



UNIVERSITÀ
DEGLI STUDI
DI BERGAMO

Dipartimento
di Lingue, Letterature
e Culture Straniere

Academy of Research Methodologies

Geourbanistica

Planning and Management of
Tourism Systems

Text Sciences and Culture
Enhancement in the Digital Age

Dott. Umberto Fede

Dott. Edmondo Pietrangeli

Mapping and Drone module

Lesson 1: Introduction to GIS systems

Università degli Studi di Bergamo,
sede di Via Salvecchio, 19

GEOGRAPHIC INFORMATION SYSTEM (GIS)

Geographic information that deals
with the **TERRITORY**



Georeferenced data (coordinate)



GEOGRAPHIC INFORMATION SYSTEM (GIS)

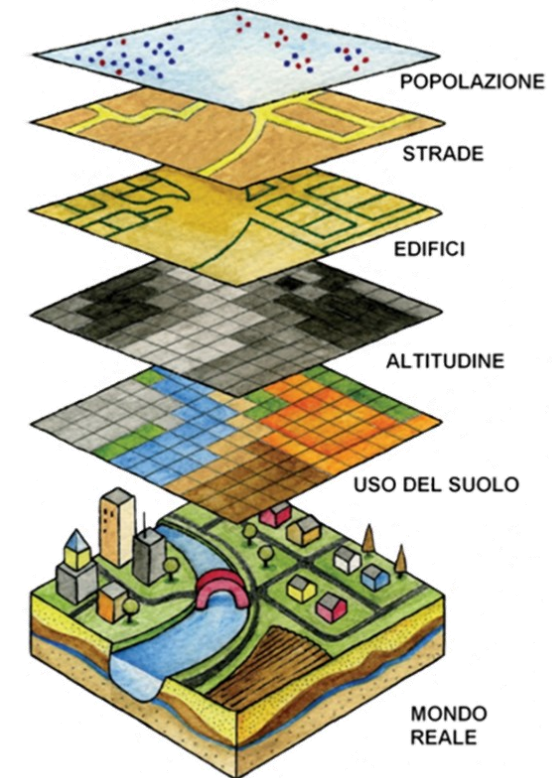
A GIS is a system based on a digital data archive containing various types of information regarding the territory of interest, useful for carrying out analyses and producing cartographic representations.



SISTEMA INFORMATIVO TERRITORIALE (SIT)

to acquire
to store
to organize
to catalog
to modify
to rework
to integrate
to return the data

LAYERS



CARTOGRAPHIES

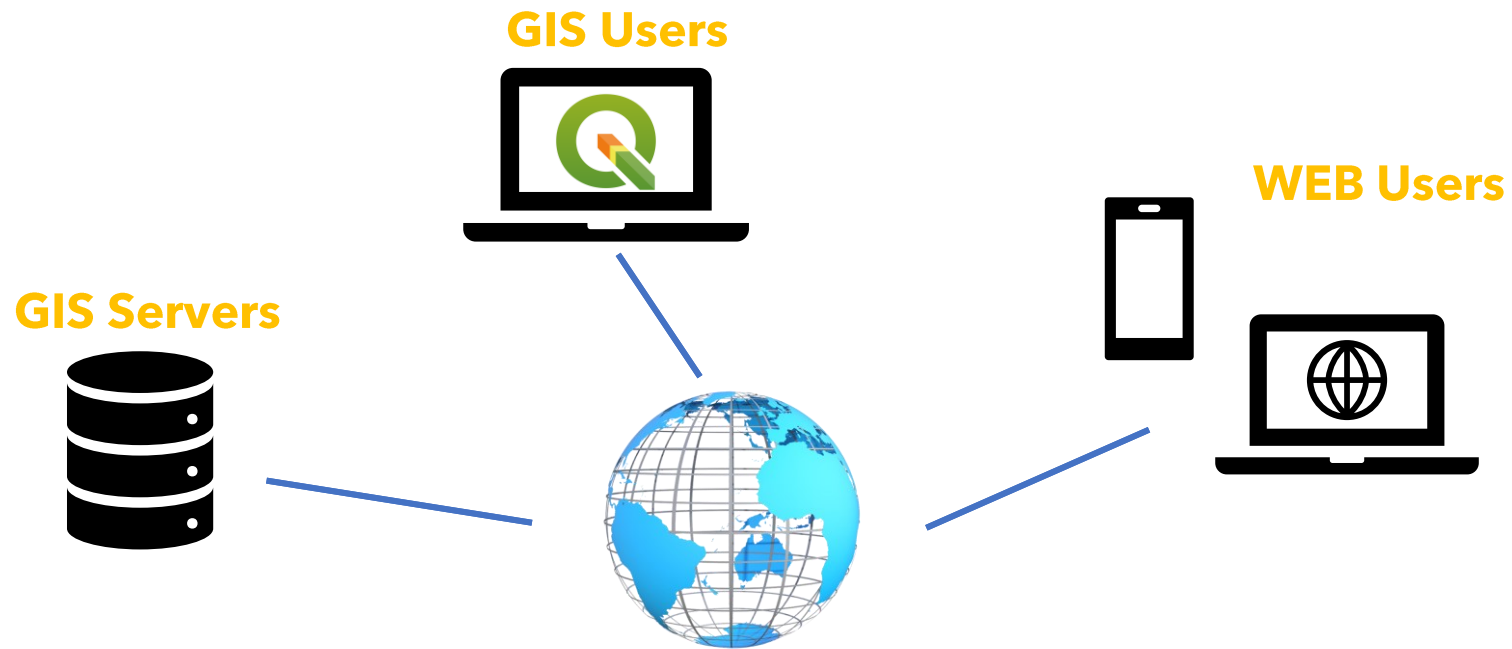


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a **WEBGIS**

it's a online published GIS



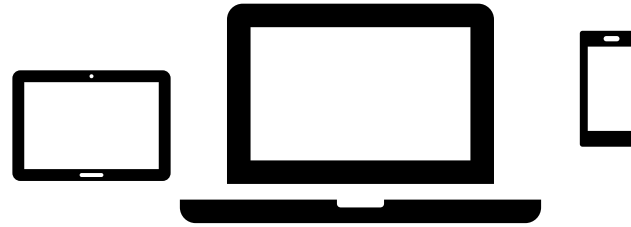
WEB GIS



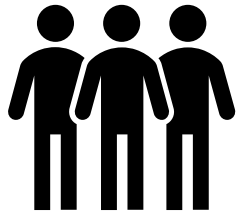
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HARDWARE



PEOPLE



GIS

SOFTWARE



GEOGRAPHIC DATA



(georeferenced database)



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GEOREFERENCED DATABASE

ATTRIBUTE DATA

SPATIAL DATA

Name: A14
Length: 743,4 km
Type: Highway

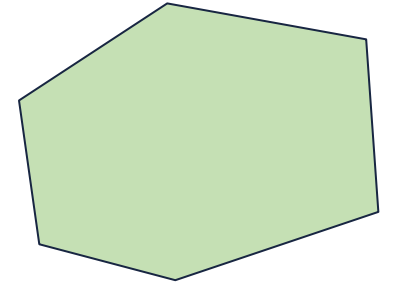
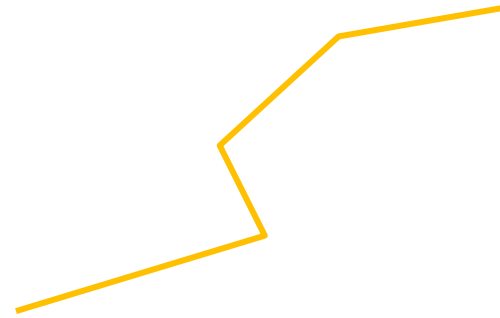


Vector

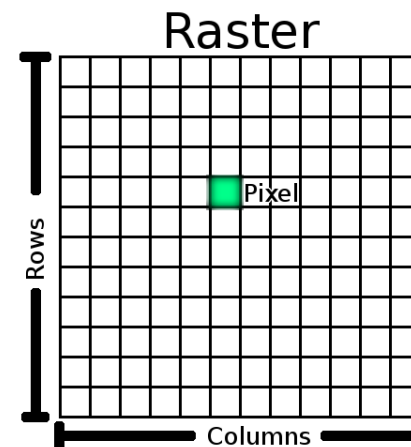
Raster

Two models of data format

- **Vector**



- **Raster**



Vector model: database (attribute data)

Com01012024_WGS84 — Elementi Totali: 7899, Filtrati: 7899, Selezionati: 0

COD_RIP	COD_REG	COD_PROV	COD_CM	COD_UTS	PRO_COM	PRO_COM_T	COMUNE	COMUNE_A	CC_UTS	Shape_Leng	Shape_Area
4982	4	13	68	1	68	68028 068028	Pescara	0	1	42729,5629454...	34416340,9292...
4983	1	3	19	0	19	19069 019069	Pescarolo ed Uniti	0	0	24642,1852484...	16543411,7906...
4984	4	13	66	0	66	66068 066068	Pescasseroli	0	0	50198,3029794...	91158495,7795...
	1	3	97	0	97	97068 097068	Pescate	0	0	7678,74634079...	2092676,36788...
	4	14	94	0	94	94031 094031	Pesche	0	0	16308,9285622...	12962535,4028...
	4	16	71	0	71	71038 071038	Peschici	0	0	42637,1463193...	49384568,1150...
4988	1	3	15	0	215	15171 015171	Peschiera Borromeo	0	0	28698,2447609...	23221281,2078...
4989	2	5	23	0	23	23059 023059	Peschiera del Garda	0	0	29496,7572875...	18259808,9780...
			47	0	47	47012 047012	Pescia	0			
			66	0	66	66069 066069	Pescina	0			
			62	0	62	62050 062050	Pesco Sannita	0			
			66	0	66	66070 066070	Pescocostanzo	0			
			94	0	94	94032 094032	Pescolanciano	0			
			76	0	76	76058 076058	Pescopagano	0			
			94	0	94	94033 094033	Pescopennataro	0			
			57	0	57	57049 057049	Pescorocchiano	0			
			68	0	68	68029 068029	Pescosansonesco	0			
4999	3	12	60	0	60	60049 060049	Pescosolido	0	0	29444,1394382...	44888921,7612...
5000	1	3	15	0	215	15172 015172	Pessano con Borna...	0	0	16180,3492204...	6662670,77075...
5001	1	3	19	0	19	19070 019070	Pessina Cremonese	0	0	31174,0297975...	22016666,6900...

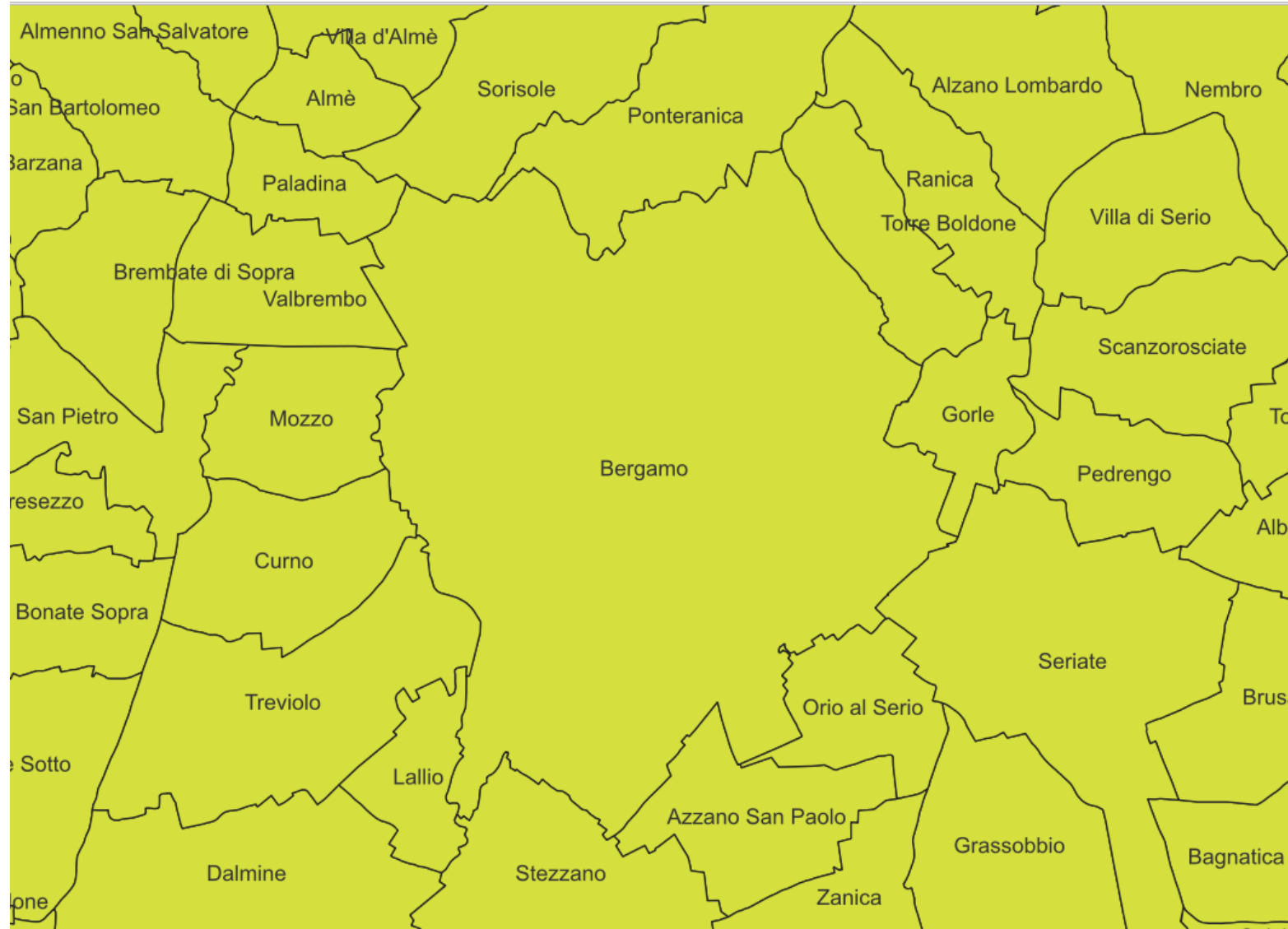
Fields (columns)

Record (lines)

Each LINE in the table (record) represents an object or vector data (point, line or polygon, therefore a city, a river, a region, etc.) with its precise spatial location

Each COLUMN represents alphanumeric data that informs us about a particular attribute (name, type, extension, length, inhabitants, qualification, etc.) of the georeferenced object

Vector model: geometry (spatial data)



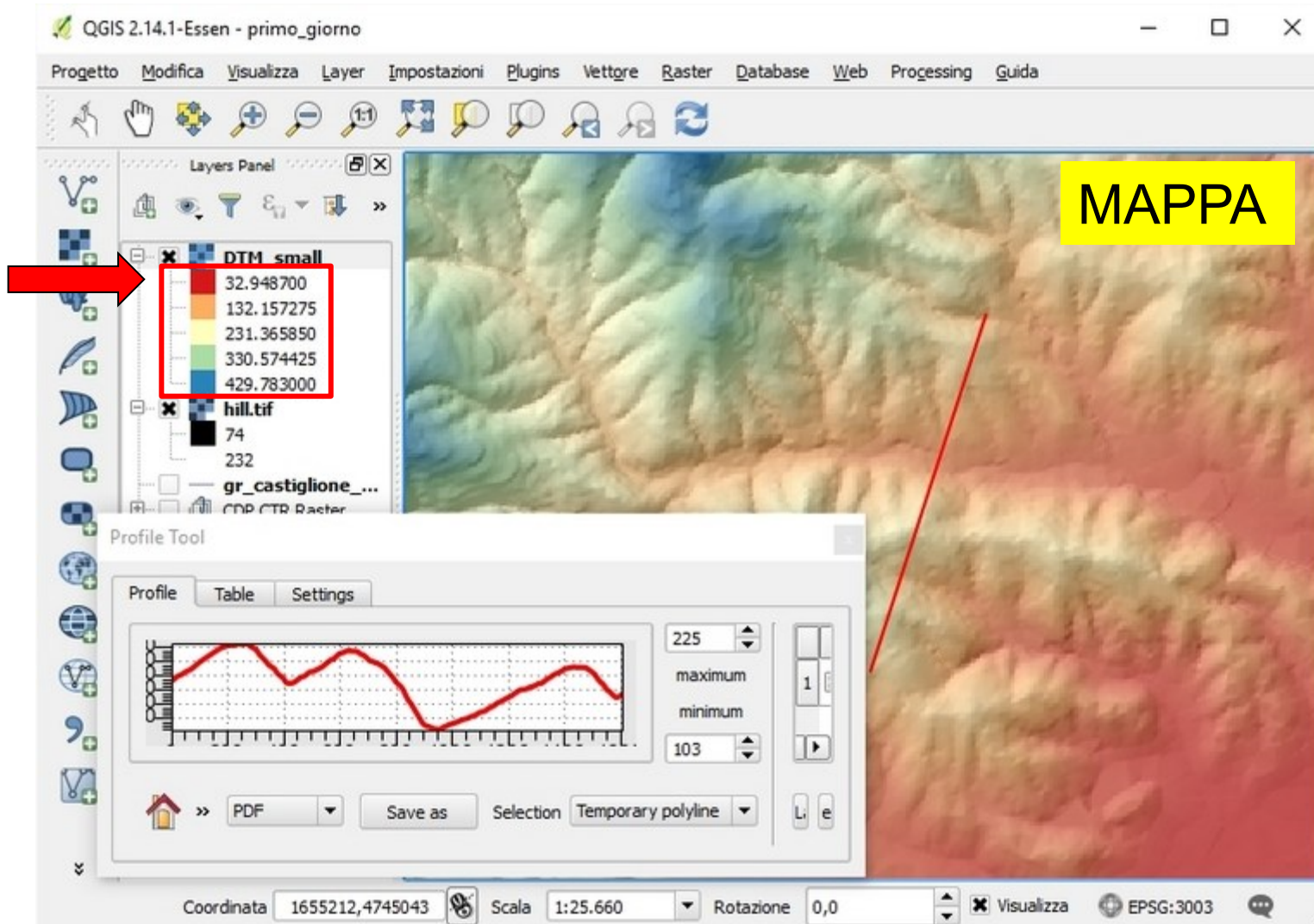
Raster model: geometry (spatial data)



Raster model: geometry (spatial data)

Digital Terrain Model (DTM) -> altimetry

Attribute data:
every pixel
contains data
about altitude



GEOGRAPHIC DATA

DATA: what is stored in the database; recording the description of any characteristic of reality which however requires interpretation to produce knowledge.

INFORMATION: what is recalled from the database; result of the interpretation of the data which involves the change in the subject's knowledge.



2. Tools: the QGIS software

The logo for QGIS software, featuring the letters 'QGIS' in a bold, green, sans-serif font. The letter 'Q' is stylized with a 3D effect, showing a white outline and a green fill, with a small orange and yellow cube-like shape integrated into its center. The letters 'G', 'I', and 'S' are solid green.

to download QGIS go to
www.qgis.org



QGIS

Tempo rimanente fino al prossimo rilascio 2024-04-19 12:00:00 UTC 9d 19h 28m

Un Sistema di Informazione Geografica Libero e Open Source

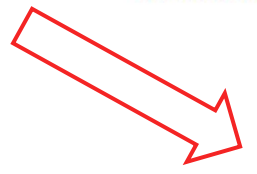


QGIS 3.36 Maidenhead
has been released!

Nuova versione: 3.36!
Ottieni [l'installatore](#) o [i pacchetti](#) per il tuo Sistema Operativo e leggi [l'elenco dei cambiamenti](#).

Crea, modifica, visualizza, analizza e pubblica informazioni geospaziali su Windows, macOS, Linux, BSD e dispositivi mobili

Per il tuo desktop, server, nel tuo browser web e come librerie per sviluppatori



Scarica adesso

Supporta QGIS



Scarica QGIS per il tuo Sistema Operativo

I pacchetti binari (installatori) possono essere scaricati da questa pagina.

La versione attuale di QGIS è la 3.36.1 'Maidenhead' ed è stata rilasciata il 22.03.2024.

I repository a lungo termine attualmente offrono QGIS 3.34.5 'Prizren'.

QGIS è disponibile per Windows, macOS, Linux, Android e iOS.

DOWNLOAD DELLE INSTALLAZIONI

TUTTE LE VERSIONI

SORGENTI

Scarica per Windows



Scarica QGIS 3.36

Stai cercando la versione più stabile? [Scarica QGIS 3.34 LTR](#)



Programma di Installazione di Rete OSGeo4W

Il programma di installazione OSGeo4W è raccomandato per gli utenti regolari o per la distribuzione in organizzazioni. *Esso permette di*

VECTOR DATA: SHAPEFILE




The shapefile is the standard for vector data -> it allows interoperability between different software

A shapefile is not made up of a single file but of a group of at least 3 files: **.shp, .dbf, .shx**

The absence of one of **.shp, .shx or .dbf** files prevents the shapefile from opening in GIS software






VECTOR DATA: SHAPEFILE

Nome	Ultima modifica	Tipo
 Province_2017	10/04/2017 15:28	File DBF
 Province_2017.shp	10/04/2017 15:28	File SHP
 Province_2017.shx	10/04/2017 15:28	File SHX






VECTOR DATA: SHAPEFILE

Nome	Ultima modifica	Tipo
 Province_2017	10/04/2017 15:28	File DBF
 Province_2017.shp	10/04/2017 15:28	File SHP
 Province_2017.shx	10/04/2017 15:28	File SHX








VECTOR DATA: SHAPEFILE

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 Province_2017	10/04/2017 15:28	File DBF
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 Province_2017.shx	10/04/2017 15:28	File SHX








VECTOR DATA: SHAPEFILE

Nome	Ultima modifica	Tipo
 Province_2017	10/04/2017 15:28	File PRJ
 Province_2017.sbn	10/04/2017 15:28	File SBN
 Province_2017.sbx	10/04/2017 15:28	File SBX
 Province_2017.cpg	10/04/2017 15:28	File CPG
 Province_2017.shp	10/04/2017 15:28	Documento XML



VECTOR DATA: SHAPEFILE

Nome	Ultima modifica	Tipo
 Province_2017	10/04/2017 15:28	File PRJ
 Province_2017.sbn	10/04/2017 15:28	File SBN
 Province_2017.sbx	10/04/2017 15:28	File SBX
 Province_2017.cpg	10/04/2017 15:28	File CPG
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