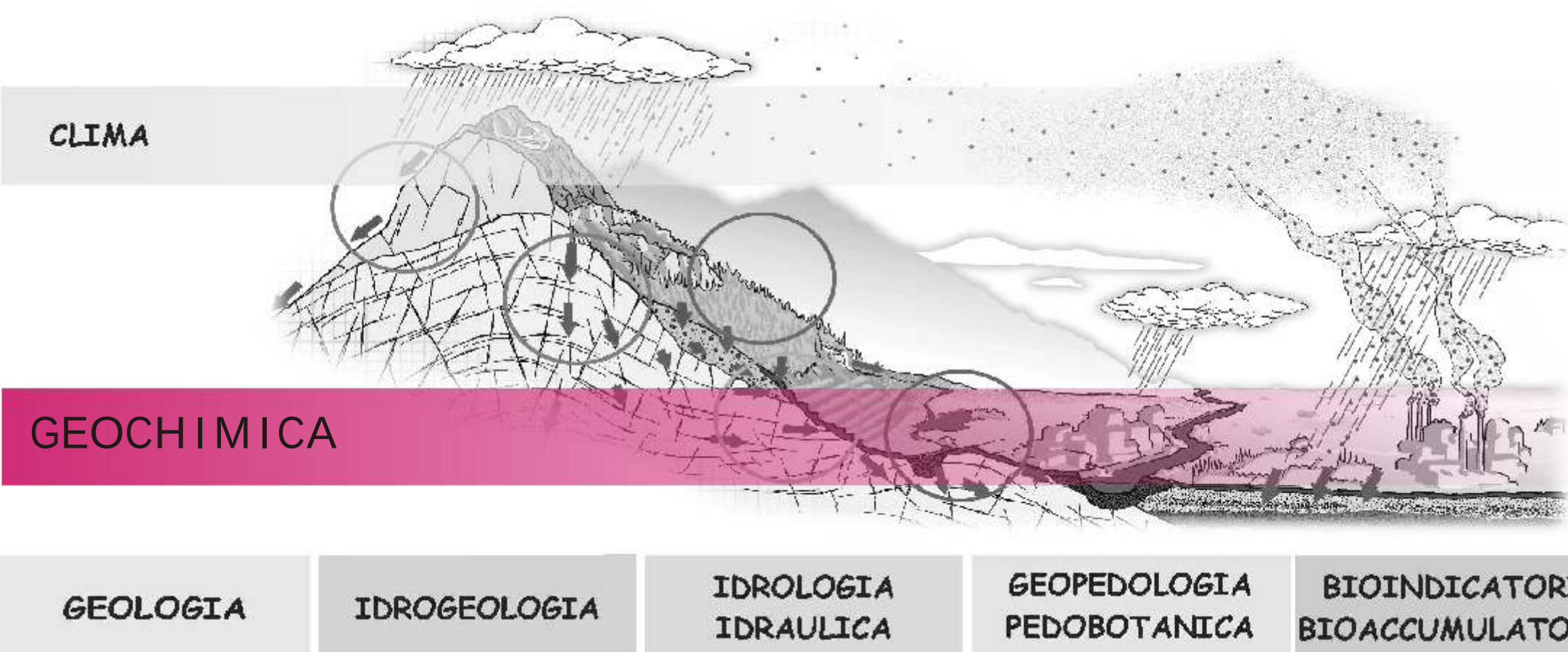




GEOCHIMICA

Contaminazione naturale

Impatto antropico

LA GEOCHIMICA AMBIENTALE

La geochimica ambientale studia l'involucro esterno del Pianeta Terra (suolo, acqua, atmosfera), valutando quantitativamente la distribuzione degli elementi e degli isotopi nei processi chimico-fisici naturali e i processi alterativi indotti dall'attività umana.

LA GEOCHIMICA IN VALCHIAVENNA

LA NATURA DELLE ACQUE

Le acque chiavennasche studiate sono di:

1. scorrimento superficiale,
2. laghi e invasi,
3. sorgenti,
4. pozzi,
5. fontanili e lavatoi
6. pioggia

PARAMETRI CHIMICO-FISICI

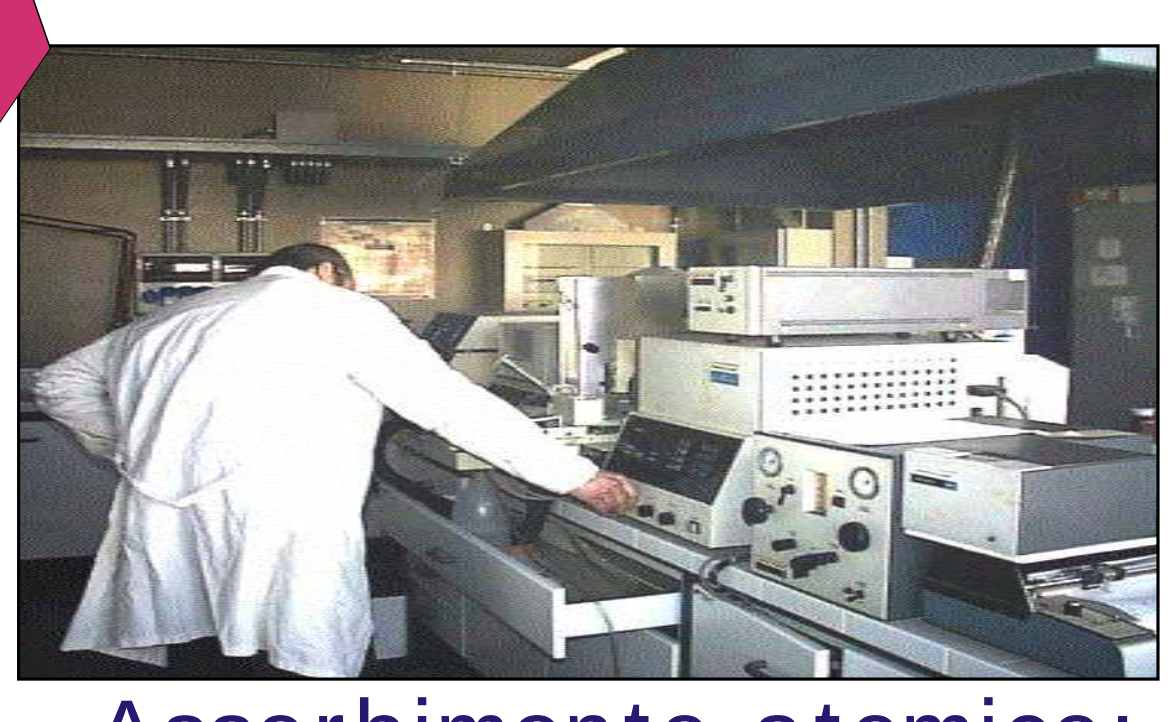
I parametri controllati sono:

1. temperatura, pH, conducibilità,
2. composizione chimica principale,
3. metalli pesanti,
4. composti organici,
5. isotopi ossigeno ed idrogeno.

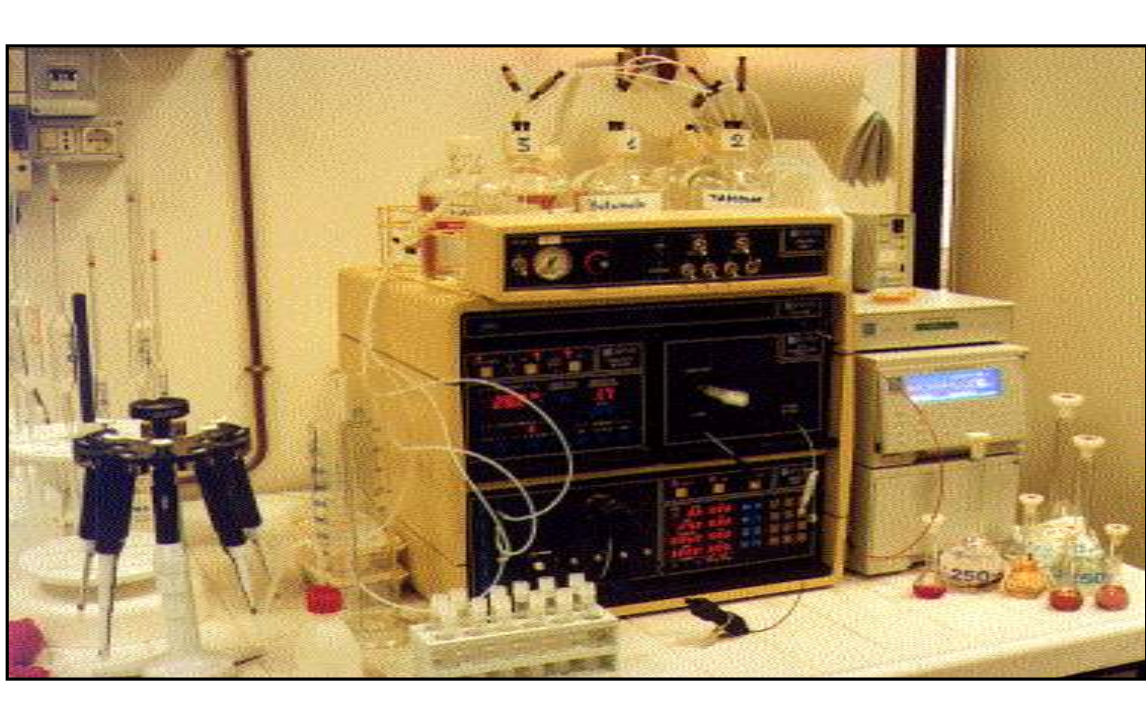
LA NORMATIVA VIGENTE

1. Acque destinate al consumo umano (DP 24/5/88 n. 236 e DL 2/2/02 n. 31)
2. Acque di sorgente (DL 4/8/99 n. 339)
3. Acque minerali naturali (Art. 1 DL 25/1/92 e mod. n. 339/99)
4. Acque termali (DL n. 339/99 e DL n. 31/01)

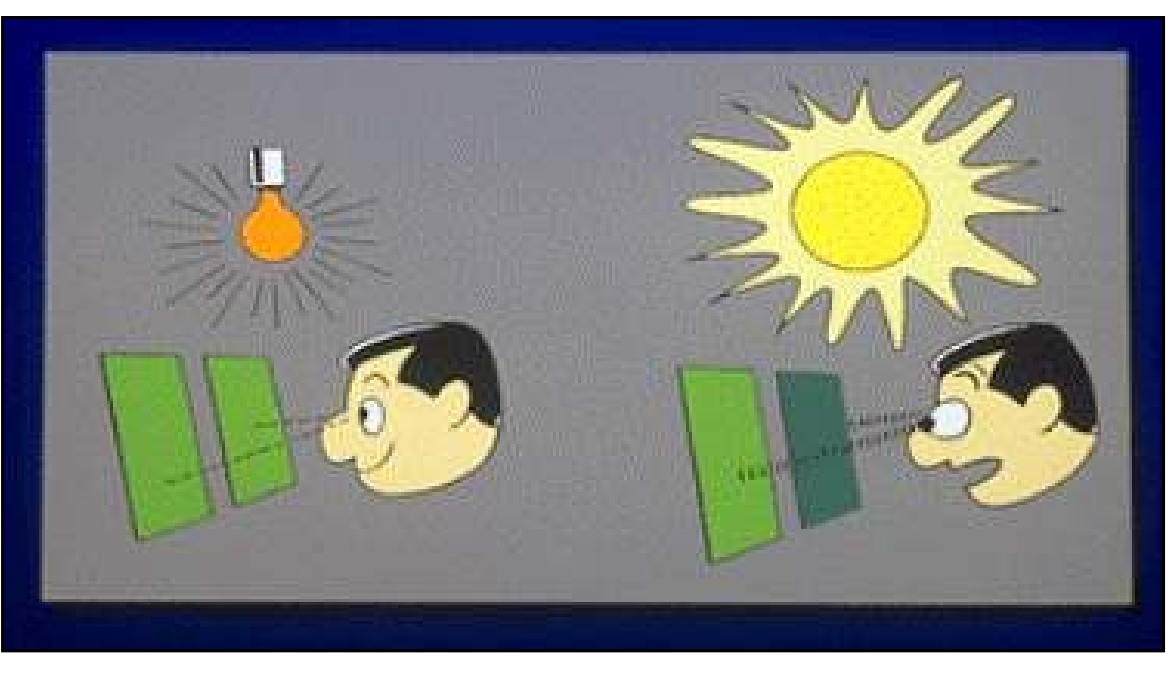
METODOLOGIE ANALITICHE



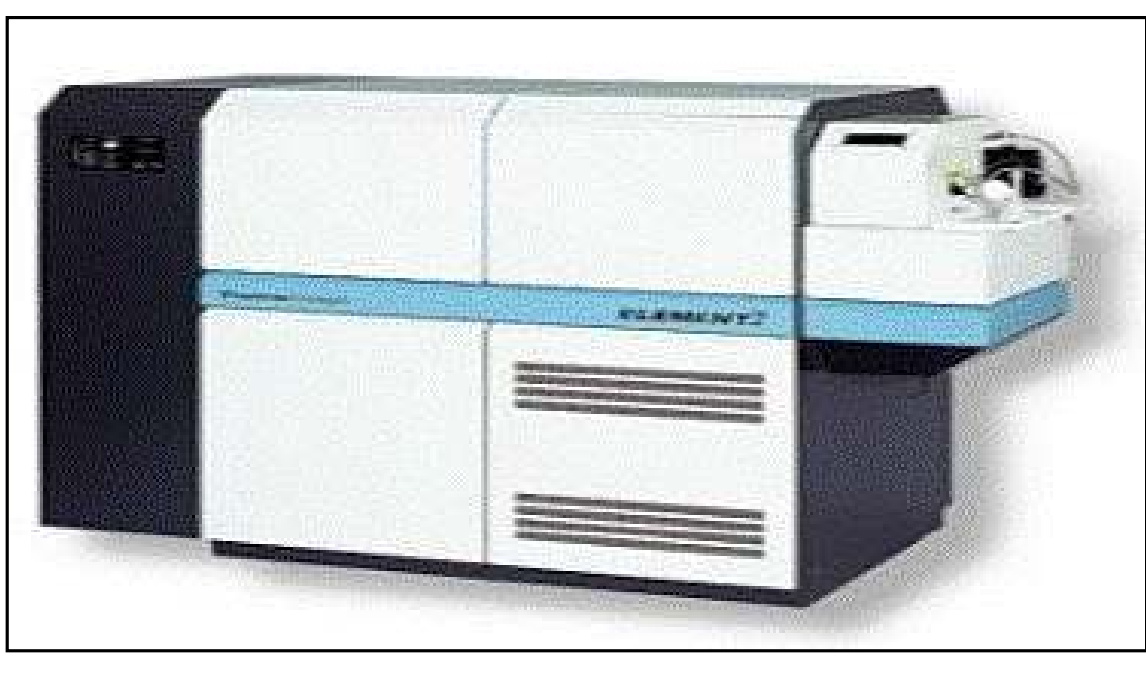
Assorbimento atomico:
Ca, Mg, Na, K



Cromatografo ionico:
Cl, SO₄, F, Br



Colorimetria:
Specie azotate



ICP - MS:
Metalli pesanti

Sample name	Quota m.	T °C	pH	Cond us/cm	Na ppm	K ppm	Ca ppm	Mg ppm	HCO ₃ ppm	SO ₄ ppm	Cl ppm	NH ₄ ppm	NO ₃ ppm	PO ₄ ppm	Br ppm	P ppm	O ₂ ppm
151.149 Travertino creek	1300	1.7	7.3	1244	2.19	2.39	266.48	43.50	128.11	764.8	7.97	5.02	0.600	0.020	<	<	<
152.150 Ponte romano creek	1630	8.4	9.2	530	0.65	1.16	106.29	16.48	126.6	202.2	2.91	0.19	0.131	<0.001	<	<	<
154.161 Travertino spring	1300	5.8	7.9	1000	1.77	1.77	203.69	26.99	106.8	568.7	0.78	6.00	0.070	0.006	<	<	<
155.162 Tunnel spring	1480	5.3	8	56	0.52	0.48	4.44	0.50	11.2	3.9	0.24	17.00	0.036	0.002	<	<	<
156.163 Scatologia creek 2	1450	7.4	7.6	193	0.87	3.00	29.44	3.10	65.8	34.0	11.30	10.50	0.030	0.010	<	<	<
157.164 Mottaletta spring	1320	7.7	8.2	128	1.28	2.28	18.66	1.10	51.9	11.5	2.36	1.60	0.180	<	<	<	<
158.165 Campodolcino spring 1	1065	8.2	8	123	0.88	2.66	21.66	1.79	64.1	12.0	1.55	4.25	0.150	<	<	<	<
159.166 Campodolcino spring 2	1090	8.9	8	138	0.70	1.64	23.75	4.17	75.3	10.7	2.70	4.00	0.150	<	<	<	<
160.167 Acqua Maria	1100	7.1	8	168	0.88	1.87	25.75	6.00	106.2	13.5	0.65	1.50	0.075	<	<	<	<
161.168 S.G. Filippo spring	640	9.3	7.9	69	2.42	2.00	5.14	1.00	12.2	11.1	0.80	3.25	0.275	0.015	<	<	<
162.169 Sommarovina creek	920	6.8	7.9	77	1.45	1.63	8.33	0.95	19.2	10.4	0.33	6.60	0.625	<	<	<	<
163.170 Motta di Olmo spring	500	8.1	7.9	90	3.06	2.49	9.20	2.35	22.0	14.5	2.45	13.50	0.275	0.015	<	<	<
164.171 Caneto spring	717	7	7.2	64	1.19	1.21	6.44	1.10	18.3	10.3	0.78	4.40	0.080	0.005	<	<	<
165.172 Vertura creek	950	4.5	7.1	52	0.93	1.60	4.99	3.05	19.9	9.5	0.44	5.40	0.036	0.002	<	<	<
166.173 Caneto spring 2	715	7.3	7.2	100	1.73	2.46	10.95	4.10	51.9	3.6	2.55	2.25	0.150	0.010	<	<	<
167.174 Pian del cà creek	650	3.7	7.6	38	0.81	0.89	4.89	0.50	10.4	6.5	0.38	3.70	0.325	0.210	<	<	<
168.175 Auroslina spring	500	6.4	7.6	64	1.02	0.96	7.80	0.90	21.4	9.4	1.05	5.00	0.040	0.005	<	<	<
169.176 Prati ruina creek	420	8.1	6.6	42	1.67	1.13	5.04	0.95	15.3	6.3	0.22	7.25	0.090	0.002	<	<	<
170.177 Prosto creek	380	7.7	7.9	184	0.99	3.30	10.68	16.89	100.7	25.0	2.70	4.50	0.225	0.005	<	<	<
171.178 Nogaredo creek	230	11	7.9	57	1.85	1.28	6.44	0.60	21.4	5.3	0.37	4.35	0.130	0.005	<	<	<
172.179 Paledo creek	1000	11	7.9	39	0.79	0.63	2.94	0.65	8.4	2.5	2.60	4.80	0.055	0.002	<	<	<
173.180 Cino Prati spring	1060	11	7.8	54	1.31	1.81	7.63	0.50	21.4	5.8	0.75	11.90	0.105	0.004	<	<	<
174.171 Paledo spring	900	10	7.8	43	1.36	0.95	5.29	0.49	10.4	10.9	0.60	6.75	0.115	0.004	<	<	<
175.172 Fontanedo spring	490	12	7.7	63	2.50	1.62	4.79	1.35	20.1	5.5	0.85	3.25	0.275	0.005	<	<	<
176.173 S. Andrea creek	370	11	7.4	49	1.62	1.13	6.68	0.75	17.3	7.9	0.49	6.55	0.105	0.004	<	<	<
177.174 Berzo spring	360	13	7.6	91	2.55	1.83	6.79	5.61	42.7	10.0	3.15	6.60	0.175	<	<	<	<
178.175 Sasso Dasco spring	280	11	6.6	75	2.94	1.57	5.69	1.70	10.7	15.5	3.50	2.55	0.150	0.045	<	<	<
179.176 Bagni Masino spring	1152	34	9	689	108.55	4.42	39.92	0.50	33.9	29.19	26.40	0.001	3.000	0.040	<	<	<
180.177 Passo servizio creek	2100	9.2	7.6	33	0.46	0.24	3.29	0.21	6.5	4.1	0.20	1.85	0.025	<0.001	<	<	<
181.178 Croce creek	2080	10	7.8	60	0.31	0.23	2.89	0.30	7.4	2.2	0.40	2.50	0.045	0.001	<	<	<
182.179 Nero lake	2100	14	7.5	80	0.35	0.24	1.74	0.02	1.9	0.9	0.05	0.05	0.005	0.005	<	<	<
183.180 Torto creek	2165	5	7.1	29	0.49	0.29	2.40	0.29	3.6	0.67	0.53	3.19	0.29	0.02	<	<	<
184.181 Truzzo lake	2050	7	7.3	73	0.49	0.74	7.68	0.40	1.9	0.9	0.05	0.05	0.005	0.005	<	<	<
185.182 Camosciera creek	230	11	7.9	39	0.79	0.63	2.94	0.65	8.4	2.5	2.60	4.80	0.055	0.002	<	<	<
186.183 Cordisavio spring	1000	11	7.9	54	1.31	1.81	7.63	0.50	21.4	5.8	0.75	11.90	0.105	0.004	<	<	<
187.184 Drogo creek 1	900	10	7.8	43	1.36	0.95	5.29	0.49	10.4	10.9	0.60	6.75	0.115	0.004	<	<	<
188.185 Drogo creek 2	490	12	7.7	63	2.50	1.62	4.79	1.35	20.1	5.5	0.85	3.25	0.275	0.005	<	<	<
189.186 Drogo creek 3	74	48	0.99	0.27	5.29	0.27	5.29	0.27	5.29	0.27	5.29	0.27	5.29	0.27	<	<	<
190.187 Drogo spring	5	7.3	42	2.10	0.81	5.69	0.30	7.4	2.2	0.40	2.50	0.045	0.001	<	<	<	<

UBICAZIONE DEI SITI DI PRELIEVO E BANCA DATI

