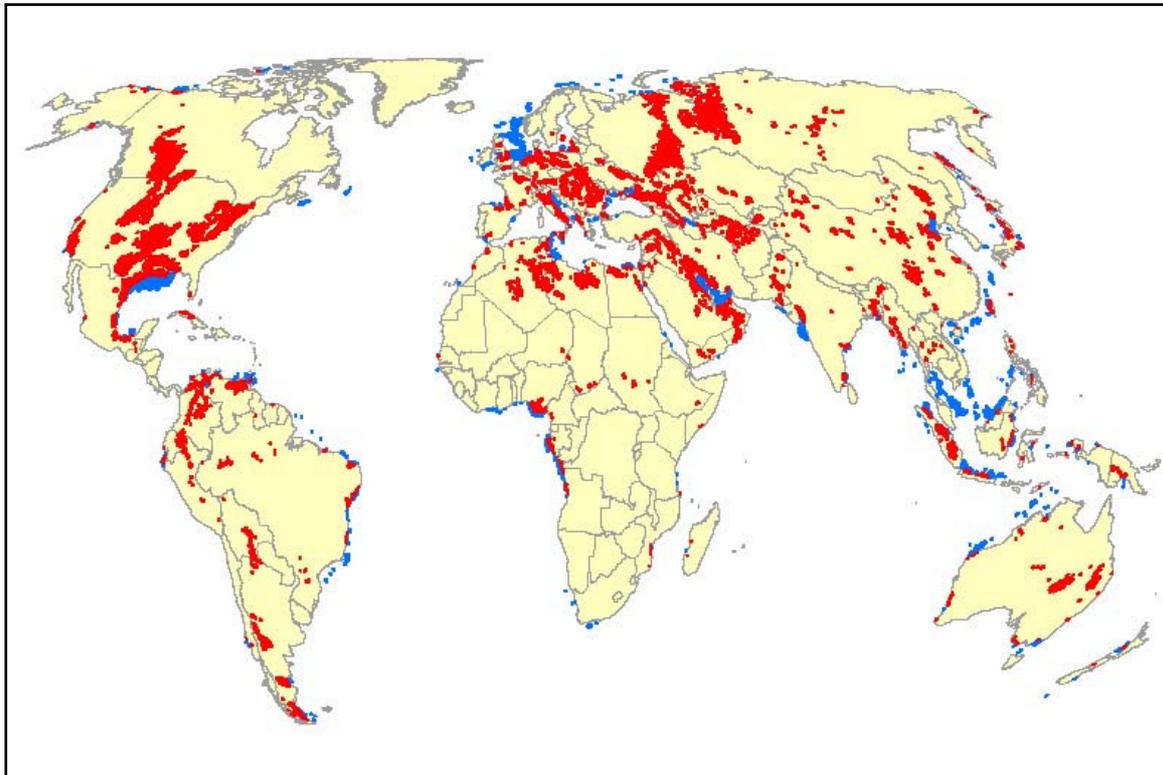


# THE PETROLEUM DATASET CODEBOOK<sup>1</sup>



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## 1. INTRODUCTION<sup>2</sup>

The petroleum dataset (PETRODATA) is a dataset of oil and gas fields throughout the world. It includes information about the geographic location of hydrocarbon reserves and is specifically designed for display, manipulation and analysis in geographic information systems (GIS). The attribute table can also be viewed separately, for example, in Microsoft Excel. PETRODATA was compiled for the purpose of investigating the relationship between armed civil conflict and natural resources, but it can also be used to study other consequences of natural resource endowment. While the codebook was written specifically for PETRODATA, the basic structure and coding of the dataset follows a similar dataset on diamond occurrences, DIADATA (Gilmore et al, 2005).

Petroleum (from Greek *πετρα* (petra), stone and Latin *oleum*) is a naturally occurring liquid found in formations in the Earth, both onshore and offshore. Consequently, PETRODATA consists of two equally structured datasets: one for onshore and one for offshore petroleum fields. A petroleum field is broadly defined as the region around any site with hydrocarbon discovery or production activity. The molecular structure of hydrocarbon compounds (consisting of hydron and carbon) varies greatly. The approximate length range for crude oil is from C<sub>5</sub>H<sub>12</sub> to C<sub>18</sub>H<sub>38</sub>. Any shorter hydrocarbon chain is considered natural gas, while longer hydrocarbon chains are more solid, coal having the longest chains. In PETRODATA, we have excluded solid forms of hydrocarbons and included only natural gas and crude oil. In total, PETRODATA consists of 884 records for onshore and 378 records for offshore occurrences in 114 countries (see Appendix B). PETRODATA covers the period 1946–2003.

Armed conflicts occur both in space and in time, and as a result, an explicit time component was required for the dataset. Therefore, PETRODATA includes the year for the first discovery in the region as well as the year production took place for the first time. Other descriptive information is also appended in the attribute tables.

Additionally, a country profile was created in Microsoft Word for every country represented in the dataset. The country profile contains an overview with facts about the country's discovery and production history, estimates on oil and gas output and reserves, and the geographic distribution of the regions with important oil and gas potential. Country profiles are available in a separate file.

The accompanying article *Fighting over Oil: Introducing a New Dataset* (Lujala et al, 2007) provides a more general overview of PETRODATA. It also discusses dataset's shortcomings and limitations.

## 2. DATA SOURCES

### 2.1. Geographic Data

Although the final version of PETRODATA represents petroleum fields as polygons (see Section 4.), point data was used in the initial spatial data collection. The main sources include:

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<sup>2</sup> This dataset is part of a larger data collection project conducted at the Center for the Study of Civil War (CSCW), Working Group 3 (Environmental Aspects of Civil War) of the International Peace Research Institute, Oslo (PRIO) and the Norwegian University of Science and Technology (NTNU). The objective of the project is to collect spatial information on environmental features relevant to armed conflict research.

1. World Petroleum Assessment by U.S. Geological Survey (USGS, 2000).
2. Digital database on Giant Fields of the World by Earth Sciences and Resources Institute at the University of South Carolina (ESRI-USC, 1996).
3. World Energy Atlas by Petroleum Economist (Petroleum Economist, 2003).
4. Internet

The data provided by USGS is stored as scanned maps in Adobe Acrobat's pdf format and/or shapefiles. The shapefiles from USGS include petroleum fields located in Africa, Asia-Pacific, Europe including Turkey and parts of South Asia and Iran. The pdf maps from USGS cover oil and gas fields located in South America, the Middle East and parts of South Asia.

The Earth Sciences and Resources Institute supplied data in Excel file form for Algeria, Angola, Canada, Cuba, Gabon, Iran, Kazakhstan, Libya, Mexico, Russia, Tajikistan, Tunisia, Turkmenistan, Ukraine, and the United States of America. The data includes geographic coordinates for major oil and gas fields in these countries. It also provides the first discovery year for the fields in question. The information by the Institute was used as additional data due to its incompleteness (only giant fields are included).

World Energy Atlas consists of maps of all countries with hydrocarbon potential and production activity. Fields for Canada, Cuba, Guatemala, Mexico and the United States were gathered from these maps. In addition, the atlas includes names for most major and several minor oil and gas fields. This information was used to collect descriptive data for regions with hydrocarbon fields.

Internet was used to gather additional data on field locations and to confirm locations provided by the other sources.

## **2.2. Descriptive Data**

Books by Kulke (1994, 1995) represent a major source for descriptive information in PETRODATA. They contain articles from different authors about the geological settings and hydrocarbon potential for most countries in the world. The articles include information about exploration and production history, maps, tables and figures.

A major source for information about hydrocarbon discoveries was provided by an article in *Oil & Gas Journal* (Anonymous, 2001). It provides a list of many hydrocarbon fields which were under production in 2001. It lists field names and the discovery year of the each field. The table separates between onshore and offshore fields.

Digital sources from the Internet were an important source for descriptive information for the attribute tables and country profiles. Country and company websites, online news services and other publications were used to gather information about the discovery year, production status, and the content of the hydrocarbon reserves. Three web sources were central in writing the country profiles. The website of the Energy Information Administration ([www.eia.doe.gov](http://www.eia.doe.gov)) provides Country Analysis Briefs for several countries with significant petroleum potential including a general background and detailed paragraphs of many countries' oil and gas industry. The World Factbook from CIA ([www.cia.gov/cia/publications/factbook](http://www.cia.gov/cia/publications/factbook)) includes information about oil and gas production and reserves in 2001. The World Energy Council ([www.worldenergy.org/wec-geis](http://www.worldenergy.org/wec-geis)) provides data on hydrocarbon production and reserves in general and for some fields it contains also

additional data. It also describes geographic distribution of the hydrocarbon occurrences for many countries with significant production.

### **3. DATA PREPARATION**

#### **3.1. Structure of the Dataset**

PETRODATA is stored in ESRI's shapefile format<sup>3</sup> which is a common way of representing vector data. The shapefile format consists of both a spatial part (the digital map) and a descriptive part (the attribute table). The shapefile format is easily converted into other GIS formats and can be opened in many mainstream spreadsheet software such as in Microsoft Excel. Therefore, PETRODATA should be widely available to different sorts of users with various kinds of software.

#### **3.2. Georeferencing and Screen digitizing**

Several of the sources for field locations were not provided in GIS readable format (e.g. shapefiles). Therefore, we had to use GIS operations on vector data capture and data transfer to include these fields in the dataset. The maps from the U.S. Geological Survey (USGS, 2000) which were in Adobe Acrobat's pdf format and the paper maps from Petroleum Economist were converted and scanned, respectively, and saved as JPEG raster format. The JPEG format is GIS readable, but with inconsistent coordinate system. To have a consistent dataset, we imported the raster maps into ArcGIS where we georeferenced them to an equal area projection. Georeferenced raster maps make it possible to extract information in vector format in a desired coordinate system. From these georeferenced raster maps we extracted point information about petroleum locations using screen digitizing.

#### **3.3. Data Transfer**

The Earth Sciences and Resources Institute of the University of South Carolina (ESRI-USC, 1996) provided data on petroleum location stored in Excel files. Location was provided by geographical coordinates (latitude and longitude). Consequently, these data files were easily transferred into shapefiles and projected to the same equal area projection.

### **4. GENERALIZATION OF FIELD LOCATIONS**

A global dataset on oil and gas location represented as points would result in such a detailed dataset that would have made most information queries inadequate. In addition, collecting descriptive data for such a number of individual fields would be time prohibitive. Moreover, none of the conflict datasets with location information operates at such a level of accuracy and field level data would be overly detailed and unpractical. We therefore generalized the point dataset by grouping proximate point locations and represented the clusters as polygons. The grouping was realized by applying a buffer from every point location. We specified a uniform buffer distance of 30 000 projected meters (30 km). Overlapping buffer polygons were then merged and clipped towards country borders. In addition, polygons covering two or more geological basins as defined by the U.S. Geological Survey (USGS, 2000) were divided by the basin border. This reduced considerable the number of observation in the dataset. For

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<sup>3</sup> For more information: [www.esri.com/library/whitepapers/pdfs/shapefile.pdf](http://www.esri.com/library/whitepapers/pdfs/shapefile.pdf)

example, for Egypt the number of fields—represented as 249 points—was reduced to 13 polygons. A polygon may include one or several fields, and the size of the polygon is not related to the number of fields inside it; the size is determined by the distribution of the fields.

An ArcGIS script<sup>4</sup> was run to create the geographic coordinates of each polygon’s centroid (the gravity center point of the polygon). The centroids are stored as latitude and longitude coordinates in the attribute table. On the map, the hydrocarbon fields are represented as polygons.

The generalization was done separately for onshore and offshore occurrence. For the offshore polygons this process was cumbersome as offshore country boundaries tend to be fuzzy. The following sources were used to create boundaries in order to assign countries to offshore polygons: OPL (1991), Kulke (1994, 1995), North Sea Digital Atlas (2004), and USGS (2004).

## 5. VARIABLE DEFINITIONS AND CODING STRUCTURE

Table 1. Definition of variables

No	Variable	Label	Description	Format
1	PRIMKEY	Primary key	The unique identifier for all polygons	String
2	COUNTRY	Country of location	The name of the country where the polygon is located	String
3	FIPSCODE	FIPS code for location	FIPS abbreviation for country location	String
4	COWCODE	COW numbers of location	COW country number	Integer
5	CONTCODE	Continent of location	Continent for the country location	Integer
6	SITENUM	Number of location	The unique identifier for each polygon by country	Integer
7	NAME	Name of location	The name of the region or basin	String
8	LAT	Latitude of location	First component of the geographic coordinates in decimal degrees	Double
9	LONG	Longitude of location	Second component of the geographic coordinates in decimal degrees	Double
10	RES	Natural resource code	Natural resource of interest; PET for Petroleum	String
11	RESINFO	Reserve type	Information on type of hydrocarbons present in the polygon	String
12	LOCSOURCE	Source of geographic location information	Reference for the location information	String
13	FIELDINFO	Field information	Production status	String
14	DISC	Discovery year	Year when the first field in the polygon was discovered	Integer
15	DISCPRES	Discovery year precision	Precision coding for the discovery year	Integer
16	PROD	Production year	Year when the first field in the polygon was in production	Integer
17	PRODPRES	Production year precision	Precision coding for the production year	String
18	OTHERINFO	General information	Additional information for the polygon	String

<sup>4</sup> <http://support.esri.com/index.cfm?fa=knowledgebase.techarticles.articleShow&d=21473>.

19	SOURCEINFO	Reference(s)	All references used for the polygon	String
20	VERSION	Version number	The current version of the dataset	Float

### 5.1. Primary Key (PRIMKEY)

Each observation has a unique primary key. It is built by three components from each entry. For onshore polygons it is assembled by the country code (FIPS), the number of the polygon (SITENUM) and the resource code (RES). For example, the primary key VE001PET stands for the first observation of petroleum occurrence in Venezuela.

For offshore polygons the primary key consist of prefix OF (for offshore), a running number and the resource code.

### 5.2. Country Name (COUNTRY)

The assigned country is the country in which the petroleum field exists at the present time. See Appendix A for a list of the potential countries that could have been included in PETRODATA. The dataset uses the international boundaries as they were in 2000. Country's name, geographical extent or status may change over time. This may require manipulation of the dataset if the user's data structure has an explicit time component.

### 5.3. FIPS Code (FIPSCODE)

FIPS (Federal Information Processing Standards) code is a two character long string variable commonly used in datasets from ESRI. Appendix A lists the codes for each country.

### 5.4. Correlates of War Code (COWCODE)

For compatibility with the Uppsala/PRIO Armed Conflict Dataset, the countries are also coded with their Correlates of War (COW) number. The COW codes used in PETRODATA build on the Gleditsch & Ward (1999) modification of the nation codes used by the Correlates of War (COW) project<sup>5</sup>. For countries with non-existing COW number, -9999 was recorded. Appendix A lists the codes for each country.

### 5.5. Continent (CONTCODE)

Each country is assigned to a continent by the following definition used by the PRIO/Uppsala Armed Conflict Dataset<sup>6</sup>:

1. Europe: Geographic definition, including the states in the Caucasus, COW numbers [200,395]
2. Middle East (Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Syria, Turkey, and the states of the Arabian Peninsula), COW numbers [630,698]
3. Asia: Geographic definition, including Oceania, Australia, and New Zealand, and excluding states in the Middle East, COW numbers [700,990]
4. Africa: Geographic definition, excluding states in the Middle East (see above), COW numbers [400,625]

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<sup>5</sup> [www.correlatesofwar.org/](http://www.correlatesofwar.org/).

<sup>6</sup> [www.prio.no/cscw/armedconflict](http://www.prio.no/cscw/armedconflict).

5. Americas: Geographic definition, including states in the Caribbean, COW numbers [2,165]

All countries not covered by these definitions were assigned continent codes based on the regions listed in *The World Factbook* by CIA ([www.cia.gov/cia/publications/factbook](http://www.cia.gov/cia/publications/factbook)). See Appendix A for a listing.

#### **5.6. Site Number (SITENUM)**

The site number (SITENUM) is assigned to each polygon and represents one of the identifiers in the primary key. For both onshore and offshore polygons we have tried to allocate the SITENUM from North to South and from West to East so that the lowest SITENUM is in the country's upper left 'corner'.

#### **5.7. Site Name (NAME)**

The site name is identifying name for the polygon. It is the name of the geological province provided by the U.S. Geological Survey (USGS, 2000).

#### **5.8. Geographic Coordinates, Latitude (LAT)**

Geographic coordinates give the location of the centroid of the polygon representing the petroleum field(s).<sup>7</sup> Latitudes are measured with decimal degrees on a 90° scale with negative values for southern latitudes and positive values for northern latitudes. The coordinates are expressed with two decimal points.

#### **5.9. Geographic Coordinates, Longitude (LONG)**

Longitudes are measured with decimal degrees on a 180 scale with negative values for western longitudes (west of the Greenwich prime meridian) and positive values for eastern longitudes. The coordinates are expressed with two decimal points.

#### **5.10. Resource Code (RES)**

PET for PETroleum was assigned to each observation.

#### **5.11. Type of Hydrocarbon Reserve (RESINFO)**

Information about the type of hydrocarbon reserve is coded in this field. Polygons with mainly crude oil are coded 'oil', those with mainly natural gas 'gas' and those with both 'oil and gas'.

#### **5.12. Location Source (LOCSOURCE)**

LOCSOURCE lists the references used to compile information for the variables no. 2 to 9. Full references are listed in a separate Microsoft Word file.

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<sup>7</sup> We assigned the geographic coordinates of each polygon's centroids by running a script. This functionality is embedded in the current ArcGIS version, but for the version we used at the time, we needed a script which we found at: <http://support.esri.com/index.cfm?fa=knowledgebase.techarticles.articleShow&d=21473>

### **5.13. Field Information (FIELDINFO)**

For each observation the production status was entered as follows:

- 1 Known production: oil or/and gas produced by one or several fields in the polygon
- 2 No known production: none of the fields inside the polygon has produced hydrocarbons but hydrocarbon discovery is confirmed
- 3 Production status unknown
- 4 Under exploration: no formal discovery

### **5.14. Discovery Year (DISC)**

For each observation the year of the first discovery in the polygon is recorded. For discoveries prior to 1946, 1945 is entered. Observations with missing values are assigned value -9999.

### **5.15. Discovery Precision (DISCPRES)**

The precision of discovery year varies due to incomplete information and inconsistent sources. In addition, for several polygons this information is missing. The following list distinguishes between these cases:

- 1 Year is precisely coded
- 2 Conflicting information in different sources: the year is assigned based on subjective judgement
- 3 Year is unknown: corresponds to -9999 in DISC (see Section 5.14)

### **5.16. Production Year (PROD)**

For each polygon with at least one producing field, the first production year is recorded. For polygons with production start before 1946, 1945 is entered. Polygons with confirmed discovery but no production correspond to a blank entry. Value -9999 is coded for observation with missing values.

### **5.17. Production Precision (PRODPRES)**

The precision of discovery year varies due to incomplete information and inconsistent sources and for several polygons this information is missing. The following list distinguishes between these cases:

- 1 Year is precisely coded
- 2 Conflicting information in different sources: the year is assigned based on subjective judgement
- 3 Year is unknown or no production occurred in polygon: corresponds to -9999 in PROD (see Section 5.14)
- 4 No production occurred in polygon: corresponds to -9999 in PROD

### **5.18. Additional Information (OTHERINFO)**

This record gives additional information for the polygon.

### **5.19. Source Information (SOURCEINFO)**

A complete listing of the sources for variables no. 11 to 18 is included in this field. The full references are given in a separate Reference List file.

### **5.20. Version (VERSION)**

The current version of this dataset is 1.1. The version number consists of a major and minor indicator. A change in the minor indicator indicates that errors have been corrected or that some cosmetic changes have been done. Changes from version 1.0 to version 1.1 are described in a separate document. A change in the major indicator indicates that new data has been added.

**APPENDIX A: Country and corresponding COW, FIPS and Continent codes. Countries included in PETRODATA are highlighted.**

<b>COUNTRY</b>	<b>FIPS</b>	<b>COW</b>	<b>CONTINENT</b>
Afghanistan	AF	700	3
Albania	AL	339	1
Algeria	AG	615	4
Andorra	AN	232	1
Angola	AO	540	4
Anguilla	AV	0	5
Antigua and Barbuda	AC	58	5
Argentina	AR	160	5
Armenia	AM	371	1
Aruba	AA	-9999	5
Australia	AS	900	3
Austria	AU	305	1
Azerbaijan	AJ	373	1
Bahamas	BF	31	5
Bahrain	BA	692	2
Bangladesh	BG	771	3
Barbados	BB	53	5
Belgium	BE	211	1
Belize	BH	80	5
Benin	BN	434	4
Bermuda	BD	-9999	5
Bhutan	BT	760	3
Bolivia	BL	145	5
Bosnia and Herzegovina	BK	346	1
Botswana	BC	571	4
Brazil	BR	140	5
British Virgin Islands	VI	-9999	5
Brunei	BX	835	3
Bulgaria	BU	355	1
Burkina Faso	UV	439	4
Burundi	BY	516	4
Byelarus	BO	370	1
Cambodia	CB	811	3
Cameroon	CM	471	4
Canada	CA	20	5
Cape Verde	CV	402	4
Cayman Islands	CJ	-9999	5
Central African Republic	CT	482	4
Chad	CD	483	4
Chile	CI	155	5
China	CH	710	3
Cocos (Keeling) Islands	CK	-9999	3
Colombia	CO	100	5

Comoros	CN	581	4
Congo	CF	484	4
Cook Islands	CW	-9999	3
Costa Rica	CR	-9999	5
Croatia	HR	344	1
Cuba	CU	40	5
Cyprus	CY	352	1
Czech Republic	EZ	316	1
D.R. Congo	CG	490	4
Denmark	DA	390	1
Djibouti	DJ	522	4
Dominica	DO	42	5
Dominican Republic	DR	42	5
Ecuador	EC	130	5
Egypt	EG	651	4
El Salvador	ES	92	5
Equatorial Guinea	EK	411	4
Eritrea	ER	531	4
Estonia	EN	366	4
Ethiopia	ET	530	4
Falkland Islands (Islas Malvinas)	FK	-9999	5
Faroe Islands	FO	-9999	1
Federated States of Micronesia	FM	987	3
Fiji	FJ	950	3
Finland	FI	375	1
France	FR	220	1
French Guiana	FG	-9999	5
French Polynesia	FP	-9999	3
Gabon	GB	481	4
Gambia	GA	420	4
Gaza Strip	GS	-9999	2
Georgia	GG	372	1
Germany	GM	255	1
Ghana	GH	452	4
Gibraltar	GI	-9999	1
Glorioso Islands	GO	-9999	4
Greece	GR	350	1
Greenland	GL	-9999	1
Grenada	GJ	55	5
Guadeloupe	GP	-9999	5
Guatemala	GT	90	5
Guernsey	GK	-9999	1
Guinea	GV	438	5
Guinea-Bissau	PU	404	4
Guyana	GY	110	5
Haiti	HA	41	5
Heard Island & McDonald Islands	HM	-9999	3

Honduras	HO	91	5
Hungary	HU	310	1
Iceland	IC	395	1
India	IN	750	3
Indonesia	ID	850	3
Iran	IR	630	2
Iraq	IZ	645	2
Ireland	EI	205	1
Israel	IS	666	2
Italy	IT	325	1
Ivory Coast	IV	437	4
Jamaica	JM	51	5
Jan Mayen	JN	-9999	1
Japan	JA	740	3
Jarvis Island	DQ	-9999	5
Jersey	JE	-9999	1
Jordan	JO	663	2
Juan De Nova Island	JU	-9999	4
Kazakhstan	KZ	705	3
Kenya	KE	501	4
Kiribati	KR	946	3
Kuwait	KU	690	2
Kyrgyzstan	KG	703	3
Laos	LA	812	3
Latvia	LG	367	1
Lebanon	LE	660	2
Lesotho	LT	570	4
Liberia	LI	450	4
Libya	LY	620	4
Liechtenstein	LS	223	1
Lithuania	LH	368	1
Luxembourg	LU	212	1
Macau	MC	-9999	3
Macedonia	MK	343	1
Madagascar	MA	580	4
Malawi	MI	553	4
Malaysia	MY	820	3
Maldives	MV	-9999	3
Mali	ML	432	4
Malta	MT	698	1
Marshall Islands	RM	-9999	3
Martinique	MB	-9999	5
Mauritania	MR	435	4
Mauritius	MP	590	4
Mayotte	MF	-9999	4
Mexico	MX	70	5
Moldova	MD	359	1

Monaco	MN	221	1
Mongolia	MG	712	3
Montenegro <sup>8</sup>	MW	345	1
Montserrat	MH	-9999	5
Morocco	MO	600	4
Mozambique	MZ	541	4
Myanmar (Burma)	BM	775	3
Namibia	WA	565	4
Nauru	NR	970	3
Nepal	NP	790	3
Netherlands	NL	210	1
Netherlands Antilles	NT	-9999	5
New Caledonia	NC	-9999	3
New Zealand	NZ	920	3
Nicaragua	NU	93	5
Niger	NG	436	4
Nigeria	NI	475	4
Niue	NE	-9999	3
Norfolk Island	NF	-9999	3
North Korea	KN	731	3
Norway	NO	385	1
Oman	MU	698	2
Pakistan	PK	770	3
Panama	PM	95	5
Papua New Guinea	PP	910	3
Paracel Islands	PF	-9999	3
Paraguay	PA	150	5
Peru	PE	135	5
Philippines	RP	840	3
Pitcairn Islands	PC	-9999	3
Poland	PL	290	1
Portugal	PO	235	1
Puerto Rico	RQ	-9999	5
Qatar	QA	694	2
Reunion	RE	-9999	4
Romania	RO	360	1
Russia	UR	365	1
Rwanda	RW	517	4
San Marino	SM	331	1
Sao Tome and Principe	TP	403	4
Saudi Arabia	SA	670	2
Senegal	SG	433	4
Serbia	SR	345	1
Seychelles	SE	591	4
Sierra Leone	SL	451	4

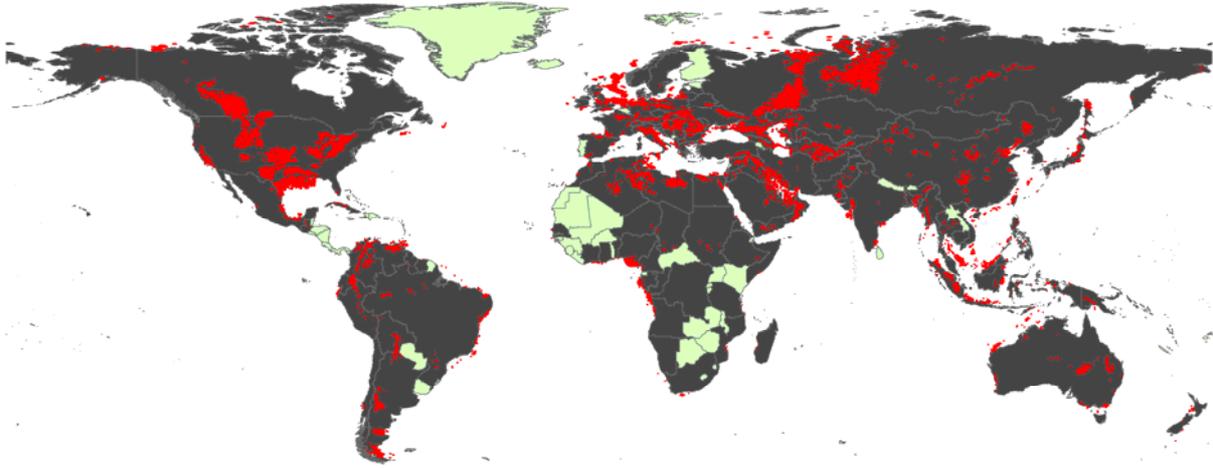
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<sup>8</sup> Note that it is now Serbia and Montenegro

Singapore	SN	830	3
Slovakia	LO	317	1
Slovenia	SI	349	1
Solomon Islands	BP	-9999	3
Somalia	SO	520	4
South Africa	SF	560	4
South Georgia and the South Sandwich Islands	SX	-9999	5
South Korea	KS	732	3
Spain	SP	230	1
Spratly Islands	PG	-9999	3
Sri Lanka	CE	780	3
St. Helena	SH	-9999	4
St. Kitts and Nevis	SC	-9999	5
St. Lucia	ST	56	5
St. Pierre and Miquelon	SB	-9999	5
St. Vincent and the Grenadines	VC	57	5
Sudan	SU	625	4
Suriname	NS	115	5
Svalbard	SV	-9999	1
Swaziland	WZ	572	4
Sweden	SW	380	1
Switzerland	SZ	225	1
Syria	SY	652	2
Taiwan	TW	713	3
Tajikistan	TI	702	3
Tanzania	TZ	510	4
Thailand	TH	800	3
Togo	TO	461	4
Tokelau	TL	-9999	3
Tonga	TN	955	3
Trinidad and Tobago	TD	52	5
Tunisia	TS	616	4
Turkey	TU	640	2
Turkmenistan	TX	701	3
Turks and Caicos Islands	TK	-9999	5
Tuvalu	TV	947	3
Uganda	UG	500	4
Ukraine	UP	369	1
United Arab Emirates	TC	696	2
United Kingdom	UK	200	1
United States	US	2	5
Uruguay	UY	165	5
Uzbekistan	UZ	704	3
Vanuatu	NH	935	3
Venezuela	VE	101	5
Vietnam	VM	816	3

Virgin Islands	VQ	-9999	5
Wake Island	WQ	-9999	3
Wallis and Futuna	WF	-9999	3
West Bank	WB	-9999	2
Western Sahara	WI	-9999	4
Yemen	YM	679	2
Zambia	ZA	551	4
Zimbabwe	ZI	552	4

**APPENDIX B: The map shows countries with hydrocarbon reserves (in dark). Hydrocarbon fields are indicated with red.**



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Full references of sources used in PETRODATA are available in a separate file. This list includes only references made in this document.

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