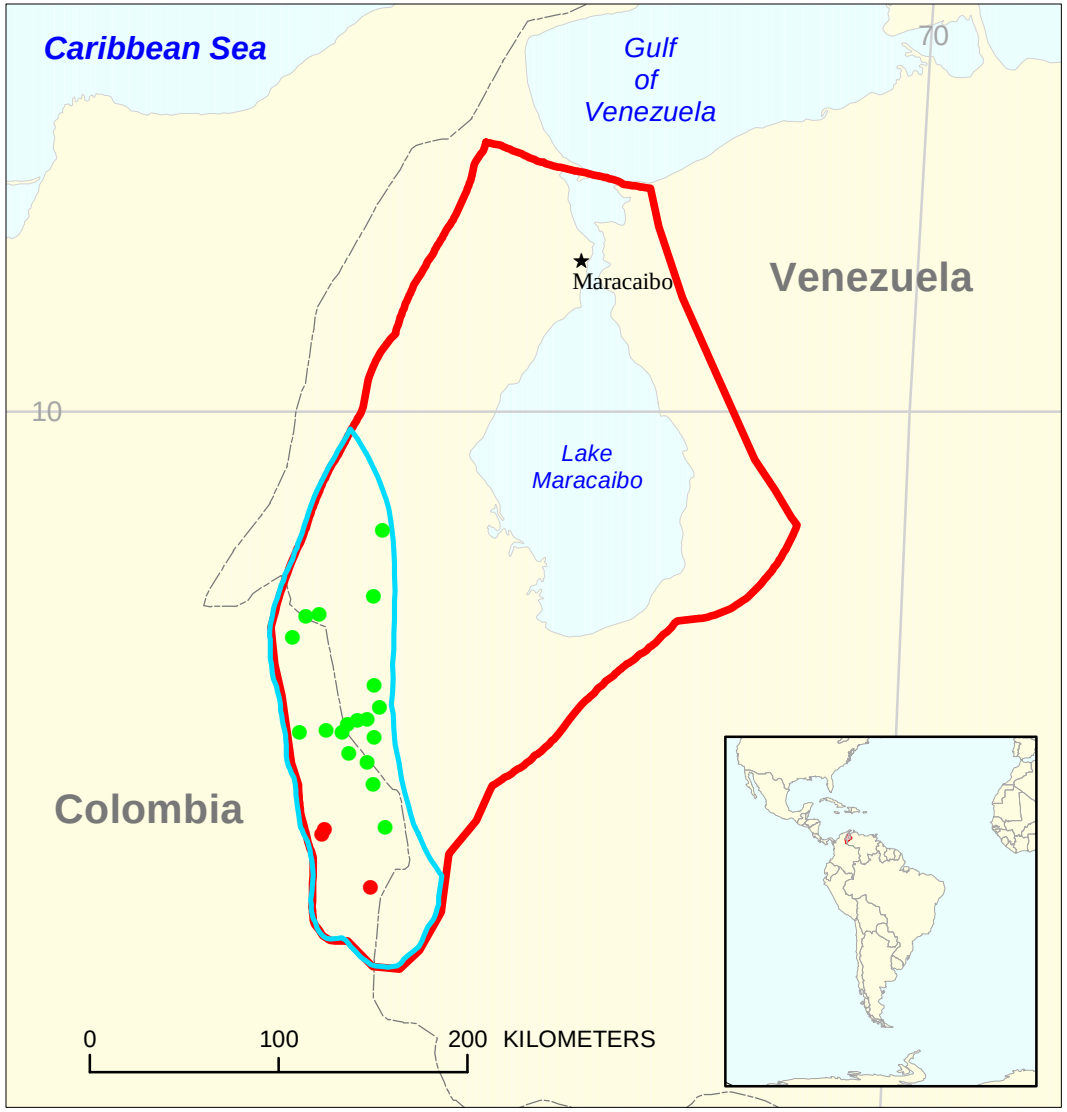
Go to Table of Contents

Go to index map

# Southwest Maracaibo Basin Fold Belt
# Assessment Unit 60990102




Southwest Maracaibo Basin Fold Belt Assessment Unit 60990102
Maracaibo Basin Geologic Province 6099

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:** Maracaibo Basin (6099) **GEOLOGIST:** C.J. Schenk

**TOTAL PETROLEUM SYSTEM:** La Luna/Maracaibo (609901)

**ASSESSMENT UNIT:** Southwest Maracaibo Basin Fold Belt (60990102)

**DESCRIPTION:** This assessment unit was defined to encompass oil and gas from the La Luna and Orocue source rocks in predominantly structural traps in the narrow fold belt in the frontal zone of the Perija Range in the southwest part of the basin.

**SOURCE ROCKS:** Source rocks are mudstones of the Cretaceous La Luna Formation, which occurs throughout the basin. Coals of the Paleocene Orocue Formation are a minor source, possibly leading to mixed oils in this assessment unit.

**MATURATION:** Maturation of the La Luna in the south and southwest part of the basin occurred in the Miocene, generally later than in the first assessment unit.

**MIGRATION:** Migration was mainly updip to the west and southwest from the foredeep where the La Luna reached oil and gas maturation.

**RESERVOIR ROCKS:** Reservoir rocks are mainly fluvial-deltaic sandstones in the Paleocene to Miocene section, and are mainly in the Oricuye and Mirador formations.

**TRAPS AND SEALS:** Traps are mainly anticlines and faulted anticlines in the fold belt in the southern frontal zone of the Perija Range. Seals are mainly intraformational mudstones within the Paleocene to Miocene section.

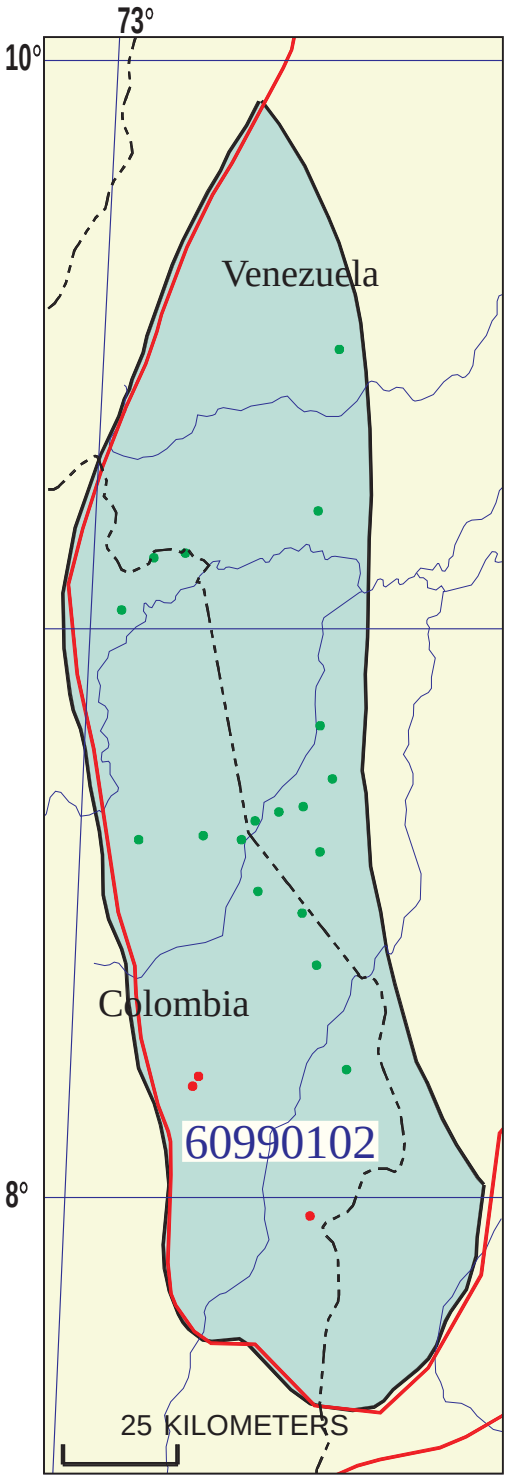
**REFERENCES:**

James, K.H., 1990, The Venezuelan hydrocarbon habitat, *in* Brooks, J., ed., Classic petroleum provinces: Geological Society of London Special Publication 50, p. 9-35.

Lugo, J. and Mann, P., 1995, Jurassic-Eocene tectonic evolution of the Maracaibo Basin, Venezuela, *in* Tankard, A.J., Suarez S., R., and Welsink, H.J., eds., Petroleum basins of South America: American Association of Petroleum Geologists Memoir 62, p. 699-725.

Talukdar, S., Gallango, O., and Lien, C.A., 1986, Generation and migration of hydrocarbons in the Maracaibo Basin, Venezuela–an integrated basin study: Organic Geochemistry, v. 10, p. 261-279.

Talukdar, S., and Marcano, F., 1994, Petroleum systems of the Maracaibo Basin, Venezuela, *in* Magoon, L.B., and Dow, W.G., eds., The petroleum system–from source to trap: American Association of Petroleum Geologists Memoir 60, p. 463-481.




# Southwest Maracaibo Basin Fold Belt Assessment Unit - 60990102

EXPLANATION

- Hydrography
- Shoreline
- 6099 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 60990102 Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

| | | | |
|---|---|---|---|
| Date:…….. | 4/27/99 | | |
| Assessment Geologist:…….. | C.J. Schenk | | |
| Region:…….. | Central and South America | Number: | 6 |
| Province:…….. | Maracaibo Basin | Number: | 6099 |
| Priority or Boutique…… | Priority | | |
| Total Petroleum System:…… | La Luna/Maracaibo | Number: | 609901 |
| Assessment Unit:…….. | Southwest Maracaibo Basin Fold Belt | Number: | 60990102 |
| * Notes from Assessor | Lower 48 growth factor. | | |

## CHARACTERISTICS OF ASSESSMENT UNIT

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

What is the minimum field size?……. 4 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: 12 Gas: 2
Established (>13 fields) X Frontier (1-13 fields) _____ Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 110 2nd 3rd 12 3rd 3rd _____
Median size (grown) of discovered gas fields (bcfg):
1st 3rd 150 2nd 3rd _____ 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) | 2 | median no. | 20 | max no. | 42 |
| Gas fields:……min. no. (>0) | 1 | median no. | 10 | max no. | 22 |

**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 | 4 | median size | 10 | max. size | 280 |
| Gas in gas fields (bcfg):……min. size | 24 | median size | 50 | max. size | 1200 |

Assessment Unit (name, no.)
Southwest Maracaibo Basin Fold Belt, 60990102

## AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

| Oil Fields: | minimum | median | maximum |
|---|---|---|---|
| Gas/oil ratio (cfg/bo)…… | 1000 | 2000 | 3000 |
| NGL/gas ratio (bngl/mmcfg)…… | 30 | 60 | 90 |

| Gas fields: | minimum | median | maximum |
|---|---|---|---|
| Liquids/gas ratio (bngl/mmcfg)…… | 22 | 44 | 66 |
| 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)…… | 20 | 35 | 50 |
| Sulfur content of oil (%)…… | 0.1 | 0.4 | 0.8 |
| Drilling Depth (m) …… | 1500 | 2500 | 4000 |
| Depth (m) of water (if applicable)…… | | | |

| Gas Fields: | minimum | median | maximum |
|---|---|---|---|
| Inert gas content (%)…… | | | |
| $CO_2$ content (%)…… | | | |
| Hydrogen-sulfide content(%)…… | | | |
| Drilling Depth (m)…… | 1500 | 3000 | 5000 |
| Depth (m) of water (if applicable)…… | | | |

Assessment Unit (name, no.)
Southwest Maracaibo Basin Fold Belt, 60990102

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

1. Venezuela represents 57 areal % of the total assessment unit

| Oil in Oil Fields: | minimum | median | maximum |
|---|---|---|---|
| Richness factor (unitless multiplier):…… | | | |
| Volume % in parcel (areal % x richness factor):… | | 60 | |
| Portion of volume % that is offshore (0-100%)…… | | 0 | |

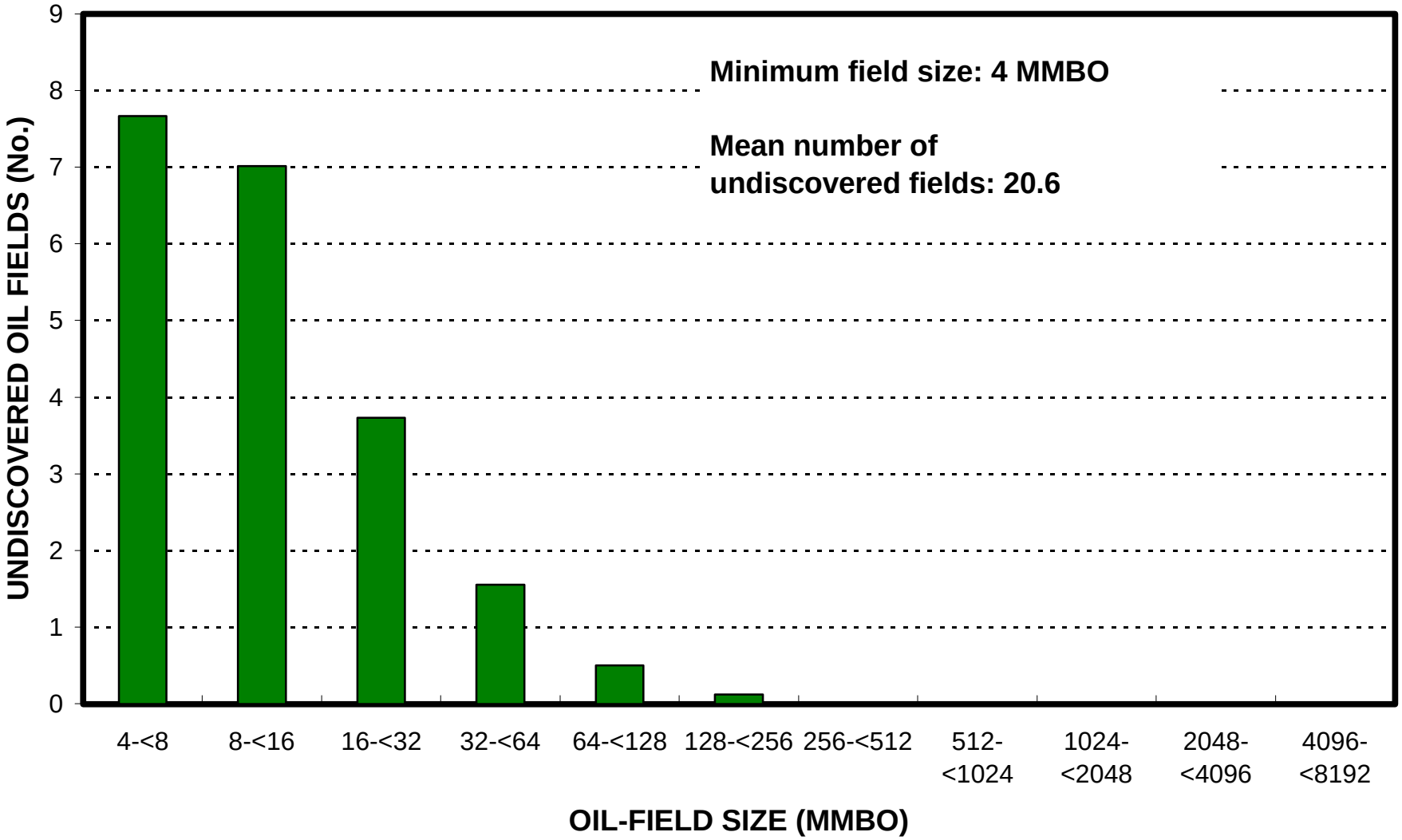
| Gas in Gas Fields: | minimum | median | maximum |
|---|---|---|---|
| Richness factor (unitless multiplier):…… | | | |
| Volume % in parcel (areal % x richness factor):… | | 60 | |
| Portion of volume % that is offshore (0-100%)…… | | 0 | |

2. Colombia represents 43 areal % of the total assessment unit

| Oil in Oil Fields: | minimum | median | maximum |
|---|---|---|---|
| Richness factor (unitless multiplier):…… | | | |
| Volume % in parcel (areal % x richness factor):… | | 40 | |
| Portion of volume % that is offshore (0-100%)…… | | 0 | |

| Gas in Gas Fields: | minimum | median | maximum |
|---|---|---|---|
| Richness factor (unitless multiplier):…… | | | |
| Volume % in parcel (areal % x richness factor):… | | 40 | |
| Portion of volume % that is offshore (0-100%)…… | | 0 | |

# Southwest Maracaibo Basin Fold Belt, AU 60990102
## Undiscovered Field-Size Distribution



# Southwest Maracaibo Basin Fold Belt, AU 60990102
## Undiscovered Field-Size Distribution