



Alma Mater Studiorum – Università di Bologna
Facoltà di Scienze Matematiche, Fisiche e Naturali

Laurea Magistrale in Biologia Marina

Insegnamento di
RICERCA SCIENTIFICA SUBACQUEA

A.A. 2001/2011

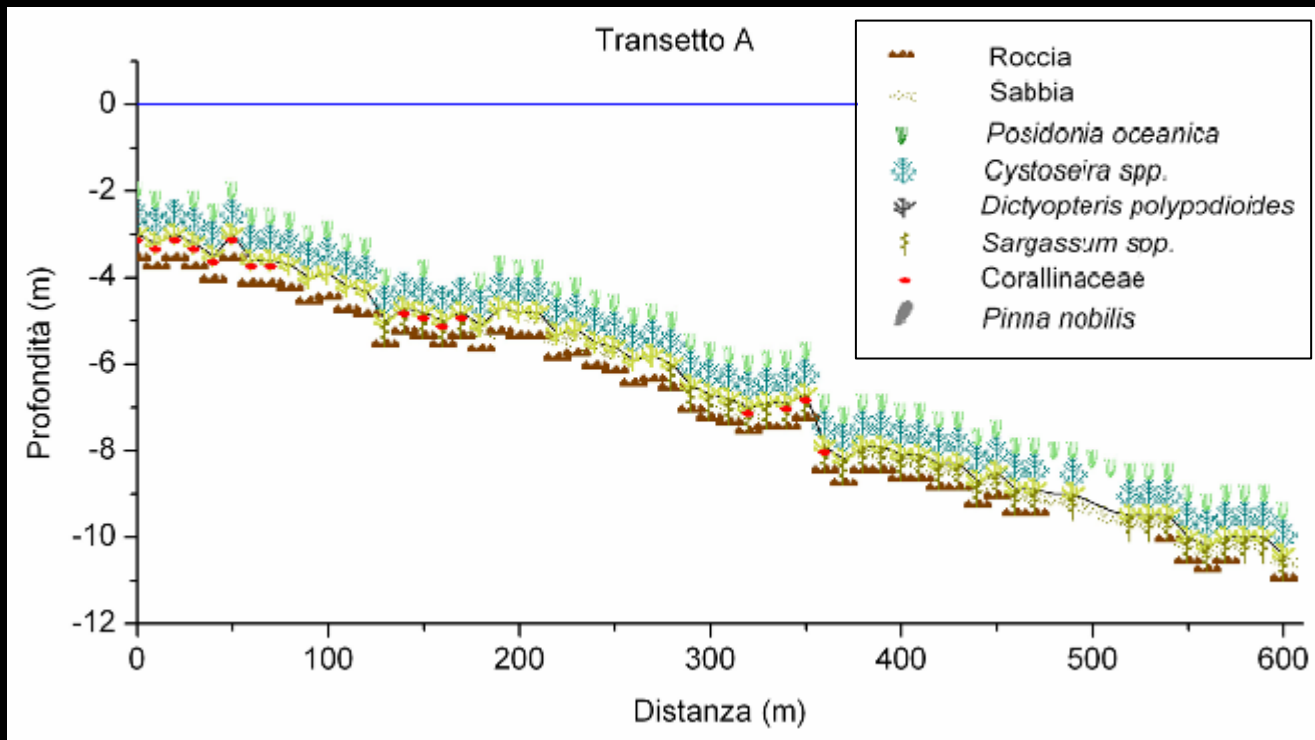
Prof. Marco Abbiati - Dr. Massimo Ponti

Esercitazione 1a

Ricostruzione del profilo del fondale (PIT metric)

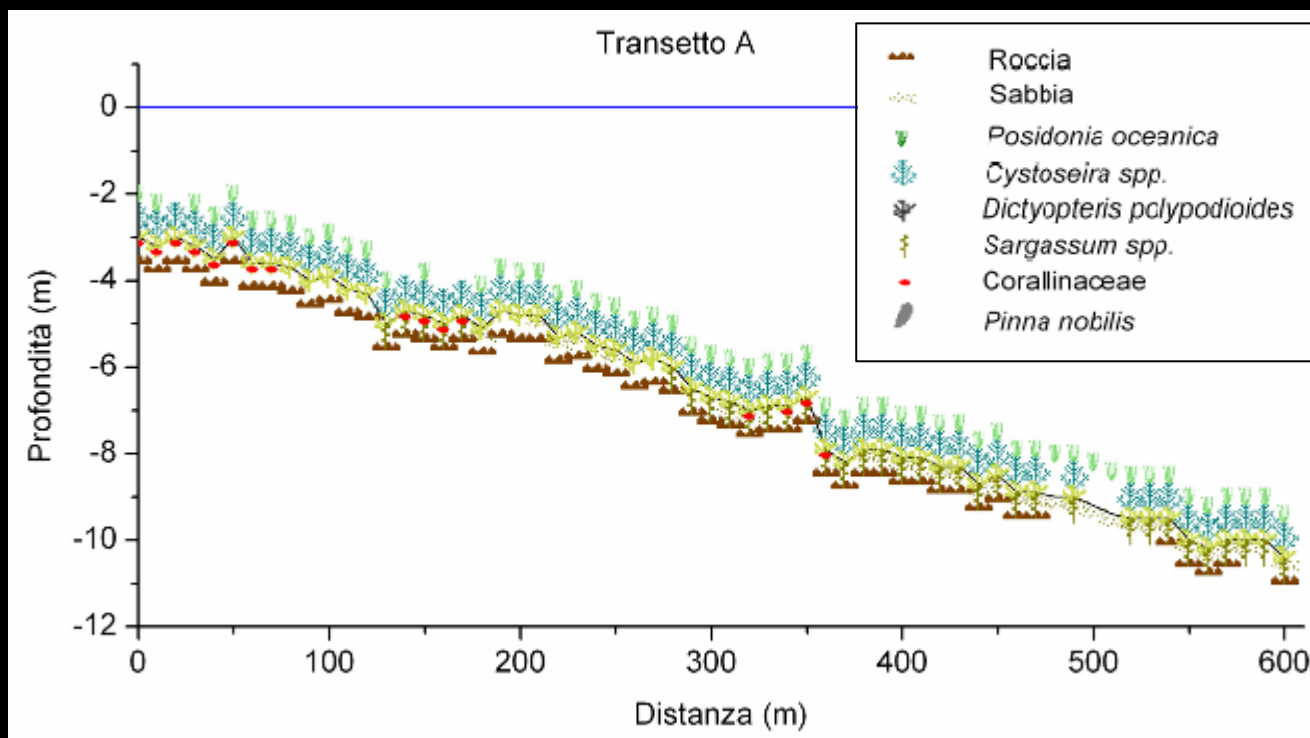
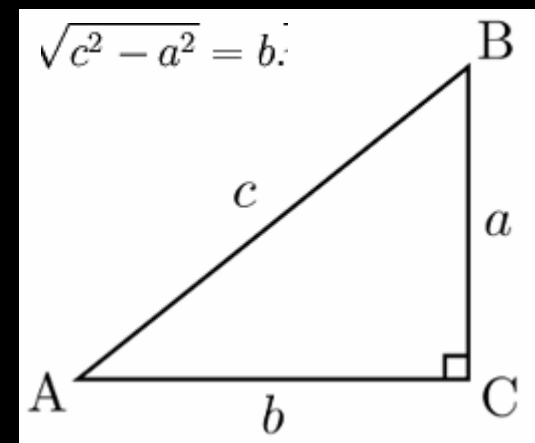
- GPS sul punto di partenza
- Cordella metrica
- Bussola
- Profondimetro
- Lavagnetta

Date	Code #	Name			
Lat	Long	Area			
Site	Distance from coast				
Starting time (hr:min)	LIM (PM)	Dive length			
Temperature air °C	water °C				
Visibility m	Depth m	Current			
Slope	Exposure	Direction			
NOTES:					
METHOD	see	1	METHOD	see	1



Ricostruzione del profilo del fondale (PIT)

B6		=B5+RADQ(((A6-A5)^2-(C6-C5)^2)		
	A	B	C	D
1	trasetto n°			
2	data			
3	ora locale			
4	distanza	dist. oriz.	prof.	osservazioni
5	0	0.00	-11.30	
6	1	0.95	-11.00	
7	2	1.95	-11.10	
8	3	2.75	-11.70	
9	4	3.35	-12.50	
10	5	4.27	-12.90	



Esercitazione 1a

Ricostruzione del profilo del fondale (PIT metric)

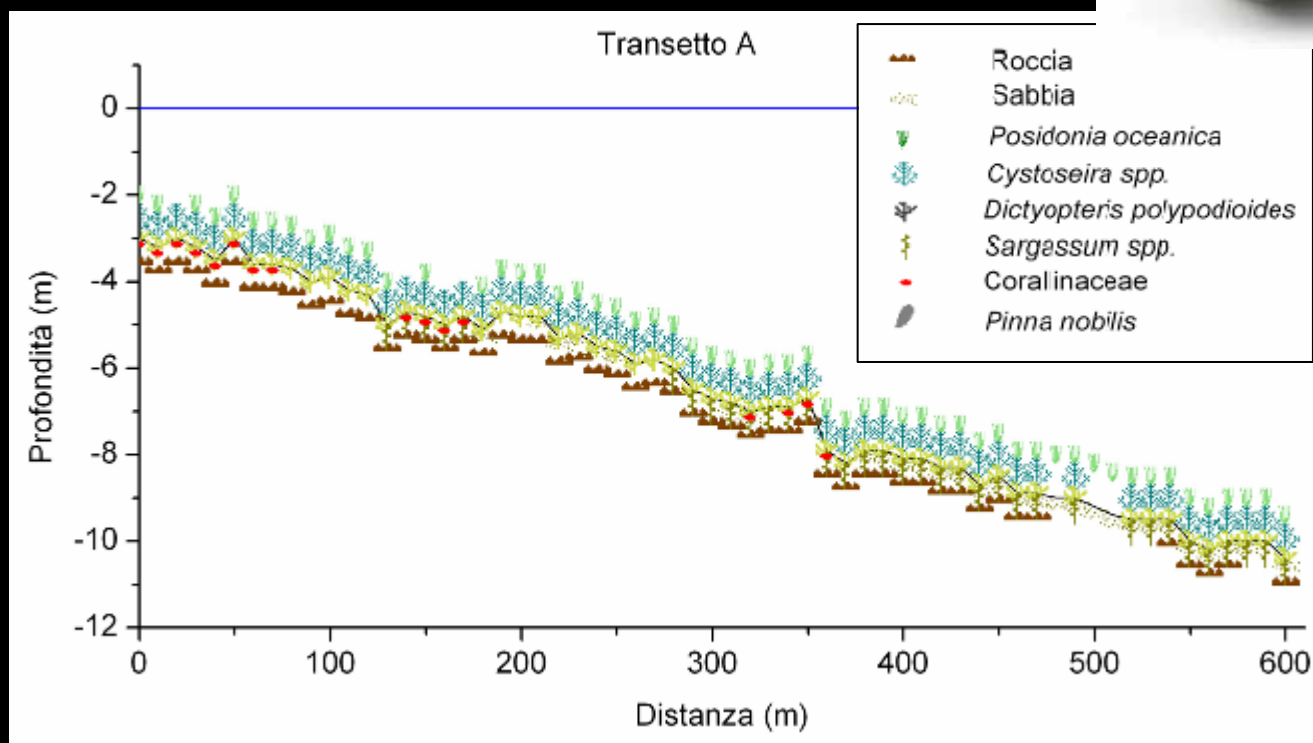
- Esempio con dati reali

<http://www.ecology.unibo.it/> → didattica [Esempio profilo PIT.xls](#)

Esercitazione 1b

Ricostruzione video transetto (PIT time lapse → metric)

- GPS trascinato o sistema di posizionamento subacqueo
- Videocamera digitale
- Bussola
- Computer subacqueo con registrazione/esportazione profilo

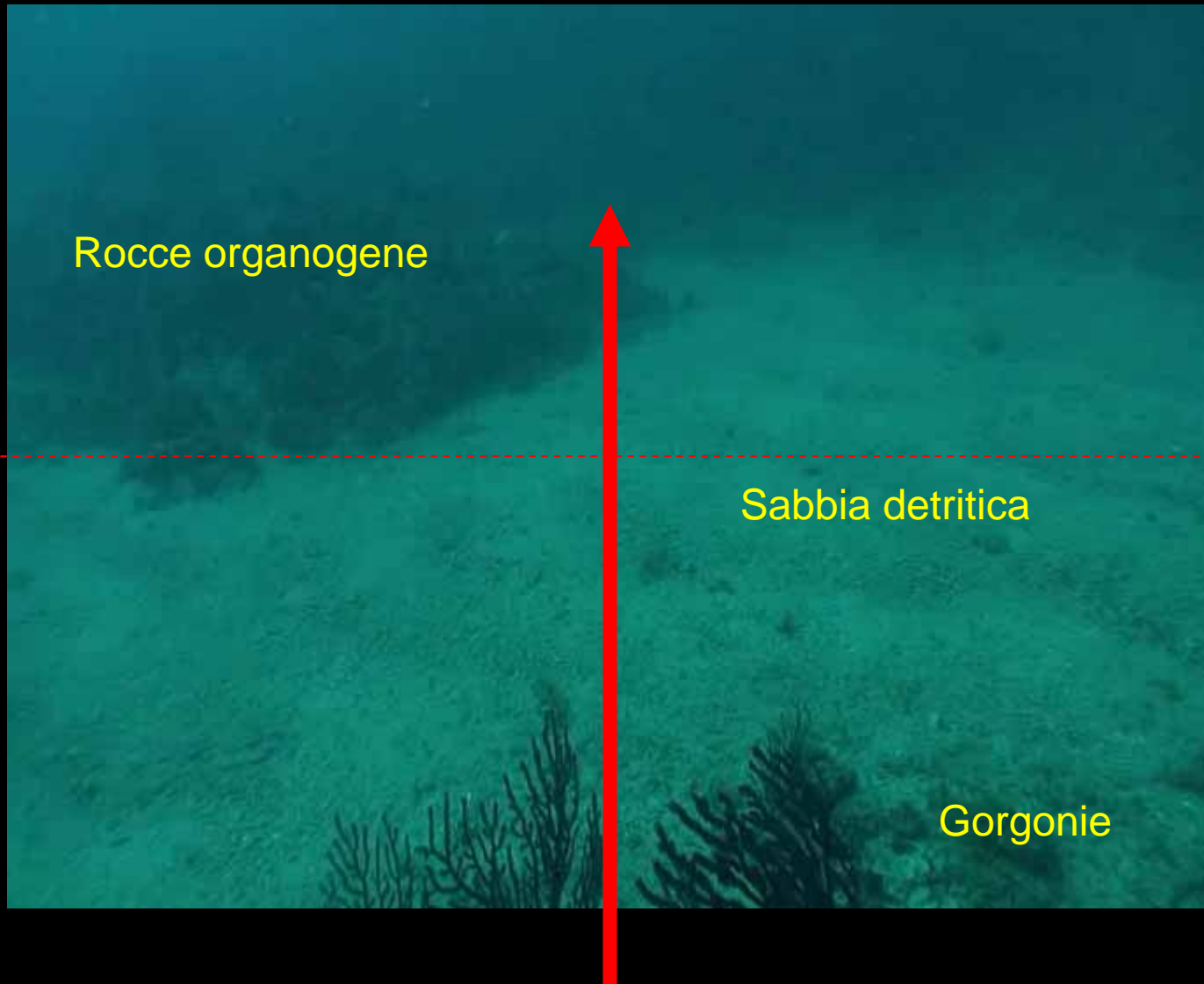


Transetti lunghi e veloci

- Videoripresa
- Scooter subacquei / traino della superficie



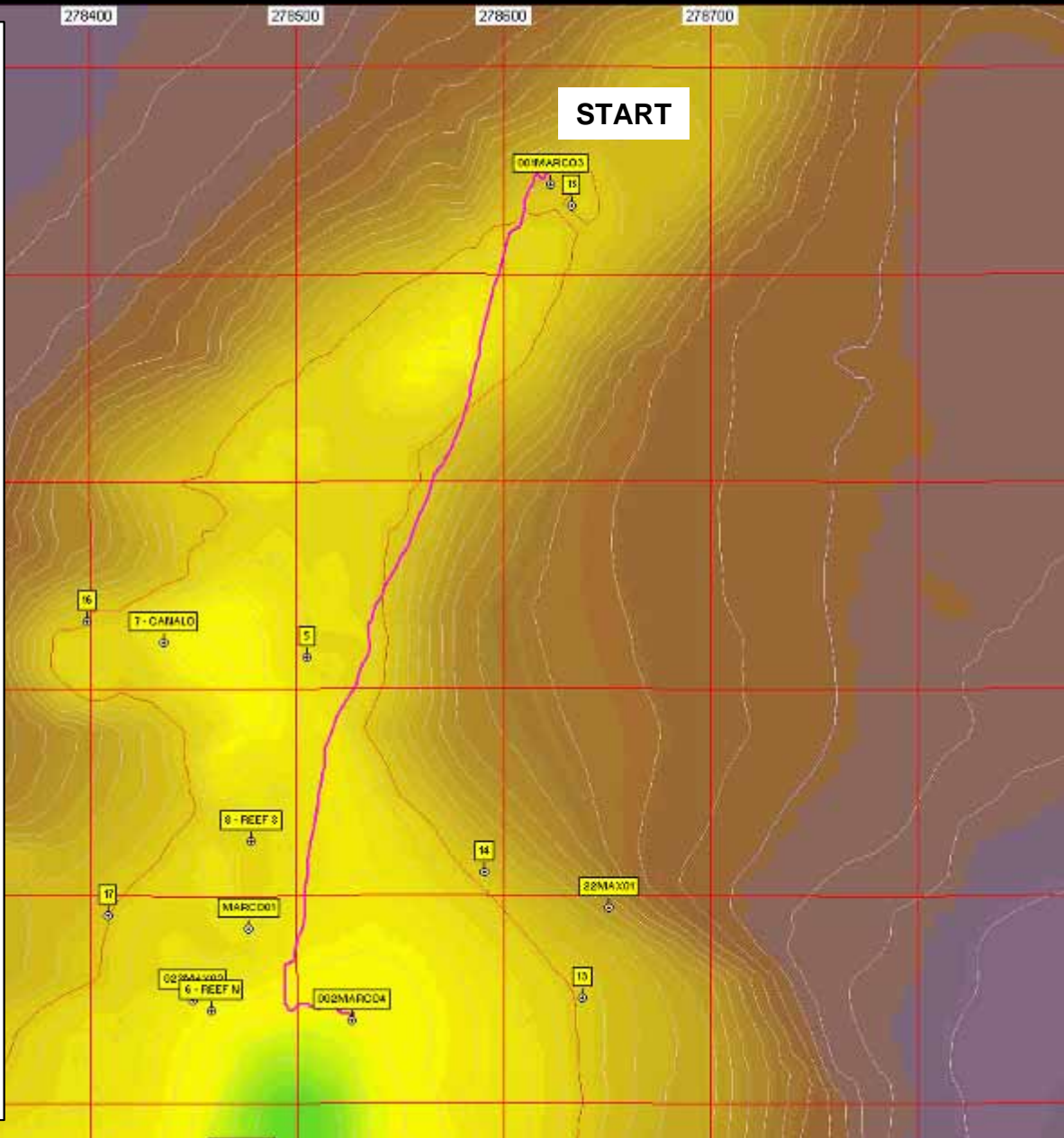
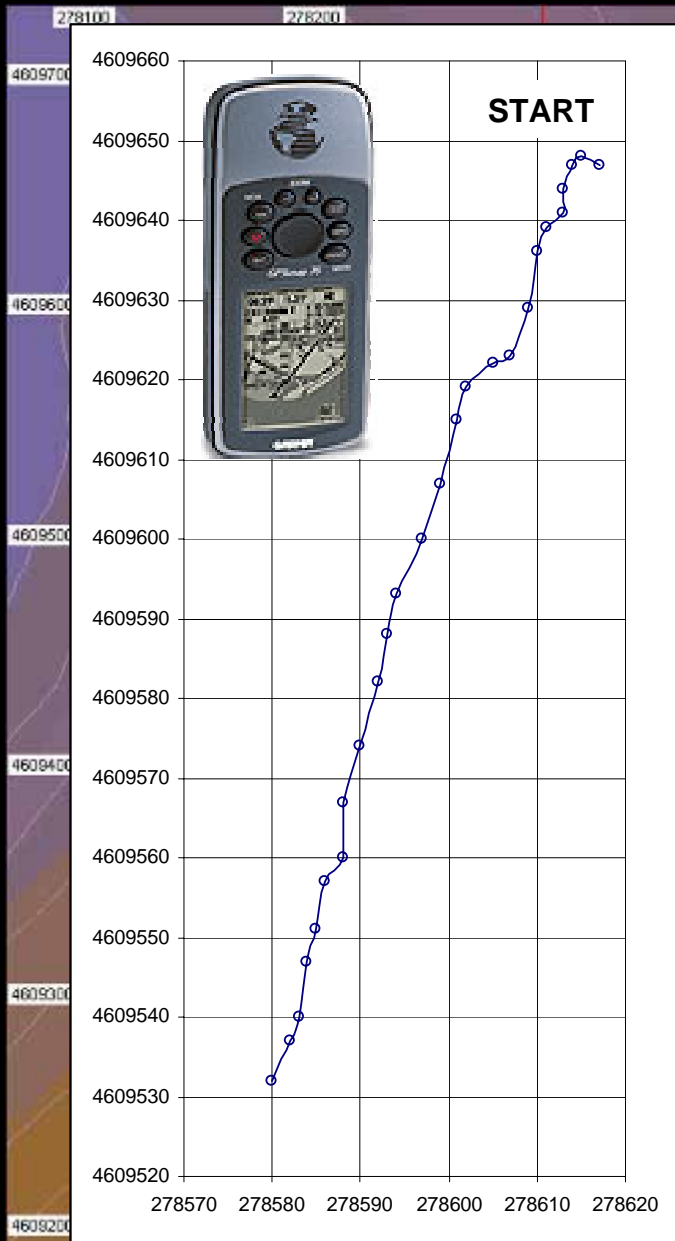




Rocce organogene

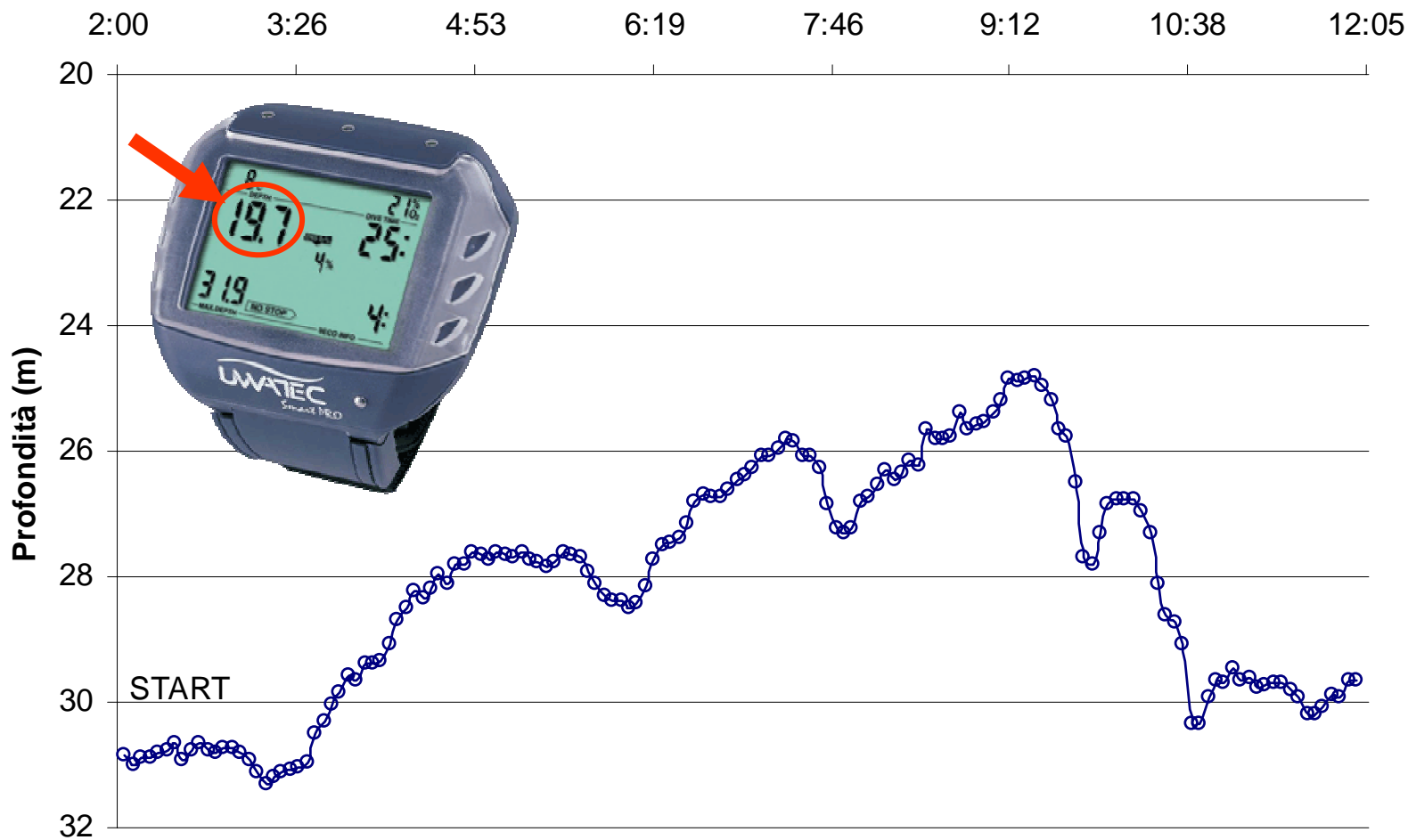
Sabbia detritica

Gorgonie



Profilo verticale

Tempo (min)

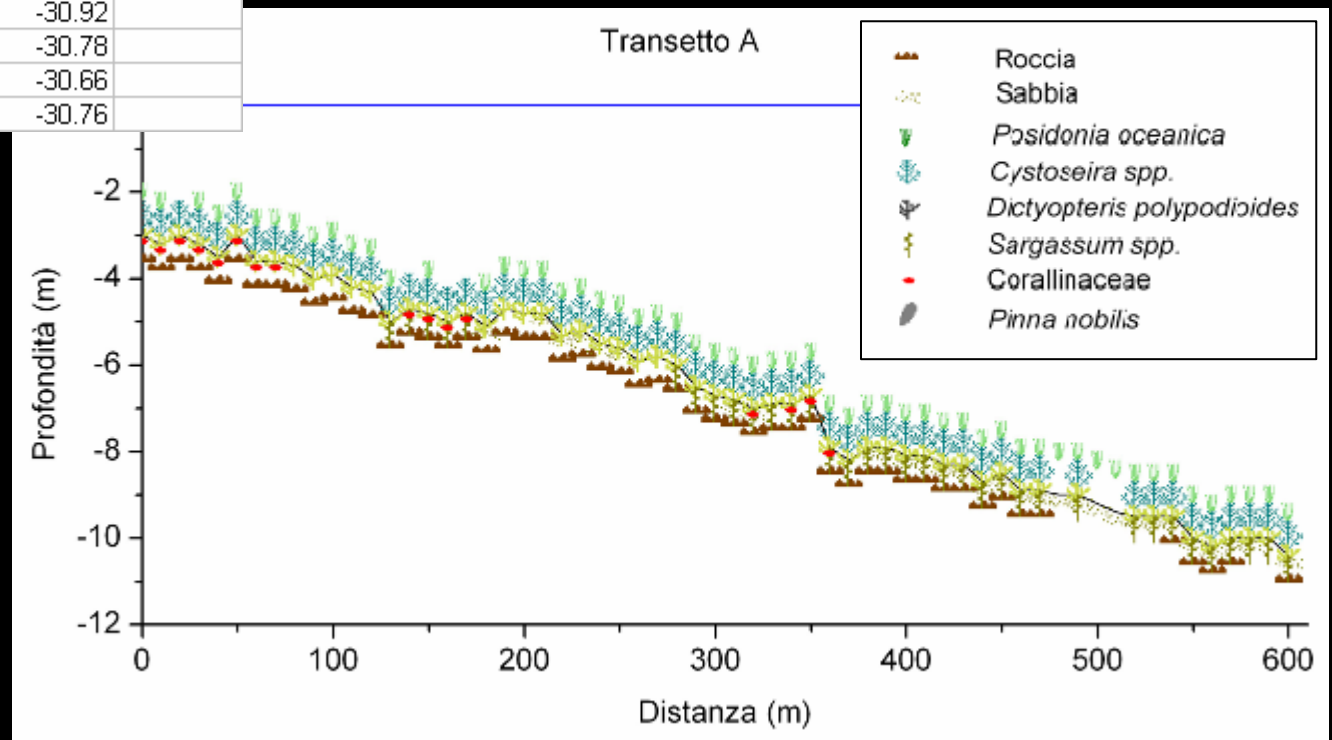


Allineamento dati divelog e GPS (interpolazione lineare)

Orario	Tempo d'immersione	m	Position	Va	X utm33	Y utm33	11	X utm33	Y utm33	
07:17:04	2:04	30.86	T		278617	4609647	0	0	278617.00	4609647.00
07:17:08	2:08	31.00	F				1	11	278616.83	4609647.08
07:17:12	2:12	30.88	F				2	10	278616.67	4609647.17
07:17:16	2:16	30.90	F				3	9	278616.50	4609647.25
07:17:20	2:20	30.82	F				4	8	278616.33	4609647.33
07:17:24	2:24	30.76	F				5	7	278616.17	4609647.42
07:17:28	2:28	30.64	F				6	6	278616.00	4609647.50
07:17:32	2:32	30.92	F				7	5	278615.83	4609647.58
07:17:36	2:36	30.78	F				8	4	278615.67	4609647.67
07:17:40	2:40	30.66	F				9	3	278615.50	4609647.75
07:17:44	2:44	30.76	F				10	2	278615.33	4609647.83
07:17:48	2:48	30.80	F				11	1	278615.17	4609647.92
07:17:52	2:52	30.72	T		278615	4609648	0	0	278615.00	4609648.00
07:17:56	2:56	30.74	F				1	7	278614.88	4609647.88
07:18:00	3:00	30.82	F				2	6	278614.75	4609647.75
07:18:04	3:04	30.92	F				3	5	278614.63	4609647.63
07:18:08	3:08	31.12	F				4	4	278614.50	4609647.50
07:18:12	3:12	31.30	F				5	3	278614.38	4609647.38
07:18:16	3:16	31.18	F				6	2	278614.25	4609647.25
07:18:20	3:20	31.12	F				7	1	278614.13	4609647.13
07:18:24	3:24	31.08	T		278614	4609647	0	0	278614.00	4609647.00
07:18:28	3:28	31.04	F				1	5	278613.83	4609646.50
07:18:32	3:32	30.96	F				2	4	278613.67	4609646.00
07:18:36	3:36	30.50	F				3	3	278613.50	4609645.50
07:18:40	3:40	30.32	F				4	2	278613.33	4609645.00
07:18:44	3:44	30.04	F				5	1	278613.17	4609644.50
07:18:48	3:48	29.84	T		278613	4609644	0	0	278613.00	4609644.00

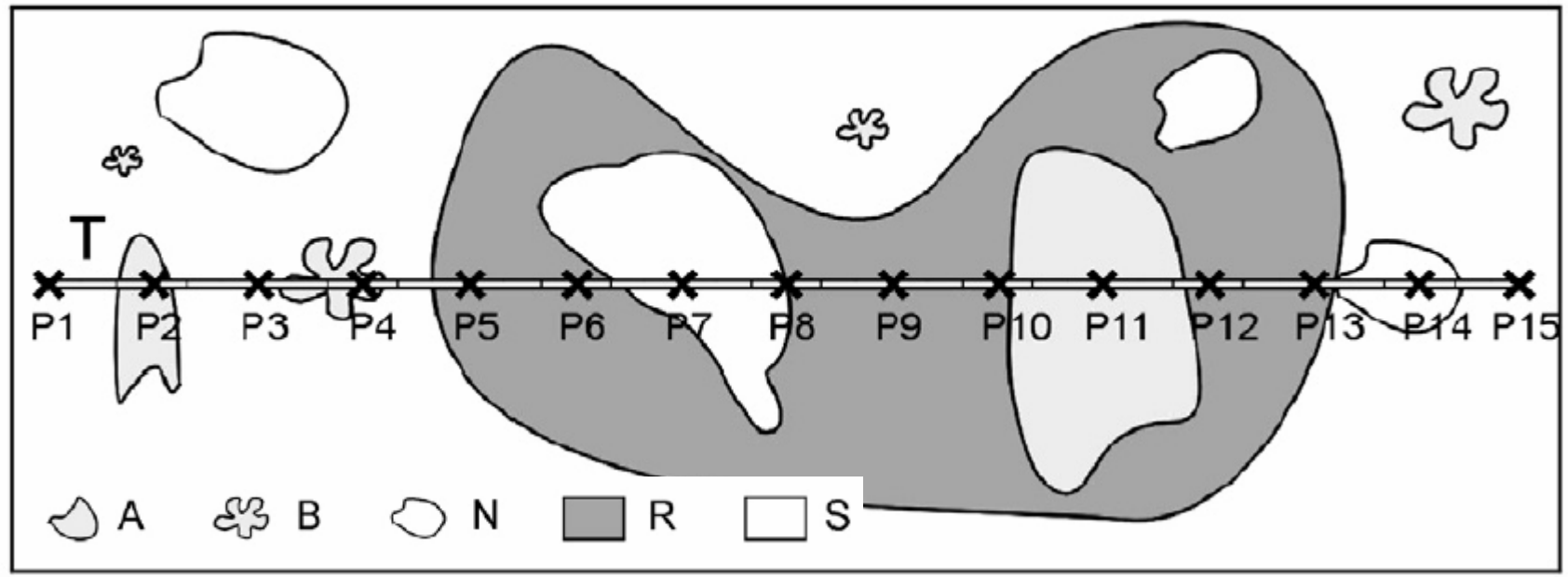
Variabili misurate

X utm33	Y utm33	Z (no tide c)	Variabile
278617.00	4609647.00	-30.86	
278616.83	4609647.08	-31.00	
278616.67	4609647.17	-30.88	
278616.50	4609647.25	-30.90	
278616.33	4609647.33	-30.82	
278616.17	4609647.42	-30.76	
278616.00	4609647.50	-30.64	
278615.83	4609647.58	-30.92	
278615.67	4609647.67	-30.78	
278615.50	4609647.75	-30.66	
278615.33	4609647.83	-30.76	



POINT INTERCEPT TRANSECT (PIT)

Bianchi et al., 2003



P_x = numero di punti in cui è presente l'organismo x

P_{tot} = numero totale di punti

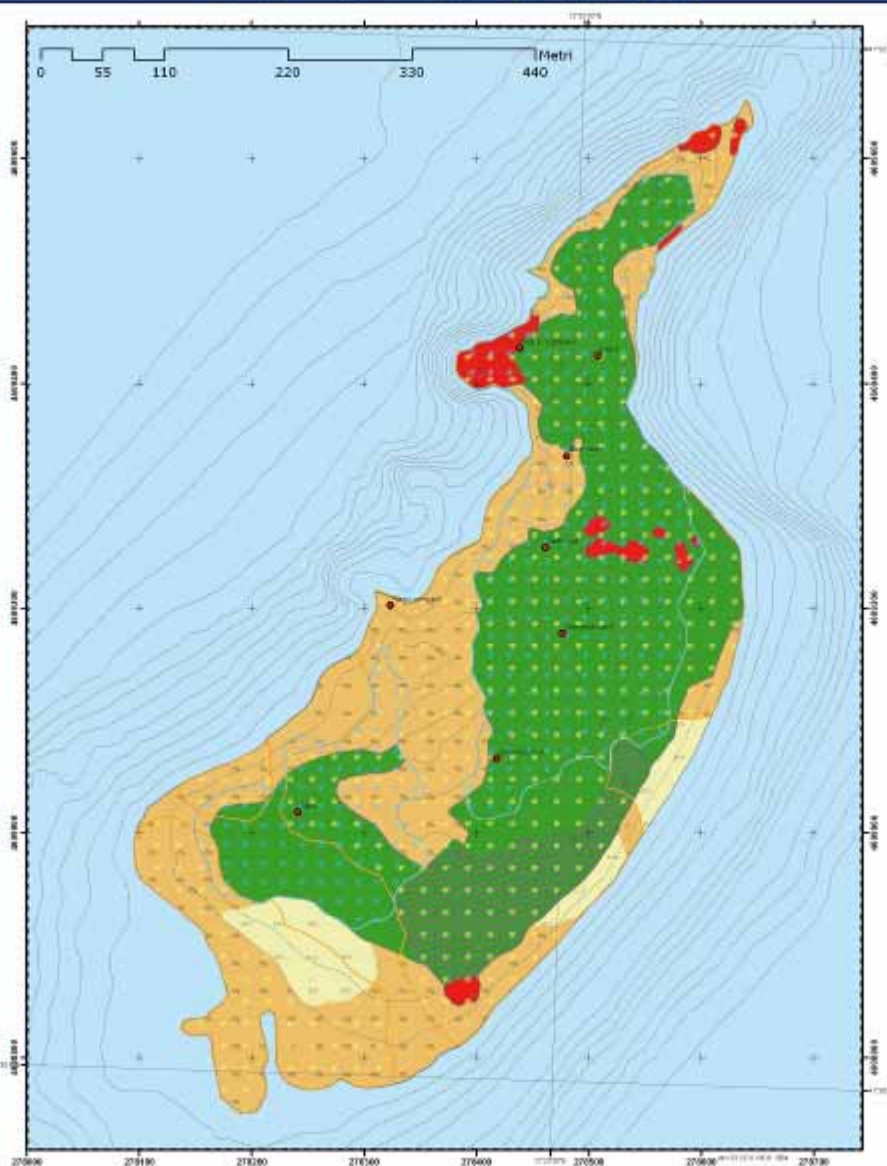
PIT	Punti	Frequenza
A	P2, P11	2
B	P4	1
N	P7, P8, P14	3
S	P1, P3, P15	3
R	P5, P6, P9, P10, P12, P13	6

Percentuale di ricoprimento degli organismi (percent cover)

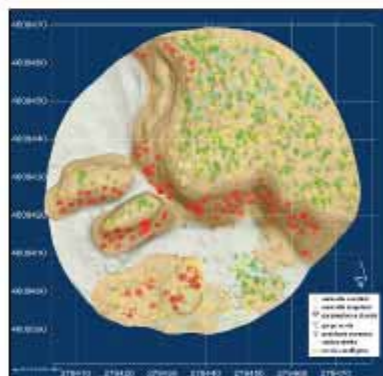
$$r_x \% = P_x / P_{tot} \times 100$$

Area Marina Protetta Secche di Tor Paterno

Carta Bionomica dei Fondi Marini



Angular Unit: Degree (0.017453292519943299)
 Prime Meridian: Greenwich (0.000000000000000000)
 Datum: D_WGS_1984
 Spheroid: WGS_1984
 Semimajor Axis: 6378137.000000000000000000
 Semiminor Axis: 6356752.314245179300000000
 Inverse Flattening: 298.257223563000030000



Esempi di cartografie interattive: Secche di Tor Paterno

