



Promoting Successful Partnerships to Advance Exploration & Production in the Regional Oil & Gas Sector



Christine Roche – New Ventures Manager PGS

February 2020

PGS... Who We Are



Employees:

1250



Countries:

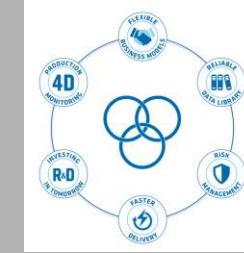
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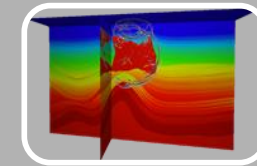
Active Vessels:

8

A Global Marine Geophysical Company



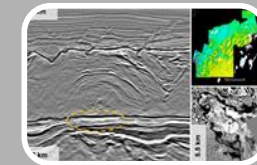
Fully Integrated Marine Seismic Services Company



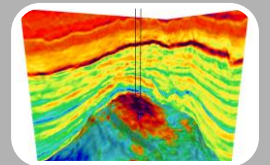
Survey Design



Acquisition

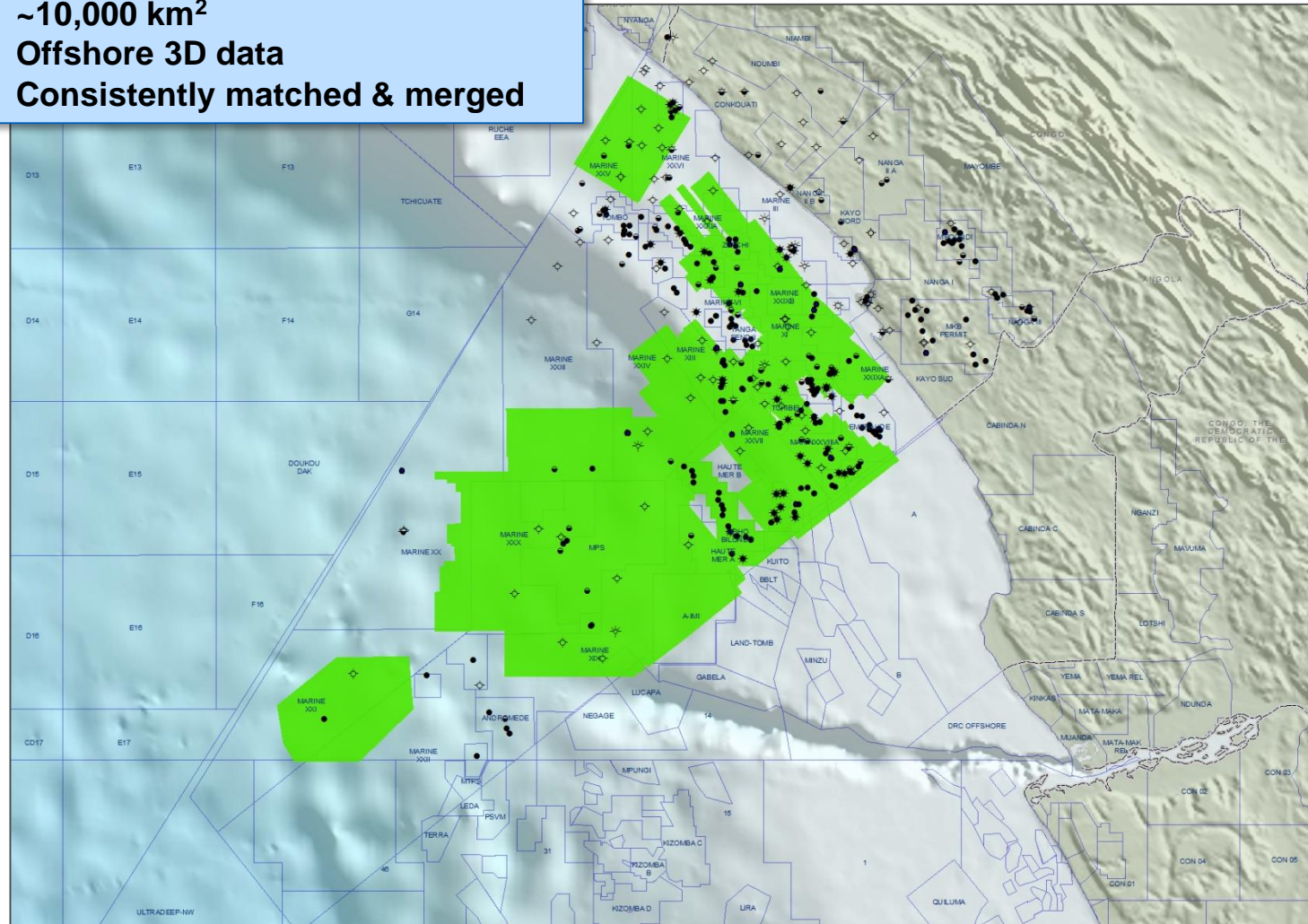


Imaging



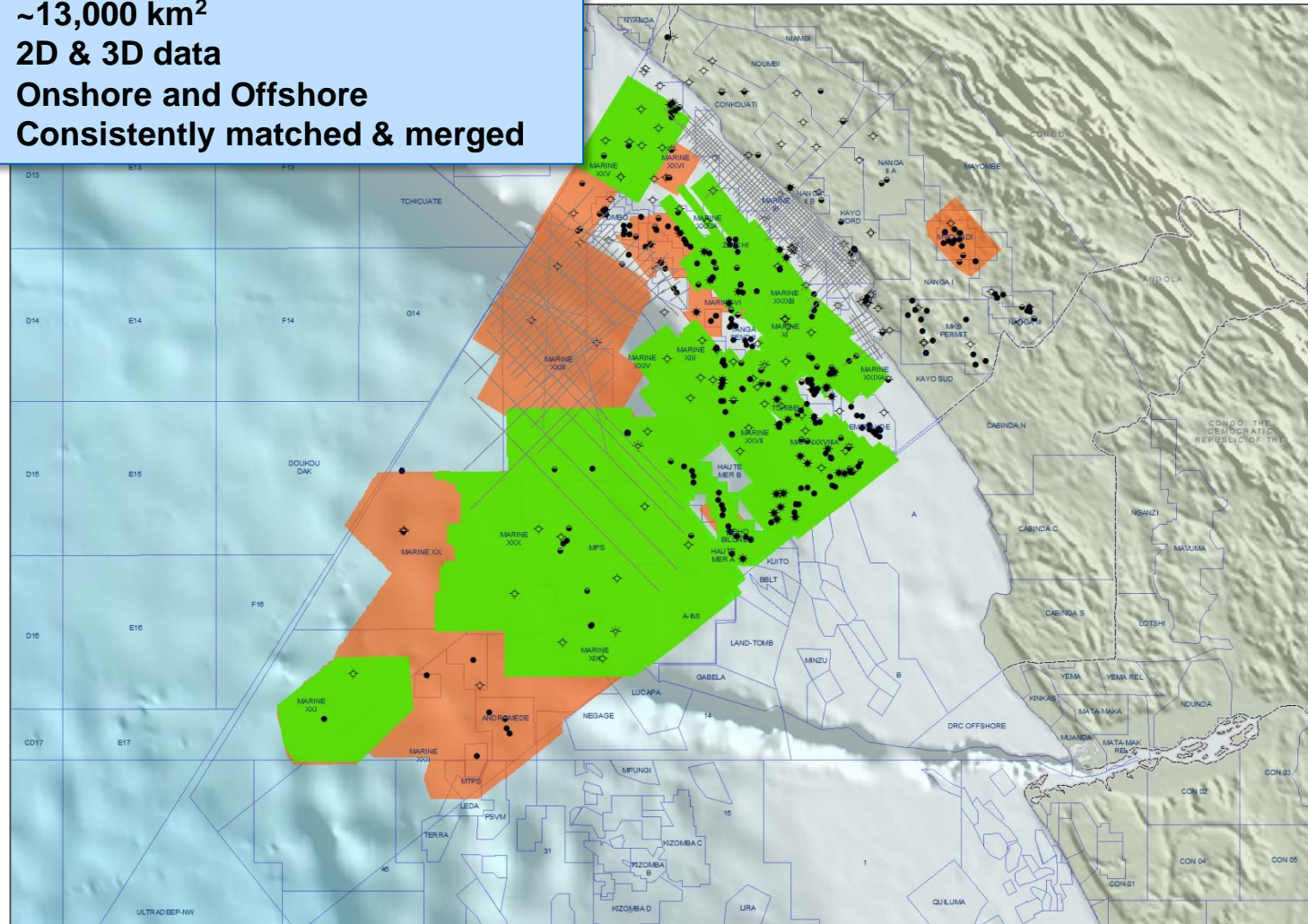
Interpretation

- **2010-2011**
- **~10,000 km²**
- **Offshore 3D data**
- **Consistently matched & merged**



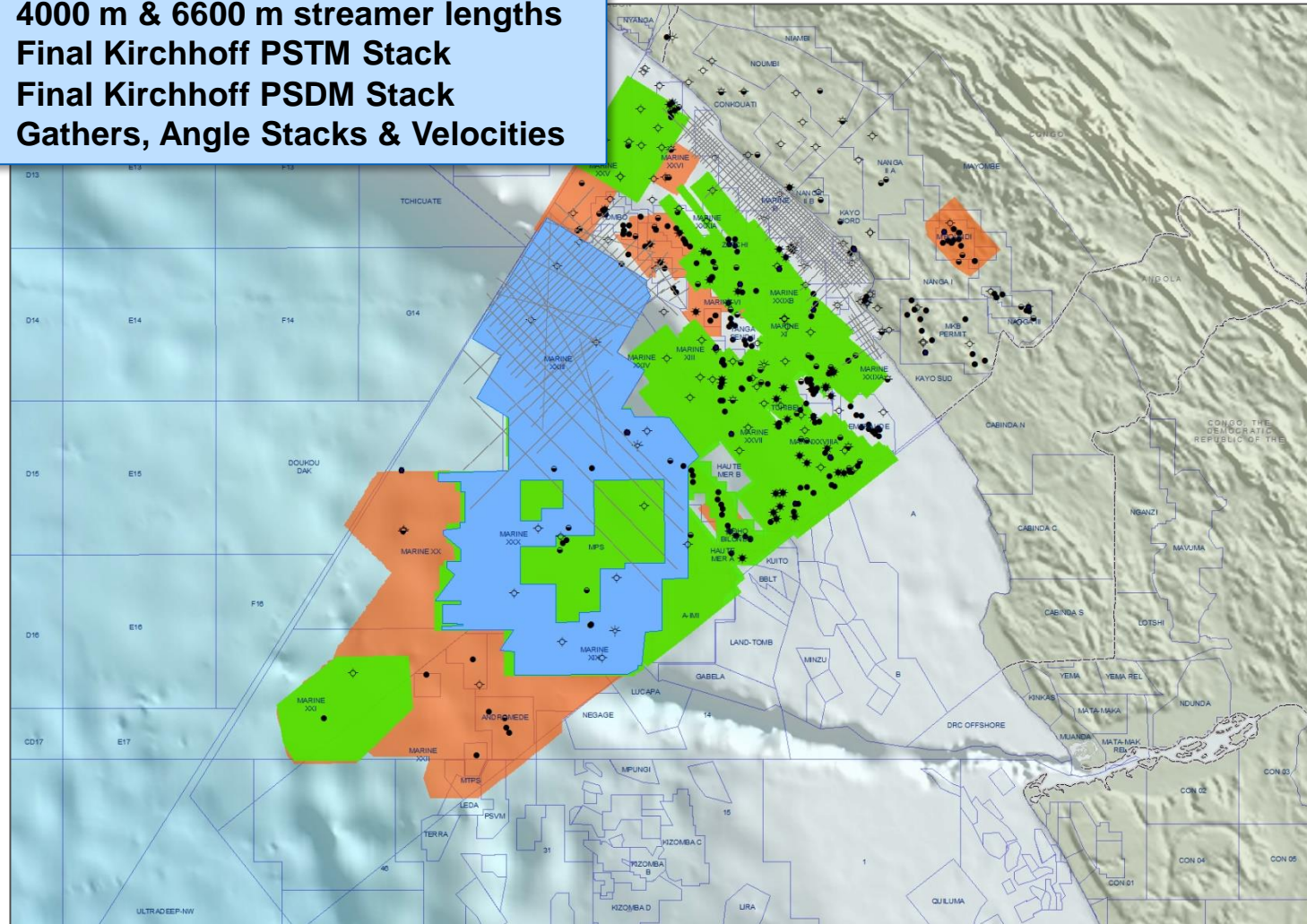
2010

- **2012-2013**
- **~13,000 km²**
- **2D & 3D data**
- **Onshore and Offshore**
- **Consistently matched & merged**



2010

- Brokerage agreement in 2014
- 4000 m & 6600 m streamer lengths
- Final Kirchhoff PSTM Stack
- Final Kirchhoff PSDM Stack
- Gathers, Angle Stacks & Velocities



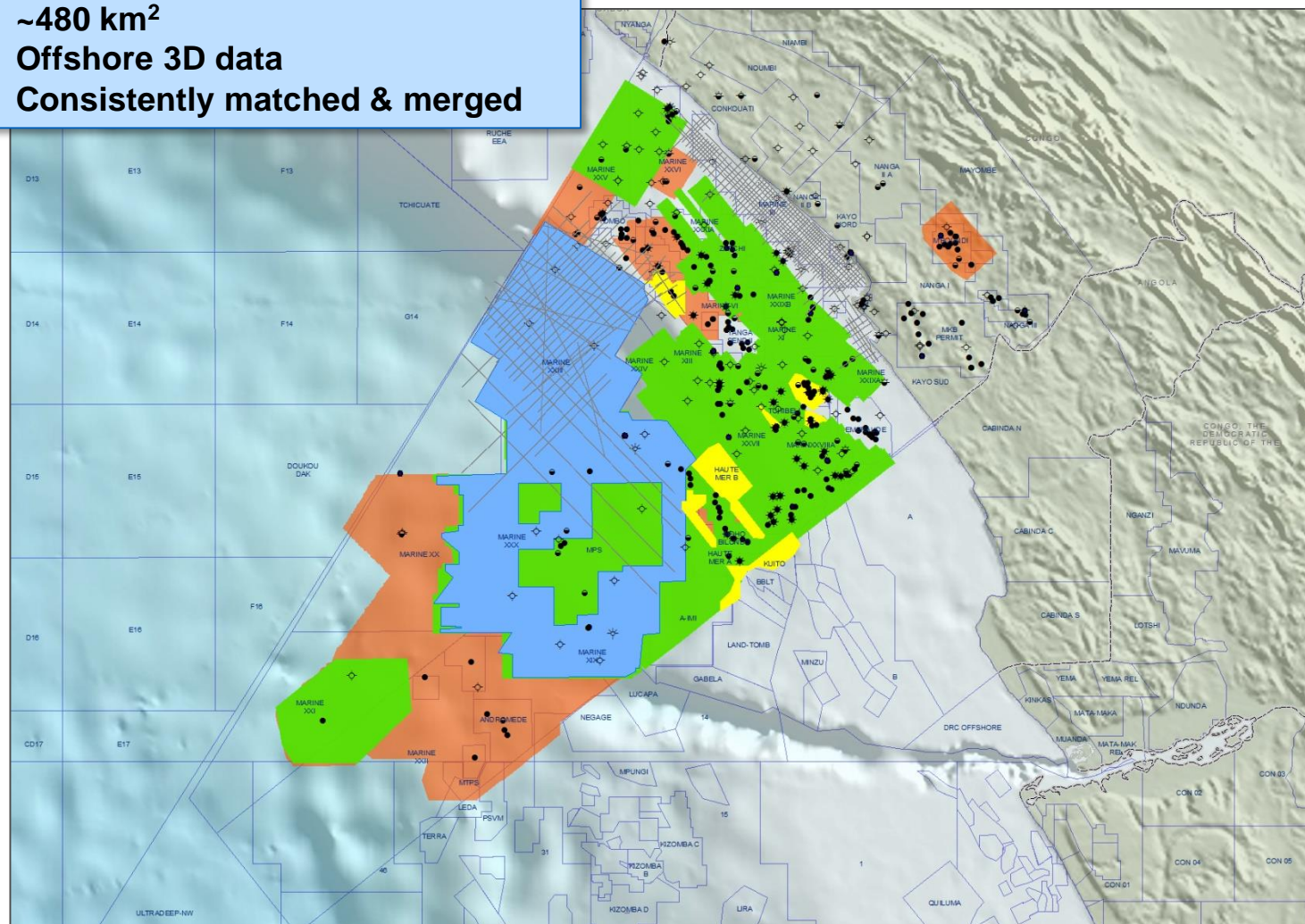
2010

PGS SNPC Partnership Timeline



Congo MegaSurvey Phase III

- 2015
- ~480 km²
- Offshore 3D data
- Consistently matched & merged



2016

2015

2014

2013

2012

2011

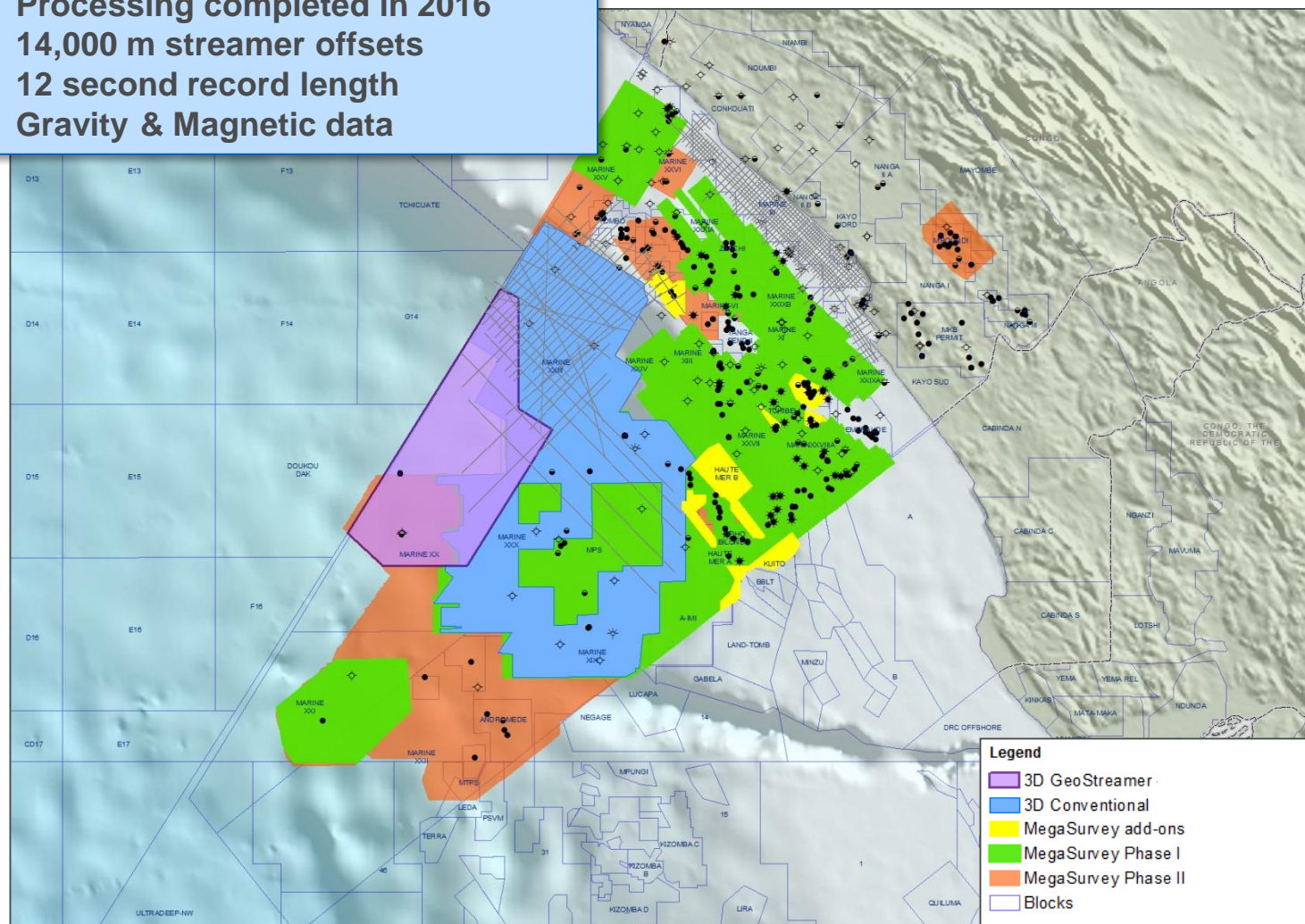
2010

PGS SNPC Partnership Timeline



Marine XX GeoStreamer® 3D

- Acquisition in 2015
- Processing completed in 2016
- 14,000 m streamer offsets
- 12 second record length
- Gravity & Magnetic data



2016

2015

2014

2013

2012

2011

2010

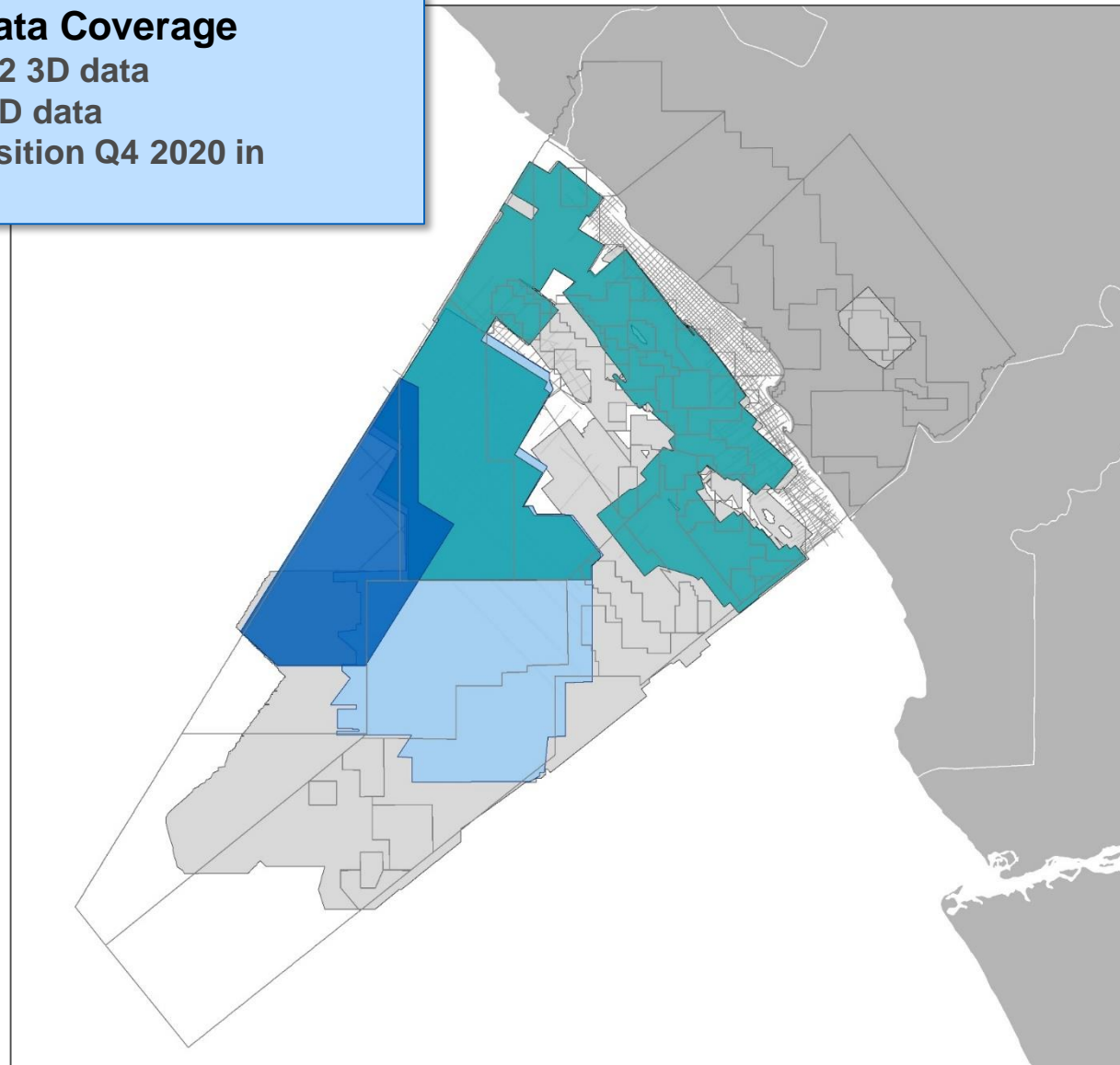
PGS SNPC Partnership Timeline



Extensive Data Coverage

- 25, 000 km2 3D data
- 5,300 km 2D data
- New acquisition Q4 2020 in planning

- MegaSurvey
- MegaSurveyPlus
- 3D GeoStreamer
- 3D Conventional



2020

2016

2015

2014

2013

2012

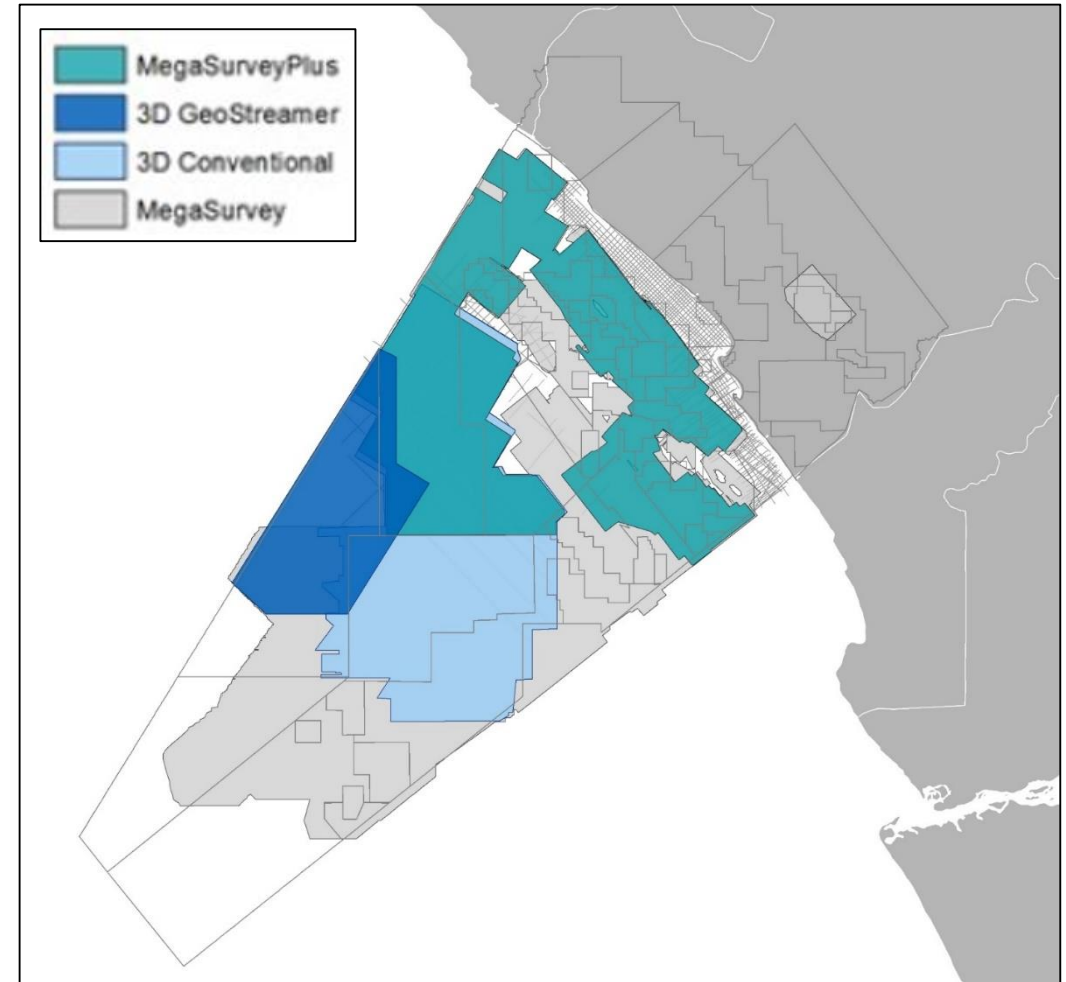
2011

2010

- Depth-migrated regional 3D dataset revitalizes the entire basin area with better structural imaging, improved signal to noise and pre-stack data available, this is the perfect dataset for regional screening work and exploration in this area
- Basin-wide multi-vintage processing yields a considerable uplift in data quality and provides additional information in Time and Depth such as **velocities, gathers, angle stacks and associated AVO** products which may not have been produced at the time of the original acquisition.

Depth Products available:

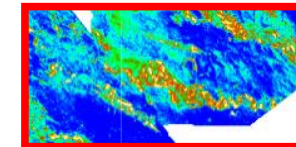
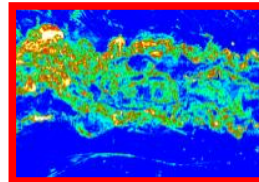
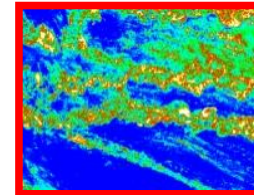
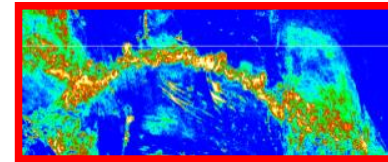
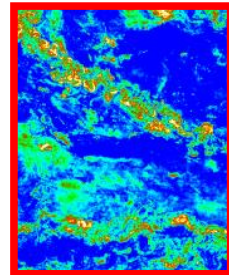
- » Final Kirchhoff PSDM Stack
- » Final BEAM PSDM Stack
- » Final RTM PSDM Stack
- » Velocity Model
- » Final BEAM PSDM Angle Stacks
- » Final Kirchhoff PSDM Angle Stacks



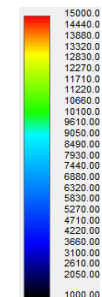
Congo MegaSurvey - Interpretation: The BIG Picture



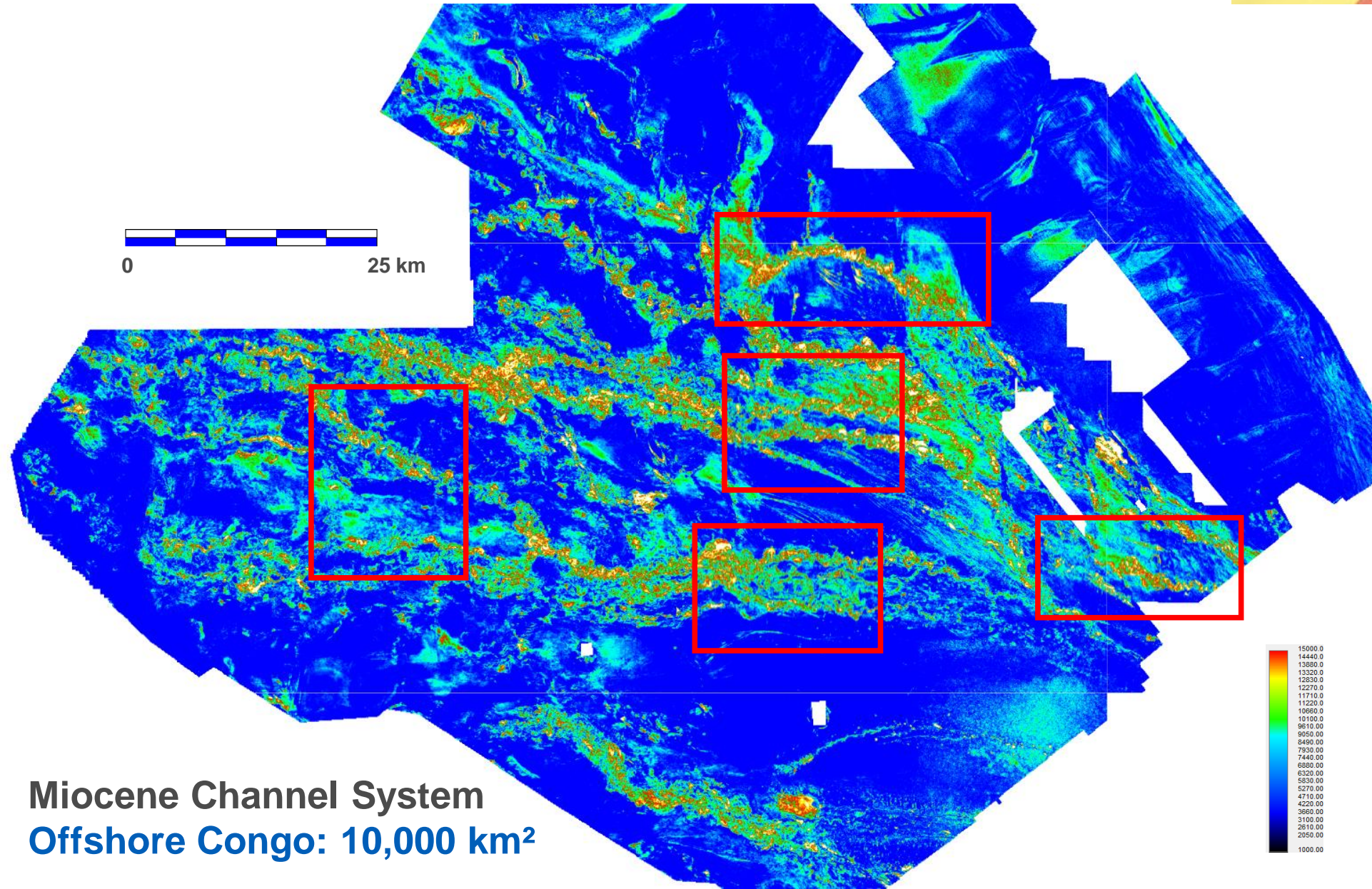
0 25 km



Upper Miocene RMS Amplitude Extraction (0.1-0.2s)
Offshore Congo: 300 - 400 km² 3D Surveys



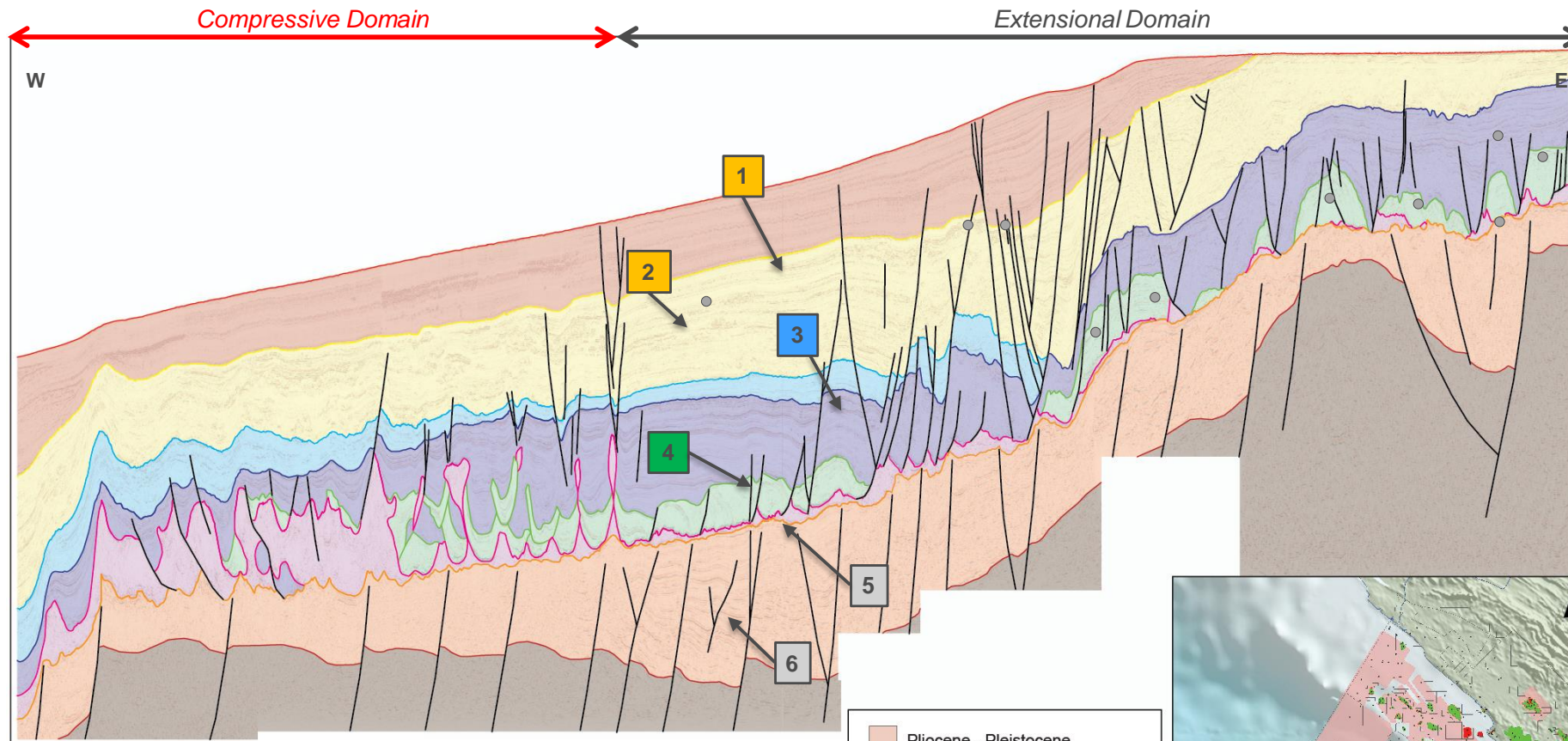
Congo MegaSurvey - Interpretation: The BIG Picture



Miocene Channel System
Offshore Congo: 10,000 km²

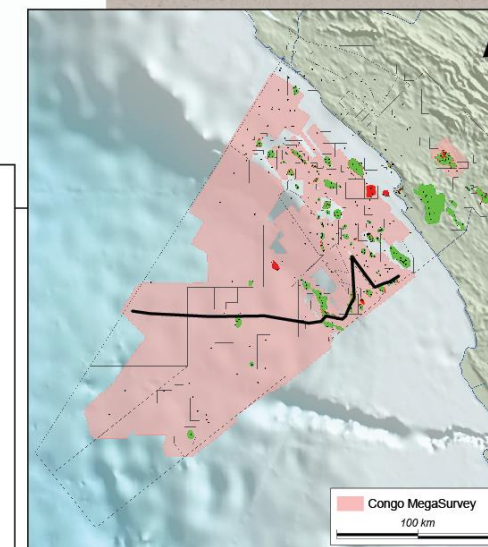
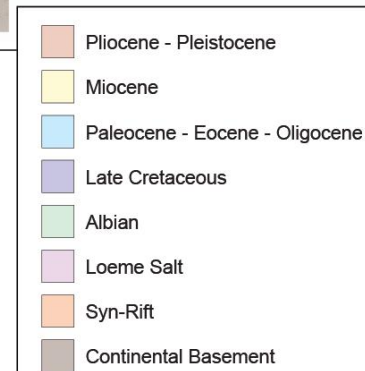
Play Types and Examples

Regional Geology: Seismic Cross-section

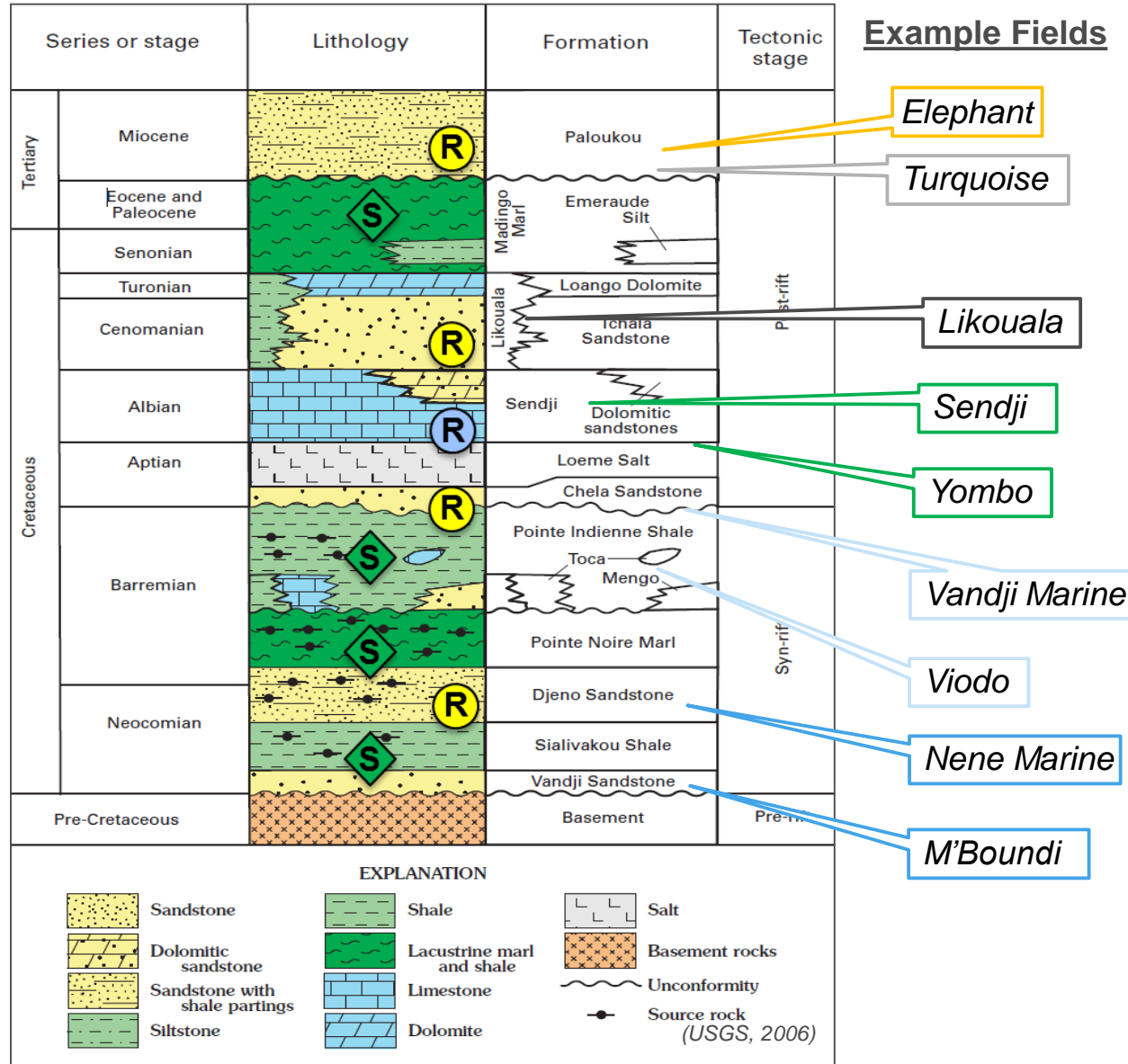


Play types

1. Upper Miocene channel systems
 2. Lower Miocene turbidite channels
 3. Cenomanian sandstones
 4. Albian Sendji Carbonates
 5. Upper Pre-salt sandstones and carbonates
 6. Lower Pre-salt syn-rift and pre-rift sandstones
- Proven Reservoirs



Congo MegaSurvey – Sequence Constrained Plays



Plays

1. Upper Miocene

Paloukou Formation channels

2. Lower Miocene

Paloukou Formation turbidites & channels

3. Cenomanian

Tchala and Likouala Silt formations sandstones within anticlinal traps

4. Albian

Sendji Formation carbonates within faulted raft blocks

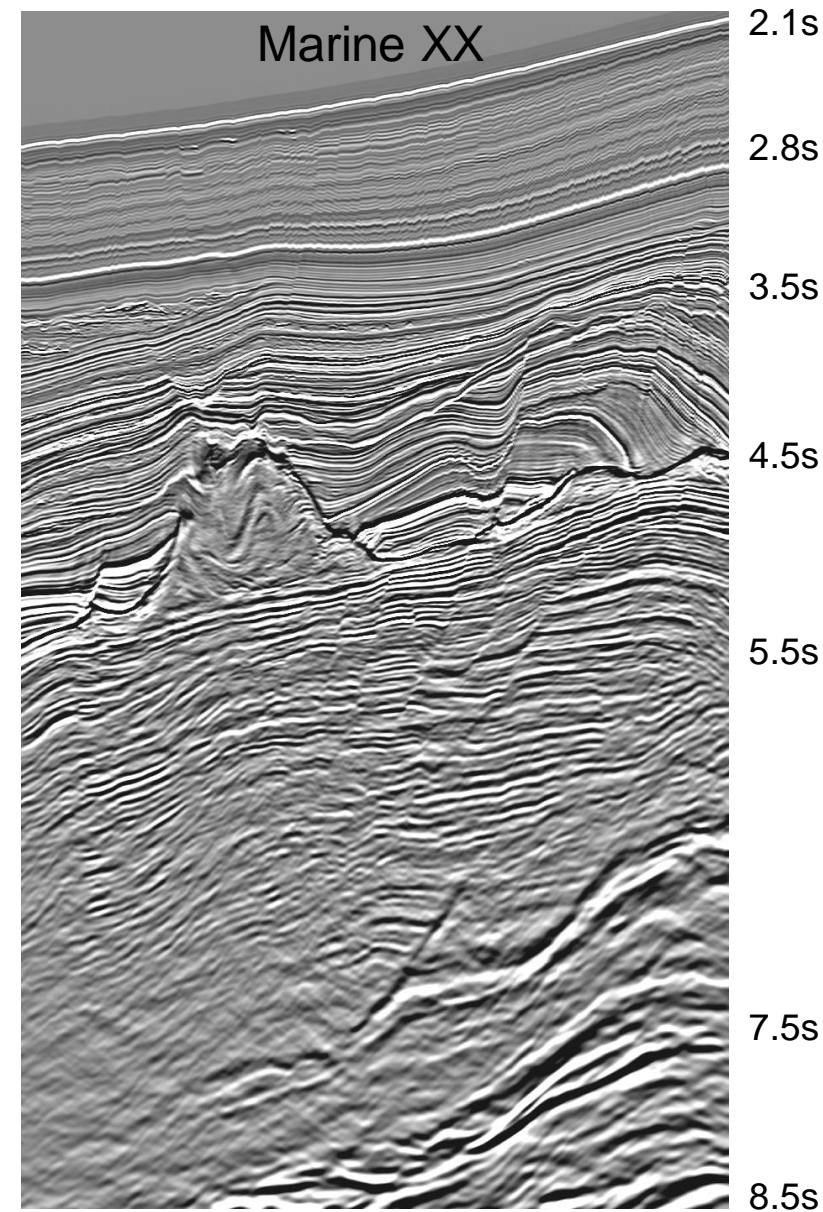
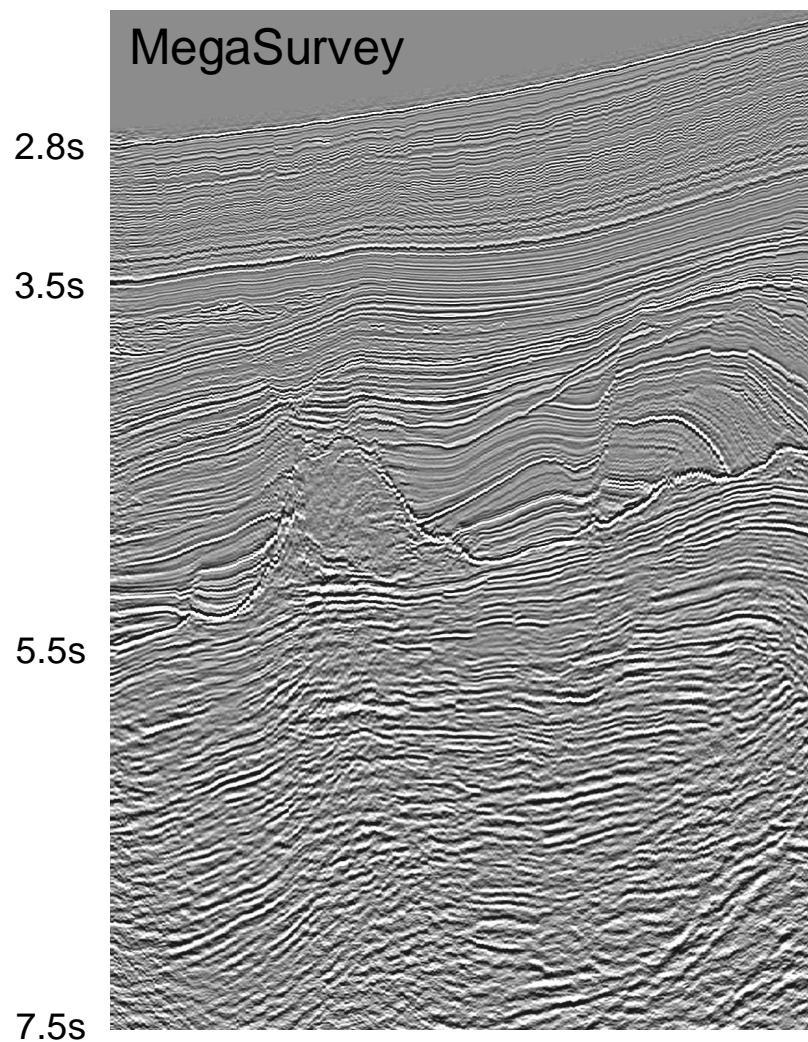
5. Upper Pre-salt

Chela Formation sandstones and Toca Formation carbonates

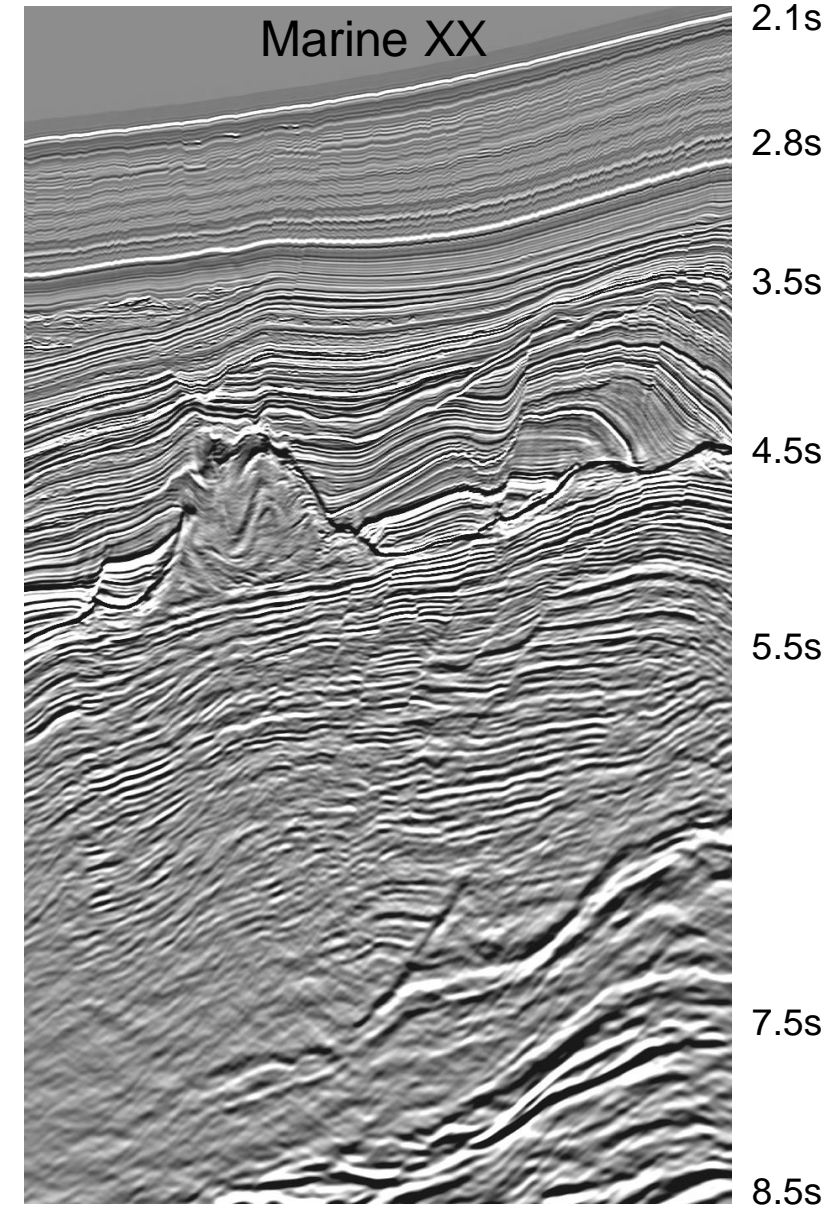
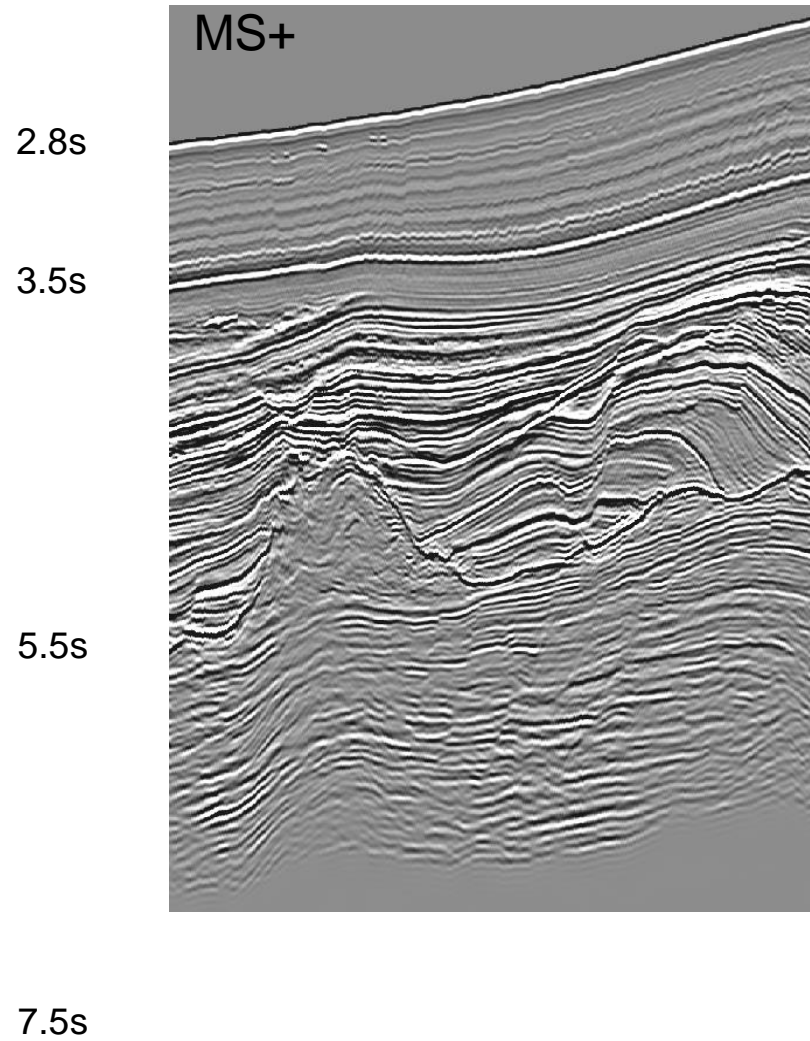
6. Lower Pre-salt

Djeno and Vandji formations sandstones within tilted fault blocks

Congo MegaSurvey vs Marine XX Final Kirchhoff (TIME)



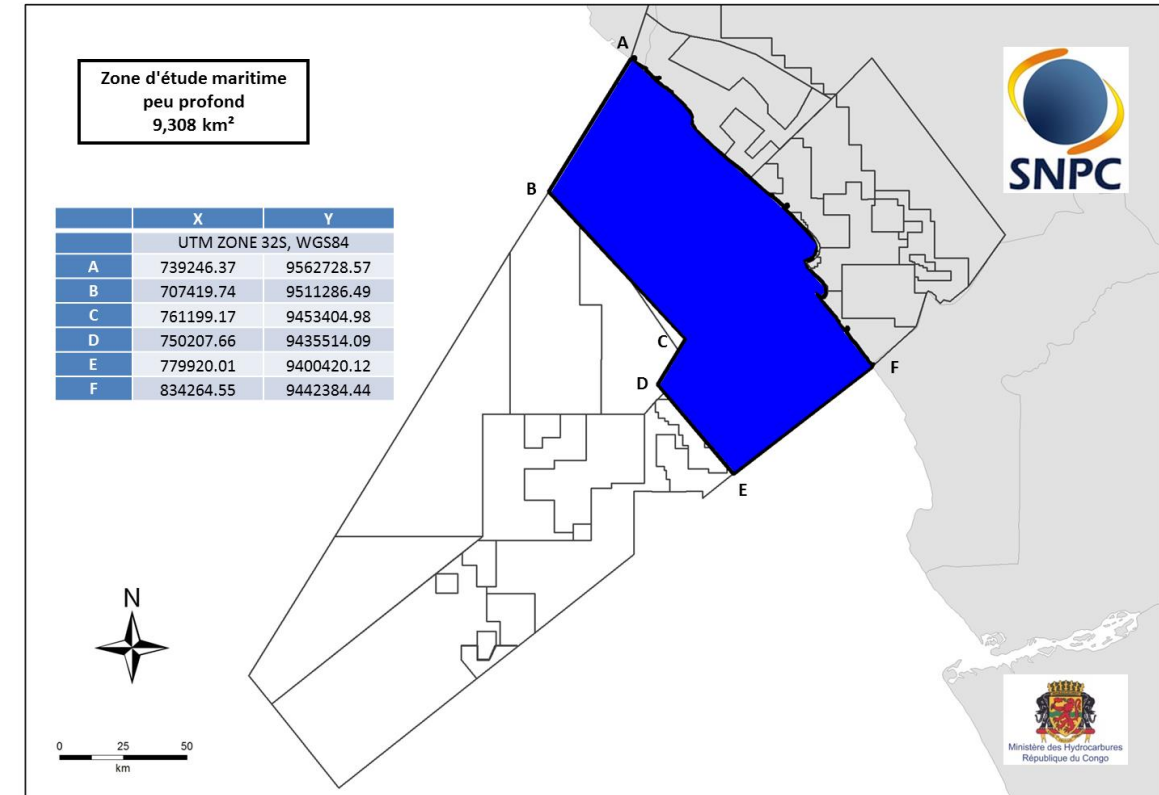
Congo MegaSurveyPlus vs Marine XX Final Kirchhoff (TIME)

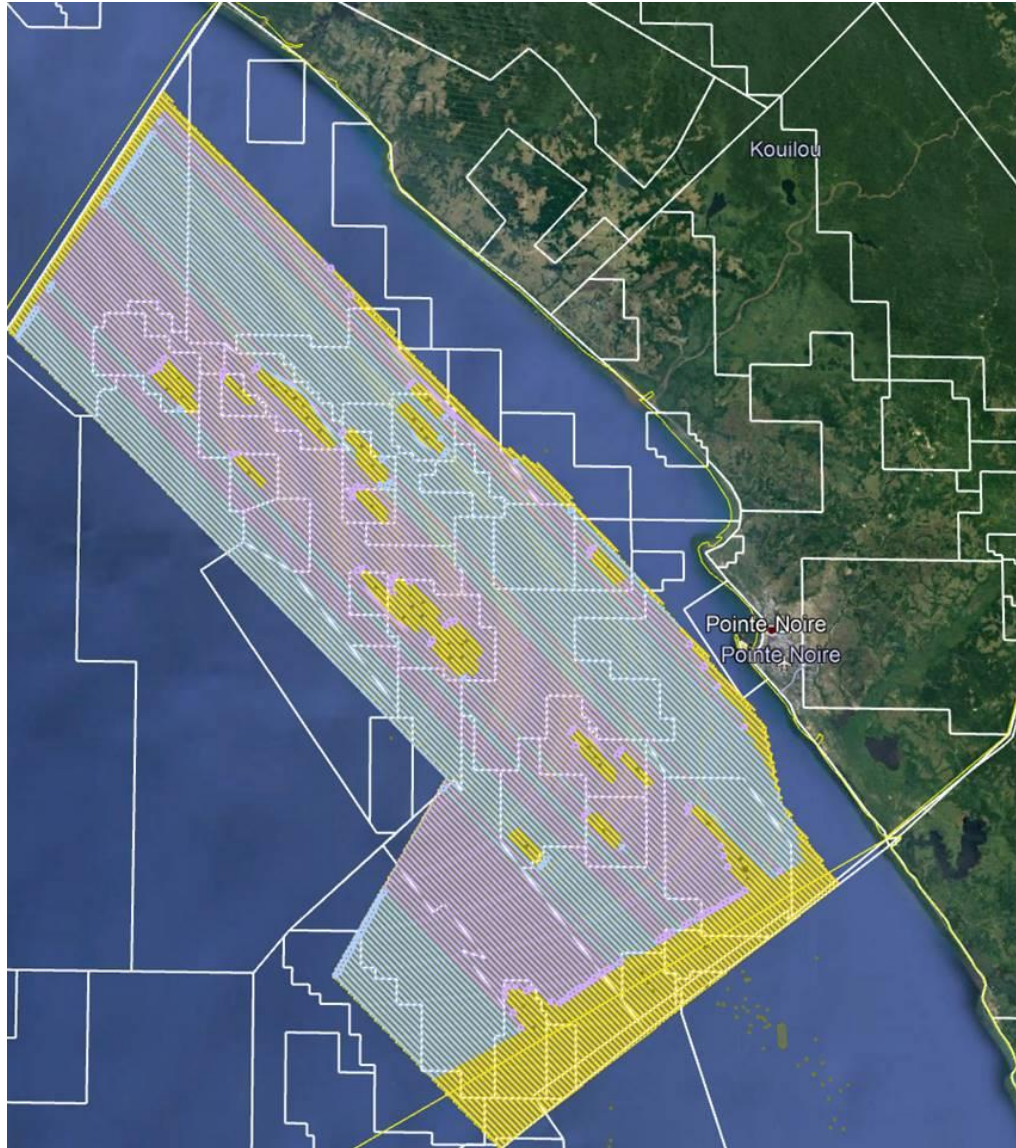


MC3D Peu Profond – Congo Shelf Survey



- DGH and SNPC, along with partners PGS, are planning to acquire, process and deliver modern, high quality MultiClient towed streamer 3D seismic survey over the Congo Shelf
- Recent renewed focus on the present-day shelfal areas, with proven and producing plays, where considerable pre-salt exploration success has already been discovered with exploration carried out many years ago
- This opportunity allows SNPC, DGH and PGS to provide extensive coverage over the prospective and producing region, to unlock plays and prospects not seen by the existing data





- Acquisition direction parallel to coast to improve efficiency and maximise coverage
- Recognise existing infrastructure, drilling activity and marine traffic
- Coordinated effort with all companies participating to ensure minimal obstruction
- Key risks in the area include oilfield infrastructure, oilfield supply traffic, noise, fishing, currents, water-depth, barnacles, a national park and international boundaries

Health, Safety, Environment and Quality (HSEQ)



Our Ambition

To cause **zero** injury to people,
and minimal harm to the
environment.

Our Commitment

To be **safe, responsible and
productive.**
Everyone, all the time.

This means...

- Living our HSEQ commitment at all times
- Empowering colleagues to lead by example and promote safe behavior
- Acting responsibly and being responsible for our actions
- Stopping any unsafe activity, and intervening and welcoming intervention

We will **identify, assess, mitigate and manage** risks to employees,
contractors, assets and the environment.

HSEQ is a **line management responsibility** fully endorsed and
supported by senior management.





Merci!

MC3D Peu Profond – Congo Shelf Survey

- PGS GeoStreamer to support SNPC programme
- GeoStreamer data acquisition will enhance both lower and higher frequency content
- Modern long offset data will enhance pre-salt imaging and improve our knowledge of the post-salt opportunities
- Proposed SLO acquisition configuration
 - 12 x 3500m x 75m providing 7 km offsets
 - dense streamer spread (75m) using long offsets
- New technologies such as CWI, FWI and SWIM will help to improve shallow imaging
- Full support required from all involved

7,000 km² - subject to planning

