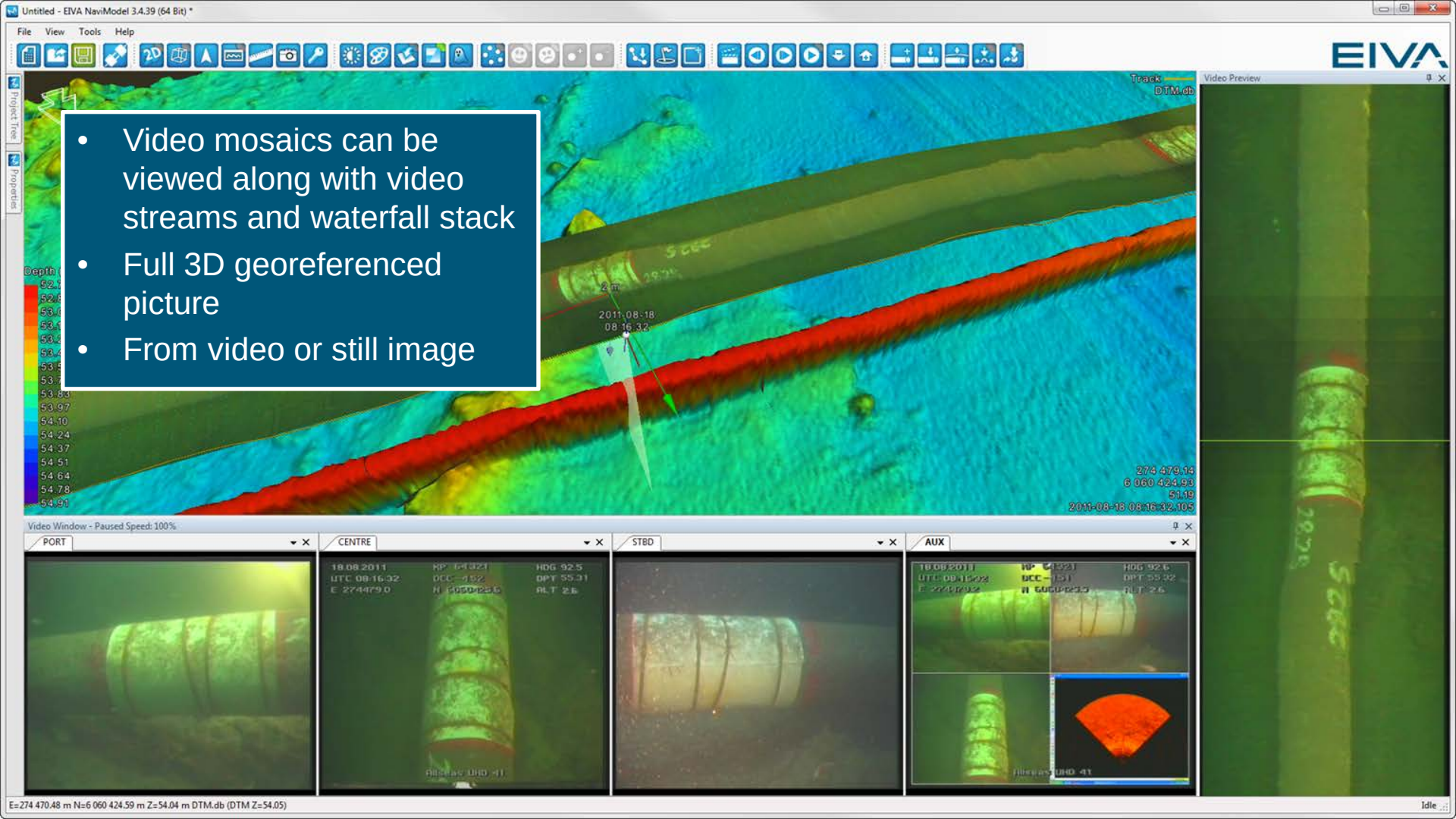


Video – a sensor like any other

- Basically, we do not care about the video source – it is just another sensor
- We are using VLC player toolkit – so if it works in VLC, it works in NaviModel
- File names must contain start time of video – eg 2011-0818-010354-000--CENTRE.avi
- 20071010002735904@C-STBD.mpg
- Uniform frame rate
- NetMC, VisualSoft, SubC Control, Fugro, etc

But it's slow

- It's very time-consuming to work with
- In the best case, video review is double the speed of survey
- It's boring ☹

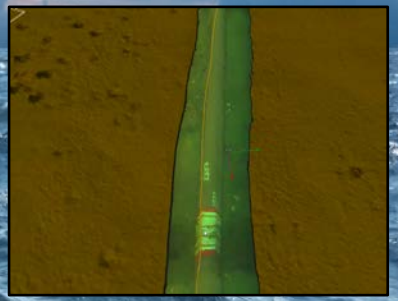


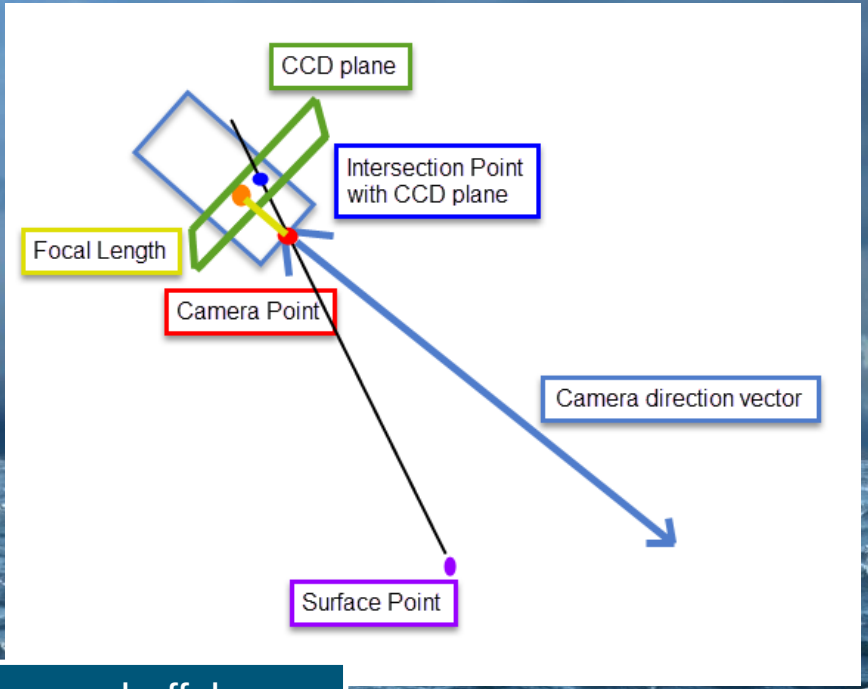
- Video mosaics can be viewed along with video streams and waterfall stack
- Full 3D georeferenced picture
- From video or still image

Full 3D georeferenced picture

Need to know a lot about:

- Camera mounting
- Camera characteristics
- Accurate positioning in 3D





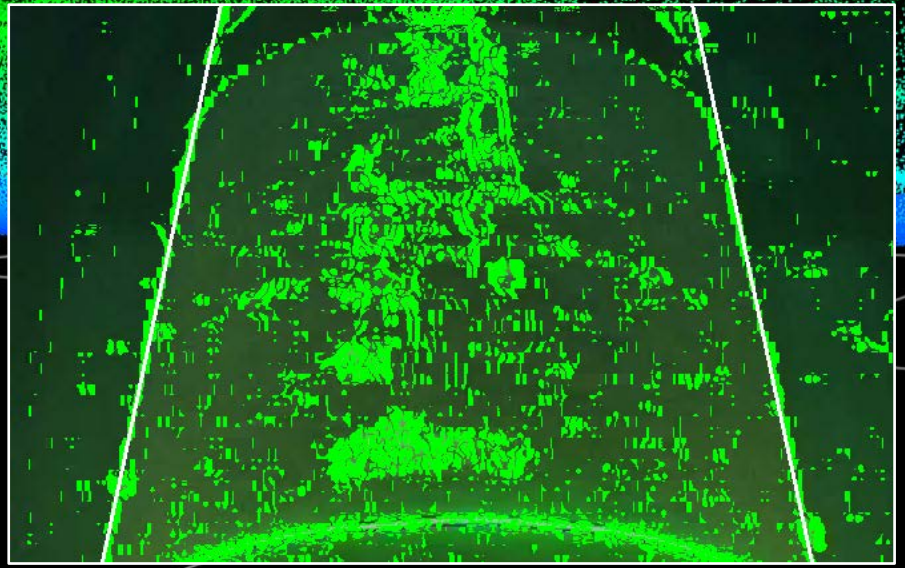
Very difficult in a real offshore environment

Edge detection

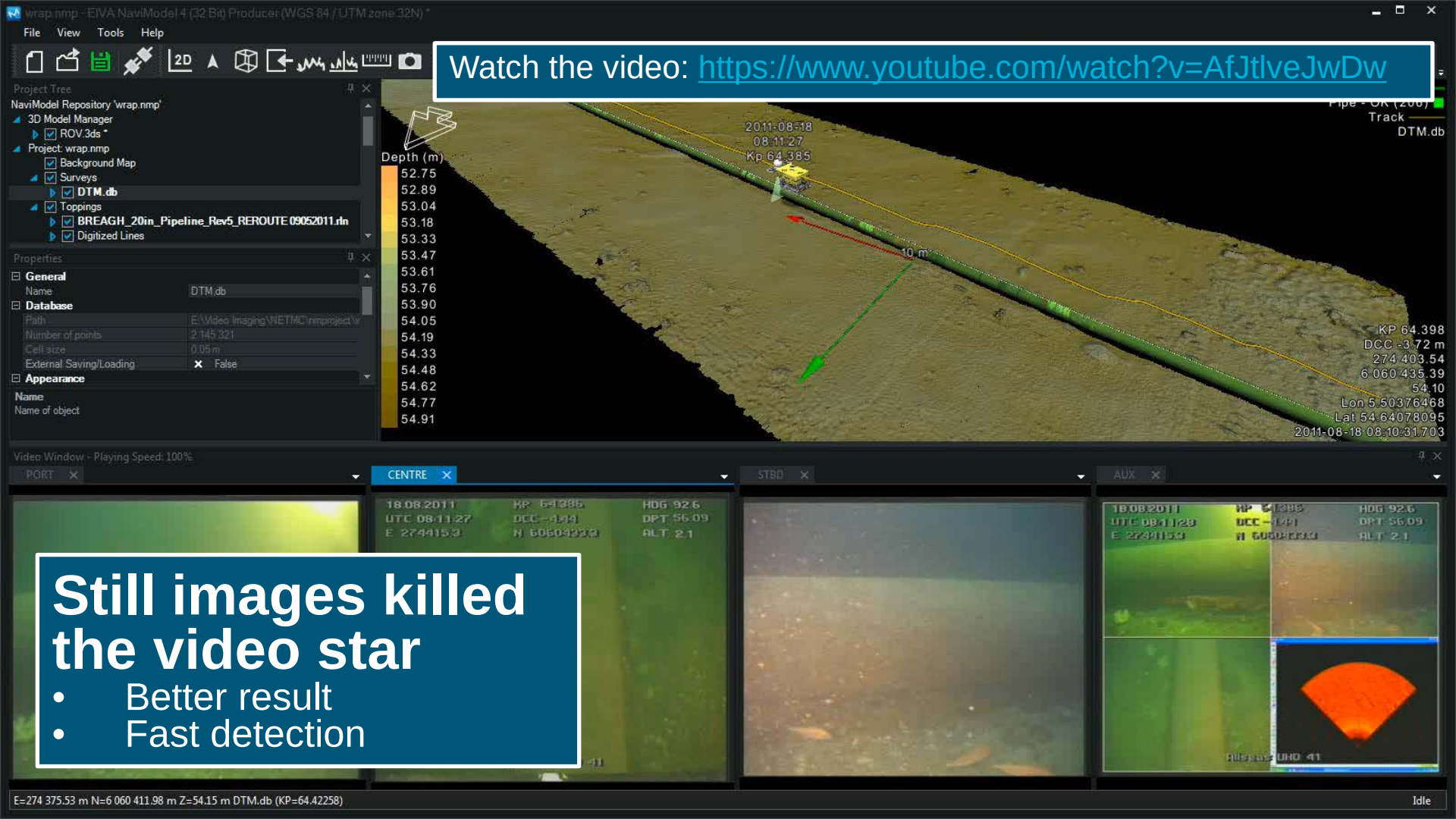
- The software uses ‘edge detection’ to find the pipe in the individual video frame. Using the edges, the software can stretch the image to match the pipe diameter.
- Edge detection is a scoring of significant differences in the picture – and thus finding lines in those

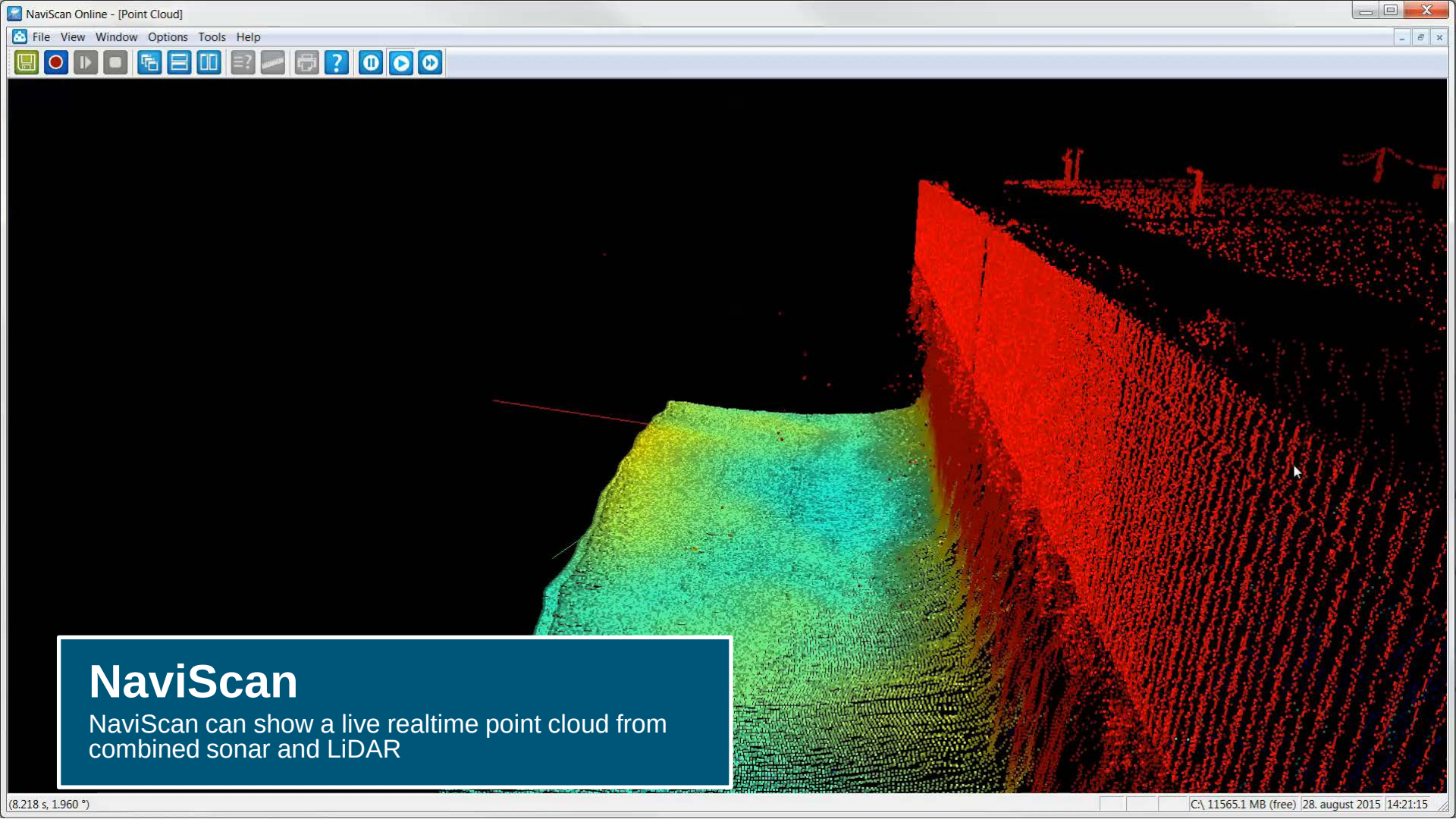
Edges

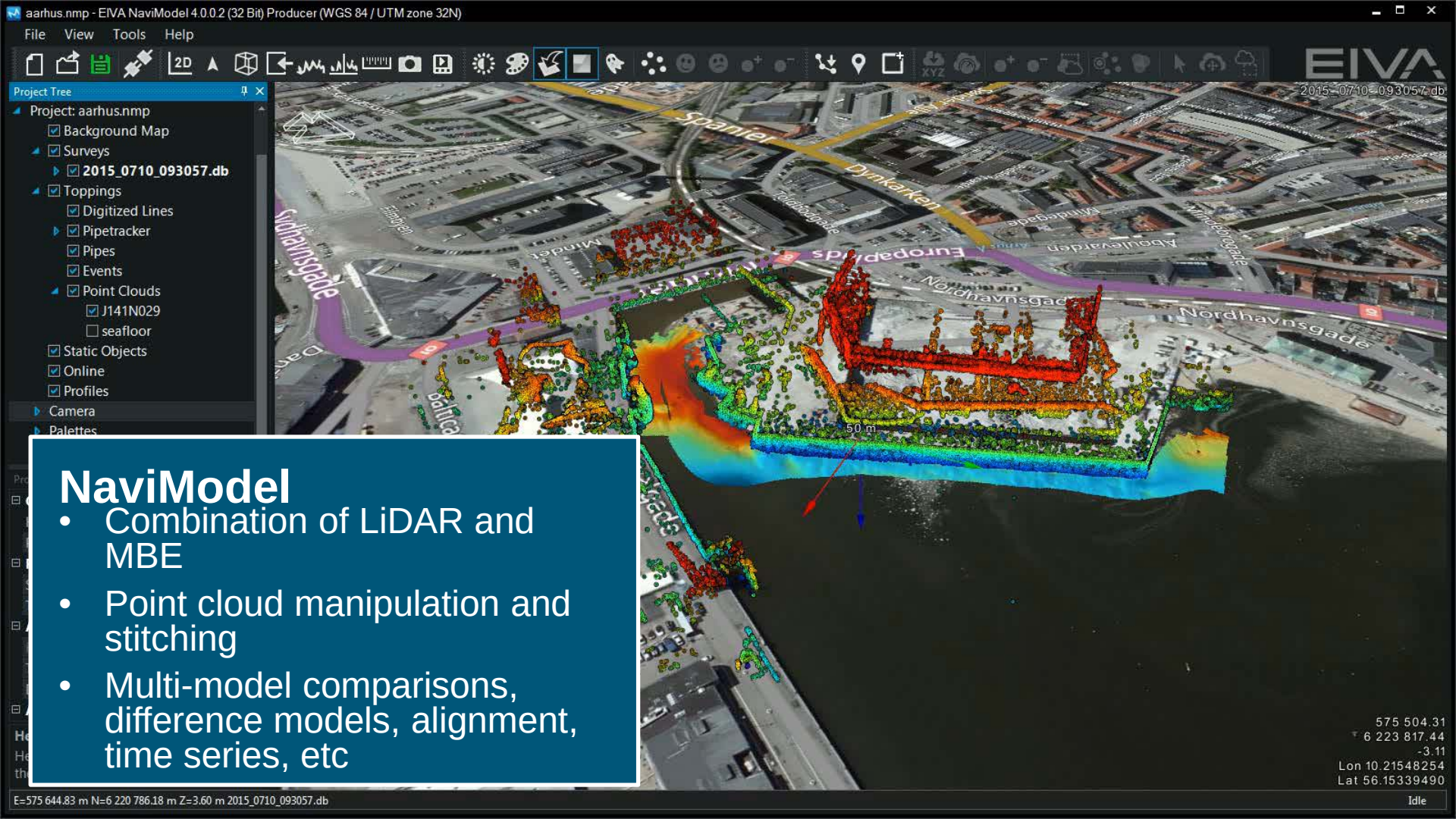
Raw video frame



Same frame with edge detection in NaviModel


Watch the video: https://www.youtube.com/watch?v=AfJtlveJwDw
Still images killed the video star
• Better result
• Fast detection


NaviScan Online - [Point Cloud]
File View Window Options Tools Help
NaviScan
NaviScan can show a live realtime point cloud from combined sonar and LiDAR
(8.218 s, 1.960 °)
C:\ 11565.1 MB (free)
28. august 2015
14:21:15



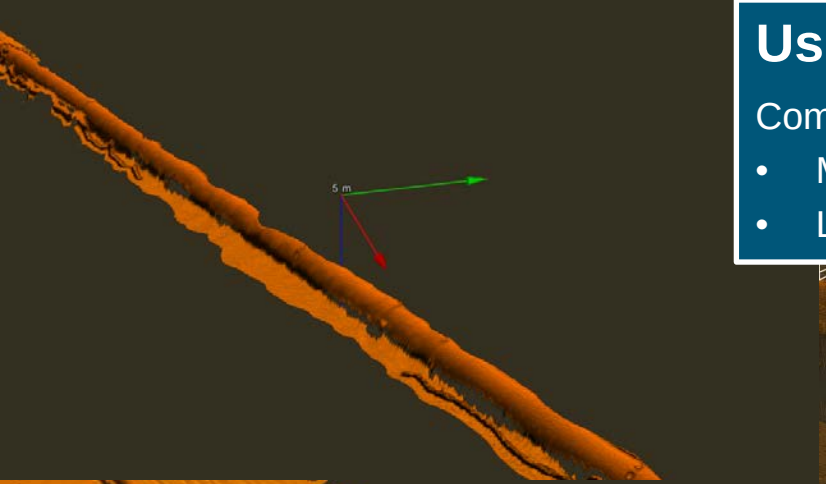
NaviModel

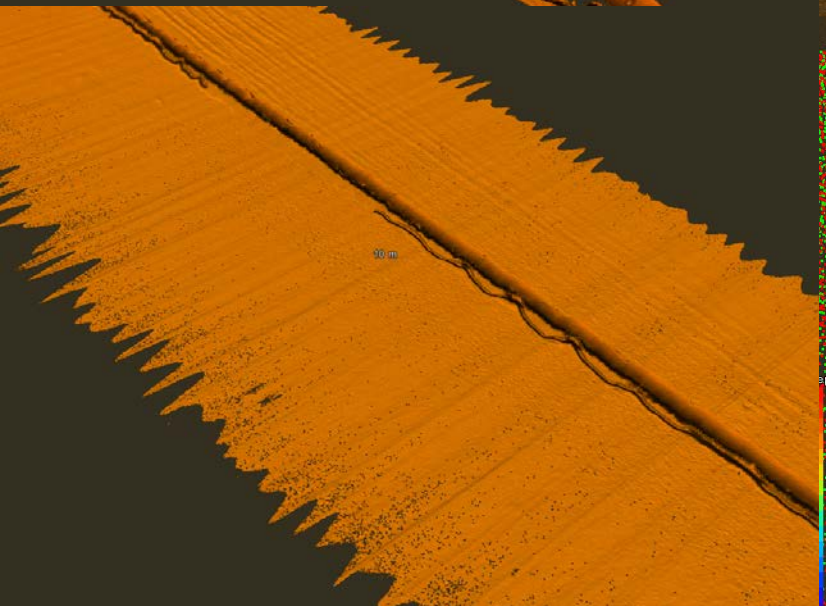
- Combination of LiDAR and MBE
- Point cloud manipulation and stitching
- Multi-model comparisons, difference models, alignment, time series, etc

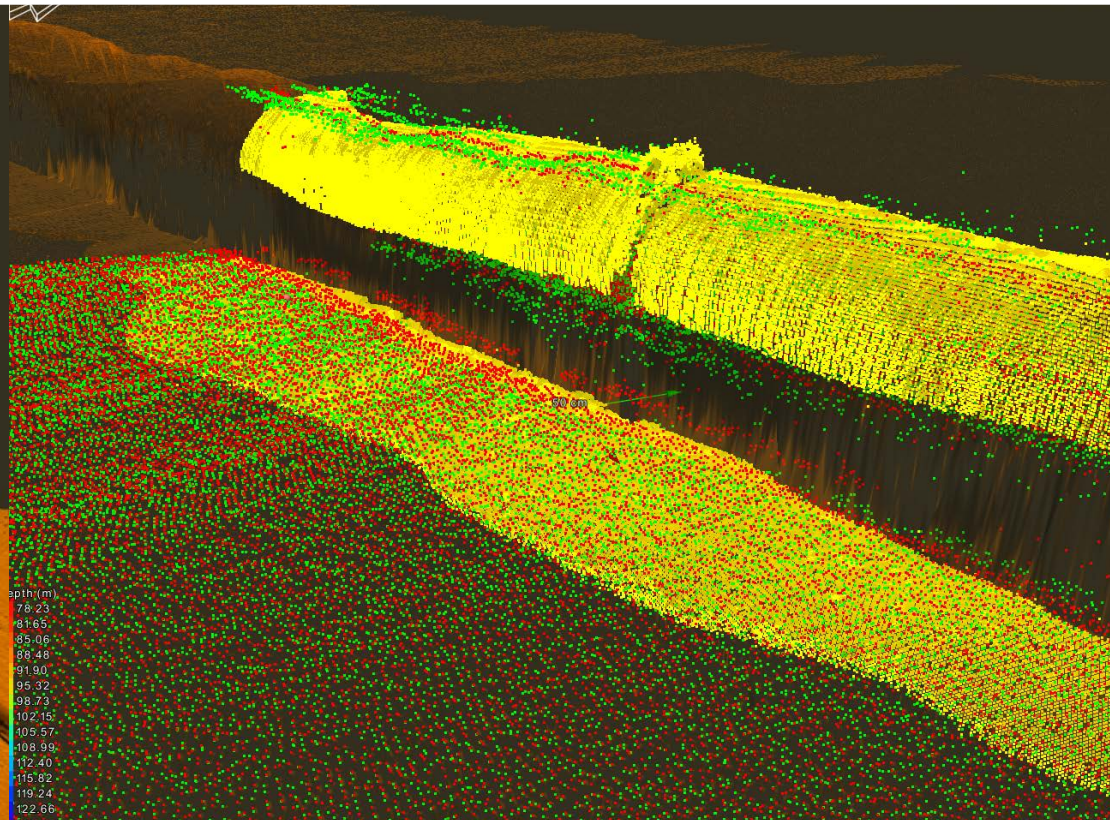
Use of subsea lasers

Combining multiple sensors: 2G Robotics or CatHX

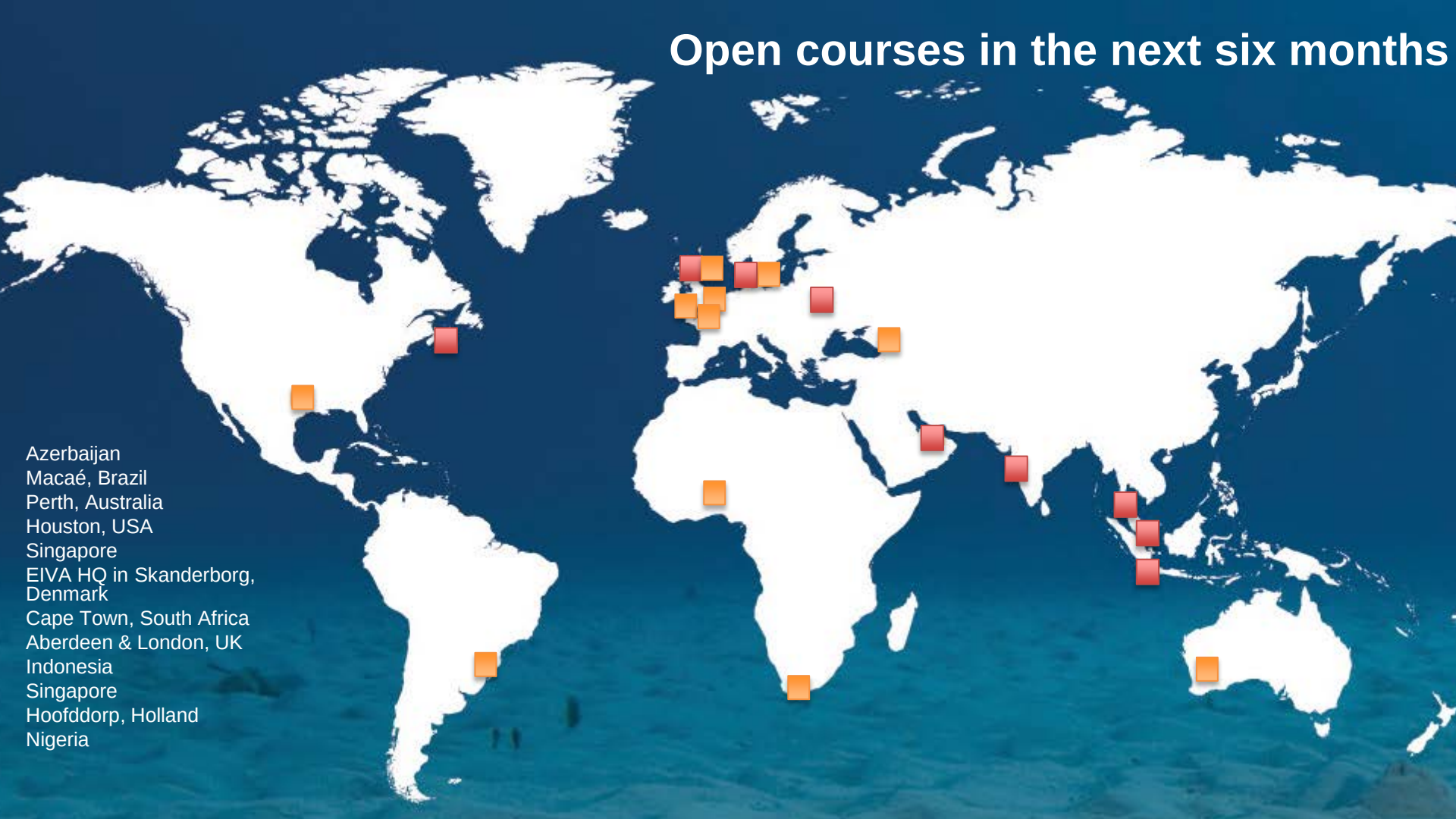
- MBE for coverage
- Laser for details





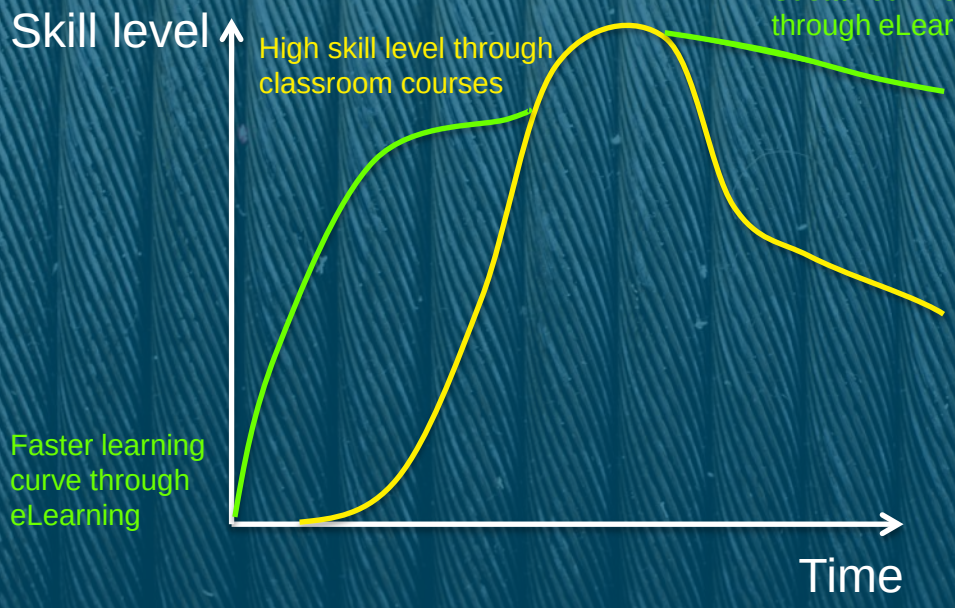


Open courses in the next six months



Azerbaijan
Macaé, Brazil
Perth, Australia
Houston, USA
Singapore
EIVA HQ in Skanderborg, Denmark
Cape Town, South Africa
Aberdeen & London, UK
Indonesia
Singapore
Hoofddorp, Holland
Nigeria

eLearning



eLearning is a supplement to class room training

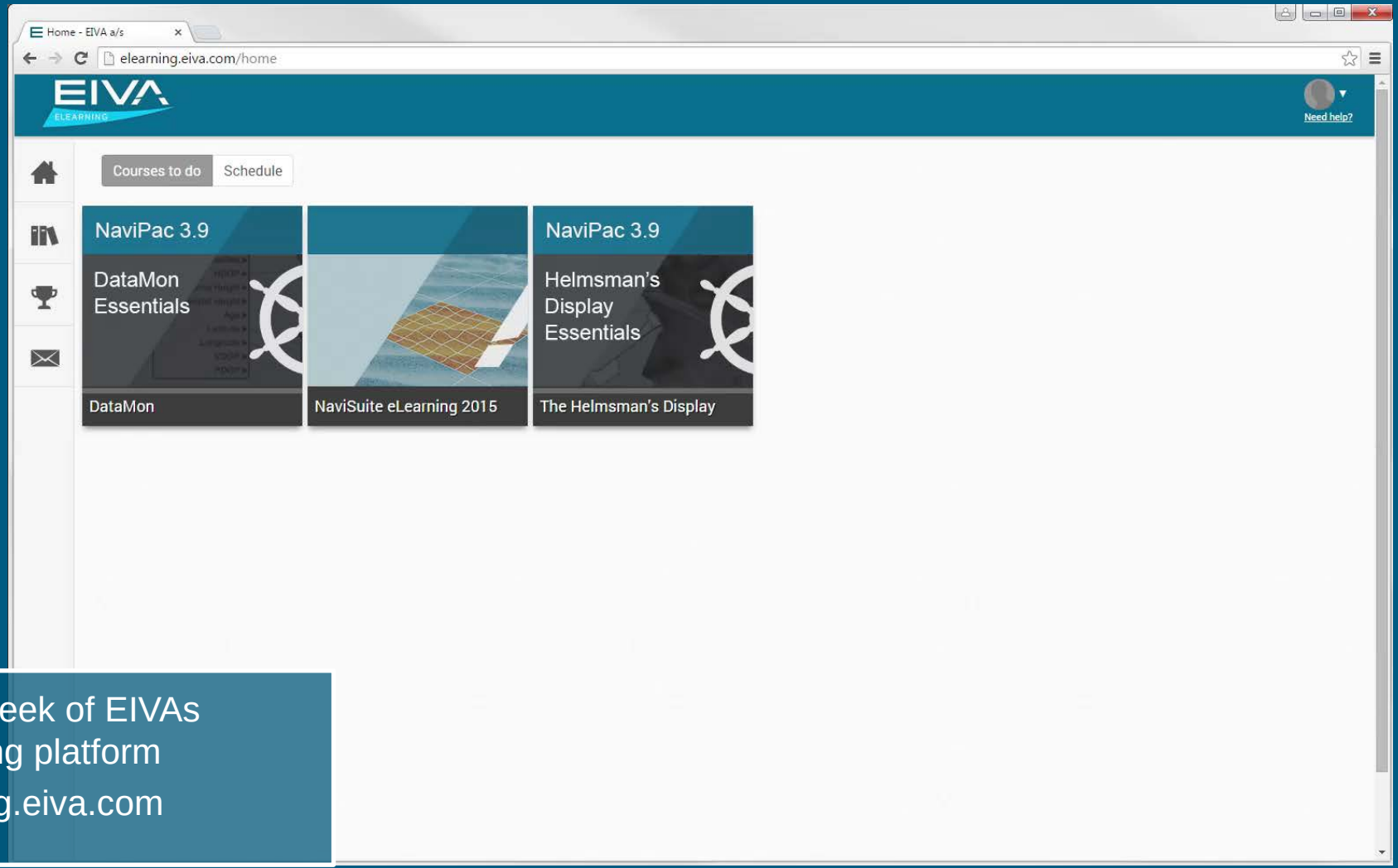
- Base skill level
- Train when you want
- Train in what you want

eLearning ensures that skills are kept up to date.

eLearning will become the foundation for getting on EIVAs class room courses

eLearning – How?

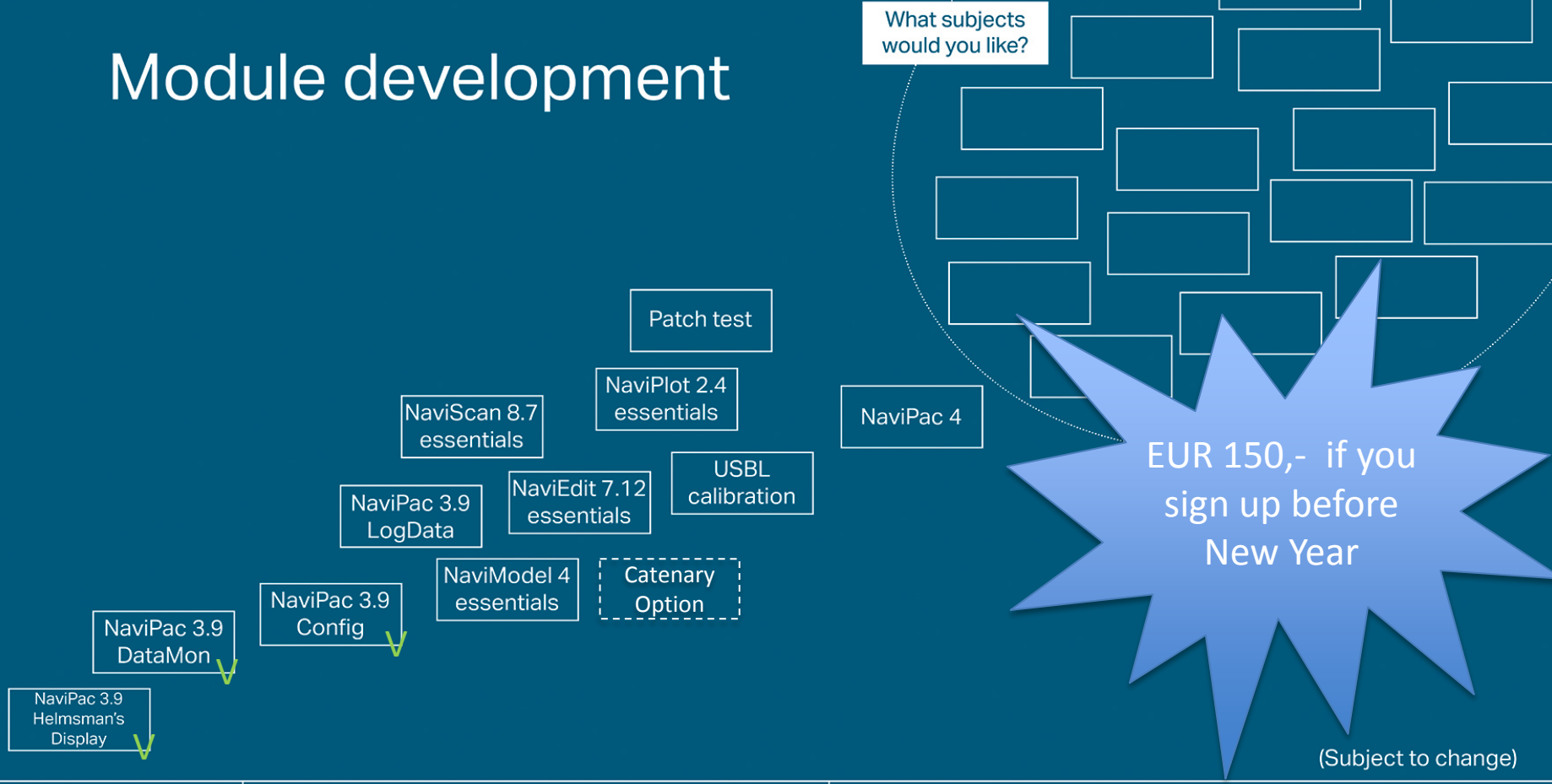
- It is internet based
  - Modules are completed online
  - Combination of tutorials, videos, animations, etc
  - Each module includes a test that is used to complete and pass the module
- It is personal
  - Individual login
  - Keep track of individual progress and results
  - Possibility to pause and resume
- It is a subscription
  - You sign up for a year at a time
  - EIVA will publish new modules and update existing modules as the software evolves



Sneak-peek of EIVAs eLearning platform

elearning.eiva.com

Module development



LIDAR Demo.nmp - EIVA NaviModel 4.0.1.2 Producer. *
File
View
Tools
Help
EIVA
FRAME 42262
FPS 60.0
Project Tree
NaviModel Repository 'LIDAR Demo.nmp'
3D Model Manager
Project: LIDAR Demo.nmp
Background Map
Surveys
Toppings
Digitized Lines
Pipetracker
Pipes
Events
Waypoints
Online
Lidar Online Point Cloud
Profiles
Camera
Palettes
Color modes
Properties
Misc
Path
5 m
LiDAR navigation
NaviPac 4 includes easy use of LiDAR for relative positioning
Path
Path of the project file
0,00
0,00
0,00
Idle

Q3/4 – 2015

- NaviPac 3.10
- NaviModel 4
- NaviScan 9
- NaviEdit 8
- NaviSuite Kuda Single User

- New NaviScan drivers
  - Velodyne
  - Kongsberg GeoSwath
- Hot fixes?

- NaviCat – new version of Beka

- ß version of the **Helmsman's Display** is ready if you want to try it out

- ß version of the configuration program will be avaialable in Q4

NaviPac 4.0

- New **Helmsman's Display**
  - Multiple 2D/3D
  - Many more remotes
  - Integrated **DataMon** views
  - Unmatched, ultra-high performance

- New simplified configuration
  - New user interface
  - Multiple, advanced subsea objects
  - Auto-discovery of equipment

- New Tile Server
  - High performance overlays
  - CAD, ortophoto, navigation charts

- ETA: OI 2016 London – March

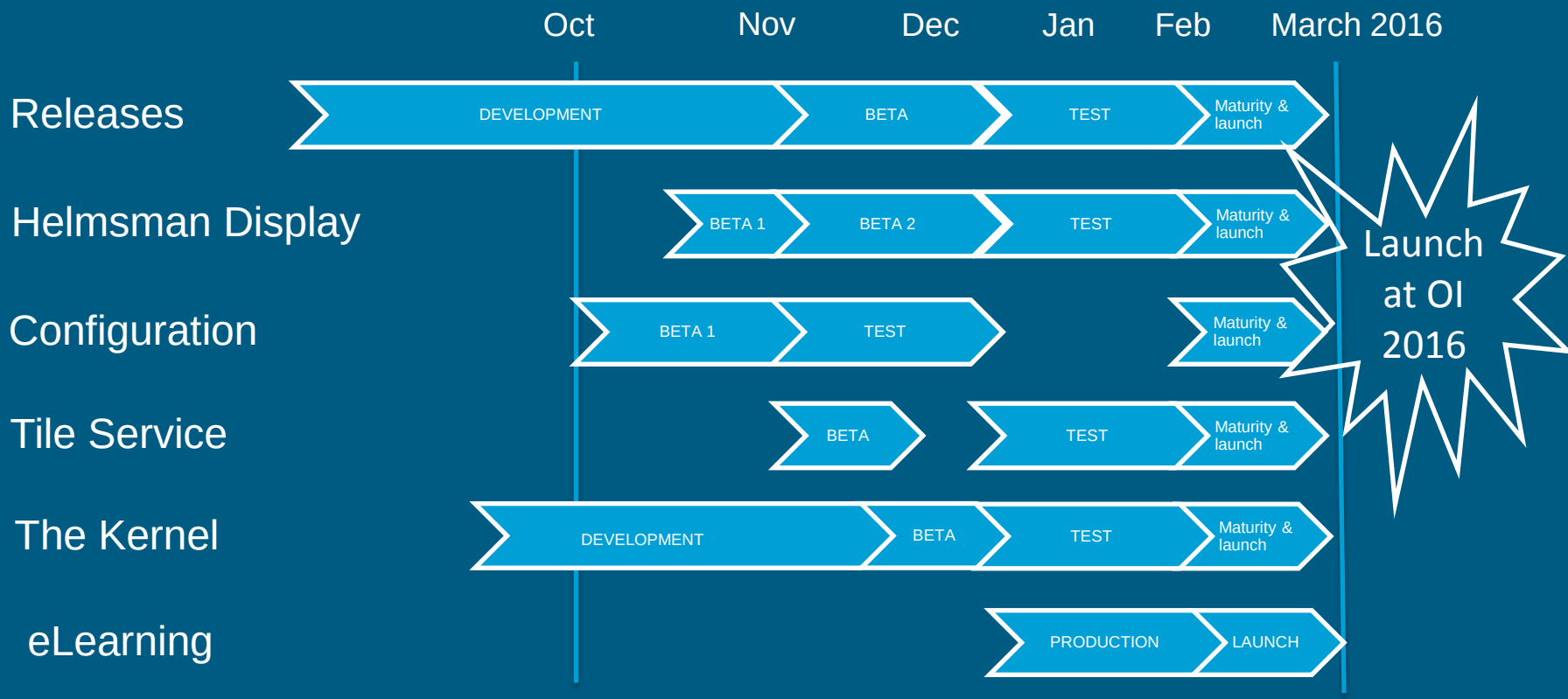
NaviPac 4.x

- New recording, new formats, concepts, etc

- New tug/barge user interface

- (And a lot of other very secret stuff ;-))

NaviPac 4 release plan



Background

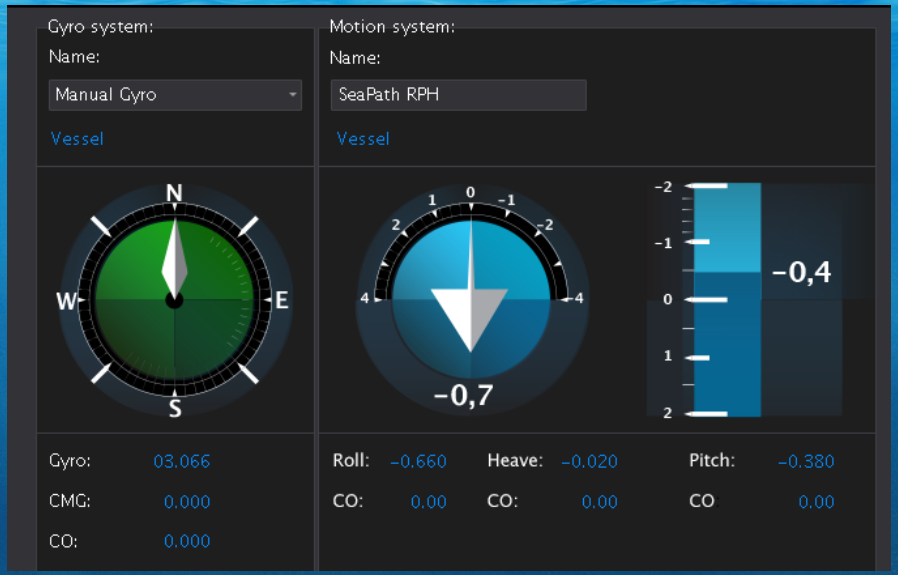
- The ‘modern version’ of NaviPac was born in 1997 – based on code structure from a Sun Sparc UNIX version from 1994
- We call it generation 3
- The main structure has proven to be a stable and long-term base for new developments
  - GUI and kernel separated (Date/View)
  - Modular design
  - Network-based client/server
  - Scalable (Lite/Plus/Pro/TMS)

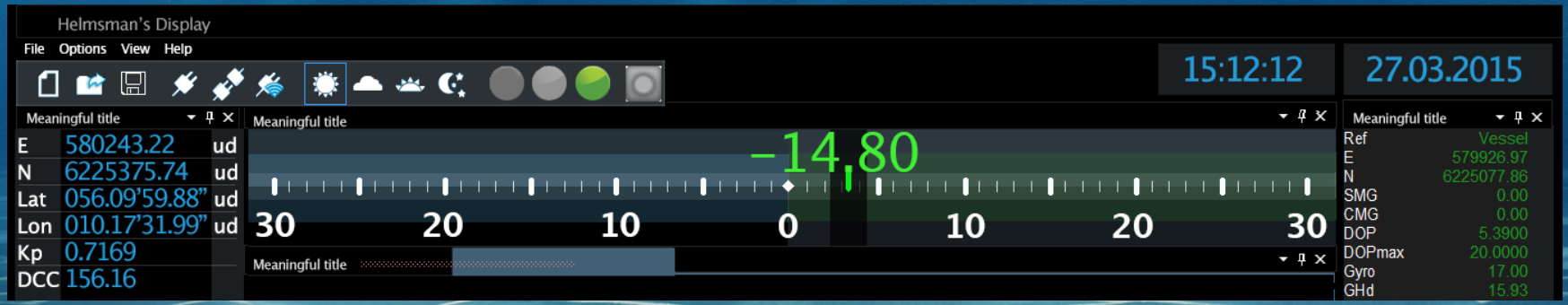
Usability and new looks

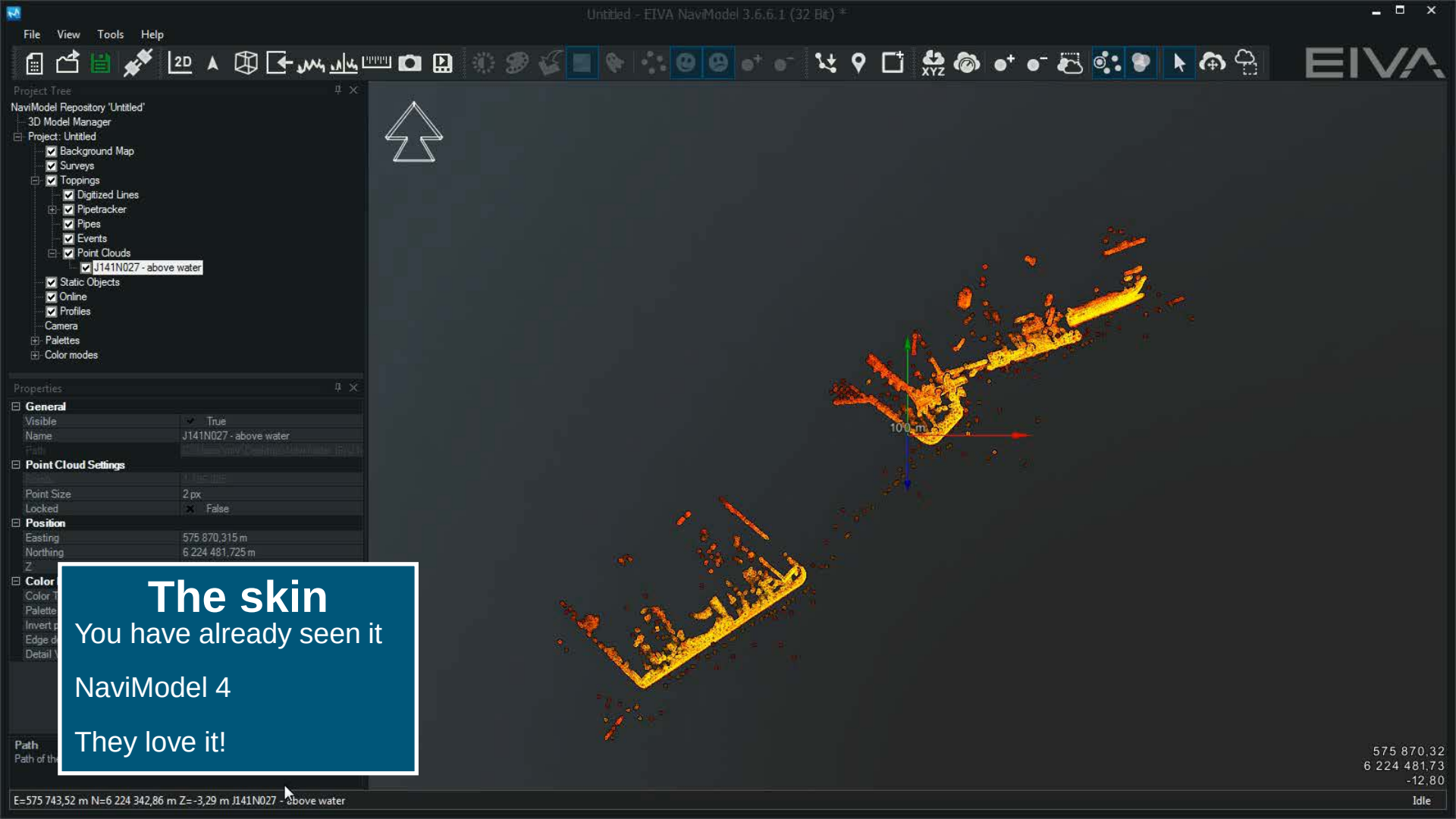
NaviPac 4

New generation – New looks

- Two skins
  - Windows (NaviPac 3.9 style)
  - Dark grey – modern and easy on the operator's eye
- Same icons – better usage
- Night vision
- New design of all graphical elements






Untitled - EIVA NaviModel 3.6.6.1 (32 Bit) *
File View Tools Help
EIVA
Project Tree
NaviModel Repository 'Untitled'
3D Model Manager
Project: Untitled
Background Map
Surveys
Toppings
Digitized Lines
Pipetracker
Pipes
Events
Point Clouds
J141N027 - above water
Static Objects
Online
Profiles
Camera
Palettes
Color modes
Properties
General
Visible True
Name J141N027 - above water
Point Cloud Settings
Point Size 2 px
Locked False
Position
Easting 575 870,315 m
Northing 6 224 481,725 m
Z
The skin
You have already seen it
NaviModel 4
They love it!
100 m
575 870,32
6 224 481,73
-12,80
E=575 743,52 m N=6 224 342,86 m Z=-3,29 m J141N027 - above water
Idle

Technology

NaviPac 4

New technology

- Sharing functionality between NaviSuite modules
  - For EIVA, this means faster development due to shared components
- Microsoft .NET
  - New Windows technology requires .NET
  - Automated test
- Microsoft Windows
  - No dependency on Windows folders
  - Minimum Windows user rights
  - Many more remote Helmsman's Display instances

Easy, free and safe upgrade

- We have focused on making transition painless
- No loss of features compared to NaviPac 3.10
- NaviPac 4.0 will be made available as part of the SMS service
- NaviPac 4.0 will be backwards compatible
  - Configuration tool will work on NaviPac 3.10 configurations
  - **Helmsman's Display 3.10** will be part of NaviPac 4.0 software distribution, so it is possible to use a mix of NaviPac 3.10 **Helmsman's Display** with NaviPac 4 **Helmsman's Display**

What about NaviPac in the meantime?

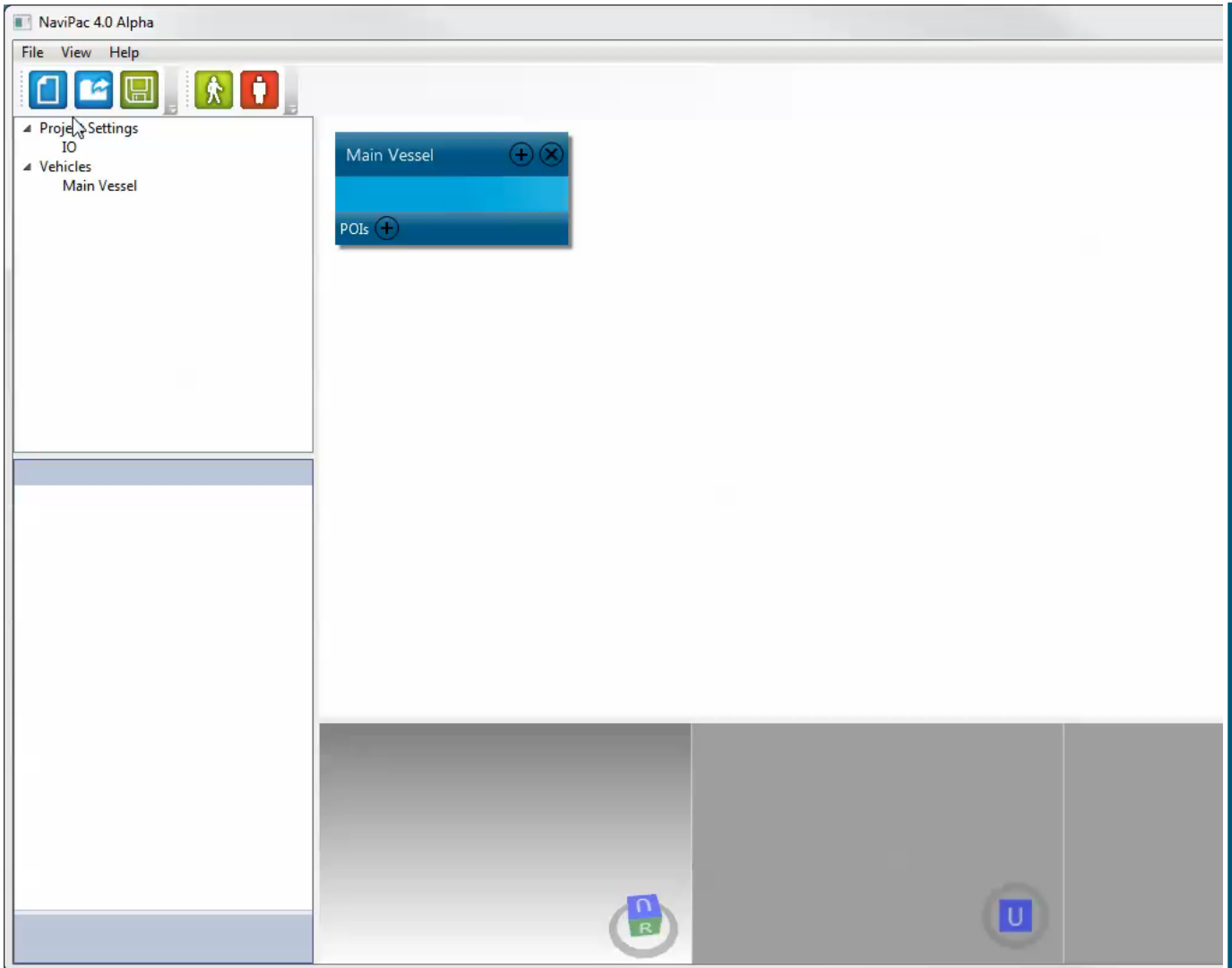
- NaviPac 3.XX will be maintained for several years
  - Bug fixes
  - New drivers
  - Specific requirements catered to – but we would like to avoid making substantial GUI changes

Configuration made simple

NaviPac 4

ROV and underwater position

- NaviPac 3 handles multi vessel, multi ROV operations in a powerfull operation – but we want to **Simplify** the operation
- NaviPac 3 handles the main vessel significantly differently (more advanced) than remote and underwater objects
  - This is based on history – previously, you had much less information from an ROV
  - Today, an ROV is at least as advanced (if not more) as the vessel
- NaviPac 4
  - A logical setup – 'ROV is a vessel'
  - Algorithmic design of ROV object with multiple inputs
  - Advanced Kalman filter
  - Monitor ROV positioning by having multiple solutions



NaviPac 4 Configuration

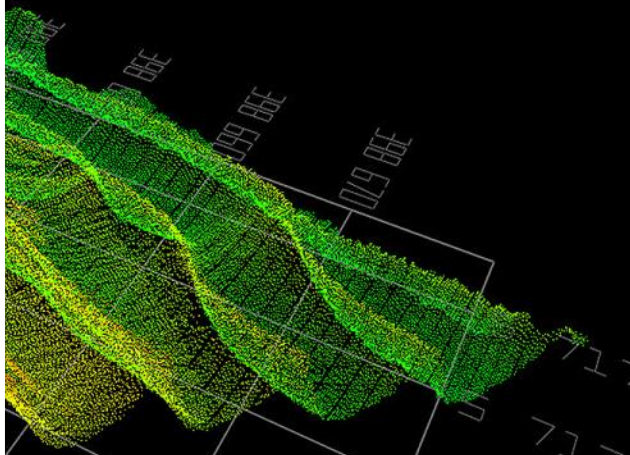
- Flexibility – multiple complex, dynamic objects
- Full front page visibility
  - Instruments
  - Vehicles
  - 2D/3D drawings
  - Simplified drawing
- Auto-configuration – automatically look for connected equipment and determine type

New Helmsman’s Display

NaviPac 4

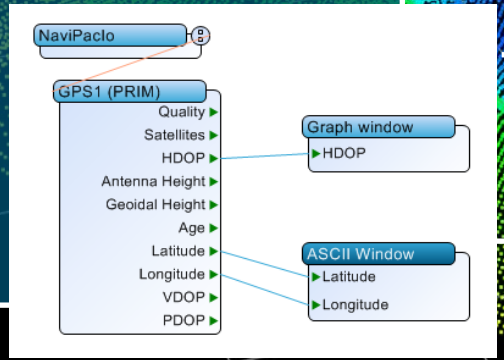
3D Helmsman’s Display

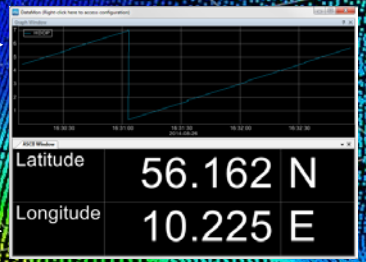
- With NaviPac 4, the **Helmsman’s Display** will be natively 3D and 2D
  - All the capabilities of Online 3D – now inside the **Helmsman’s Display**
    - Real time 3D positioning
    - Real time DTM generation
    - Real time 3D sensor coverage
  - Multiple 3D & 2D dockable windows
- NaviModel and the **Helmsman’s Display** will be based on the same 2D/3D engine, allowing for sharing of functionality

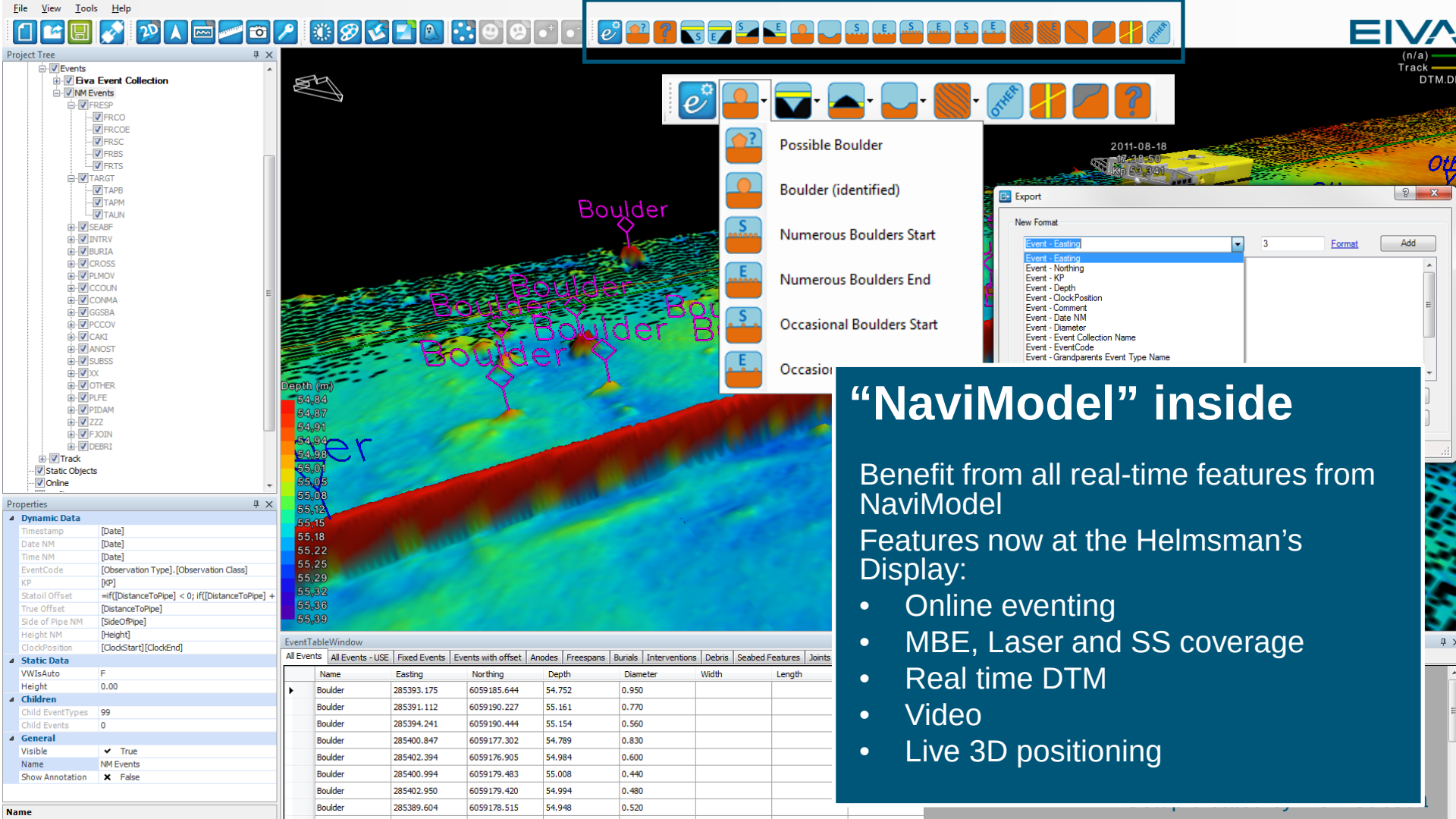


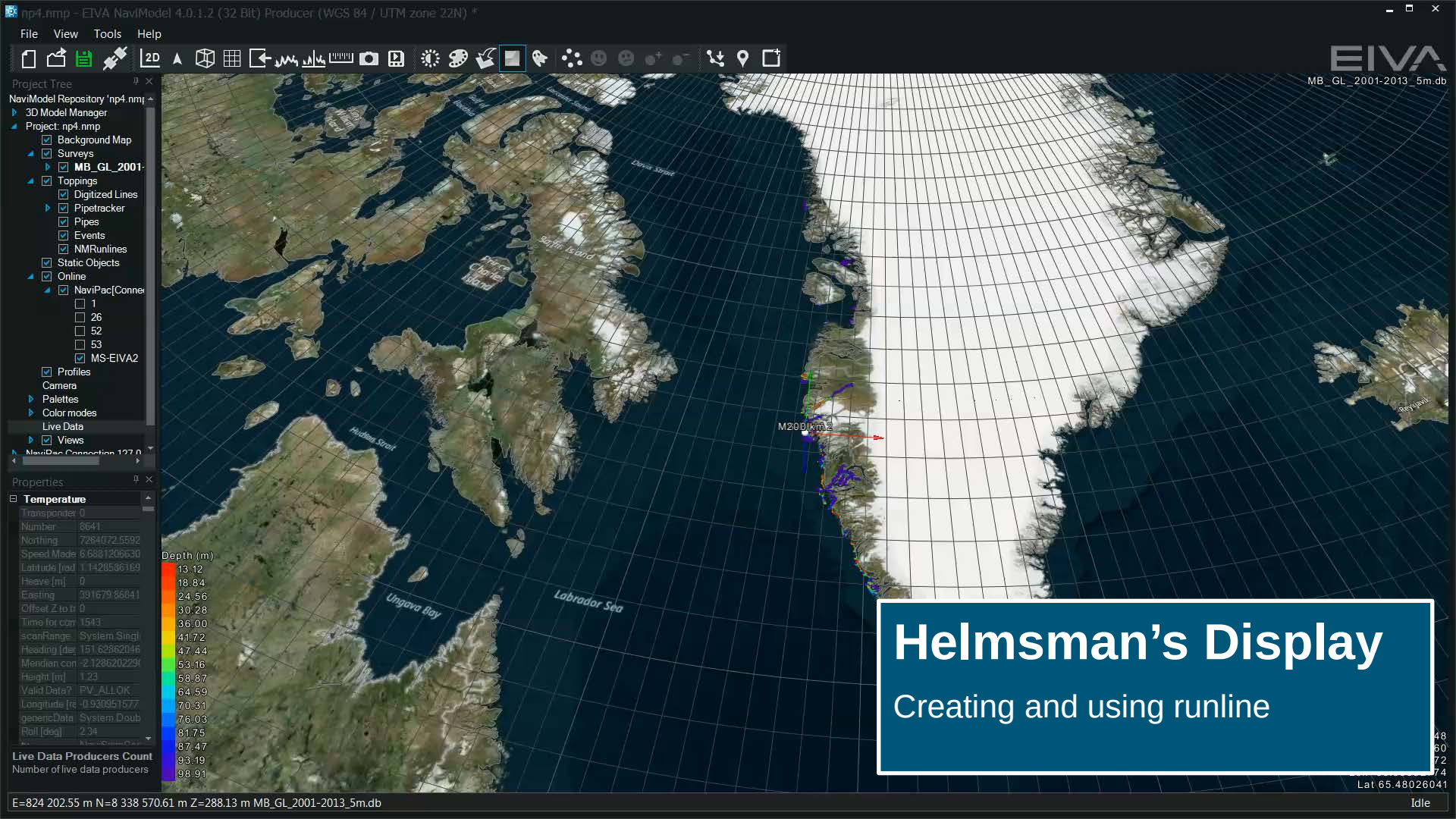
DataMon inside the Helmsman's Display

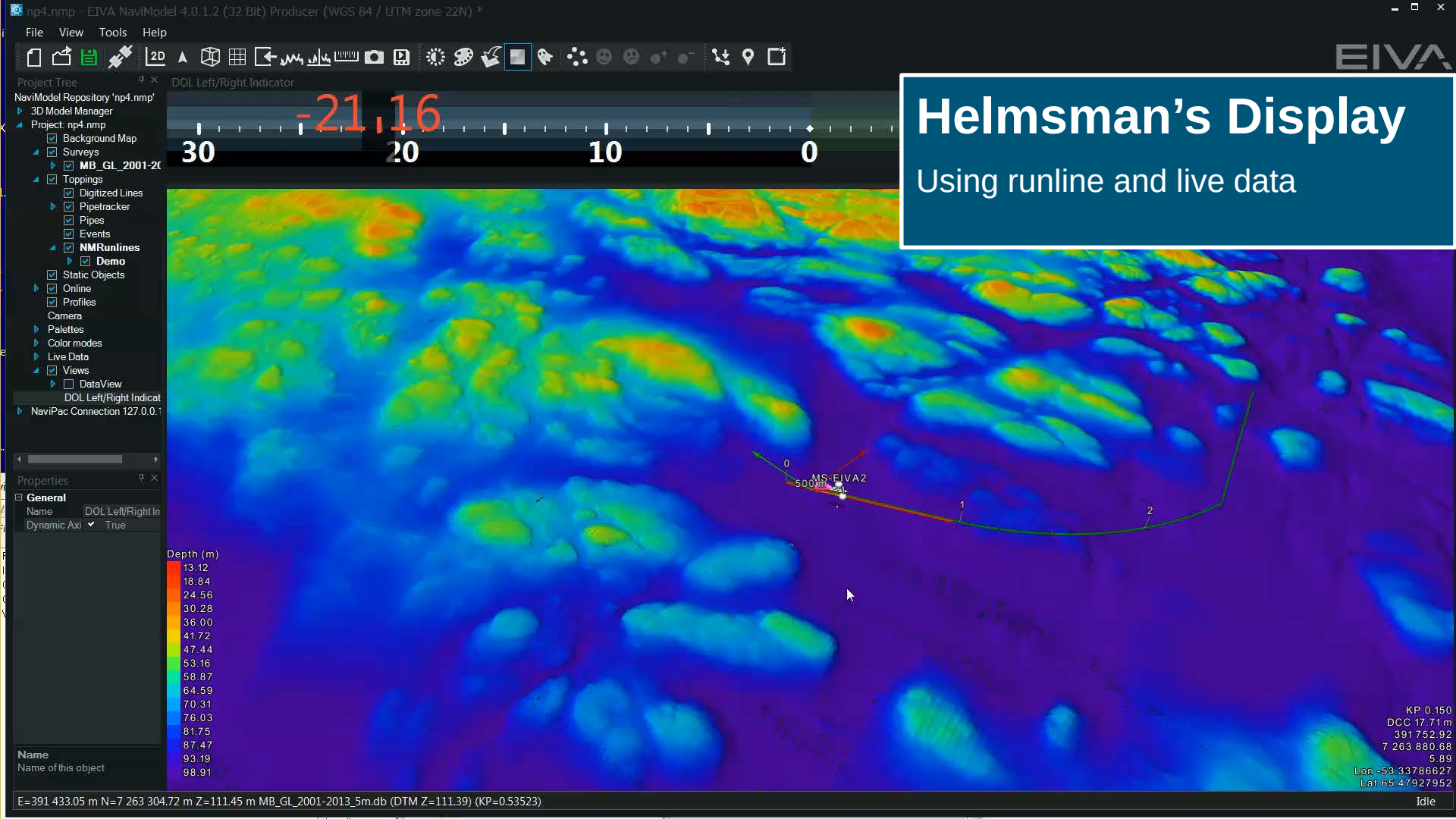
- **DataMon** introduced a lot of very powerful and easy-to-use tailoring features in NaviPac 3.10 – it turned out that this was a real life saver in many occasions
- In NaviPac 4, we are putting them inside the **Helmsman's Display**
  - More information in one place
  - Configurable contents
  - Graphs, data views, etc
  - Tailoring your own display






File View Tools Help
Project Tree
Events
Eiva Event Collection
NM Events
FRESP
FRCO
FRCOE
FRSC
FRBS
FRTS
TARGT
TAPB
TAPM
TAUN
SEABF
INTRV
BURIA
CROSS
PLMOV
CCOUN
CONMA
GGSBA
PCCOV
CAKI
ANOST
SUBSS
XX
OTHER
PLFE
PIDAM
ZZZ
FJOIN
DEBRI
Track
Static Objects
Online
Properties
Dynamic Data
Timestamp [Date]
Date NM [Date]
Time NM [Date]
EventCode [Observation Type].[Observation Class]
KP [KP]
Statoil Offset =if([DistanceToPipe] < 0; if([DistanceToPipe] +
True Offset [DistanceToPipe]
Side of Pipe NM [SideOfPipe]
Height NM [Height]
ClockPosition [ClockStart][ClockEnd]
Static Data
VWIsAuto F
Height 0.00
Children
Child EventTypes 99
Child Events 0
General
Visible True
Name NM Events
Show Annotation False
Name
Possible Boulder
Boulder (identified)
Numerous Boulders Start
Numerous Boulders End
Occasional Boulders Start
Occasion
Boulder
Depth (m)
54,84
54,87
54,91
54,94
54,98
55,01
55,05
55,08
55,12
55,15
55,18
55,22
55,25
55,29
55,32
55,36
55,39
EventTableWindow
All Events
All Events - USE
Fixed Events
Events with offset
Anodes
Freespans
Burials
Interventions
Debris
Seabed Features
Joints
Name Easting Northing Depth Diameter Width Length
Boulder 285393.175 6059185.644 54.752 0.950
Boulder 285391.112 6059190.227 55.161 0.770
Boulder 285394.241 6059190.444 55.154 0.560
Boulder 285400.847 6059177.302 54.789 0.830
Boulder 285402.394 6059176.905 54.984 0.600
Boulder 285400.994 6059179.483 55.008 0.440
Boulder 285402.950 6059179.420 54.994 0.480
Boulder 285389.604 6059178.515 54.948 0.520
2011-08-18
Export
New Format
Event - Easting
3
Format
Add
Event - Easting
Event - Northing
Event - KP
Event - Depth
Event - ClockPosition
Event - Comment
Event - Date NM
Event - Diameter
Event - Event Collection Name
Event - EventCode
Event - Grandparents Event Type Name
“NaviModel” inside
Benefit from all real-time features from NaviModel
Features now at the Helmsman’s Display:
• Online eventing
• MBE, Laser and SS coverage
• Real time DTM
• Video
• Live 3D positioning


np4.nmp - EIVA NaviModel 4.0.1.2 (32 Bit) Producer (WGS 84 / UTM zone 22N) *
File View Tools Help
EIVA
MB_GL_2001-2013_5m.db
Project Tree
NaviModel Repository 'np4.nmp'
3D Model Manager
Project: np4.nmp
Background Map
Surveys
MB_GL_2001-
Toppings
Digitized Lines
Pipetracker
Pipes
Events
NMRunlines
Static Objects
Online
NaviPac[Connec
1
26
52
53
MS-EIVA2
Profiles
Camera
Palettes
Color modes
Live Data
Views
Properties
Temperature
Transponder 0
Number 8641
Northing 7264072.5592
Speed Mode 6.6881206630
Latitude [rad 1.1420586169
Heave [m] 0
Easting 391679.86841
Offset Z to tr 0
Time for corr 1543
scanRange System.Singl
Heading [de 151.62862046
Meridien con -2.1286202290
Height [m] 1.23
Valid Data? PV_ALL.OK
Longitude [ra -0.930951577
genericData System.Doub
Roll [deg] 2.34
Live Data Producers Count
Number of live data producers
Depth (m)
13.12
18.84
24.56
30.28
36.00
41.72
47.44
53.16
58.87
64.59
70.31
76.03
81.75
87.47
93.19
98.91
Hudson Strait
Baffin Island
Davis Strait
Ungava Bay
Labrador Sea
Reykjanes
M200lkm2
Helmsman's Display
Creating and using runline
Lat 65.48026041
E=824 202.55 m N=8 338 570.61 m Z=288.13 m MB_GL_2001-2013_5m.db
Idle


np4.nmp - EIVA NaviModel 4.0.1.2 (32 Bit) Producer (WGS 84 / UTM zone 22N) *
File View Tools Help
EIVA
Project Tree
NaviModel Repository 'np4.nmp'
3D Model Manager
Project: np4.nmp
Background Map
Surveys
MB_GL_2001-2(
Toppings
Digitized Lines
Pipetracker
Pipes
Events
NMRunlines
Demo
Static Objects
Online
Profiles
Camera
Palettes
Color modes
Live Data
Views
DataView
DOL Left/Right Indicat
NaviPac Connection 127.0.0.1
Properties
General
Name
DOL Left/Right In
Dynamic Axi
True
Name
Name of this object
DOL Left/Right Indicator
-21,16
30
20
10
0
Helmsman's Display
Using runline and live data
0
500m
MS-EIVA2
1
2
Depth (m)
13.12
18.84
24.56
30.28
36.00
41.72
47.44
53.16
58.87
64.59
70.31
76.03
81.75
87.47
93.19
98.91
KP 0.150
DCC 17.71 m
391 752.92
7 263 880.68
5.89
Lon -53.33786627
Lat 65.47927952
E=391 433.05 m N=7 263 304.72 m Z=111.45 m MB_GL_2001-2013_5m.db (DTM Z=111.39) (KP=0.53523)
Idle

Any questions?

Contact Ole Kristensen at okr@eiva.com