EVENTO INFORMATIVO-DIVULGATIVO / *STROKOVNO IZOBRAŽEVANJE NA TEMO*

LE ACQUE DELLA PIANURA ISONTINA
VODE SOŠKEGA ALUVIJA

IDROGEOLOGIA DELLA PIANURA ISONTINA / HIDROGEOLOGIJA SOŠKE NIŽINE

Francesco Treu

Dipartimento di Matematica e Geoscienze

Trieste, 14.3.2014

dipartimento di matematica e geoscienze

UNIVERSITÀ DEGLI STUDI DI TRIESTE

GEP

2007-2013

cooperazione territoriale europea
programma per la cooperazione transfrontaliera
Italia-Slovenia

evropsko teritorialno sodelovanje
program čezmejnega sodelovanja
Slovenija-Italija

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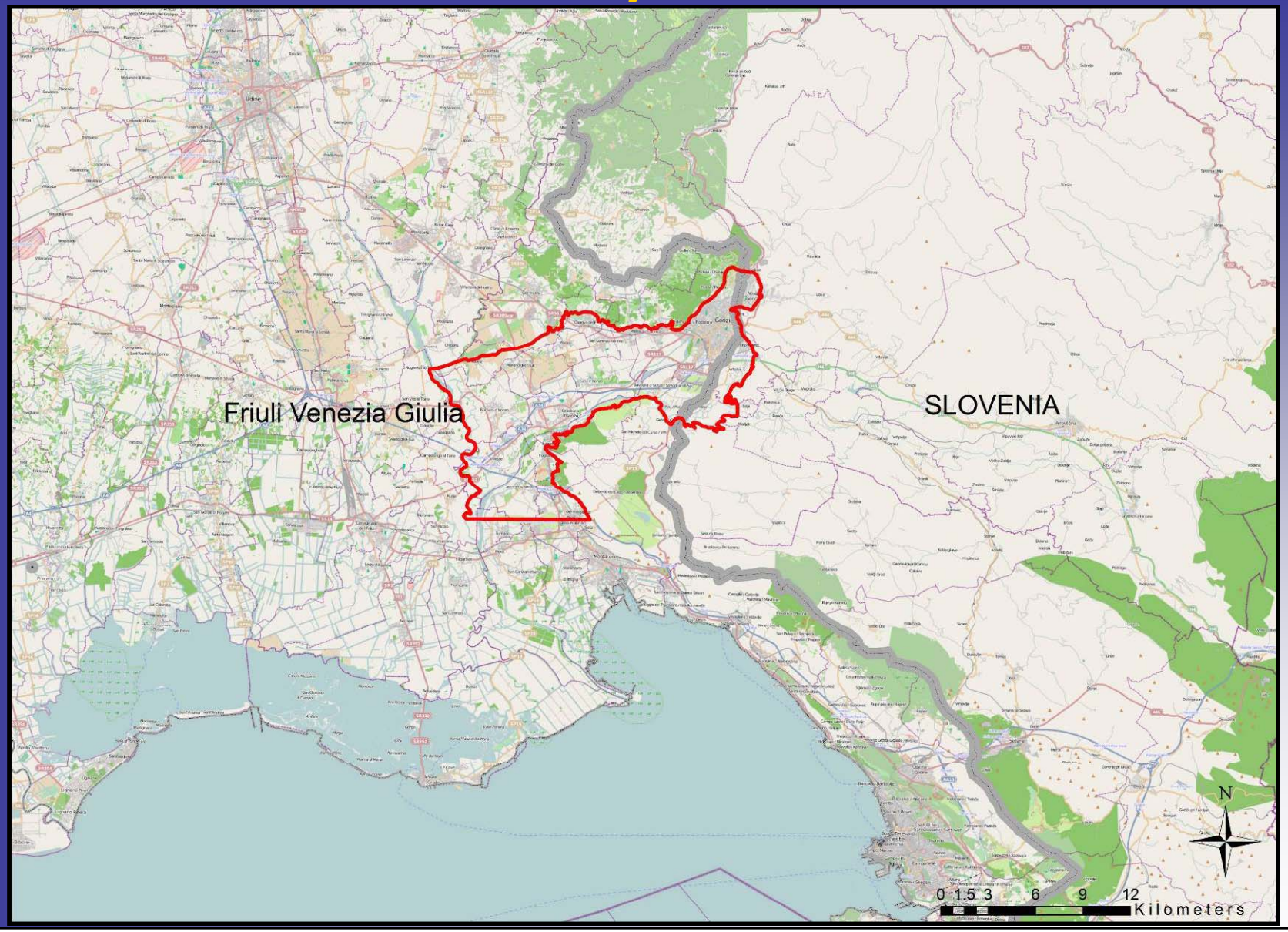
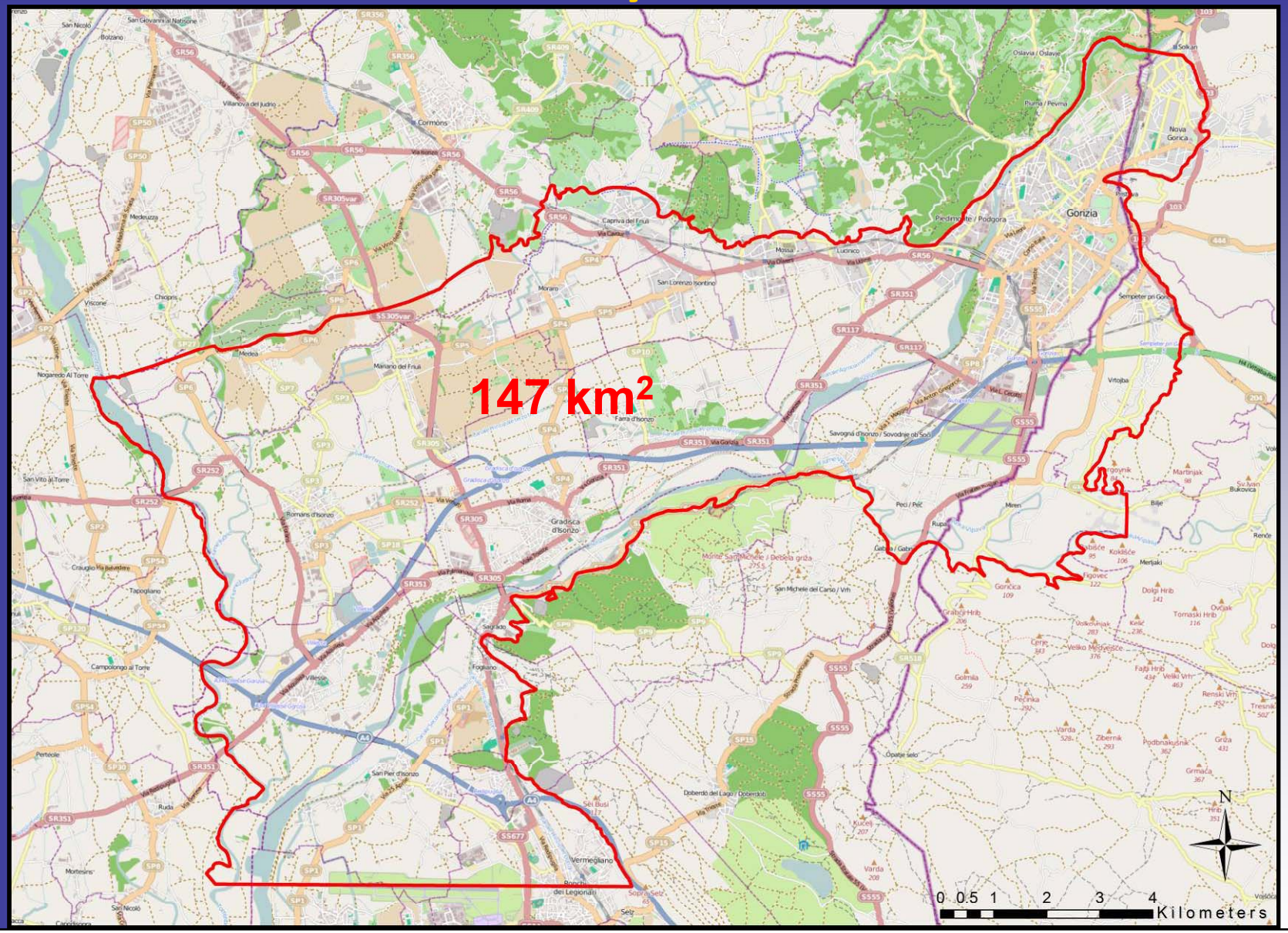
Progetto cofinanziato dal Fondo europeo di sviluppo regionale

Projekt sofinancira Evropski sklad za regionalni razvoj

Study area

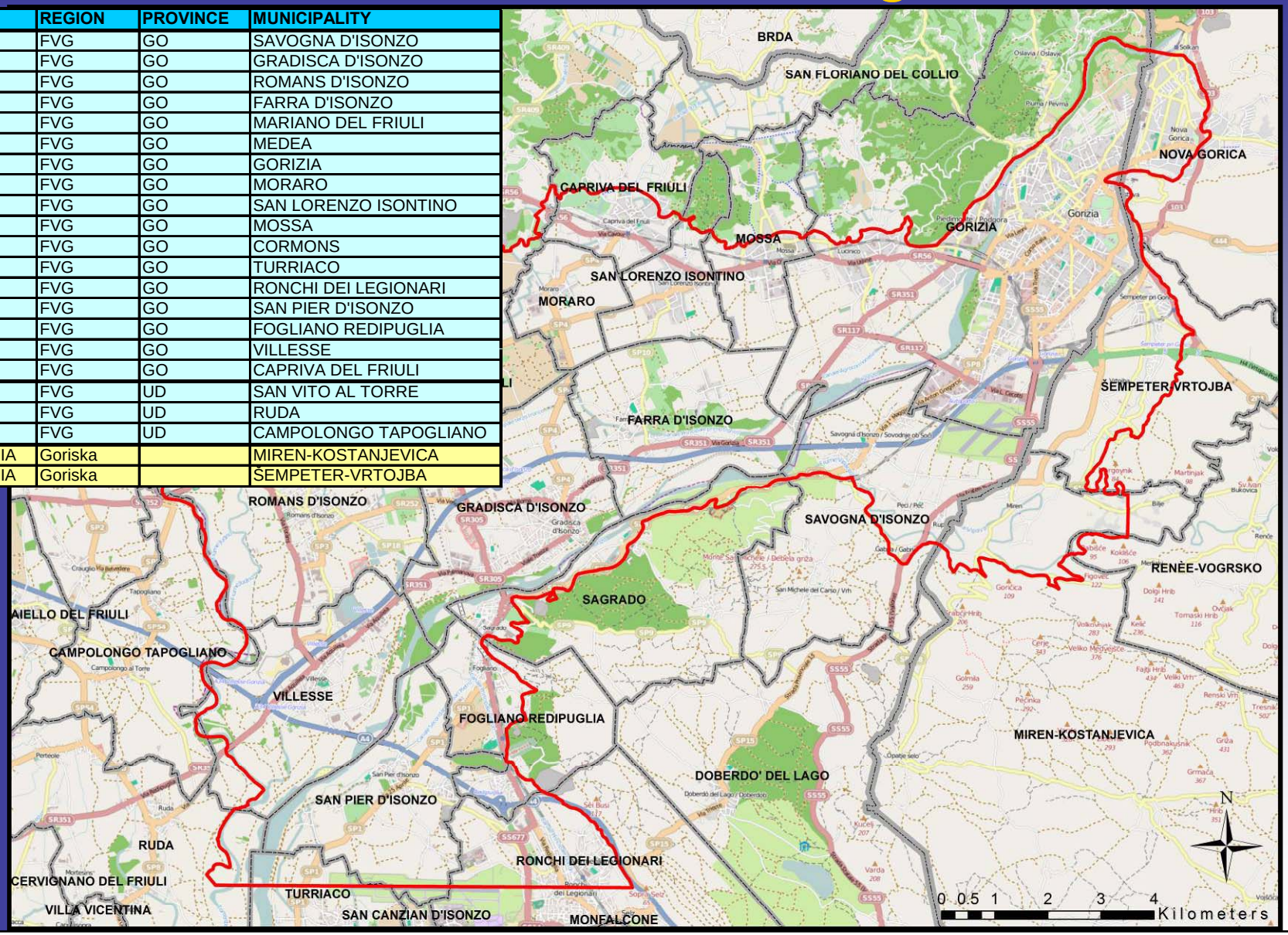


Study area



Administrative setting

NATION	REGION	PROVINCE	MUNICIPALITY
ITALY	FVG	GO	SAVOGNA D'ISONZO
ITALY	FVG	GO	GRADISCA D'ISONZO
ITALY	FVG	GO	ROMANS D'ISONZO
ITALY	FVG	GO	FARRA D'ISONZO
ITALY	FVG	GO	MARIANO DEL FRIULI
ITALY	FVG	GO	MEDEA
ITALY	FVG	GO	GORIZIA
ITALY	FVG	GO	MORARO
ITALY	FVG	GO	SAN LORENZO ISONTINO
ITALY	FVG	GO	MOSSA
ITALY	FVG	GO	CORMONS
ITALY	FVG	GO	TURRIACO
ITALY	FVG	GO	RONCHI DEI LEGIONARI
ITALY	FVG	GO	SAN PIER D'ISONZO
ITALY	FVG	GO	FOGLIANO REDIPUGLIA
ITALY	FVG	GO	VILLESSE
ITALY	FVG	GO	CAPRIVA DEL FRIULI
ITALY	FVG	UD	SAN VITO AL TORRE
ITALY	FVG	UD	RUDA
ITALY	FVG	UD	CAMPOLONGO TAPOGLIANO
SLOVENIA	Goriska		MIREN-KOSTANJEVICA
SLOVENIA	Goriska		ŠEMPETER-VRTOJBA



VAROVANJE VIROV PITNE VODE V IZREDNIH DOGODKIH / *VODE SOŠKEGA ALUVIJA*

Evento informativo-divulgativo/Strokovno izobraževanje

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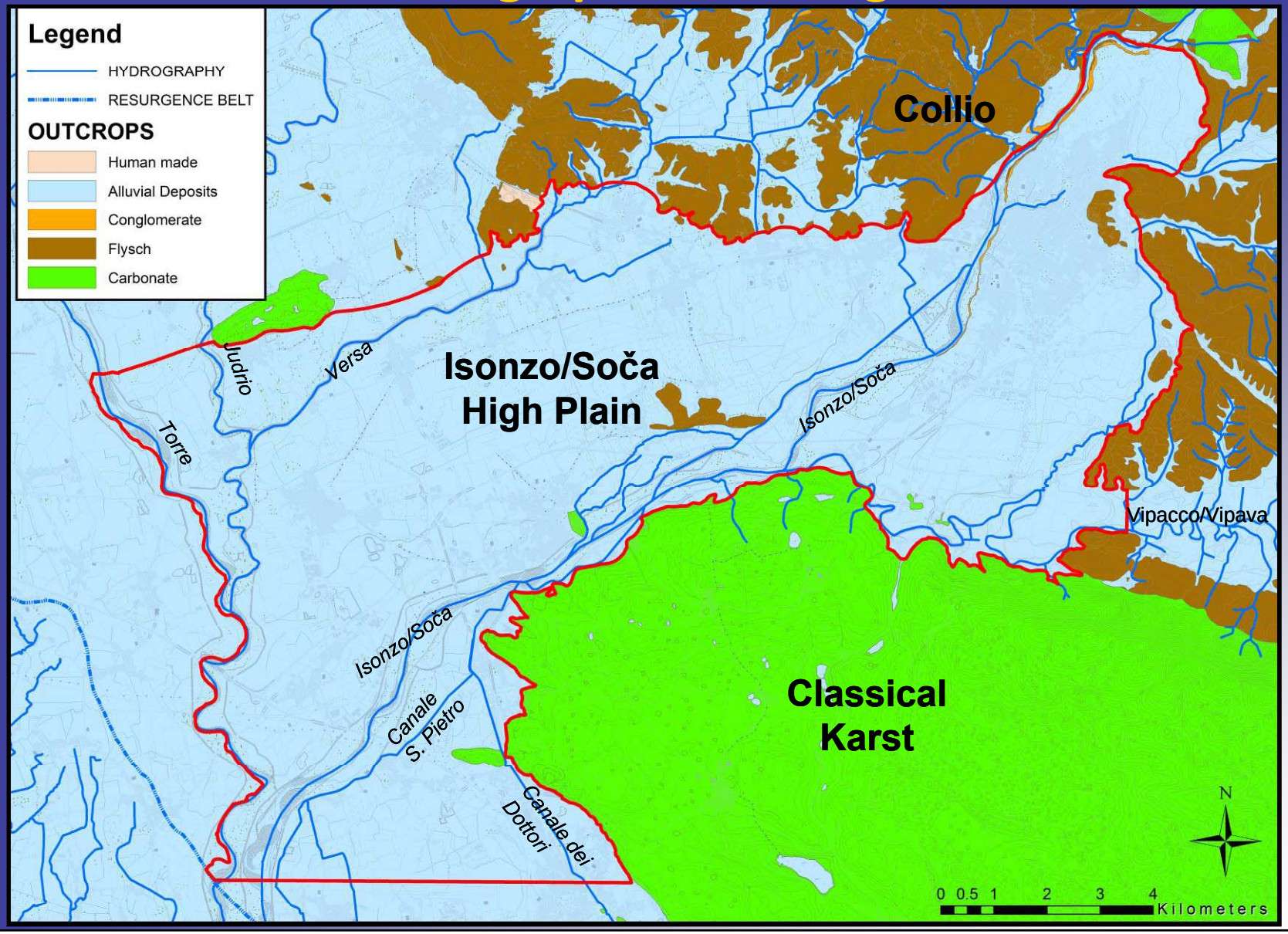
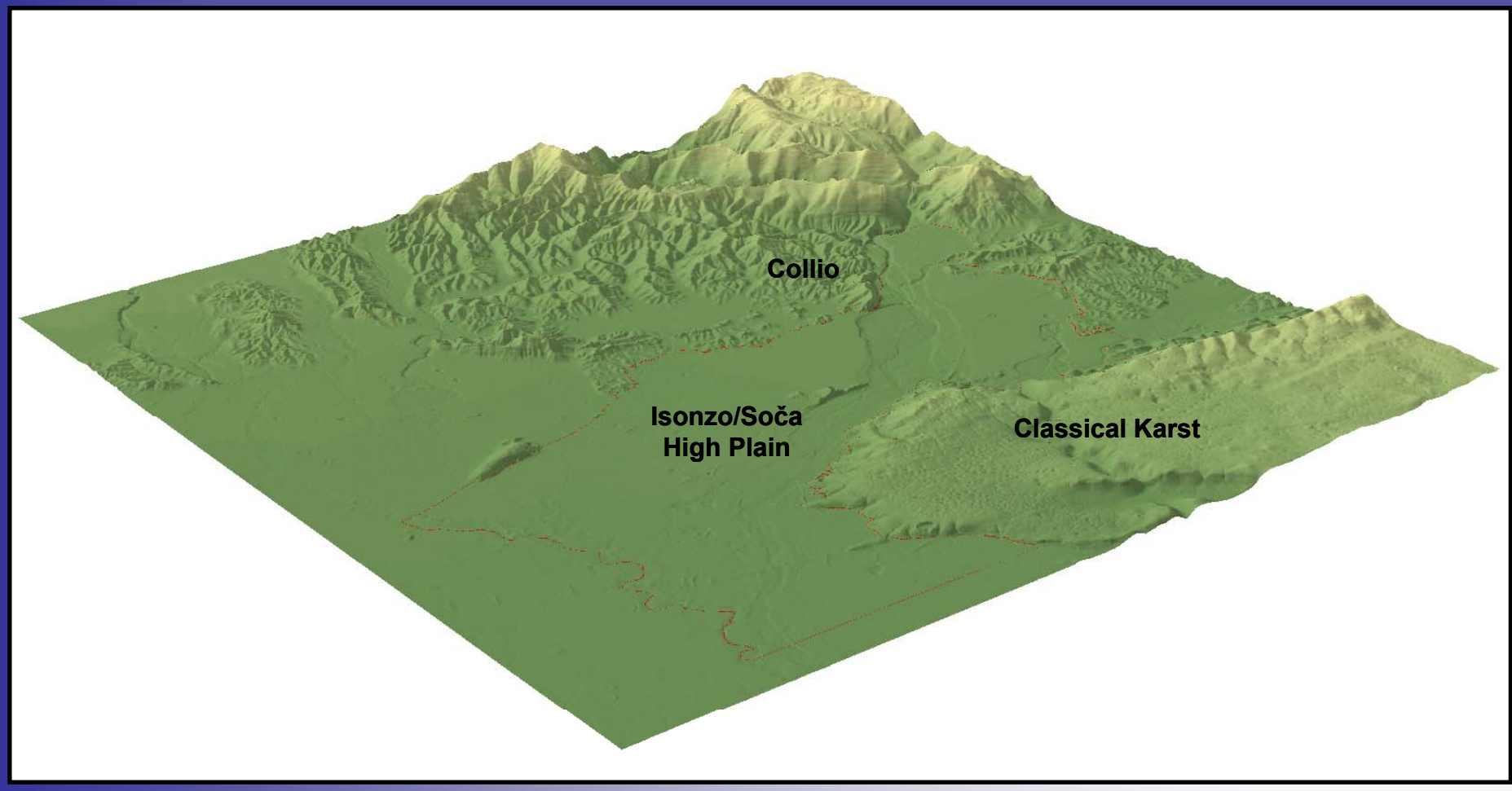
GEP

Italia-Slovenia 2007 FESR
Slovenija-Italija 2013 FESR

Geographical setting

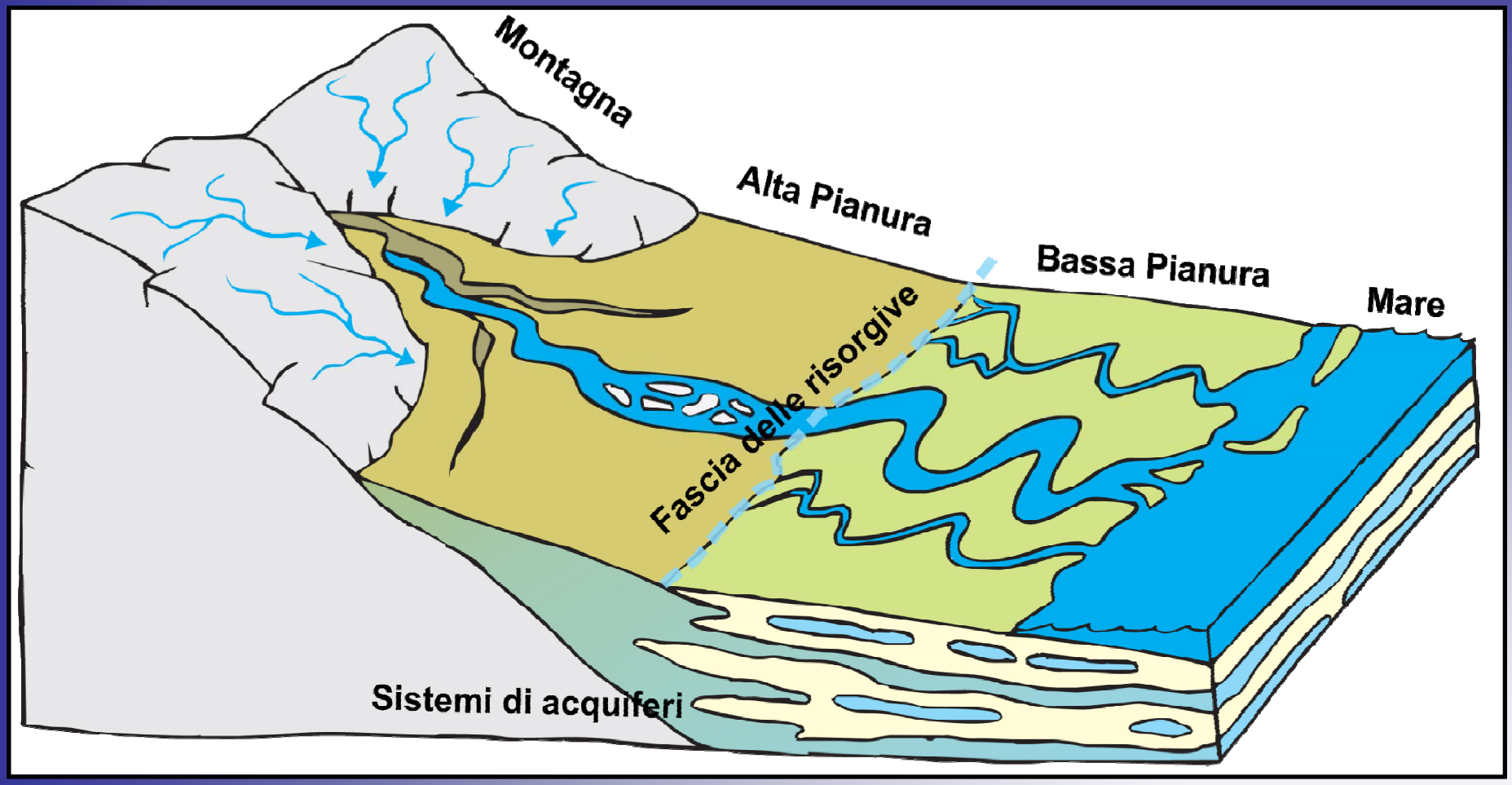


DEM (vertical exaggeration 2x)

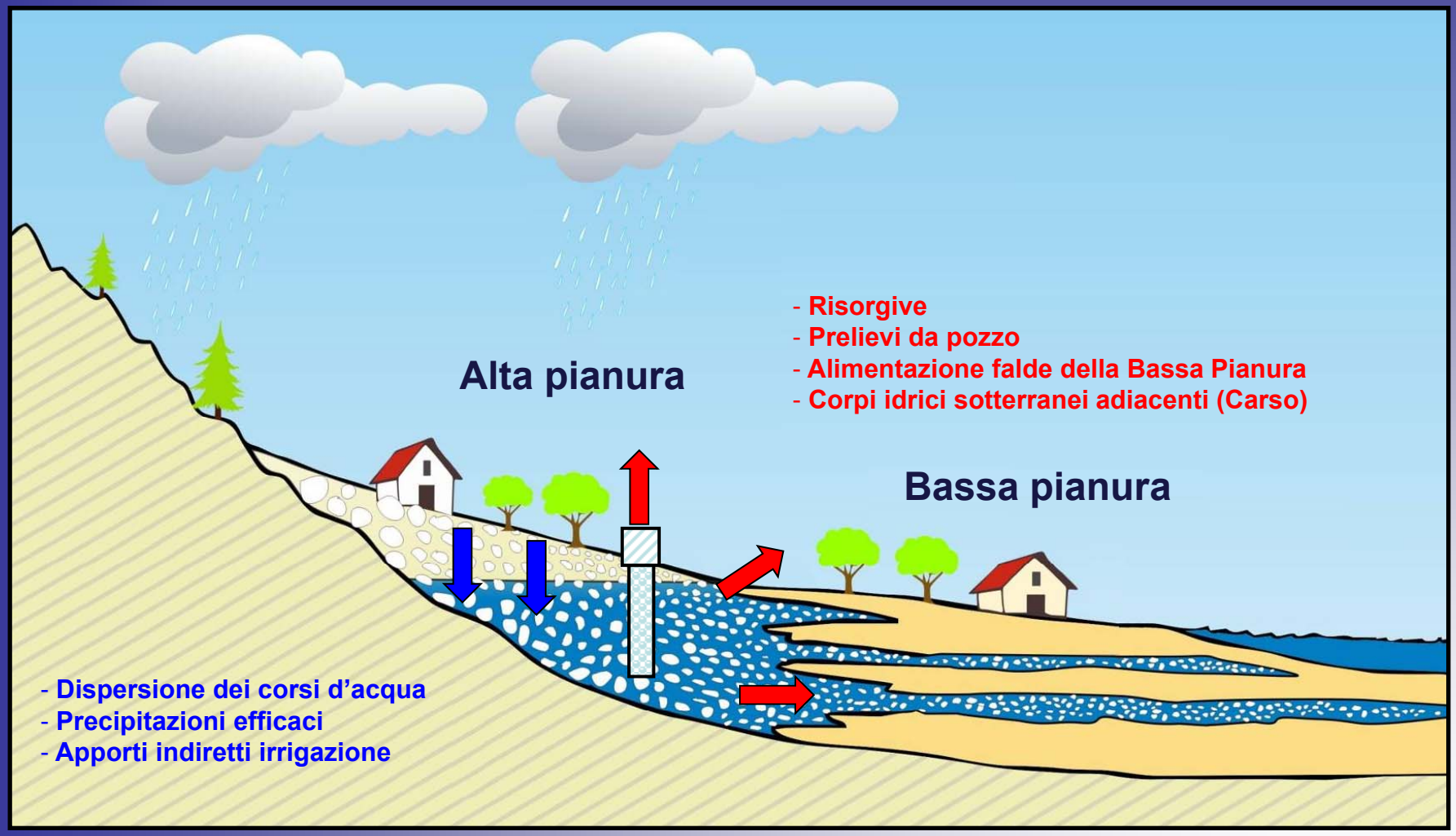


Physiogeographical setting

Hydrogeological setting



Hydrogeological setting



Hydrogeological balance

INPUT

RIVER LOSING

UNDERGROUND WATERS

IRRIGATION RETURN FLOW AND INFILTRATION

OUTPUT

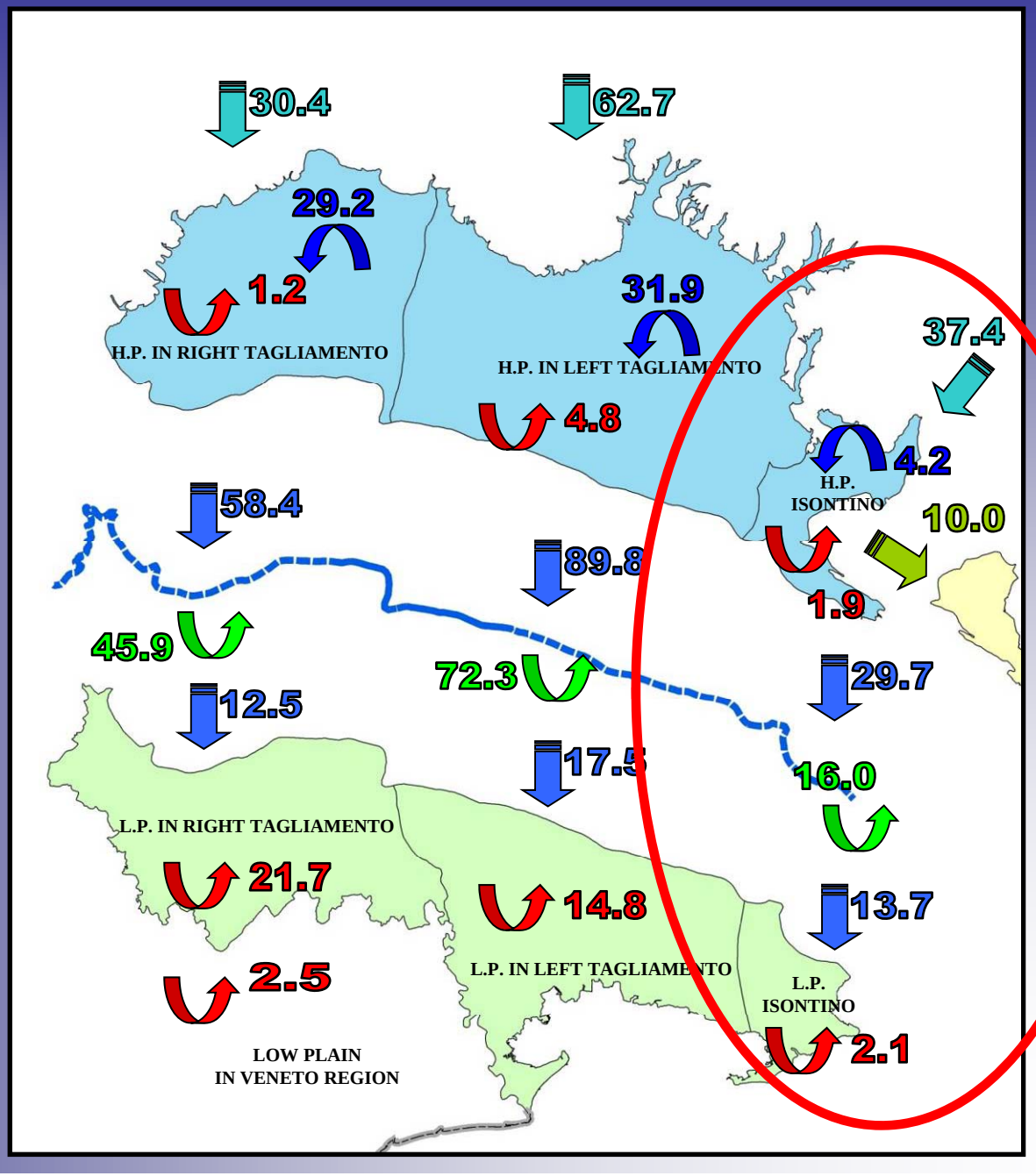
WELL WITHDRAWALS

RESURGENCE BELT DISCHARGE

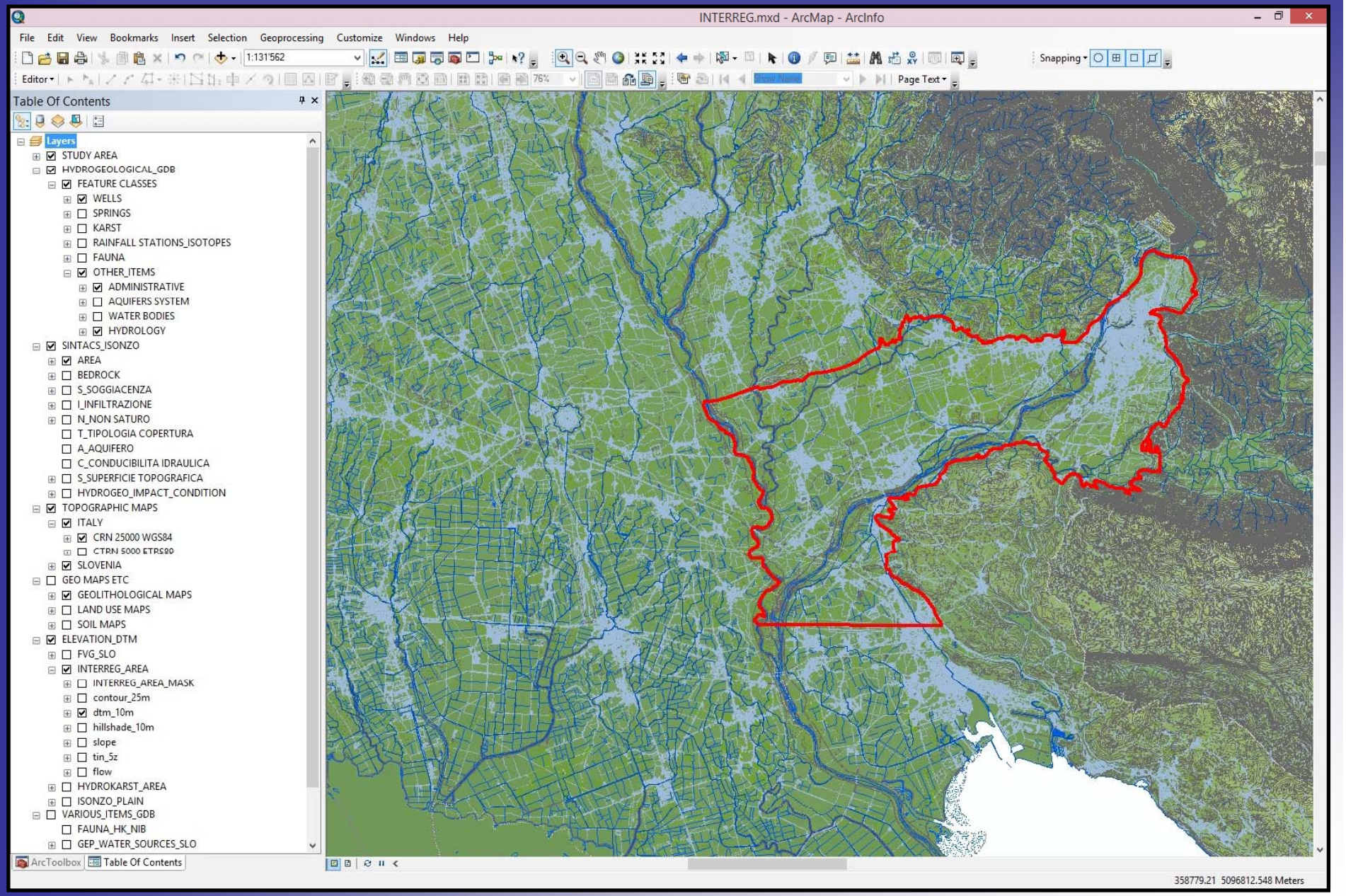
KARST DRAINAGE

NOTE:

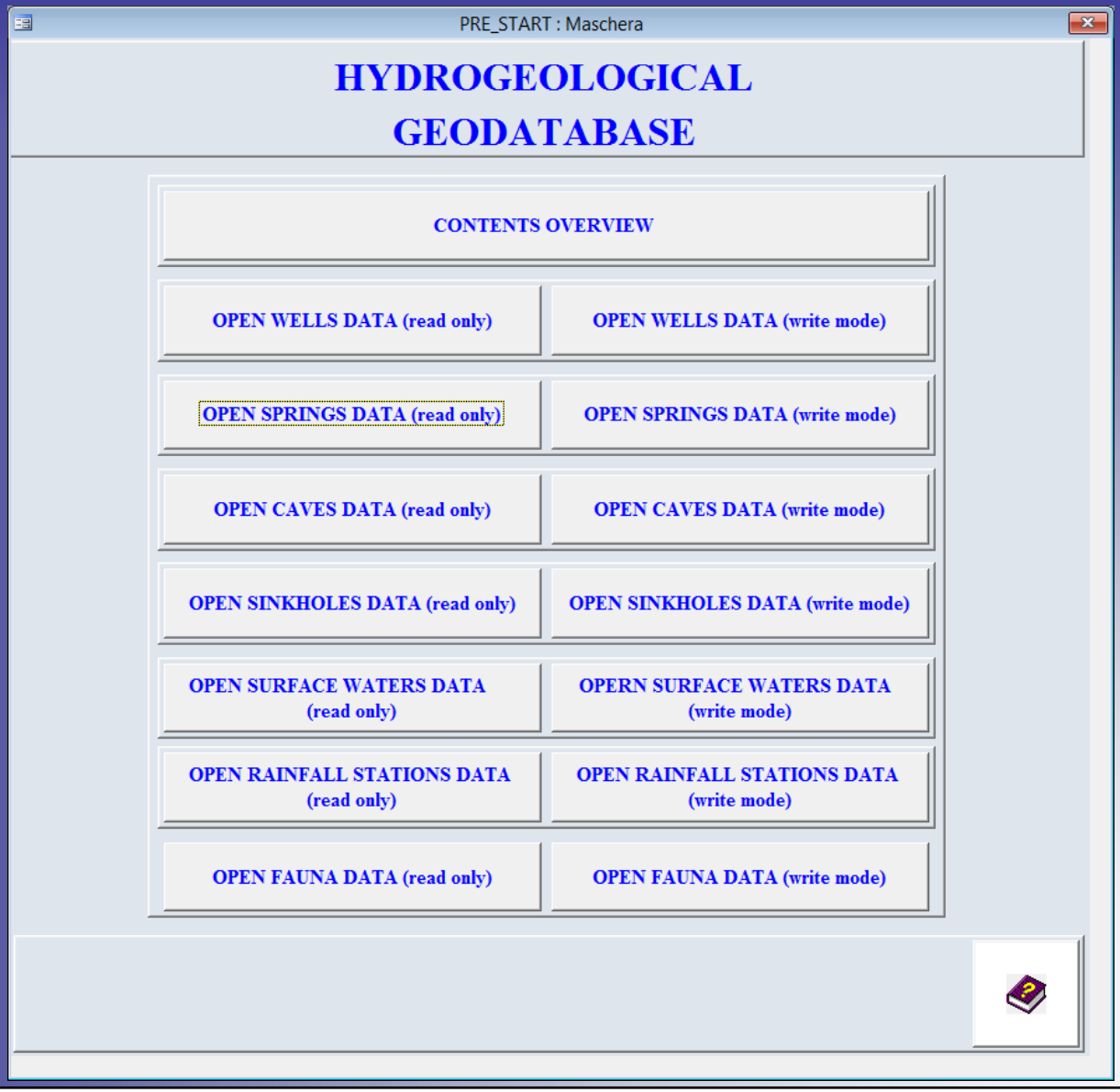
LOW PLAIN WELLS WITHDRAWALS REFER ONLY TO THE CONFINED AQUIFERS



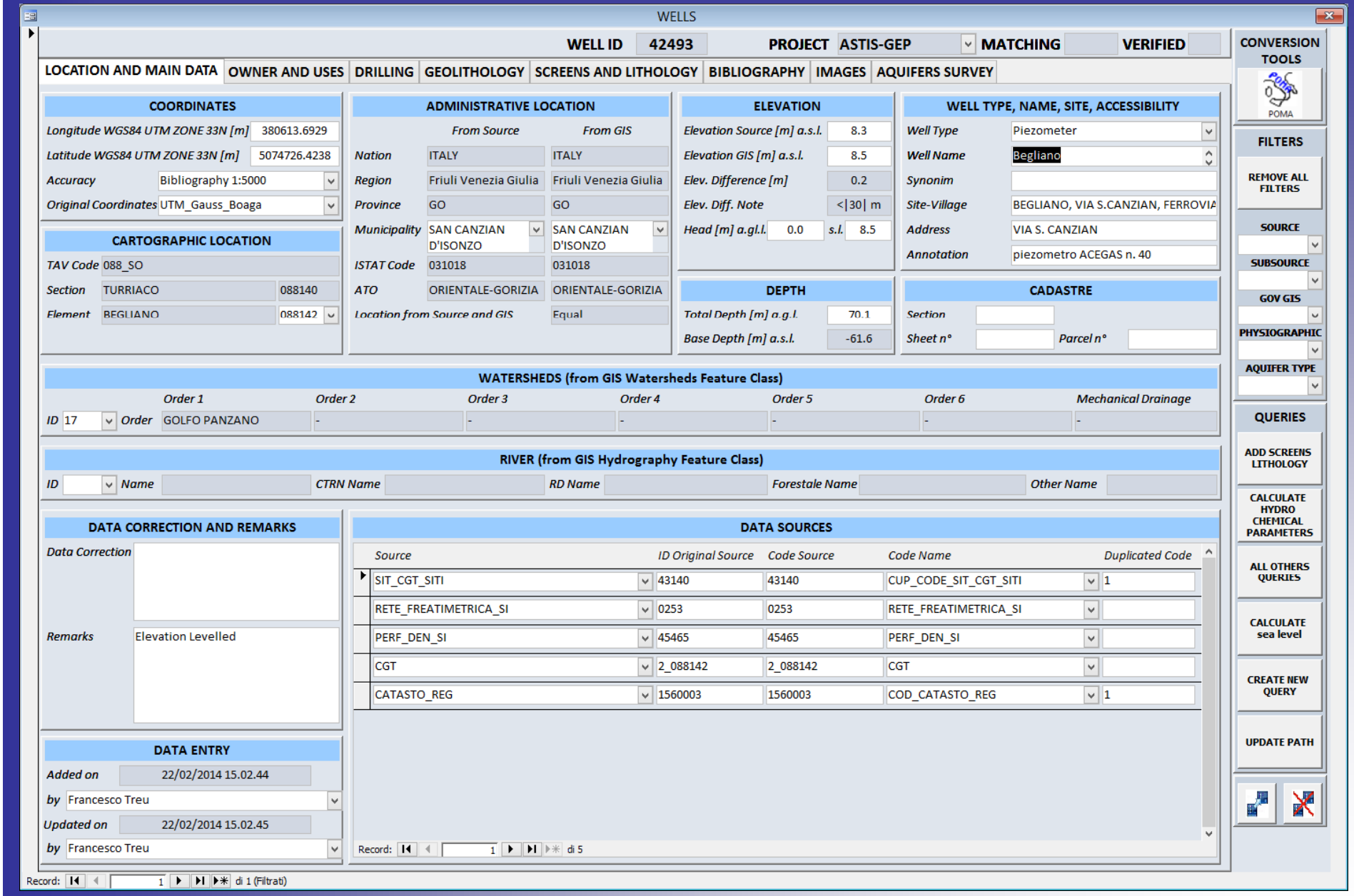
The GIS Project and the Geodatabases



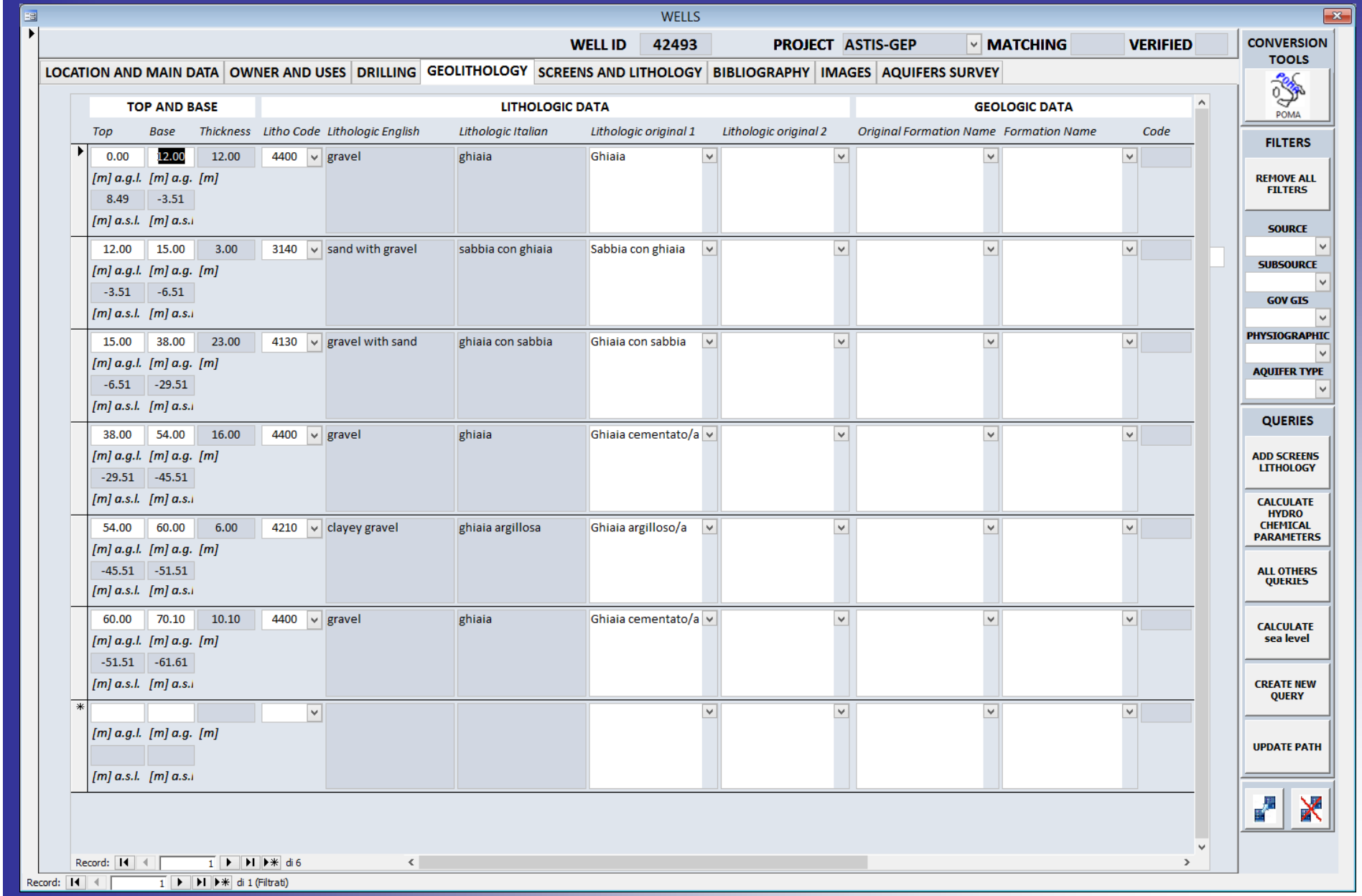
The Hydrogeological Geodatabase



The Hydrogeological Geodatabase



The Hydrogeological Geodatabase



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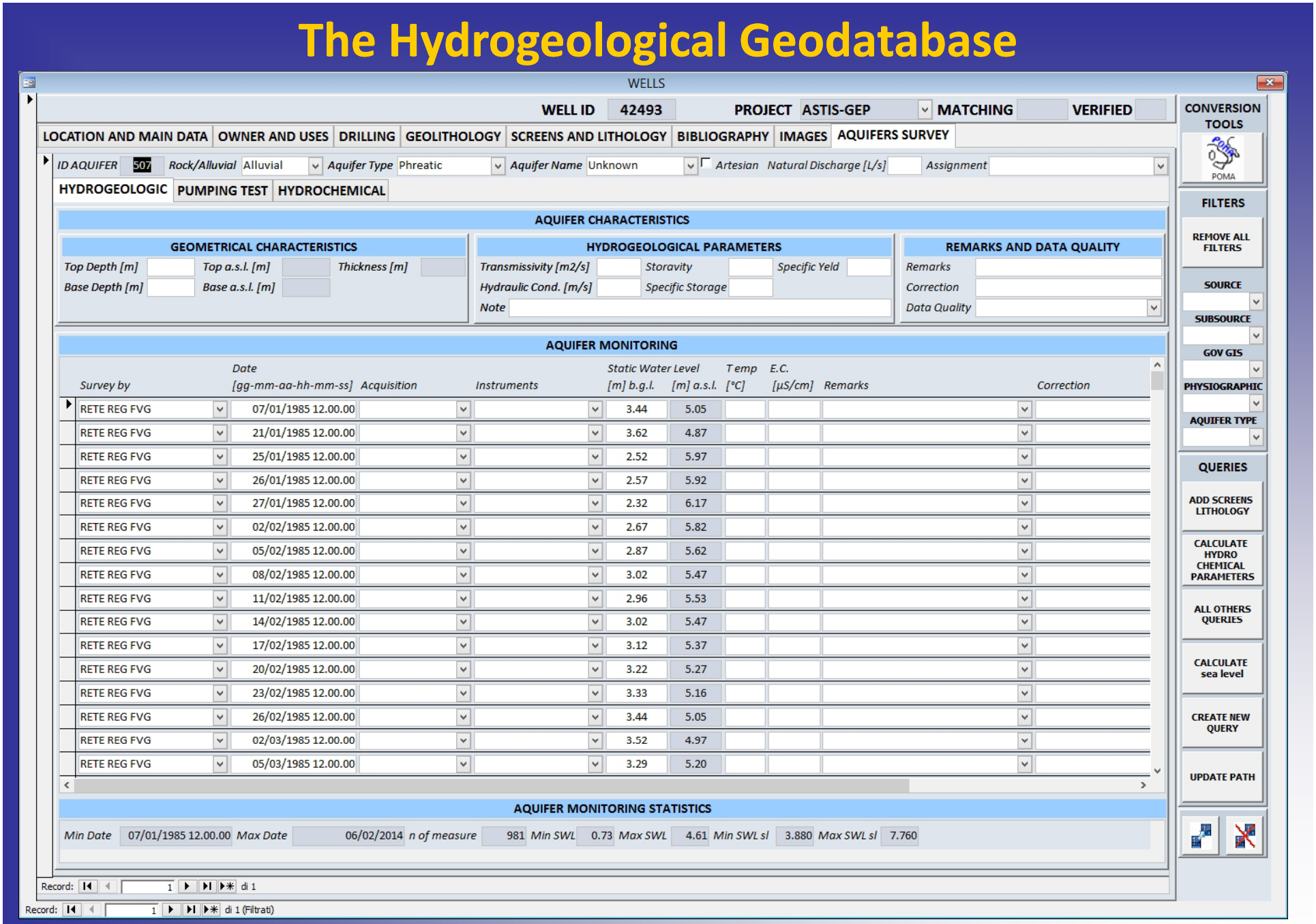

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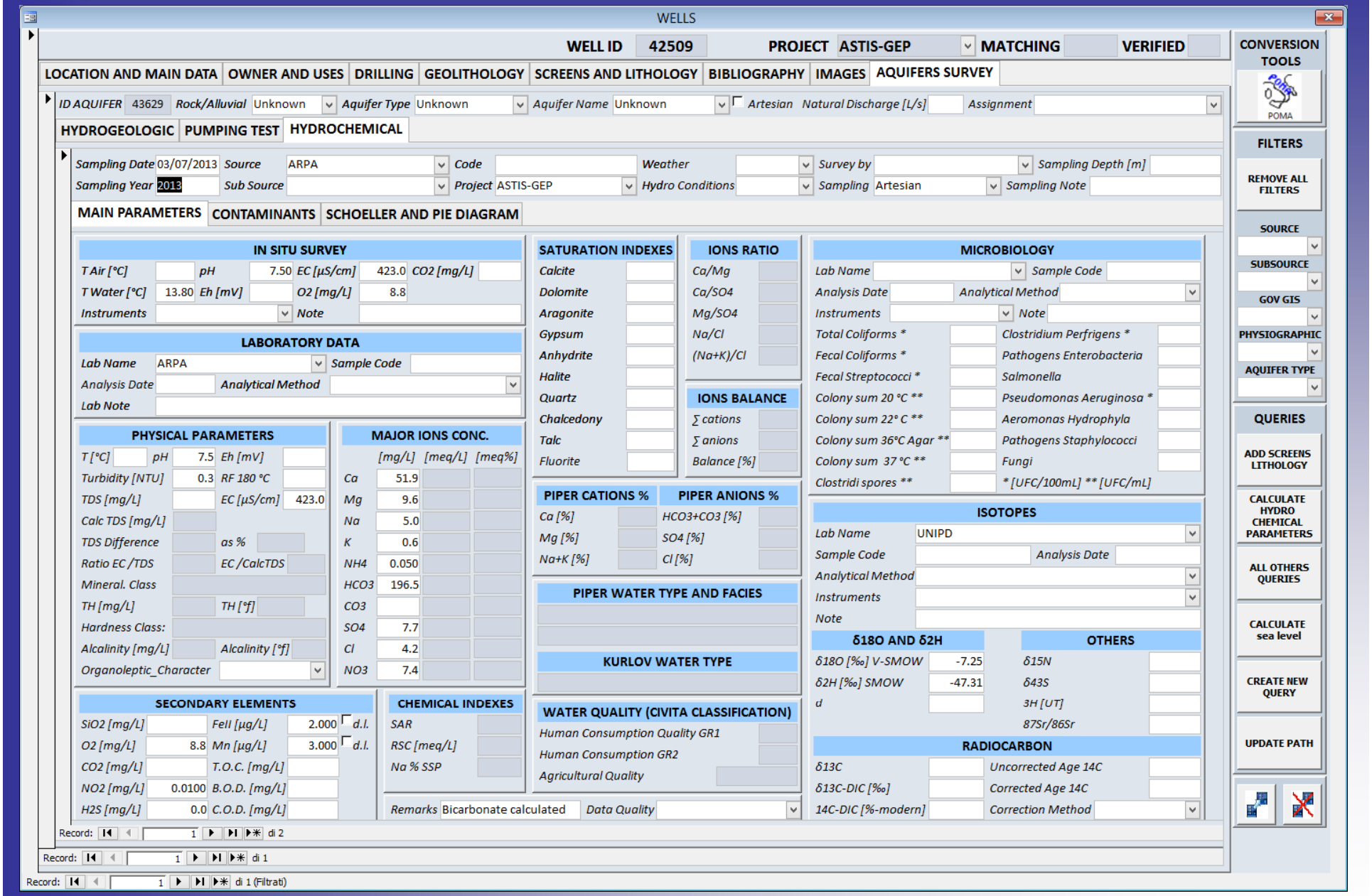

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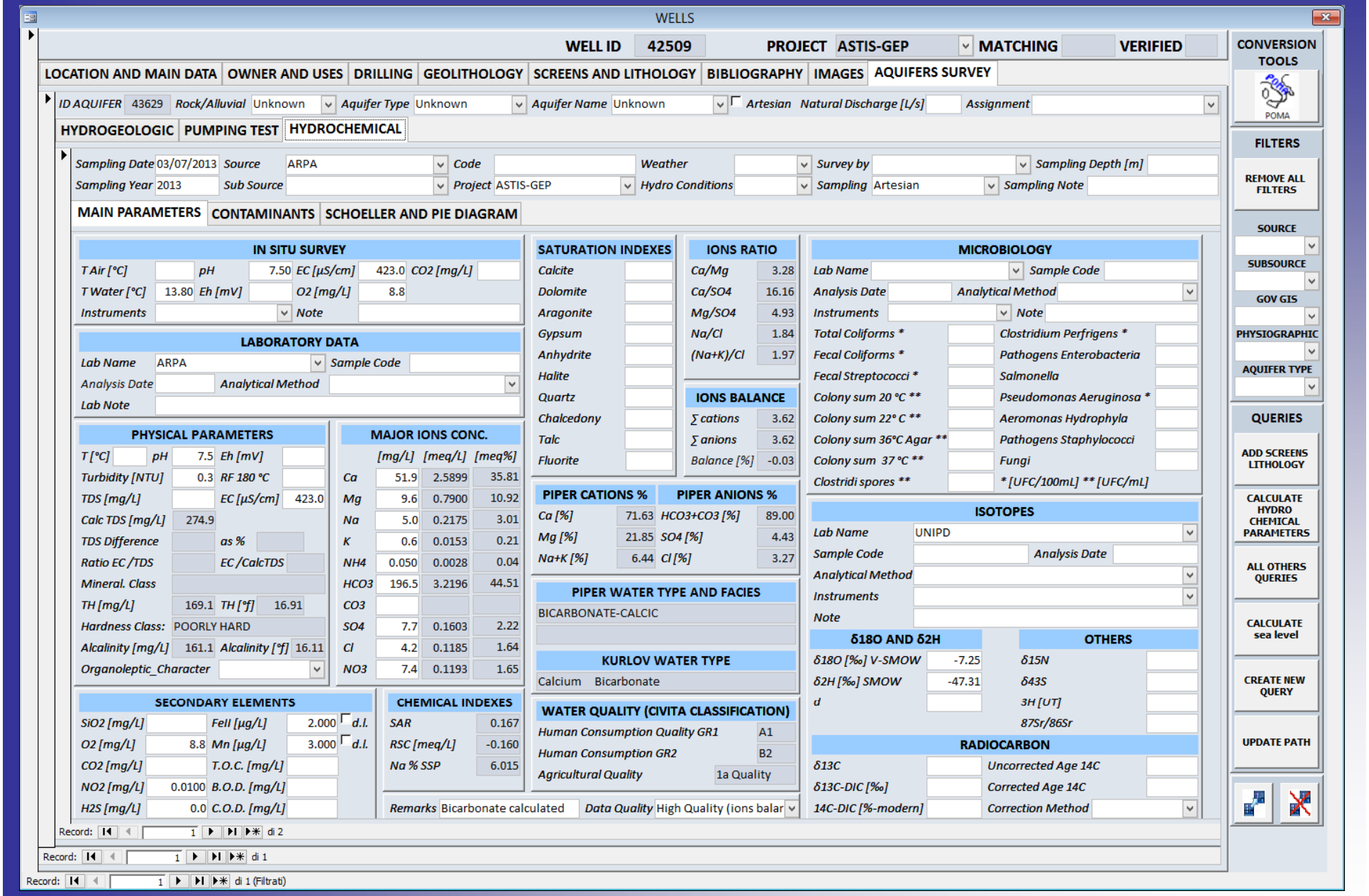

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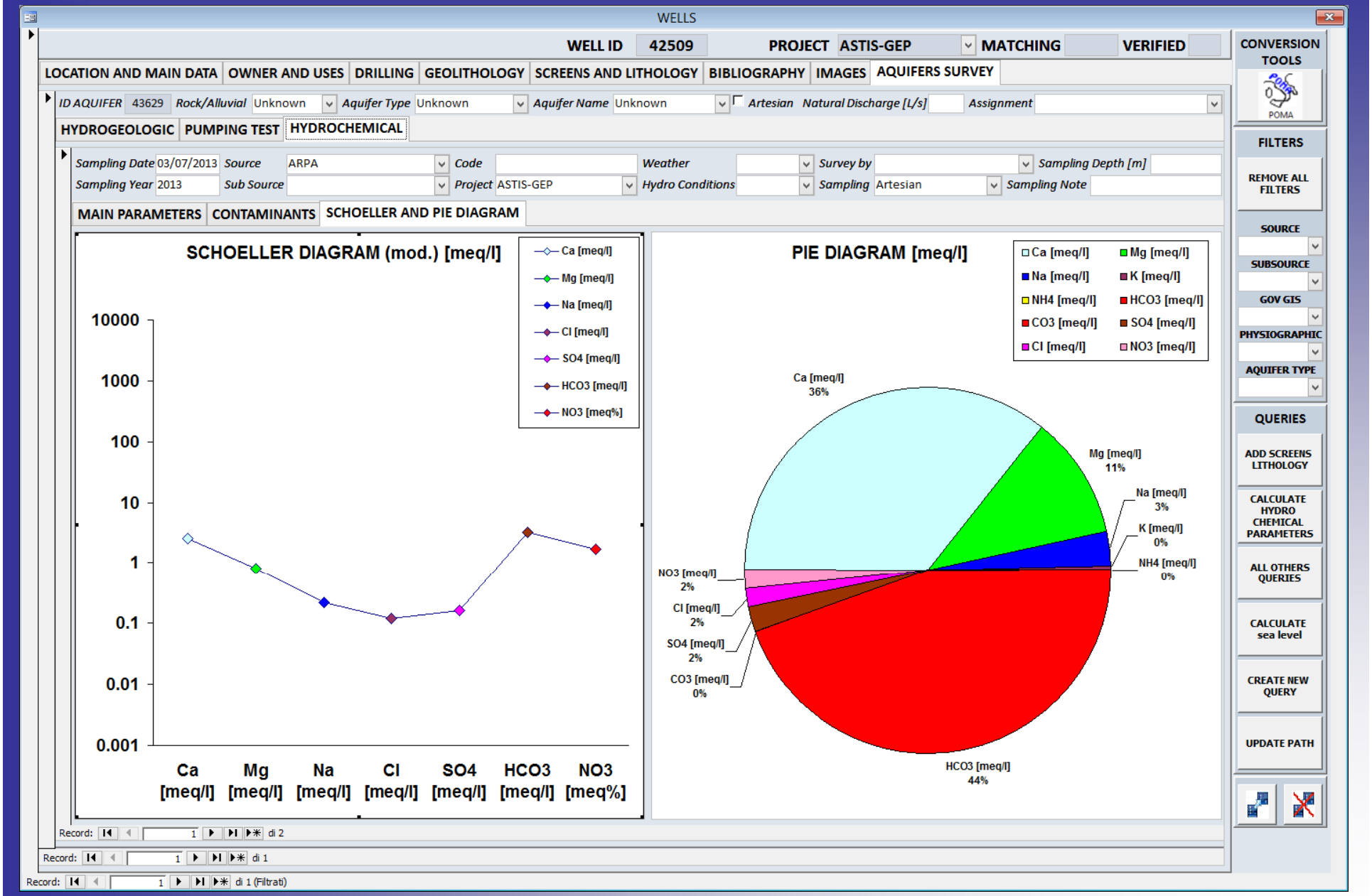
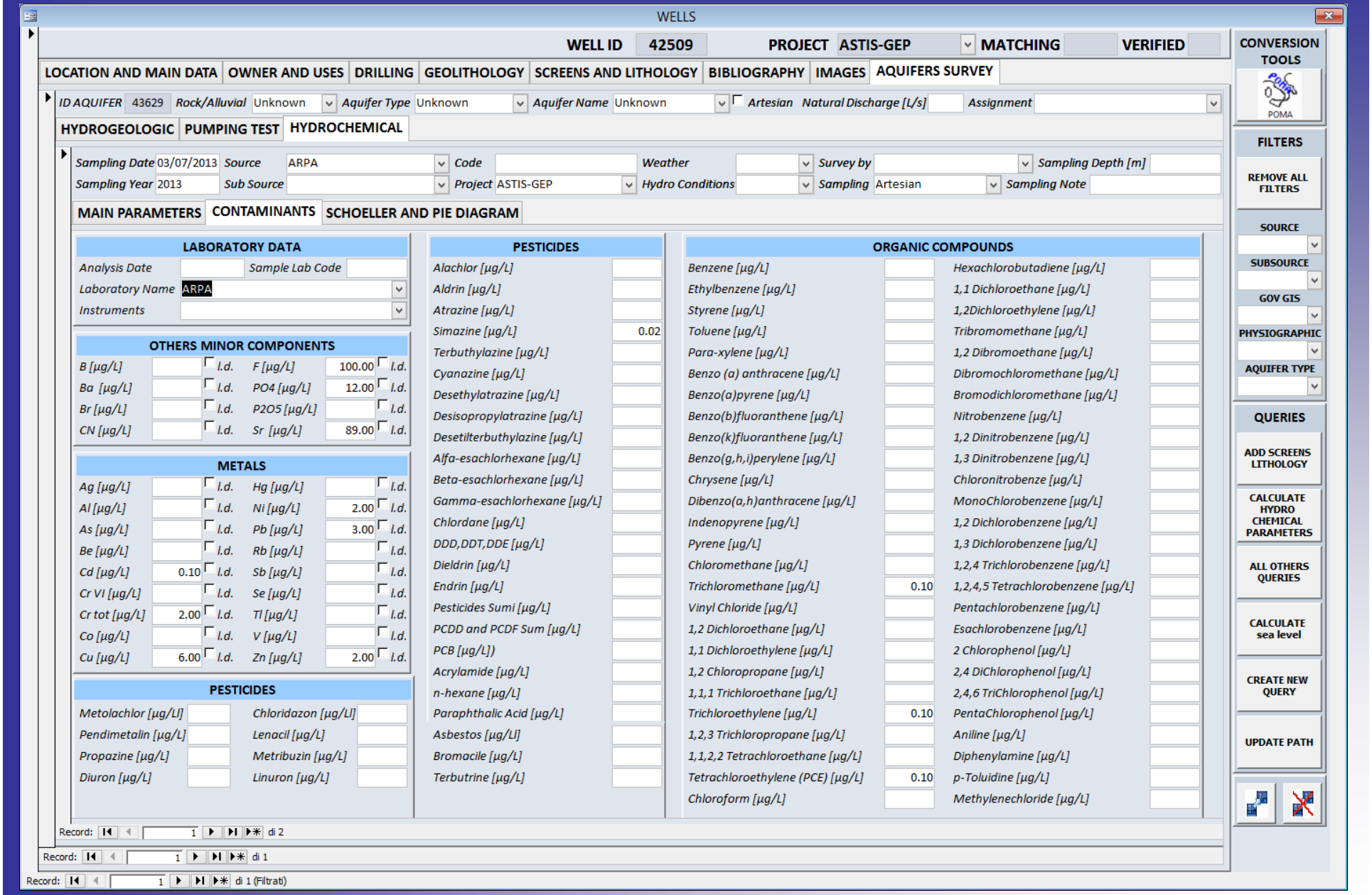
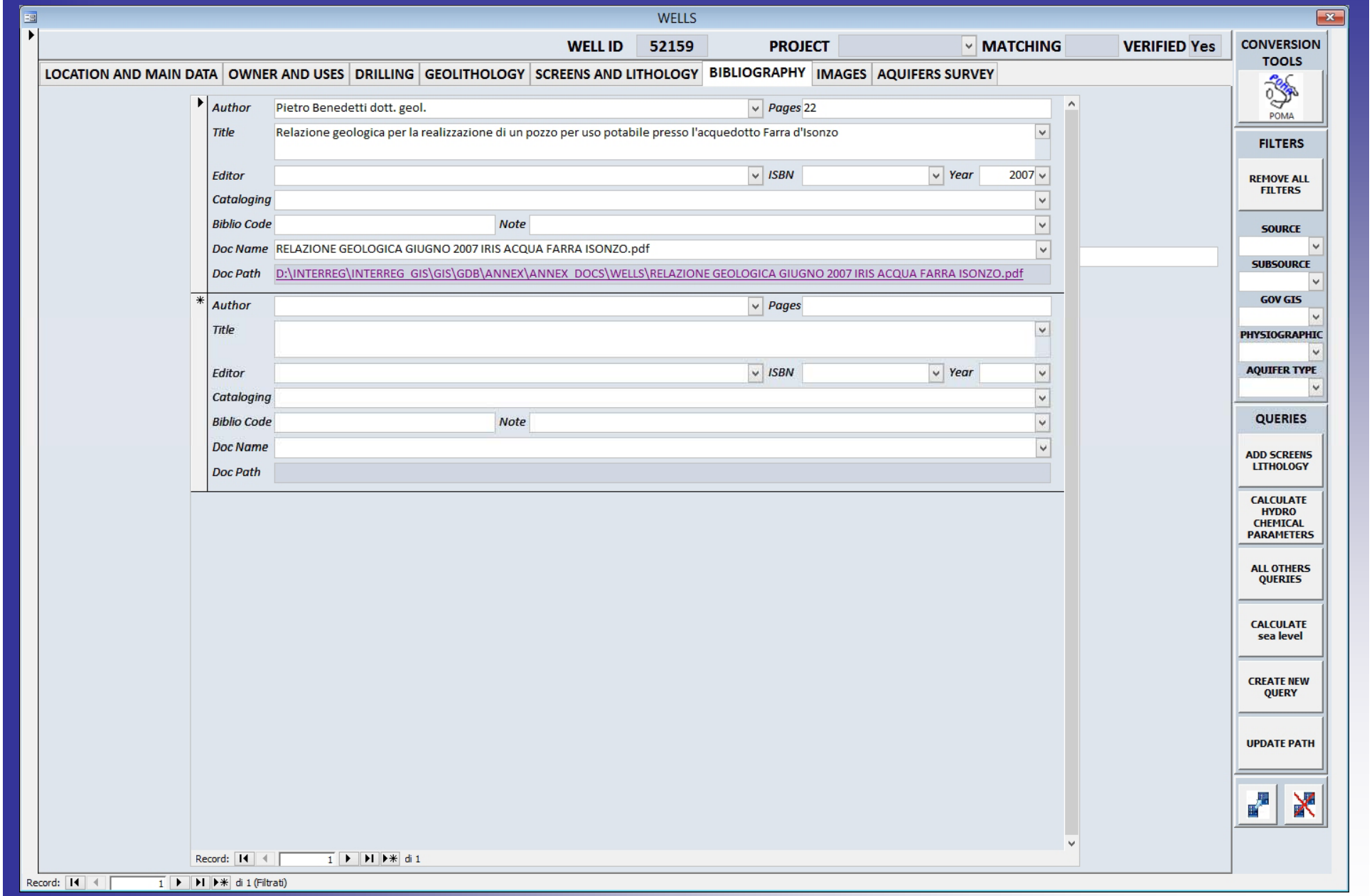


The Hydrogeological Geodatabase



The Hydrogeological Geodatabase



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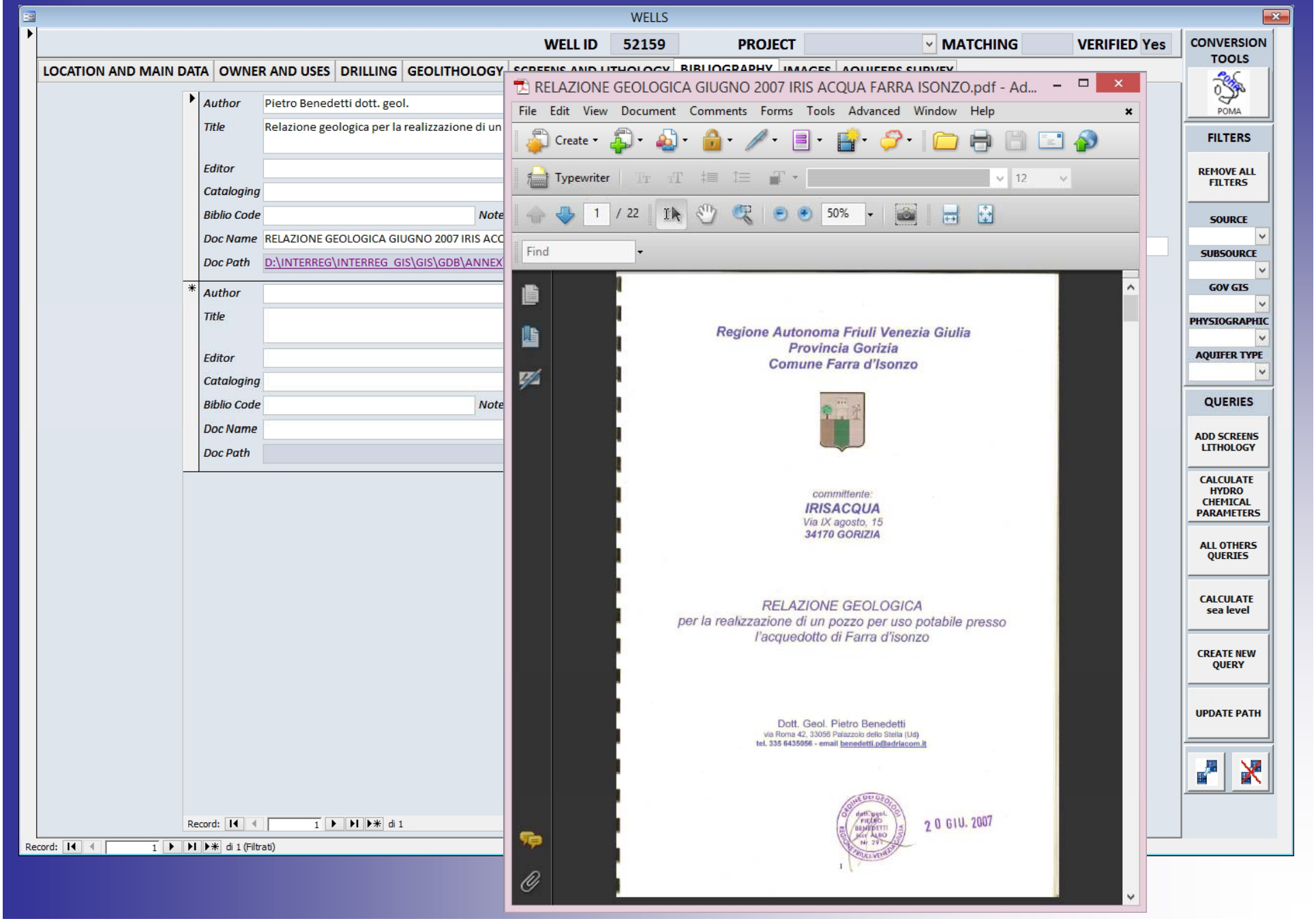

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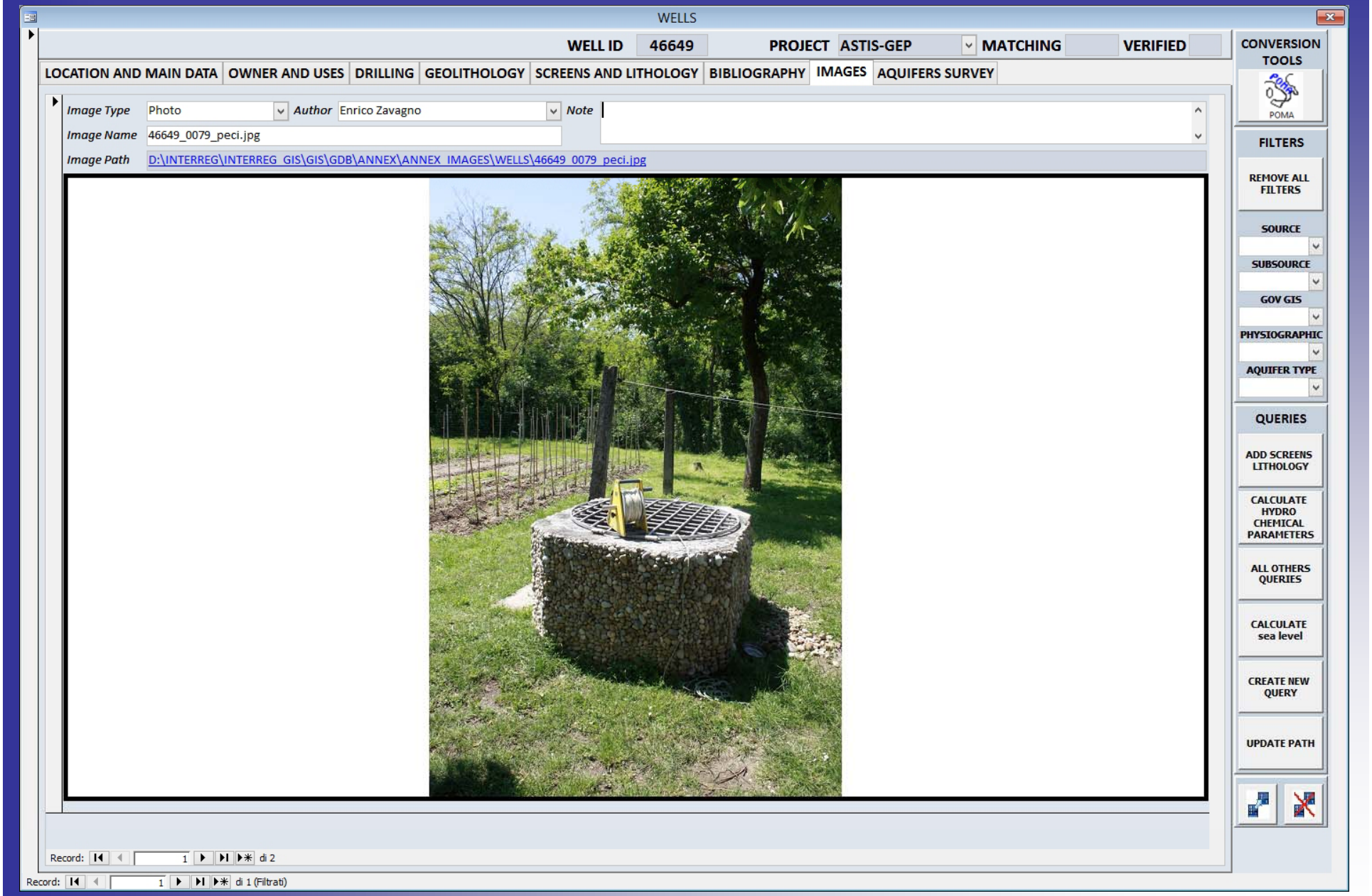
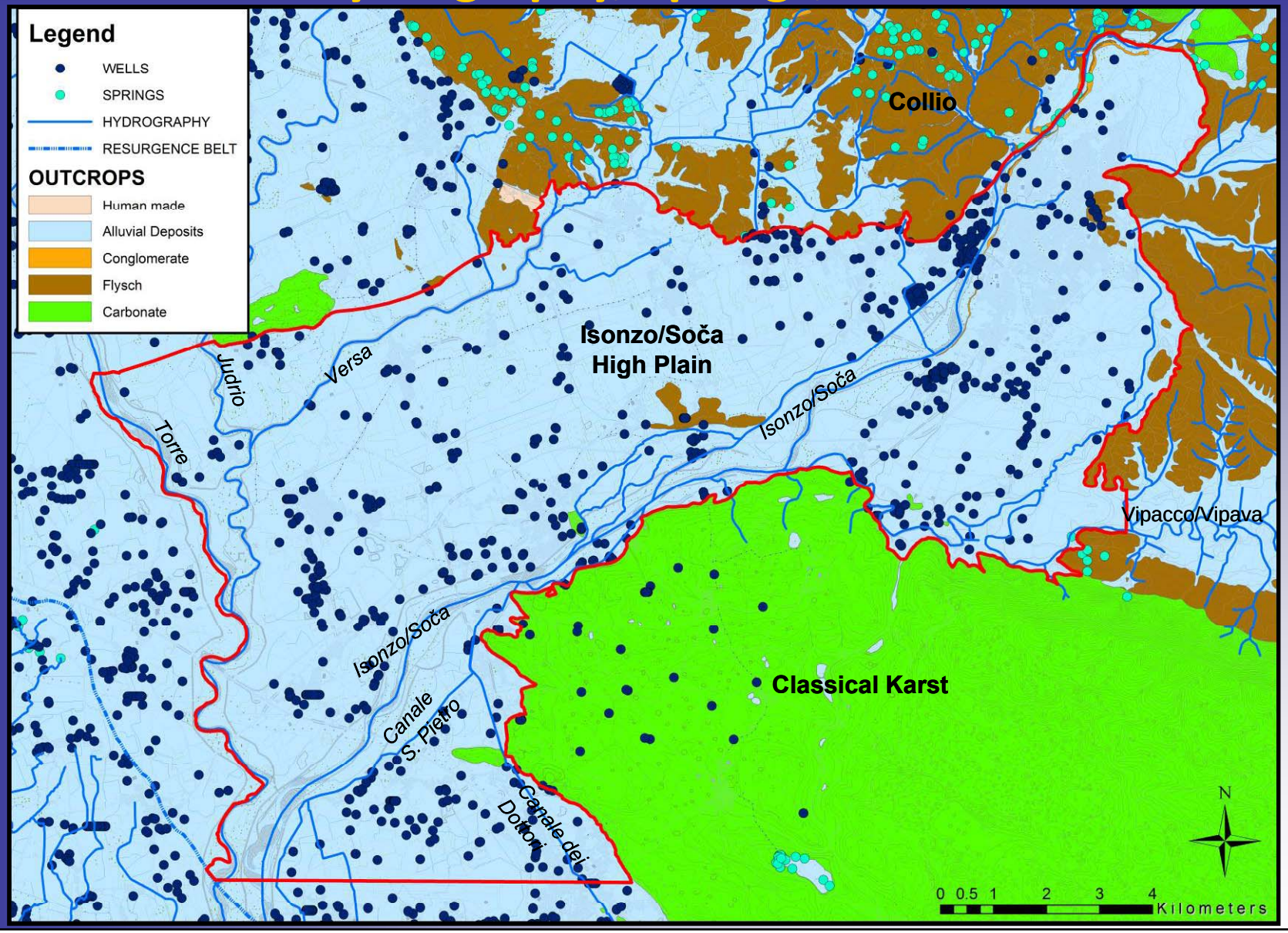
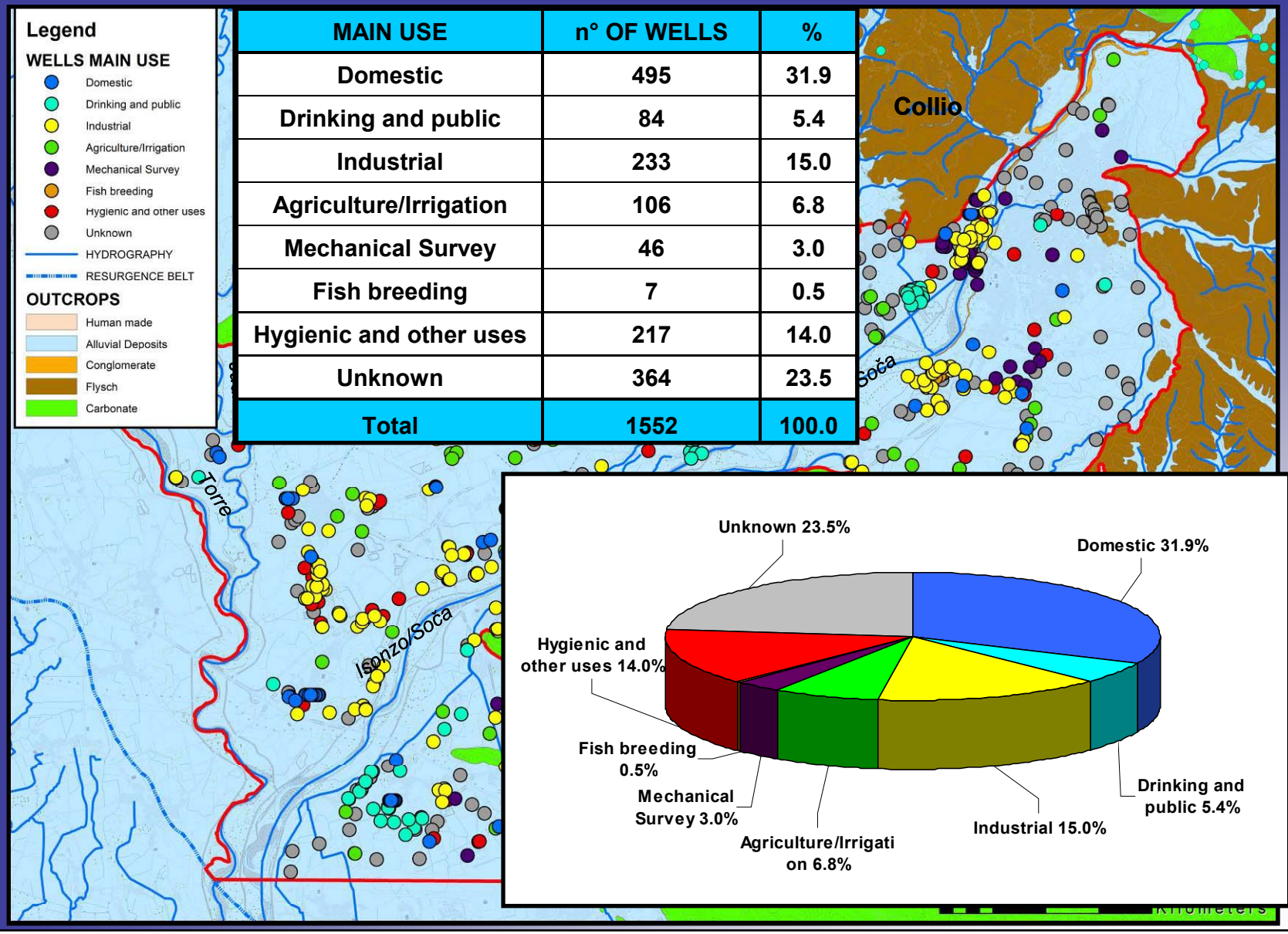


Hydrography, Springs, Wells



Wells main uses

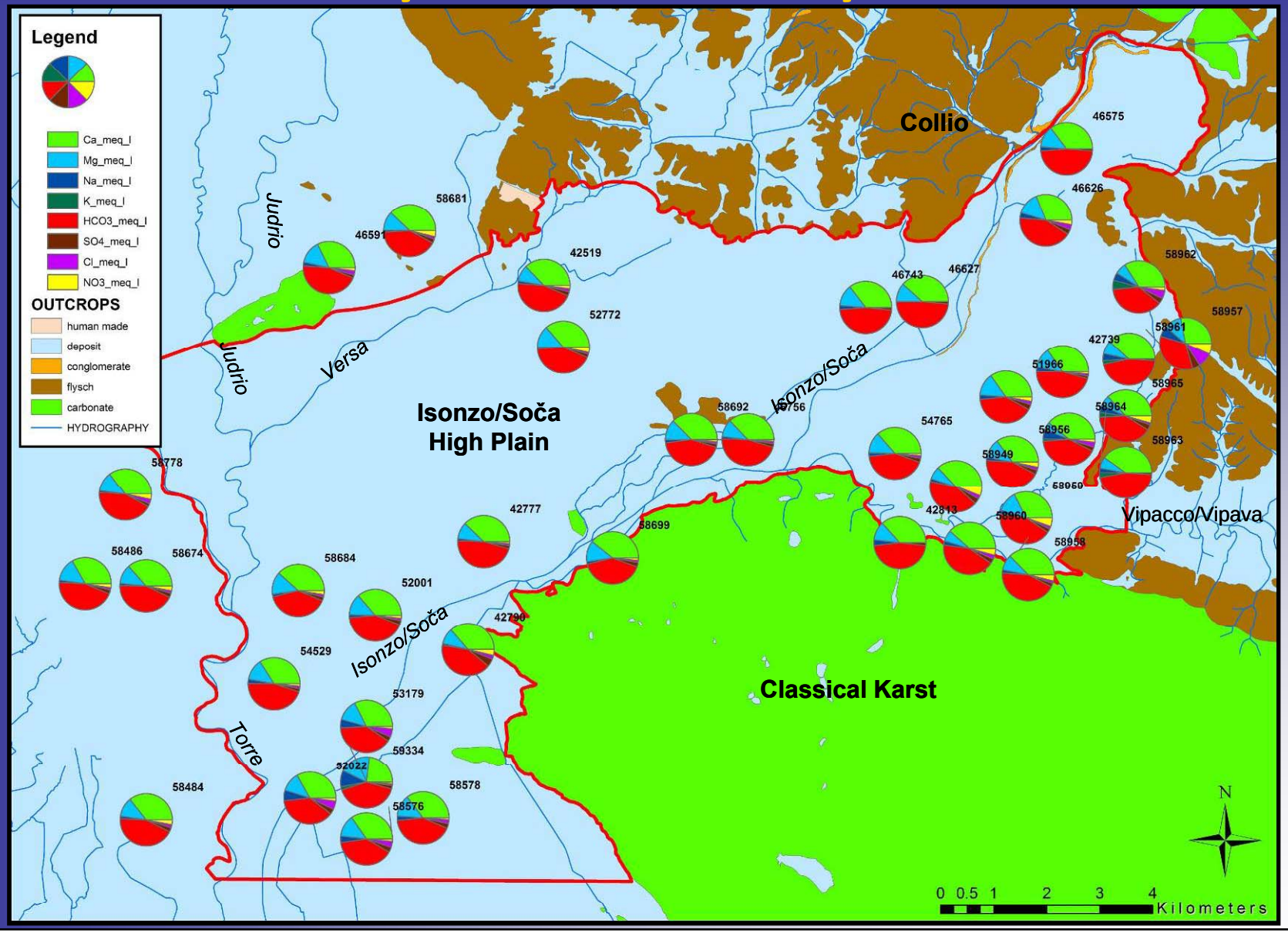


MAIN USE	n° OF WELLS	%
Domestic	495	31.9
Drinking and public	84	5.4
Industrial	233	15.0
Agriculture/Irrigation	106	6.8
Mechanical Survey	46	3.0
Fish breeding	7	0.5
Hygienic and other uses	217	14.0
Unknown	364	23.5
Total	1552	100.0

Hydrochemical Analysis: 243 analysis, 40 monitoring points

WELL_ID	n° of analysis	From Year	To Year	EC	TDS	Ca	Mg	Na	K	HCO3	SO4	Cl	NO3
42519	1	2012	2012	668.00	530.83	103.70	16.78	5.35	2.31	378.60	16.84	9.58	16.99
42739	2	2012	2013	568.50	459.11	83.57	18.36	7.08	1.85	334.50	9.57	6.03	10.27
42777	1	2012	2012	407.00	313.98	61.55	10.12	2.45	0.86	228.95	7.30	3.60	6.20
42790	1	2012	2012	325.00	266.92	52.25	8.68	1.80	0.60	181.27	16.83	6.09	16.40
42813	1	2012	2012	370.00	369.04	69.55	13.23	7.80	3.30	268.02	7.99	2.46	3.39
46575	1	2012	2012	547.00	389.52	70.65	16.19	5.55	1.11	288.62	6.13	2.37	3.97
46591	2	2012	2013	750.00	546.70	93.54	25.01	7.42	1.47	394.06	12.87	13.80	16.29
46626	1	2012	2012	620.00	361.93	60.65	16.98	7.53	2.90	251.58	14.45	10.75	17.01
46627	1	2012	2012		316.27	60.95	11.19	1.79	0.74	234.73	5.54	2.07	3.20
46743	1	2012	2012	600.00	421.51	76.55	17.39	6.05	3.70	310.06	8.12	3.35	5.29
46756	1	2012	2012	330.00	302.90	58.45	10.36	2.49	0.75	219.73	8.08	3.80	5.23
51966	14	2002	2013	453.84	348.80	67.23	16.35	6.00	2.16	237.05	15.06	7.11	16.13
52001	11	2003	2013	358.00	266.25	52.25	11.44	3.00	0.95	186.19	9.53	3.84	7.70
52022	6	1996	1998	446.42	326.57	60.07	13.20	13.35	1.05	209.28	14.17	16.50	10.55
52772	10	2001	2013	453.92	351.03	70.54	16.13	2.37	0.81	248.69	10.55	3.99	19.62
53179	12	1996	2013	406.39	308.01	54.68	13.41	10.16	0.88	203.25	11.40	15.12	7.53
54529	4	2011	2013	393.68	329.54	59.05	13.80	5.15	0.93	238.87	8.05	4.63	7.95
54765	14	2001	2013	283.73	224.13	43.98	9.56	3.00	0.74	157.36	7.17	3.56	4.84
58484	12	1996	2006	651.15	530.03	101.76	20.65	5.27	2.32	374.69	18.10	9.57	26.27
58486	10	1996	2005	461.53	373.05	66.17	17.55	3.16	1.17	269.50	11.60	5.07	15.31
58576	6	1996	1998	380.08	282.50	53.97	12.75	7.08	0.78	186.97	11.38	10.35	7.10
58578	4	1996	1998	315.96	244.95	46.83	10.78	4.00	0.75	168.45	8.98	5.93	4.75
58674	27	1997	2011	662.54	541.89	106.66	21.24	4.34	1.47	383.52	18.08	8.04	26.86
58681	17	2001	2013	711.82	535.52	112.77	21.64	3.69	1.08	372.26	18.34	8.02	34.87
58684	4	2004	2006	406.32	291.66	62.88	13.75	2.89	1.37	198.50	9.30	4.35	12.40
58692	17	2001	2013	327.04	248.55	50.05	10.36	2.81	0.84	176.15	6.50	3.12	5.80
58699	3	2003	2005	288.62	206.03	44.53	9.00	2.00	0.57	140.33	7.37	2.80	5.17
58778	8	2003	2006	713.14	567.43	108.66	23.44	4.38	0.78	401.75	13.26	15.94	31.55
58949	3	2012	2013	551.00	324.31	65.72	8.57	3.52	0.49	224.86	14.38	7.26	33.10
58956	13	2007	2013	665.87	509.81	96.25	19.89	6.16	2.11	359.81	19.33	8.37	26.92
58957	2	2013	2013	714.50	405.21	65.40	15.22	17.68	4.24	242.05	26.38	38.49	46.85
58958	14	2007	2013	612.46	467.82	94.12	14.69	5.42	2.13	333.20	13.54	6.84	29.58
58959	3	2012	2013	623.50	349.84	62.27	15.08	4.74	1.35	251.00	11.29	5.46	31.88
58960	2	2013	2013	631.00	314.84	65.04	7.07	4.89	0.93	218.19	12.08	7.58	21.50
58961	3	2012	2013	263.00	309.36	61.88	8.20	8.28	7.24	224.10	4.33	2.57	3.60
58962	3	2012	2013	742.00	544.76	105.48	13.29	16.56	33.84	356.93	24.36	28.15	20.41
58963	1	2012	2012		592.90	124.40	13.02	9.31	19.19	433.67	8.26	4.24	6.48
58964	3	2012	2013	545.50	495.49	104.20	7.67	17.92	7.50	335.47	15.98	14.25	15.25
58965	3	2012	2013	463.50	383.38	79.17	8.69	10.59	12.35	263.15	16.95	4.83	28.98
59334	1	2012	2012		207.92	27.14	13.95	13.61	4.47	145.18	5.91	2.14	4.19

Hydrochemical Analysis



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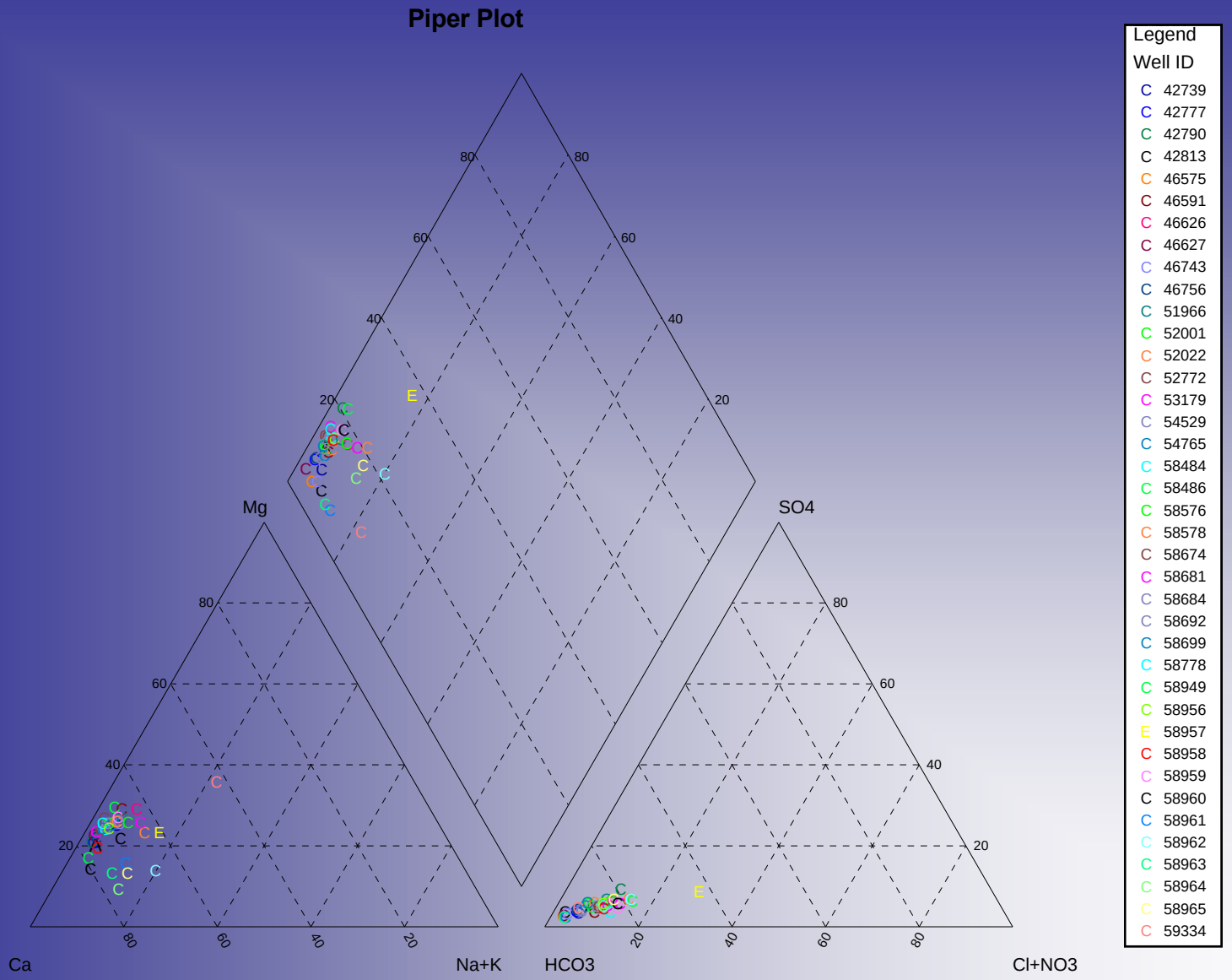
Hydrochemical Analysis: Piper diagram



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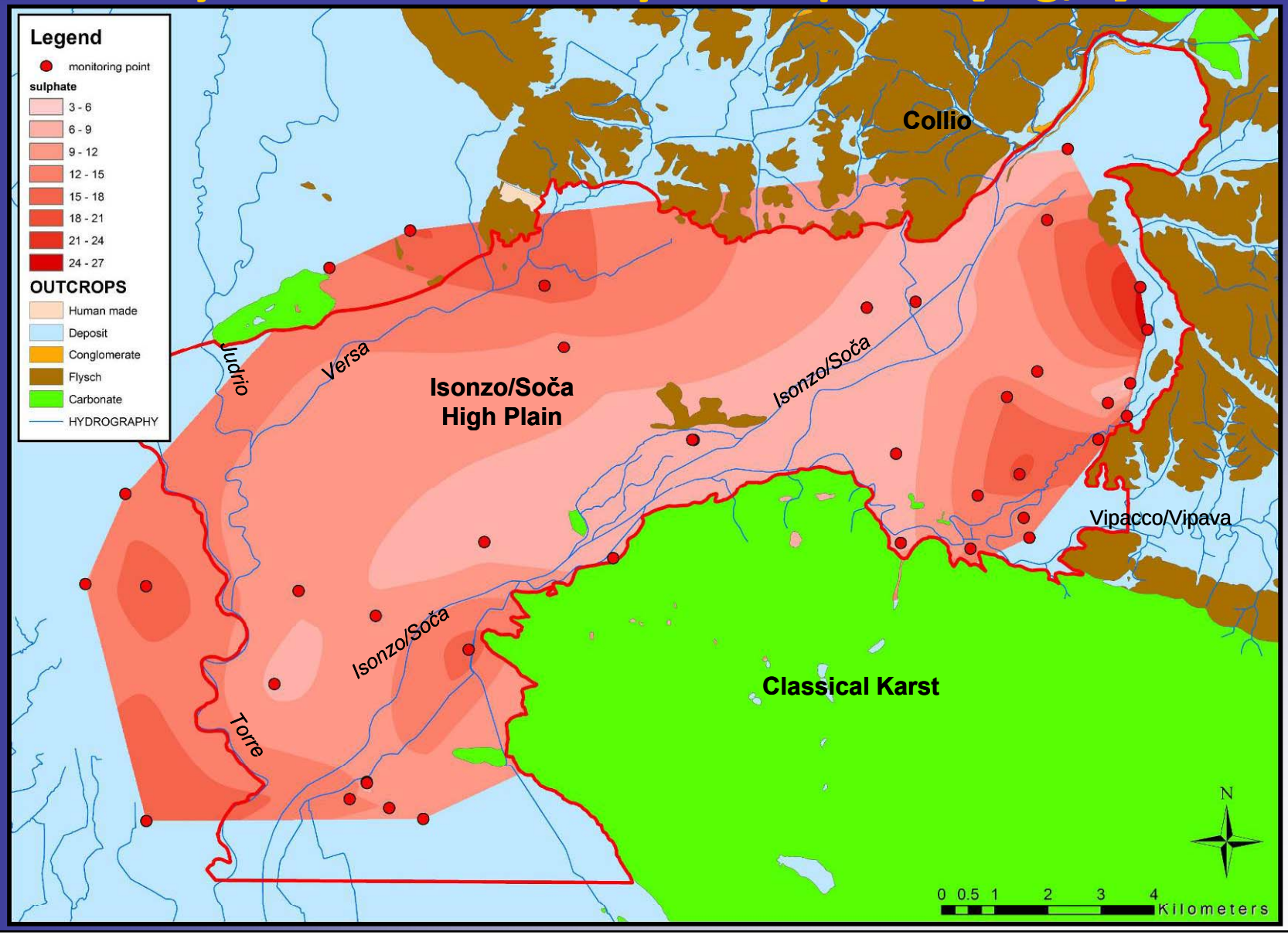
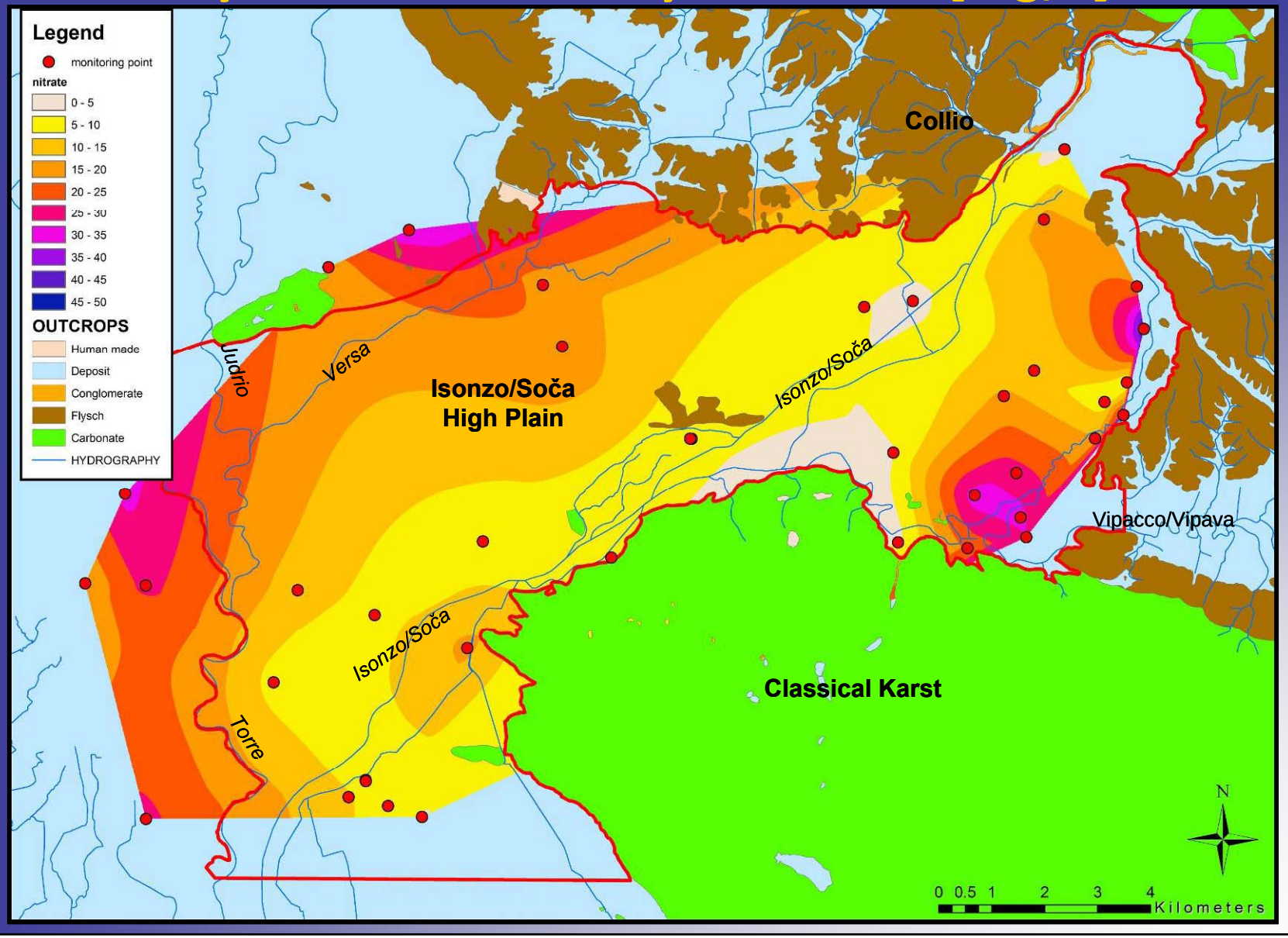
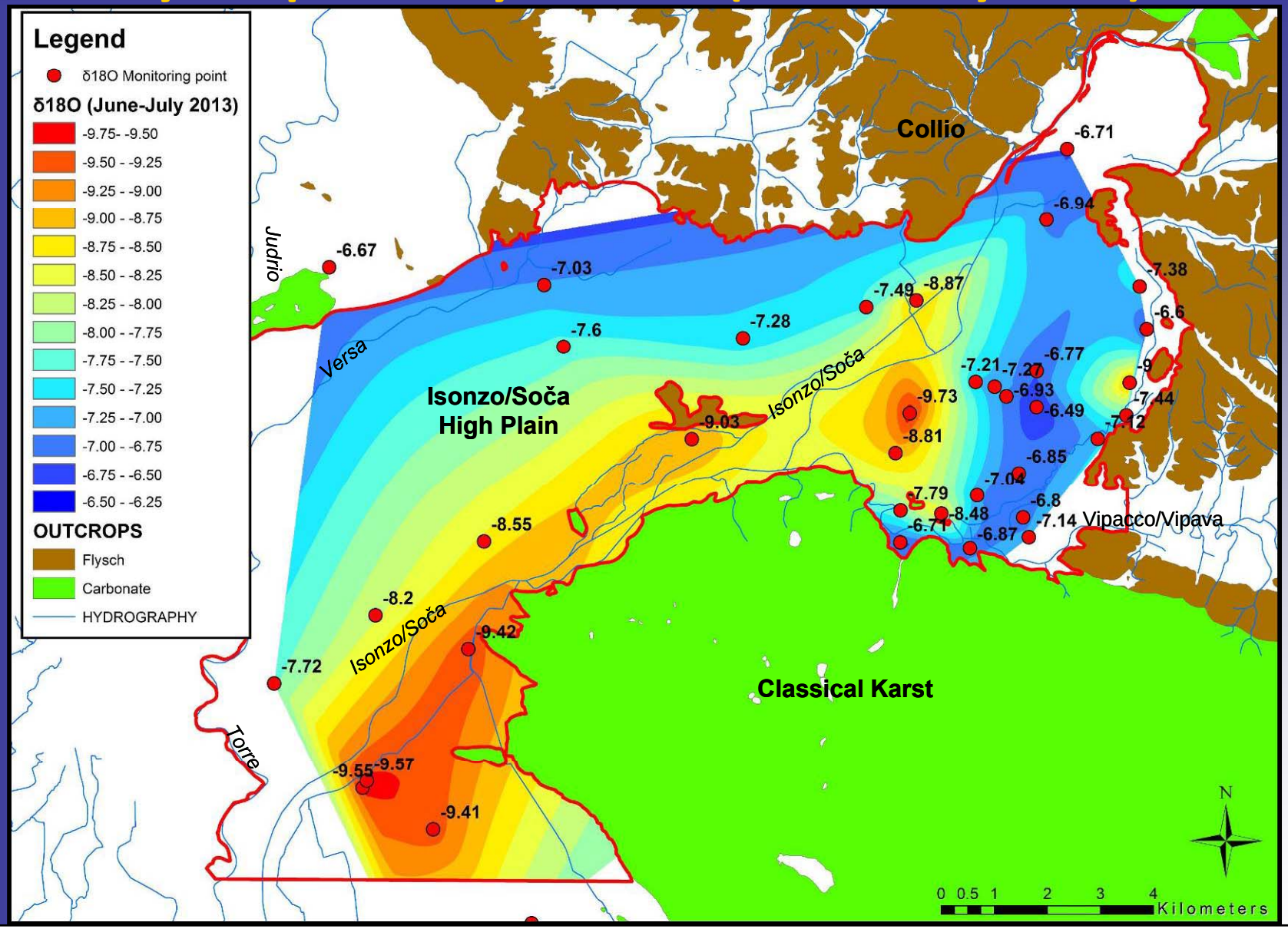
Hydrochemical Analysis: sulphate [mg/L]



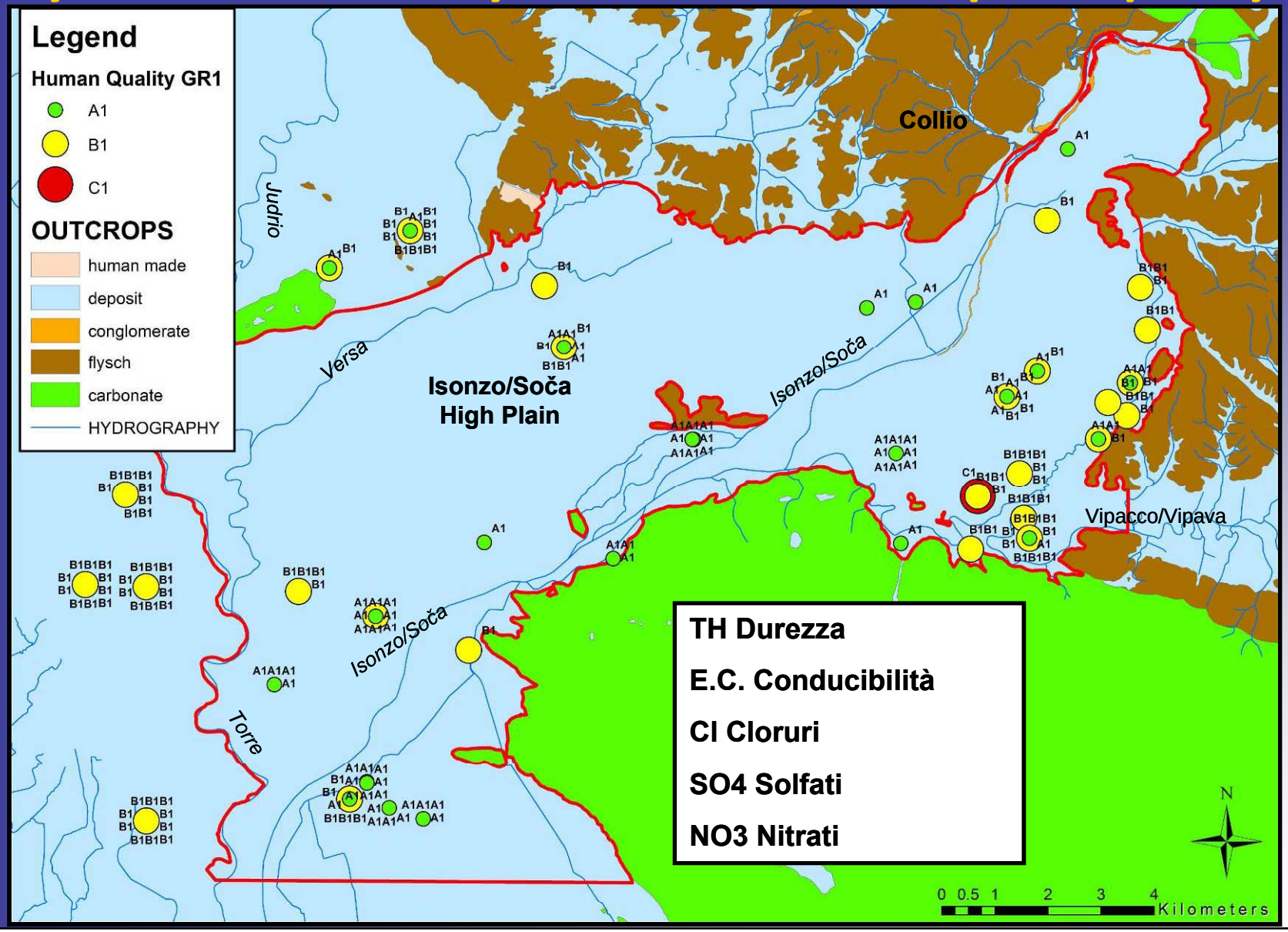
Hydrochemical Analysis: nitrate [mg/L]



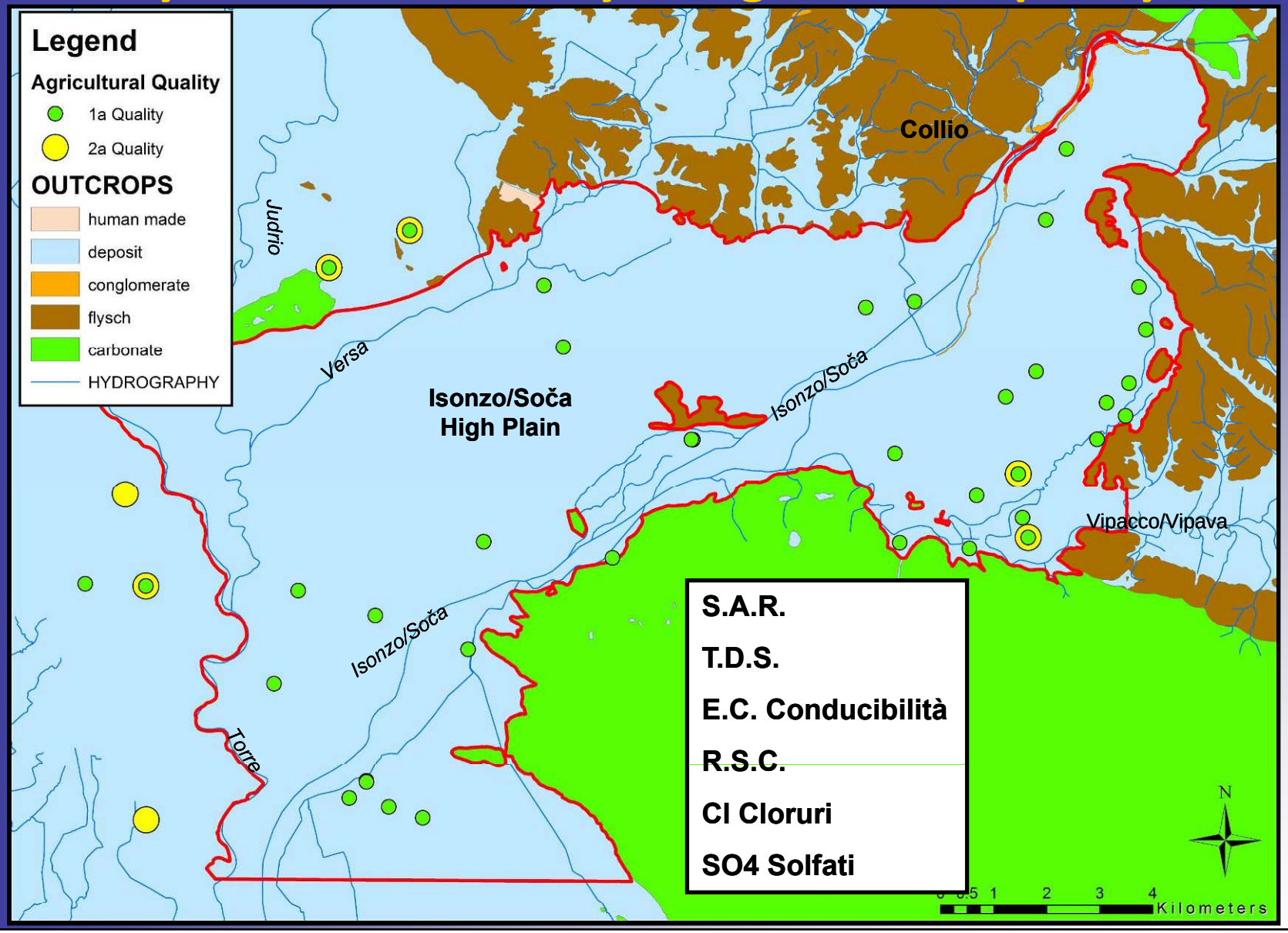
Hysotopes Analysis: $\delta^{18}O$ (June – July 2013)



Hydrochemical Analysis: human consumption quality



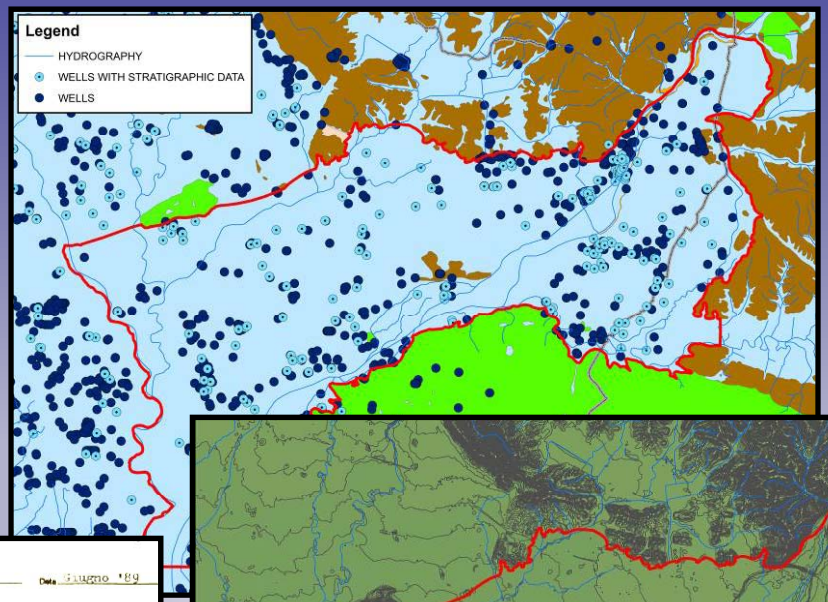
Hydrochemical Analysis: agricultural quality

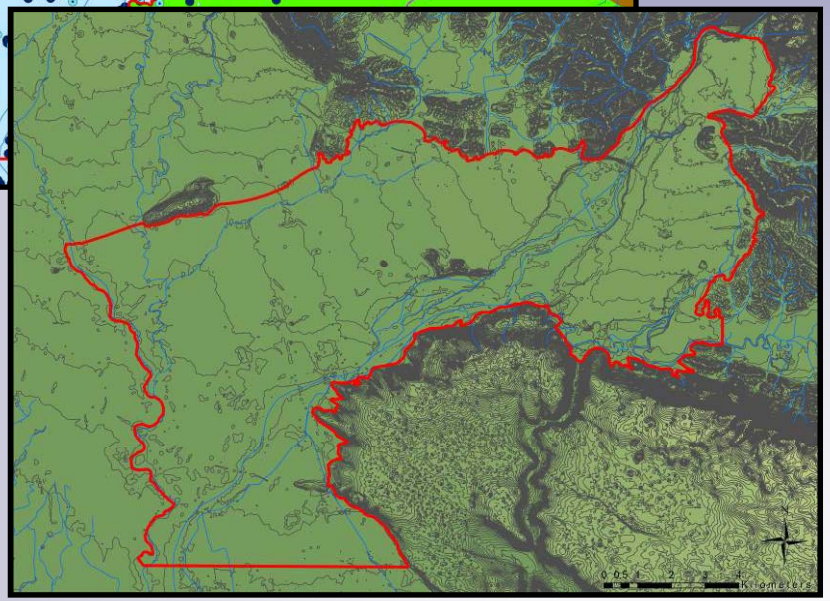


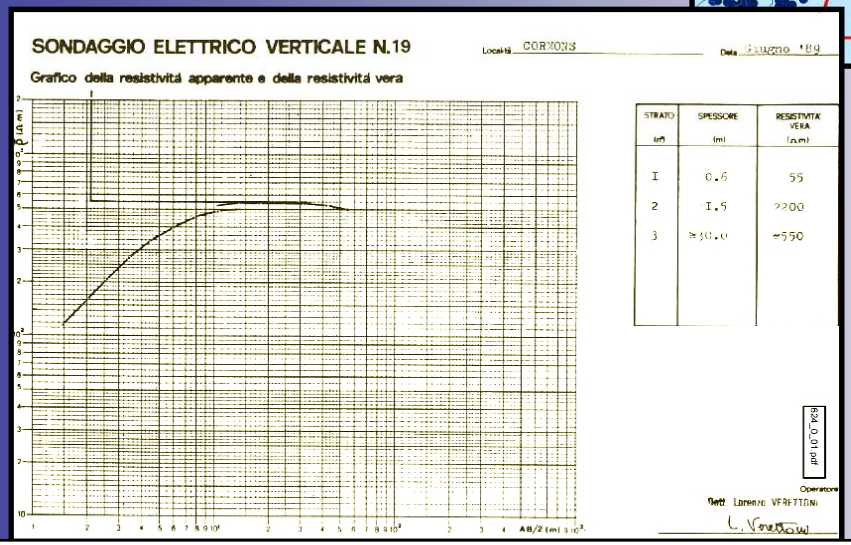
ISOBATHS AND BEDROCKS RECONSTRUCTION

Available and necessary data:

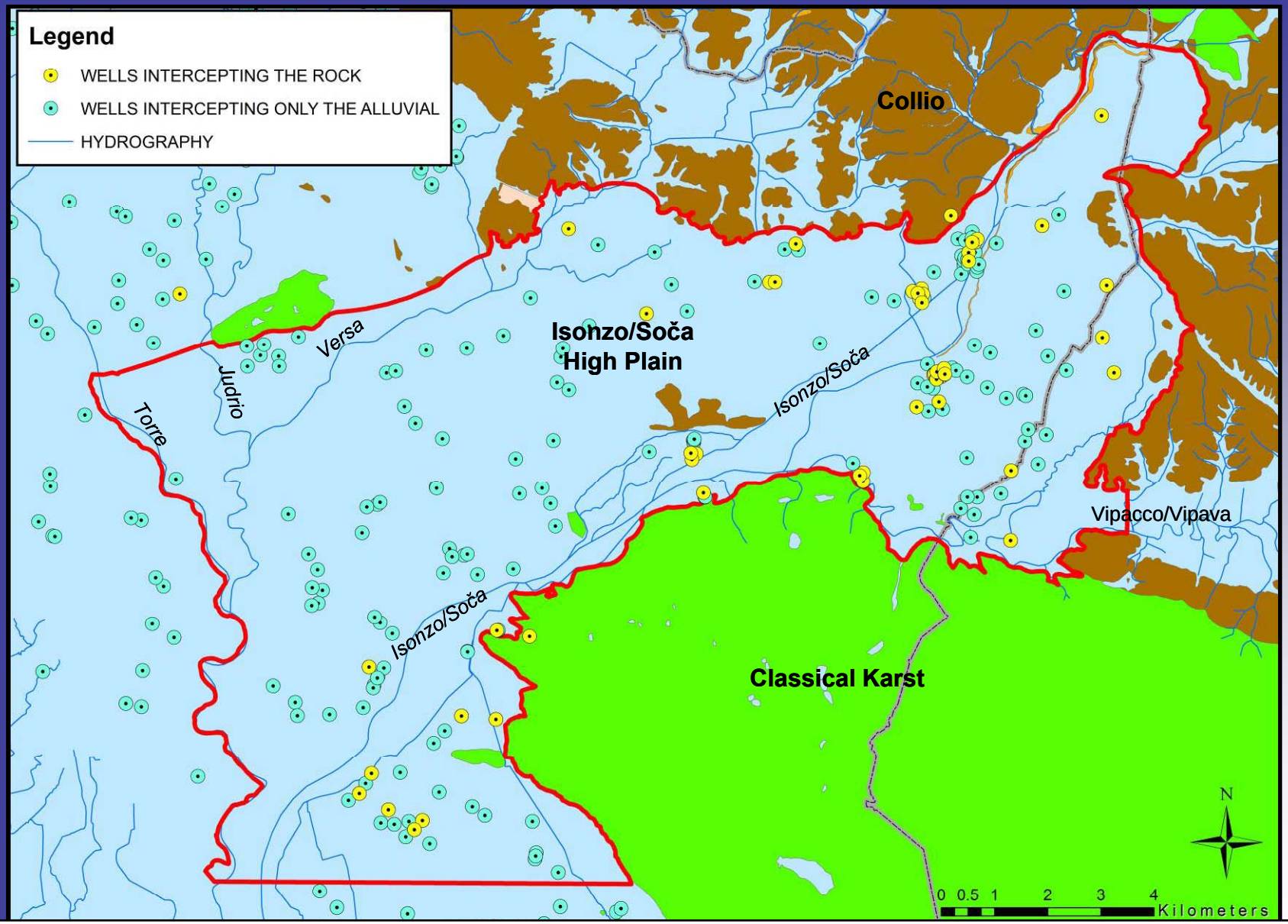
- bibliography
- geolithological map
- wells data
- lithostratigraphic data
- geophysical data
- DEM



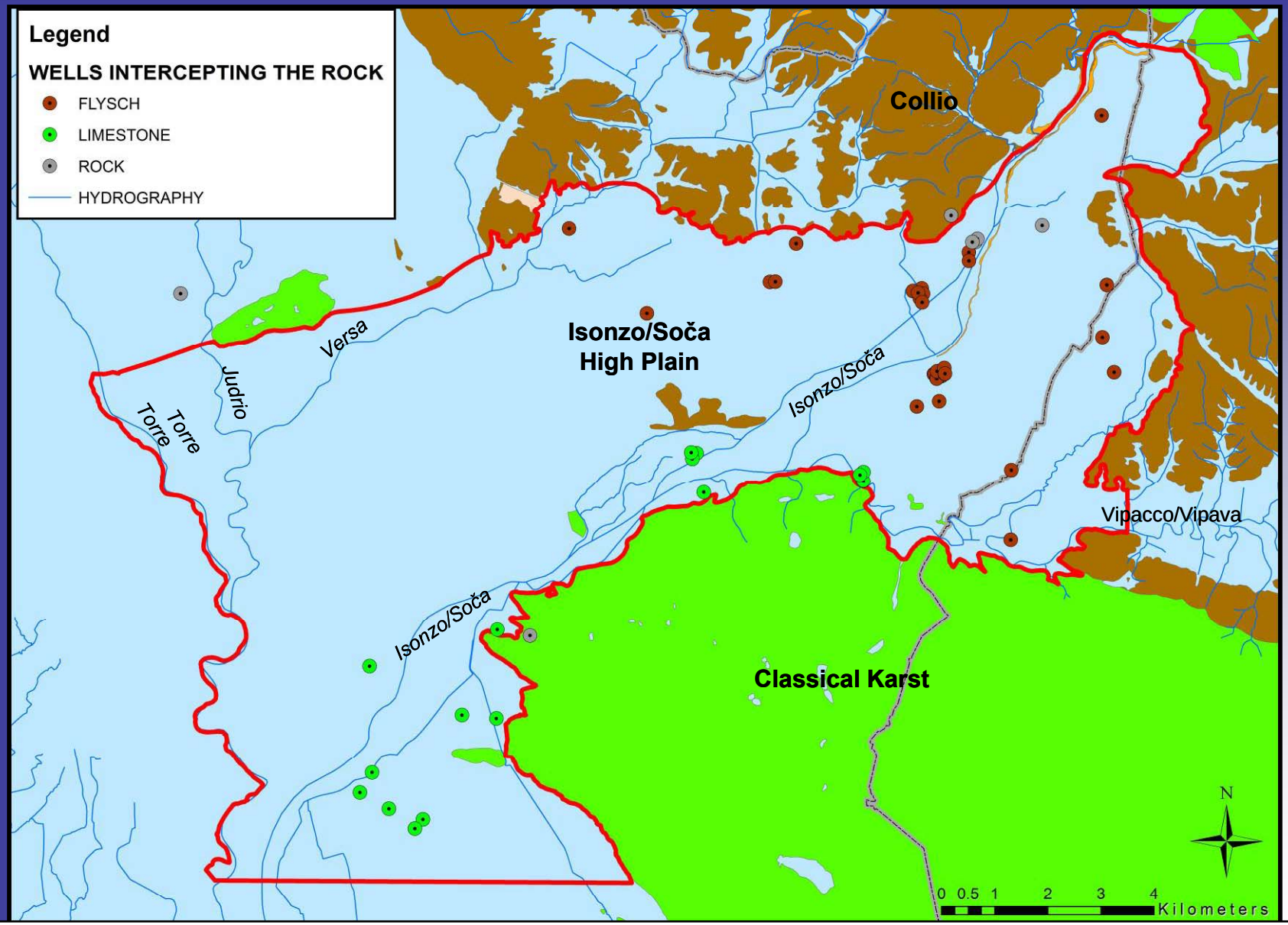




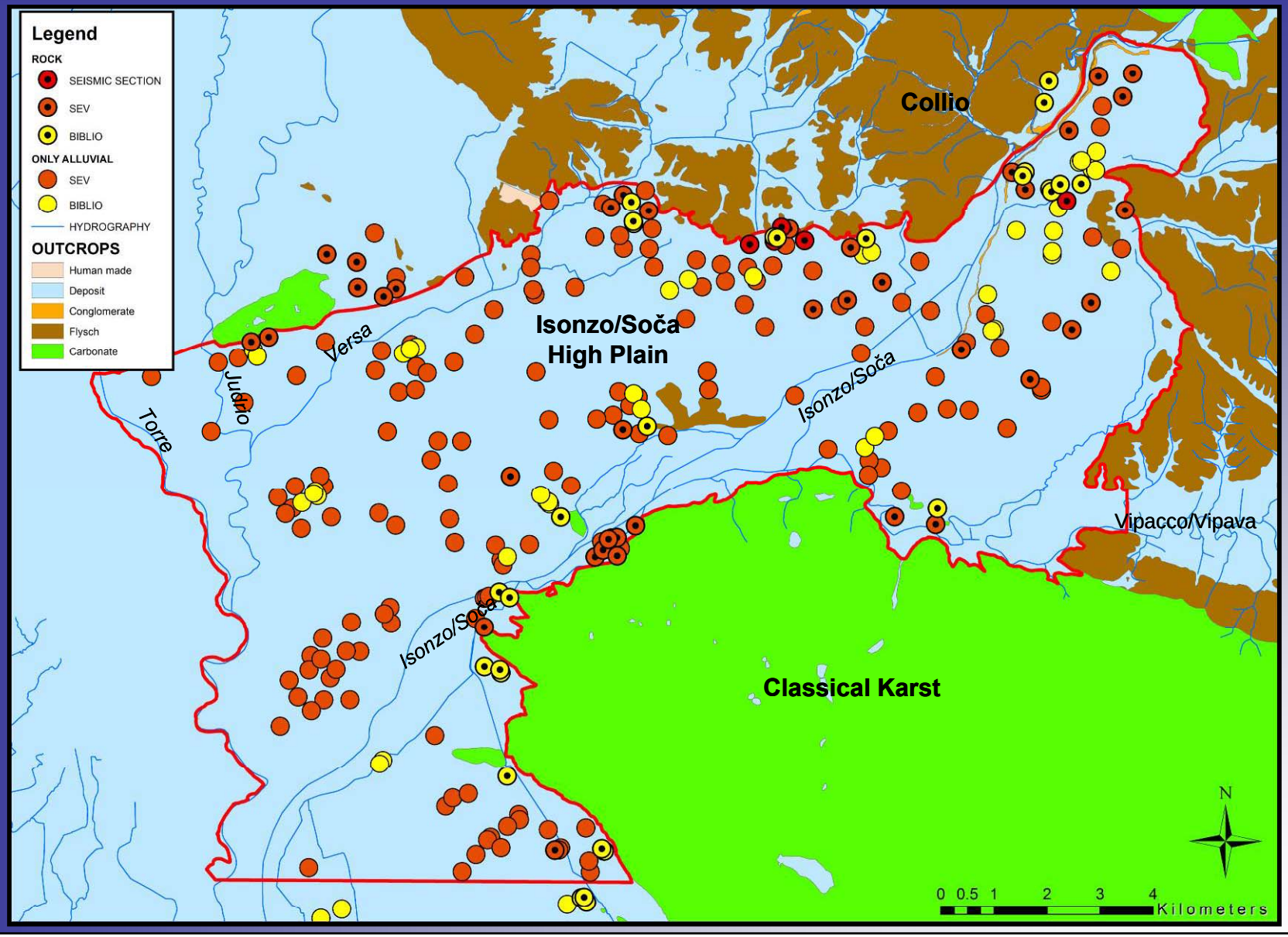
ISOBATHS AND BEDROCKS RECONSTRUCTION: WELLS DATA



ISOBATHS AND BEDROCKS RECONSTRUCTION: WELLS DATA



ISOBATHS AND BEDROCKS RECONSTRUCTION: GEOPHYSICAL DATA



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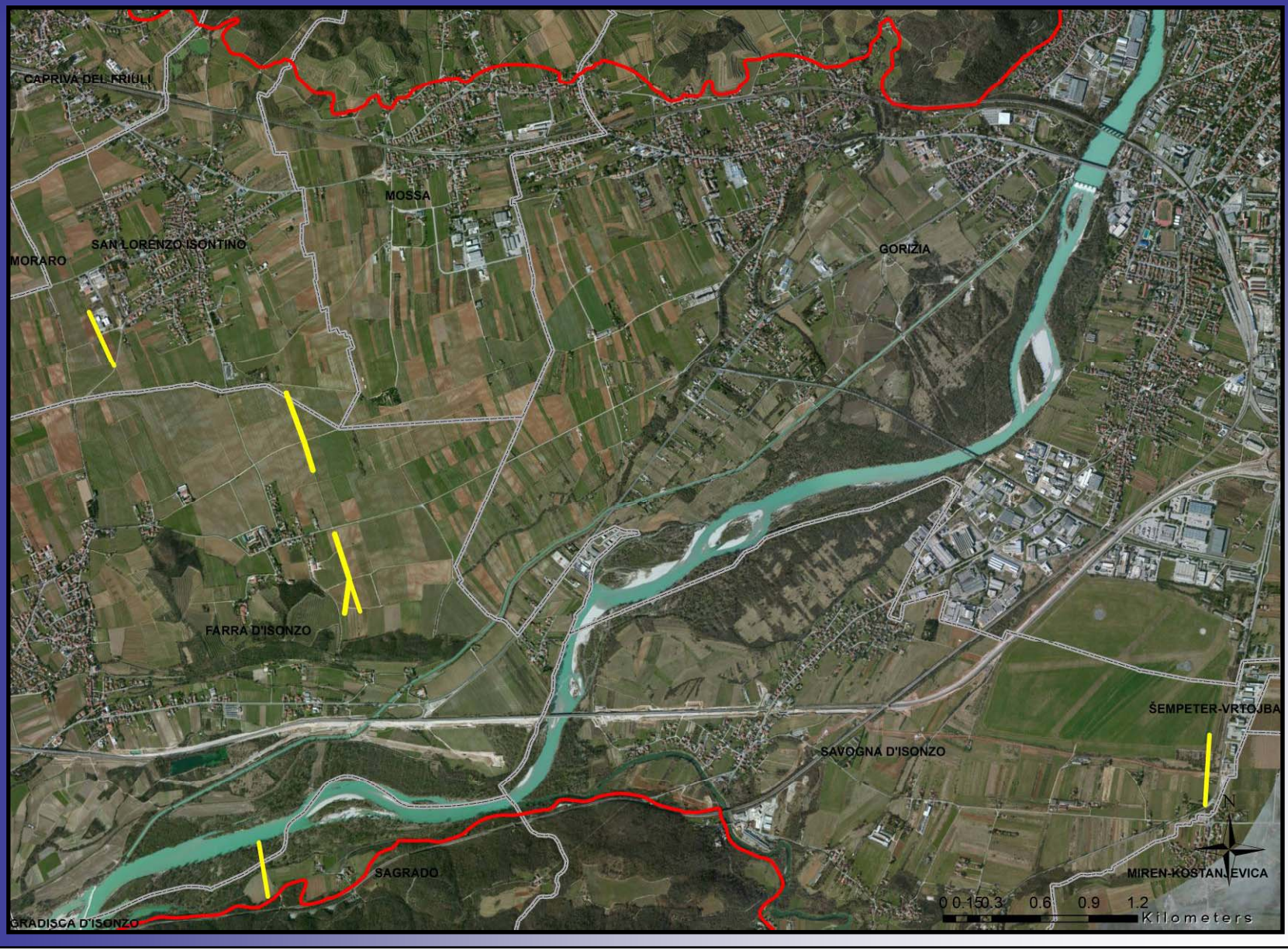
ISOBATHS AND BEDROCKS RECONSTRUCTION: GEOPHYSICAL DATA



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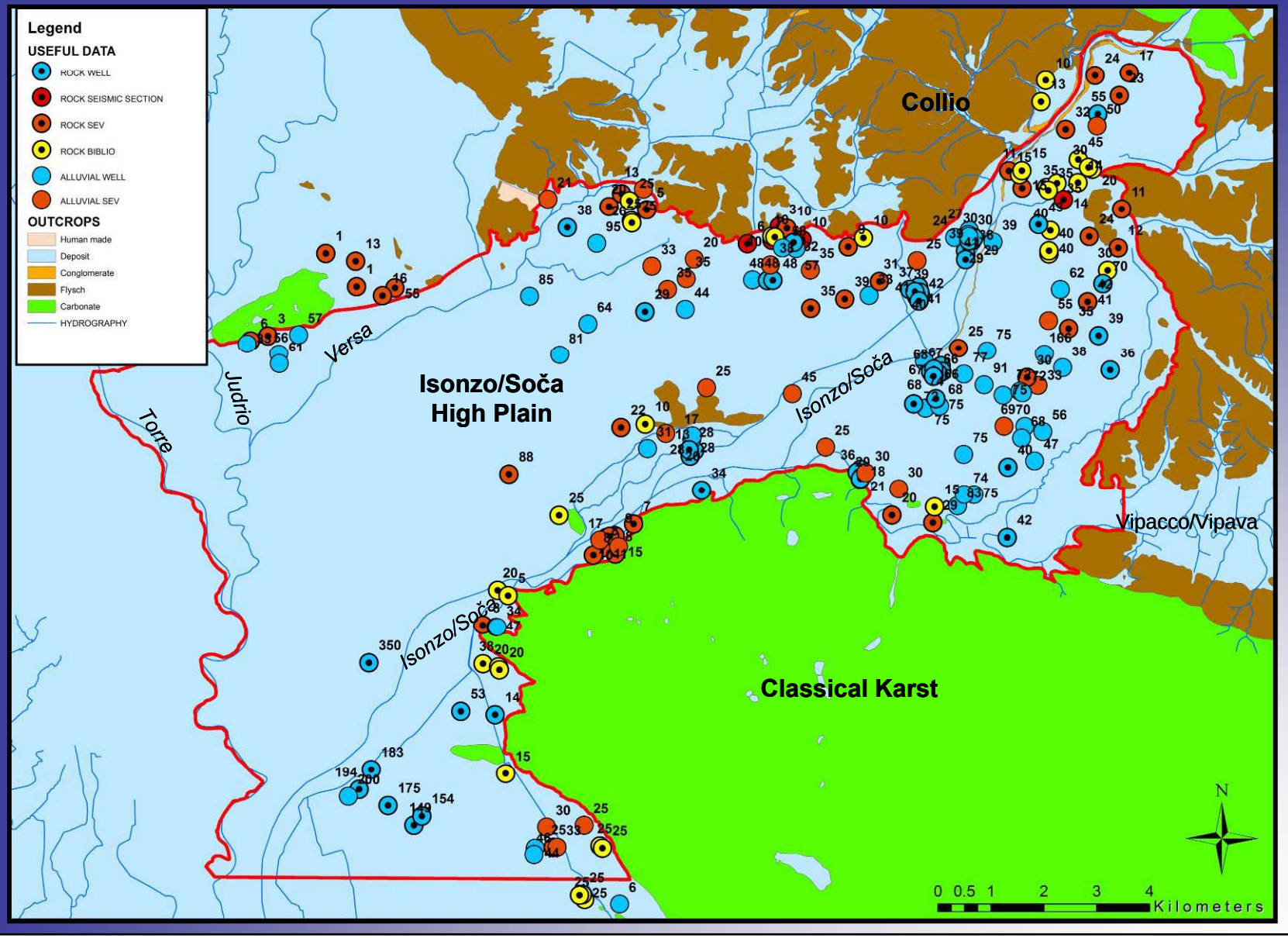
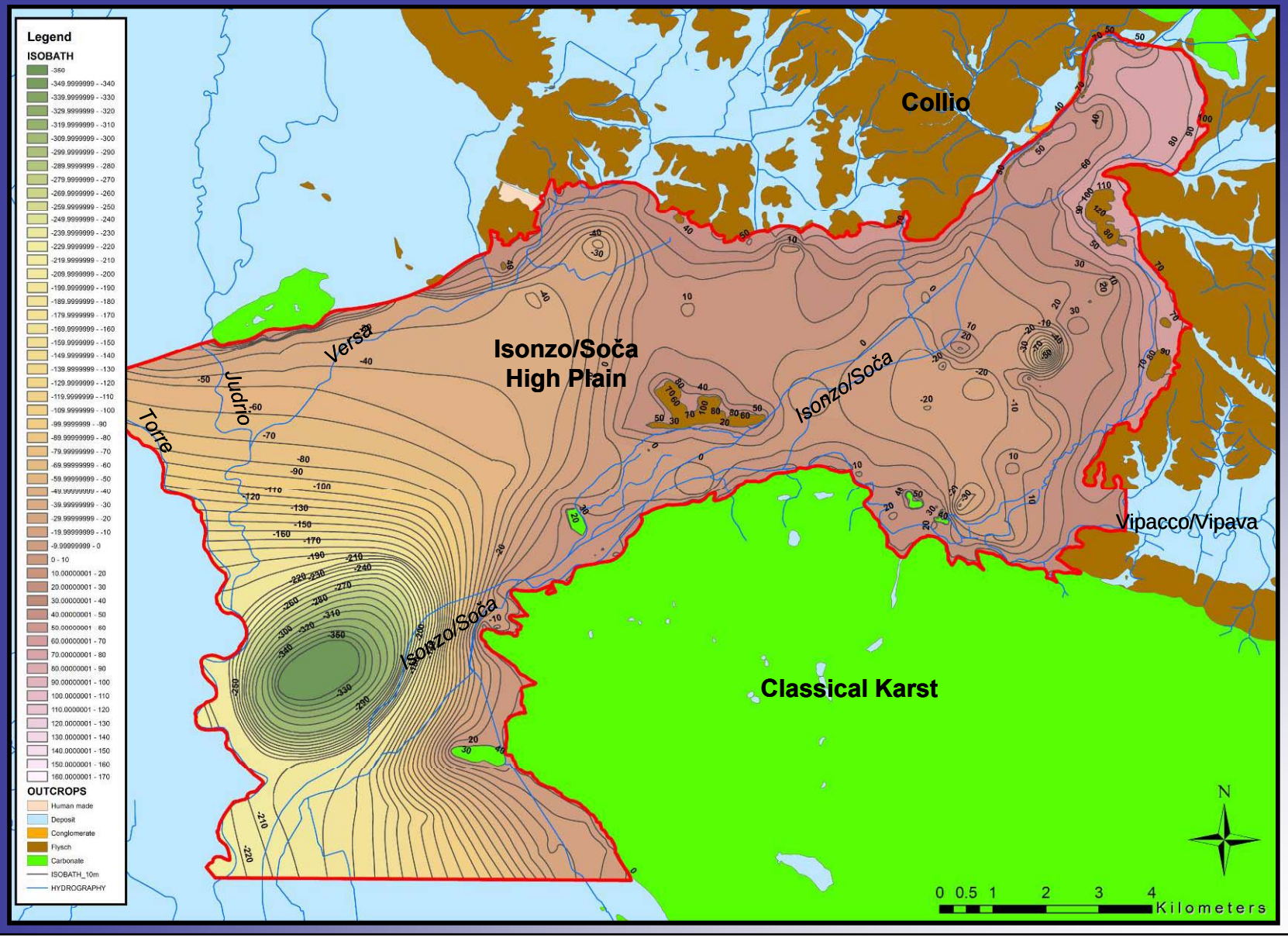


ISOBATHS AND BEDROCKS



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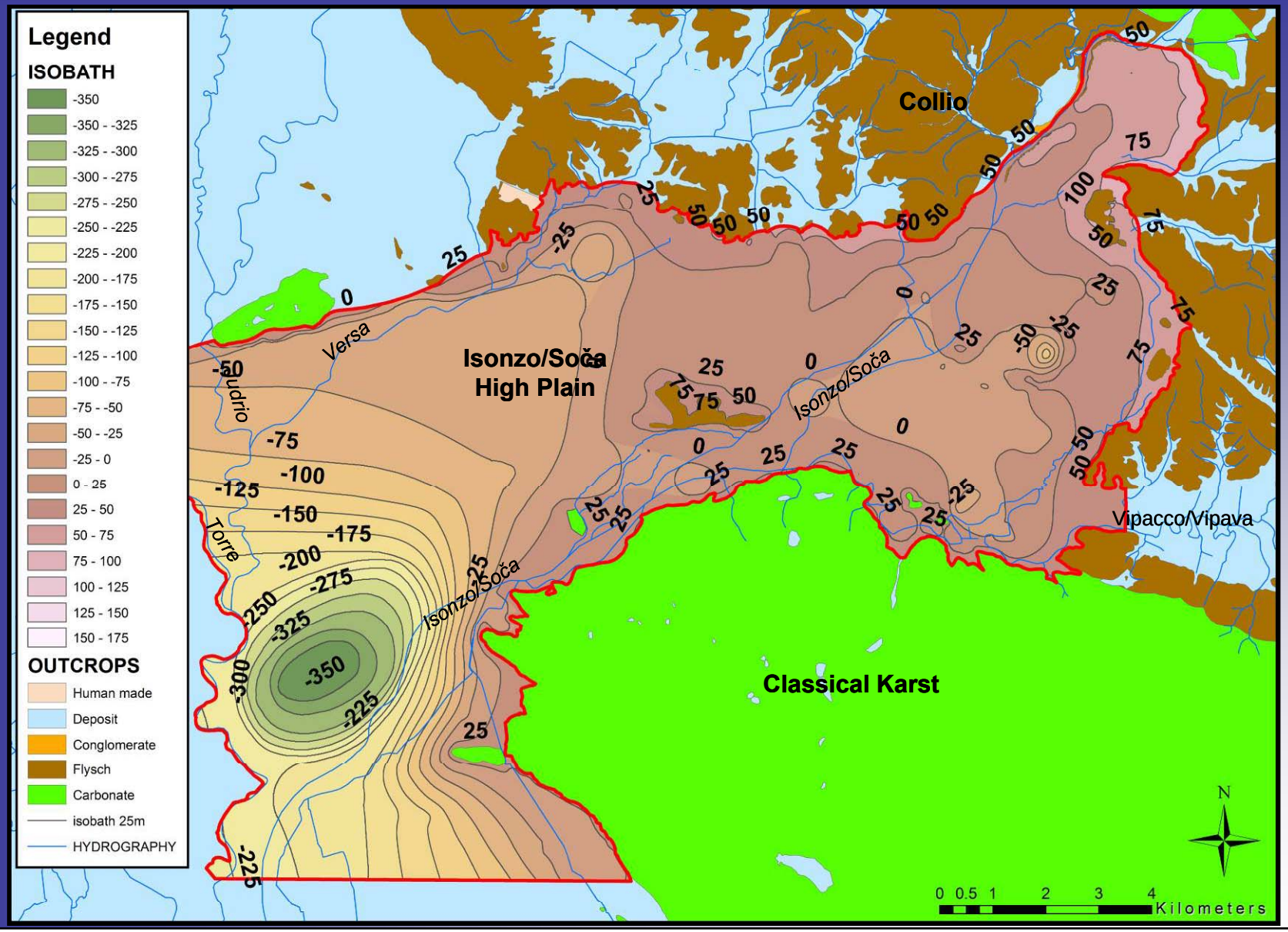

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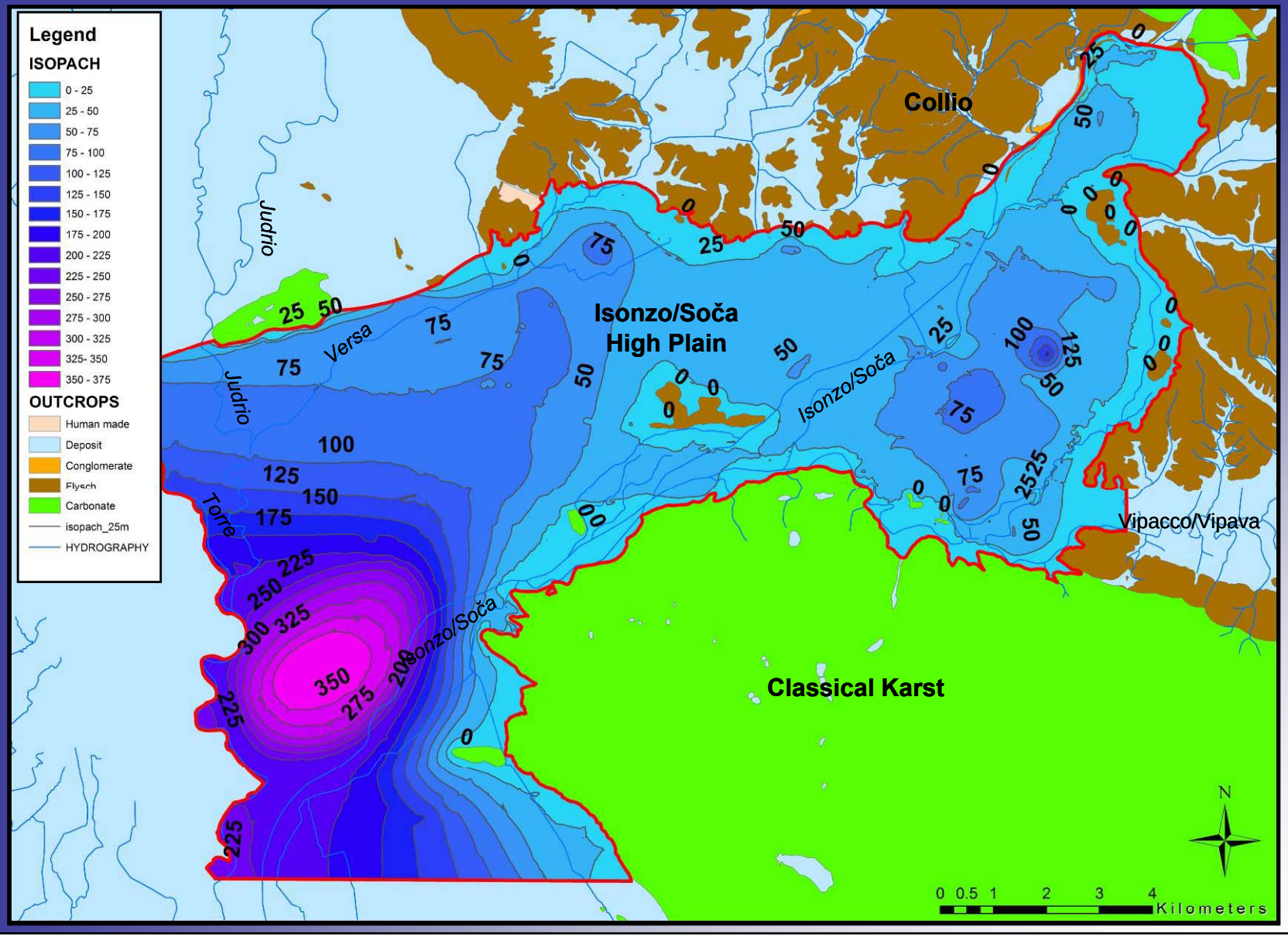
ISOPACH AND BEDROCKS



EVENTO INFORMATIVO–DIVULGATIVO / STROKOVNO IZOBRAŽEVANJE NA TEMO

LE ACQUE DELLA PIANURA ISONTINA
VODE SOŠKEGA ALUVIJA

Idrogeologia della Pianura Isontina

ftreu@units.it

Dipartimento di Matematica e Geoscienze

dipartimento di matematica e geoscienze
UNIVERSITÀ DEGLI STUDI DI TRIESTE

Progetto GEP finanziato nell'ambito del Programma per la Cooperazione Transfrontaliera Italia-Slovenia 2007-2013, dal Fondo europeo di sviluppo regionale e dai fondi nazionali.

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