

Geological Map of the Northern Apennines (Italy) at 1:250,000 scale: GIS Data (v. 1.0)

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1 The Geological Map

In December 2019 the University of Siena - Center for Geotechnologies and the Geological Surveys of the Emilia-Romagna, Marche, Tuscany and Umbria regions published a Geological Map at 1:250.000 scale covering the Italian Northern Apennines. The paper version of the Geological Map is enclosed in an article published by the Italian Geological Society ¹ and in a booklet with Italian explanatory notes, published by the Regione Emilia-Romagna.

All the above documents and GIS data are freely available from <http://www.geological-map.it>.

2 The geological database

2.1 Getting started

The GIS data and associated files are bundled in a single downloadable zip file: **Geol250k-GIS-v1_0.zip**.

¹Conti P., Cornamusini G. & Carmignani L. - An outline of the geology of the Northern Apennines (Italy), with Geological Map at 1:250,000 scale. Italian Journal of Geosciences, <https://doi.org/10.3301/IJG.2019.25>

This PDF document is included in the zip file and provide informations about the geological database and how informations are organized.

The geological database was compiled using ESRI ArcGIS software and QGIS software. We are planning to produce in the next future a geological database conform to the GeoSciML INSPIRE data models, but for the moment we only deliver a very simple geological database consisting of only two file in *shapefile* format:

- **Lines.shp** (and related files), for all the linear features;
- **Polygonso.shp** (and related files), for all the areal (polygonal) features.

In the Geological Map no point features are present.

2.2 Lines

In the **geol250-lines.shp** file each record shows only one TEXT Data Type attribute, the “TYPE” field. The “TYPE” field can have one of the below values and their significance is reported in the **Tab. 1** below.

Table 1 – *Field and values in the Lines.shp file.*

TYPE	
strat	(stratigraphic contact)
tect	(tectonic contact: thrust, reverse fault, low-angle normal fault)
fault	(high-angle normal fault)
coast	(coastline, lakes)
border	(border of the map)

2.3 Polygons

In the **Polygons.shp** file each record have values in the ...in the TEXT Data Type: “GeolUnit”, “GeolUnit_N”, “GeolUnit_1”, “GeolUnit_2” and “GeolUnit_3”.

The field “GeolUnit” shows all the 98 Geologic Unit labels (it. “Sigla”), as in the printed Geological Map.

The field “GeolUnit_N” shows all the 98 Geologic Units labels, preceded by a progressive number (01-98) which indicates the sequence of the Geological units as in the printed Legend of the Geological Map.

The field “GeolUnit_1” groups all the Geological Units in 12 major successions and paleogeographic domains. The successions and domains are preceded by a progressive number (01-12) which indicates their position as in the printed Legend of the Geological Map.

The field “GeolUnit_2” groups all the Geological Units in 30 successions, paleogeographic domains. The successions and domains are preceded by a progressive number (01-30) which indicates their position as in the printed Legend of the Geological Map.

The field “GeolUnit_3” groups all the Geological Units in 31 successions, paleogeographic domains. The successions and domains are preceded by a progressive number (01-30) which indicates their position as in the printed Legend of the Geological Map.

Their values are reported in the **Tab. 2** below.

Table 2 – *Fields and values in the Polygons.shp file.*

GeolUnit	GeolUnit_N	GeolUnit_1	GeolUnit_2	GeolUnit_3
Qt	01 Qt	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits
Qa7	02 Qa7	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits
Qa6	03 Qa6	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits
Qa5	04 Qa5	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits
Qa4	05 Qa4	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits
Qa3	06 Qa3	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits
Qa2	07 Qa2	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits
Qa1	08 Qa1	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits
Tv	09 Tv	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits	01 Quaternary (post- “Villafranchian”) conti- nental and coastal de- posits
beta	10 beta	02 Magmatic rocks	02 Magmatic rocks	02 Magmatic rocks
gamma	11 gamma	02 Magmatic rocks	02 Magmatic rocks	02 Magmatic rocks
PEfe	12 PEfe	03 Miocene-Pleistocene syn- and post-evaporite succession of the Po Plain and Adriatic mar- gin	03 Pliocene – Pleis- tocene marine succes- sion	03 Pliocene – Pleis- tocene marine succes- sion
PEim	13 PEim	03 Miocene-Pleistocene syn- and post-evaporite succession of the Po Plain and Adriatic mar- gin	03 Pliocene – Pleis- tocene marine succes- sion	03 Pliocene – Pleis- tocene marine succes- sion

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GeolUnit	GeolUnit_N	GeolUnit_1	GeolUnit_2	GeolUnit_3
PLaz	14 PLaz	03 Miocene-Pleistocene syn- and post-evaporite succession of the Po Plain and Adriatic margin	03 Pliocene – Pleistocene marine succession	03 Pliocene – Pleistocene marine succession
PLar	15 PLar	03 Miocene-Pleistocene syn- and post-evaporite succession of the Po Plain and Adriatic margin	03 Pliocene – Pleistocene marine succession	03 Pliocene – Pleistocene marine succession
MIco	16 MIco	03 Miocene-Pleistocene syn- and post-evaporite succession of the Po Plain and Adriatic margin	04 Messinian post-evaporite succession	04 Messinian post-evaporite succession
MIsd	17 MIsd	03 Miocene-Pleistocene syn- and post-evaporite succession of the Po Plain and Adriatic margin	04 Messinian post-evaporite succession	04 Messinian post-evaporite succession
MIgr	18 MIgr	03 Miocene-Pleistocene syn- and post-evaporite succession of the Po Plain and Adriatic margin	04 Messinian post-evaporite succession	04 Messinian post-evaporite succession
MIgs	19 MIgs	03 Miocene-Pleistocene syn- and post-evaporite succession of the Po Plain and Adriatic margin	05 Messinian Evaporite succession	05 Messinian Evaporite succession
MItr	20 MItr	03 Miocene-Pleistocene syn- and post-evaporite succession of the Po Plain and Adriatic margin	05 Messinian Evaporite succession	05 Messinian Evaporite succession
PLvl	21 PLvl	04 Miocene-Pleistocene succession of the Tyrrhenian margin and intermontane basins	06 Ruscian and “Villafranchian” continental succession	06 Ruscian and “Villafranchian” continental succession
PEag	22 PEag	04 Miocene-Pleistocene succession of the Tyrrhenian margin and intermontane basins	07 Pliocene-Pleistocene marine succession	07 Pliocene-Pleistocene marine succession
PLaa	23 PLaa	04 Miocene-Pleistocene succession of the Tyrrhenian margin and intermontane basins	07 Pliocene-Pleistocene marine succession	07 Pliocene-Pleistocene marine succession

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GeolUnit	GeolUnit_N	GeolUnit_1	GeolUnit_2	GeolUnit_3
PLcg	24 PLcg	04 Miocene-Pleistocene succession of the Tyrrhenian margin and intermontane basins	07 Pliocene-Pleistocene marine succession	07 Pliocene-Pleistocene marine succession
MIcg	25 MIcg	04 Miocene-Pleistocene succession of the Tyrrhenian margin and intermontane basins	08 Messinian syn- and post-evaporite succession	08 Messinian syn- and post-evaporite succession
MIem	26 MIem	04 Miocene-Pleistocene succession of the Tyrrhenian margin and intermontane basins	08 Messinian syn- and post-evaporite succession	08 Messinian syn- and post-evaporite succession
MIro	27 MIro	04 Miocene-Pleistocene succession of the Tyrrhenian margin and intermontane basins	09 Messinian pre-evaporite marine succession	09 Messinian pre-evaporite marine succession
MIfo	28 MIfo	04 Miocene-Pleistocene succession of the Tyrrhenian margin and intermontane basins	10 Lower Tortonian (Upper Tortonian) fluvio-lacustrine succession	10 Lower Tortonian (Upper Tortonian) fluvio-lacustrine succession
MIma	29 MIma	04 Miocene-Pleistocene succession of the Tyrrhenian margin and intermontane basins	11 Middle Burdigalian - Lower Tortonian marine deposits (Tyrrhenian Epiligurides Auctt.)	11 Middle Burdigalian - Lower Tortonian marine deposits (Tyrrhenian Epiligurides Auctt.)
EPte	30 EPte	05 Epiligurian succession (pre-evaporitic)	12 Epiligurian succession (pre-evaporitic)	12 Epiligurian succession (pre-evaporitic)
EPbs	31 EPbs	05 Epiligurian succession (pre-evaporitic)	12 Epiligurian succession (pre-evaporitic)	12 Epiligurian succession (pre-evaporitic)
EPra	32 EPra	05 Epiligurian succession (pre-evaporitic)	12 Epiligurian succession (pre-evaporitic)	12 Epiligurian succession (pre-evaporitic)
ILbo	33 ILbo	06 Ligurian Domain	13 Internal Ligurian Domain	13 Internal Ligurian Domain
ILgo	34 ILgo	06 Ligurian Domain	13 Internal Ligurian Domain	13 Internal Ligurian Domain
ILap	35 ILap	06 Ligurian Domain	13 Internal Ligurian Domain	13 Internal Ligurian Domain
ILds	36 ILds	06 Ligurian Domain	13 Internal Ligurian Domain	13 Internal Ligurian Domain
ILof	37 ILof	06 Ligurian Domain	13 Internal Ligurian Domain	13 Internal Ligurian Domain
ELla	38 ELla	06 Ligurian Domain	14 External Ligurian Domain	14 Inner Succession
ELmo	39 ELmo	06 Ligurian Domain	14 External Ligurian Domain	14 Inner Succession
ELhe	40 ELhe	06 Ligurian Domain	14 External Ligurian Domain	14 Inner Succession
ELcb	41 ELcb	06 Ligurian Domain	14 External Ligurian Domain	14 Inner Succession

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GeolUnit	GeolUnit_N	GeolUnit_1	GeolUnit_2	GeolUnit_3
ELof	42 ELof	06 Ligurian Domain	14 External Ligurian Domain	14 Inner Succession
ELel	43 ELel	06 Ligurian Domain	14 External Ligurian Domain	15 Outer Succession
ELpf	44 ELpf	06 Ligurian Domain	14 External Ligurian Domain	15 Outer Succession
ELvr	45 ELvr	06 Ligurian Domain	14 External Ligurian Domain	15 Outer Succession
ELro	46 ELro	06 Ligurian Domain	14 External Ligurian Domain	15 Outer Succession
SLar	47 SLar	07 Subligurian Domain	15 Subligurian Domain	16 Subligurian Domain
SLac	48 SLac	07 Subligurian Domain	15 Subligurian Domain	16 Subligurian Domain
SVar	49 SVar	08 Sestola-Vidiciatico unit	16 Sestola-Vidiciatico unit	17 Sestola-Vidiciatico unit
SVtu	50 SVtu	08 Sestola-Vidiciatico unit	16 Sestola-Vidiciatico unit	17 Sestola-Vidiciatico unit
SVli	51 SVli	08 Sestola-Vidiciatico unit	16 Sestola-Vidiciatico unit	17 Sestola-Vidiciatico unit
PSnu	52 PSnu	09 Tuscan Domain	22 Pseudoverrucano Succession	23 Pseudoverrucano Succession
PSvr	53 PSvr	09 Tuscan Domain	22 Pseudoverrucano Succession	23 Pseudoverrucano Succession
MOar	54 MOar	09 Tuscan Domain	17 Modino Succession	18 Modino Succession
MOfi	55 MOfi	09 Tuscan Domain	17 Modino Succession	18 Modino Succession
MObs	56 MObs	09 Tuscan Domain	17 Modino Succession	18 Modino Succession
TNmg	57 TNmg	09 Tuscan Domain	18 Tuscan Succession	19 Tuscan Succession
TNst	58 TNst	09 Tuscan Domain	18 Tuscan Succession	19 Tuscan Succession
TNca	59 TNca	09 Tuscan Domain	18 Tuscan Succession	19 Tuscan Succession
TNma	60 TNma	09 Tuscan Domain	18 Tuscan Succession	19 Tuscan Succession
TNcv	61 TNcv	09 Tuscan Domain	18 Tuscan Succession	19 Tuscan Succession
TMpm	62 TMpm	09 Tuscan Domain	21 Tuscan Metamorphic Succession	22 Tuscan Metamorphic Succession
TMsc	63 TMsc	09 Tuscan Domain	21 Tuscan Metamorphic Succession	22 Tuscan Metamorphic Succession
TMma	64 TMma	09 Tuscan Domain	21 Tuscan Metamorphic Succession	22 Tuscan Metamorphic Succession
TMvr	65 TMvr	09 Tuscan Domain	21 Tuscan Metamorphic Succession	22 Tuscan Metamorphic Succession
TMcp	66 TMcp	09 Tuscan Domain	21 Tuscan Metamorphic Succession	22 Tuscan Metamorphic Succession
TMbs	67 TMbs	09 Tuscan Domain	21 Tuscan Metamorphic Succession	22 Tuscan Metamorphic Succession
CFvc	68 CFvc	09 Tuscan Domain	19 Cervarola - Falterona Succession	20 Cervarola - Falterona Succession
CFce	69 CFce	09 Tuscan Domain	19 Cervarola - Falterona Succession	20 Cervarola - Falterona Succession
CFfa	70 CFfa	09 Tuscan Domain	19 Cervarola - Falterona Succession	20 Cervarola - Falterona Succession
CFvl	71 CFvl	09 Tuscan Domain	19 Cervarola - Falterona Succession	20 Cervarola - Falterona Succession

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GeolUnit	GeolUnit_N	GeolUnit_1	GeolUnit_2	GeolUnit_3
REar	72 REar	09 Tuscan Domain	20 Rentella Succession	21 Rentella Succession
REst	73 REst	09 Tuscan Domain	20 Rentella Succession	21 Rentella Succession
UMla3	74 UMla3	10 Umbria-Marche-Romagna Domain	23 Siliciclastic succession of the intra-Apennine minor basins and outer basins	24 Siliciclastic succession of the intra-Apennine minor basins and outer basins
UMla2	75 UMla2	10 Umbria-Marche-Romagna Domain	23 Siliciclastic succession of the intra-Apennine minor basins and outer basins	24 Siliciclastic succession of the intra-Apennine minor basins and outer basins
UMla1	76 UMla1	10 Umbria-Marche-Romagna Domain	23 Siliciclastic succession of the intra-Apennine minor basins and outer basins	24 Siliciclastic succession of the intra-Apennine minor basins and outer basins
UMam	77 UMam	10 Umbria-Marche-Romagna Domain	23 Siliciclastic succession of the intra-Apennine minor basins and outer basins	24 Siliciclastic succession of the intra-Apennine minor basins and outer basins
UMgh	78 UMgh	10 Umbria-Marche-Romagna Domain	24 Siliciclastic succession of the Inner basins	25 Siliciclastic succession of the Inner basins
UMma	79 UMma	10 Umbria-Marche-Romagna Domain	24 Siliciclastic succession of the Inner basins	25 Siliciclastic succession of the Inner basins
UMsh	80 UMsh	10 Umbria-Marche-Romagna Domain	25 Cretaceous-Miocene calcareous-marly succession	26 Cretaceous-Miocene calcareous-marly succession
UMbi	81 UMbi	10 Umbria-Marche-Romagna Domain	25 Cretaceous-Miocene calcareous-marly succession	26 Cretaceous-Miocene calcareous-marly succession
UMsc	82 UMsc	10 Umbria-Marche-Romagna Domain	25 Cretaceous-Miocene calcareous-marly succession	26 Cretaceous-Miocene calcareous-marly succession
UMsr	83 UMsr	10 Umbria-Marche-Romagna Domain	25 Cretaceous-Miocene calcareous-marly succession	26 Cretaceous-Miocene calcareous-marly succession
UMfu	84 UMfu	10 Umbria-Marche-Romagna Domain	25 Cretaceous-Miocene calcareous-marly succession	26 Cretaceous-Miocene calcareous-marly succession
UMmi	85 UMmi	10 Umbria-Marche-Romagna Domain	25 Cretaceous-Miocene calcareous-marly succession	26 Cretaceous-Miocene calcareous-marly succession
UMdi	86 UMdi	10 Umbria-Marche-Romagna Domain	26 Jurassic complete succession	27 Jurassic complete succession
UMpo	87 UMpo	10 Umbria-Marche-Romagna Domain	26 Jurassic complete succession	27 Jurassic complete succession
UMco	88 UMco	10 Umbria-Marche-Romagna Domain	26 Jurassic complete succession	27 Jurassic complete succession
UMbg	89 UMBg	10 Umbria-Marche-Romagna Domain	27 Jurassic condensed succession	28 Jurassic condensed succession
UMms	90 UMms	10 Umbria-Marche-Romagna Domain	28 Triassic – Lower Jurassic succession	29 Triassic – Lower Jurassic succession

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GeolUnit	GeolUnit_N	GeolUnit_1	GeolUnit_2	GeolUnit_3
UMrt	91 UMrt	10 Umbria-Marche-Romagna Domain	28 Triassic – Lower Jurassic succession	29 Triassic – Lower Jurassic succession
UMcv	92 UMcV	10 Umbria-Marche-Romagna Domain	28 Triassic – Lower Jurassic succession	29 Triassic – Lower Jurassic succession
HPli	93 HPli	11 Units affected by HP metamorphism	29 Units affected by HP metamorphism	30 Units affected by HP metamorphism
HPtu	94 HPtu	11 Units affected by HP metamorphism	29 Units affected by HP metamorphism	30 Units affected by HP metamorphism
SEli	95 SEli	12 Shear zones	30 Shear zones	31 Shear zones
SEar	96 SEar	12 Shear zones	30 Shear zones	31 Shear zones
SEfi	97 SEfi	12 Shear zones	30 Shear zones	31 Shear zones
SEcv	98 SEcv	12 Shear zones	30 Shear zones	31 Shear zones

Content of [Tab. 2](#) is also also available as a separate csv file.

2.4 Coordinate Reference Systems

All data are in EPSG:32632 - WGS 84 / UTM zone 32N - Projected.

3 Layers symbology

The final editing of the printed Geological map is made using Adobe Illustrator software, so there are no GIS layers symbology style file (ESRI .lyr or QGIS .QML or .SLD) available.

Are only available QML style files for QGIS that “resemble” line and polygons styles of the printed map ([download](#)).