



LUCIAD PRESENTATION
SUPPORT FOR MARITIME ANALYSIS TOOLS
7.9.17
FRONTEX

LUCIAD



LUCIAD IN ACTION

- Vessel Traffic and Coastguard Systems
- Chart Management & Distribution
- Training & Simulation
- Inland Waterway Management
- Port Security
- Strategic C2 / Planning
- Combat Management & Real-time Ops
- ISR
- Onboard systems
- Fisheries surveillance
- Pollution tracking



LUCIAD



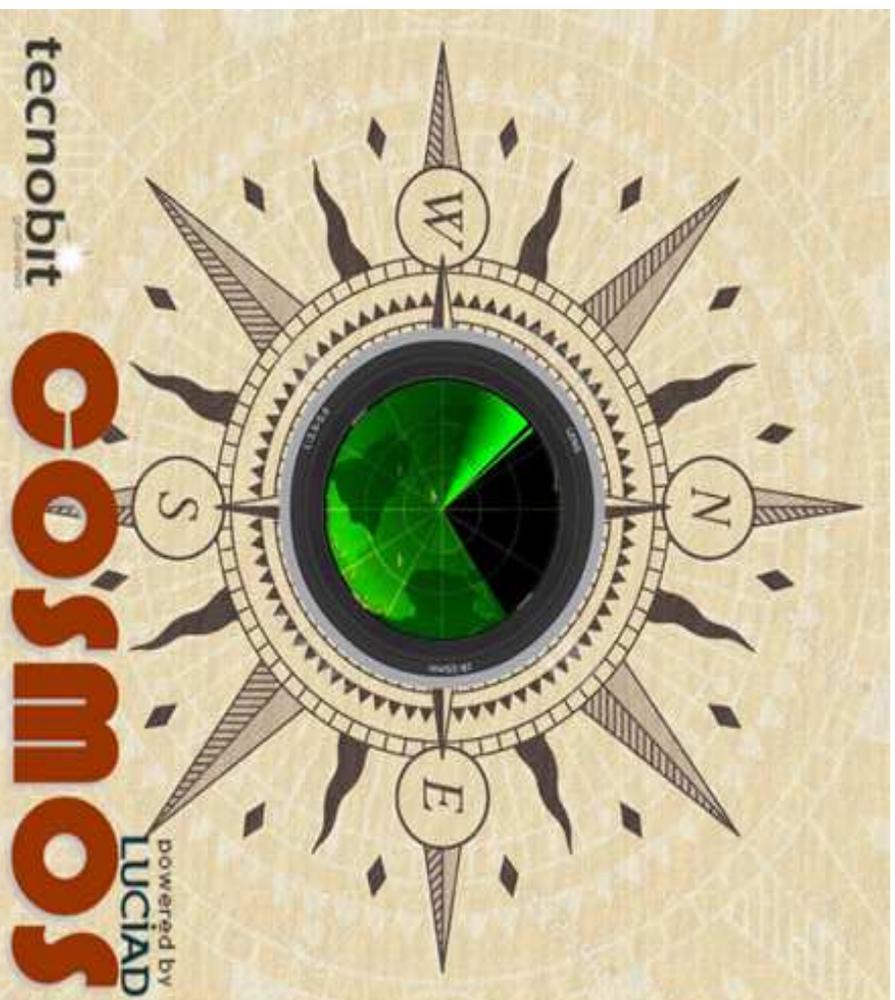
SOME CUSTOMERS

- EMSA
- LEONARDO
- INDRA
- GMV
- THALES UK, FRANCE, PORTUGAL
- LOCKHEED MARTIN
- SOPRA STERIA
- NATO (in over a dozen systems, air, land, and sea)
- SP MoD, BEL MoD, FR MoD...
- AIRBUS (SEVERAL OEM PRODUCTS)
- BAE
- NAVANTIA



OUR APPROACH – YOUR BENEFIT

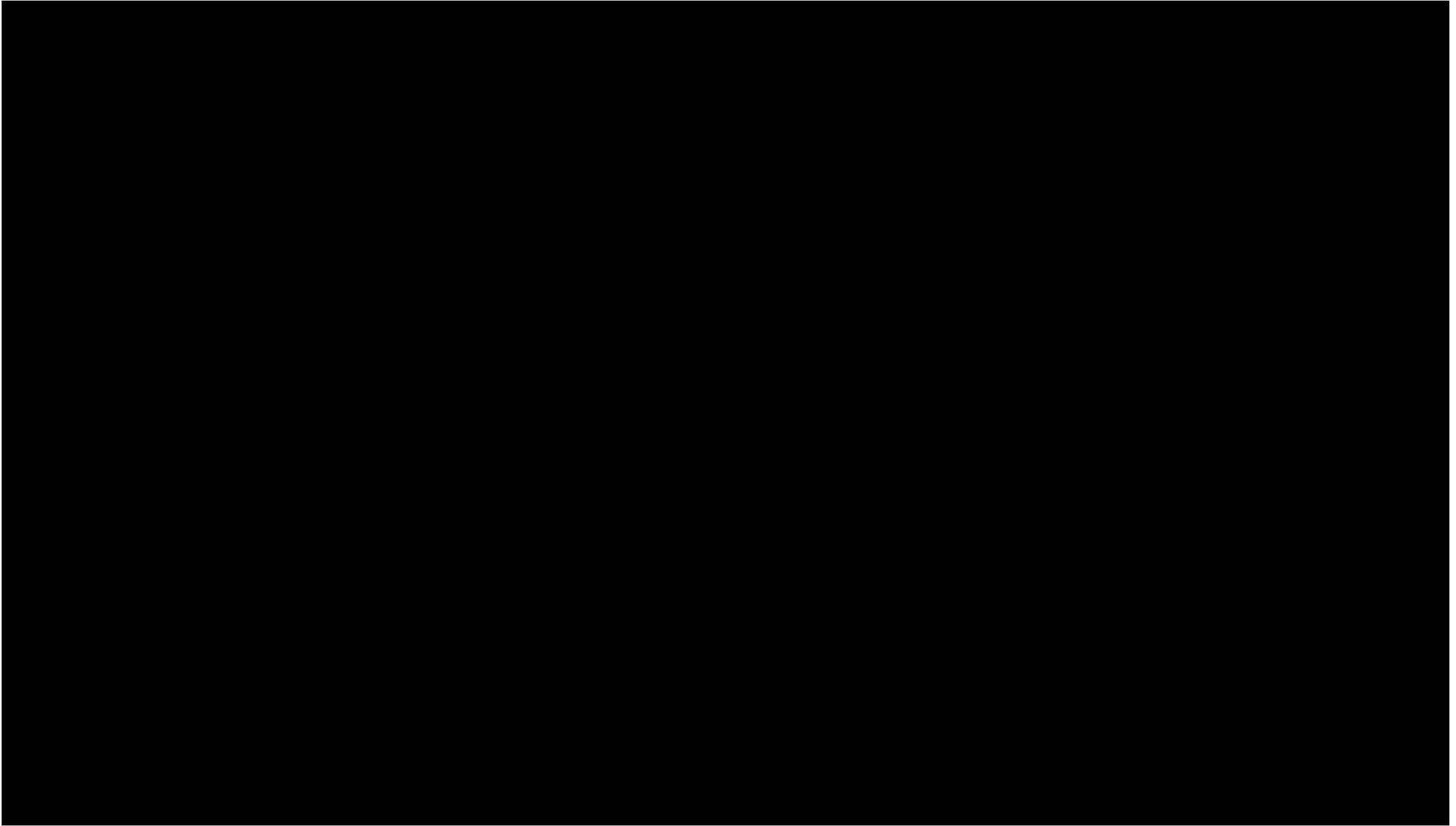
DIRECT CONNECT TO ANY DATA SOURCE

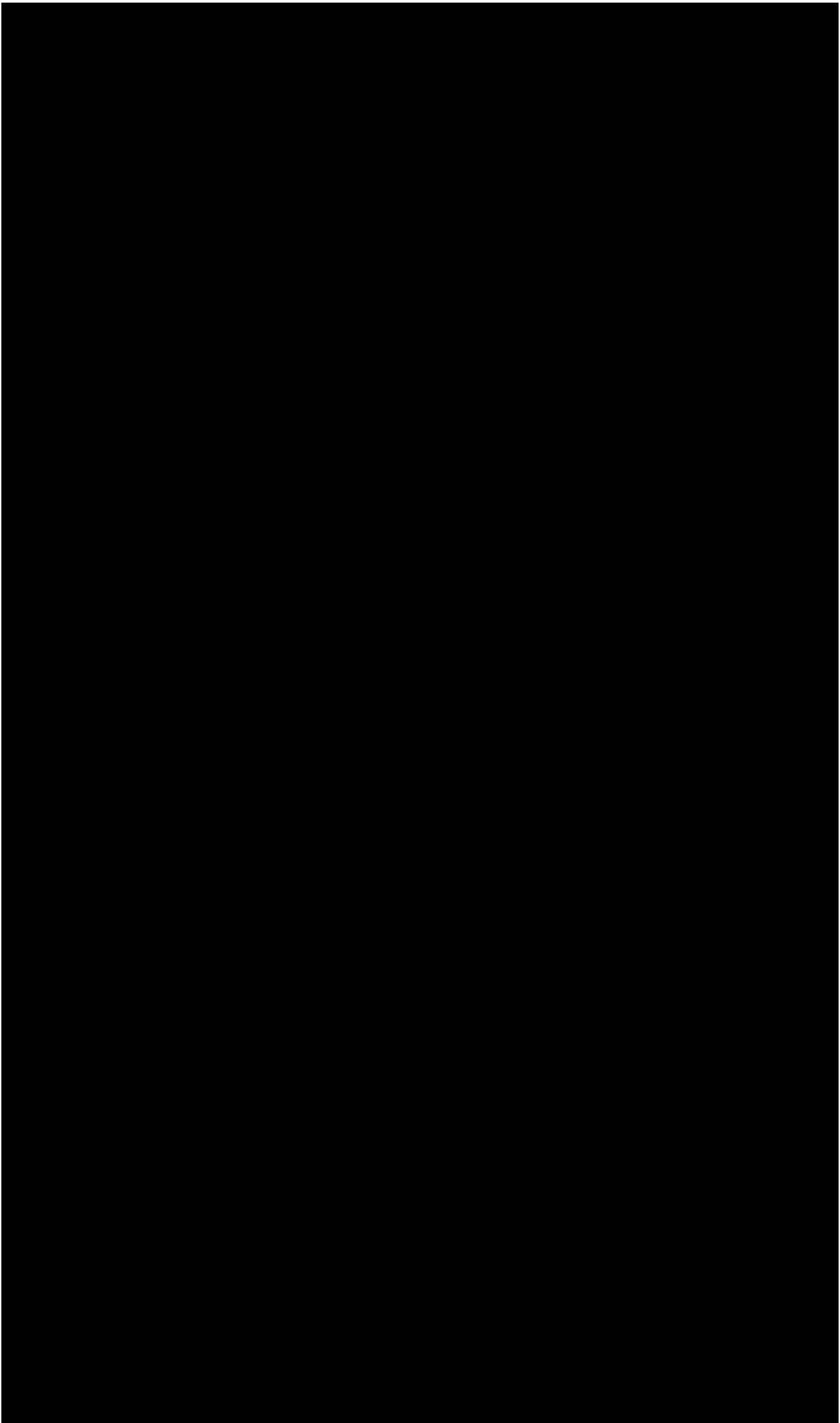


WHEN YOUR MISSION IS CRITICAL: PERFORMANCE & PRECISION



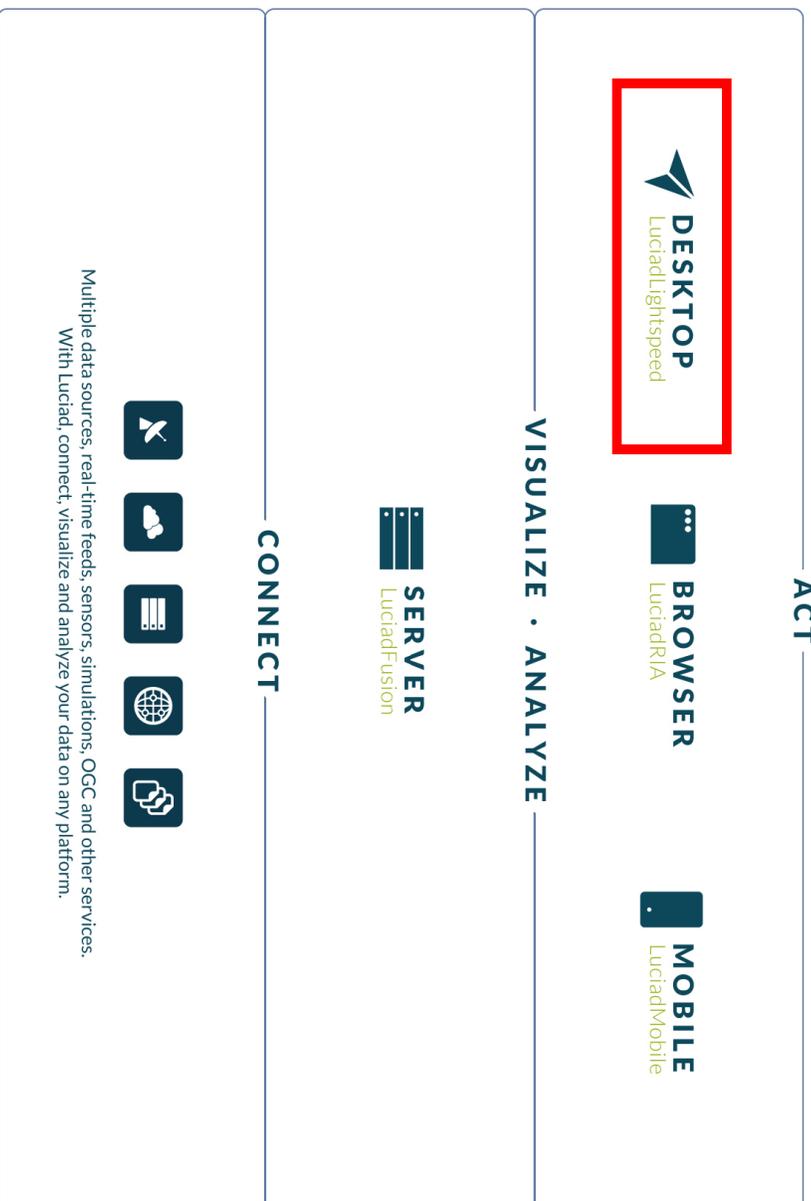
LUCIAD



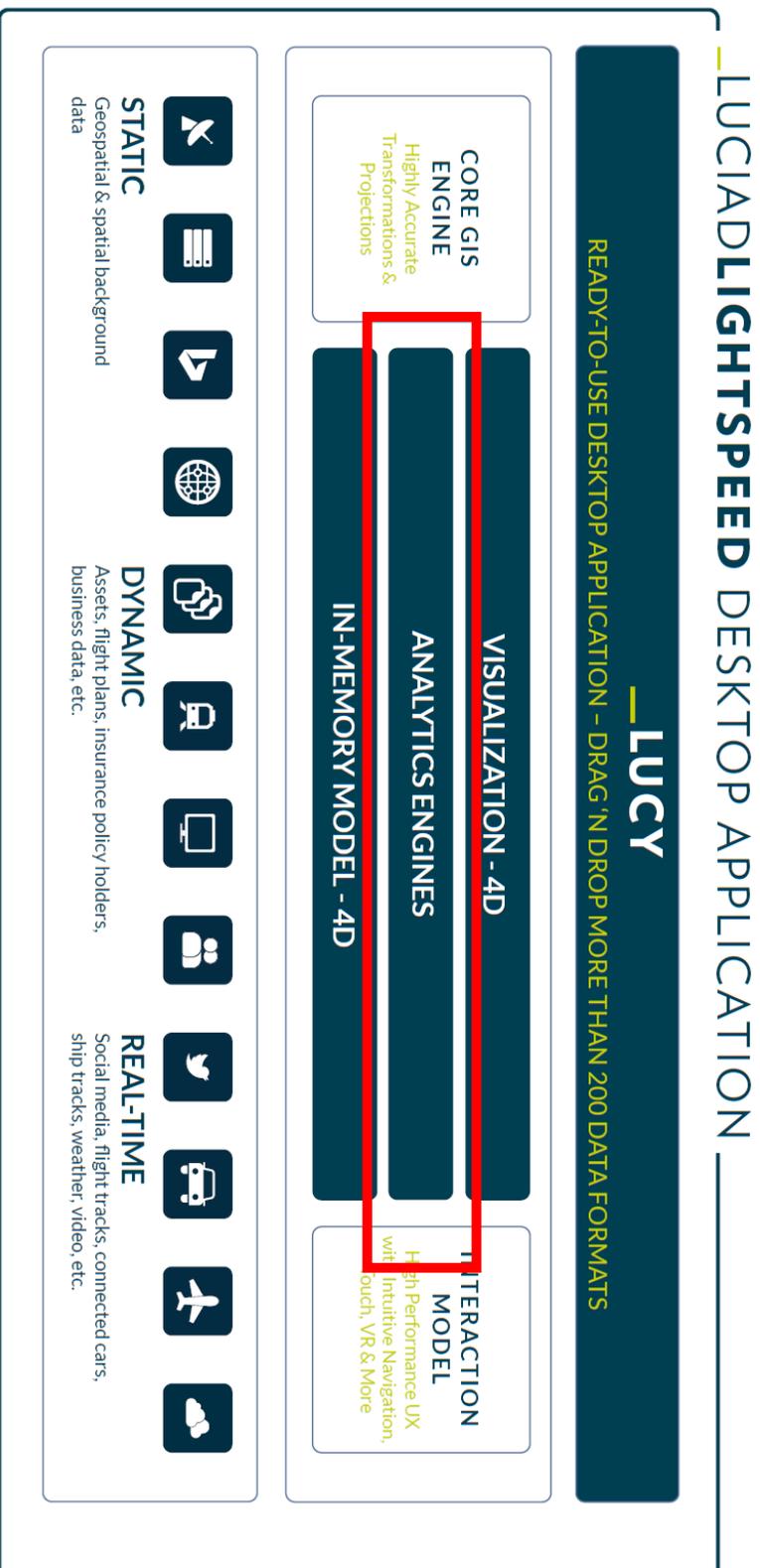


ANALYSIS CAPACITY

LUCIAD SOLUTIONS



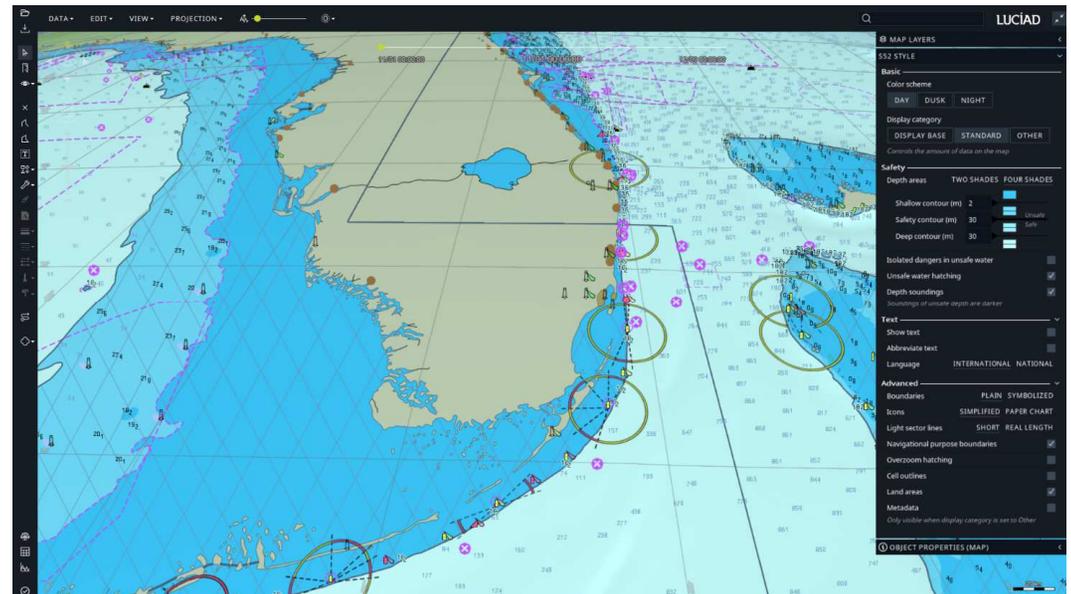
DESKTOP - ARCHITECTURE





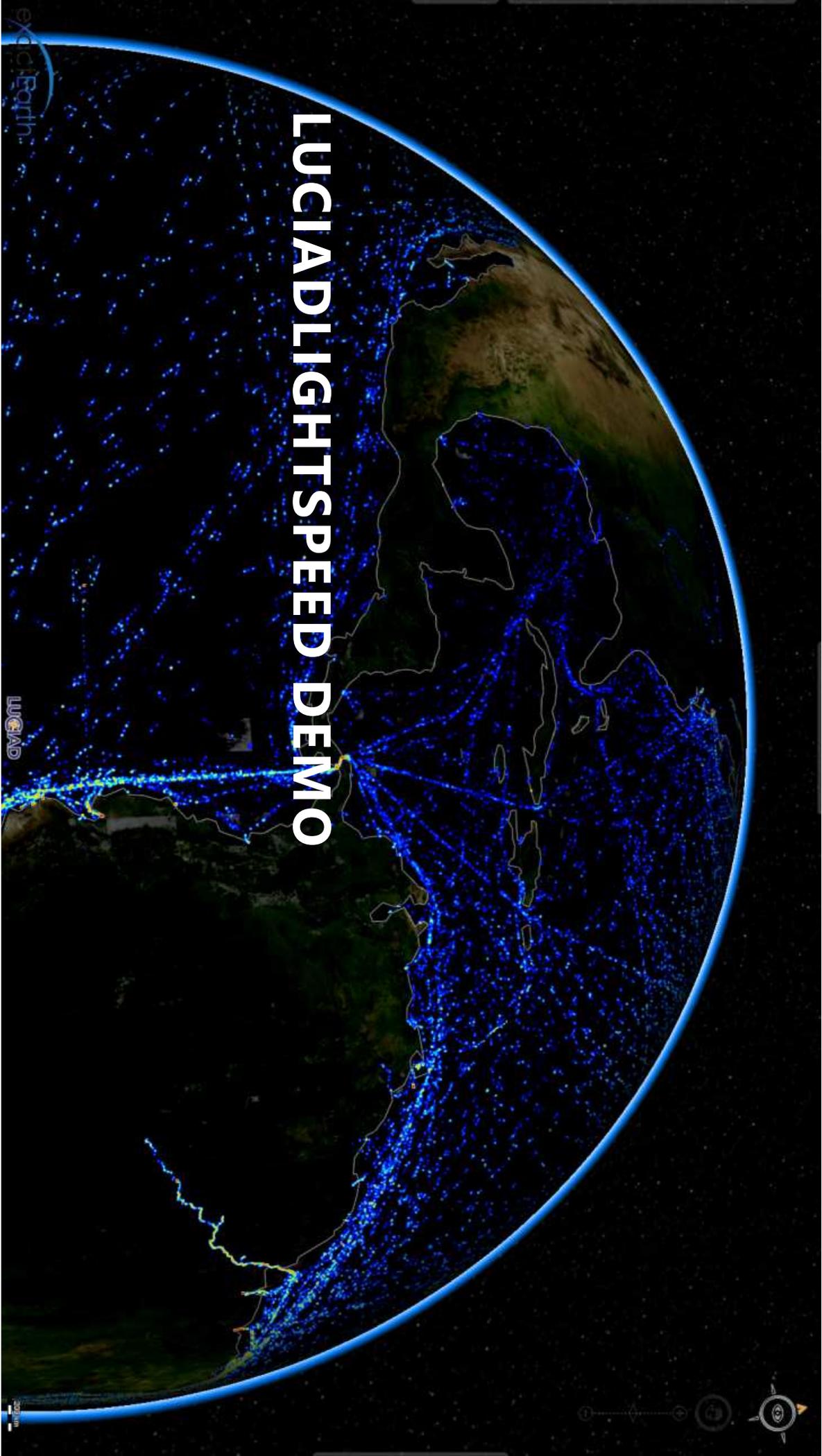
MARITIME STANDARDS

- Flexible solution for creating IHO certified systems
- Following the latest specifications
 - S-57 data format
 - S-52 symbology
 - S-63 decryption
 - S-64 and IEC61174 compliant
 - Additional Military Layers (UKHO symbology)
- Included S-52 style selection UI
 - For direct connection to ECDIS data
 - When connecting from LuciadFusion
- Fast SENC format for unparalleled ECDIS performance



LUCIAD

LUCIADLIGHTSPEED DEMO



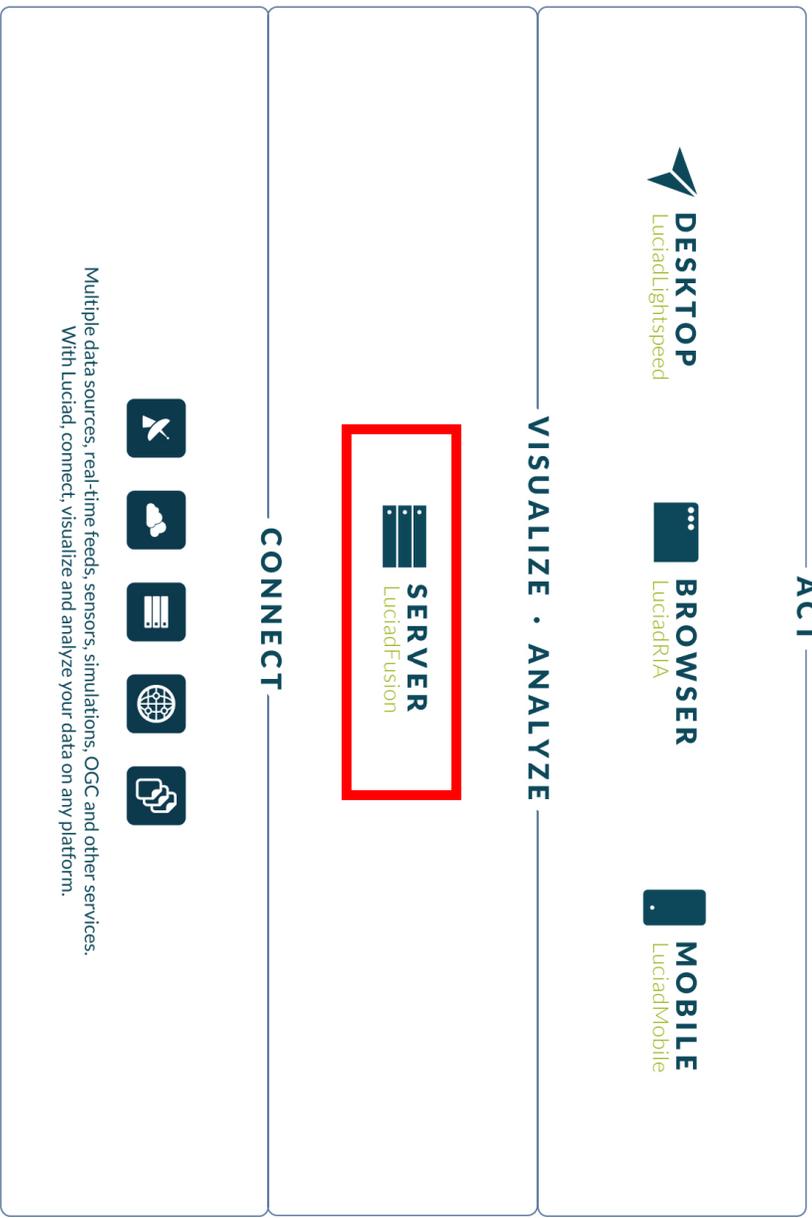
exciteEarth

LUCIAD

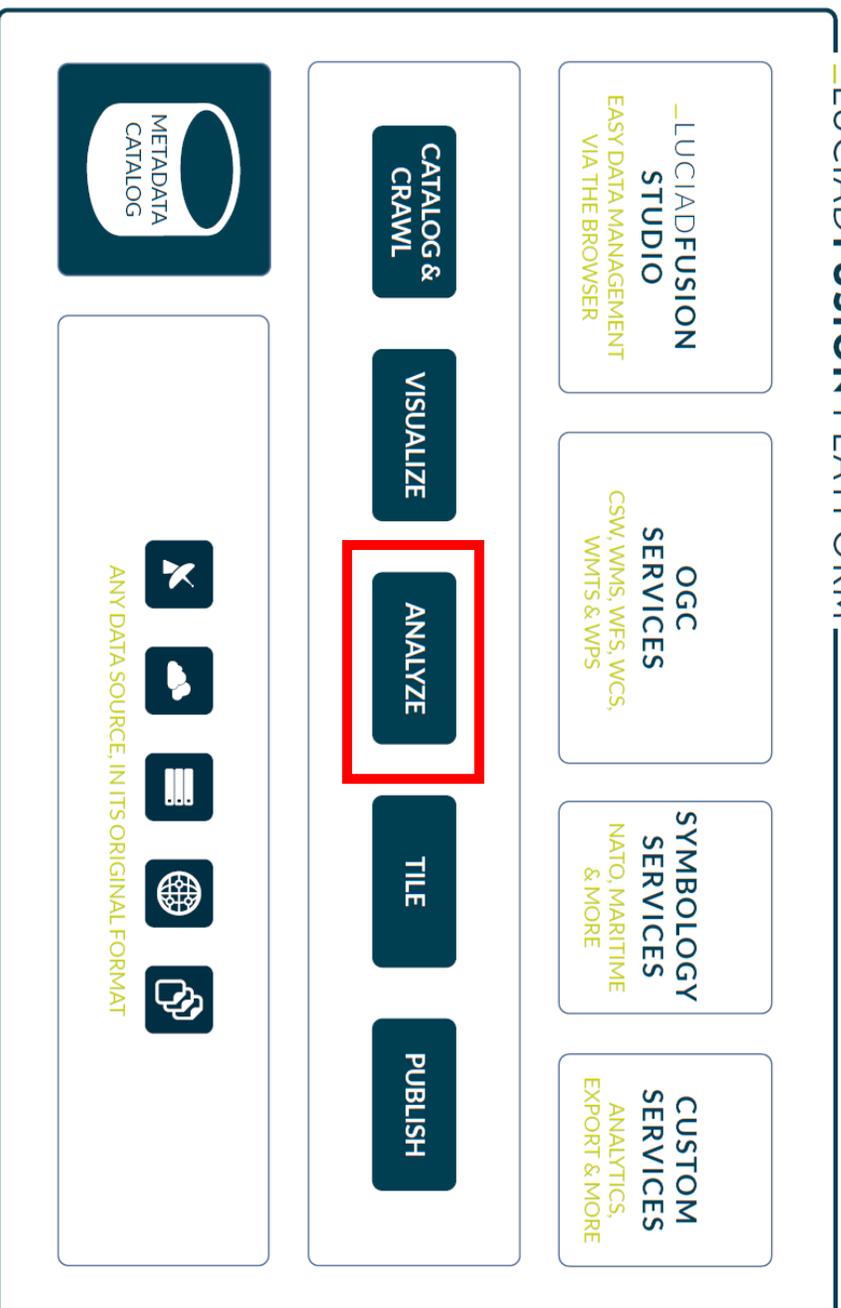
300 km



LUCIAD SOLUTIONS



SERVER - ARCHITECTURE

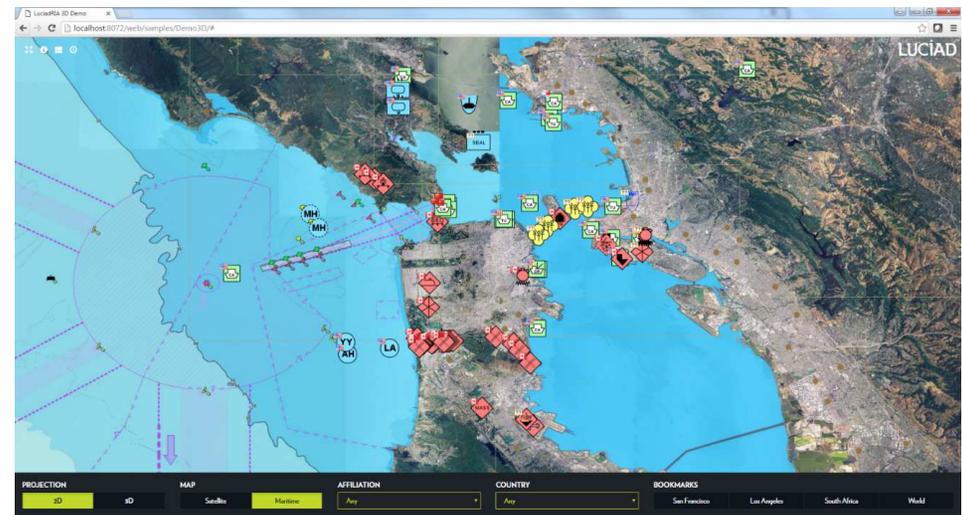




SYMBOLLOGY SERVICES

- Full set of defense symbology
 - APP-6A/B/C, MS2525B/C, TTA-106*
- Serve ECDIS charts using S-52 symbology**
- Use symbols on map, or in UI elements
- Build your custom symbology service

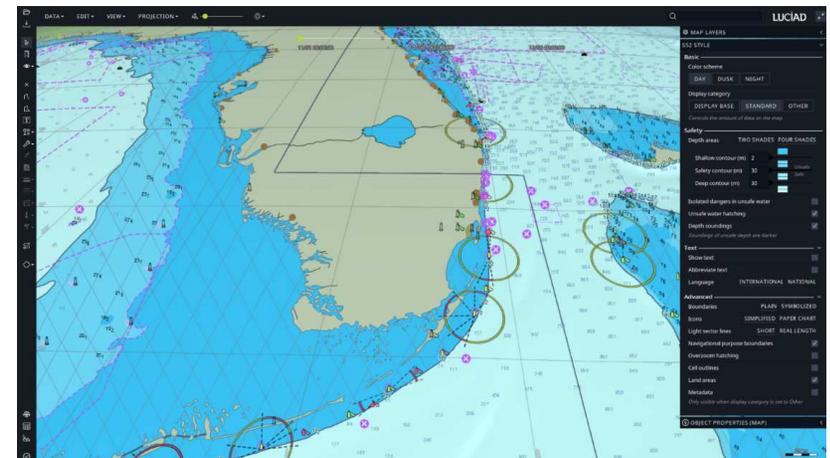
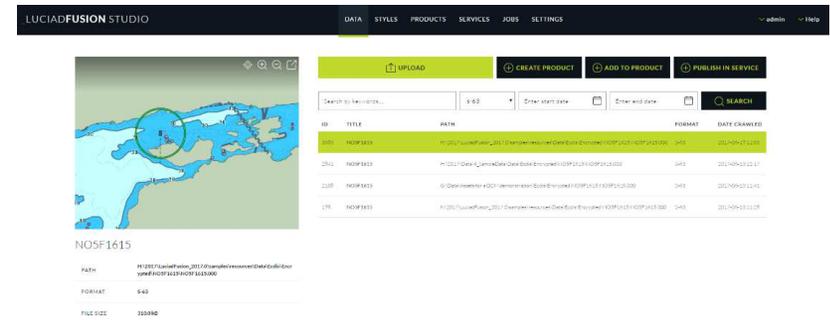
*Requires Defense Symbology Option
** Requires Maritime Standards Option



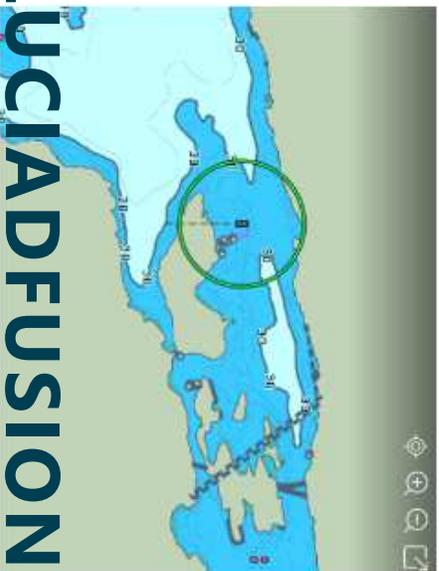


MARITIME STANDARDS

- Flexible solution for creating IHO certified systems
- Following the latest specifications
 - S-57 data format
 - S-52 symbology
 - S-63 decryption
 - S-64 and IEC61174 compliant
 - Additional Military Layers (UKHO symbology)
- Serve on-the-fly or fuse/tile/multi-level
- Supports on-the-fly S-52 styling through OGC WMS/WMTS
- Fast SENC format for unparalleled ECDIS performance



LUCIAD



NOSF1615

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typed:NOSF1615,NOSF1613,000

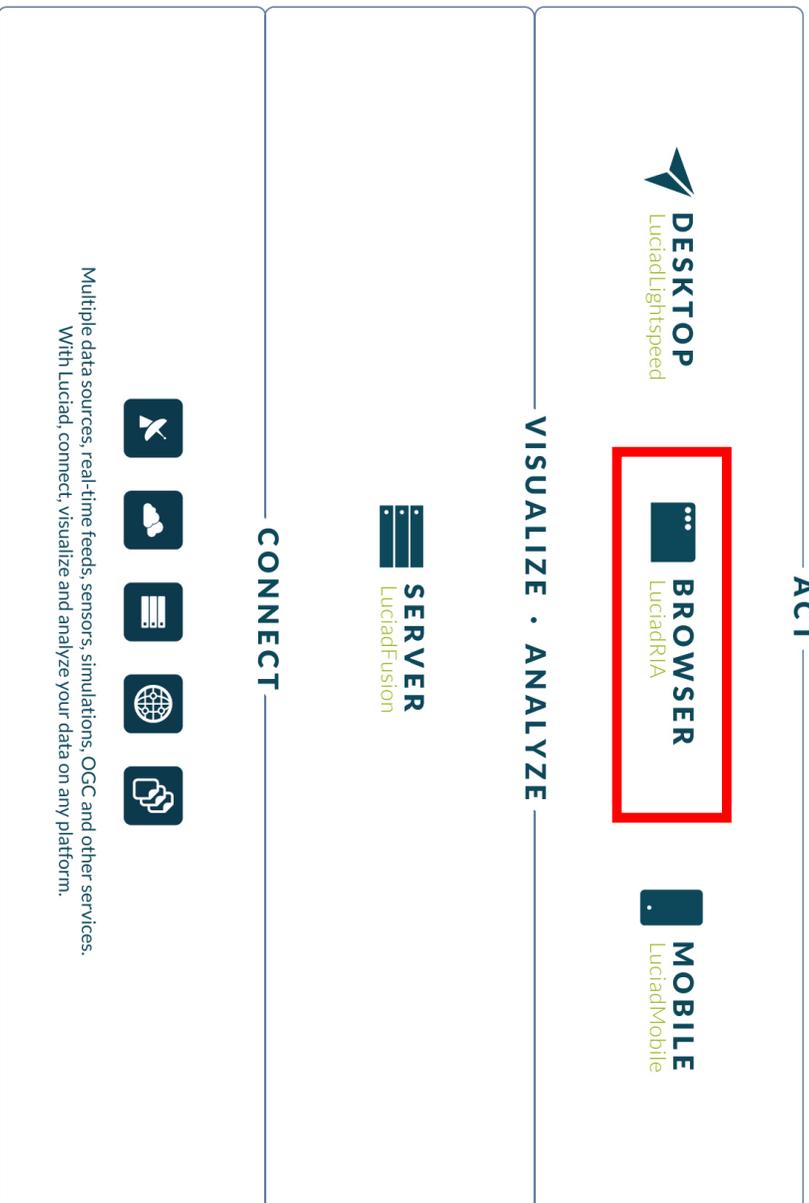
FORMAT S-63

FILE SIZE 3100KB

LUCIADFUSION DEMO

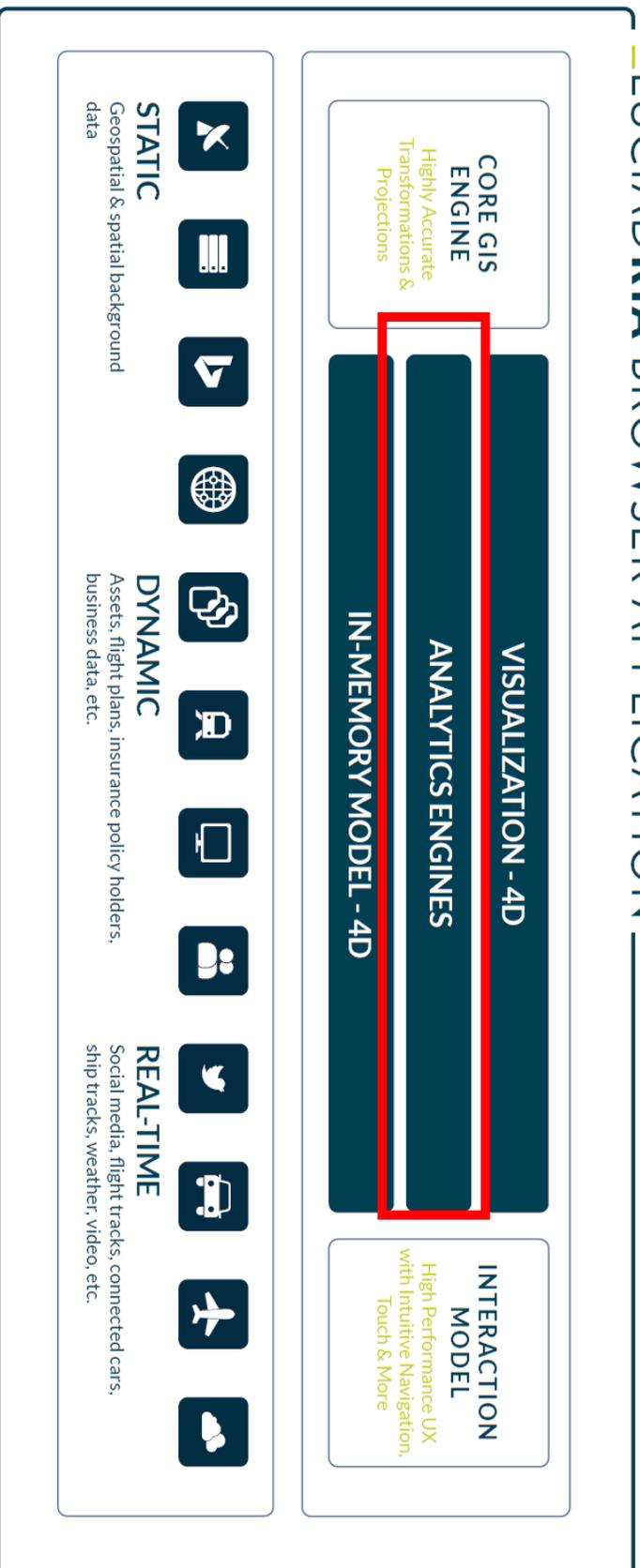
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2108	NOSF1615	G:\Data\Items for a DCI demonstration\Bath\locfish.tmx typed:NOSF1615,NOSF1613,000	S-63	2017-06-29 11:45

LUCIAD SOLUTIONS



BROWSER - ARCHITECTURE

LUCIADRIA BROWSER APPLICATION





DEFENSE SYMBOLOGY

- Support for military unit symbols
 - APP-6A
 - APP-6B
 - APP-6C
 - MIL-STD 2525b
 - MIL-STD 2525c
- Extensive support over symbol styling
 - Frame, fill, icon
- Turn any shape into a tactical graphic
- LuciadLightspeed symbology service
- Flexible clustering of icons based on any attribute



The screenshot displays the ECDIS web application interface. At the top, the browser address bar shows the URL: <https://dev.luciad.com/portal/samples/eccdis/?webgl&reference=epsg:4978>. The main area shows a nautical chart with various features and overlays. A large white text overlay reads "LUCIADRIA DEMO".

On the left side, there is a control panel with the following sections:

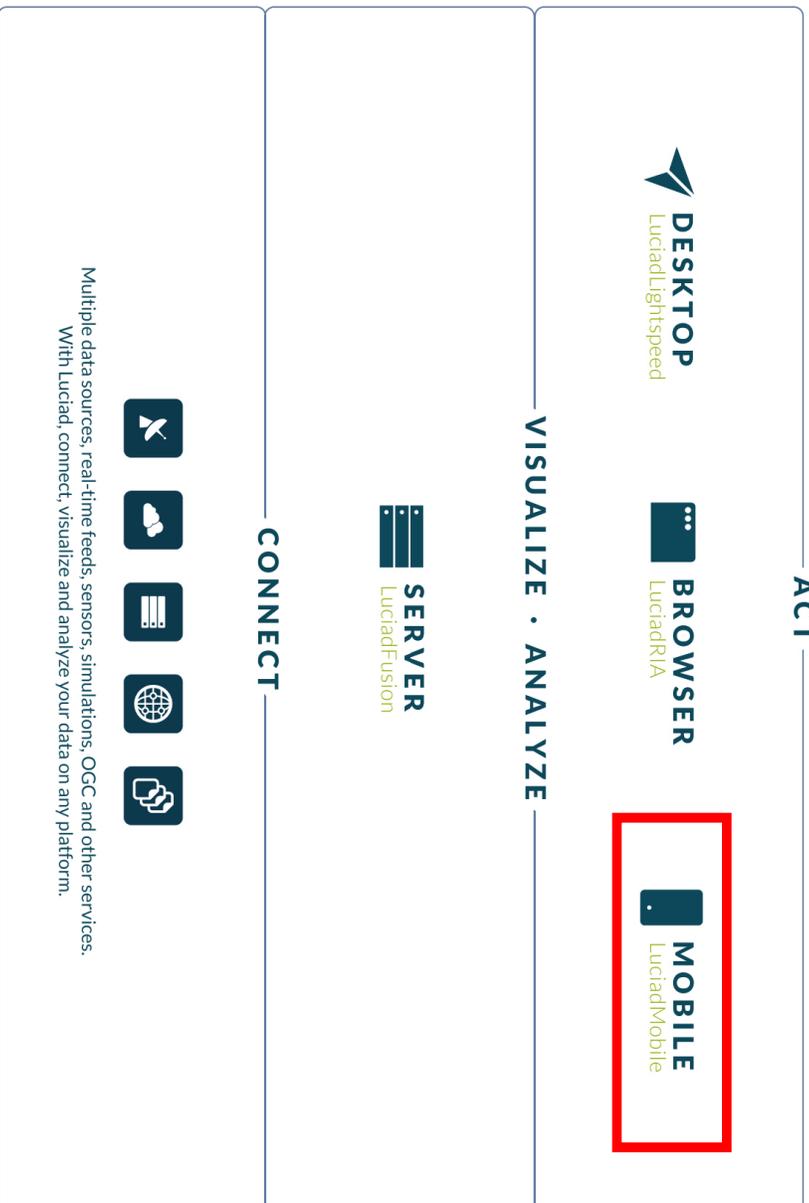
- Basic**
 - COLOR SCHEME: Day (selected), Dusk, Night
 - DISPLAY CATEGORY: Base (selected), Standard
- Safety**
 - DEPTH AREAS: Two shades (selected), Four shades
 - Safety Contour (M): 30
 - Isolate Dangers in Unsafe Waters
 - Unsafe Waters Hatching
 - Depth Soundings
- Feature Info**
 - Controller

On the right side, there is a "MAP LAYERS" panel with the following options:

- MAP LAYERS
- Elevation
- noaa-s57
- Satellite imagery

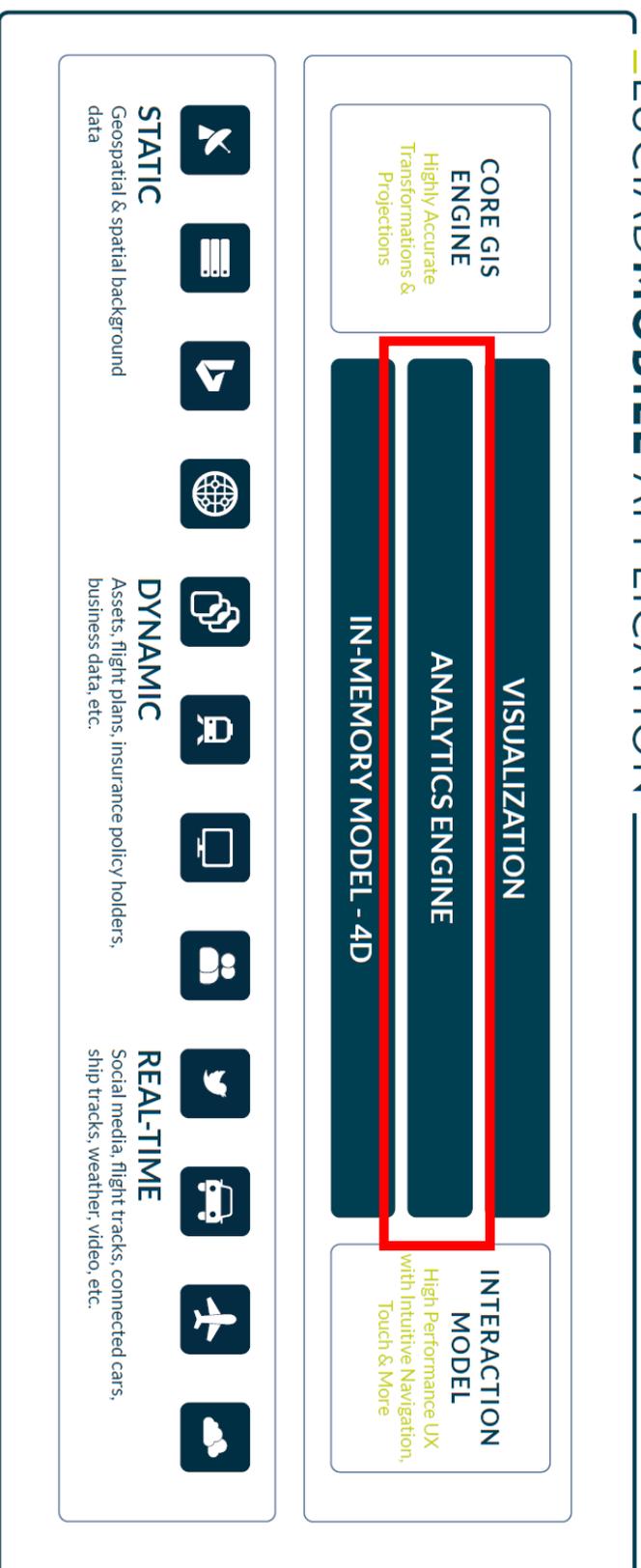
At the bottom left, there is a logo for "LUCIAD" and a note: "ECDIS S-57 ENC dataset provided by NOAA. For demo purpose only."

LUCIAD SOLUTIONS



MOBILE - ARCHITECTURE

LUCIADMOBILE APPLICATION



- MAP LAYERS
- SUSPECTS DETAILS

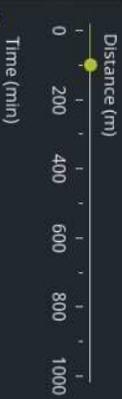
Zoom map to

- EVENT
- ENTIRE HISTORY

Zoom time to

- EVENT
- ENTIRE HISTORY

CALCULATE SUSPECTS



OBJECT PROPERTIES (MAP)

SUSPECTED VESSEL DEMO

02:06:07

01 01 2012

31/12 01/01 02/01 03/01 04/01 05/01 06/01 07/01 08/01 09/01 10/01 11/01 12/01 13/01 14/01 15/01 16/01 17/01 18/01 19/01 20/01 21/01 22/01 23/01 24/01 25/01 26/01 27/01 28/01 29/01 30/01 31/01

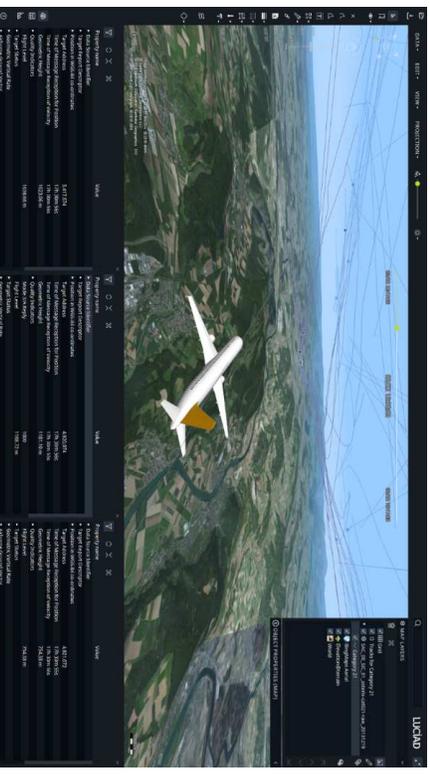
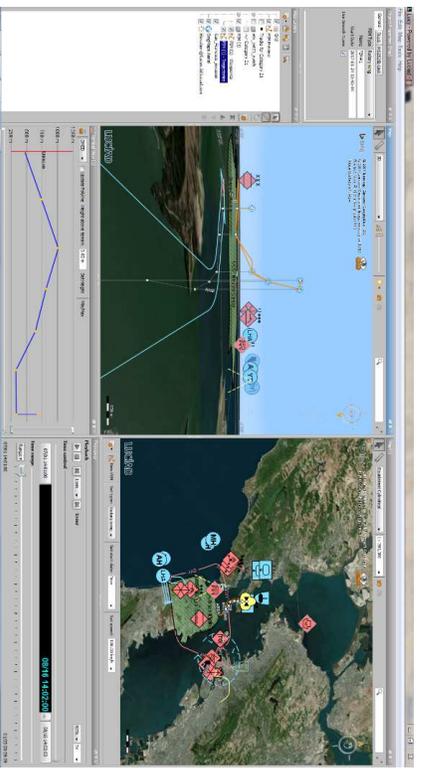
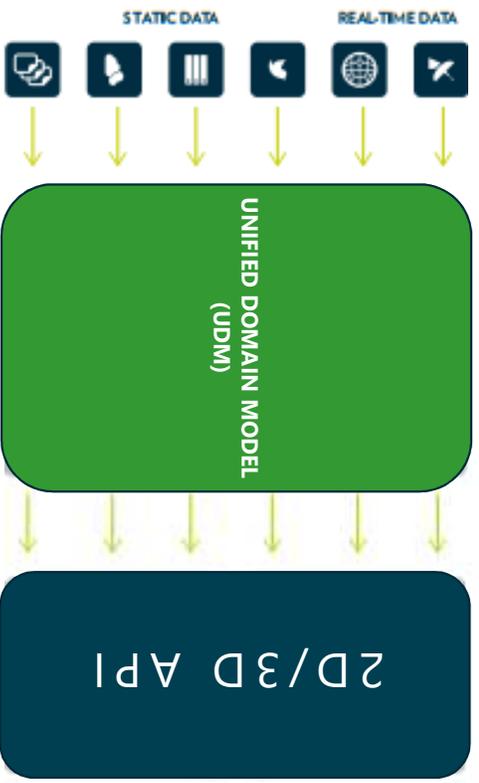
01 02 2012

17:02:06



VESSELS' HISTORICAL DATA

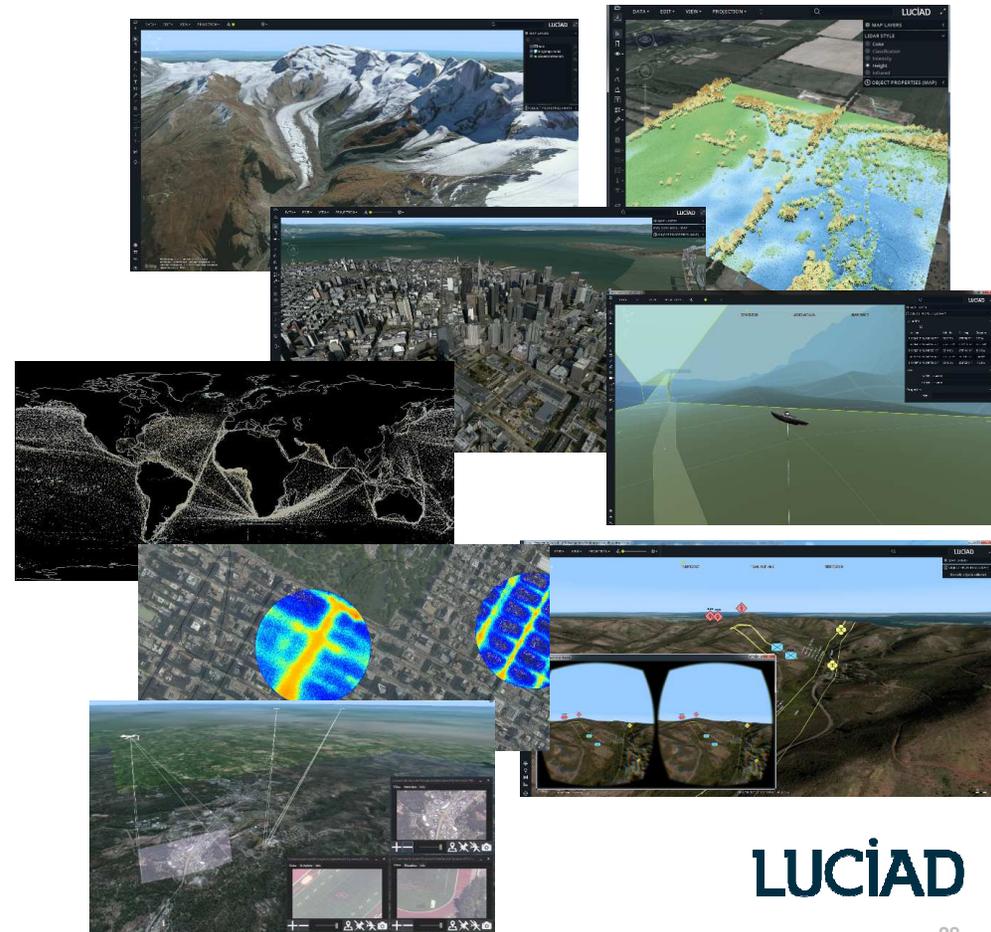
UNIFIED DATA MODEL





GPU 2D/3D/VR VISUALIZATION ENGINE

- Single unified API for 2D & 3D
- Layered view, any projection
- Optimized for large data sets and data that changes or moves
- Handles multiple millions of static points
- Handles multiple 100k of moving points
- Drape any data in 3D, including radar and (aerial) video

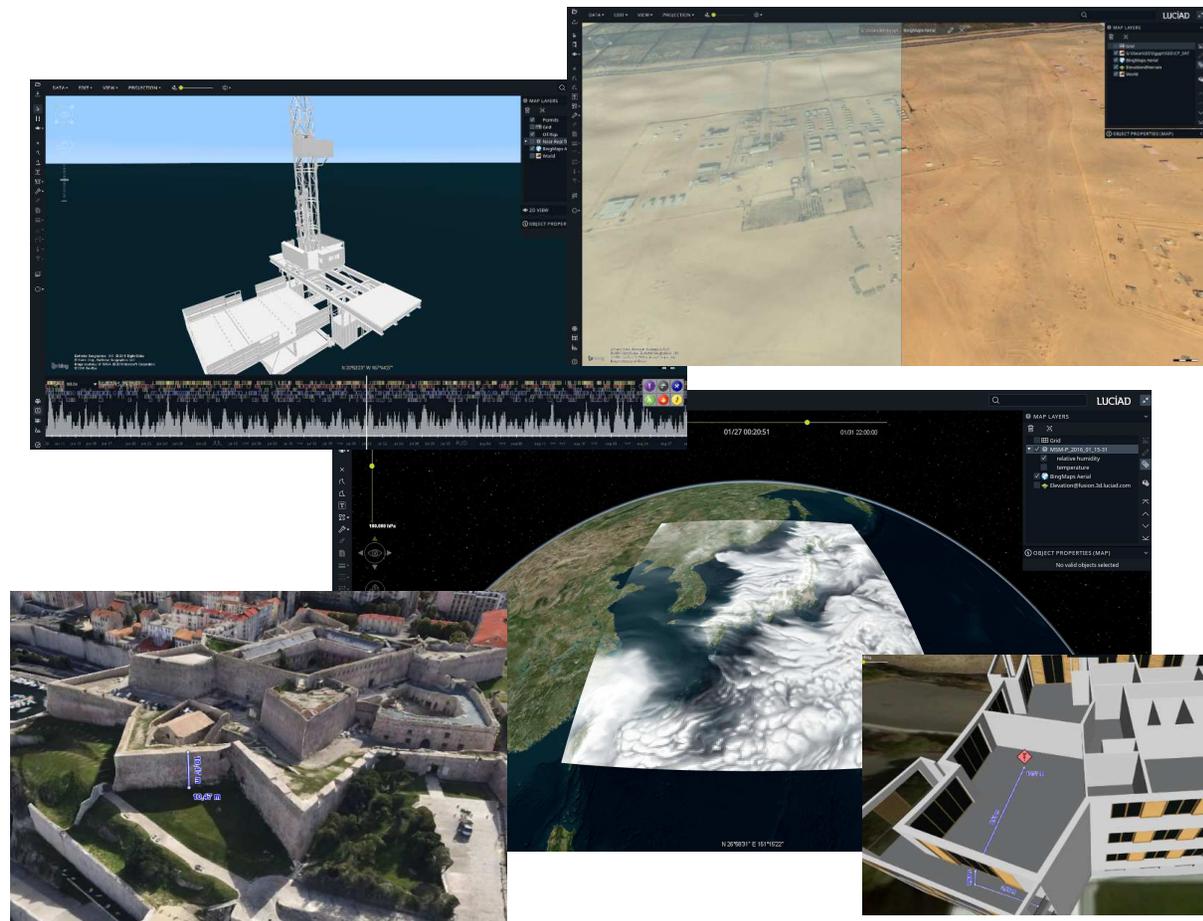


LUCIAD



2D/3D/4D INTERACTION MODEL

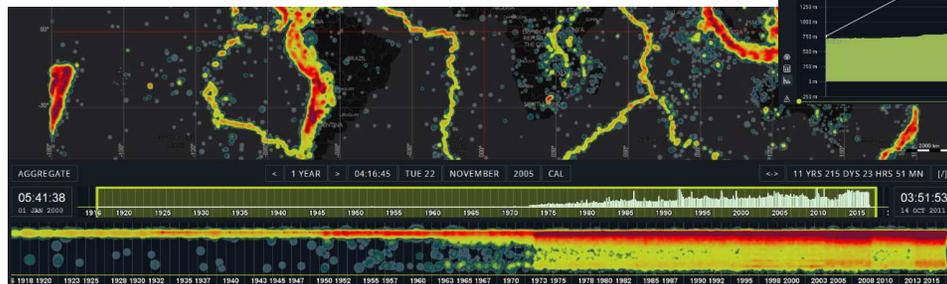
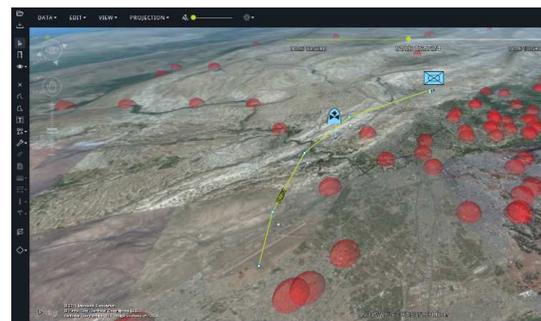
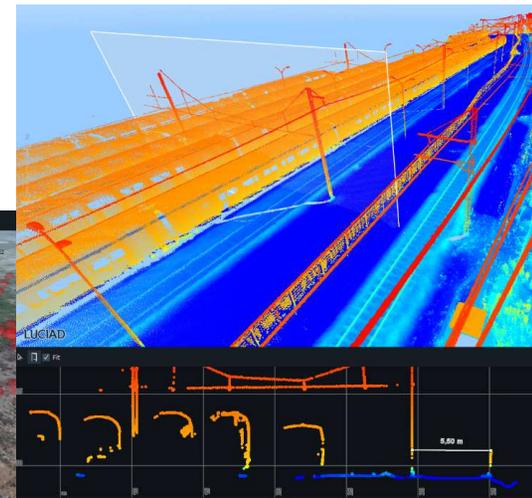
- Intuitive navigation controllers
- Mouse, multi-touch
- 2D & 3D graphical selection, creation & editing
- 2D & 3D Measurement controllers
- Dimensional and temporal sliders
- Change detection: swipe, flicker, porthole
- Timeline view





VERTICAL, PROFILE, TIMELINE VIEWS

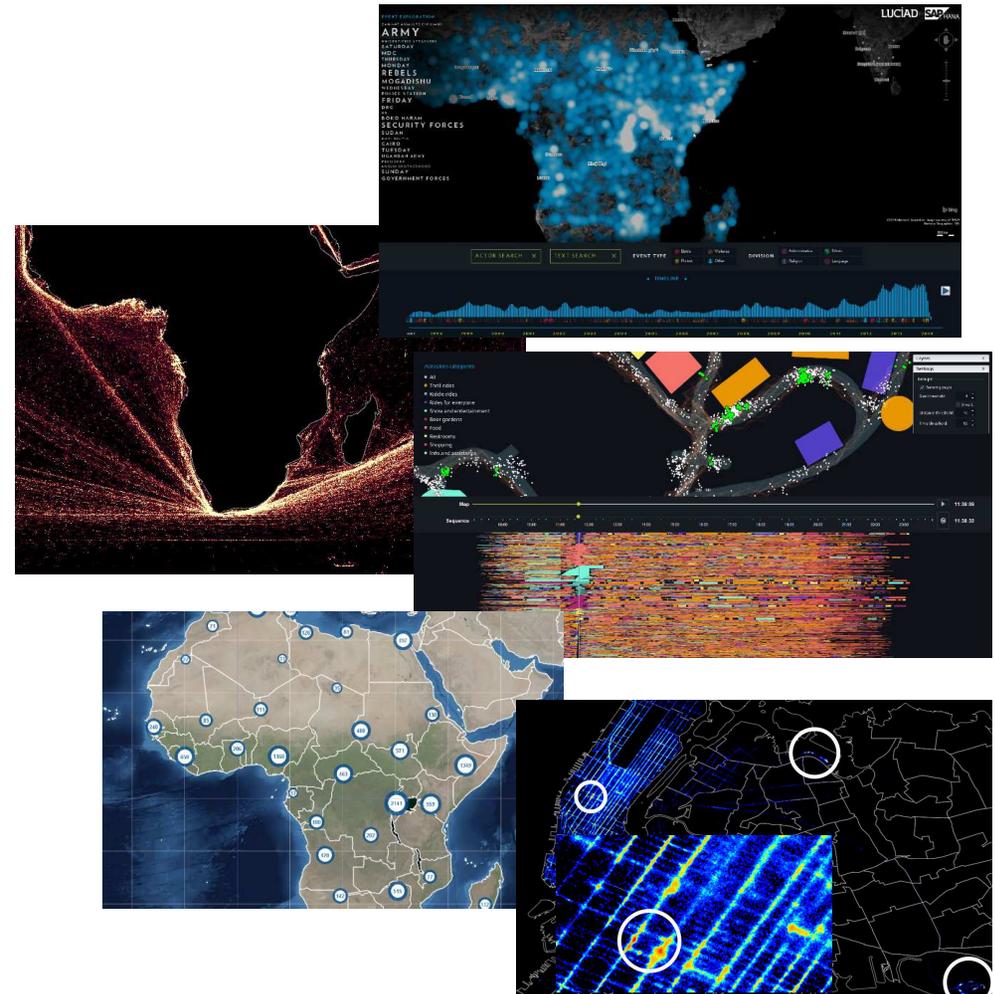
- Fully customizable
- Any visualization, editing, interaction
- Polyline altitude, terrain profile
- Cross-section with other data
- Controls: zoom, pan, ...
- Event-driven updates



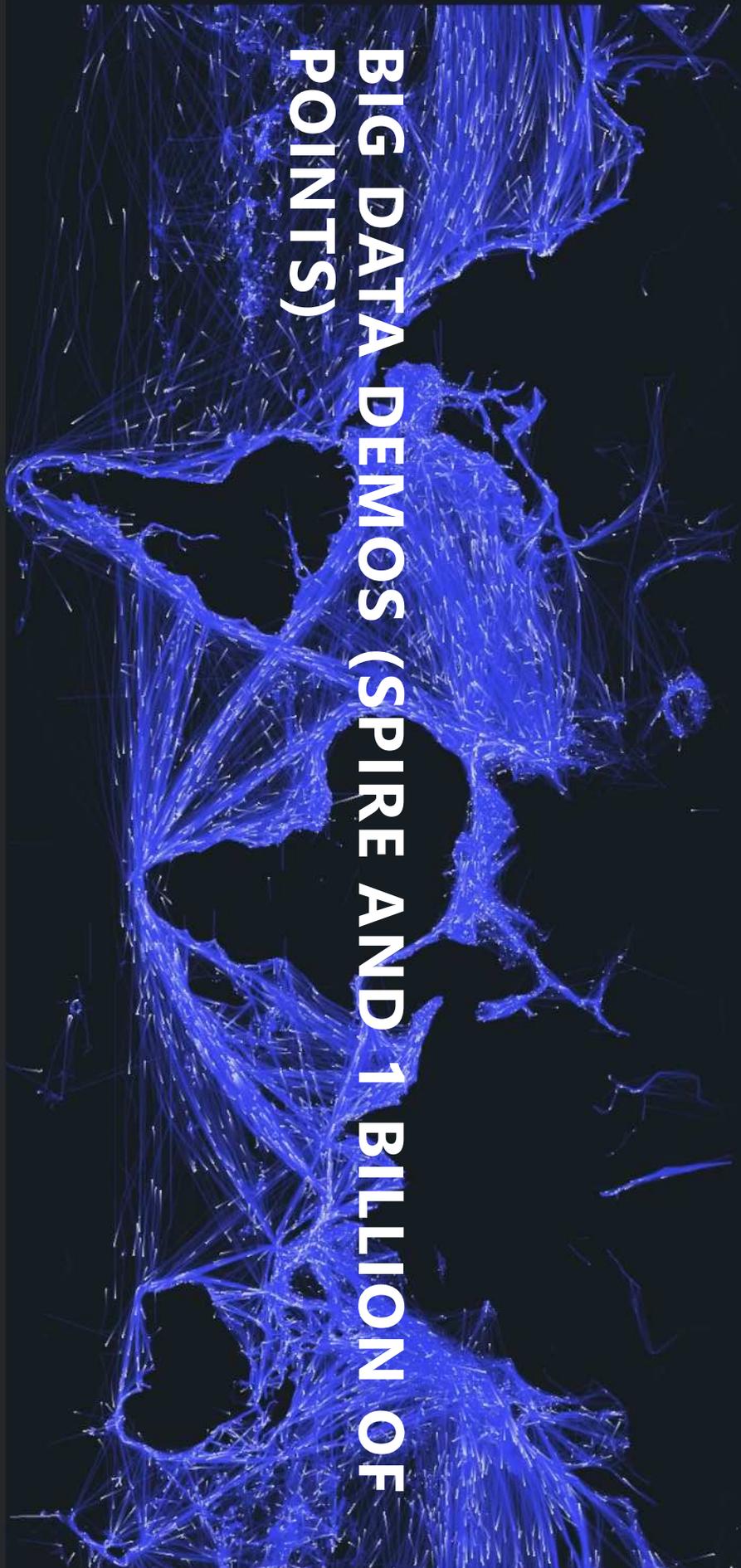


VISUAL ANALYTICS

- Data abstraction through clustering & heat maps
- Multiple views on same data
- Optimized engine for filtering and styling
- Handle 10s of millions of plots interactively
- Correlate multiple data sources
- 60 Hz interaction



BIG DATA DEMOS (SPIRE AND 1 BILLION OF POINTS)



INTEGRATION OF RELEVANT OPEN SOURCE INFORMATION



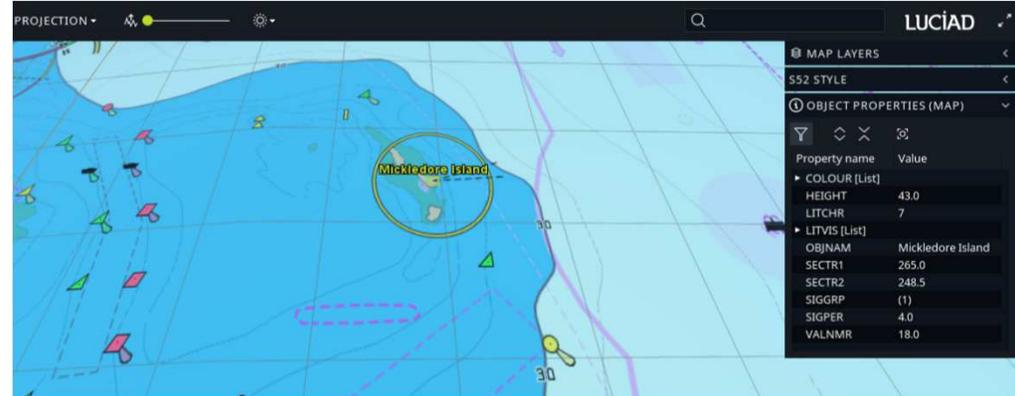
FLEXIBILITY: BASED ON STANDARDS

- Data Agnostic
- Not tied to any data format
- No pre-process is required
- Any kind of format
- OGC First!
- Open Source Software + Tied Data Format = CLOSED & UNSECURED SOLUTION
 - NGA : "No Web Mercator"



OGC STANDARDS

- OGC WMS, WFS, WCS, WMTS, CSW clients
- OGC KML
- OGC GeoPackage
- OGC SLD/SE





WEATHER & ENVIRONMENT STANDARDS

→ Visualization & Analysis

- Filtering
- Slicing
- Simulation over time

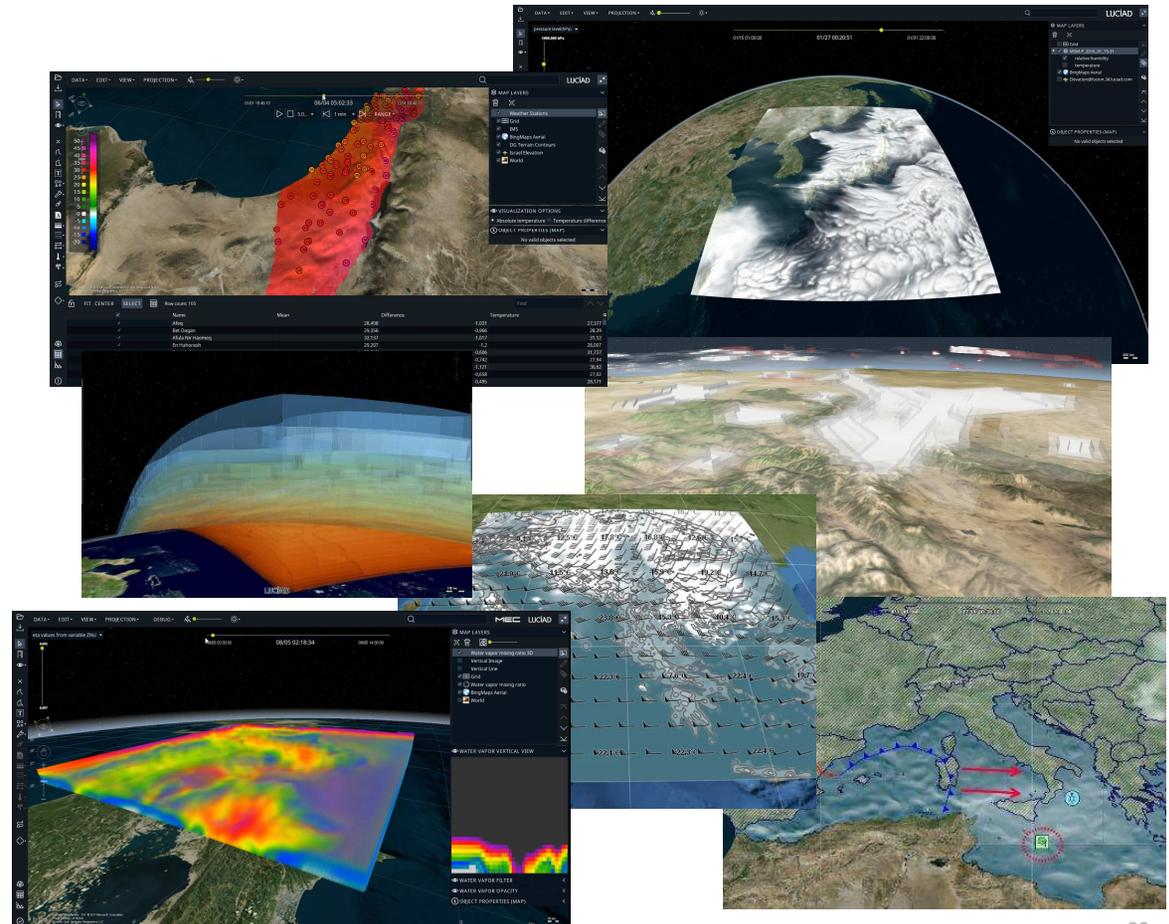
→ Access data, extract contours, extruded shapes,...

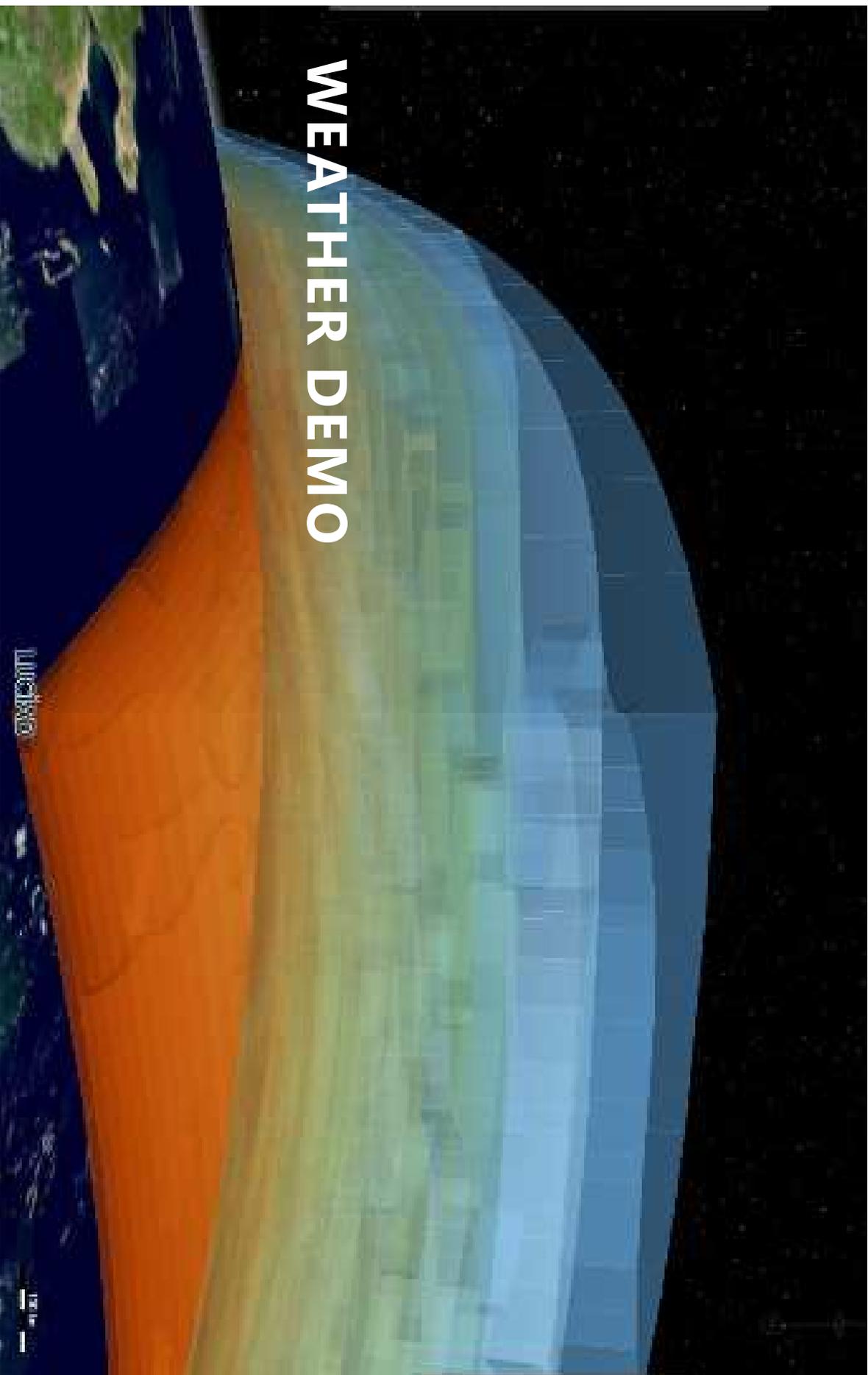
→ Style with wind barbs, icons,...

→ Integrated UI controls

→ Formats

- NetCDF-CF
- GRIB V1, V2





Luciad

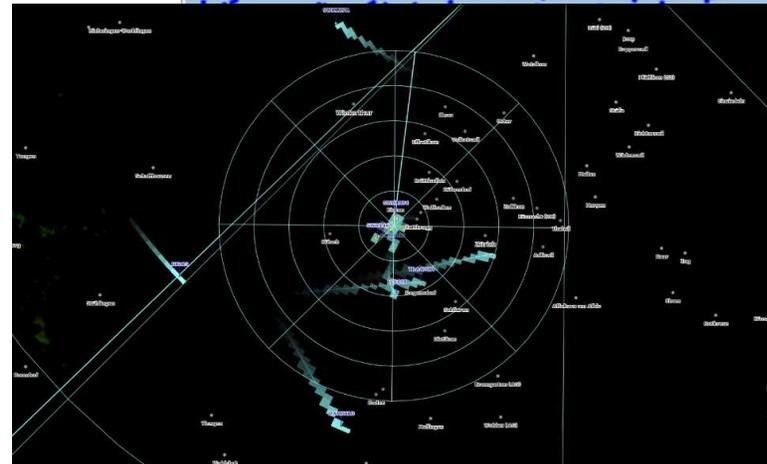
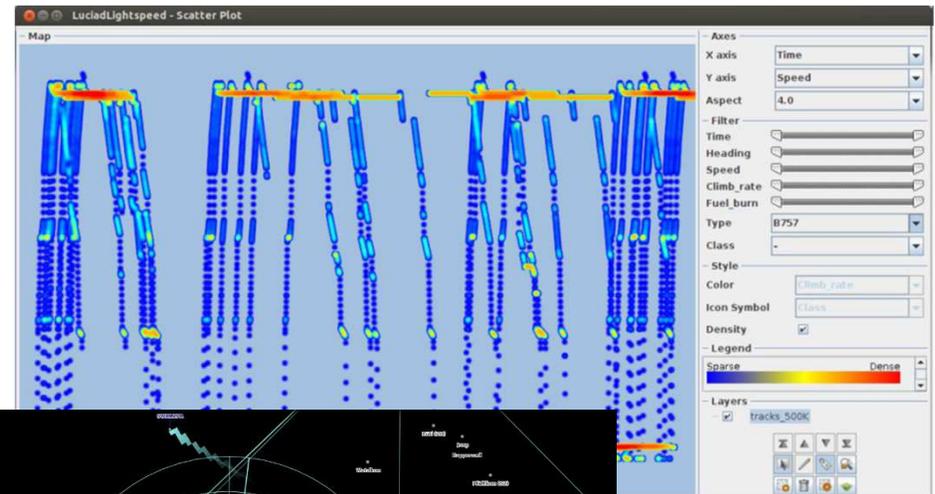
100%

SUPPORT TO RISK ASSESSMENT



GEO AND NON-GEO RISK TOOL

- Business Rules Integration
- Real Time Risk Assessment
- Geo and non-geo outcome



LUCIAD



HISTOGRAM HEADING
DENSITY HEADING
SPEED
VMG



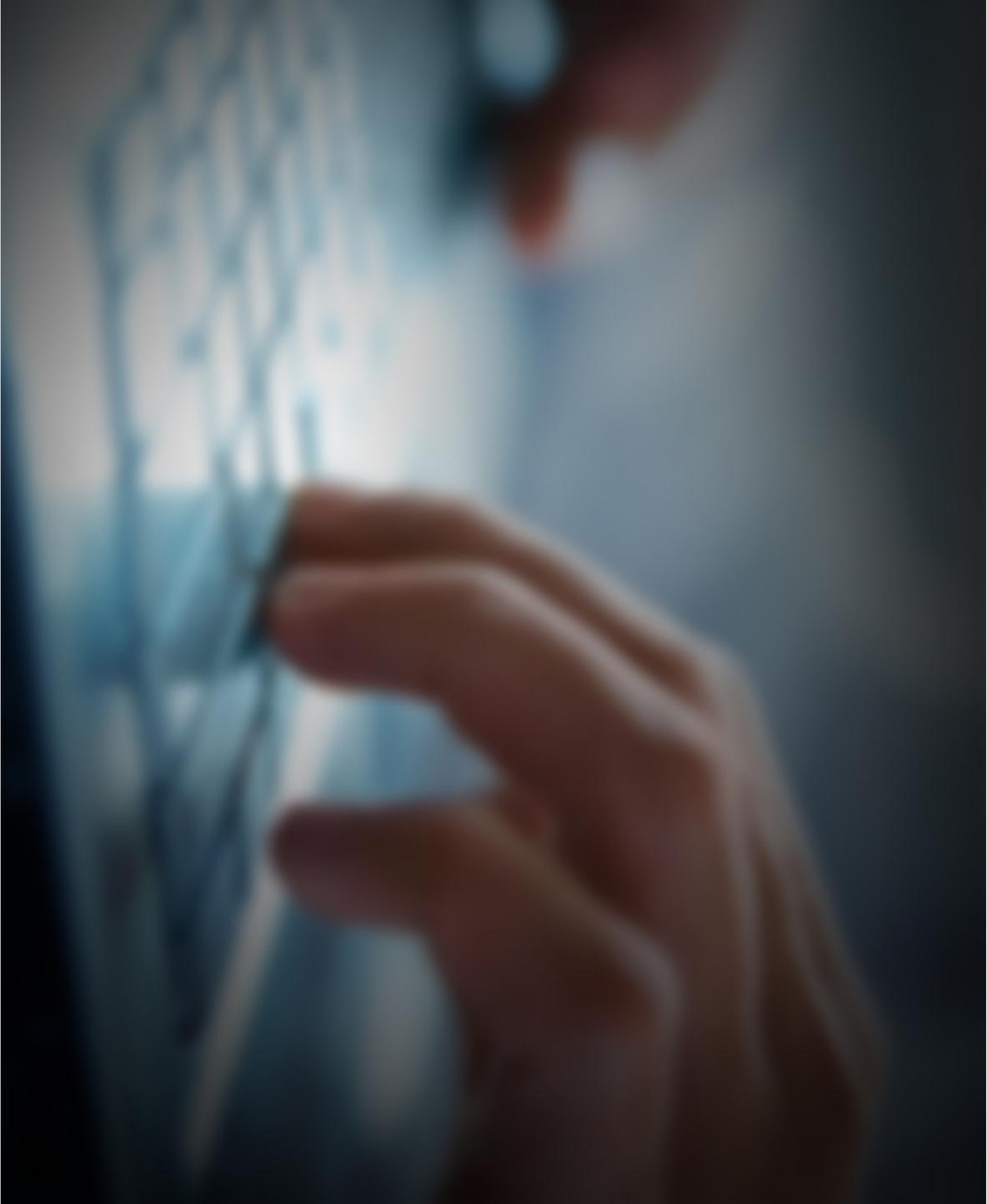
RISK ASSESSMENT DEMO



2013-09-25 13:27:32

13:07 13:08 13:09 13:10 13:11 13:12 13:13 13:14 13:15 13:16 13:17 13:18 13:19 13:20 13:21 13:22 13:23 13:24 13:25 13:26 13:27 13:28 13:29 13:30 13:31 13:32 13:33 13:34 13:35 13:36 13:37 13:38 13:39 13:40 13:41 13:42 13:43 13:44 1

TOGGLE RANGE 3D ABSOLUTE RELATIVE DOTS POLAR



THANK YOU!

LUCIAD