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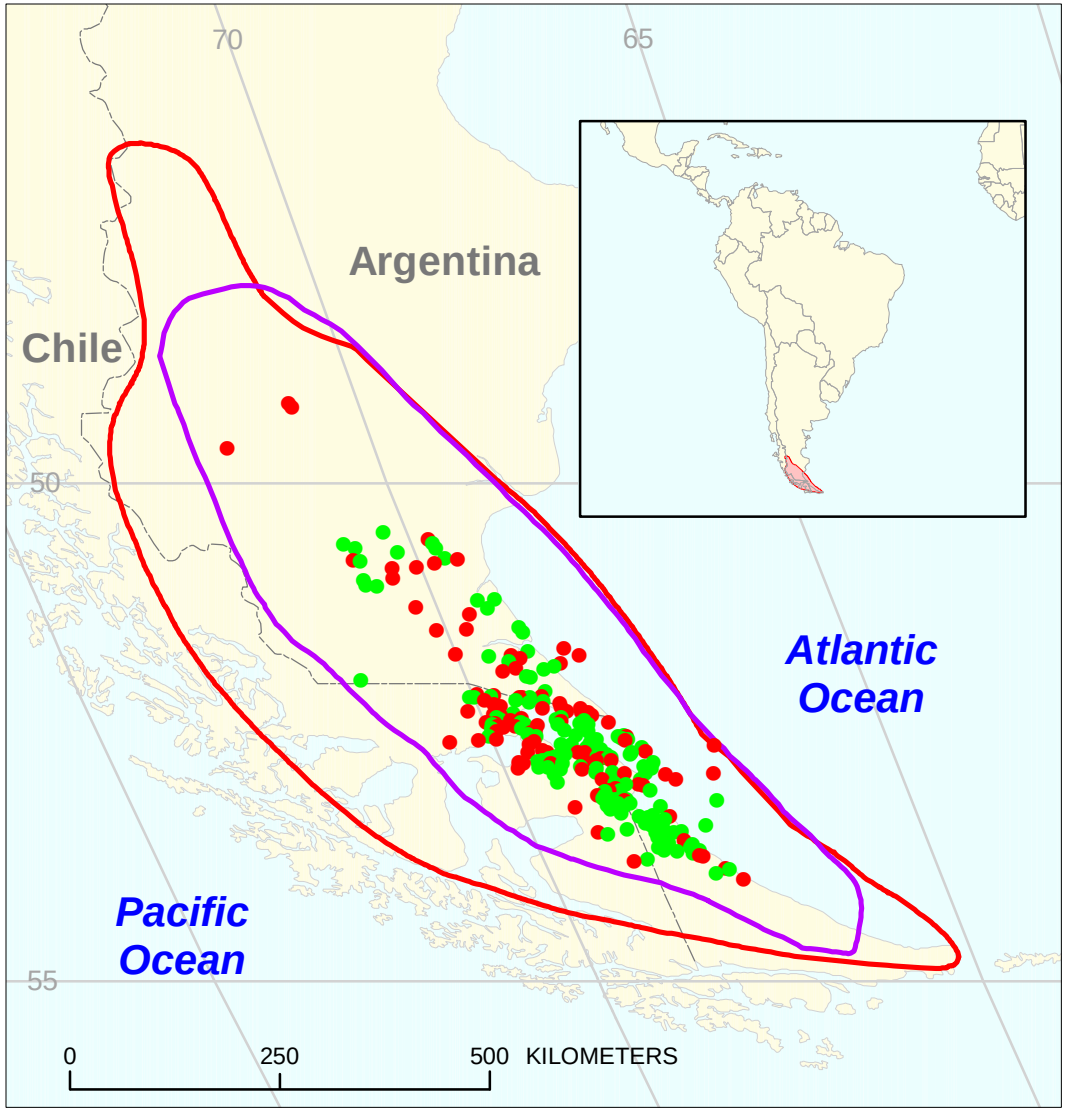
Magallanes Extensional Structures Assessment Unit 60590101



Magallanes Extensional Structures Assessment Unit 60590101

Magallanes Basin Geologic Province 6059

Geologic Summary

Detailed map of this assessment unit

Exploration/Discovery-History Data

- Plots of Known Field Sizes
- Plots of Grown Resources
- Tables

Assessment Input Data

Assessment Results

- Assessment Unit Summary
- Detailed Assessment Results
- Undiscovered Field-Size Distributions

USGS PROVINCE: Magallanes Basin (6059) **GEOLOGIST:** C.J. Schenk

TOTAL PETROLEUM SYSTEM: Lower Inoceramus (605901)

ASSESSMENT UNIT: Magallanes Extensional Structures (60590101)

DESCRIPTION: This assessment unit is defined by structural traps related to at least two phases of rifting across much of the Magallanes Basin. Sandstones of the Springhill Formation drape the extensional structures.

SOURCE ROCKS: Source rocks are the Lower Cretaceous "Lower Inoceramus" marine mudstones.

MATURATION: Hydrocarbon generation began about 75 Ma, with peak generation at approximately 50 Ma.

MIGRATION: Migration was mainly lateral from the basin axis following foreland basin development, and eastward up the monocline and into Springhill sandstones. Springhill sandstones were conduits, as were rift-related faults.

RESERVOIR ROCKS: The reservoirs are nearly all Upper Jurassic-Lower Cretaceous Springhill Formation sandstones. Reservoirs range from fluvial-deltaic to shallow marine and shelf sandstones; slope-channel and basin-floor turbidites are potentially a significant exploration target to the west.

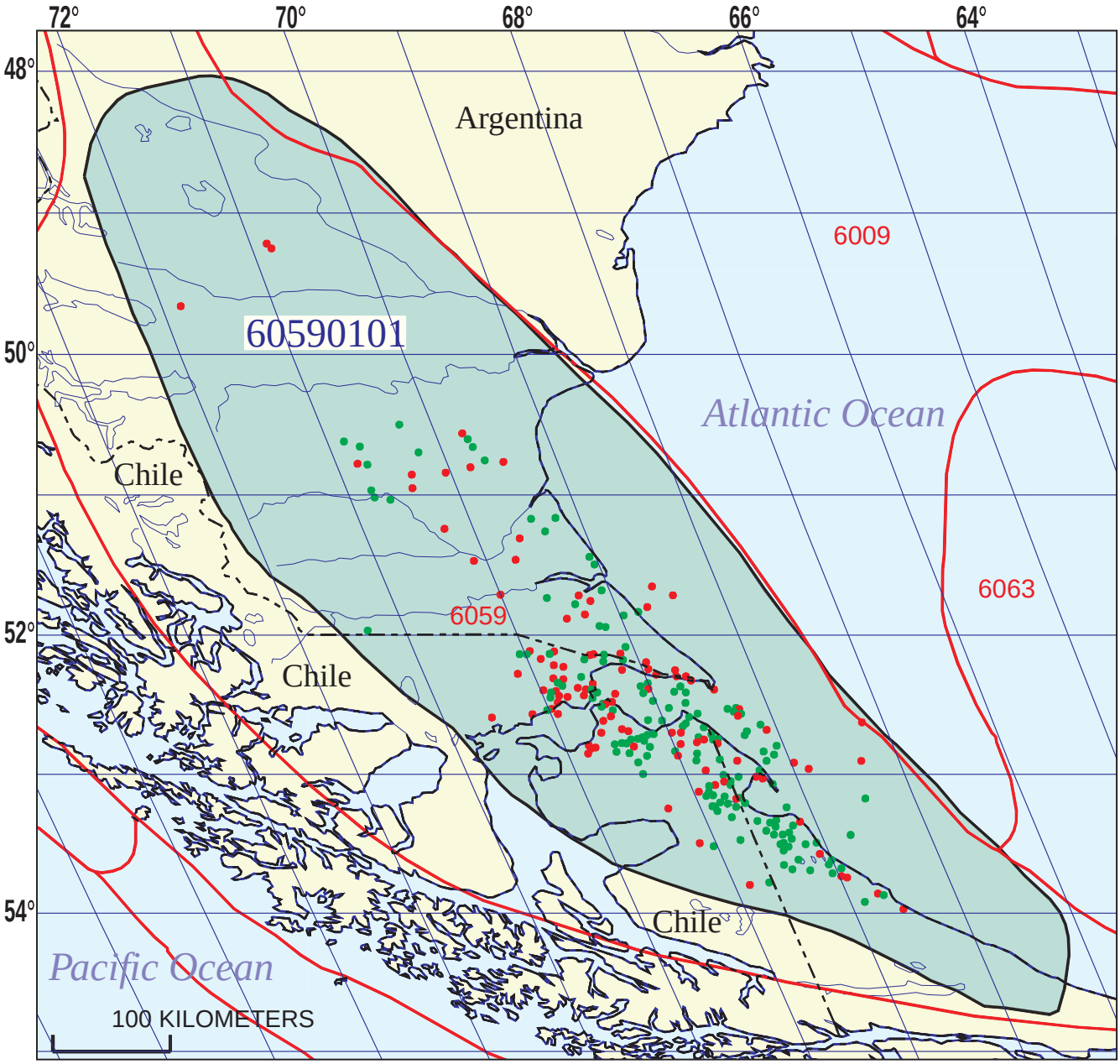
TRAPS AND SEALS: Traps were formed by the reactivation of Triassic-Late Jurassic rift-related faults along the southwest flank of the Dungeness Arch, and drapes and folds and faults of the Springhill Formation. Seals are provided by "Inoceramus" mudstones and intraformational Springhill mudstones ("Estratos con Favrella").

REFERENCES:

Biddle, K.T., Uliana, M.A., Mitchum, R.M., Fitzgerald, M.G., and Wright, R.C., 1986, The stratigraphic and structural evolution of the central and eastern Magallanes Basin, southern South America, *in* Allen, P.A., and Homewood, P., eds., Foreland basins: International Association of Sedimentologists Special Publication 8, p. 41-61.

Pittion, J.L., and Arbe, H., 1997, Petroleum system in the Austral Basin, *in* Mello, M., and Katz, B., eds., Petroleum Systems of the South Atlantic margin: Hedberg Research Symposium, Extended Abstracts Volume, 3 p.

Ramos, V.A., 1989, Andean foothills structure in northern Magallanes Basin, Argentina: American Association of Petroleum Geologists Bulletin, v. 73, no. 7, p. 887-903.



Magallanes Extensional Structures
Assessment Unit - 60590101

EXPLANATION

- Hydrography
- Shoreline
- 6059 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 60590101 Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

SEVENTH APPROXIMATION
NEW MILLENNIUM WORLD PETROLEUM ASSESSMENT
DATA FORM FOR CONVENTIONAL ASSESSMENT UNITS

Date:……..	2/5/99		
Assessment Geologist:……..	C.J. Schenk		
Region:……..	Central and South America	Number:	6
Province:……..	Magallanes Basin	Number:	6059
Priority or Boutique…….	Priority		
Total Petroleum System:……	Lower Inoceramus	Number:	605901
Assessment Unit:……..	Magallanes Extensional Structures	Number:	60590101
* Notes from Assessor	Lower 48 growth factor.		

CHARACTERISTICS OF ASSESSMENT UNIT

Oil (<20,000 cfg/bo overall) **or** Gas (≥20,000 cfg/bo overall):… Gas

What is the minimum field size?……. 1 mmboe grown (≥1mmboe)
(the smallest field that has potential to be added to reserves in the next 30 years)

Number of discovered fields exceeding minimum size:…… Oil: 83 Gas: 69

Established (>13 fields) X Frontier (1-13 fields) _____ Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 4.8 2nd 3rd 7.6 3rd 3rd 3

Median size (grown) of discovered gas fields (bcfg):
1st 3rd 99 2nd 3rd 53 3rd 3rd 41

Assessment-Unit Probabilities:

Attribute	Probability of occurrence (0-1.0)
1. **CHARGE:** Adequate petroleum charge for an undiscovered field ≥minimum size……	1.0
2. **ROCKS:** Adequate reservoirs, traps, and seals for an undiscovered field ≥ minimum size……	1.0
3. **TIMING OF GEOLOGIC EVENTS:** Favorable timing for an undiscovered field ≥ minimum size	1.0
Assessment-Unit GEOLOGIC Probability (Product of 1, 2, and 3):……..……..……	1.0
4. **ACCESSIBILITY:** Adequate location to allow exploration for an undiscovered field ≥ minimum size……	1.0

UNDISCOVERED FIELDS

Number of Undiscovered Fields: How many undiscovered fields exist that are ≥ minimum size?:
(uncertainty of fixed but unknown values)

Oil fields:……min. no. (>0)	10	median no.	80	max no.	160
Gas fields:……min. no. (>0)	15	median no.	100	max no.	200

Size of Undiscovered Fields: What are the anticipated sizes (**grown**) of the above fields?:
(variations in the sizes of undiscovered fields)

Oil in oil fields (mmbo)……	min. size	1	median size	3	max. size	150
Gas in gas fields (bcfg):……	min. size	6	median size	30	max. size	3000

Assessment Unit (name, no.)
Magallanes Extensional Structures, 60590101

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……	2000	4000	6000
NGL/gas ratio (bngl/mmcfg)……	4	8	12

Gas fields:	minimum	median	maximum
Liquids/gas ratio (bngl/mmcfg)……	15	25	35
Oil/gas ratio (bo/mmcfg)……			

SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS

(variations in the properties of undiscovered fields)

Oil Fields:	minimum	median	maximum
API gravity (degrees)……	25	35	45
Sulfur content of oil (%)……	0.06	0.1	0.12
Drilling Depth (m) ……	1000	2500	4000
Depth (m) of water (if applicable)……	0	50	100

Gas Fields:	minimum	median	maximum
Inert gas content (%)……			
CO_2 content (%)……			
Hydrogen-sulfide content(%)……			
Drilling Depth (m)……	1000	3000	6000
Depth (m) of water (if applicable)……	0	50	100

Assessment Unit (name, no.)
Magallanes Extensional Structures, 60590101

ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT TO COUNTRIES OR OTHER LAND PARCELS (uncertainty of fixed but unknown values)

1. Chile represents 20 areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		30	
Portion of volume % that is offshore (0-100%)……		25	

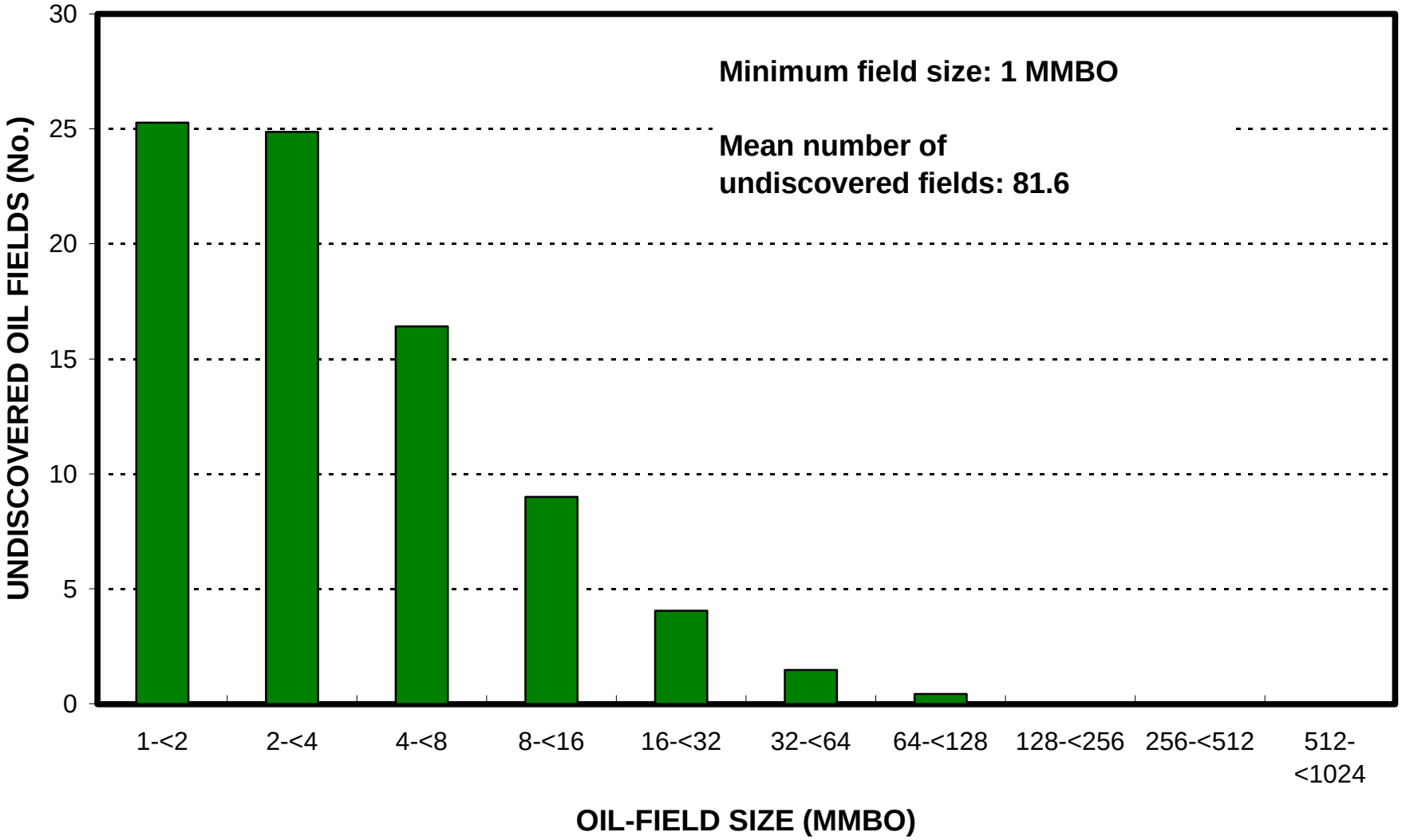
Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		30	
Portion of volume % that is offshore (0-100%)……		25	

2. Argentina represents 80 areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		70	
Portion of volume % that is offshore (0-100%)……		35	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		70	
Portion of volume % that is offshore (0-100%)……		35	

Magallanes Extensional Structures, AU 60590101
Undiscovered Field-Size Distribution



Magallanes Extensional Structures, AU 60590101
Undiscovered Field-Size Distribution