Tools and Workflow for Maintaining Global Licence Information in Statoil

Statoil

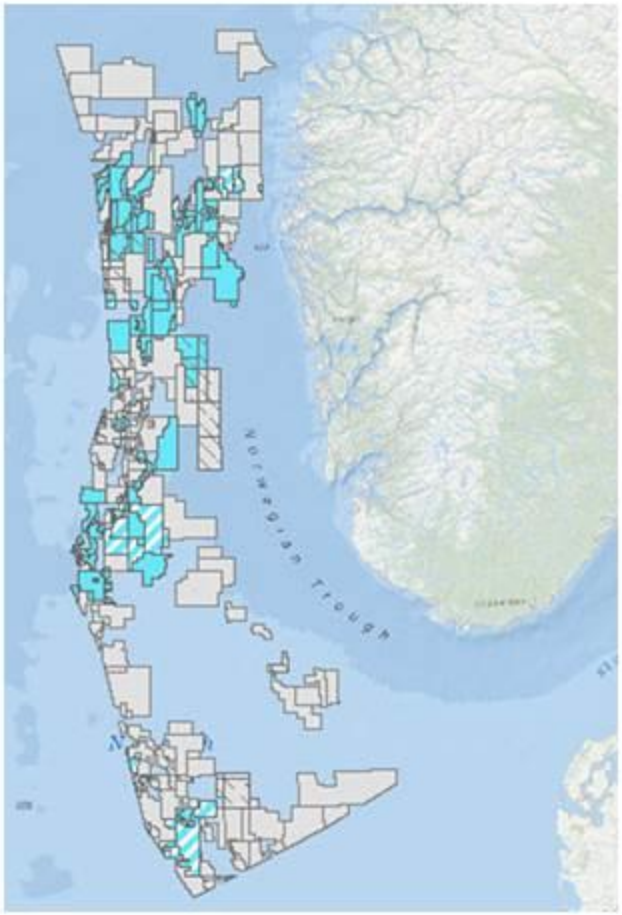
Putting the “where” with the “what”, and implementing the “how”. Easier said than done!

Nov. 5, 2015. EPUG
Leslie Austdal, Statoil ASA

Tools and Workflow for Maintaining Global Licence Information in Statoil

Outline

- About Statoil
- Global Licence Information (GLI) Project
- Geodetic Challenges
- GIS Spatial Workflow
- Information & Integration



Statoil

Who we are

Statoil is an international energy company committed to accommodating the world's energy needs in a responsible manor.

Operations in 37 countries

40 years of experience from the Norwegian continental shelf

Main office in Stavanger, Norway

Approx. 22,000 employees worldwide

More information on www.statoil.com

The GLI Project

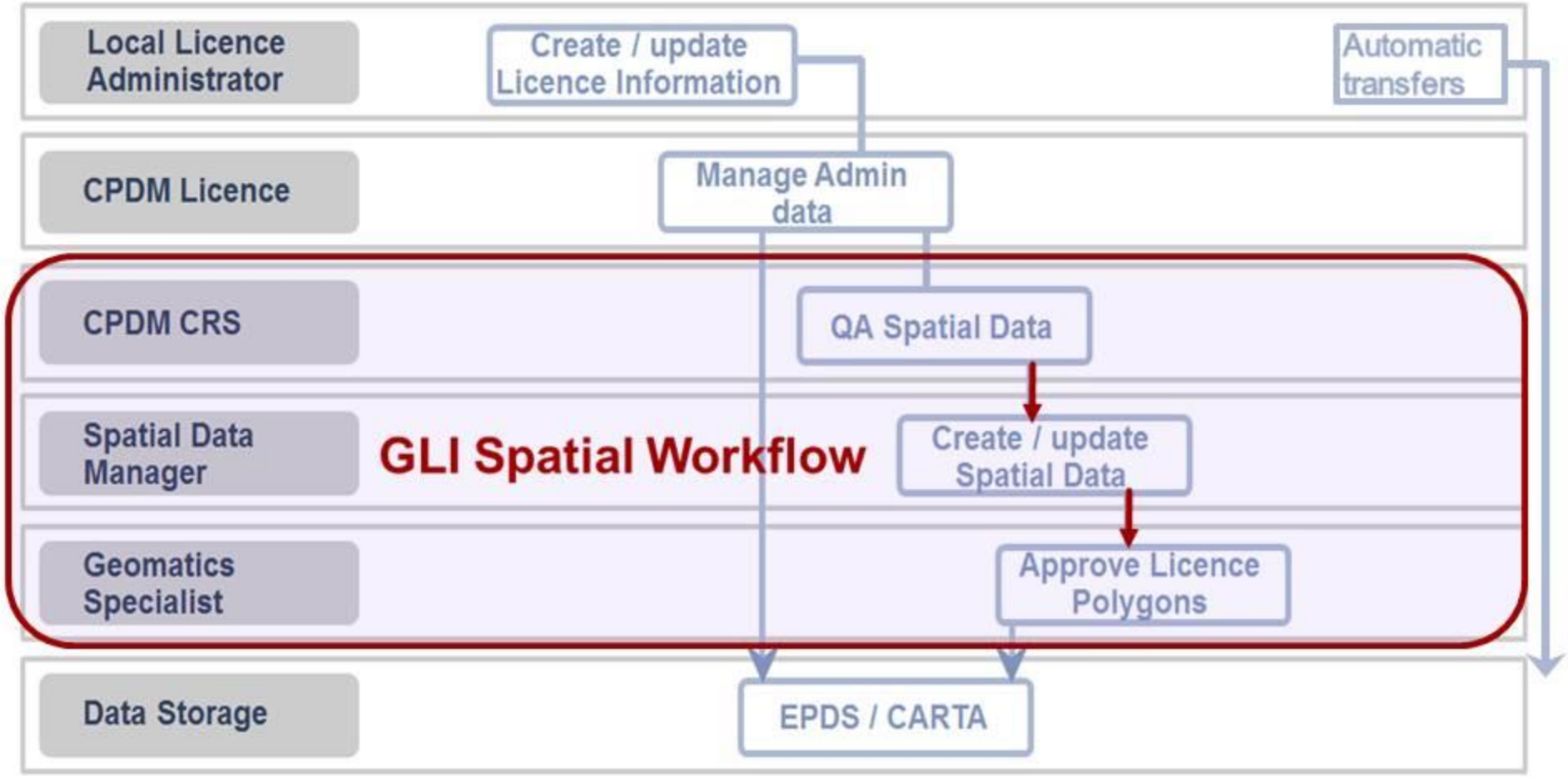
- Establish clear roles and responsibilities
- Define processes and workflows
- Expansion of data model with new requirements
- Official master store for global licence data

Licences – Spatial Information

- Planning surveys
- Relinquishment proposals and bid rounds
- Prospect analysis
- Maps used in contact with authorities
- Visualize and query license Information (also historic)
- Locational and competitor analysis
- Data integration with other applications
- Illustrations & information

Licence Terms

Global Licences: Roles and Workflows



Surveying & Positioning Guidance note 3

International Association of Oil & Gas Producers

Contract Area Description

www.iogp.org/pubs/373-03.pdf

Licence boundary

- A series of turning points given in coordinate list
- Defined line types (parallel, meridian, geodesic, loxodrome grid)
- May include intersection to agreement borders or physical features
- Definition of coordinate reference system (CRS)

Point	Latitude	Longitude	Line from - to	Line Type
A	50° 10 '00.0" N	10° 12 '00.0" E		
			A - B	Parallel
B	50° 10 '00.0" N	10° 24 '00.0" E		
			B - C	Meridian
C	50° 00 '00.0" N	10° 24 '00.0" E		
			continue until...	
N	50° 05 '30.0" N	10° 17 '00.0" E		
			N - A	Geodesic
A	50° 10 '00.0" N	10° 12 '00.0" E		

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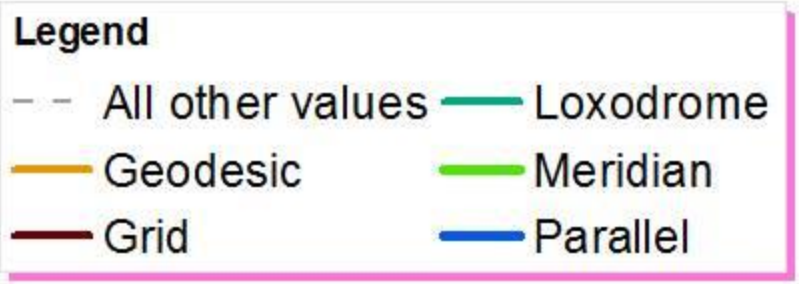
Spatial Workflow – Required Information

- Lat/Lon or x/y (with sequence of points)

- Line type



- CRS with geodetic datum

  geodetic CRS (for lat/lon)

  projected CRS (for x/y)

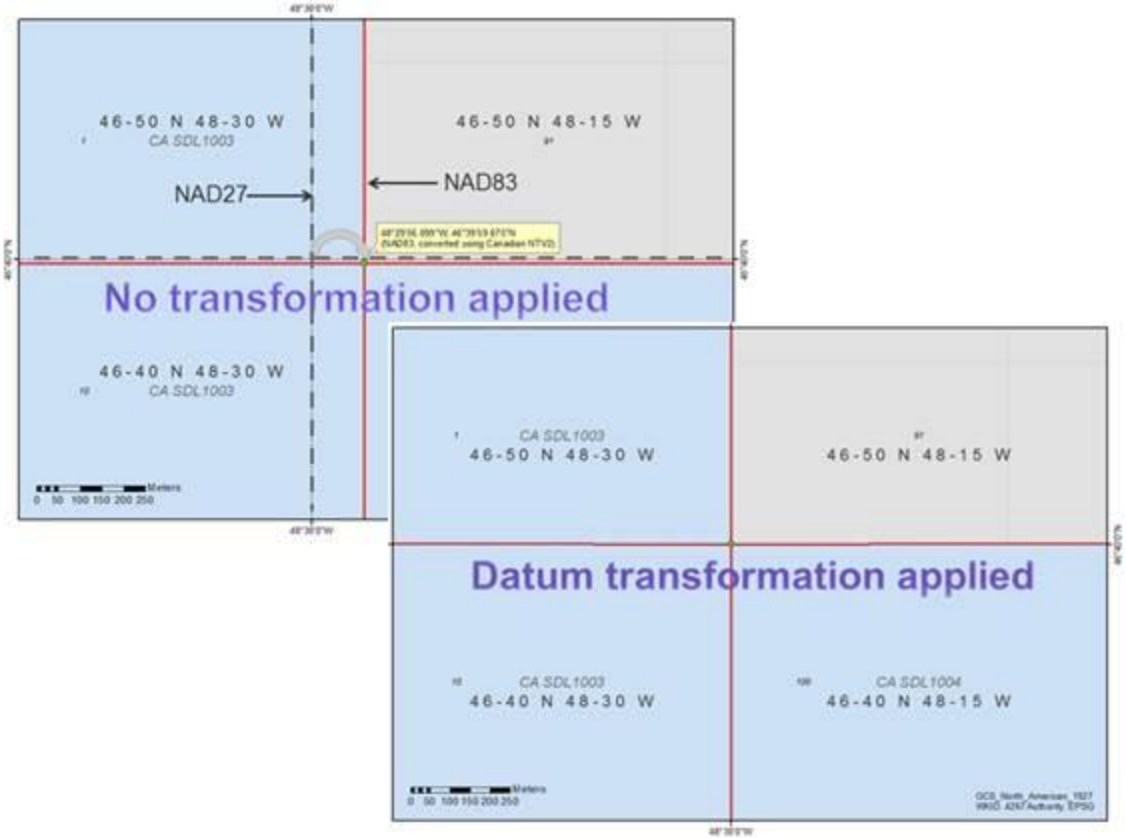
- Transformation from local datum to WGS84

Coordinate Integrity – Local Datums

Licence data are often referenced to a local geodetic datum

- European 1950
- South American 1969
- Australian 1966
- Pulkovo 1942
- North American 1927
- …

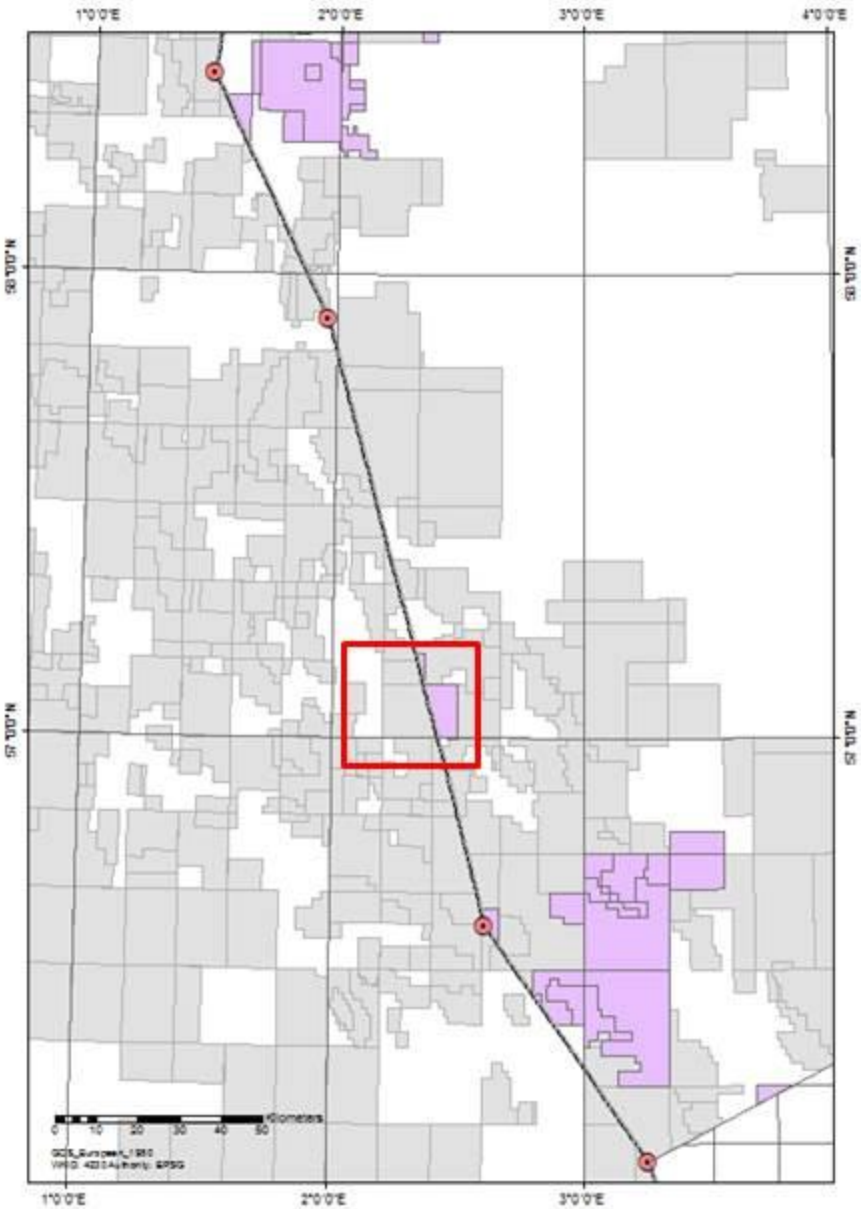
- WGS 1984

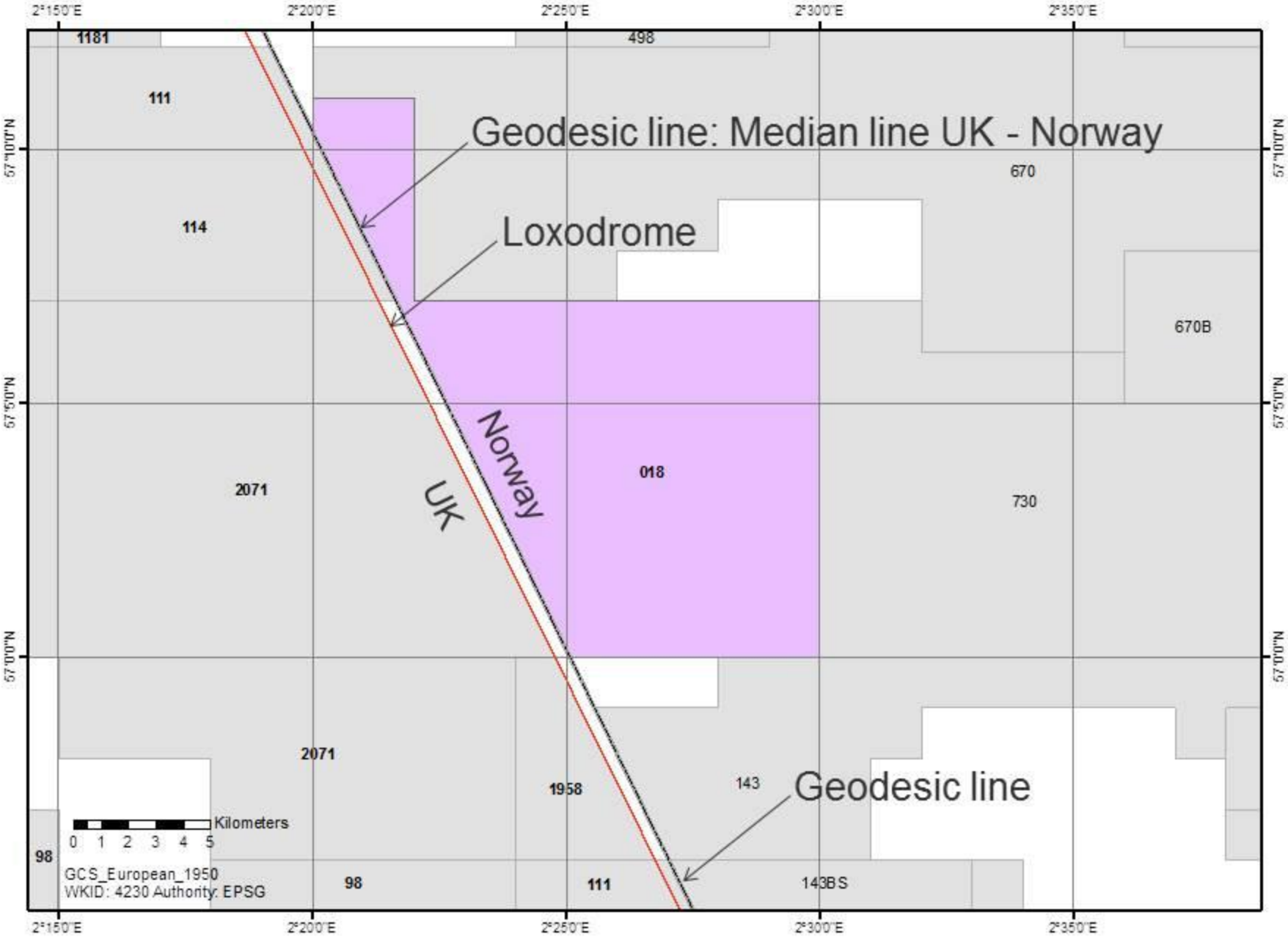


Challenges – International Median Line

Example from UK Oil and Gas Authority

- *Some* licences follow the defined border, **geodesic line** between points (agreement between Norway and the UK)
- *Some* licences incorrectly follow the **loxodromic** line between points
- This has been reported to DECC/OGA




2°15'0"E
2°20'0"E
2°25'0"E
2°30'0"E
2°35'0"E
57°10'0"N
57°5'0"N
57°0'0"N
1181
498
111
Geodesic line: Median line UK - Norway
670
114
Loxodrome
670B
Norway
UK
018
2071
730
2071
1958
143
Geodesic line
Kilometers
0 1 2 3 4 5
98
GCS_European_1950
WKID: 4230 Authority: EPSG
98
111
143BS

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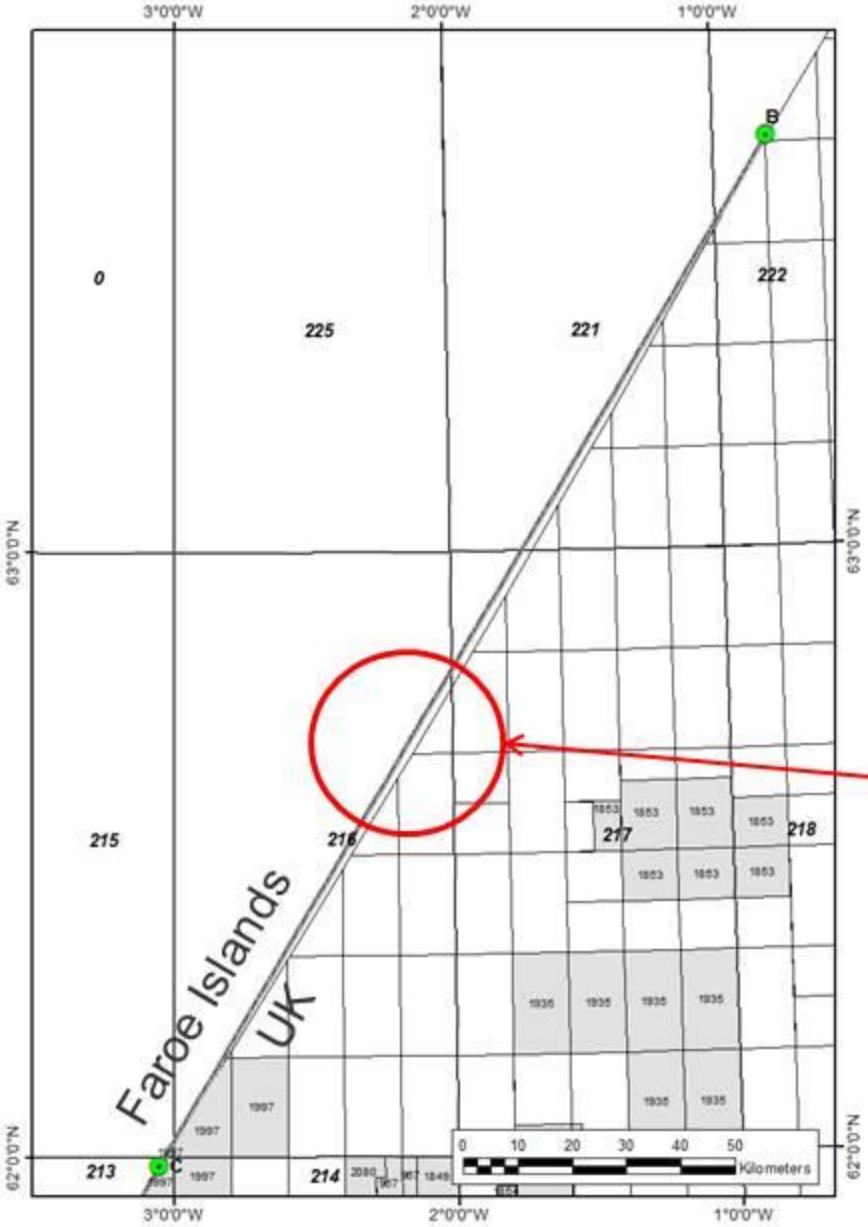


UK – Faroe Islands

- Blocks do **not** follow the geodesic line between turning points
- They follow the loxodrome, the default line type in ArcGIS
- Distance is up to about 1700 metres from the median line

GLI Spatial Workflow

- Legal Description

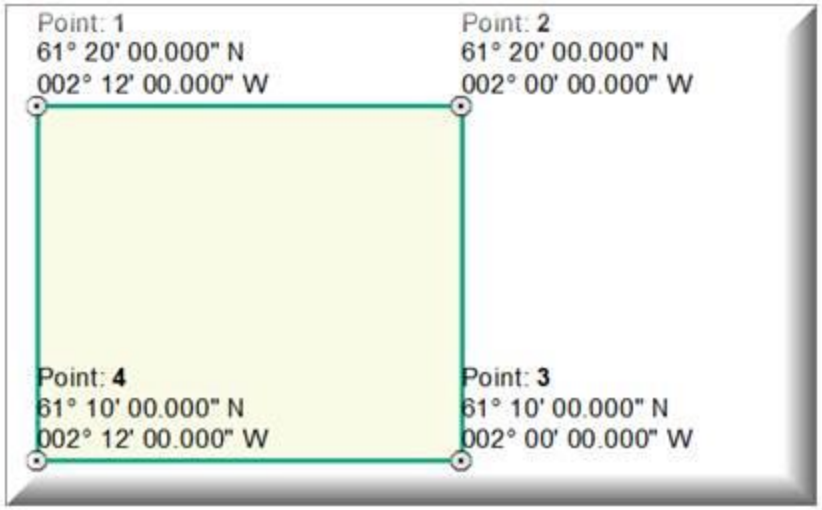
Description of Licensed Area

Block 214/25 is the region bounded by the following coordinates:

(1) 61°20'00.000"N 2°12'00.000"W
(2) 61°20'00.000"N 2°00'00.000"W
(3) 61°10'00.000"N 2°00'00.000"W
(4) 61°10'00.000"N 2°12'00.000"W
(5) 61°20'00.000"N 2°12'00.000"W

The above coordinates were specified using "European Datum 1950".
The lines joining coordinates (1) to (5) are navigated as loxodromes.

- Spatial Representation



Spatial Workflow Steps

Statoil GLI Toolbox

1. Make new concession part area
2. Prepare and Request QC
3. Archive and save concession area

Input original points and line types

Densify lines according to type

Generate polygons

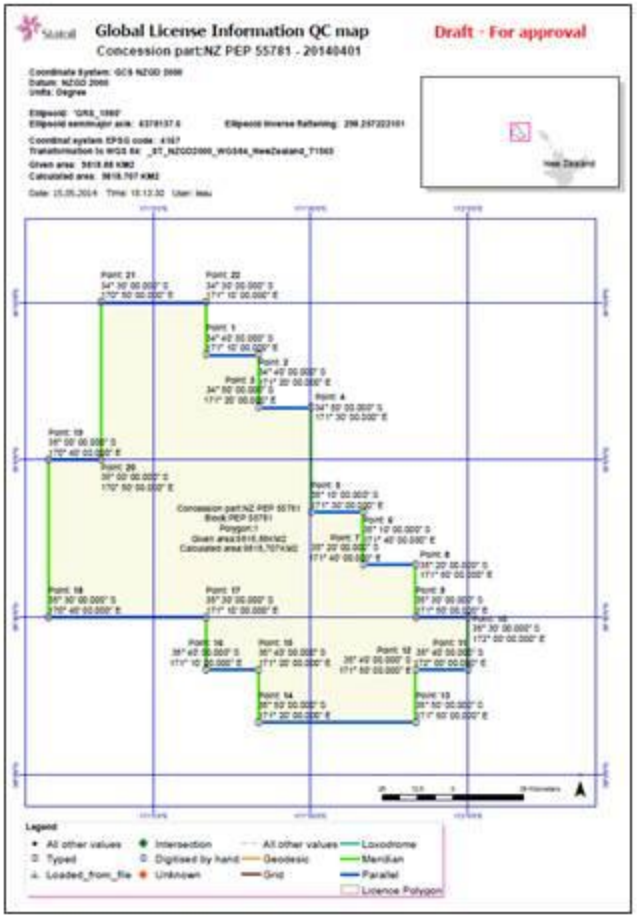
Calculate area

Create QC map for approval

Automatic aggregate with admin data

Example QC map

- List original turning points
- Original line types
- Given and calculated area
- Location map
- Datum and transformation



Legend

All other values	Intersection	All other values	Loxodrome
Typed	Digitised by hand	Geodesic	Meridian
Loaded_from_file	Unknown	Grid	Parallel
			Licence Polygon

Data Structure

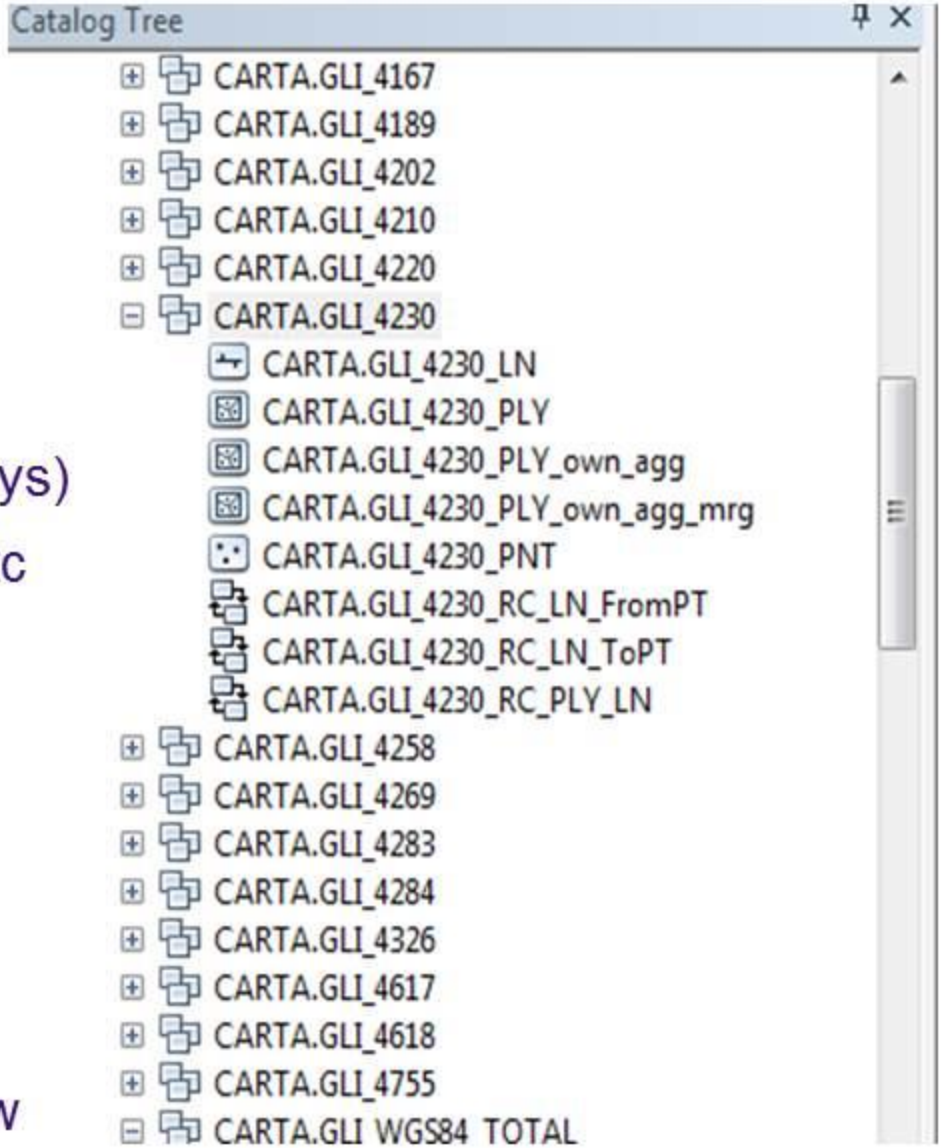
Feature datasets in original CRS
Named by EPSG CRS code

Feature classes (points, lines, polys)

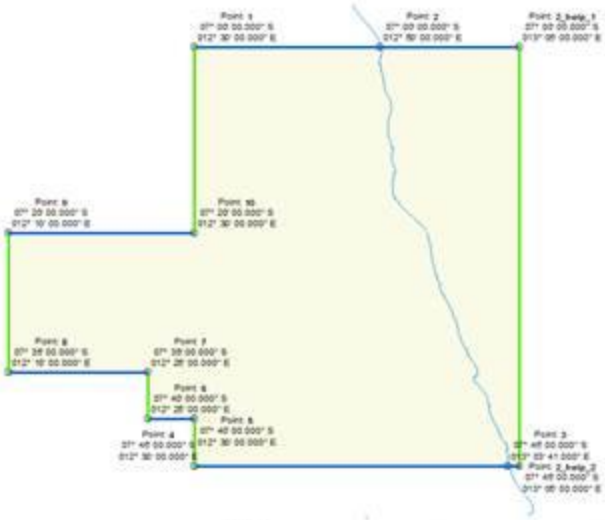
Aggregated ownerships, dates, etc

Relationship classes

WGS84 total for the complete overview

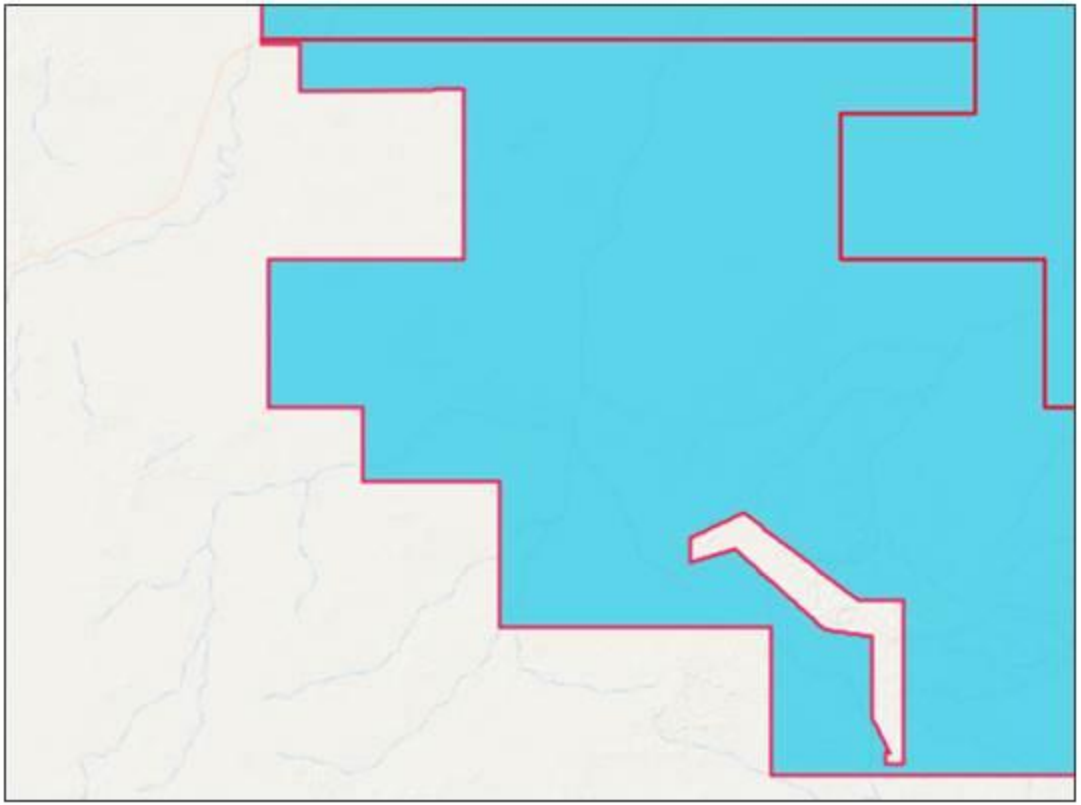


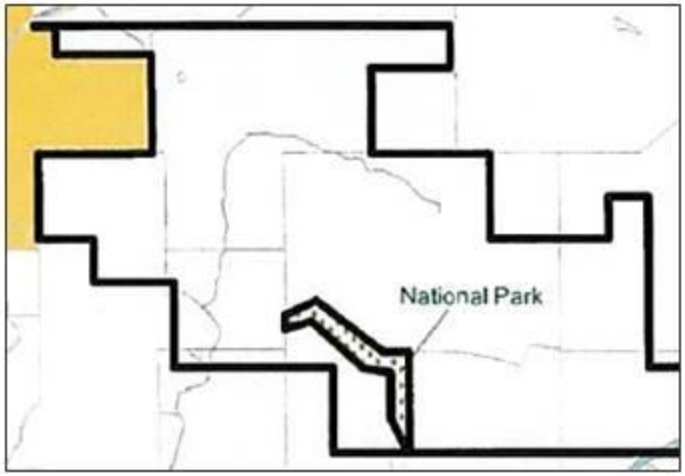
Licences defined with coastlines



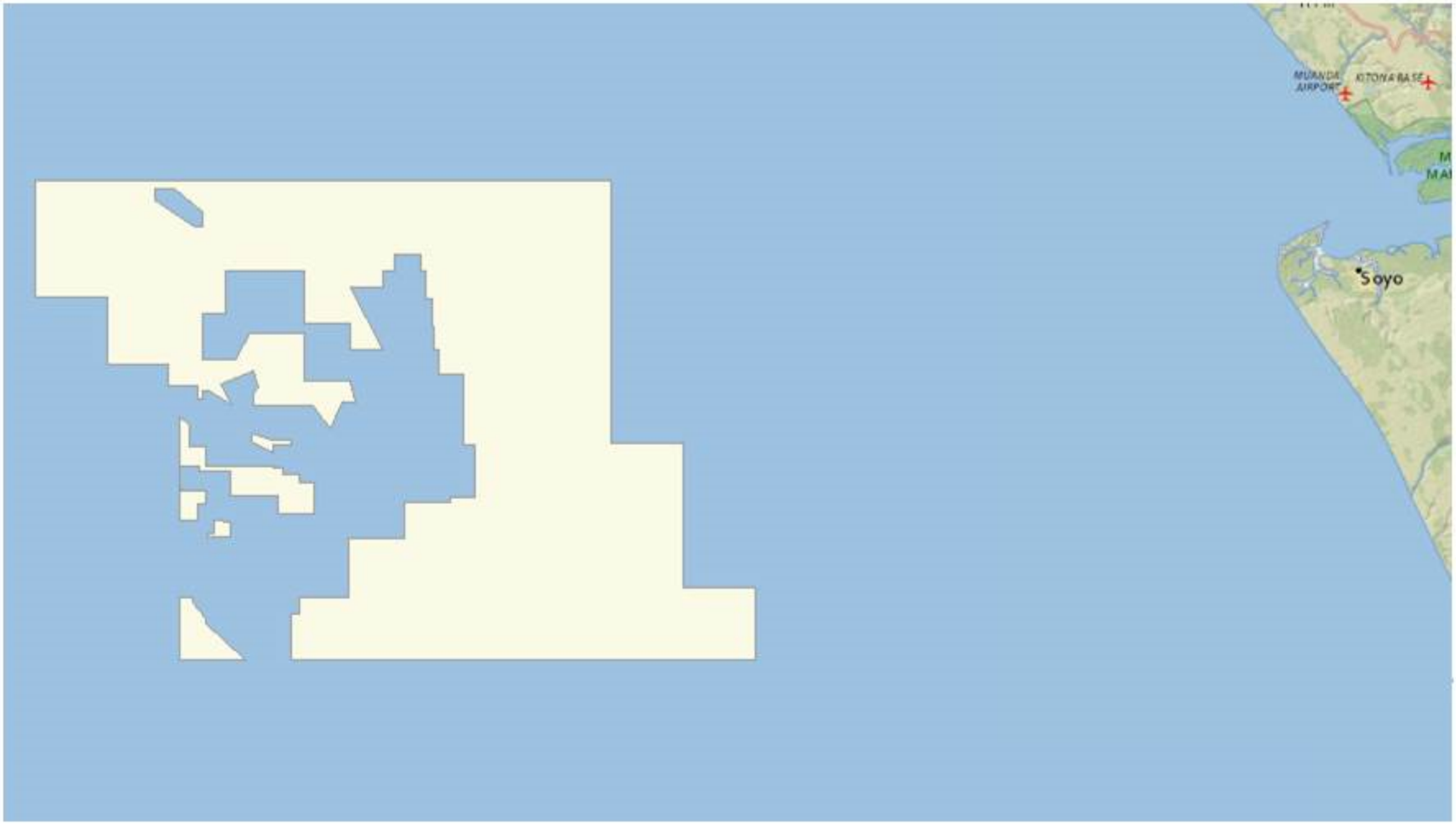
Licences with Enclaves (donut holes)

Requires a descriptor excluding the enclave from licence (OGP guidance note)





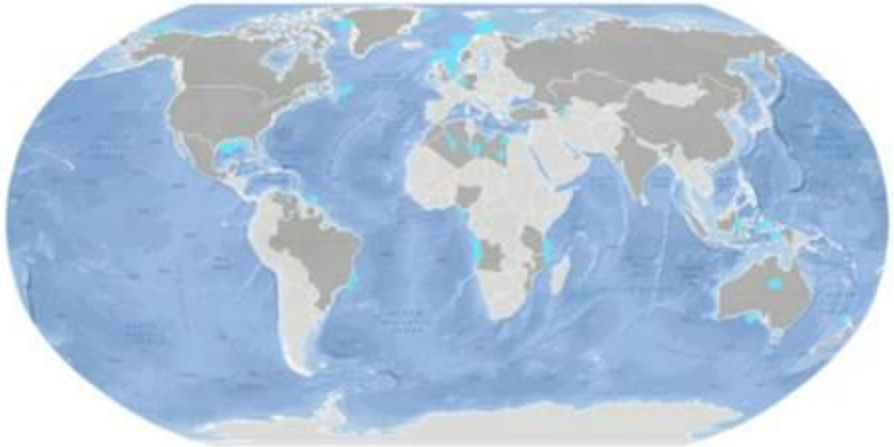
Licences with Enclaves and Islands



Licence Information - Distribution

GLI ▸ Global Licence Information Browser

GLI | License ▾ | Search | User Documentation



Welcome to the GLI Browser

The GLI Browser is tool aimed for non-experts users to easily browse license information.

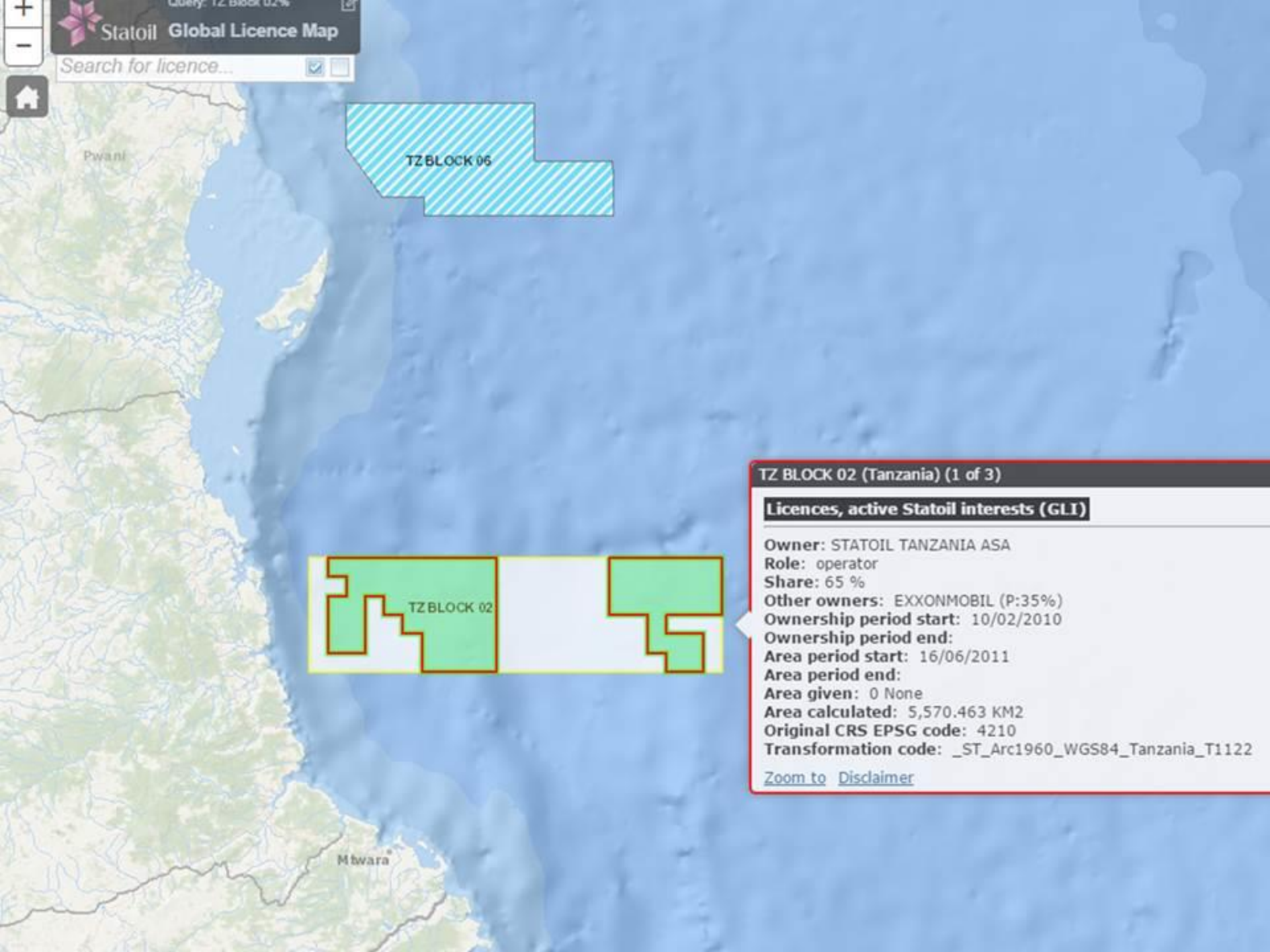
Content in the Browser

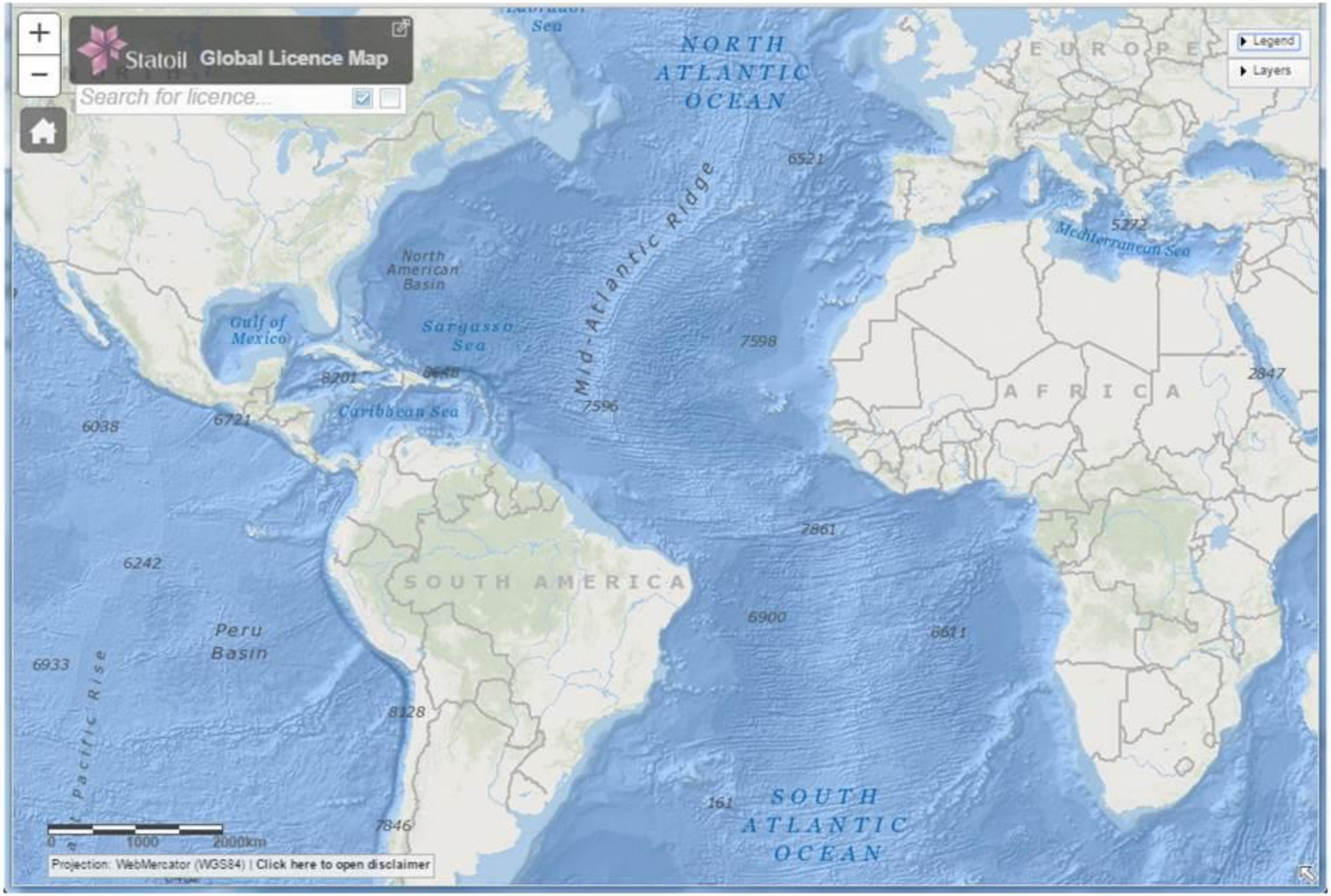
Quality Assured License Information

- All licenses and business areas on the Norwegian Continental Shelf with complete history.
- Current international licenses and business areas with Statoil interests.
- USA and Canadian onshore licenses are not included.

Map information
GLI Web Map

Data Sources
For NCS: NPD
For INT: Contract information from assets


Statoil Global Licence Map
Search for licence...
Pwani
TZ BLOCK 06
TZ BLOCK 02
Mtwara
TZ BLOCK 02 (Tanzania) (1 of 3)
Licences, active Statoil interests (GLI)
Owner: STATOIL TANZANIA ASA
Role: operator
Share: 65 %
Other owners: EXXONMOBIL (P:35%)
Ownership period start: 10/02/2010
Ownership period end:
Area period start: 16/06/2011
Area period end:
Area given: 0 None
Area calculated: 5,570.463 KM2
Original CRS EPSG code: 4210
Transformation code: _ST_Arc1960_WGS84_Tanzania_T1122
Zoom to
Disclaimer


Statoil Global Licence Map
Search for licence...
Legend
Layers
NORTH ATLANTIC OCEAN
EUROPE
Mid-Atlantic Ridge
North American Basin
Gulf of Mexico
Sargasso Sea
Caribbean Sea
Mediterranean Sea
AFRICA
SOUTH AMERICA
Peru Basin
SOUTH ATLANTIC OCEAN
6521
5272
7598
7596
8201
6721
6038
2847
7861
6242
6900
6611
6933
8128
161
7846
0 1000 2000km
Projection: WebMercator (WGS84) | Click here to open disclaimer

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Benefits of GLI

- Licence Information, consistent and centrally managed
- Efficient information – easy search and retrieval
- Timely data - updates through defined workflows
- Accurate data - a dedicated QC process
- Access to information that was previously inaccessible
- Shared data - integrated across applications and locations

Statoil. The Power of Possible

Global Licence Information

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