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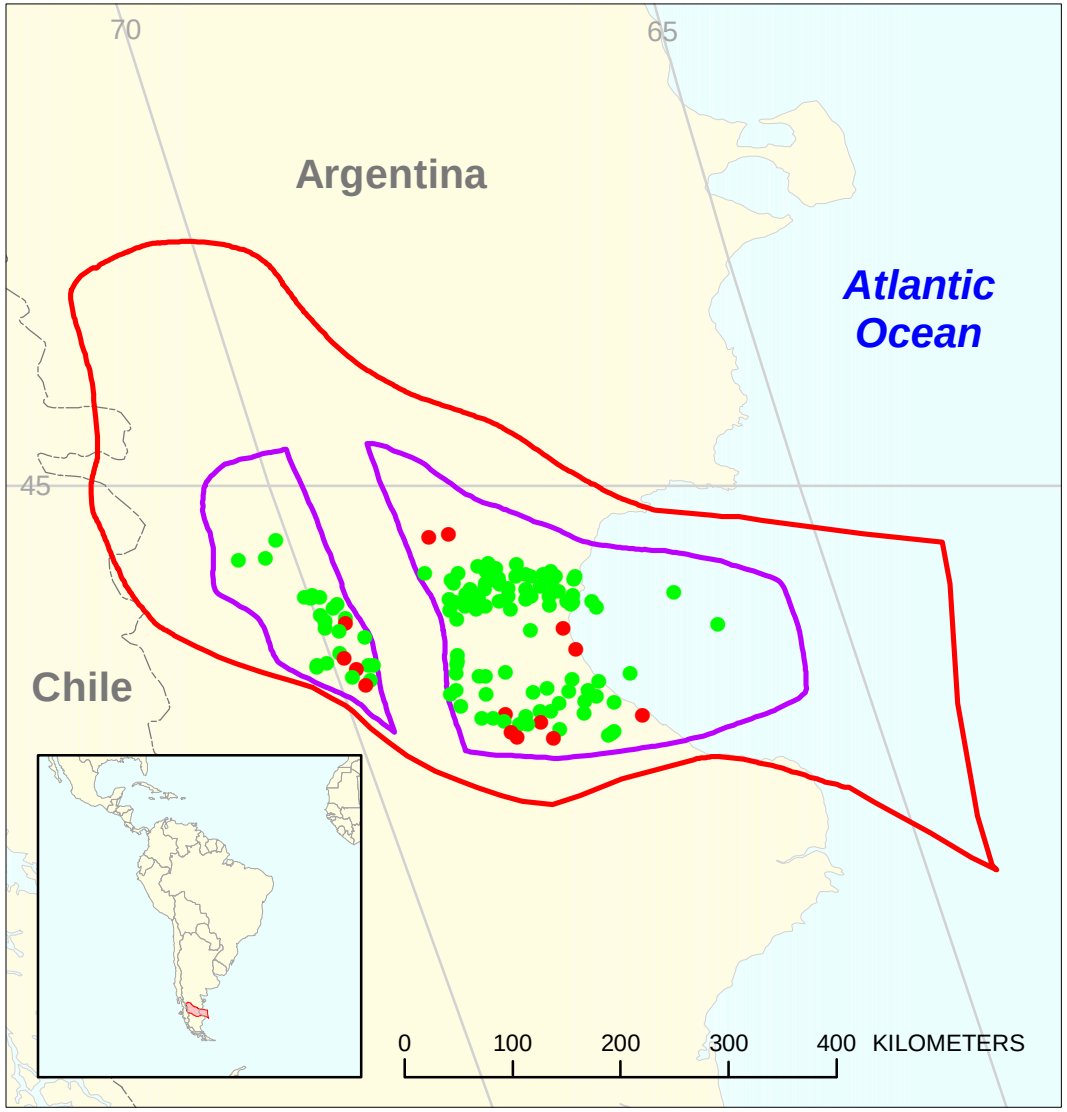
San Jorge Extensional Structures
Assessment Unit 60580101



San Jorge Extensional Structures Assessment Unit 60580101
San Jorge Basin Geologic Province 6058

USGS PROVINCE: San Jorge Basin (6058) **GEOLOGIST:** C.J. Schenk

TOTAL PETROLEUM SYSTEM: D-129 (605801)

ASSESSMENT UNIT: San Jorge Extensional Structures (60580101)

DESCRIPTION: This assessment unit is defined by structural traps associated with extensional tectonics that produced major east-west structures in the eastern area of the basin, and northwest-southeast trending structures in the western area of the basin.

SOURCE ROCKS: Source rocks are interpreted to be lacustrine mudstones of the Early Cretaceous D-129 Formation.

MATURATION: Maturation of the D-129 mudstones is interpreted to have begun in the Middle to Late Cretaceous.

MIGRATION: Migration of hydrocarbons occurred from the basinal areas up faults to the various trap types, and also laterally along permeable beds. Long distance migration was required to charge traps in the western part of the basin.

RESERVOIR ROCKS: Major reservoirs include Late Cretaceous Chubut Group sandstones and Paleocene Salamanca Formation sandstones; minor reservoirs include Early Cretaceous Mina del Carmen sandstones, Upper Cretaceous Trebol Formation sandstones, and Canadon Formation sandstones.

TRAPS AND SEALS: Traps are associated with normal faults developed during extensional events in the Late Jurassic-Early Cretaceous, with subsequent drapes over topography and existing structures and reactivation of structures. Seals are mainly intraformational mudstones.

REFERENCES

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Fitzgerald, M.G., Mitchum, R.M., Uliana, M.A., and Biddle, K.T., 1990, Evolution of the San Jorge Basin, Argentina: American Association of Petroleum Geologists Bulletin, v. 74, no. 6, p. 879-920.

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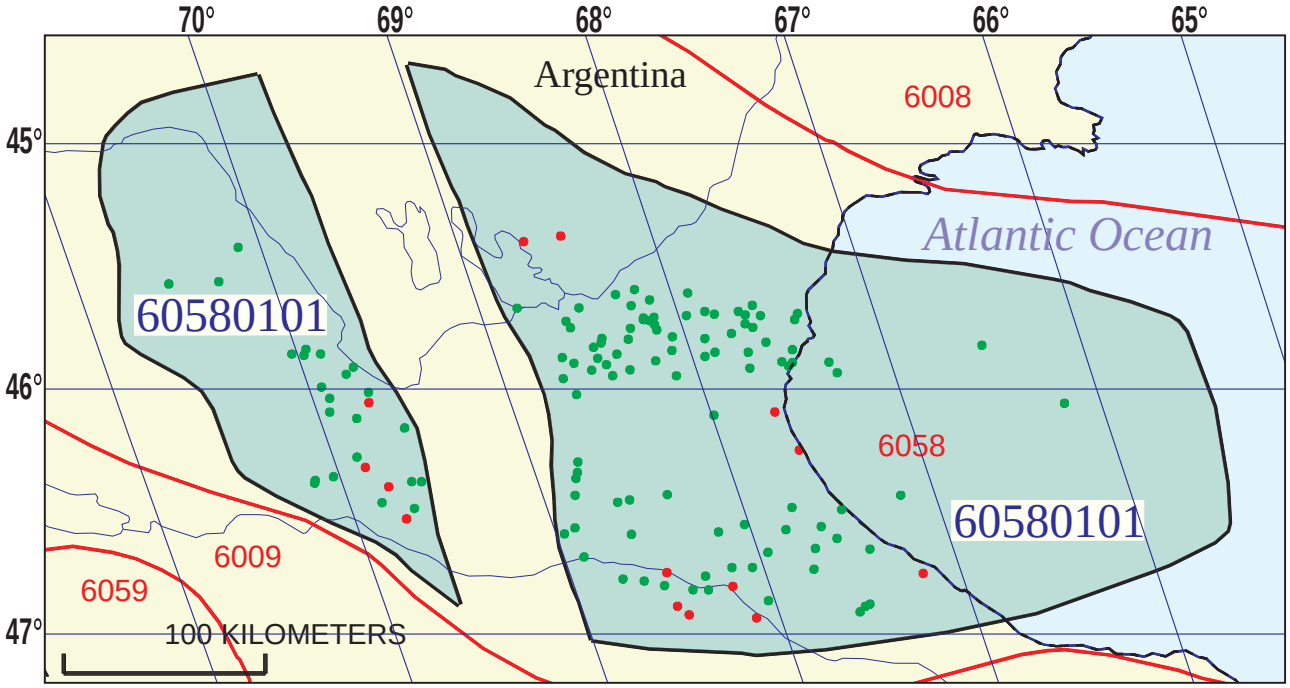

San Jorge Extensional Structures Assessment Unit - 60580101

EXPLANATION

- Hydrography
- Shoreline
- 6058 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 60580101 Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

Date:……..	2/3/99		
Assessment Geologist:……..	C.J. Schenk		
Region:……..	Central and South America	Number:	6
Province:……..	San Jorge Basin	Number:	6058
Priority or Boutique……..	Priority		
Total Petroleum System:……	D-129	Number:	605801
Assessment Unit:……..	San Jorge Extensional Structures	Number:	60580101
* Notes from Assessor	Lower 48 growth factor. Possible transitional gas traps.		

CHARACTERISTICS OF ASSESSMENT UNIT

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

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: 79 Gas: 8

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

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 36.9 2nd 3rd 32 3rd 3rd 3

Median size (grown) of discovered gas fields (bcfg):
1st 3rd 6.9 2nd 3rd 13.3 3rd 3rd

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)	6	median no.	40	max no.	90
Gas fields:…….min. no. (>0)	4	median no.	40	max no.	100

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	4	max. size	200
Gas in gas fields (bcfg):……..	min. size	6	median size	30	max. size	1500

Assessment Unit (name, no.)
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AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……	500	1000	1500
NGL/gas ratio (bngl/mmcfg)……	10	20	30

Gas fields:	minimum	median	maximum
Liquids/gas ratio (bngl/mmcfg)……	10	20	30
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)……	15	25	35
Sulfur content of oil (%)……	0.08	0.15	0.22
Drilling Depth (m) ……	500	2000	3500
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)……	500	3000	5000
Depth (m) of water (if applicable)……	0	50	100

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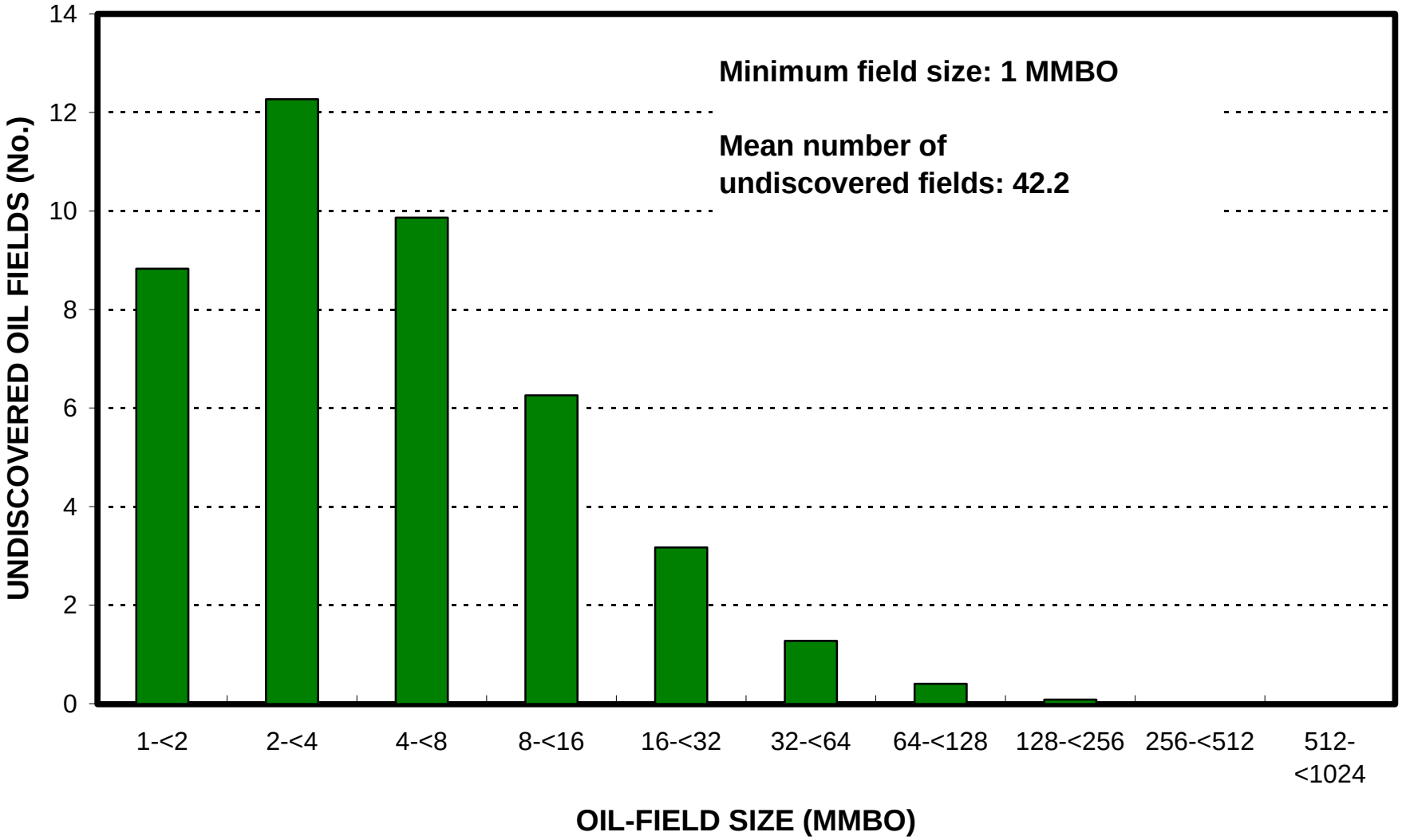
ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT TO COUNTRIES OR OTHER LAND PARCELS (uncertainty of fixed but unknown values)

1. Argentina represents 100 areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		100	
Portion of volume % that is offshore (0-100%)……		33	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		100	
Portion of volume % that is offshore (0-100%)……		33	

San Jorge Extensional Structures, AU 60580101
Undiscovered Field-Size Distribution



San Jorge Extensional Structures, AU 60580101
Undiscovered Field-Size Distribution