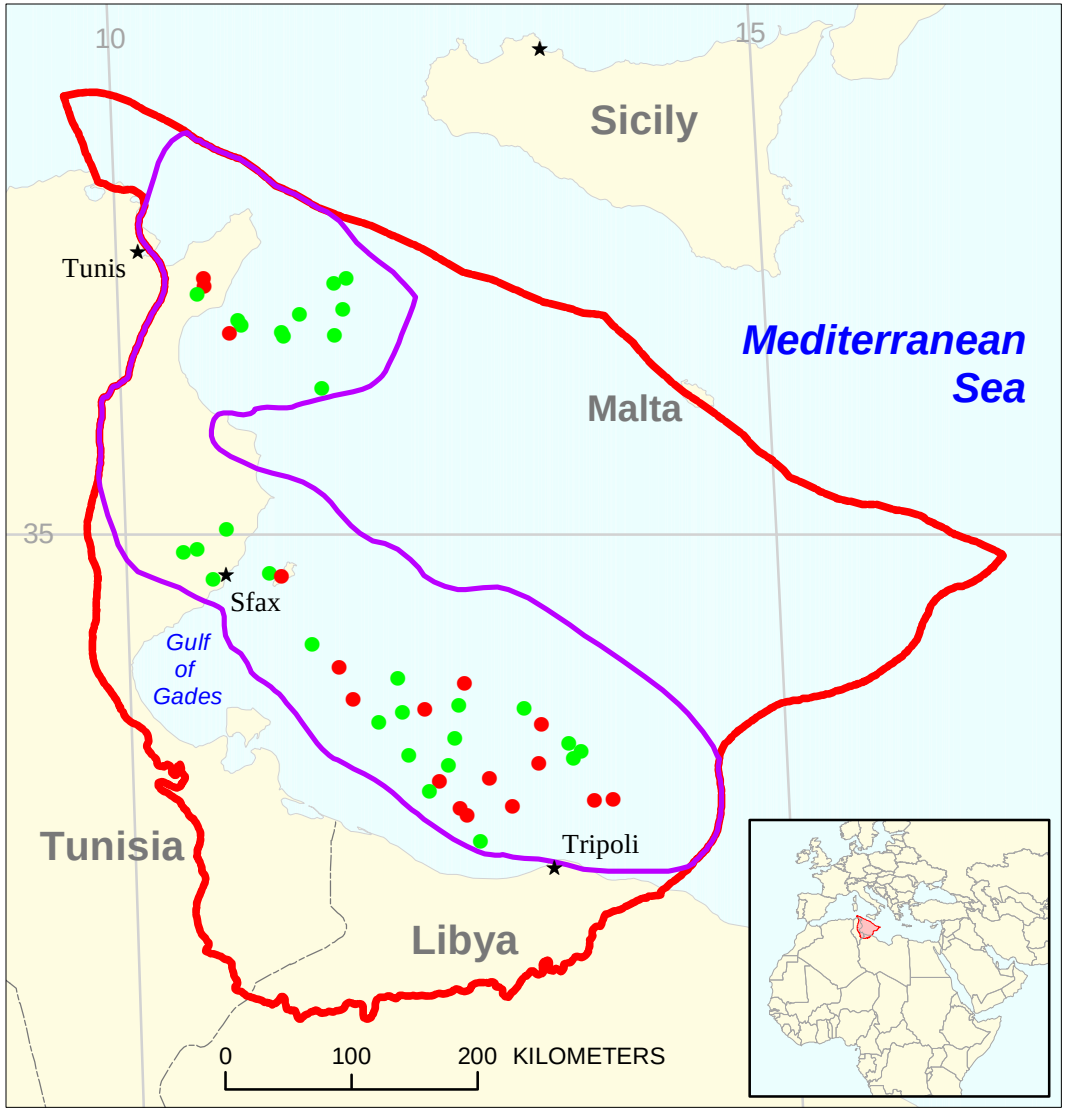
Go to Table of Contents

Go to index map

Bou Dabbous-Tertiary Structural/Stratigraphic Assessment Unit 20480101



Bou Dabbous-Tertiary Structural/Stratigraphic Assessment Unit 20480101

Pelagian Basin Geologic Province 2048

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: Pelagian Basin (2048) **GEOLOGIST:** T.R. Klett

TOTAL PETROLEUM SYSTEM: Bou Dabbous-Tertiary (204801)

ASSESSMENT UNIT: Bou Dabbous-Tertiary Structural/Stratigraphic (20480101)

DESCRIPTION: This total petroleum system and corresponding assessment unit coincide with the potential extent of petroleum migration from Eocene source rocks. The Upper Cretaceous to Paleocene El Haria mudstone separates this total petroleum system from underlying total petroleum systems. There was, however, some minor contribution of petroleum from Cretaceous source rocks to reservoirs within this total petroleum system.

SOURCE ROCKS: The primary source rock is dark brown marl and mudstone of the lower Eocene Bou Dabbous Formation. The Bou Dabbous Formation contains type I and II kerogen and ranges in thickness from 50 to 300 m. Miocene mudstone may be a secondary source of petroleum.

MATURATION: Source rocks became mature in the Miocene to Pleistocene. Total organic carbon content of the Bou Dabbous Formation ranges from 0.4 to 4 percent; maturation is described as early mature to mature.

MIGRATION: Petroleum migrated laterally into adjacent or juxtaposed reservoirs and vertically along faults or fractures.

RESERVOIR ROCKS: Known reservoir rocks include lateral equivalents of the lower Eocene Bou Dabbous Formation, such as the El Gueria fractured limestone; Eocene Souar, Reineche and Jdeir limestone; Oligocene to Miocene Ketatna limestone; the middle Miocene Aïn Grab limestone; and the middle Miocene Oum Douil sandstone and laterally equivalent Birsa and Mahmoud sandstones. The Oligocene to Miocene Fortuna sandstone is a potential reservoir.

TRAPS AND SEALS: Known accumulations are in fault blocks, low-amplitude anticlines, high-amplitude anticlines associated with reverse faults, wrench fault structures, and stratigraphic traps. Most of the traps formed before the middle Miocene. Seals include Eocene and Miocene mudstone and carbonate rocks.

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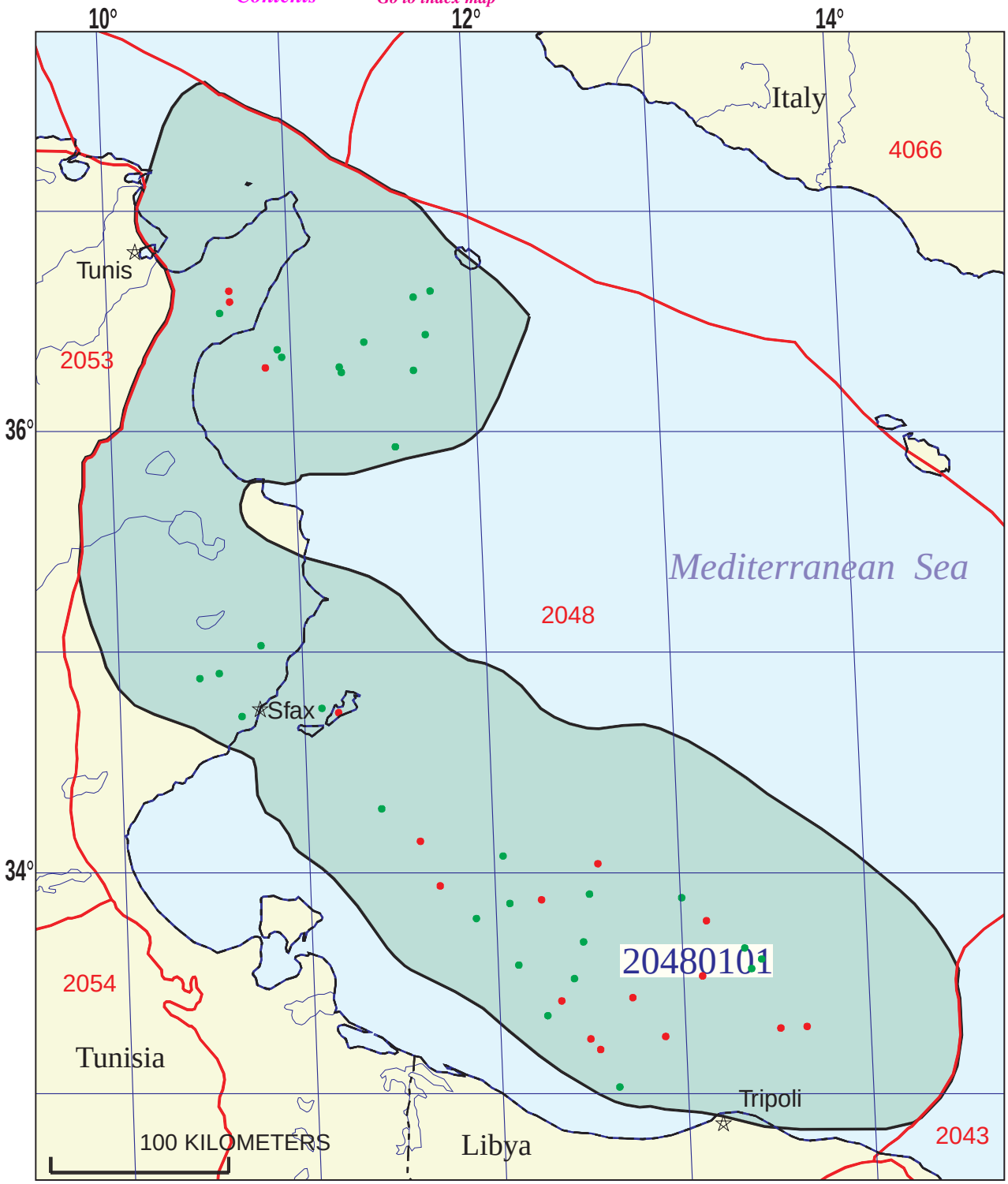
Macgregor, D.S., and Moody, R.T.J., 1998, Mesozoic and Cenozoic petroleum systems of North Africa, *in* Macgregor, D.S., Moody, R.T.J., and Clark-Lowes, D.D., eds., Petroleum geology of North Africa: London, Geological Society, Special Publication No. 132, p. 201-216.



Bou Dabbous-Tertiary Structural/Stratigraphic Assessment Unit - 20480101

EXPLANATION

- Hydrography
- Shoreline
- 2048 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 20480101 Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

USGS science for a changing world

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

Date:……..	9/23/99		
Assessment Geologist:……..	T.R. Klett		
Region:……..	Middle East and North Africa	Number:	2
Province:……..	Pelagian Basin	Number:	2048
Priority or Boutique……	Priority		
Total Petroleum System:……	Bou Dabbous-Tertiary	Number:	204801
Assessment Unit:……..	Bou Dabbous-Tertiary Structural/Stratigraphic	Number:	20480101
* Notes from Assessor	MMS 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?……. 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: 26 Gas: 13
Established (>13 fields) X Frontier (1-13 fields) _____ Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 27.3 2nd 3rd 7.2 3rd 3rd 51.9
Median size (grown) of discovered gas fields (bcfg):
1st 3rd 359 2nd 3rd 162 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)	4	median no.	30	max no.	80
Gas fields:……min. no. (>0)	2	median no.	15	max no.	40

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	12	max. size	350
Gas in gas fields (bcfg):……min. size	24	median size	60	max. size	1000

Assessment Unit (name, no.)
Bou Dabbous-Tertiary Structural/Stratigraphic, 20480101

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)……	16	32	48

Gas fields:	minimum	median	maximum
Liquids/gas ratio (bngl/mmcfg)……	10	15	20
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)……	28	38	42
Sulfur content of oil (%)……	0.2	0.4	0.6
Drilling Depth (m) ……	100	2000	3500
Depth (m) of water (if applicable)……	0	150	500

Gas Fields:	minimum	median	maximum
Inert gas content (%)……			
CO_2 content (%)……			
Hydrogen-sulfide content (%)……			
Drilling Depth (m)……	100	2200	3500
Depth (m) of water (if applicable)……	0	150	500

Assessment Unit (name, no.)
Bou Dabbous-Tertiary Structural/Stratigraphic, 20480101

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

1. Italy represents 1 areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		1	
Portion of volume % that is offshore (0-100%)……		100	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		1	
Portion of volume % that is offshore (0-100%)……		100	

2. Tunisia represents 64 areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		64	
Portion of volume % that is offshore (0-100%)……		71	

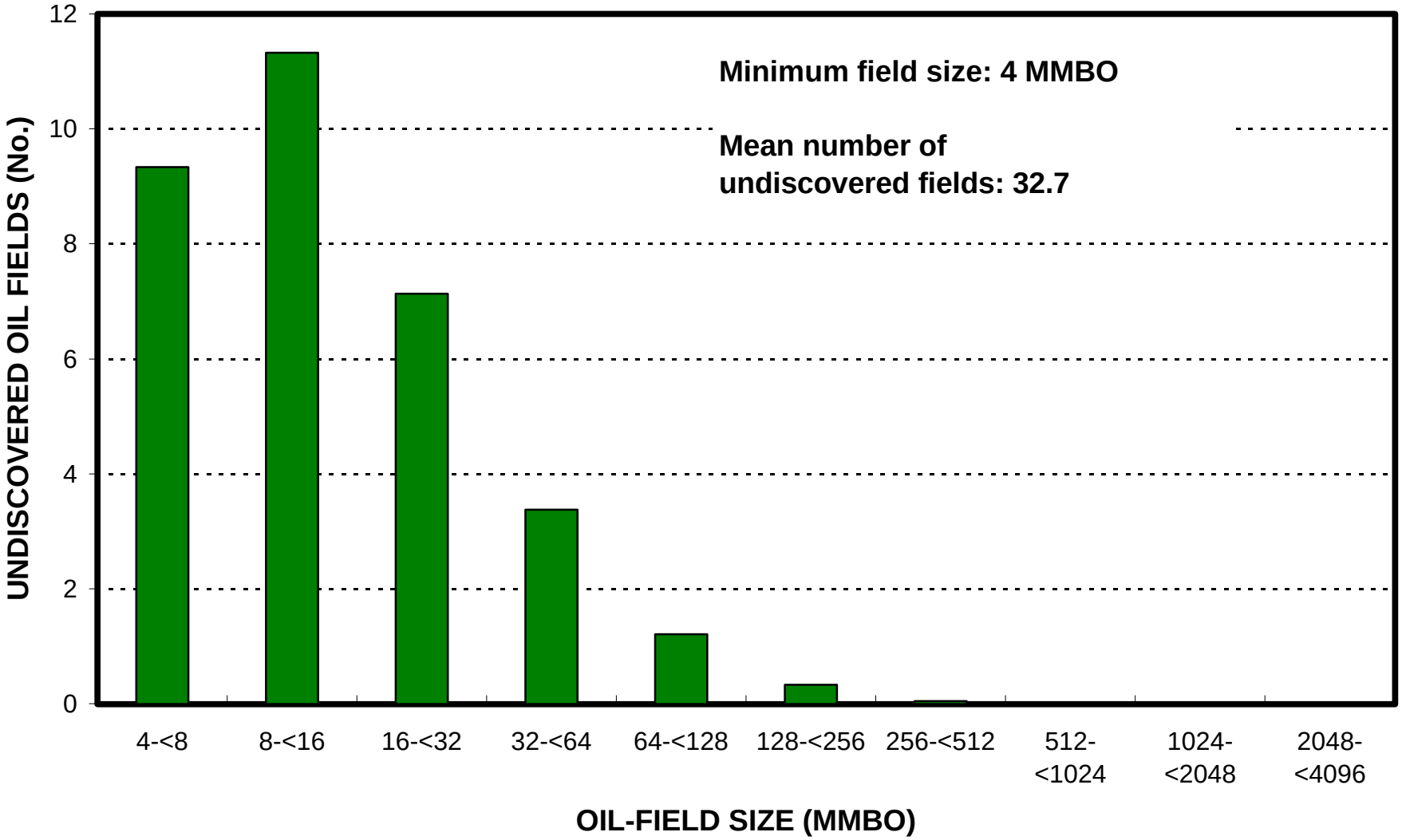
Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		64	
Portion of volume % that is offshore (0-100%)……		71	

3. Libya represents 35 areal % of the total assessment unit

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

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

Bou Dabbous-Tertiary Structural/Stratigraphic, AU 20480101
Undiscovered Field-Size Distribution



Bou Dabbous-Tertiary Structural/Stratigraphic, AU 20480101
Undiscovered Field-Size Distribution