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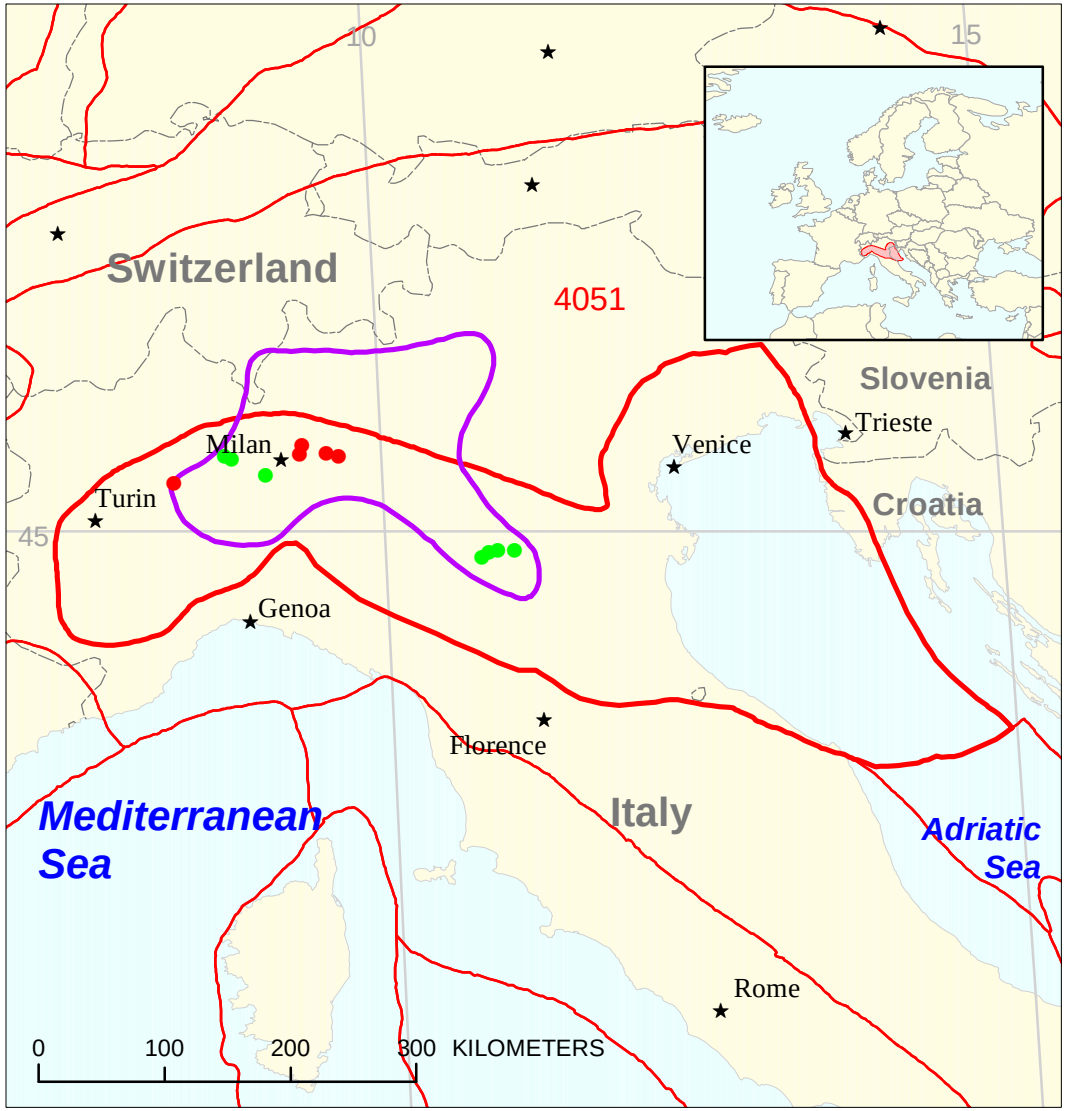
Thermal Triassic
Assessment Unit 40600201



Thermal Triassic Assessment Unit 40600201
Po Basin Geologic Province 4060

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: Po Basin (4060) **GEOLOGIST:** S.J. Lindquist

TOTAL PETROLEUM SYSTEM: Meride/Riva di Solto (406002)

ASSESSMENT UNIT: Thermal Triassic (40600201) (established)

DESCRIPTION: Assessment unit covers the entire petroleum system within the Alpine Lombardy region of onshore northern Italy. The Po Basin Province evolved from a post-Pangea, Mesozoic carbonate passive continental margin to a Tertiary siliciclastic collision zone. This assessment unit includes extensional Triassic horsts and grabens that have been partly modified by Tertiary compression.

SOURCE ROCKS: The source of thermal oil, gas, and condensate is oil-prone, Middle to Upper Triassic shales and carbonates deposited in deep anoxic basins that were adjacent to shallow carbonate platforms. Source rock and overburden thickness (thus, burial history) variability is considerable.

MATURATION: Local areas of source rock generated oil as early as Jurassic time, much of which was not trapped or was subsequently lost. Neogene foreland subsidence associated with the Alpine and Apennine orogenies resulted in some areas of Triassic source rock moving into the gas window and others moving into the oil window for the first time.

MIGRATION: Tertiary compression remobilized any existing accumulations. New structural traps were charged from vertical, stratigraphic updip, and fault migration.

RESERVOIR ROCKS: Reservoirs are Mesozoic carbonates with variable textures and porosity systems. Porosities are as much as 15 percent, and permeabilities as much as 100 mD. Fractures enhance producibility.

TRAPS AND SEALS: Traps are extensional block faults (some modified by Tertiary compression) and Tertiary faulted anticlines. Seals are impervious, Cretaceous pelagic marls and carbonates and local shales.

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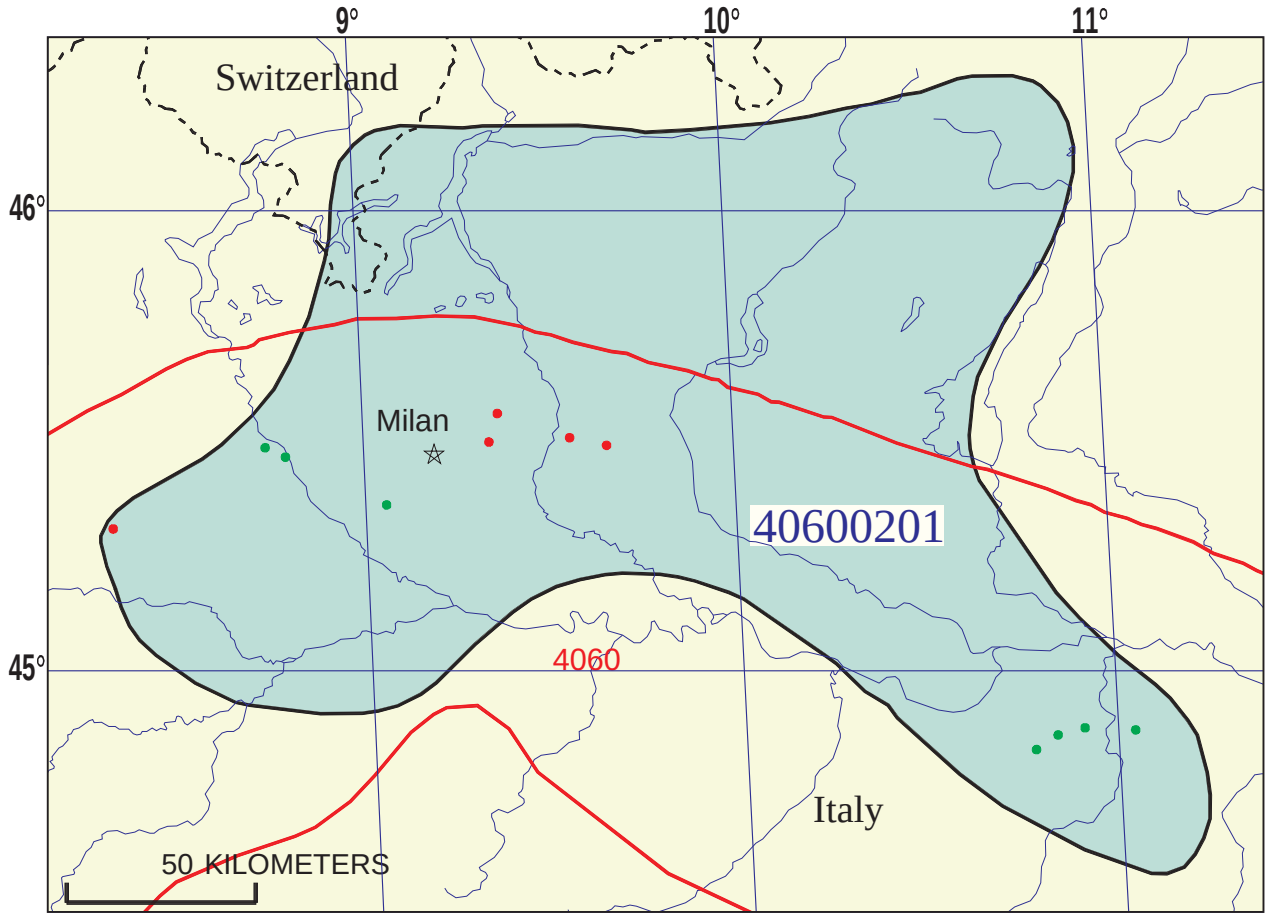

Thermal Triassic Assessment Unit - 40600201

EXPLANATION

- Hydrography
- Shoreline
- 4060 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 40600201 Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

Date:……..	8/5/99		
Assessment Geologist:……..	D.L. Gautier		
Region:……..	Europe	Number:	4
Province:……..	Po Basin	Number:	4060
Priority or Boutique……	Priority		
Total Petroleum System:……	Meride/Riva di Solto	Number:	406002
Assessment Unit:……	Thermal Triassic	Number:	40600201
* Notes from Assessor	Lower 48-all growth function.		

CHARACTERISTICS OF ASSESSMENT UNIT

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

What is the minimum field size?……. 2 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: 7 Gas: 2
Established (>13 fields) _____ Frontier (1-13 fields) X Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 25 2nd 3rd 18 3rd 3rd _____
Median size (grown) of discovered gas fields (bcfg):
1st 3rd 207 2nd 3rd 121 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)	1	median no.	10	max no.	30
Gas fields:……min. no. (>0)	1	median no.	5	max no.	14

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	2	median size	15	max. size	800
Gas in gas fields (bcfg):……min. size	12	median size	90	max. size	3000

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)……	1100	2200	3300
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)……	18	35	52
Sulfur content of oil (%)……	0.1	0.2	0.4
Drilling Depth (m) ……	900	3700	6500
Depth (m) of water (if applicable)……			

Gas Fields:	minimum	median	maximum
Inert gas content (%)……	0.2	0.5	0.8
CO_2 content (%)……	0.2	0.5	0.8
Hydrogen-sulfide content (%)……	1	2	5
Drilling Depth (m)……	900	3700	6500
Depth (m) of water (if applicable)……			

Assessment Unit (name, no.)
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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. Italy 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%)……		0	

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%)……		0	

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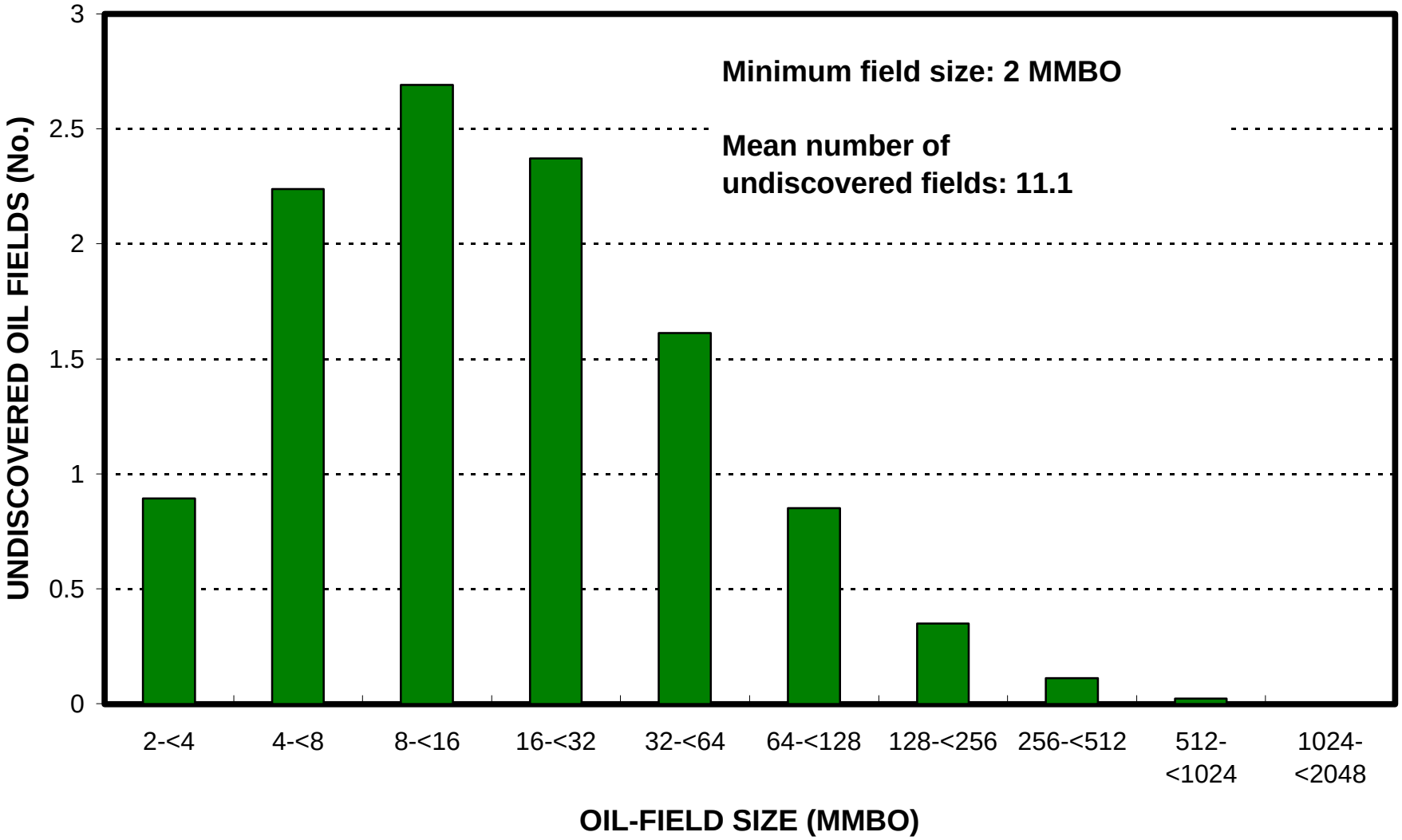
Undiscovered Field-Size Distribution



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Undiscovered Field-Size Distribution