



HEXAGON

Maintaining information flow in fast moving operations

Underpinning decisions with AI and
data fusion

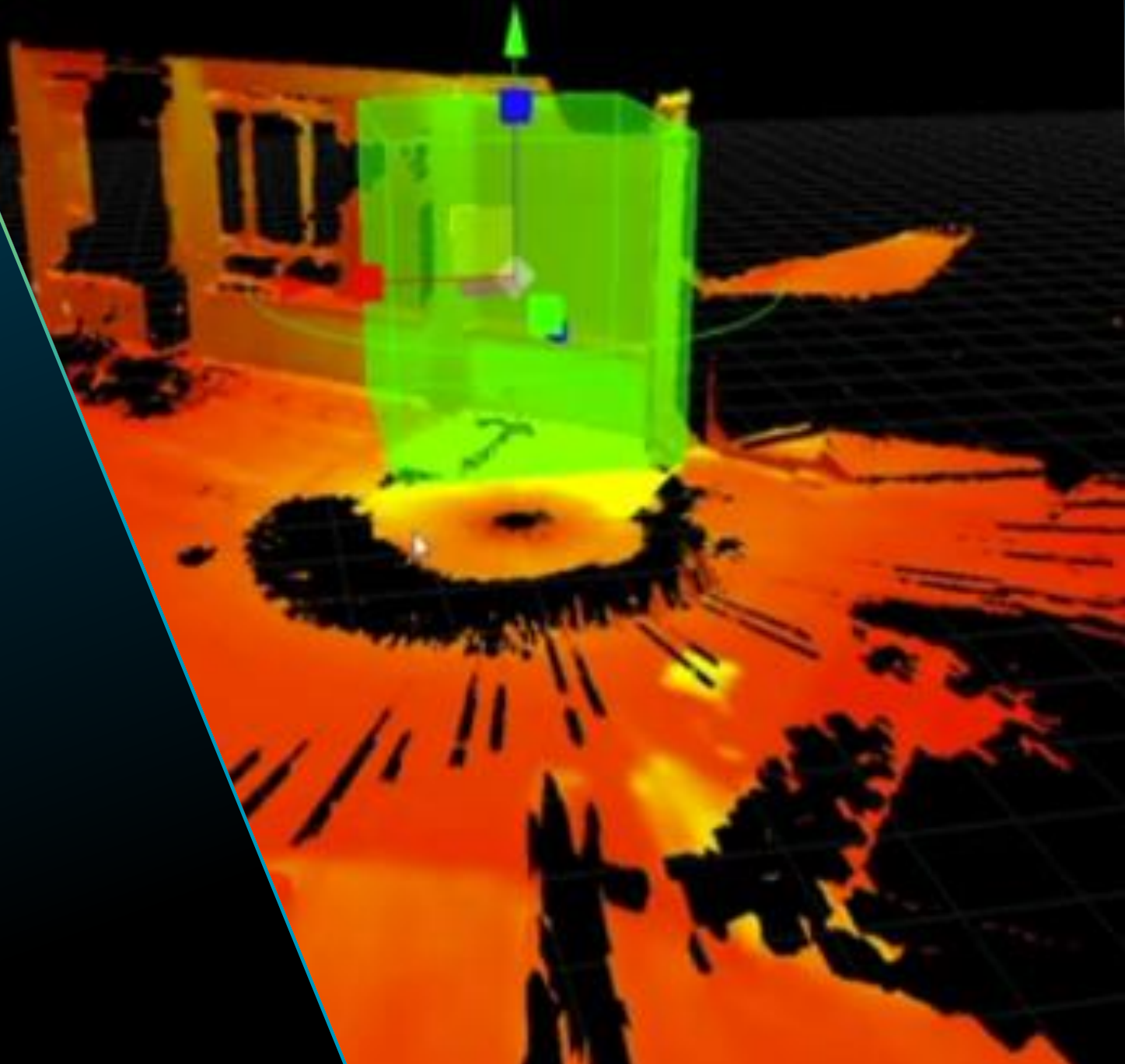
Richard Goodman
EMEA Defence Lead

GEOINT flow



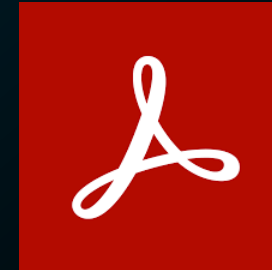
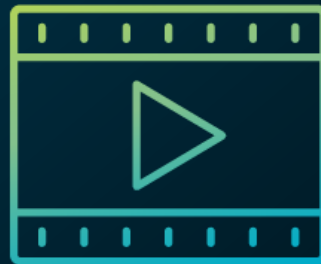
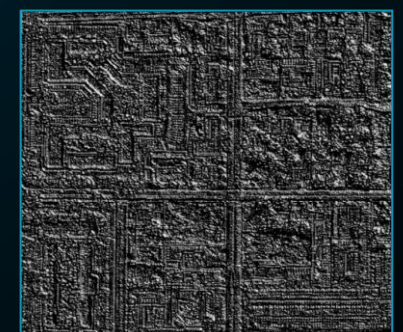
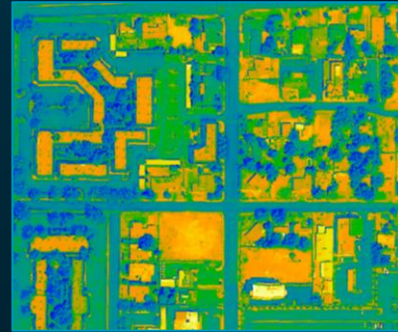
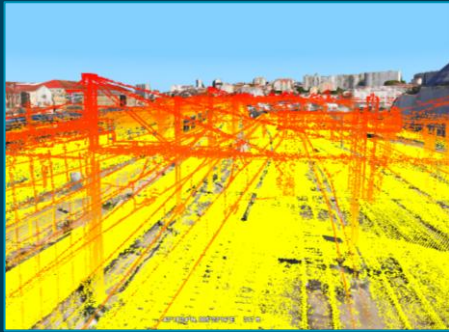
“ Data is a precious thing and will last longer than the systems themselves.”

Tim Berners-Lee



Catalogue holdings

Data formats



Interoperability

Standards

- Adherence
- Leadership
- De facto
- Implied
- Industry
 - Defence
 - Geospatial



Formats

- Hydrographic
- Defence
- Aviation
- Maritime
- Geospatial
- Legacy
- Current



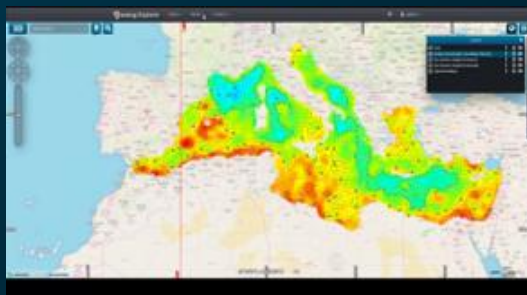
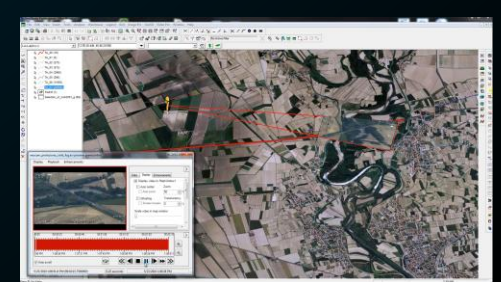
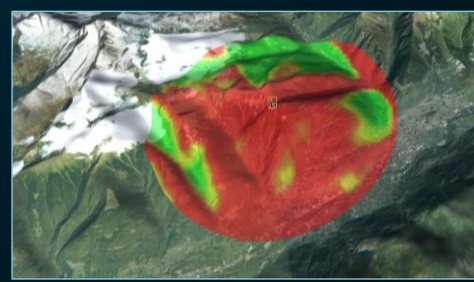
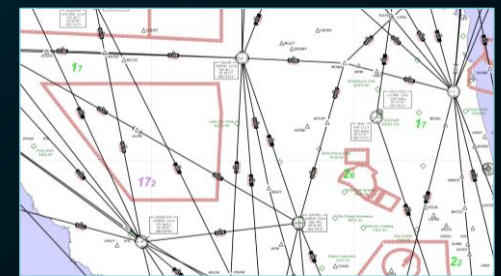
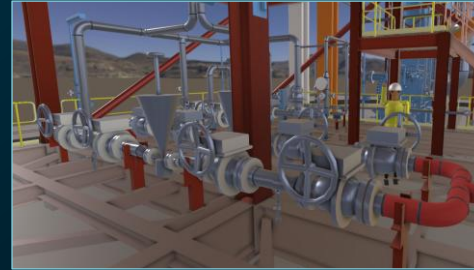
Platforms

- Operating systems
- Programming languages
- Medium / platform
- Hosts

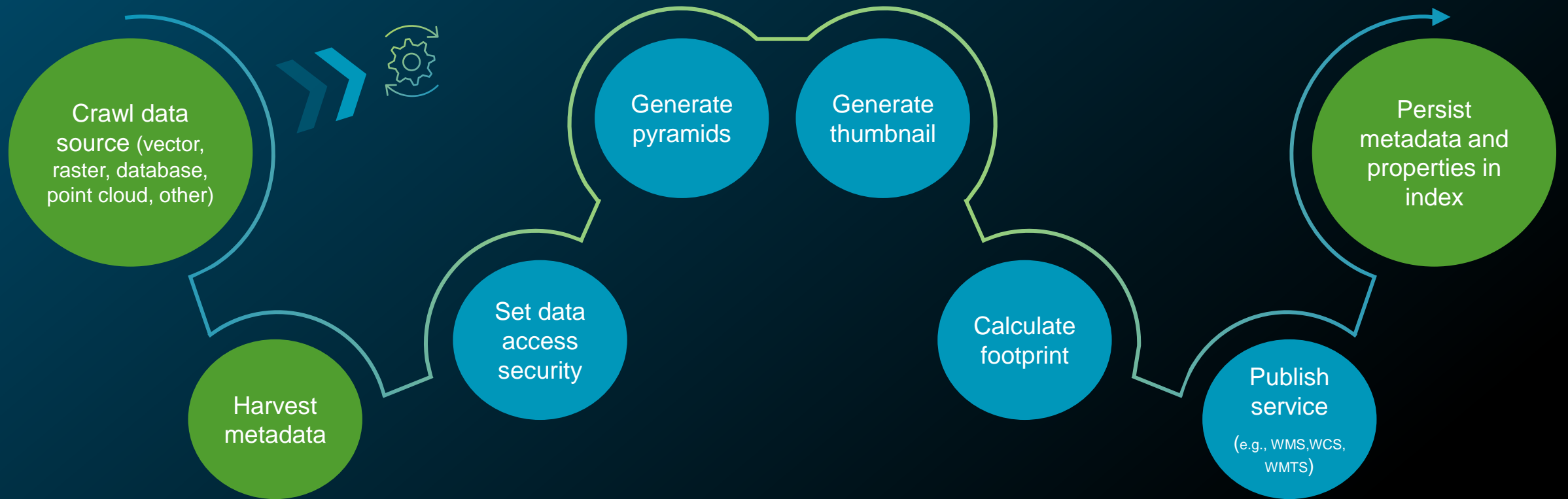


Catalogue holdings

Data types



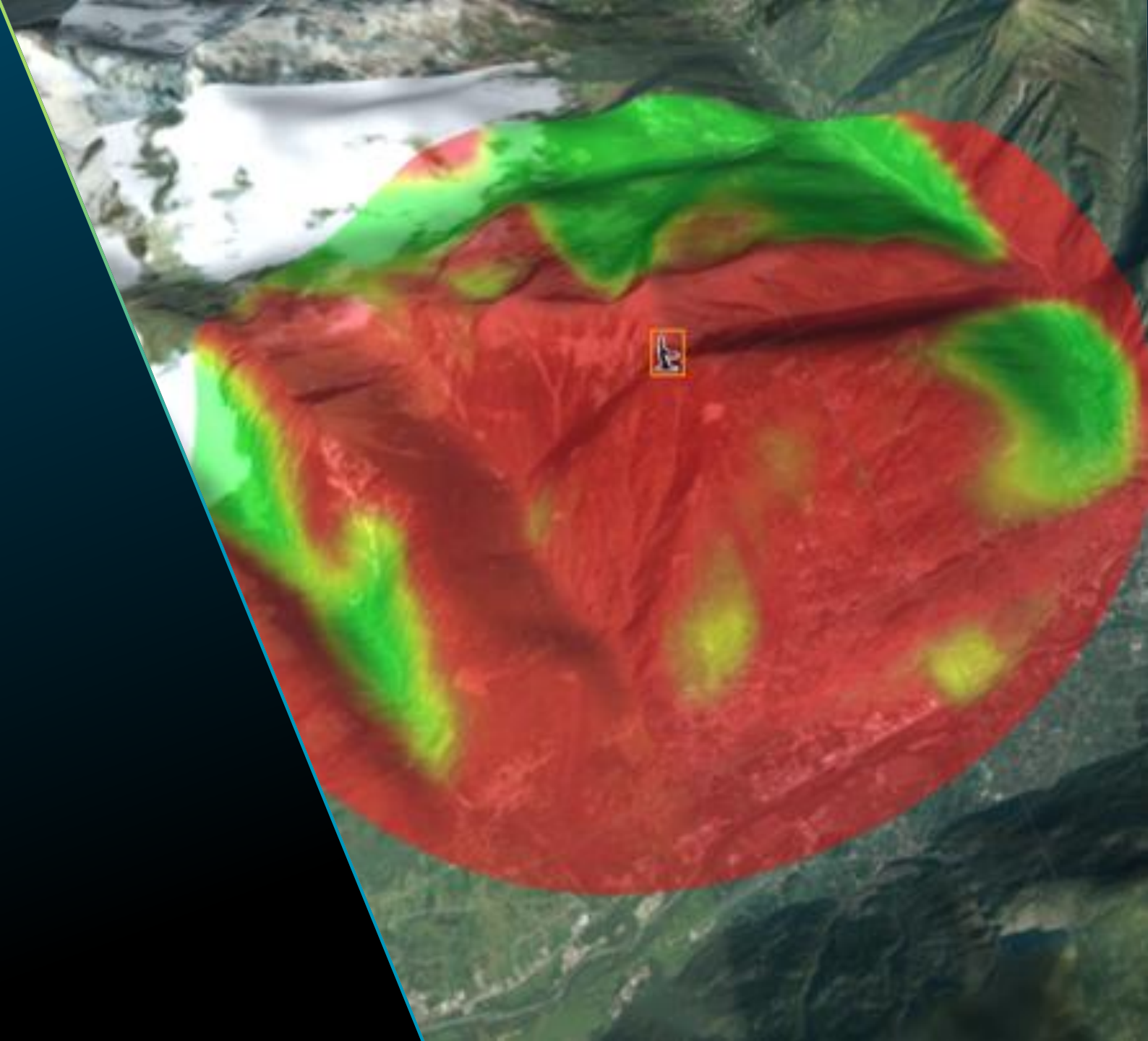
Information crawler



- Mandatory process
- Optional process

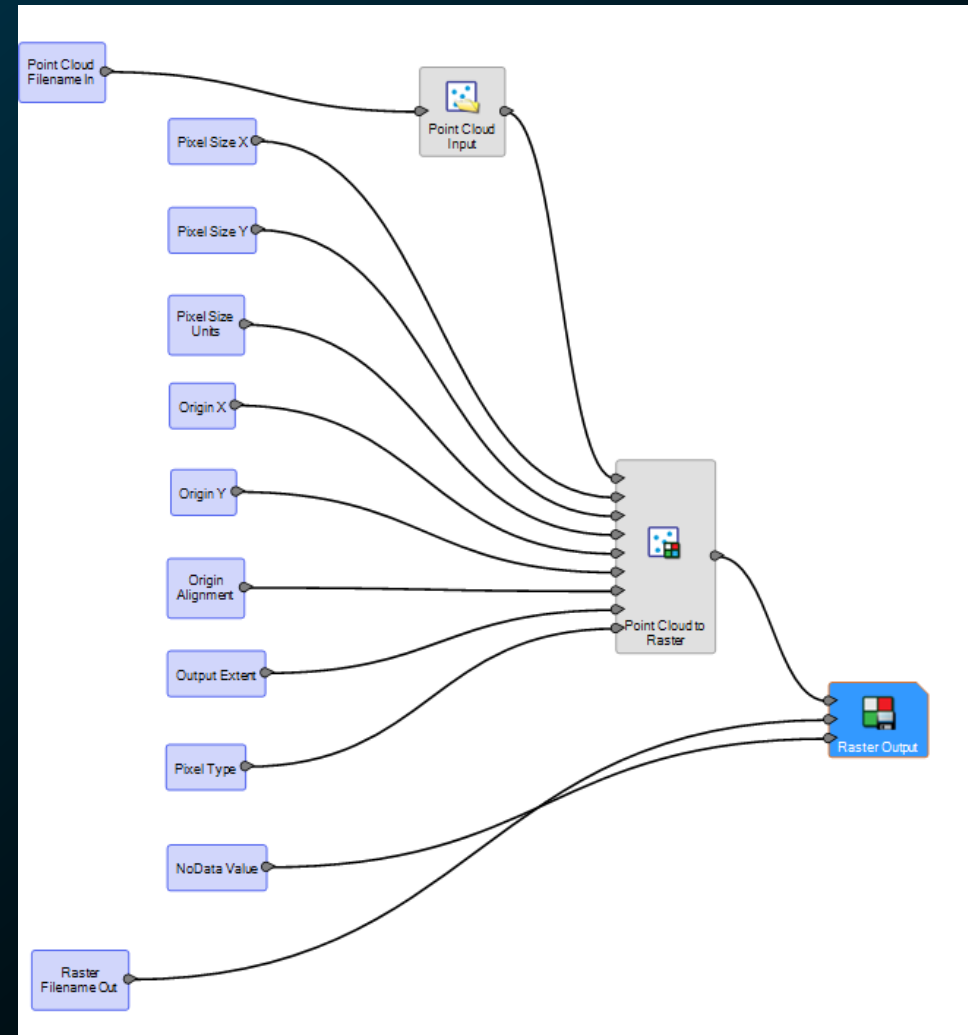
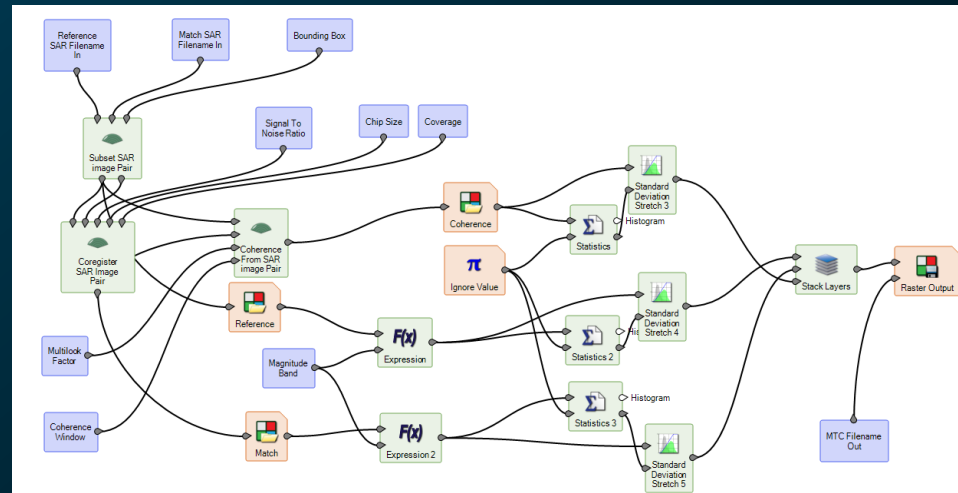
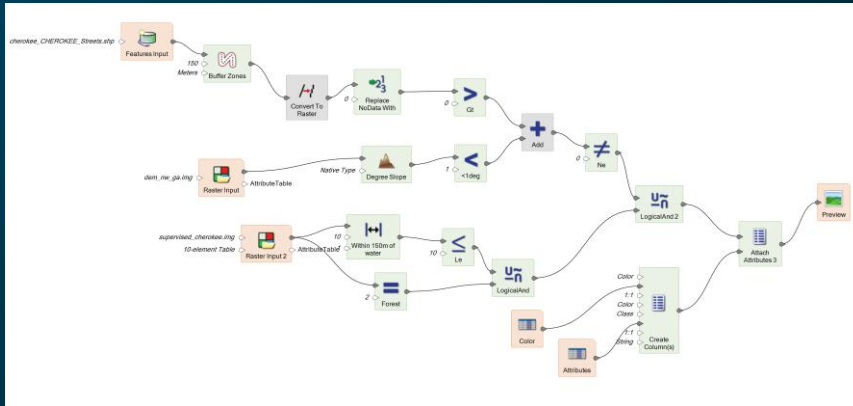
“ Without geography
you’re nowhere.”

Jimmy Buffett



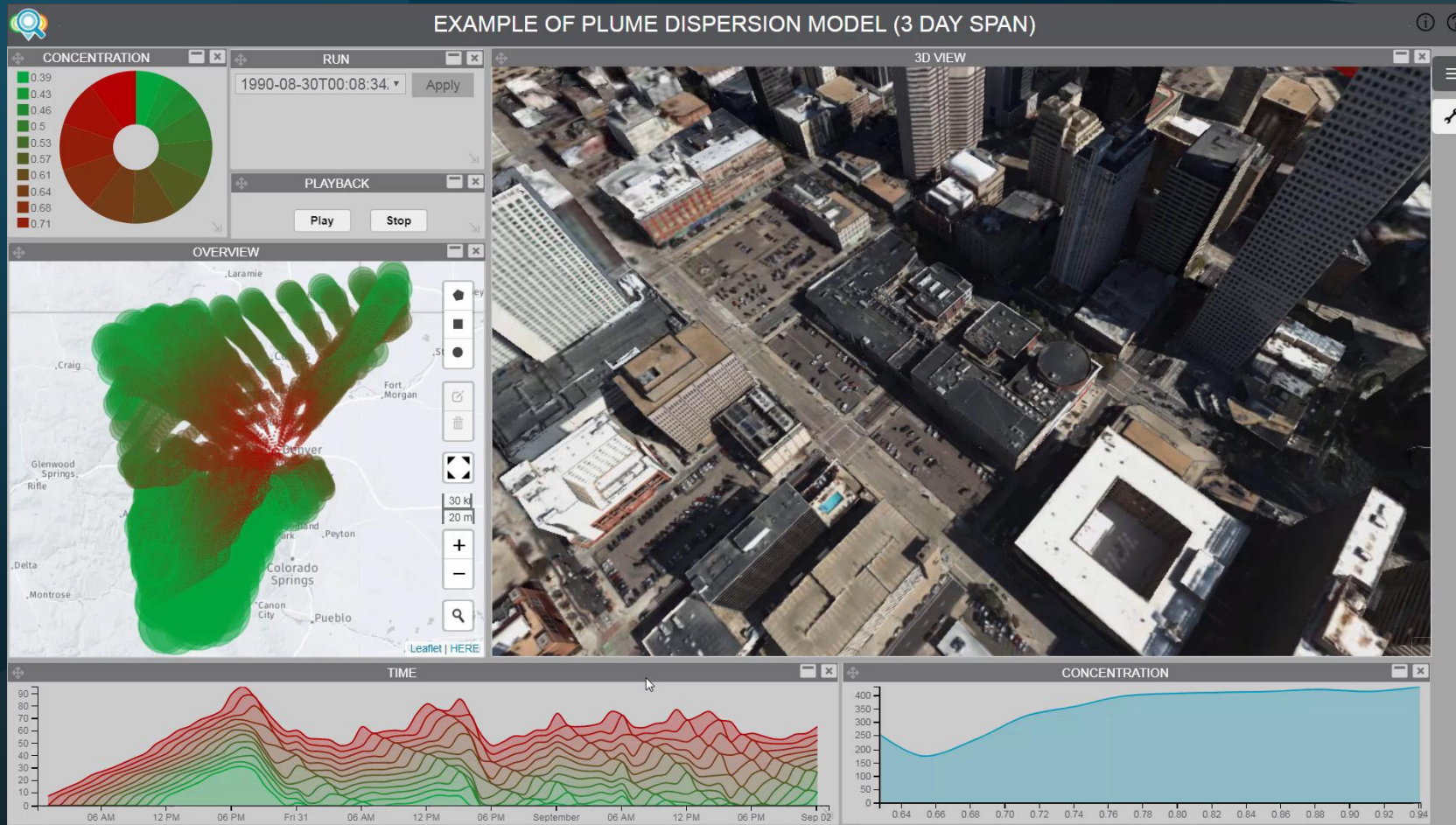
Data analysis

Scheduled and on-demand



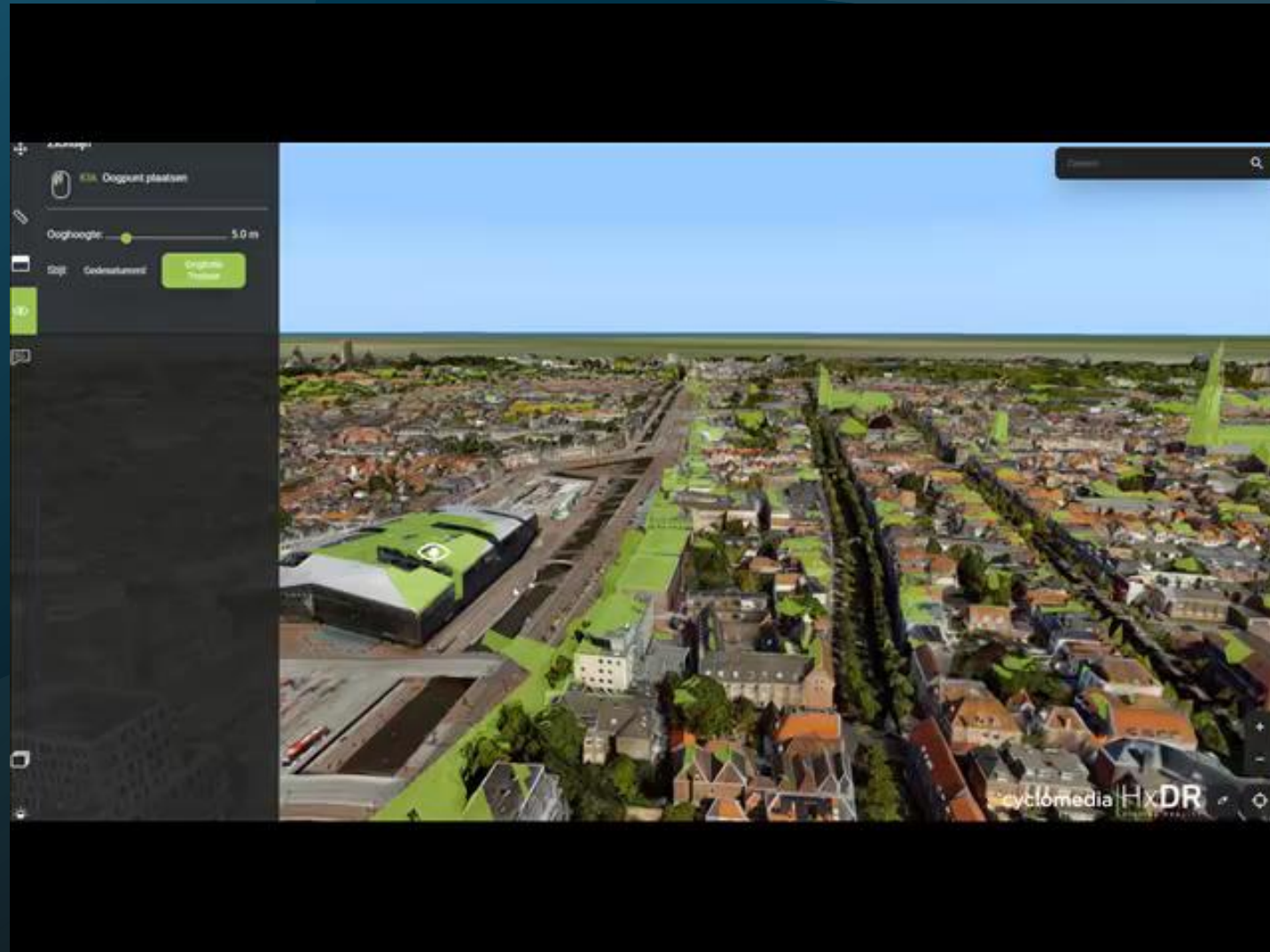
Data analysis

Predictive



Data analysis

Real time

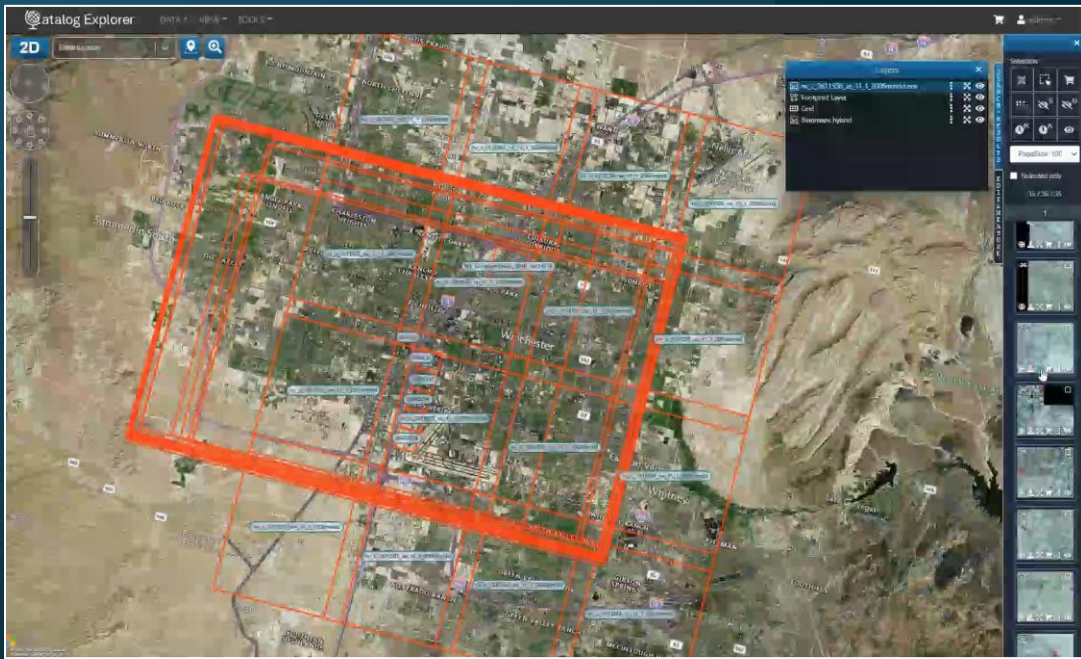


Data analysis

Real time

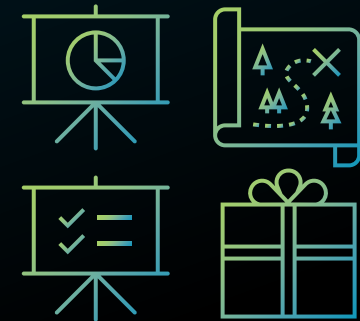


Delivery



- Geoprocessing
- AOI notifications
- Download datasets
- Upload / download / run analytics
- Product-level installation / configuration / documentation
- Standards based
- Web services and APIs

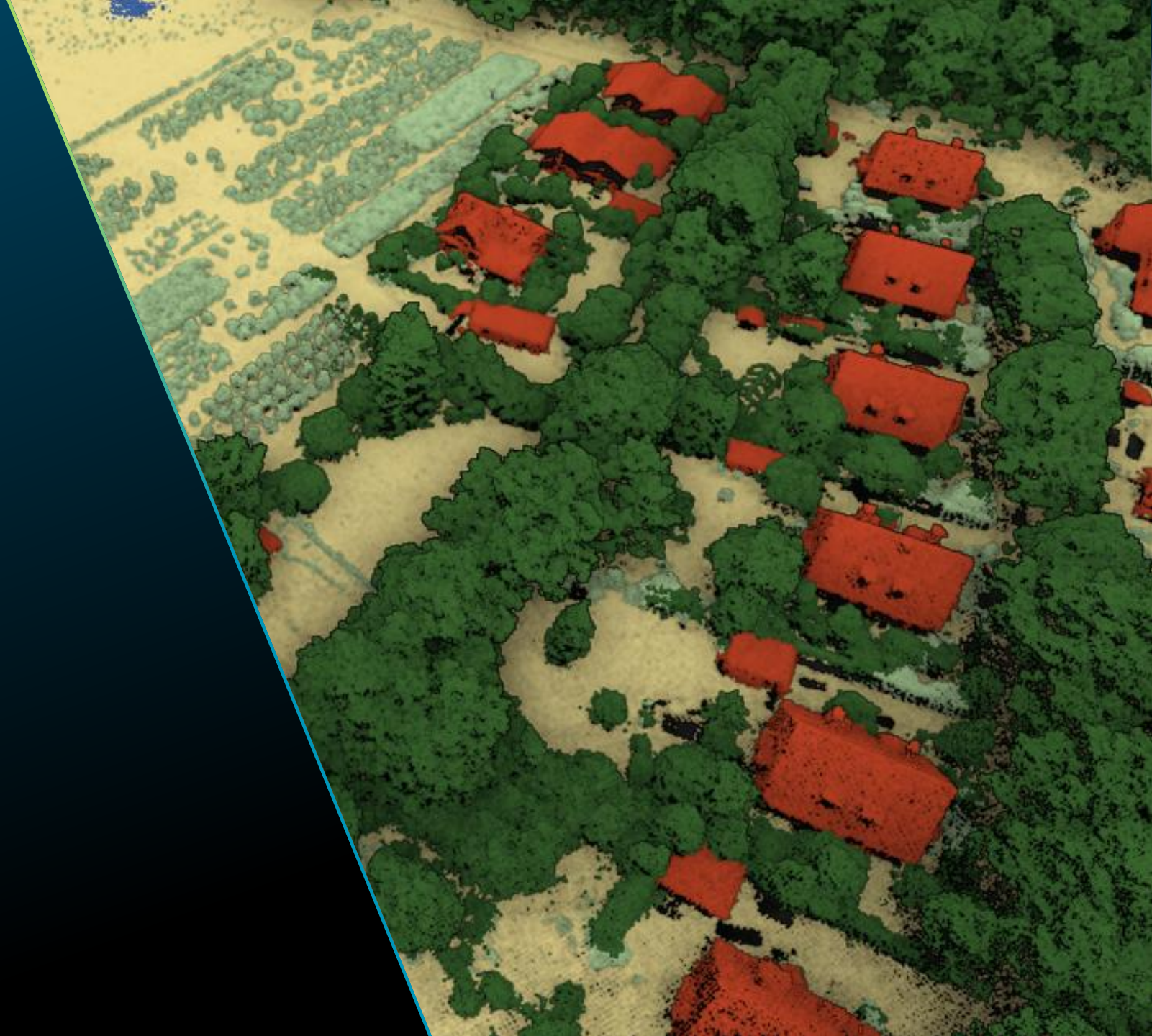
- Deliver relevant information





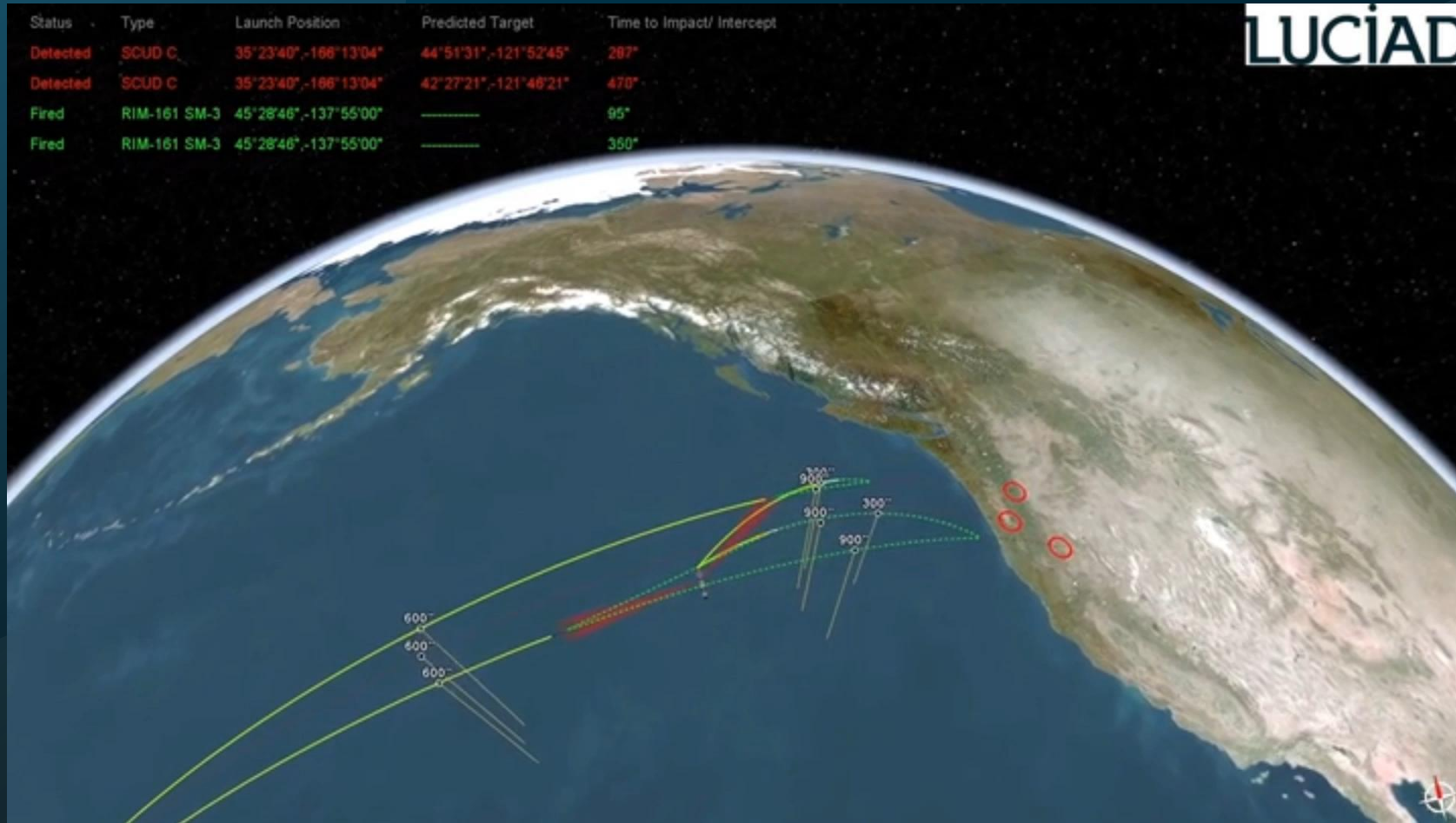
**A picture is worth a
thousand words."**

Frederick R. Barnard



Data delivery

Visual analytics



Data delivery

Visual analytics



Data delivery

Served analytics

The screenshot shows a web application interface for data delivery and served analytics. The main area displays a grayscale topographic map of Europe. On the right side, there is a control panel titled "Cross Country Europe" with the following fields and buttons:

- Collect Points** button
- Warning text: "Start and end points must be collected"
- Input DSM** dropdown menu: "eudem_dem_europe_wgs84..."
- Transportation XML Input** dropdown menu: "20180514_Leopard_wb.xml"
- Rain Precipitation Rate (mm/h)** input field: "0"
- Detail Factor** input field: "1"
- Output Raster Path** dropdown menu: "eudem_dem_europe_...img"
- Run** and **Reset** buttons

The bottom status bar contains the following information:

- Coordinates: Place
- Place Start Point
- Scale: 1:4,293
- Projection: Affine (2D)
- Altitude: 25.07 meters (Global DEM - MSL)
- Zoom: 0.000"

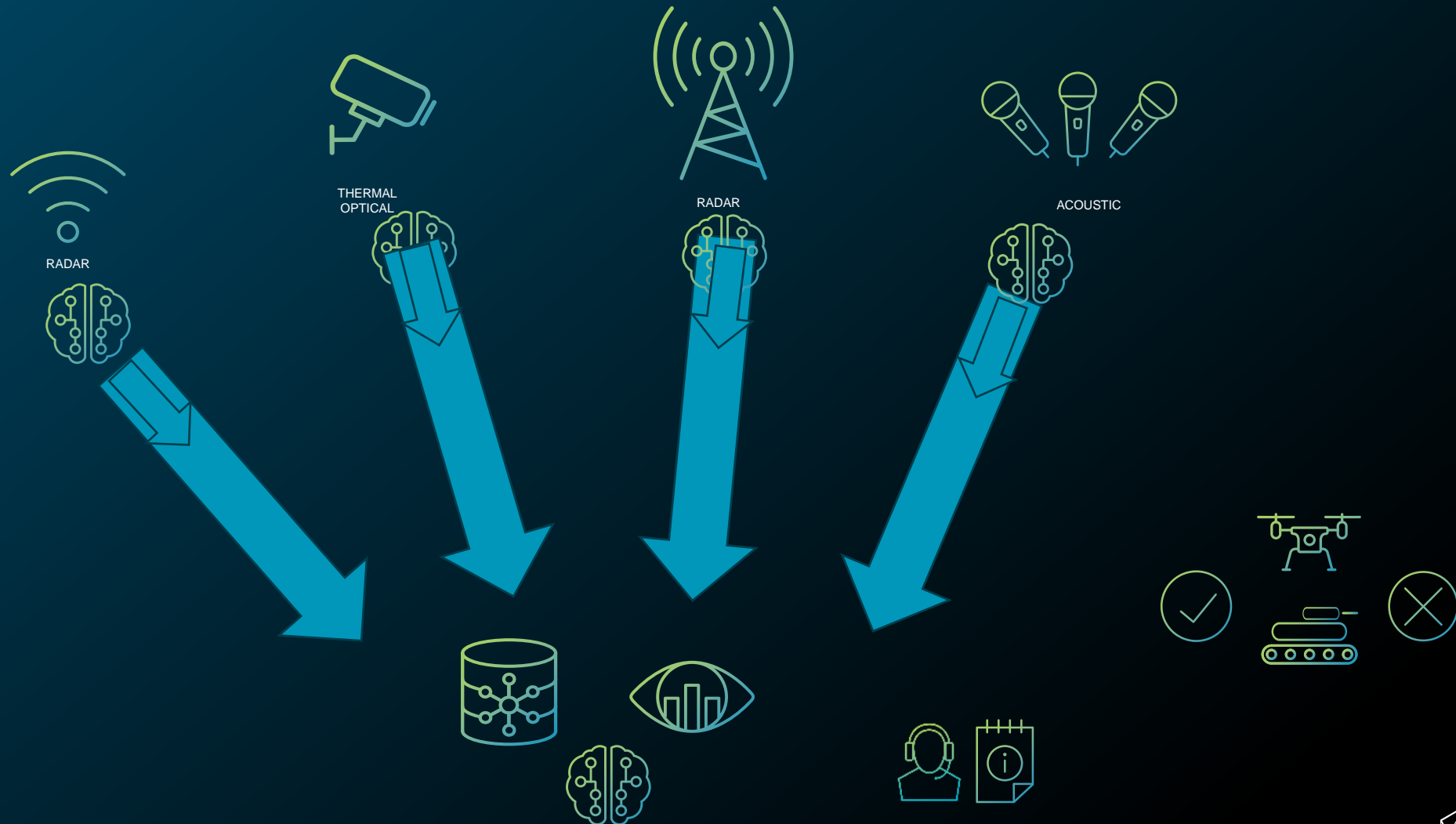
Digital twin maturity model



Green arrow – automatic process | Blue arrow – manual process

Examples

AI and HITL



Intelligent visualisation and analytics for C-UAS with Luciad



LUCIAD-based C-UAS solution



LUCIAD-powered C2 for C-UAS



C2 | ISR| Blue-Red Force | Threat & intrusion detection | Tracking | Interception | Mission planning | Perimeter surveillance & security | GEOINT | UTM | ATM/ATC integration

Real-time air situation picture visualisation in a hybrid 3D,4D view and analytics for counter UAS activities

Tracks | Custom styling & labelling | Line of sight | Military symbology| | STANAG 4609 | Swarms | Collision check | weather



DB
Files
Web Services
Tactical Links

Simulations

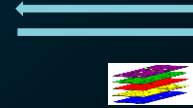


Air traffic control



LUCIAD FUSION
Mission Server SDK

Data exchange
interface



SAPIENT

Video
management

Other
modules



STATIC

SENSORS

3D

WEATHER

RADAR

SENSOR
APIs

CAMERAS

INTERCEPTOR

Satellite imagery
Vector, elevation
Other geospatial data

Asterix
Video feed
Custom, GPS
Coverages

Ogc 3D Tiles
3D building, city
Point clouds
Airspaces ARINC, DAFIF

NetCDF ISC,
GRIB V1/V2 (WMO/ICAO)
SIGWX (BUFR).

Radar tracks
Radar coverage
Tracks classification

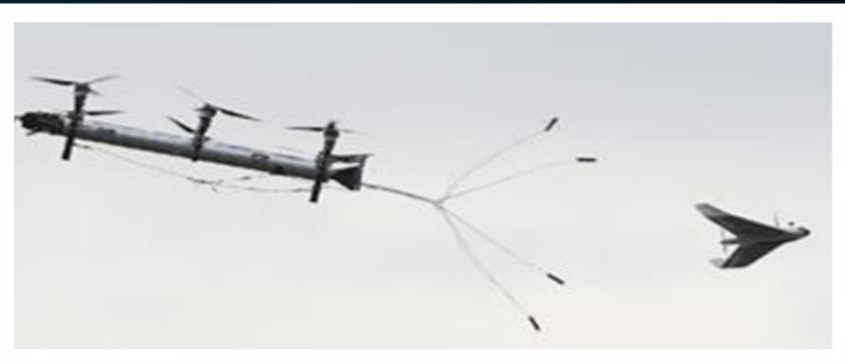
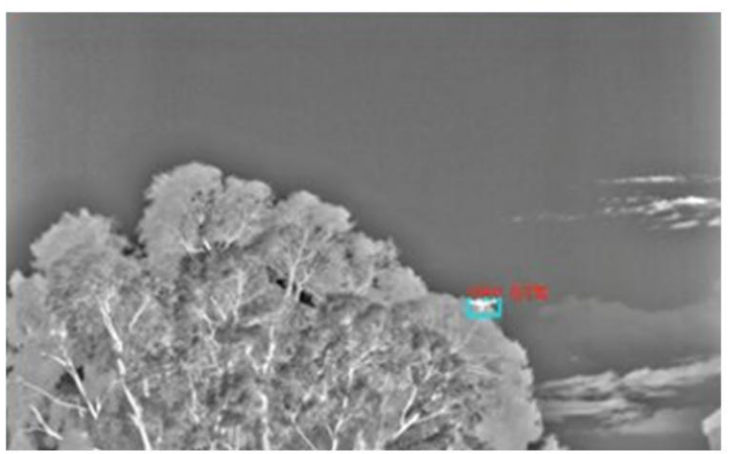
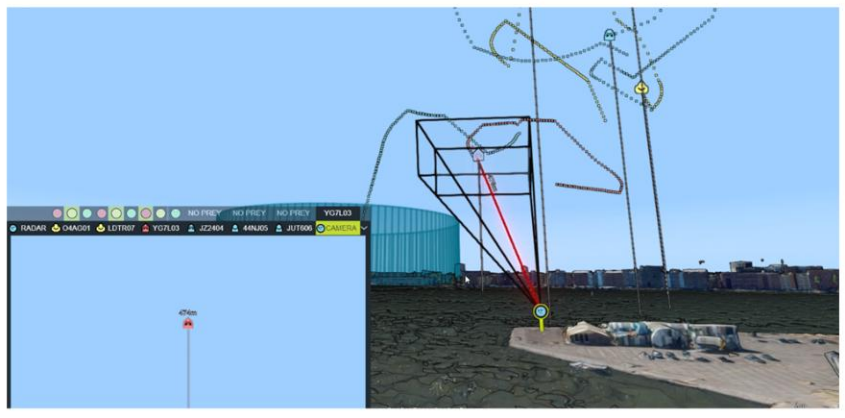
Camera controls

Camera feed
RTSP to web

Countermeasures

JAMMER

Jamming
Forced landing





NO PREY NO PREY NO PREY 6BXT03
RADAR ZFX001 BFGV02 6BXT03 6STD04 BCKI05 LKXJ06 CAMERA ^ 52°22'07", 004°55'22" 65.5m

200 m

ARMS counter-UAS system

Indra

Spain

Challenge: Indra needed to create a solution to detect and neutralise rogue drones in sensitive areas.

Solution: Using Luciad technology, Indra delivered a system that integrates data from different sensors, such as infrared and LiDAR, into a single platform, allowing coastal surveillance operators to visualise and analyse information in near-real time.

Results: From micro drones to large UAS, Indra's ARMS is a leap forward in threat detection, surpassing the surveillance capabilities of traditional services. Deployments have included Vietnam and Oman.

CBRN analysis

Bruhn Newtech

Denmark

Challenge: Bruhn Newtech needed to perform detailed CBRN analyses for various scenarios.

Solution: LuciadLightspeed has added additional functionality to the CBRN-Analysis solution for detailed predictions of the consequence of missile intercepts.

Results: The NATO-compliant software product is supplied to over 90% of NATO countries and many Partners for Peace (PfP) nations.

**Data is not information;
information is not knowledge;
knowledge is not understanding;
understanding is not wisdom.**

Clifford Stoll

Thank you

Richard Goodman

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