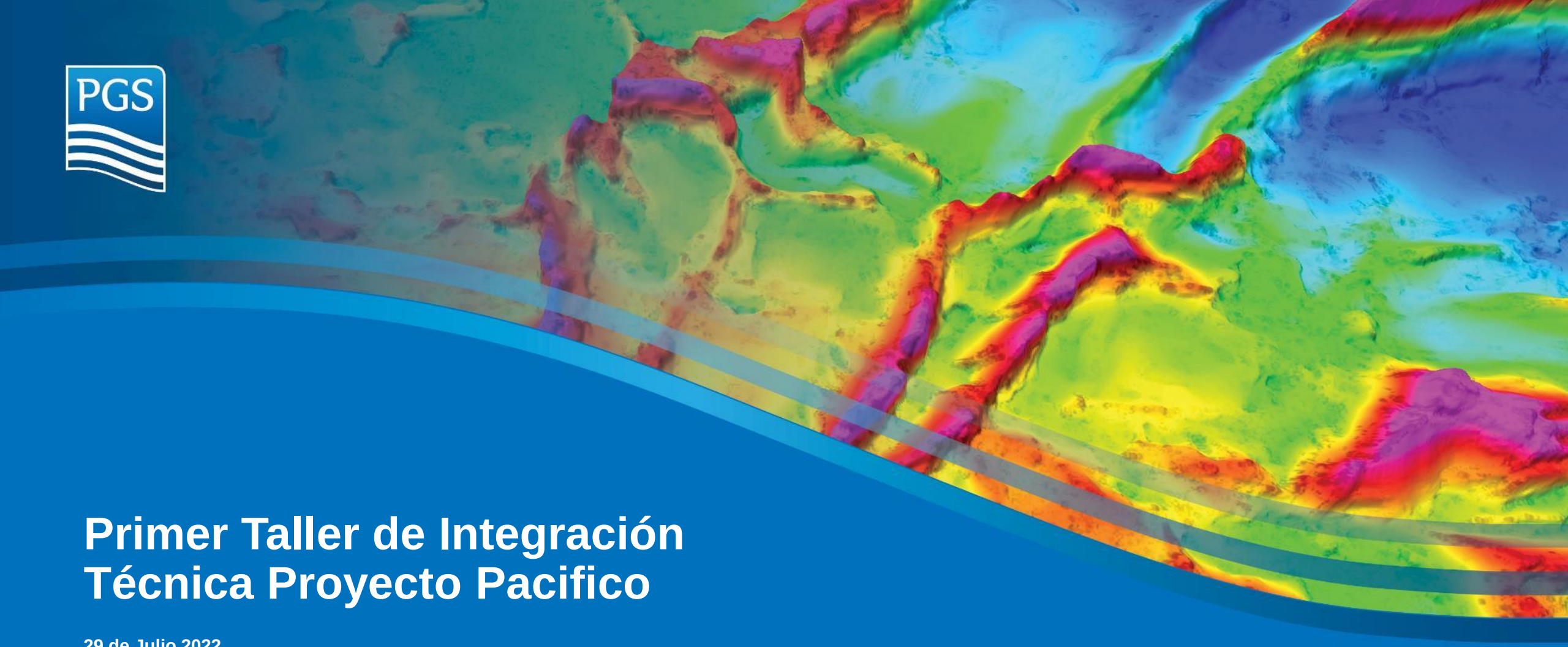


Primer Taller de Integración Técnica Proyecto Pacifico

29 de Julio 2022

PGS: Adriana Sola – Gerente Latin America

JV Lima - Project Geoscientist NSA

Agenda PGS Pacifico Multicliente

- Concepto MegaProject
- Geologia Regional: El margen del Pacífico
- Estado Reproceso Sísmico Pacífico

Concepto de MegaProject

Concepto de Proyectos Regionales

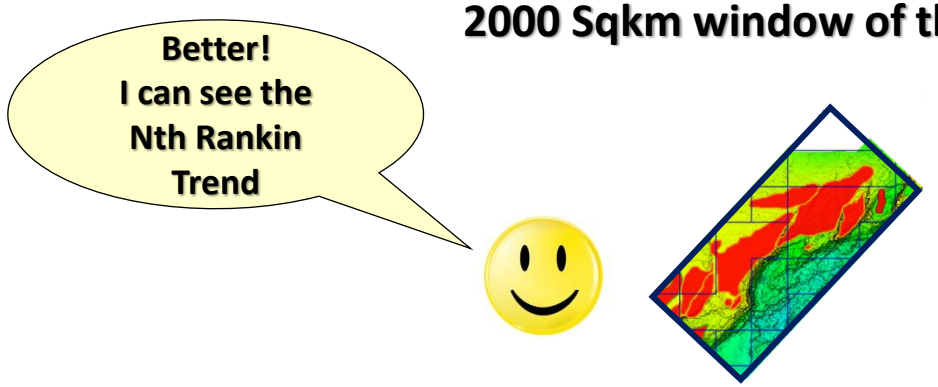
500 Sqkm window of the Sub-Surface

Nice!
I can see Nth
Rankin Field

200km

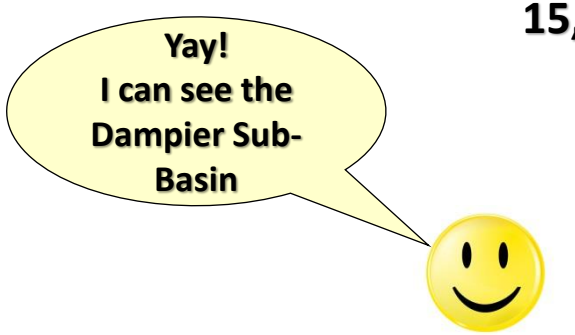
Concepto de Proyectos Regionales

2000 Sqkm window of the Sub-Surface

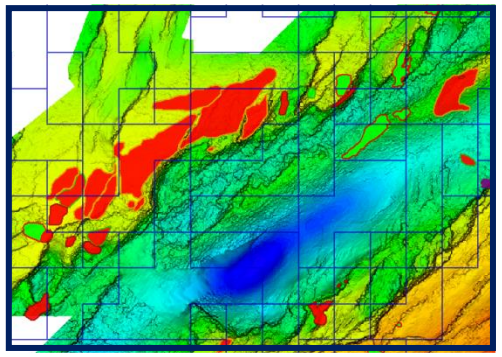


200km

Concepto de Proyectos Regionales

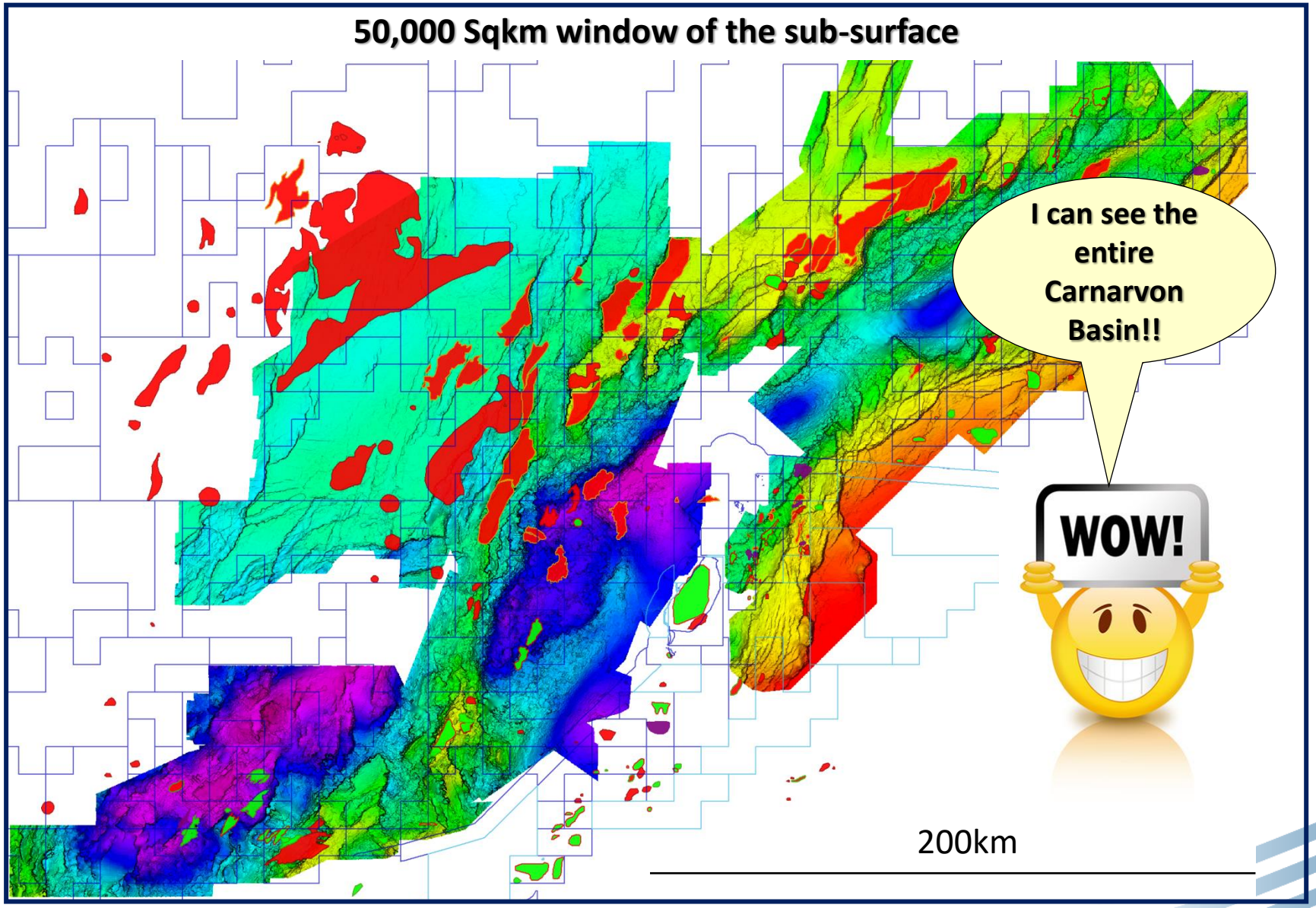


15,000 Sqkm window of the Sub-Surface

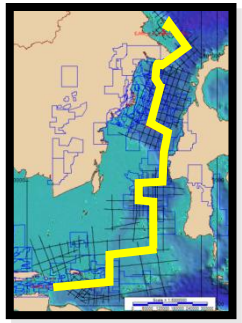


200km

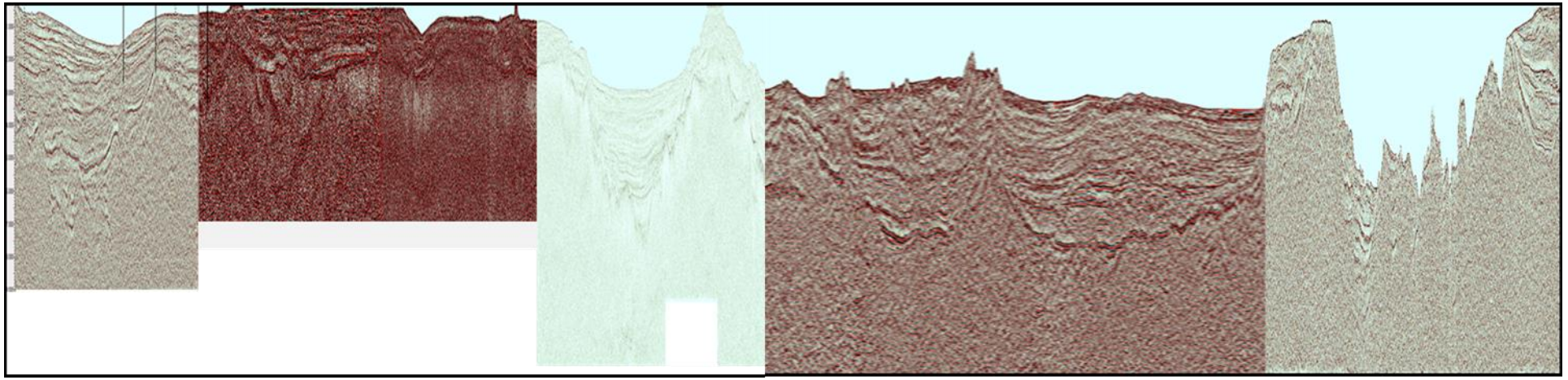
Concepto de Proyectos Regionales



Concepto de Proyectos Regionales: 2D - Indonesia

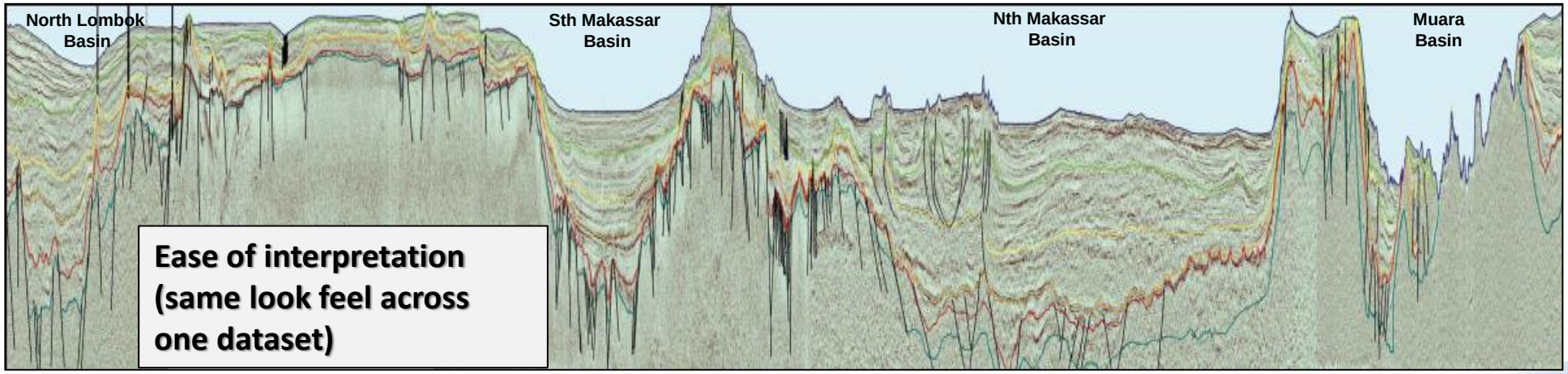


Arbitrary line across 5 vintage 2D datasets



~2000km

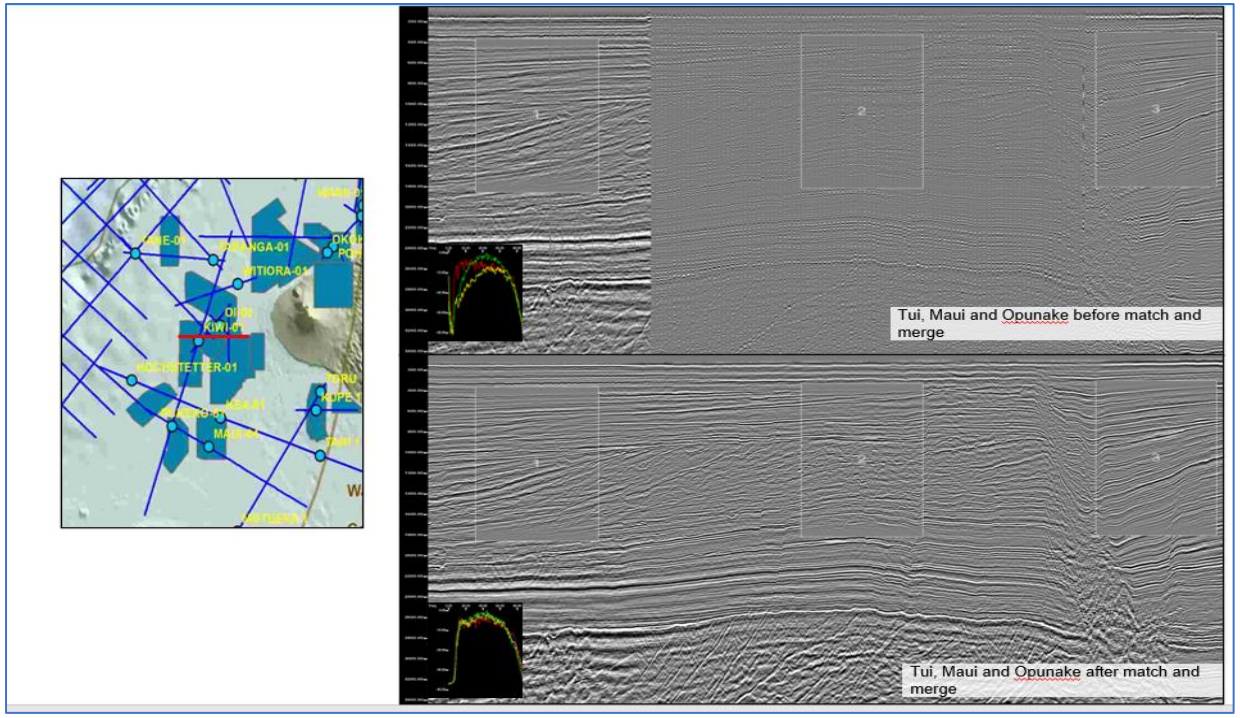
Arbitrary line across matched & merged 2D Megaproject dataset



Ease of interpretation (same look feel across one dataset)

Concepto de MegaProject

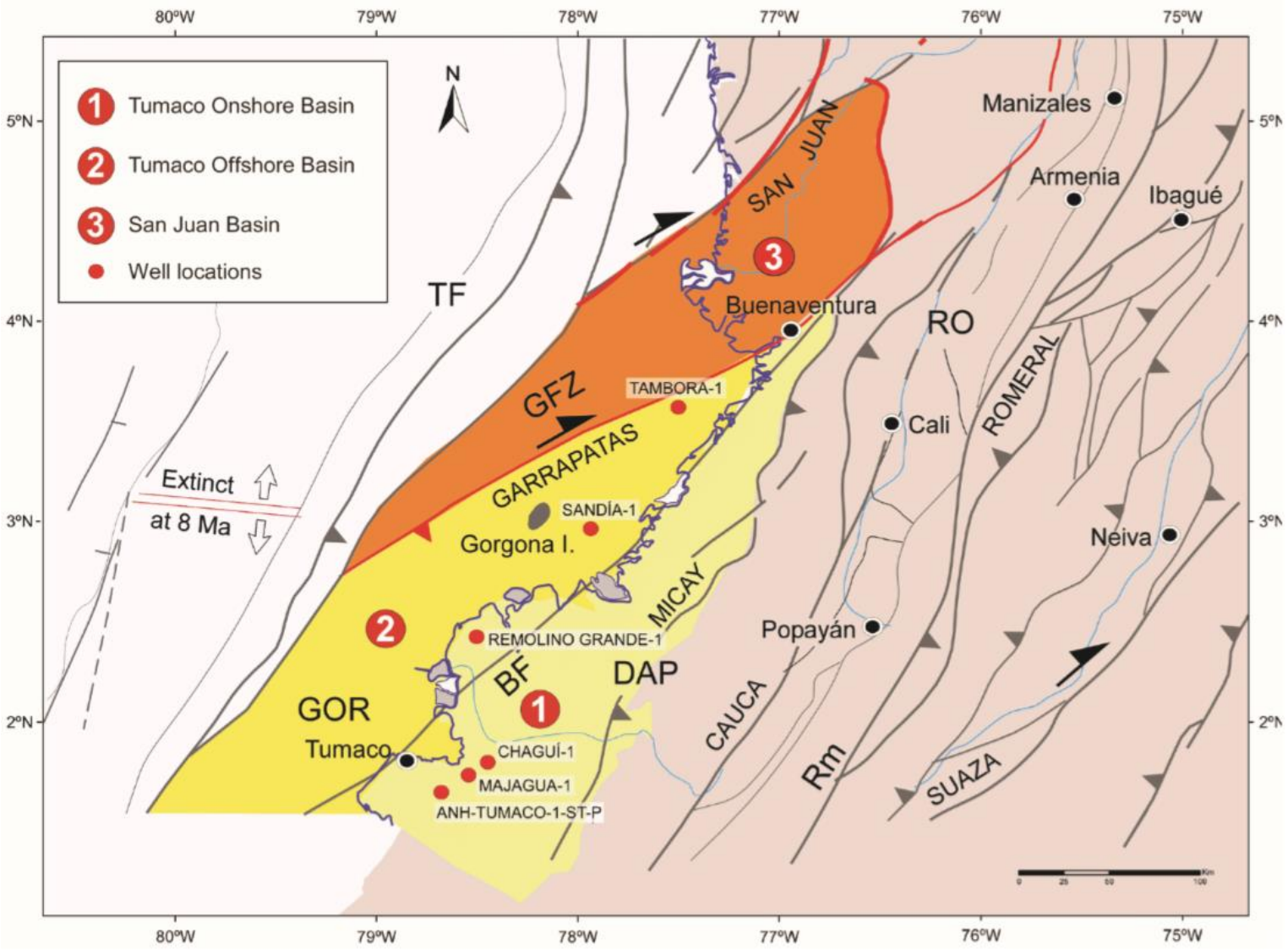
- Es la combinación de datos 2D antiguos públicos y propiedad de PGS para producir estos productos 2D regionales contiguos, equilibrados en fase, tiempo y amplitud -uniformemente escalados.
- Es posible que se incorporen algunos levantamientos 3D.
- Este producto se basa en una cuadrícula variable de líneas 2D. Se adapta a las compañías petroleras que buscan una comprensión regional amplia y rentable de la geología y la prospectividad dentro de una cuenca.
- MegaProjects se proporcionan es un estado preparado para la estación de trabajo, y muchos de ellos tienen horizontes interpretados.



Taranaki MegaProject, New Zeeland

Geología Regional - El Margen Del Pacífico

Tumaco Basin – Summary



Modified after Cediel et al., 2003

The Tumaco Basin (including San Juan basin) is a forearc basin formed in an active margin from Tertiary subduction of the Nazca Plate beneath the western part of South America.

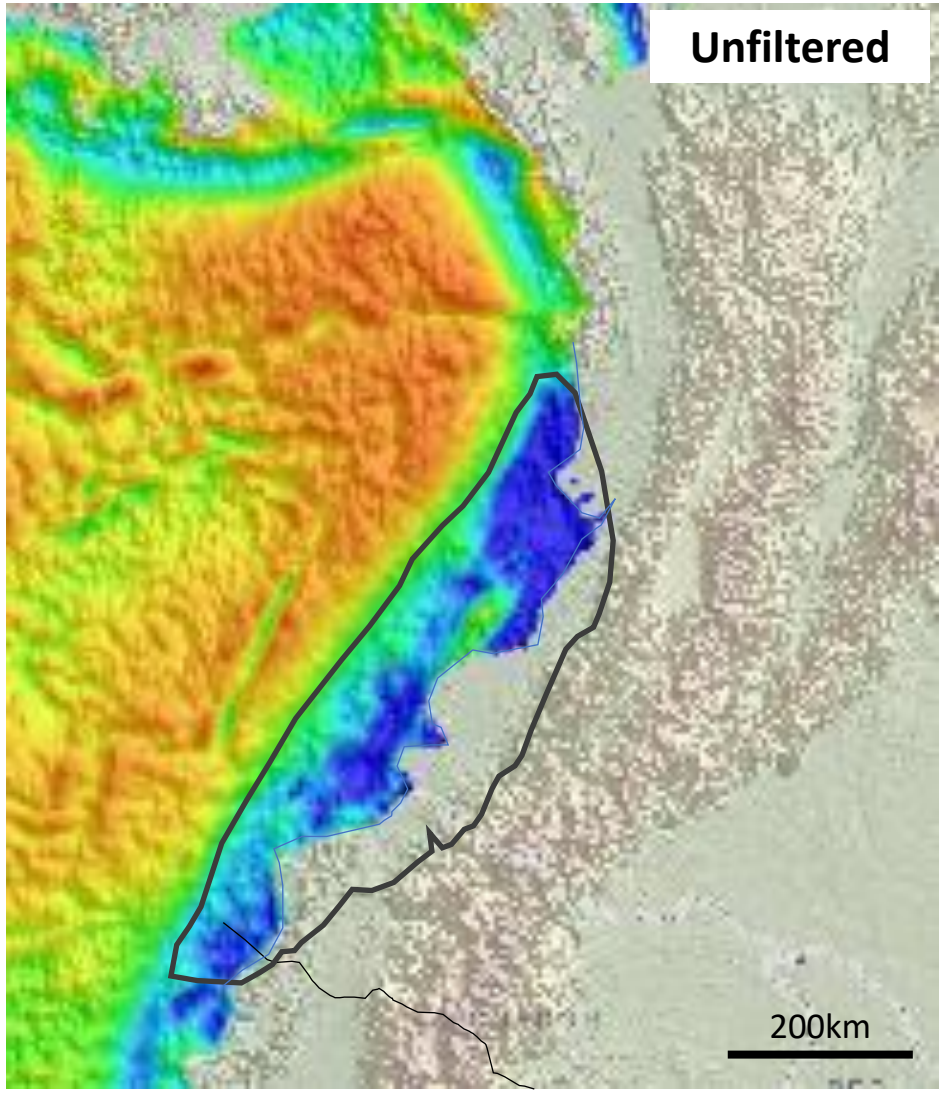
The subduction produced a depression parallel to the paleo-coastline, between the external accretional arch and the Western Cordillera, where the sedimentary fill of the basin took place.

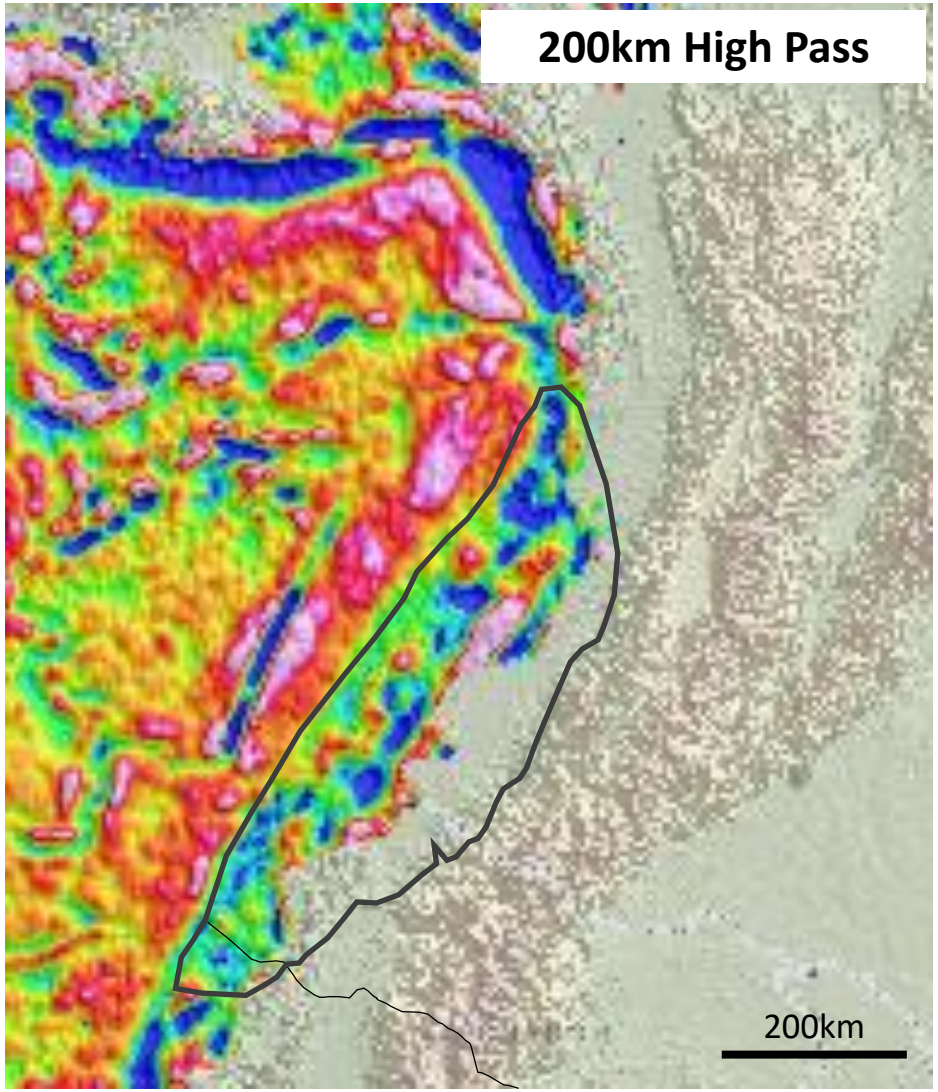
Tumaco basin comprises two depocenters separated by a basement high. This paleohigh separates two different structural settings.

Towards the continent, in the deepest depocenter, there is no major tectonic deformation, and only a slight folding generated mainly by incipient mud diapirism and minor faulting is observed. Towards the ocean, there is a stronger structural deformation with mud diapirism. Narrow folds and high-angle normal faults dipping to the west are present.

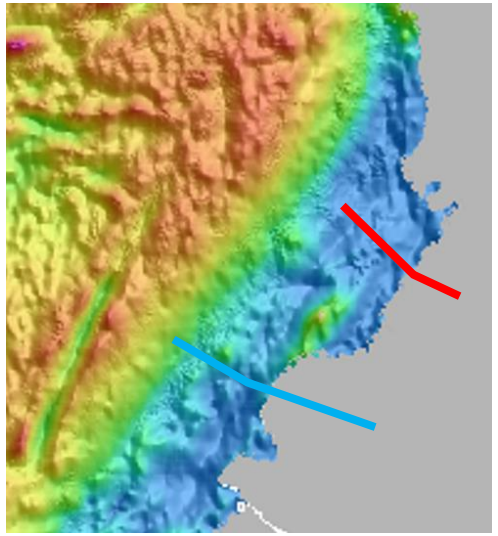
This basin contains a pre-Miocene mega-sequence and three post-lower Miocene sequences, deposited in shelf to bathyal environments over Cretaceous meta-sedimentary and a volcanic rock basement.

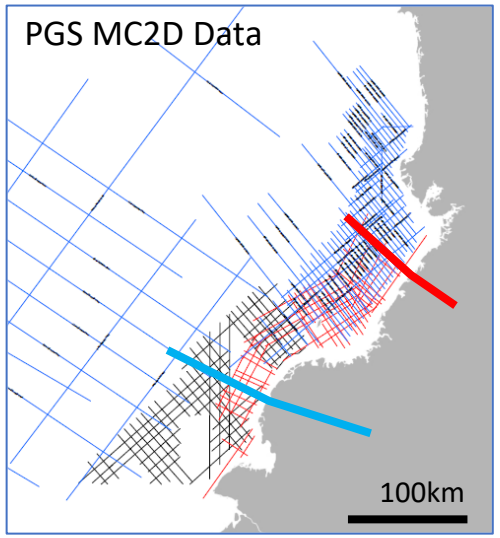
Tumaco Basin – Structure Setting: Gravity (Bouguer)

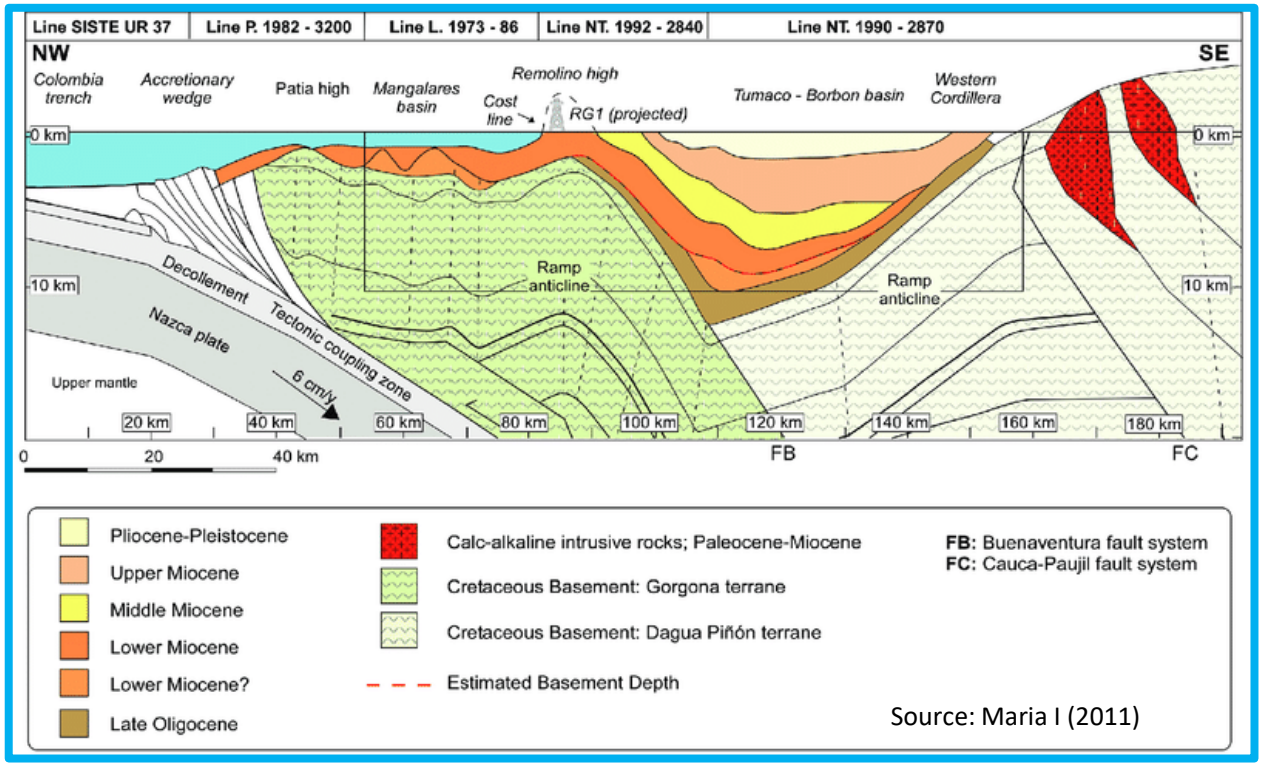


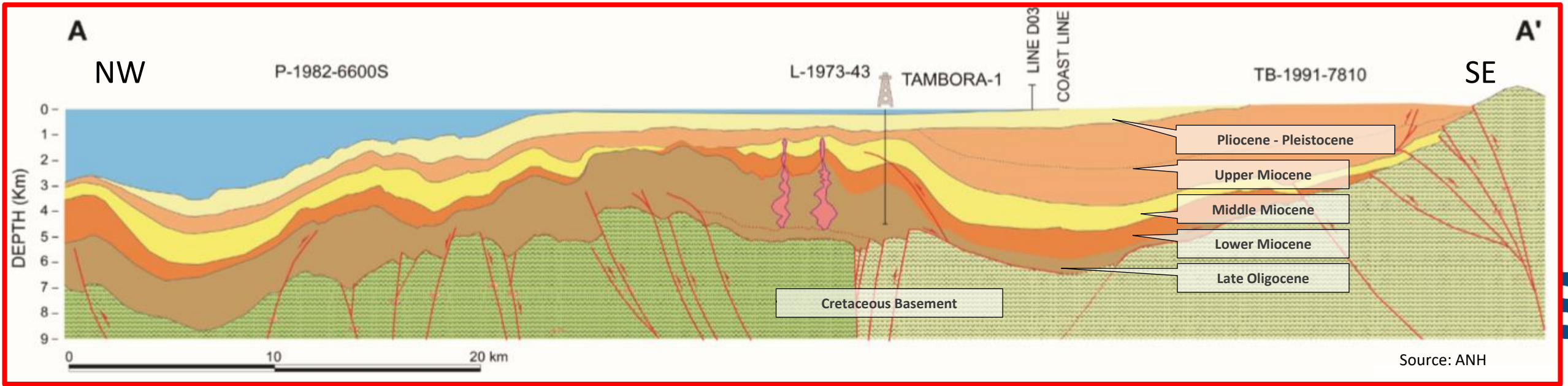


Tumaco Basin – Structure Setting

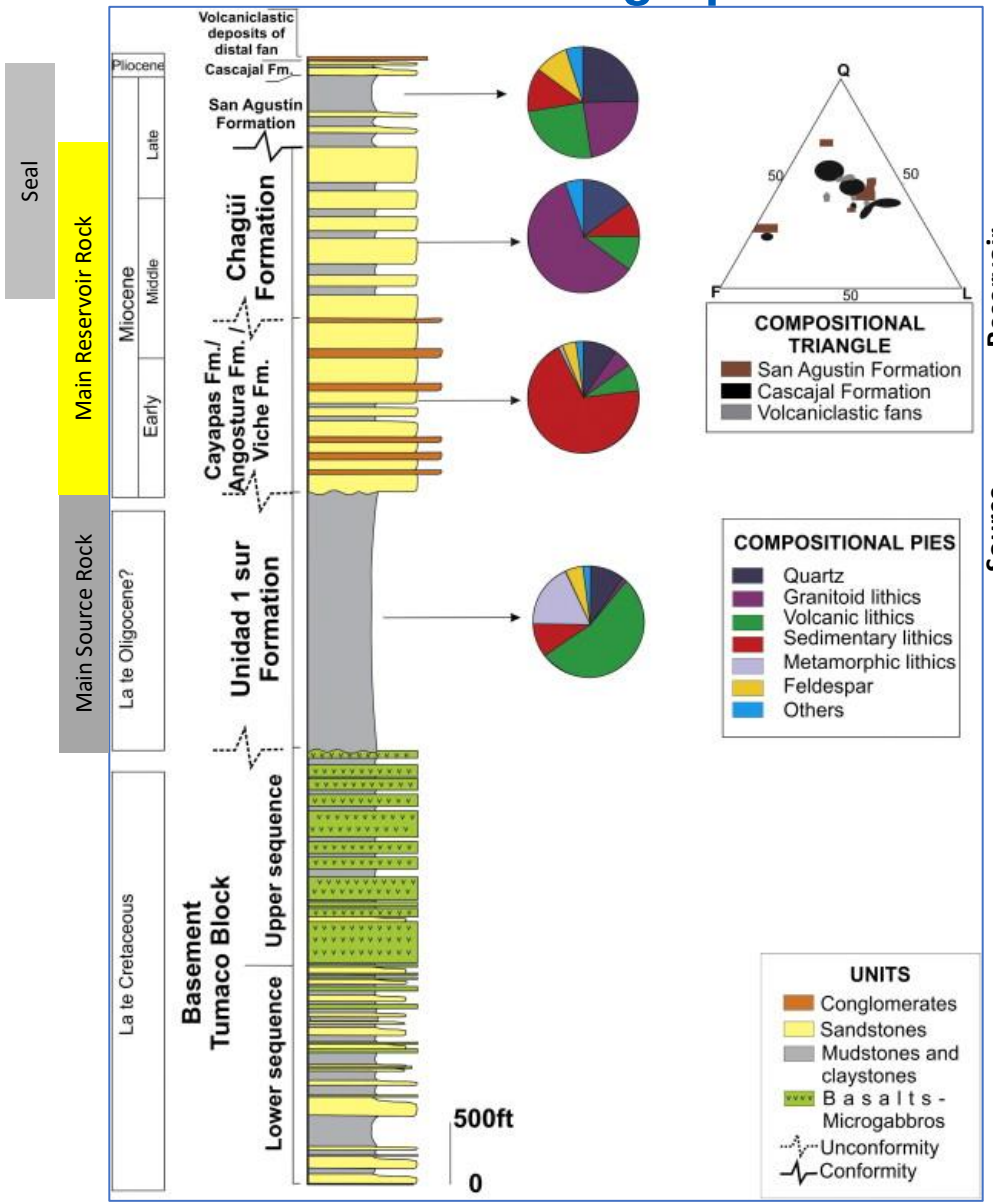








Tumaco Basin – Stratigraphic Chart



Reservoir

2.6 – 0.7My, Pleistocene: Paleodeltas, shelf and deltaic sediments.

5 – 2.6My, Pliocene: Mayorquin Fm, growth strata west, offshore in response to Remolino high uplift.

11 – 5My, Upper Miocene: Raposo Fm, shale – Slumps, turbidites, delta deposits during Remolino uplift.

23 – 11My, Lower Miocene: Nayas Fm, shale – clay, channel levee, crevasse splays and turbidite fan sediments. Intiation of shale diapirism.

Source

33 – 23My, Oligocene: Cayapas Fm, shale – clay (TOC <3%), kerogen type III-IV – immature to early mature. Gas prone. Channel levee deposits and turbidte fans. Westward sediment distribution in response to Remolino high uplift.

40 – 33My, Upper Eocene: Pacific Gp, shale and turbidite deposits – deposition focus westwards. Sudsidence related to Farallon plate subduction

70 – 50My, Upper Cretaceous - Paleocene: Volcanics, pillow basalts. Overlying shales, potential source rock, TOC >1%, kerogen type II, oil prone.

Shelf - Deltaic

Slope fan

Basin floor fan

Plateau volcanism

Source: Maria I (2011)

Tumaco Basin – Exploration Play Types

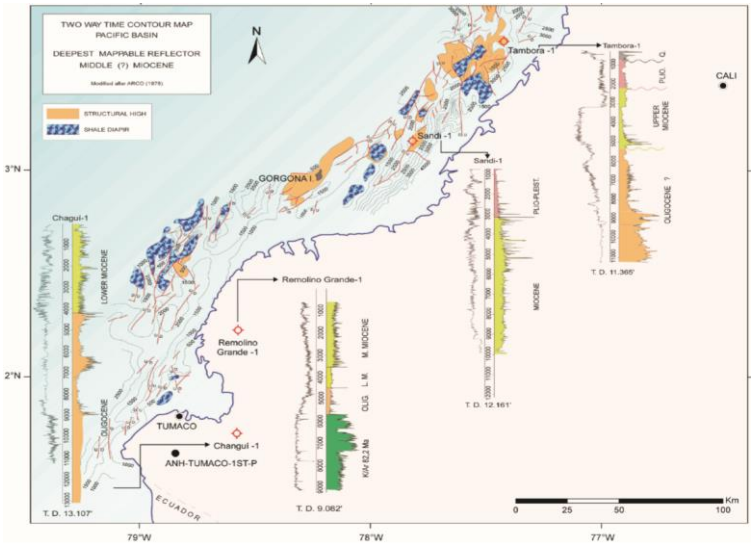
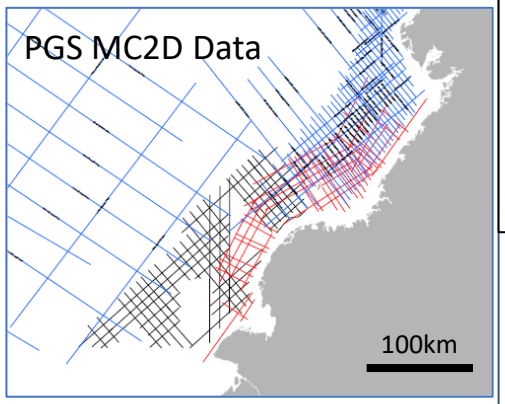
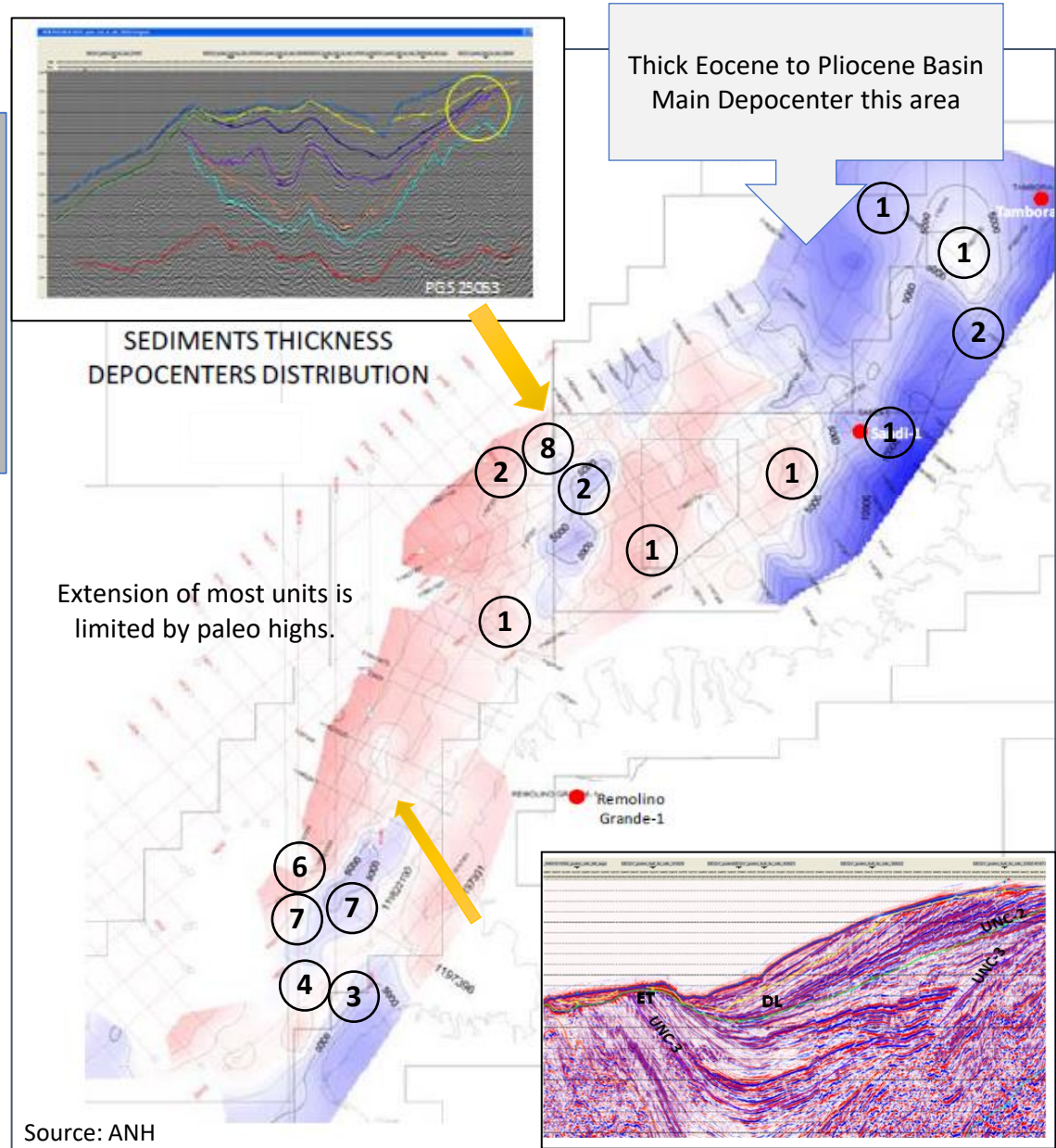


Figure 19. Deepest mappable reflector middle (?) Miocene, modified after Cediel *et al.*, 1998, Seismic Atlas of Colombia.





Source: ANH

Types of leads within the survey area

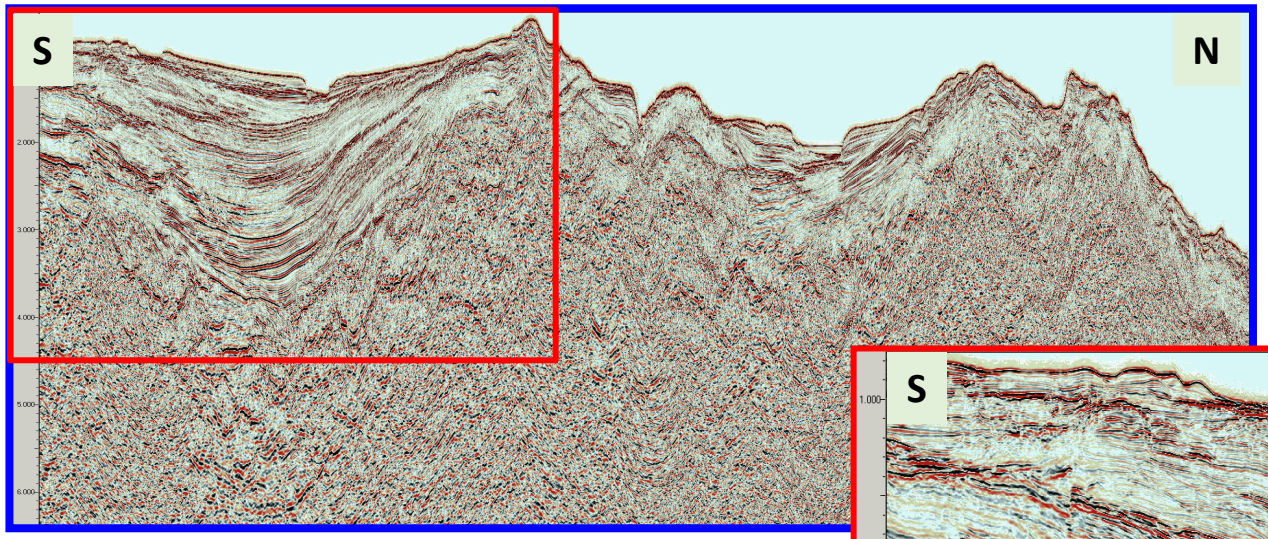
Abundant Structural Trap Opportunities

- Type 1: Folds
- Type 2: Inversion / transtensional structures

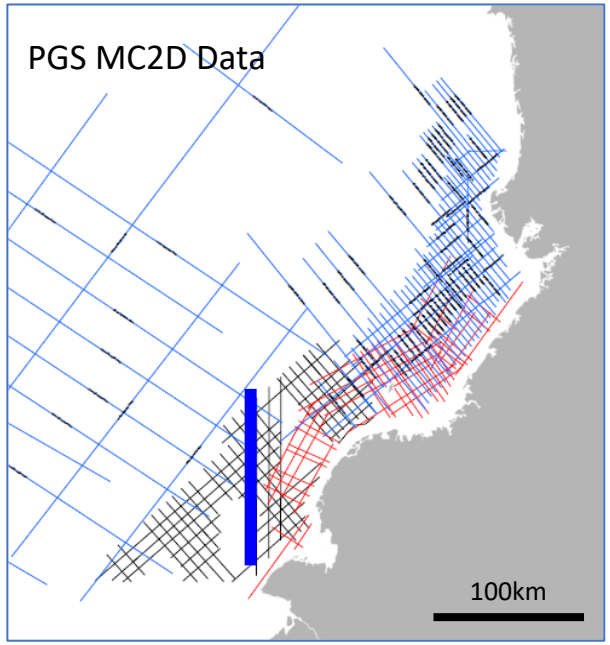
Strat Trap Opportunities – Next Phase of Exploration

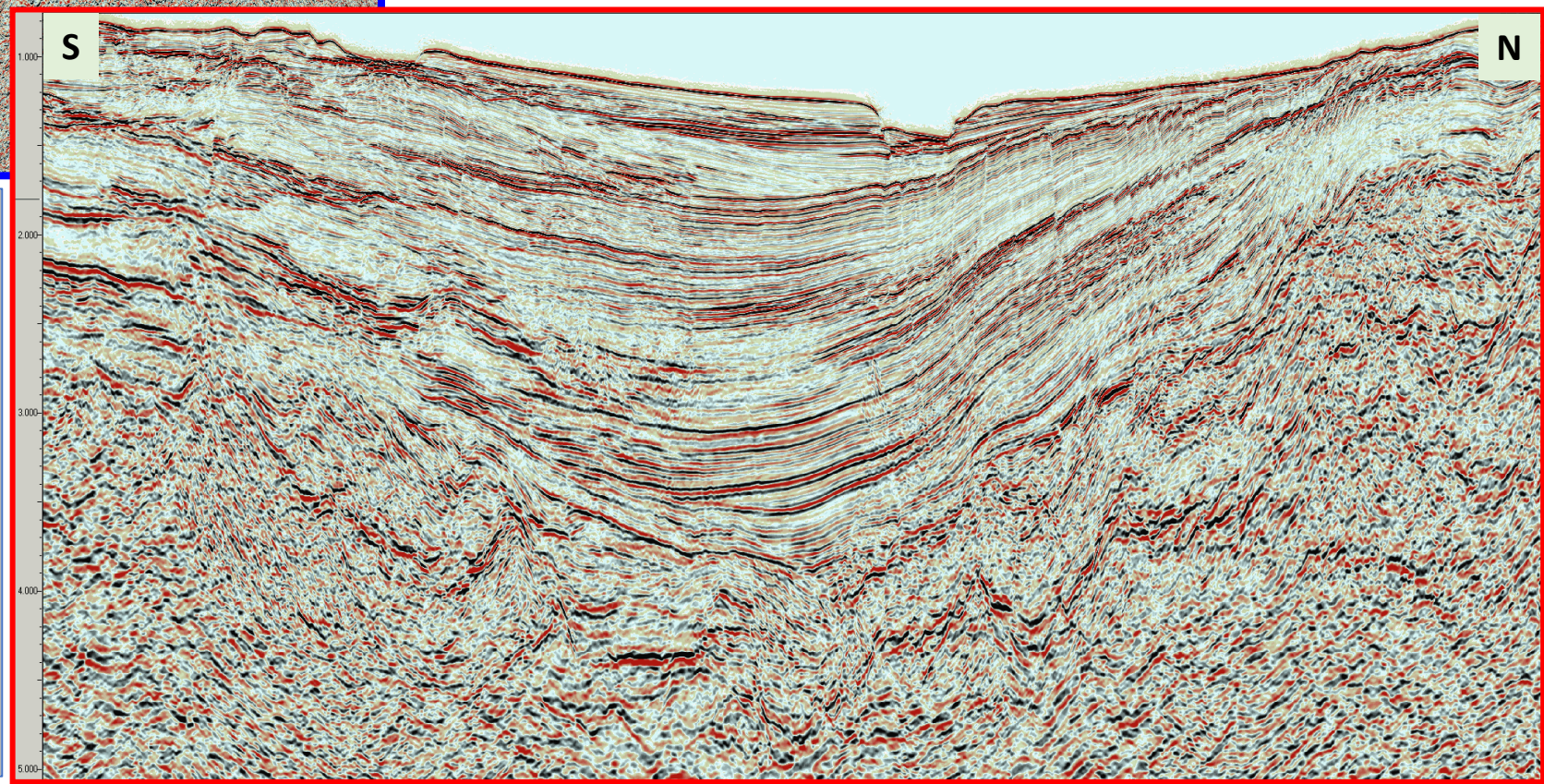
- Type 3: Change in seismic character
- Type 4: Extensional system highly block faulted
- Type 5: Eocene to Miocene units against paleohighs
- Type 6: Eocene to Miocene units against normal faults
- Type 7: Wedging on the edge of the Basin
- Type 8: Up-dip Erosional Truncation

Tumaco Basin – Exploration Play Types

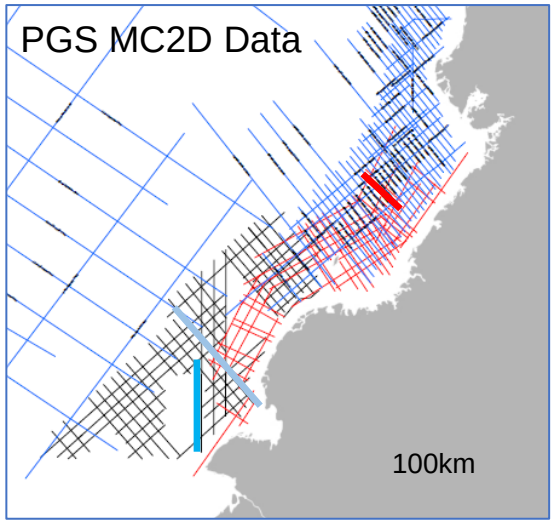


Channel – Turbidite Fan
Up-dip Fault Closures

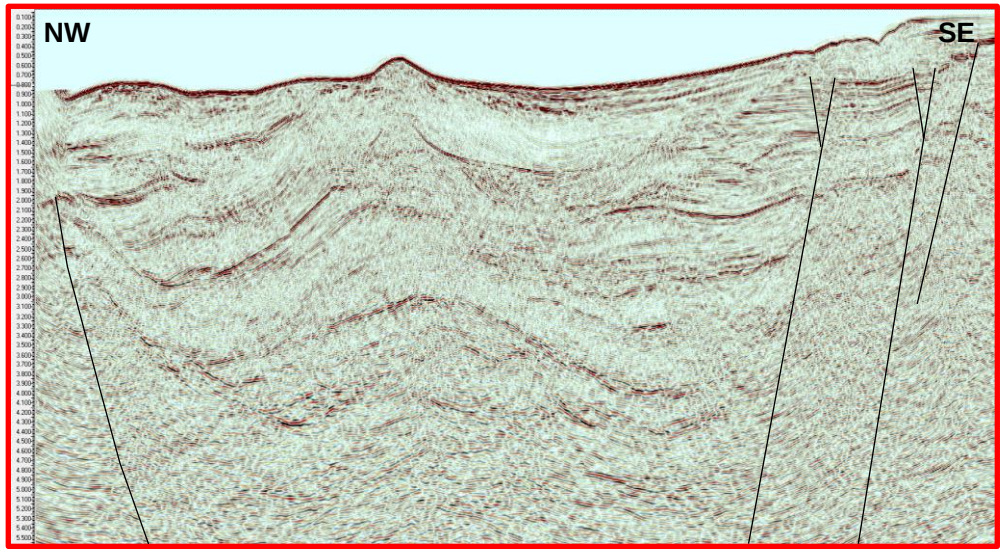


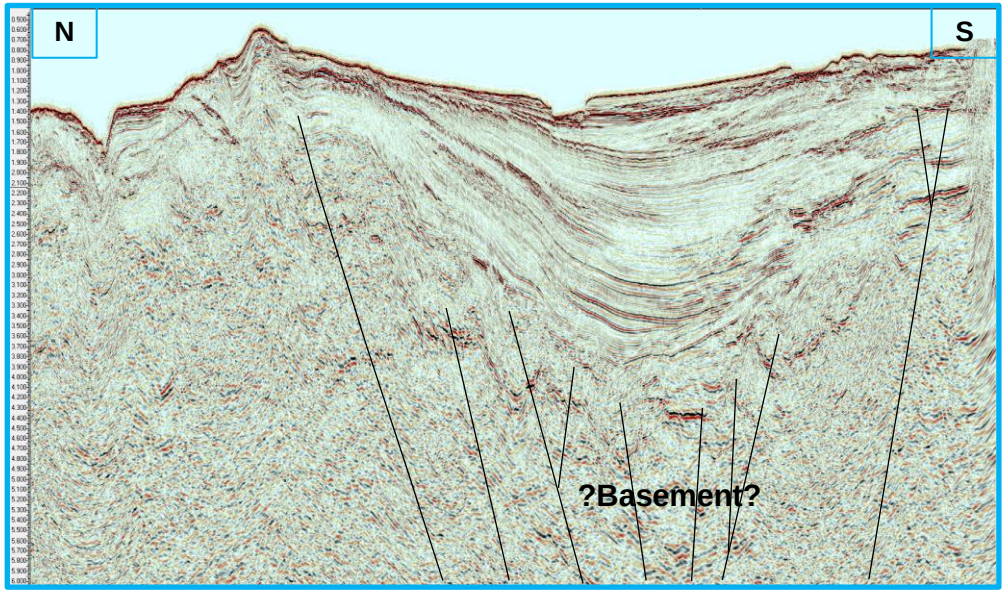


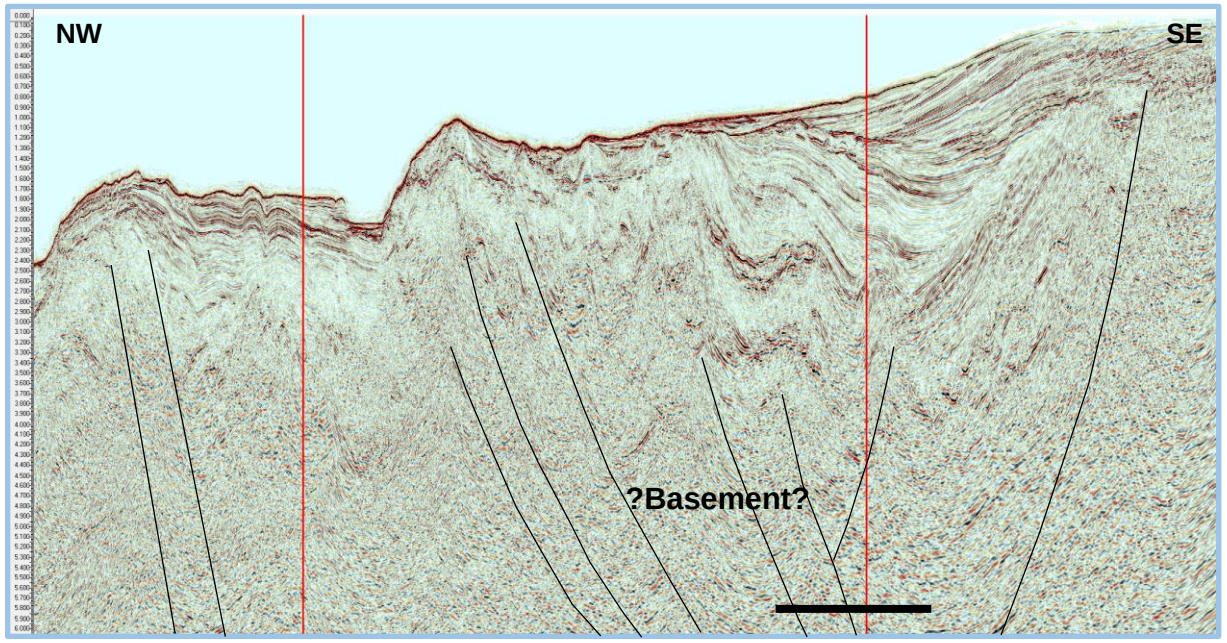
Tumaco Basin – Exploration Play Types



Reprocess data to define basement, sediment thickness and determine potential of source rock maturity







Estado Reproceso Sísmico MegaProject Pacífico

Estatus actual del Proyecto: Tiempo/Profundidad Imaging

Tiempo

- **Testing Status**
  - 2008: High resolution radon test is completed and approved.
  - 1982: High resolution radon test is ongoing .
  - 1973: High resolution radon test is ongoing.

- **Production Status**
  - 2008: High resolution radon production to start.
  - 1982: LNA and Shot Chan scaling production are completed.
  - 1973: LNA and Shot Chan scaling production are completed.

Processing Sequence / Survey Completion %	2008	1982	1973
Reformat	100%	100%	100%
Swell Noise Attenuation	100%	100%	100%
RBO & SBO	100%	100%	100%
Zero phase	100%	100%	100%
Residual Noise Attenuation	100%	100%	100%
DAA	100%	Not Needed	Not Needed
RMC	100%	NA	NA
Tidal Static Correction	100%	NA	NA
2DSRME	100%	100%	100%
Wemult2D	100%	100%	100%
Multi-Adaptive Subtraction	100%	100%	100%
Shot and Channel Scaling	100%	100%	100%
LNA	100%	100%	100%
Velocity Analysis every 1 km	100%	100%	100%
High Resolution Parabolic Radon De-Multiple	5%		
Multiple Diffraction Removal (MDR)			
Residual De-noise			
Inverse Q Compensation (Phase Only Q)			

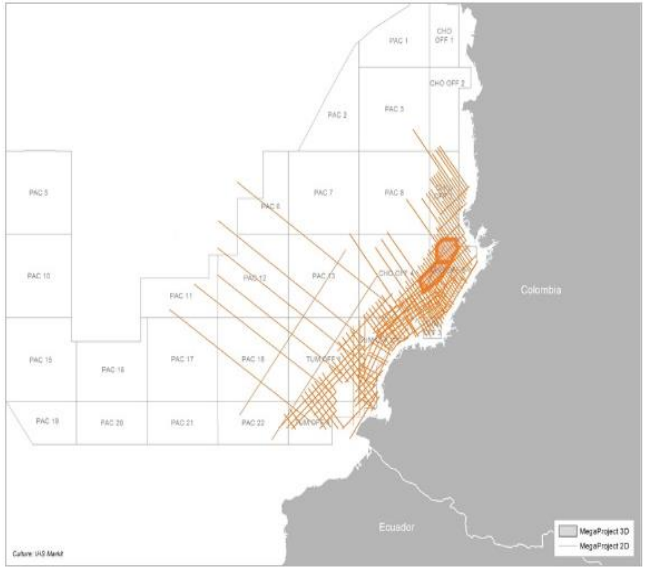
Profundidad

Testing Status:

- MBU01 tomography update is finished, and presentation is sent and waiting your feedback.
- Basement interpretation was received on 27th July and QC is ongoing.

Production Status:

- Water velocity migration is finished.
- SEGYs for all vintages for WBZ interpretation is sent to MC.
- Water bottom interpretation was received on 26th July and QC is ongoing.



Date	Processing/Imaging Step
19/04/2022	Swell Noise attenuation (2008)
21/04/2022	Swell Noise attenuation (1982)
24/04/2022	SBO/RBO/De-signature (2008)
26/04/2022	Residual Noise attenuation
08/05/2022	DAA
11/05/2022	SBO/RBO/De-signature (1982)
12/05/2022	Tidal static and RMC
15/05/2022	SBO/RBO/De-signature (1973)
26/05/2022	De-multiple models (2DSRME and Wemult2D)
01/06/2022	VMB test lines selection
14/06/2022	Multi Adaptive Subtraction
PSDM	
01/06/2022	VMB test lines selection
15/06/2022	Water velocity test
16/06/2022	Initial velocity model

Colombia MegaProject – Reprocessing Flow: SMRE Example

Reformat

↓

System delay correction

↓

Low cut filter 3Hz, 18dB/Oct

↓

Swell Noise Attenuation

↓

RBO/SBO and De-signature

↓

Residual Noise Attenuation

↓

Direct Arrival Attenuation

↓

Receiver Motion Correction

↓

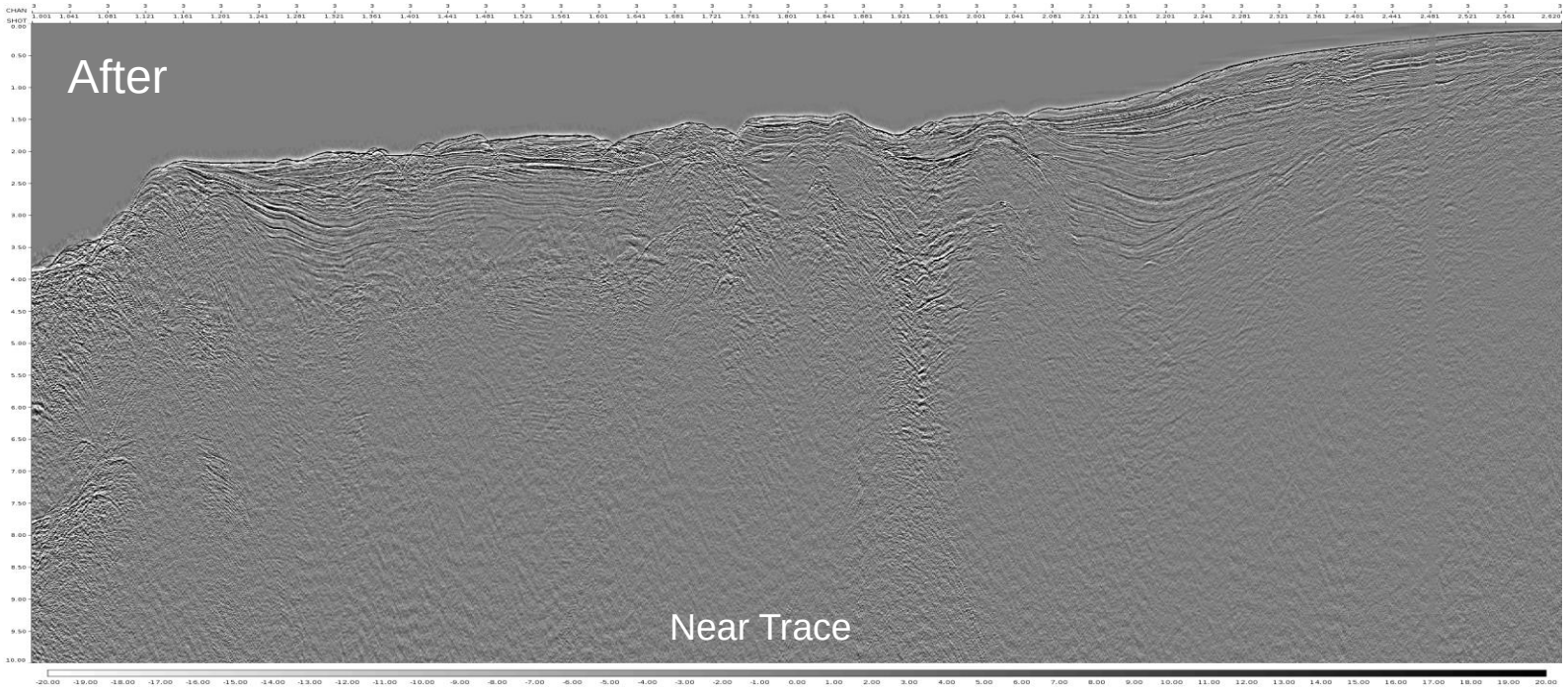
Tidal Static Correction

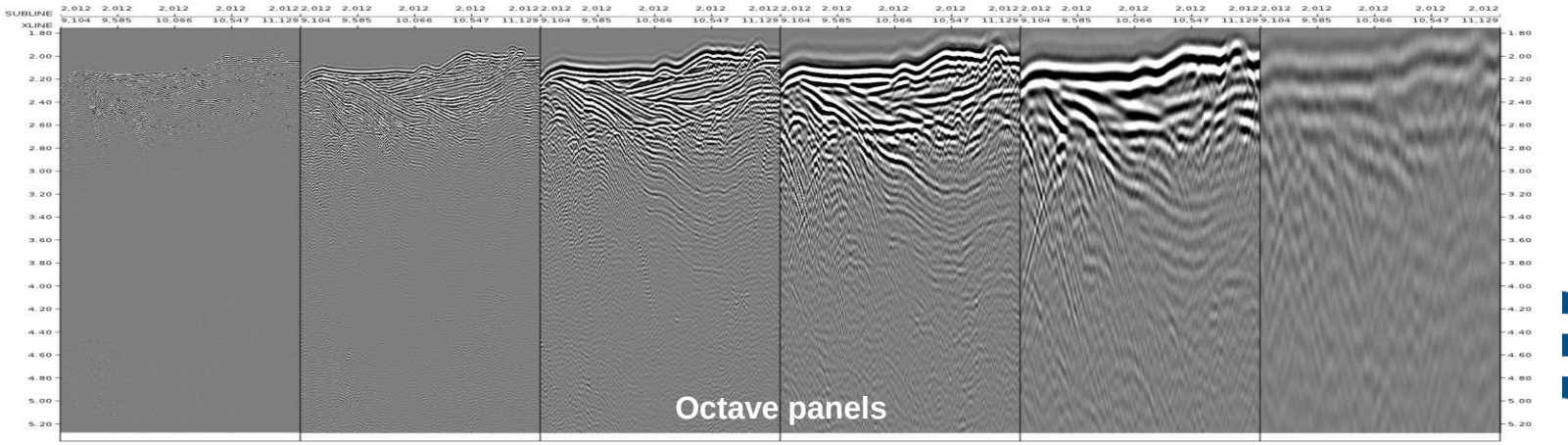
↓

Multiple modelling

↓

Adaptive Subtraction

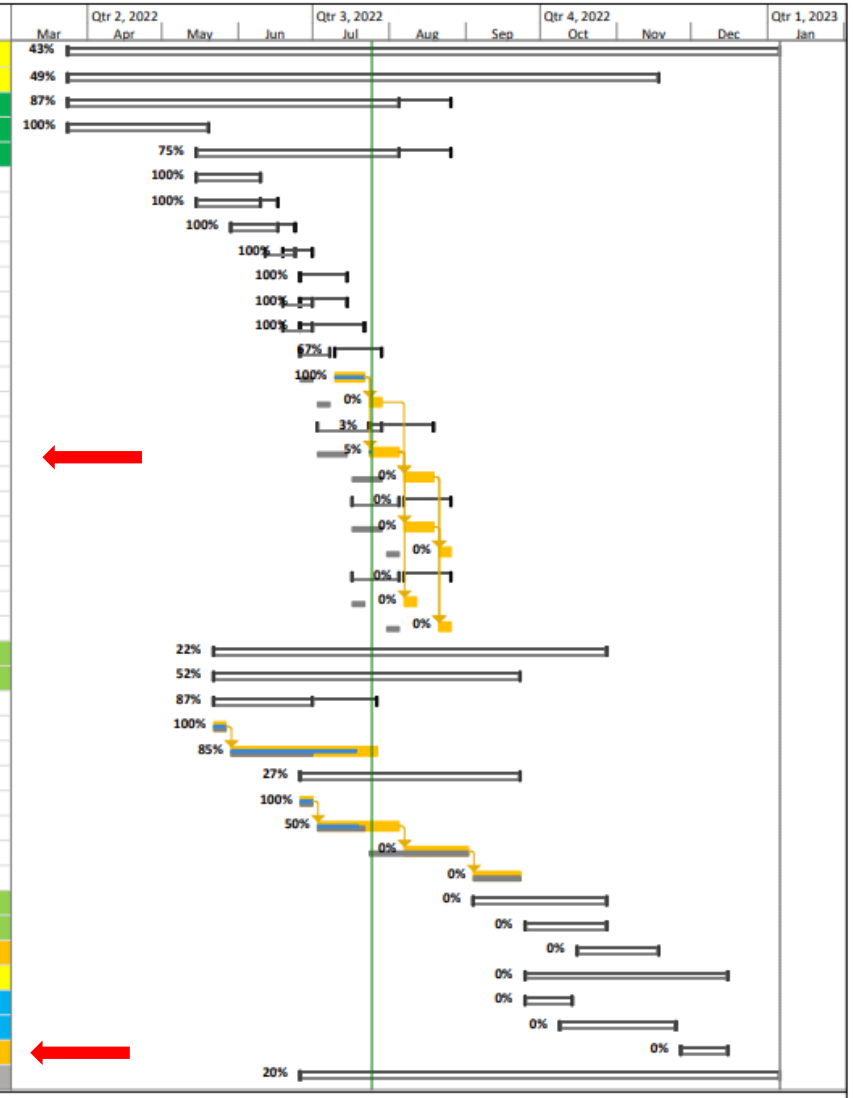




Cronograma & Conclusiones

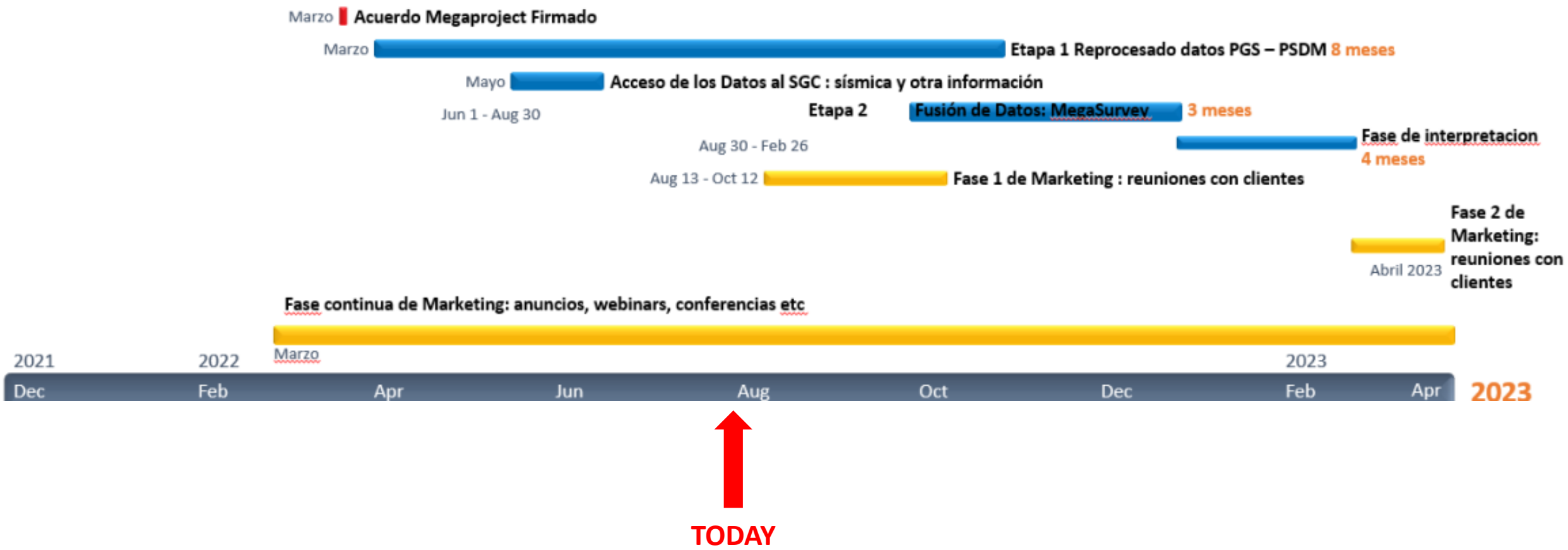
Cronograma Phase 1

ID	Task Name	% Complete	Duration	Start	Finish
1	**Colombia 2D Re-Processing and MegaMerge 2D&**	**43%**	**206 days**	**Thu 03/24/22**	**Thu 01/05/23**
2	**2D_KPSDM_Re-processing**	**49%**	**171 days**	**Thu 03/24/22**	**Thu 11/17/22**
3	**Time Imaging**	**87%**	**111 days**	**Thu 03/24/22**	**Thu 08/25/22**
4	**Pre-processing**	**100%**	**41 days**	**Thu 03/24/22**	**Thu 05/19/22**
29	**De-Multiple**	**75%**	**75 days**	**Sun 05/15/22**	**Thu 08/25/22**
30	**2D SRME**	**100%**	**20 days**	**Sun 05/15/22**	**Thu 06/09/22**
33	**Wemult2D**	**100%**	**25 days**	**Sun 05/15/22**	**Thu 06/16/22**
36	**Multi-Adaptive Subtraction**	**100%**	**20 days**	**Sun 05/29/22**	**Thu 06/23/22**
39	**Tau-P Deconvolution**	**100%**	**10 days**	**Sun 06/19/22**	**Thu 06/30/22**
42	**LNA and SI**	**100%**	**15 days**	**Sun 06/26/22**	**Thu 07/14/22**
45	**Shot and Channel Scaling**	**100%**	**15 days**	**Sun 06/26/22**	**Thu 07/14/22**
48	**Velocity Analysis every 1 km**	**100%**	**20 days**	**Sun 06/26/22**	**Thu 07/21/22**
51	**High Resolution Parabolic Radon De-Multiple**	**67%**	**15 days**	**Sun 07/10/22**	**Thu 07/28/22**
52	Testing	100%	10 days	Sun 07/10/22	Thu 07/21/22
53	Production and QC	0%	5 days	Sun 07/24/22	Thu 07/28/22
54	**Multiple Diffraction Removal (MDR)**	**3%**	**20 days**	**Sun 07/24/22**	**Thu 08/18/22**
55	Testing	5%	10 days	Sun 07/24/22	Thu 08/04/22
56	Production and QC	0%	10 days	Sun 08/07/22	Thu 08/18/22
57	**Residual De-noise**	**0%**	**15 days**	**Sun 08/07/22**	**Thu 08/25/22**
58	Testing	0%	10 days	Sun 08/07/22	Thu 08/18/22
59	Production and QC	0%	5 days	Sun 08/21/22	Thu 08/25/22
60	**Inverse Q Compensation (Phase Only Q)**	**0%**	**15 days**	**Sun 08/07/22**	**Thu 08/25/22**
61	Testing	0%	5 days	Sun 08/07/22	Thu 08/11/22
62	Production and QC	0%	5 days	Sun 08/21/22	Thu 08/25/22
63	**Depth Imaging**	**22%**	**115 days**	**Sun 05/22/22**	**Thu 10/27/22**
64	**VMB Phase**	**52%**	**90 days**	**Sun 05/22/22**	**Thu 09/22/22**
65	**Testing**	**87%**	**48 days**	**Sun 05/22/22**	**Tue 07/26/22**
66	Test Lines Data Receipt	100%	5 days	Sun 05/22/22	Thu 05/26/22
67	Setup & Testing	85%	43 days	Sun 05/29/22	Tue 07/26/22
68	**Production**	**27%**	**65 days**	**Sun 06/26/22**	**Thu 09/22/22**
69	Data Receipt & Setup	100%	5 days	Sun 06/26/22	Thu 06/30/22
70	Initial Velocity Model	50%	25 days	Sun 07/03/22	Thu 08/04/22
71	MBU01 Tomography Update	0%	20 days	Sun 08/07/22	Thu 09/01/22
72	Deep Velocity Flood	0%	15 days	Sun 09/04/22	Thu 09/22/22
73	**Migration**	**0%**	**40 days**	**Sun 09/04/22**	**Thu 10/27/22**
81	**Post-Imaging**	**0%**	**25 days**	**Sun 09/25/22**	**Thu 10/27/22**
110	**Deliverables**	**0%**	**25 days**	**Sun 10/16/22**	**Thu 11/17/22**
122	**MegaMerge processing 2D & 3D**	**0%**	**60 days**	**Sun 09/25/22**	**Thu 12/15/22**
123	**Reformat**	**0%**	**15 days**	**Sun 09/25/22**	**Thu 10/13/22**
126	**Match / Rebin**	**0%**	**35 days**	**Sun 10/09/22**	**Thu 11/24/22**
129	**Deliverables**	**0%**	**15 days**	**Sun 11/27/22**	**Thu 12/15/22**
134	**Close down and PPF**	**20%**	**140 days**	**Sun 06/26/22**	**Thu 01/05/23**



Page 1

Cronograma



TODAY

Conclusiones

- El **Megaproject del Pacifico** está efectuándose conforme al Cronograma establecido.

- Acceso a los datos del SGC continua siendo un proceso lento. Necesitamos los datos lo más pronto posible para efectuar la Etapa 2 y seguir con los tiempos del Cronograma.

- Una vez la Fase 1 completada se empezará una fase de marketing estructurada.

Gracias