GESTIONE E TUTELA DELLE COSTE

SECONDO INCONTRO TERRITORIALE

Alghero 30 Maggio 2019

Interreg

UNIONE EUROPEA

MARITTIMO-IT FR-MARITIME

Fondo Europeo di Sviluppo Regionale

MAREGOT

Un modello di previsione di instabilità delle falesie costiere

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La cooperazione al cuore del Mediterraneo

Oggetto:
analisi dei fenomeni di instabilità delle falesie costiere

Finalità:
prevedere quali settori della costa sono più propensi a franare

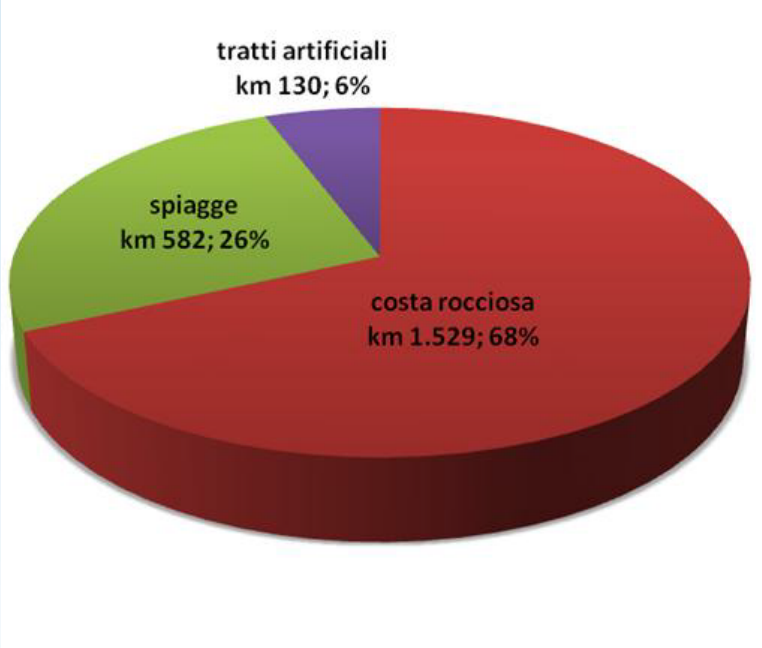
Approccio:
condivisione di un protocollo di indagine che, partendo dai siti test della Sardegna, possa essere applicato in ambito mediterraneo



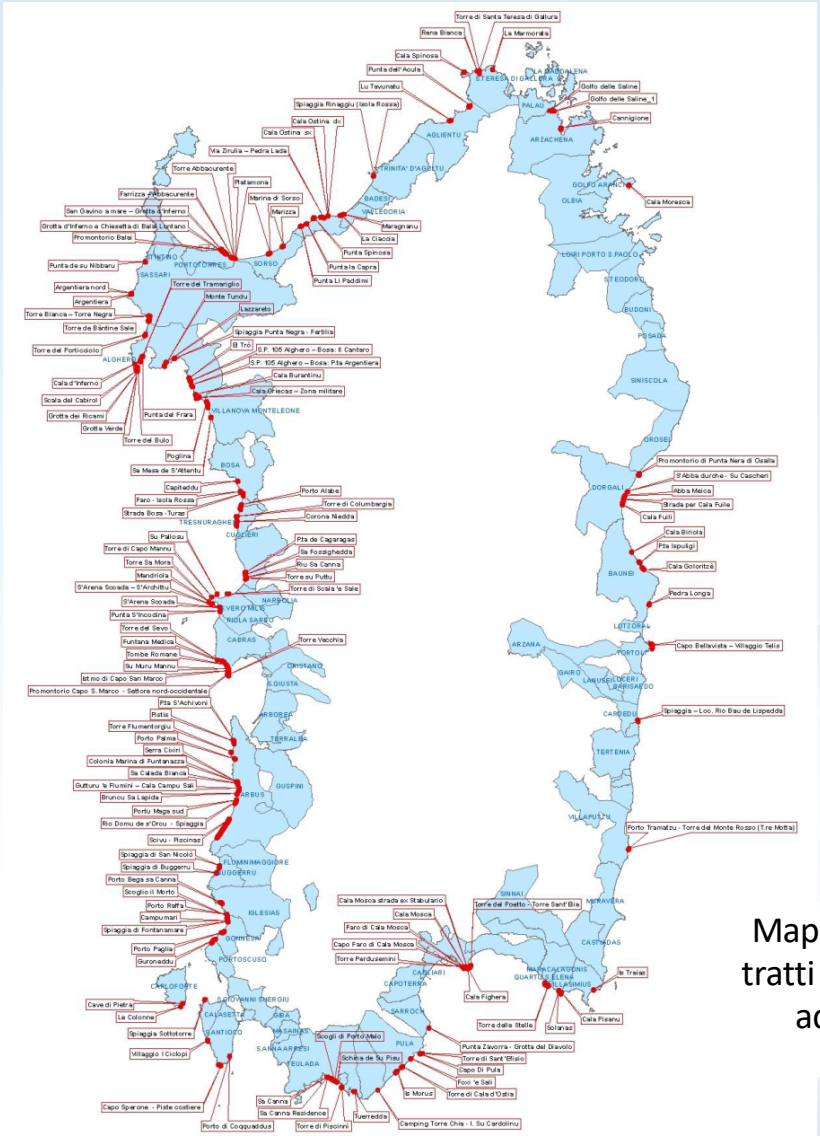


Temi: sicurezza degli insediamenti, fruizione delle piccole baie per le persone e i natanti

Le coste rocciose della Sardegna



Costa della Sardegna: **2.241 km**
Costa rocciosa **1.529 km** (68%)
di cui **127** km in falesia,
(Dati P.A.C., Regione Sardegna)



Mappa regionale dei tratti in costa rocciosa ad alta criticità

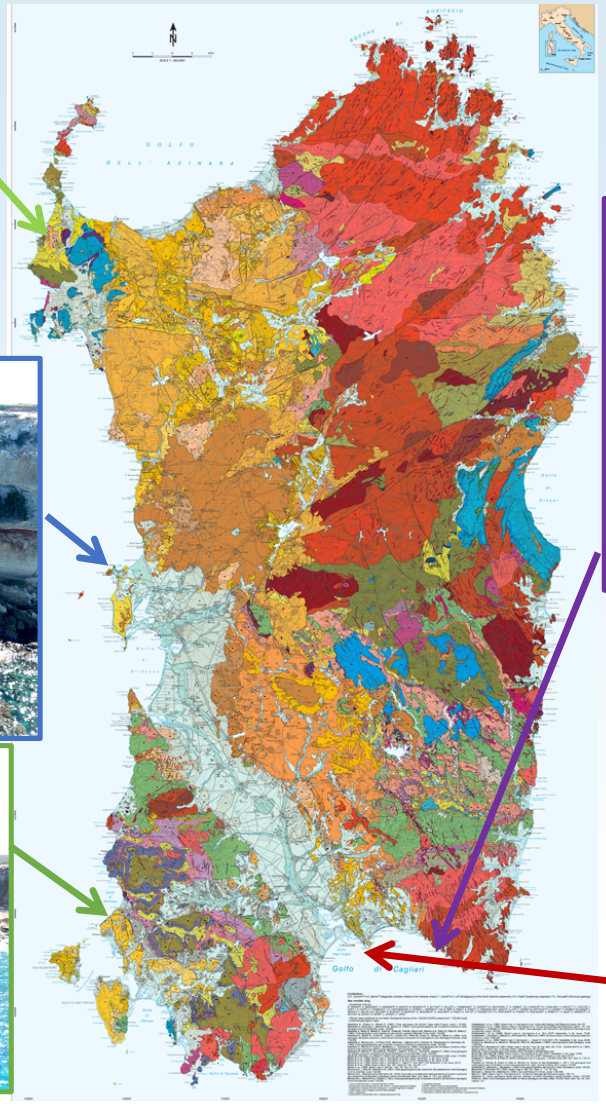
Controllo tettonico (attuale e passato)

Controllo litologico (5 aree test)















Rilevamento fotogrammetrico di dettaglio

Modello di analisi

Certainty Factor – Fattore di Certezza
Modello statistico probabilistico



Inventario frane

Geologia

Acclività

Esposizione

Indice topografico

Altimetria

?

CF

CF

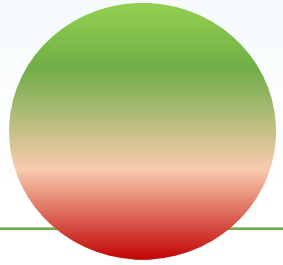
CF

CF

CF

CF

Suscettività

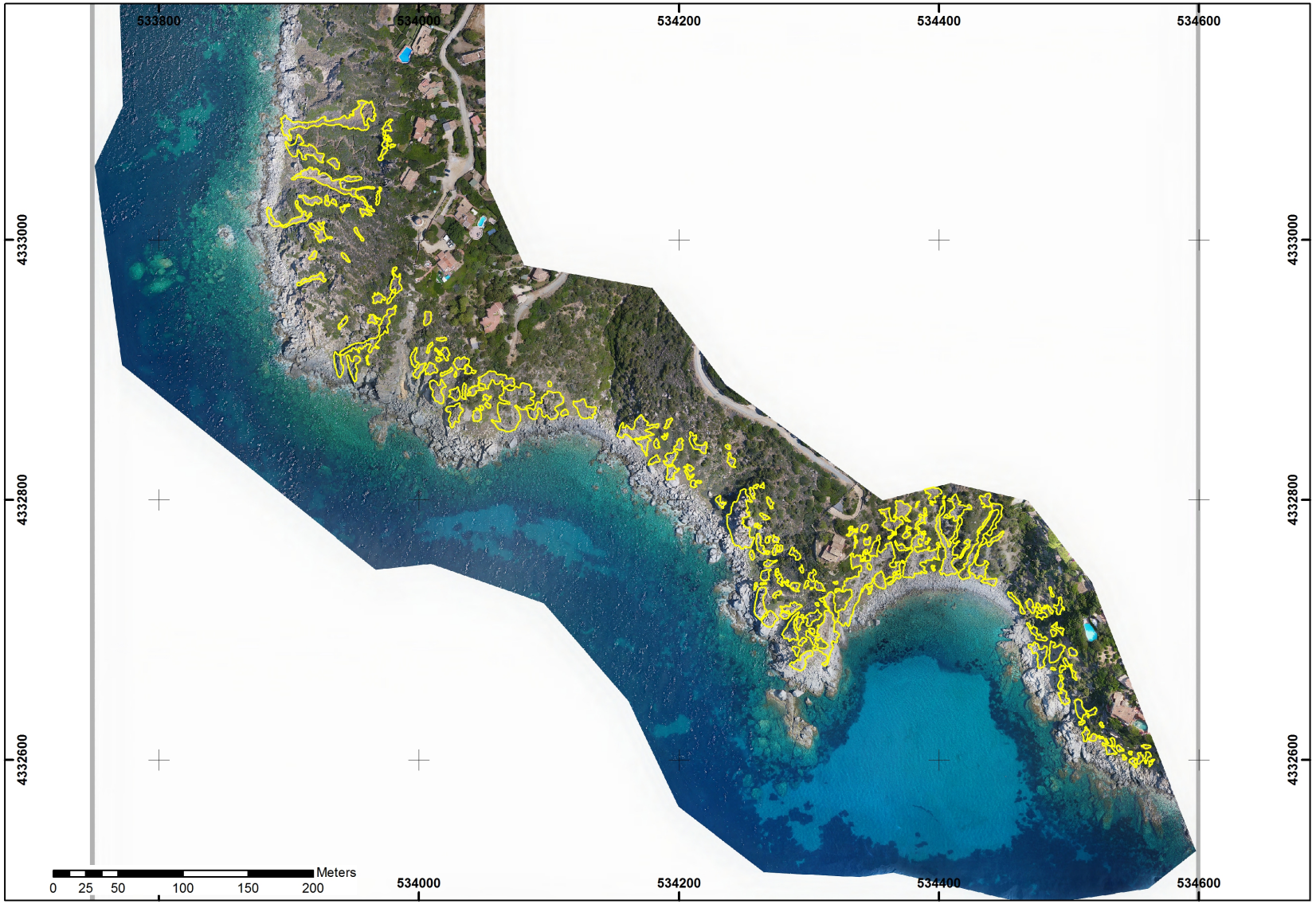


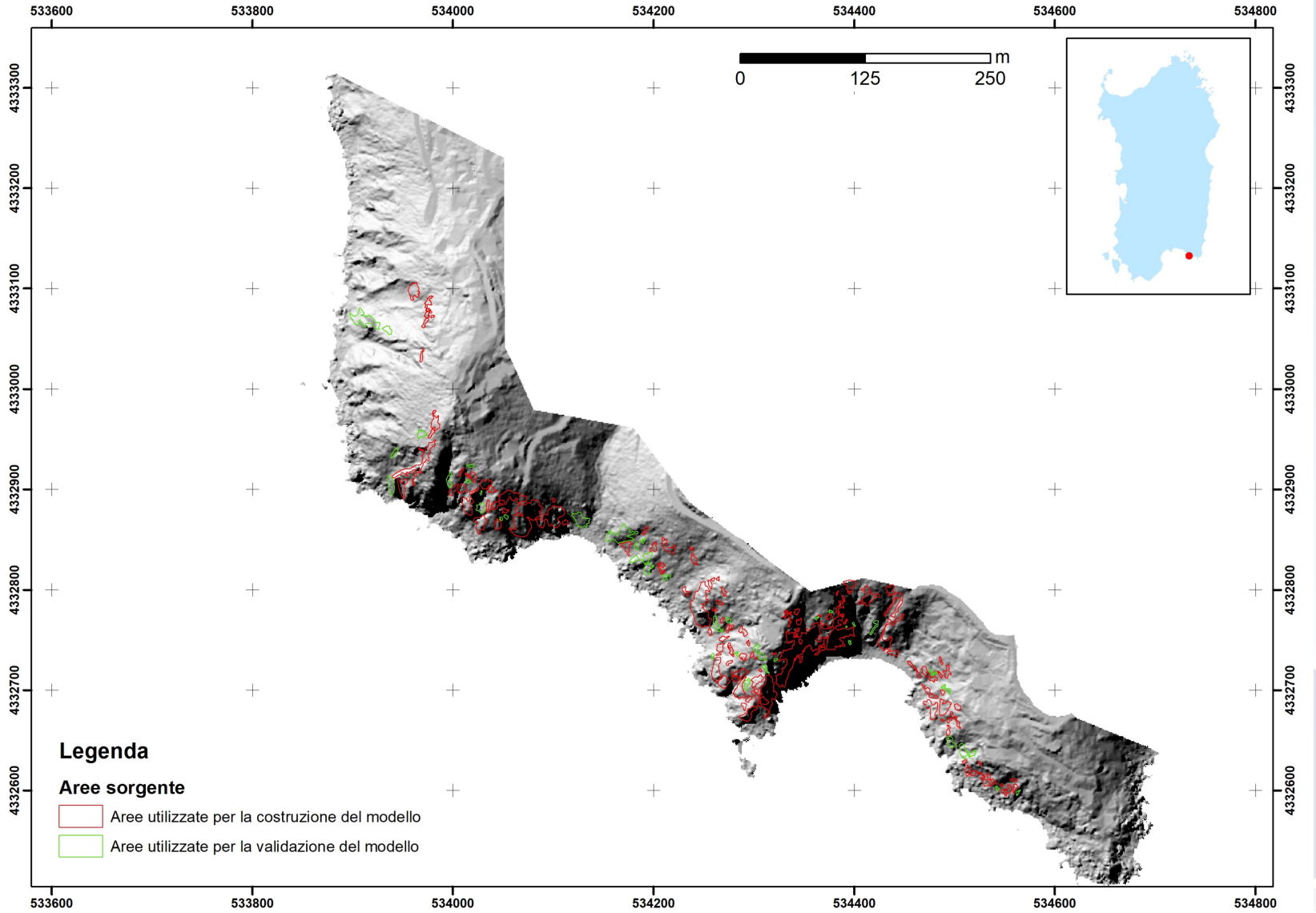
Legenda

Value

1 - Alta stabilità
2 - Media stabilità
3 - Stabilità incerta
4 - Bassa instabilità
5 - Media instabilità
6 - Alta instabilità

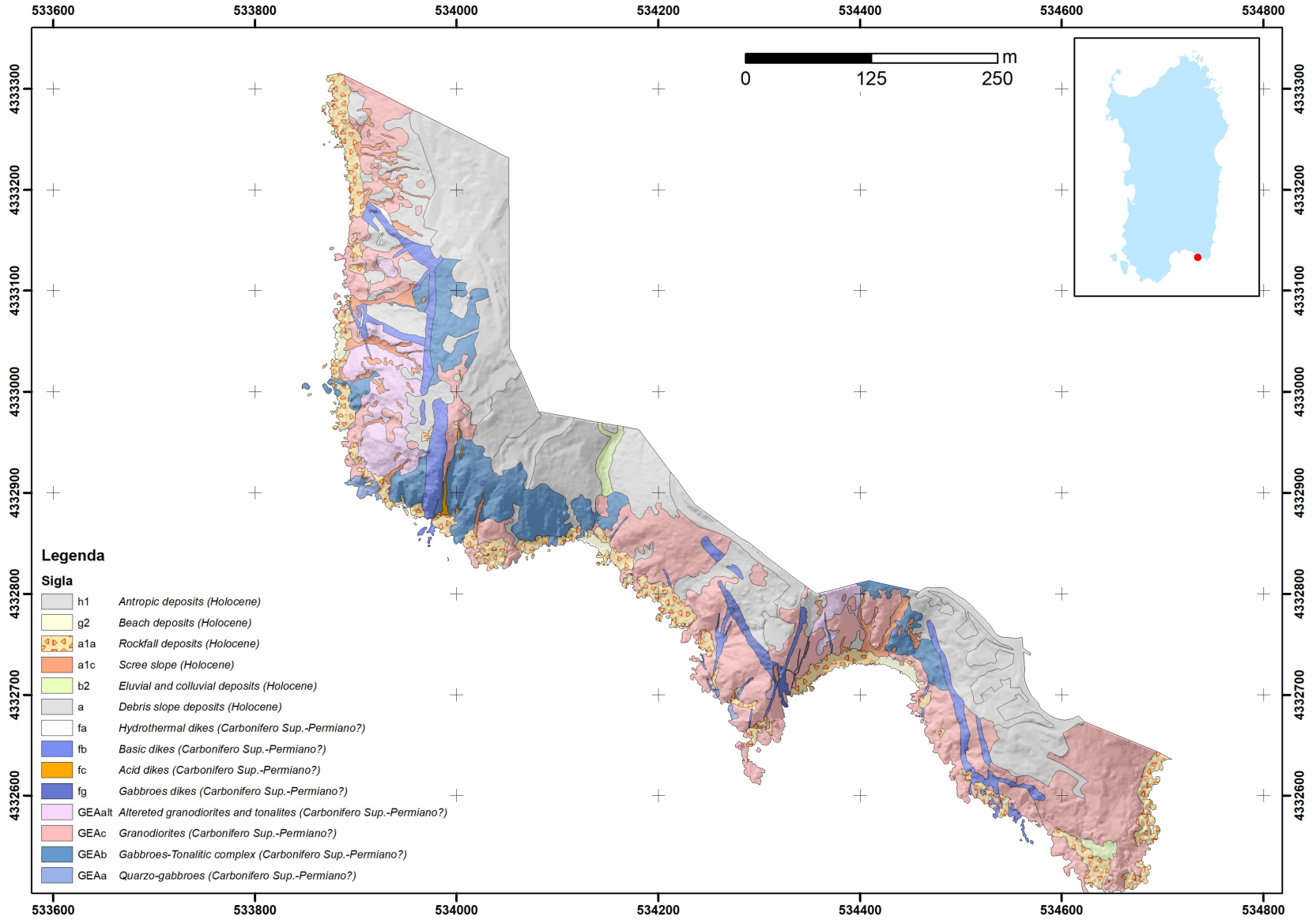
Le aree sorgente

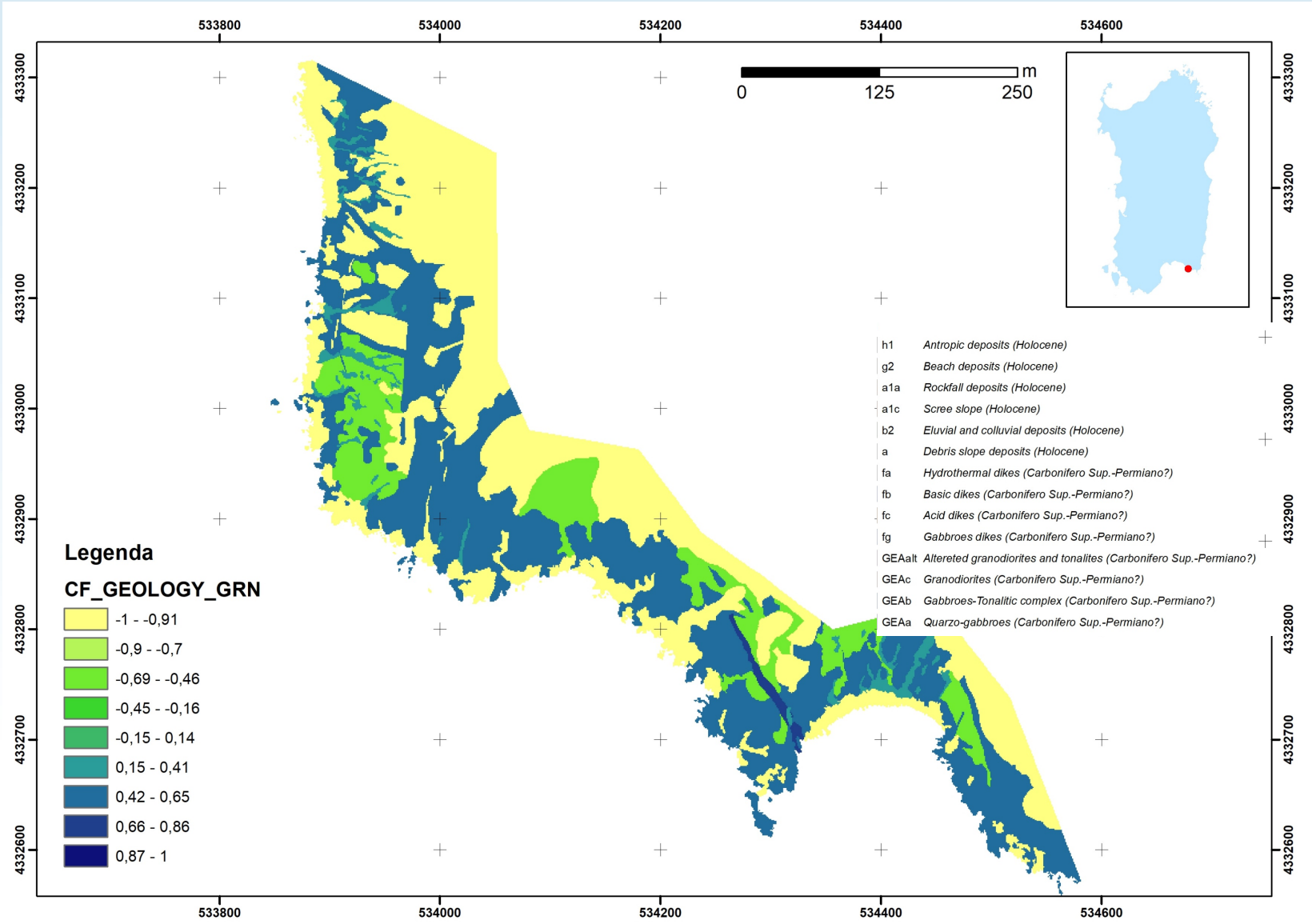




Le aree sorgente: dati di training e dati di test

La carta geologica

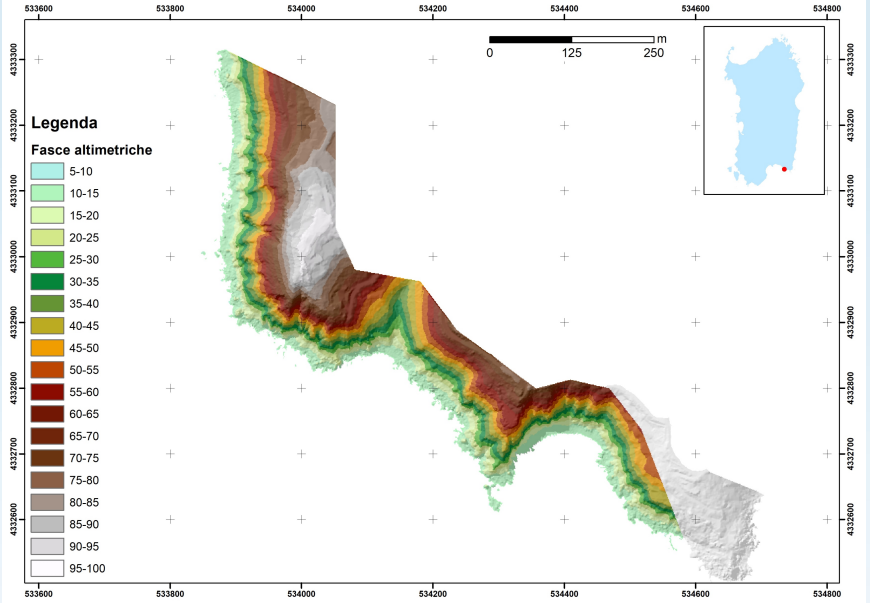


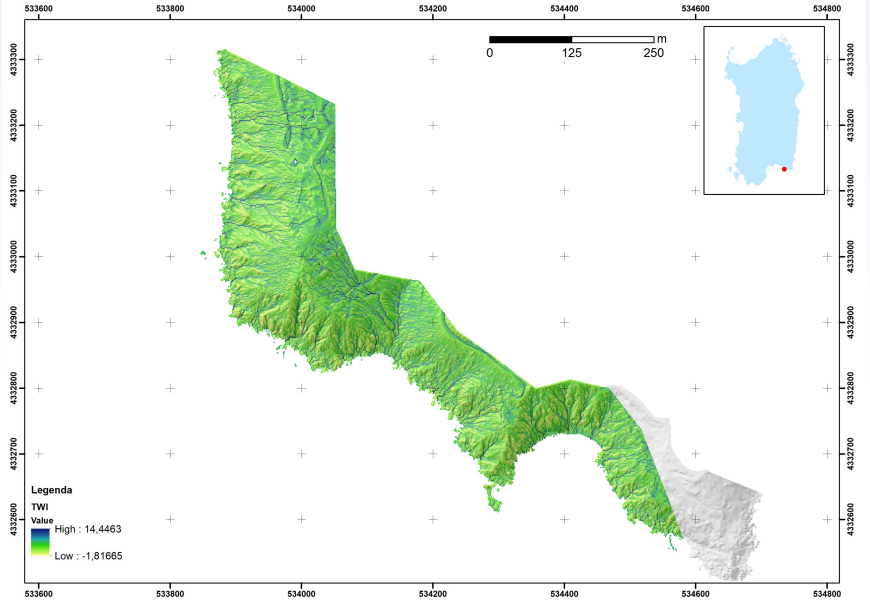


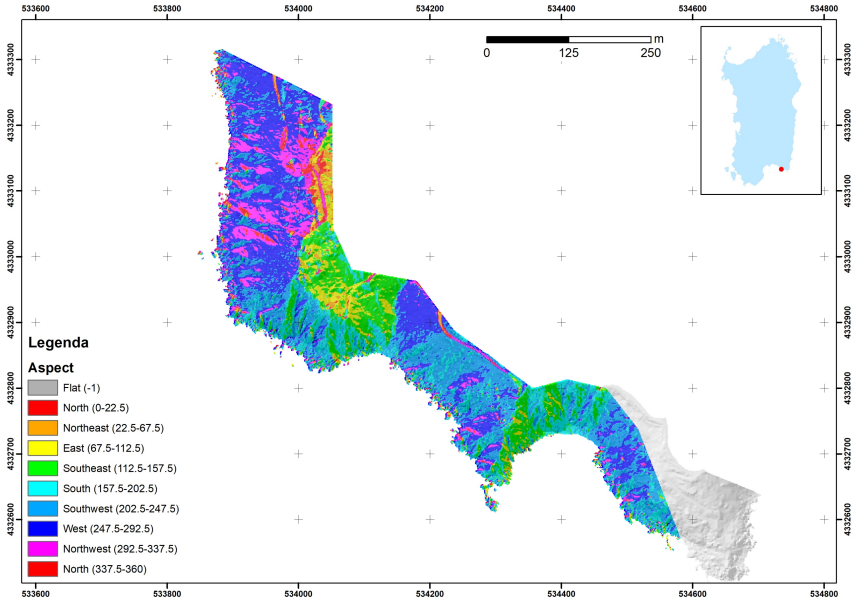
Aree sorgente /geologia

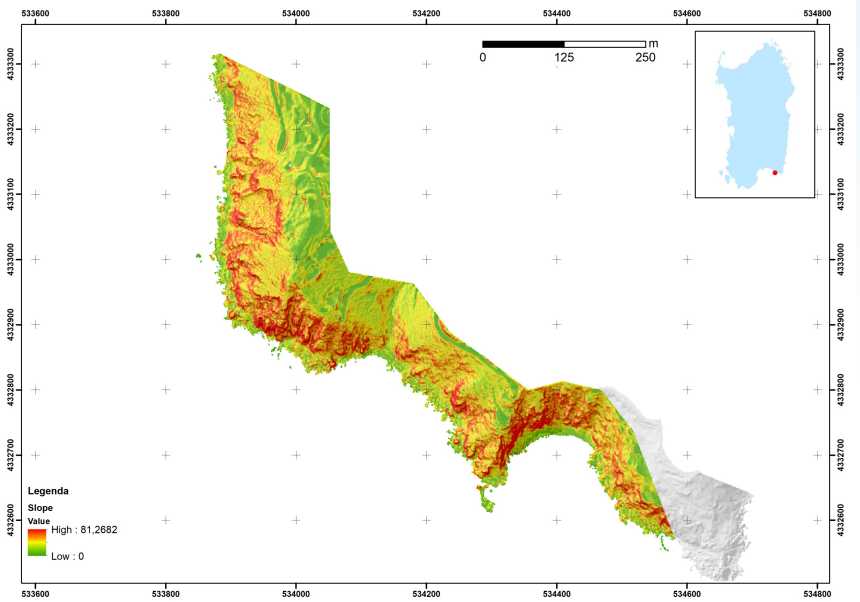
Classe	Sigla	CF
1	a1a	-0,95
2	GEAc	0,55
3	fb	0,43
4	h1	-1,00
5	GEAb	0,63
6	GEAa	-1,00
7	a1c	0,17
8	g2	-1,00
9	a	-0,96
10	fc	-1,00
11	GEAalt	-0,47
12	fa	-1,00
13	fg	0,69
14	b2	-1,00

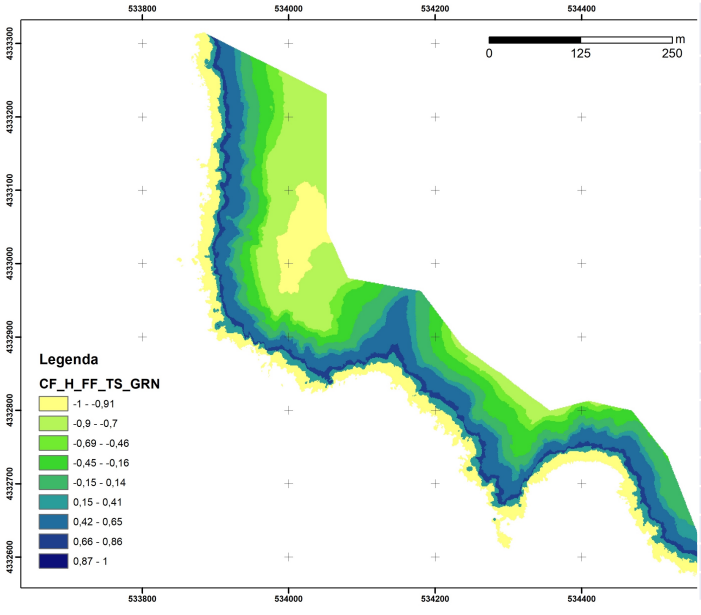
Morfometria





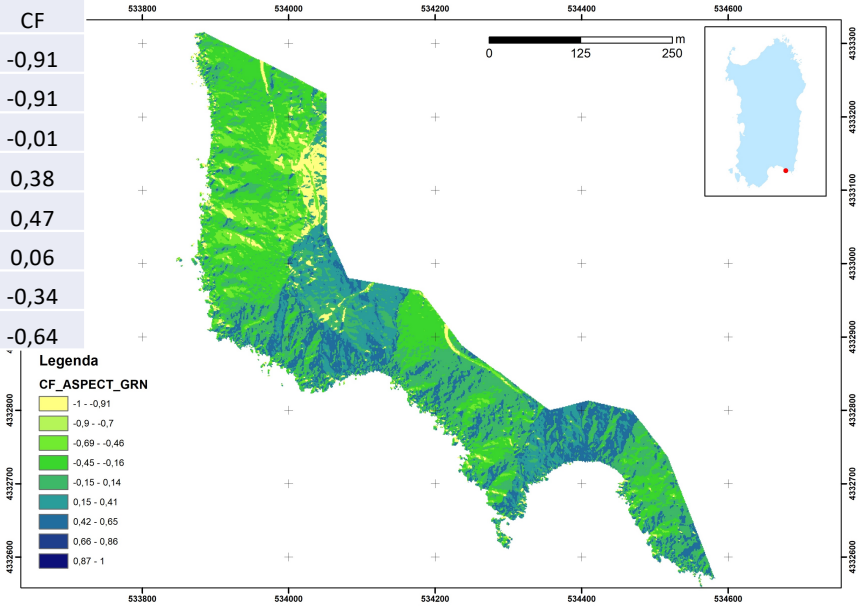


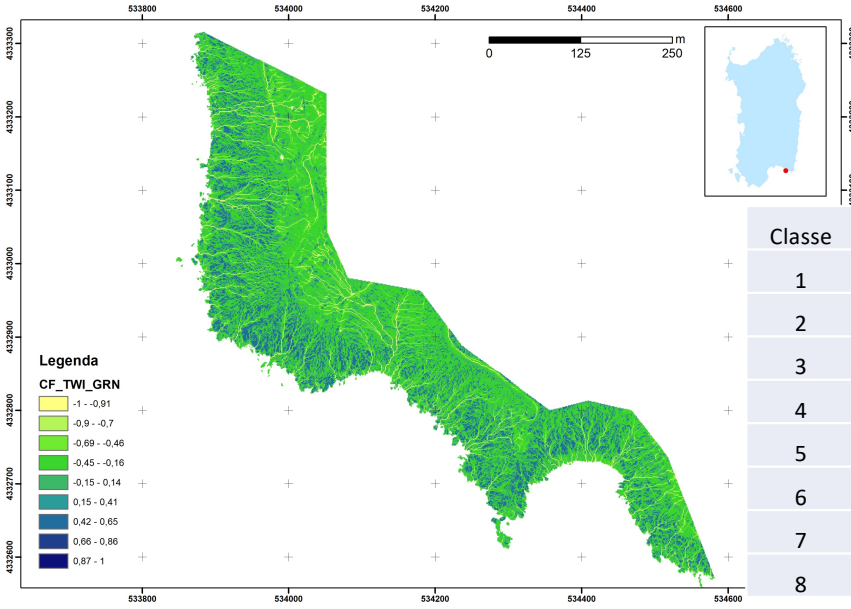




Intervallo (m)	Classe	CF
0-5	1	-1,00
5-10	2	-0,92
10-15	3	0,37
15-20	4	0,70
20-25	5	0,64
25-30	6	0,59
30-35	7	0,50
35-40	8	0,34
40-45	9	0,12
45-50	10	-0,15
50-55	11	-0,19
55-60	12	-0,18
60-65	13	-0,56
65-70	14	-0,79
70-75	15	-0,82
75-80	16	-0,85
80-85	17	-0,84
85-90	18	-1,00
90-95	19	-1,00

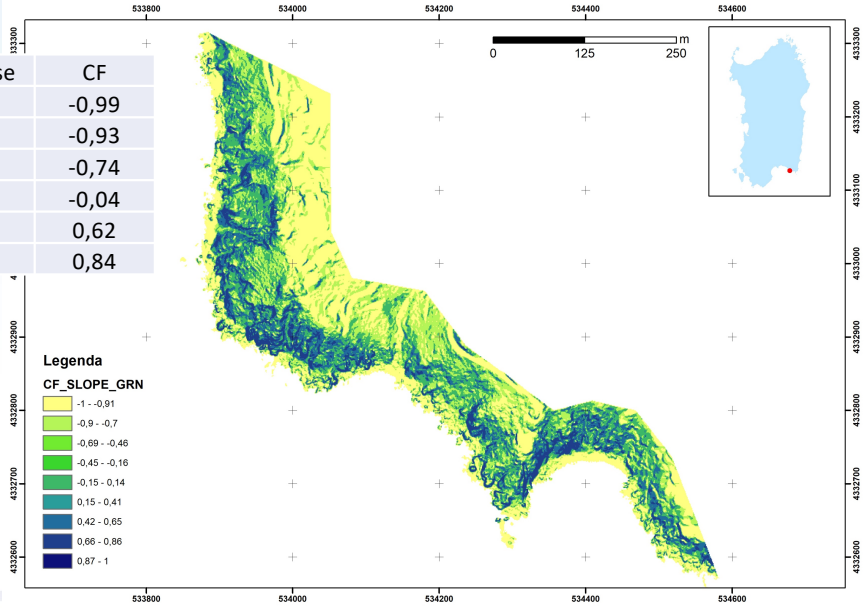
Esposizione	Classe	CF
N	1	-0,91
NE	2	-0,91
E	3	-0,01
SE	4	0,38
S	5	0,47
SW	6	0,06
W	7	-0,34
NW	8	-0,64

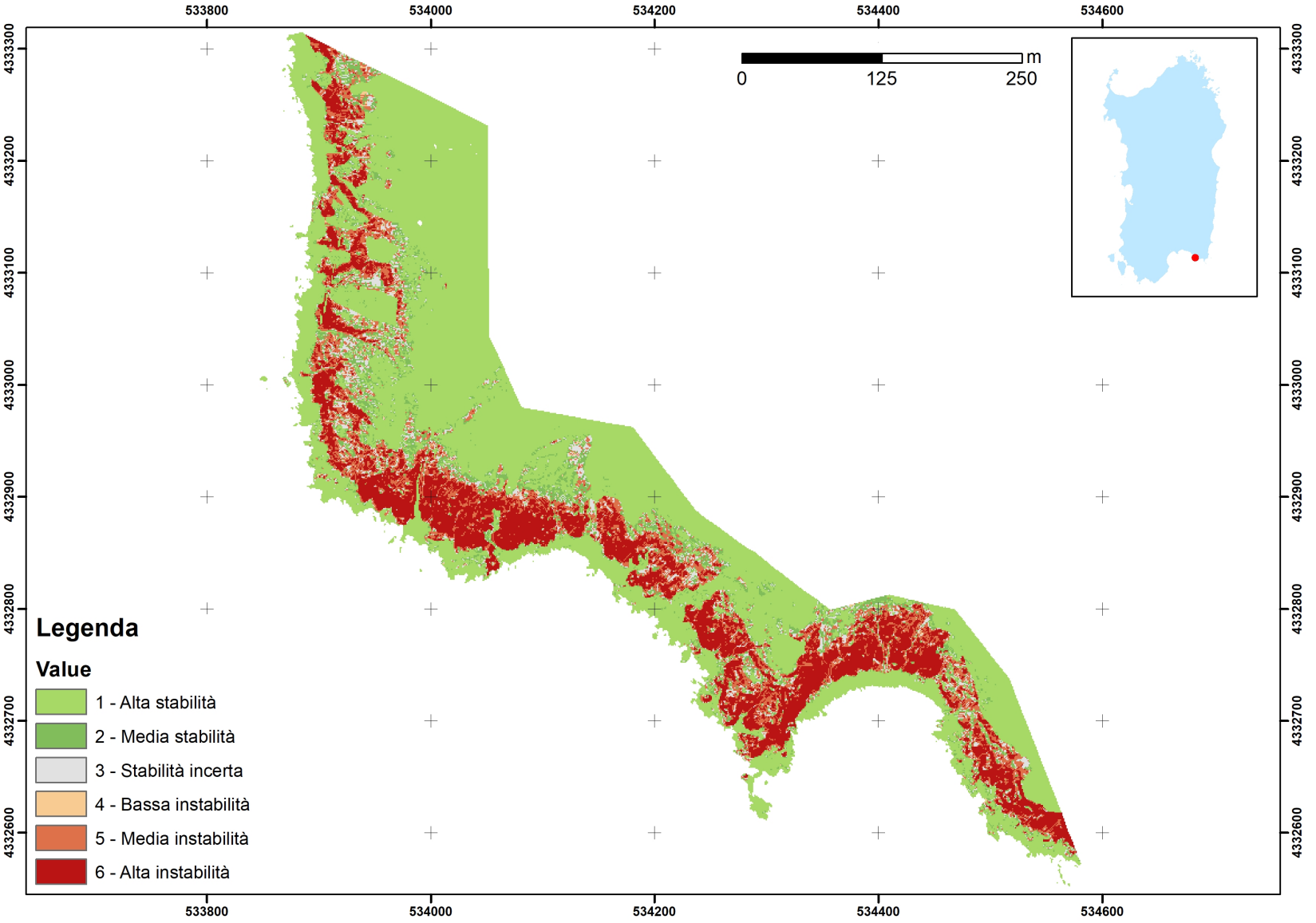




Classe	CF
1	0,59
2	0,09
3	-0,27
4	-0,40
5	-0,38
6	-0,55
7	-0,82
8	-0,99

Intervallo (°)	Classe	CF
0 - 13,06	1	-0,99
13,06 - 24,85	2	-0,93
24,85 - 34,74	3	-0,74
34,74 - 43,98	4	-0,04
43,98 - 55,13	5	0,62
55,13 - 100	6	0,84





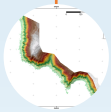
Carta della Suscettività
5 parametri



Aree sorgente



Geologia



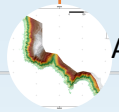
Acclività



Esposizione

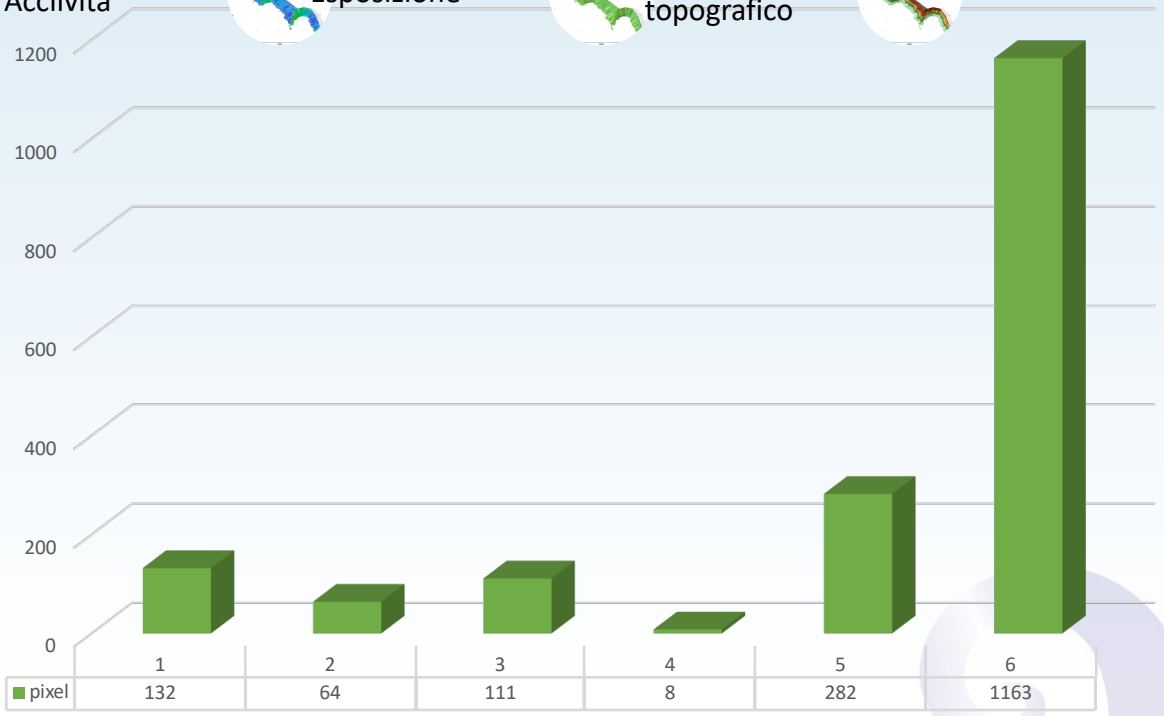


Indice topografico



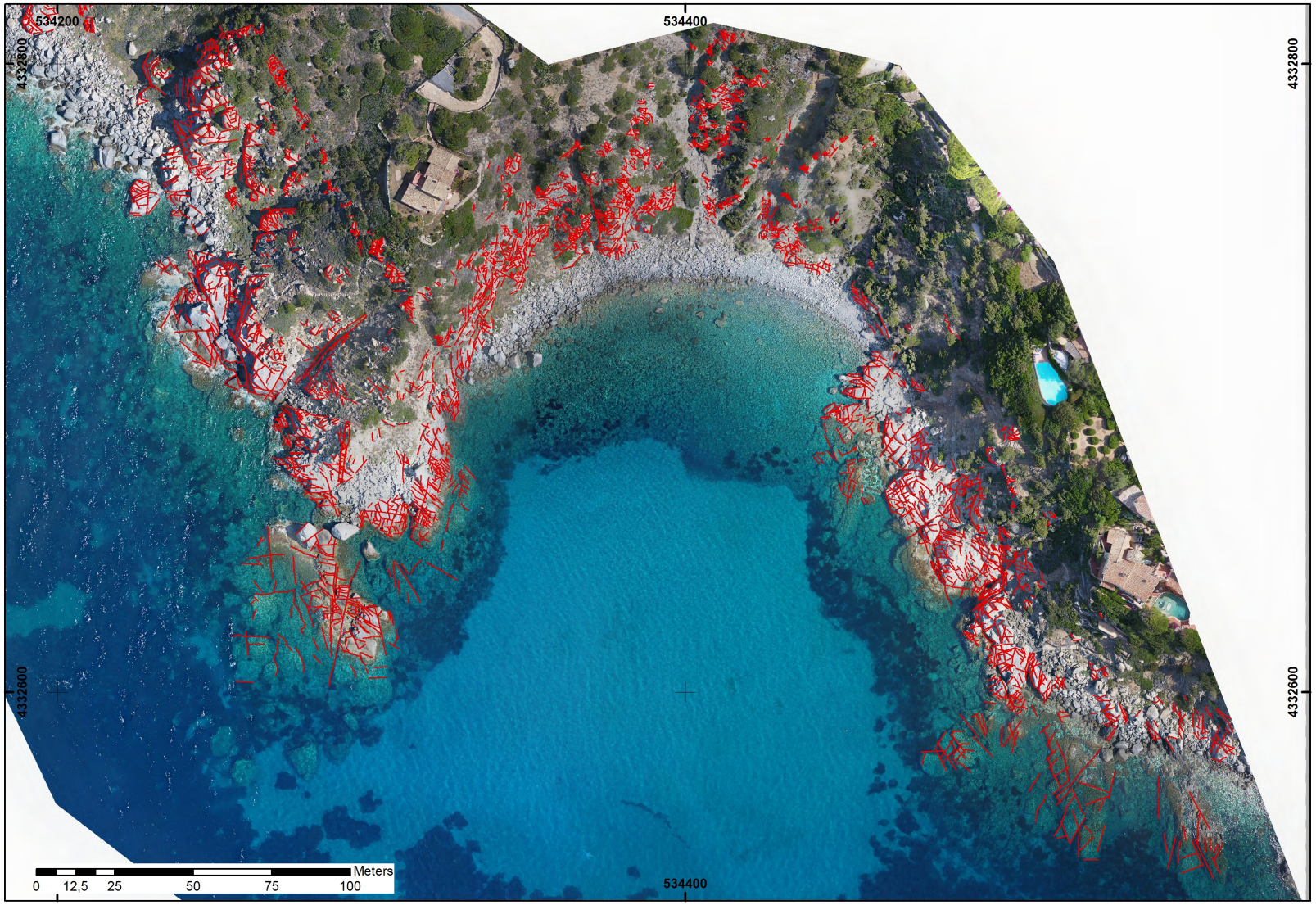
Altimetria

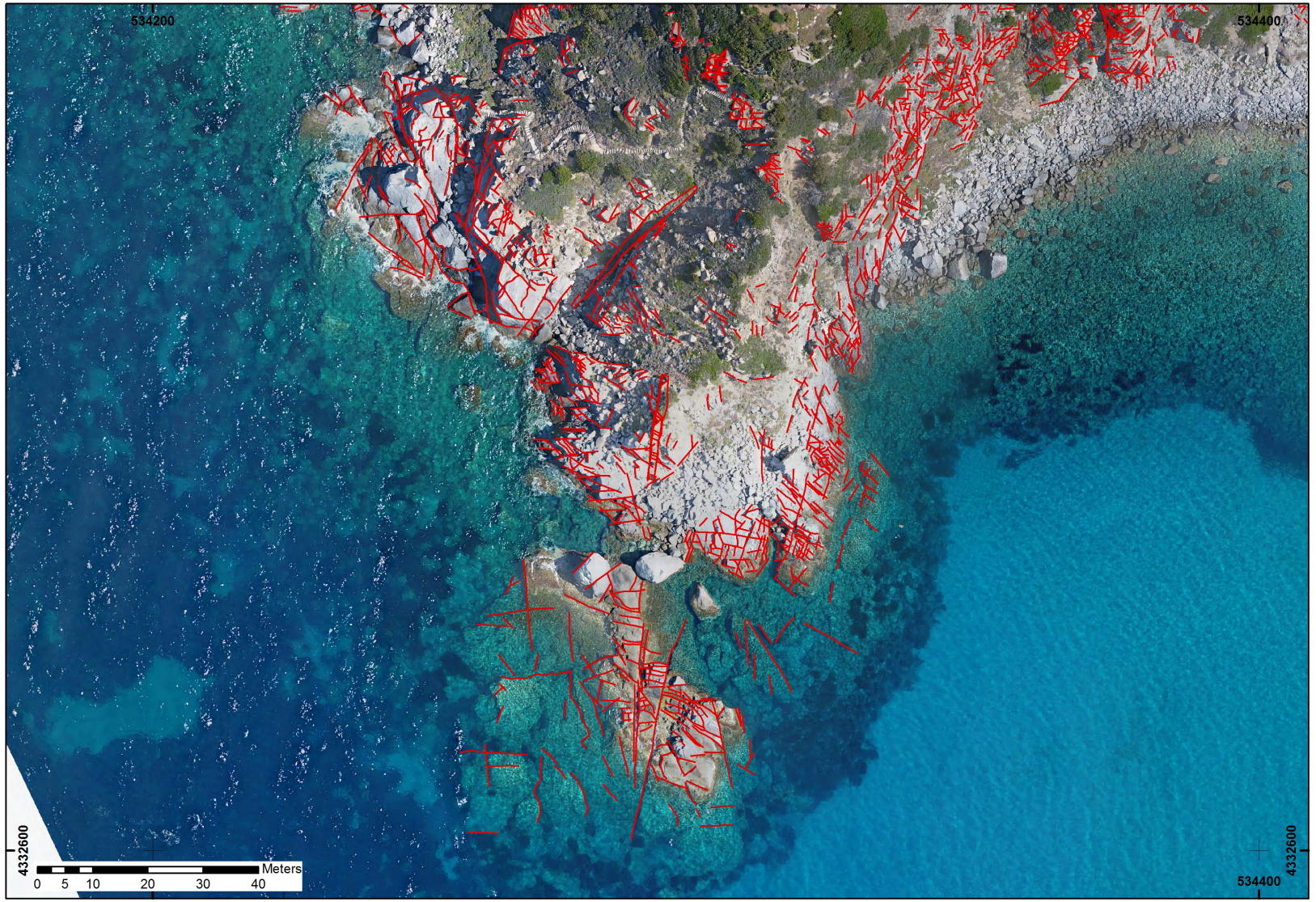
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Validazione **82,56 %**

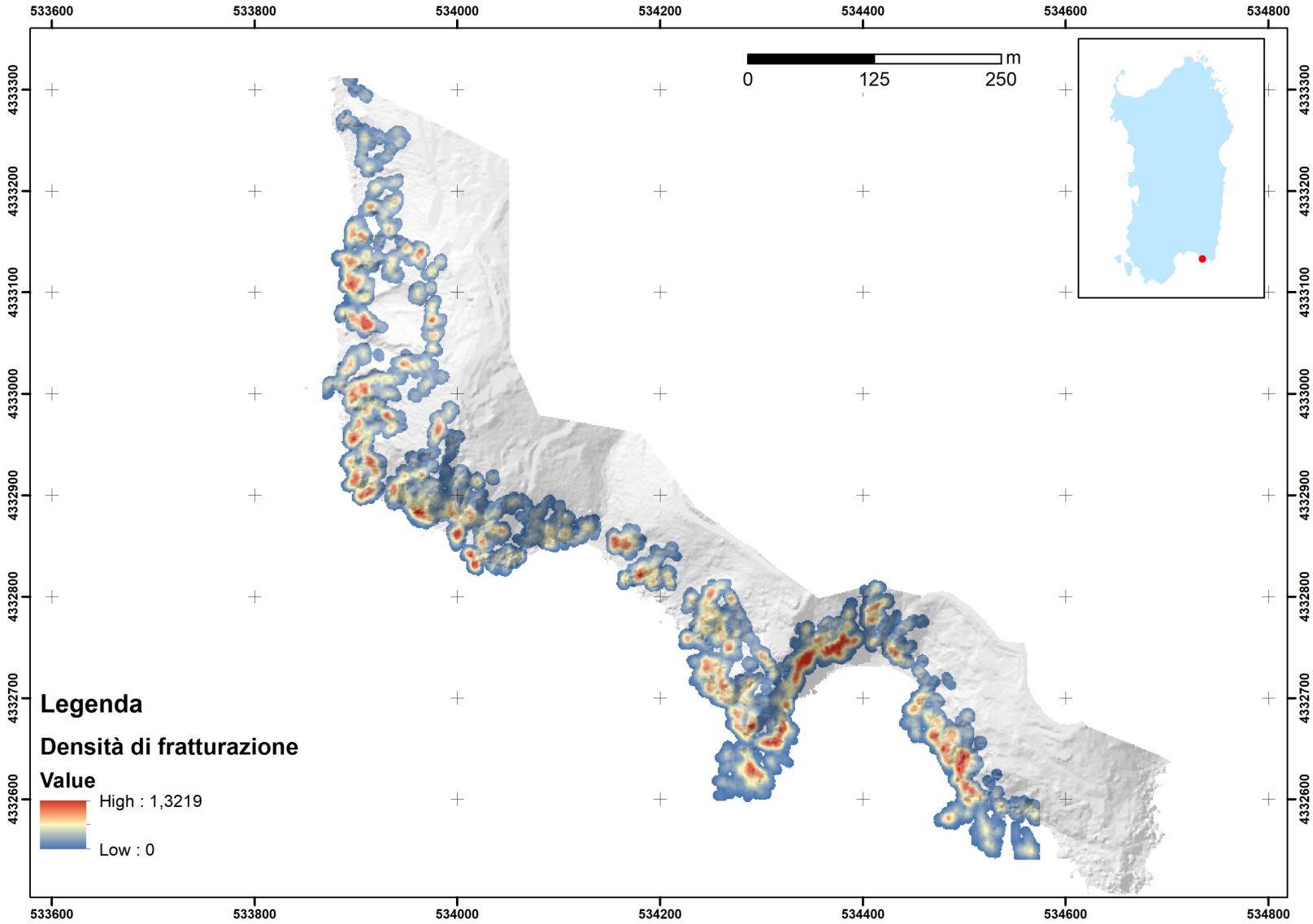
Carta della fratturazione

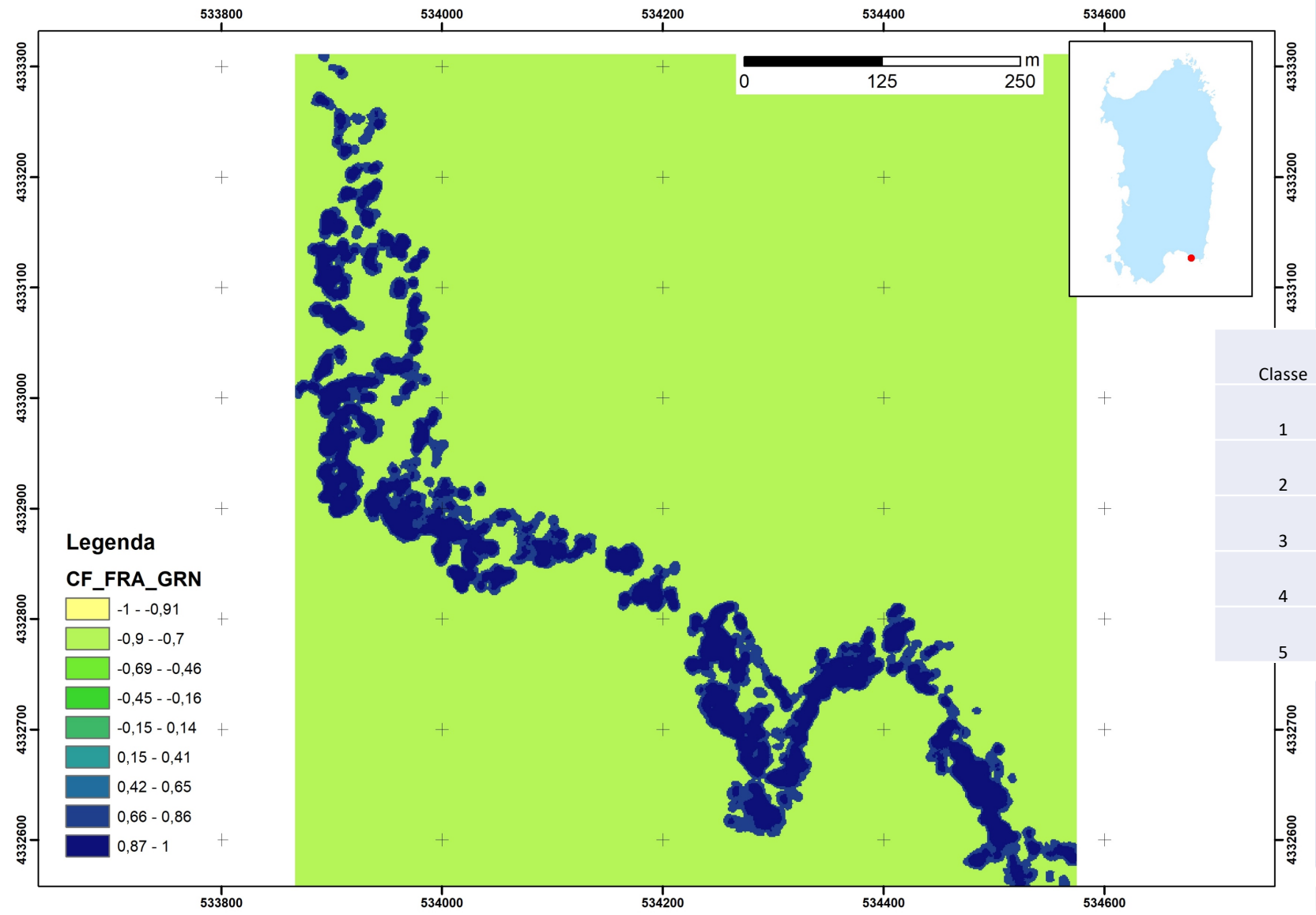




Carta della fratturazione, dettaglio

Carta della densità di fratturazione

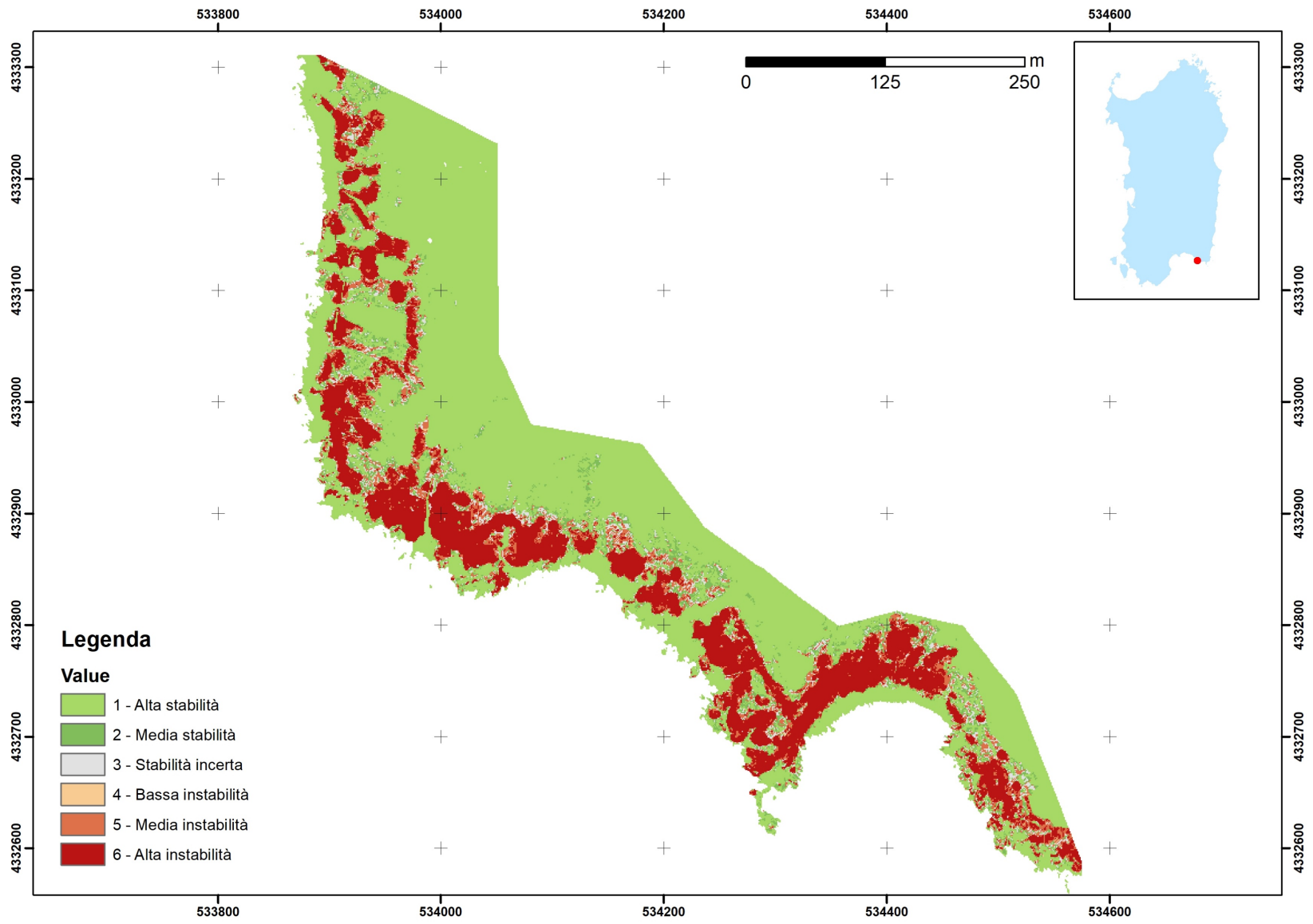




Aree sorgente /carta della densità di fratturazione

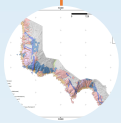
Classe	CF
1	-0,79
2	0,82
3	0,89
4	0,93
5	0,94

Carta della Suscettività
6 parametri

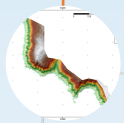




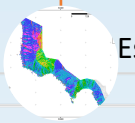
Aree sorgente



Geologia



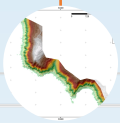
Acclività



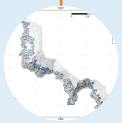
Esposizione



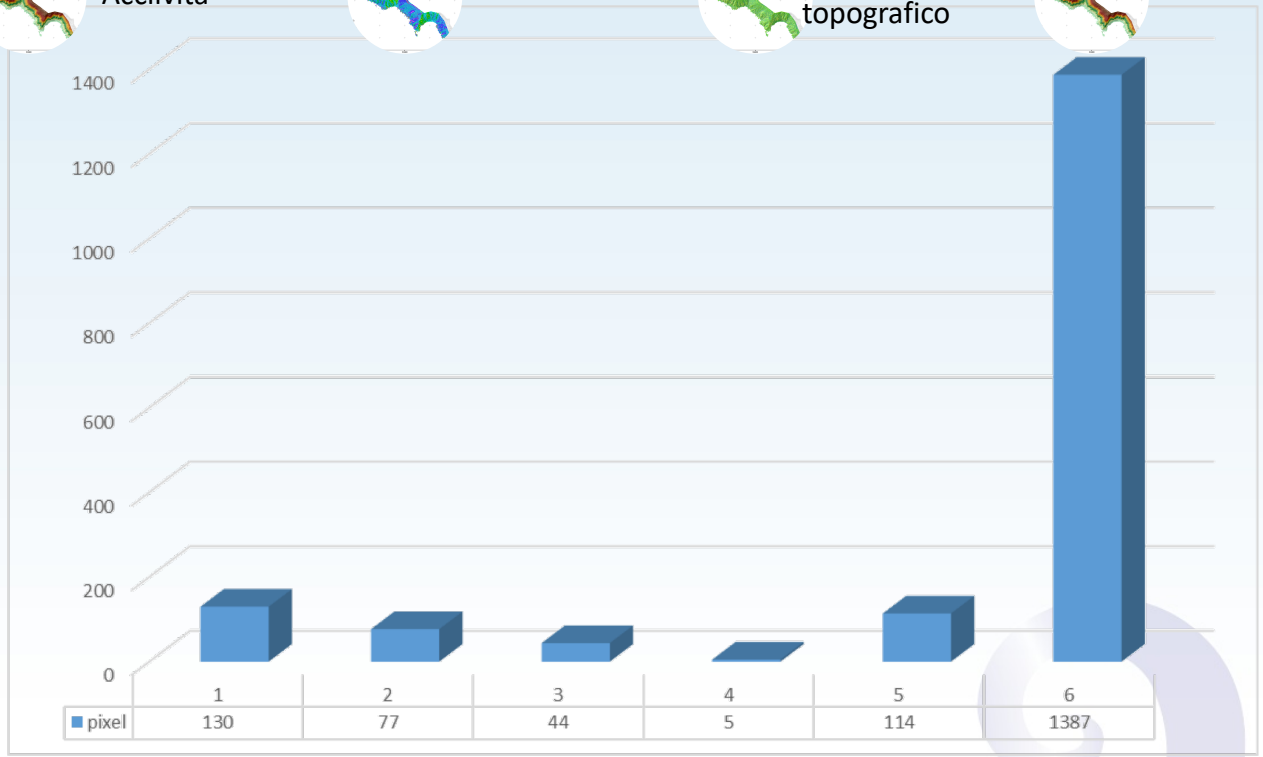
Indice topografico



Altimetria



Carta della densità di fratturazione

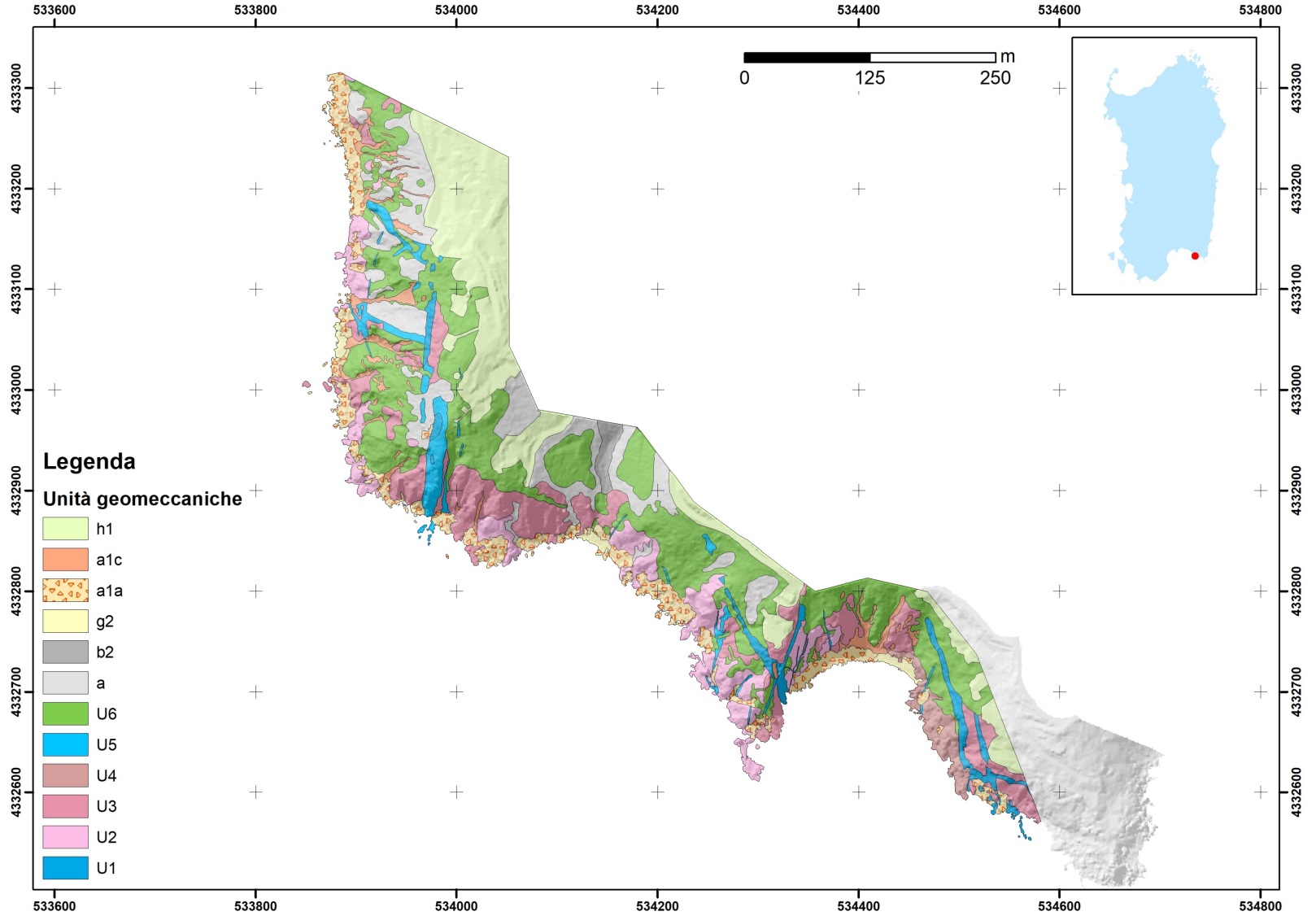


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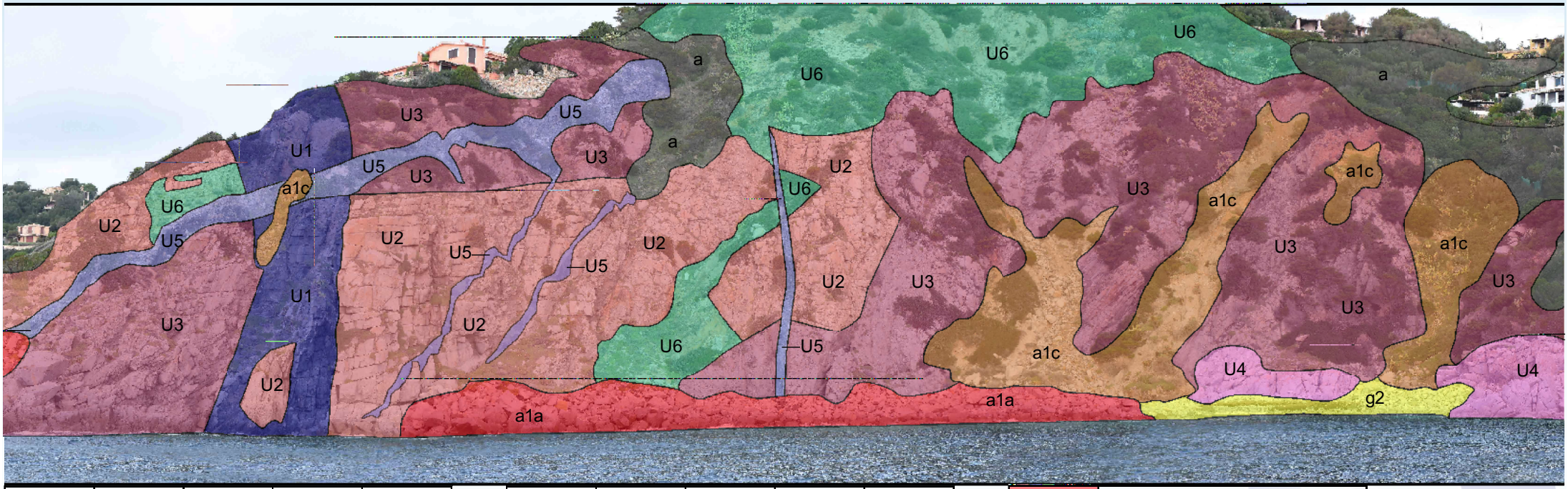
Validazione

85,71 %

Carta delle unità geomeccaniche



Esempio di Zonazione geomeccanica: dati preliminari



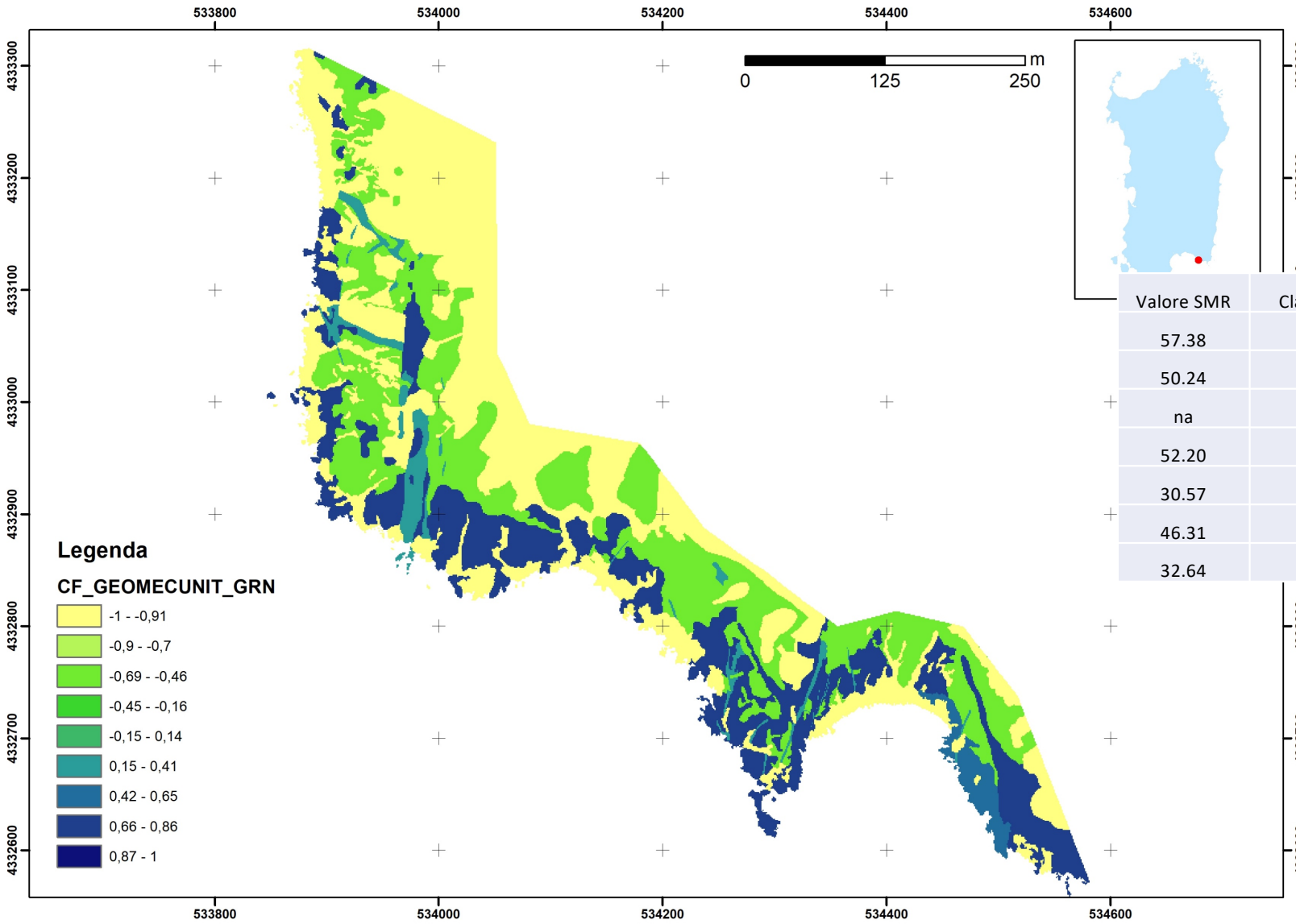
	c (kPa)	ϕ (°)	RMR	SMR
U6	300.72	35.07	45.14	32.64
U5	286.26	33.63	42.25	30.57
U4	360.99	41.10	57.20	52.20

	c (kPa)	ϕ (°)	RMR	SMR
U3	351.20	40.12	55.24	50.24
U2	386.92	43.69	62.38	57.38
U1	331.53	38.15	51.31	46.31

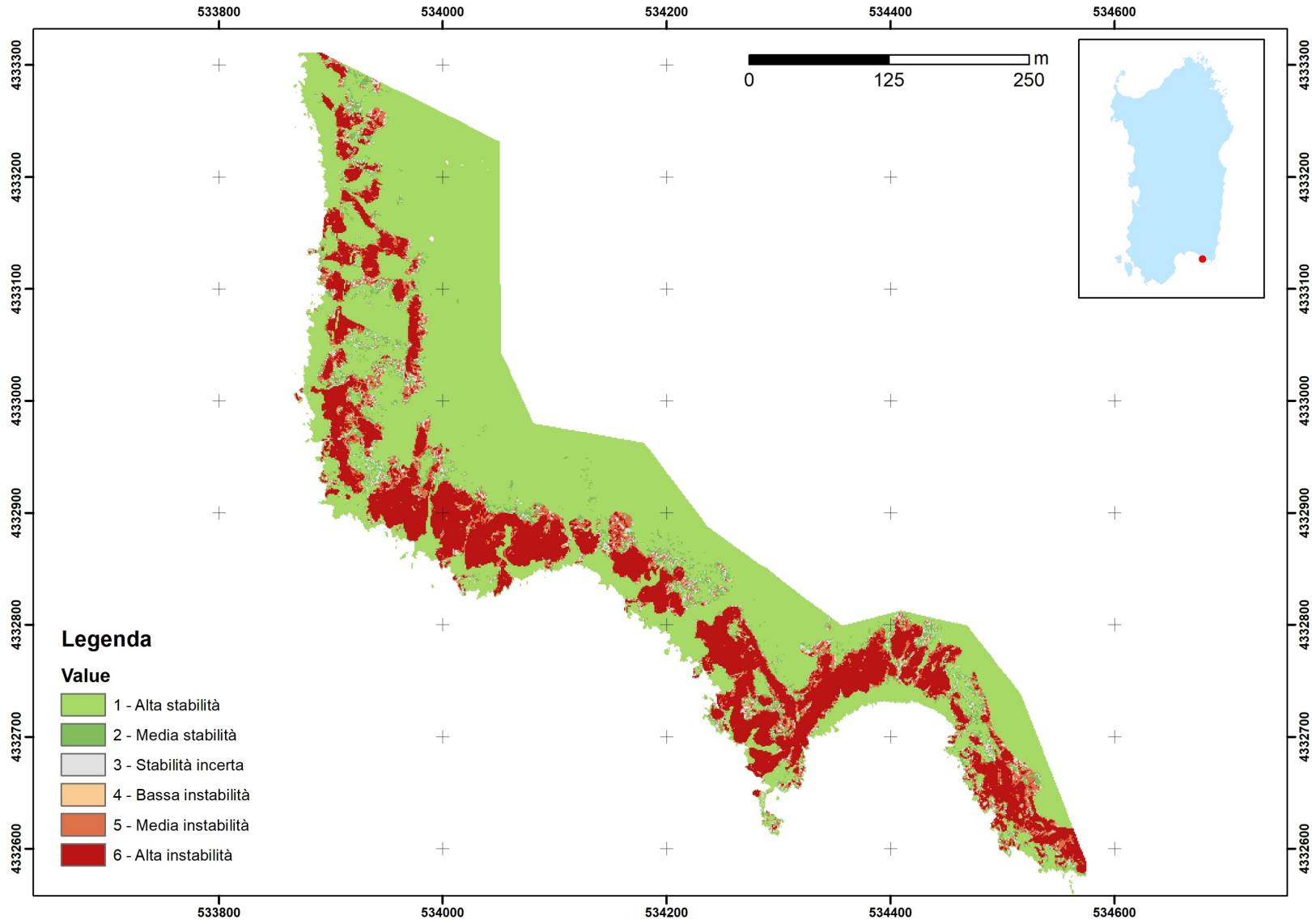
a1c	Scree Slope Deposits
a1a	Rockfall Deposits
g2	Beach Deposits
a	Debris Slope Deposits

0 mt 10 mt

Aree sorgente/
Carta delle unità geomeccaniche



Valore SMR	Classe	CF
57.38	1	0,78
50.24	2	0,72
na	3	-0,95
52.20	4	0,51
30.57	5	0,22
46.31	6	0,69
32.64	7	-0,55



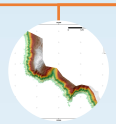
Carta della Suscettività
7 parametri



Aree sorgente



Geologia



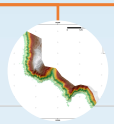
Acclività



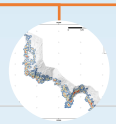
Esposizione



Indice topografico



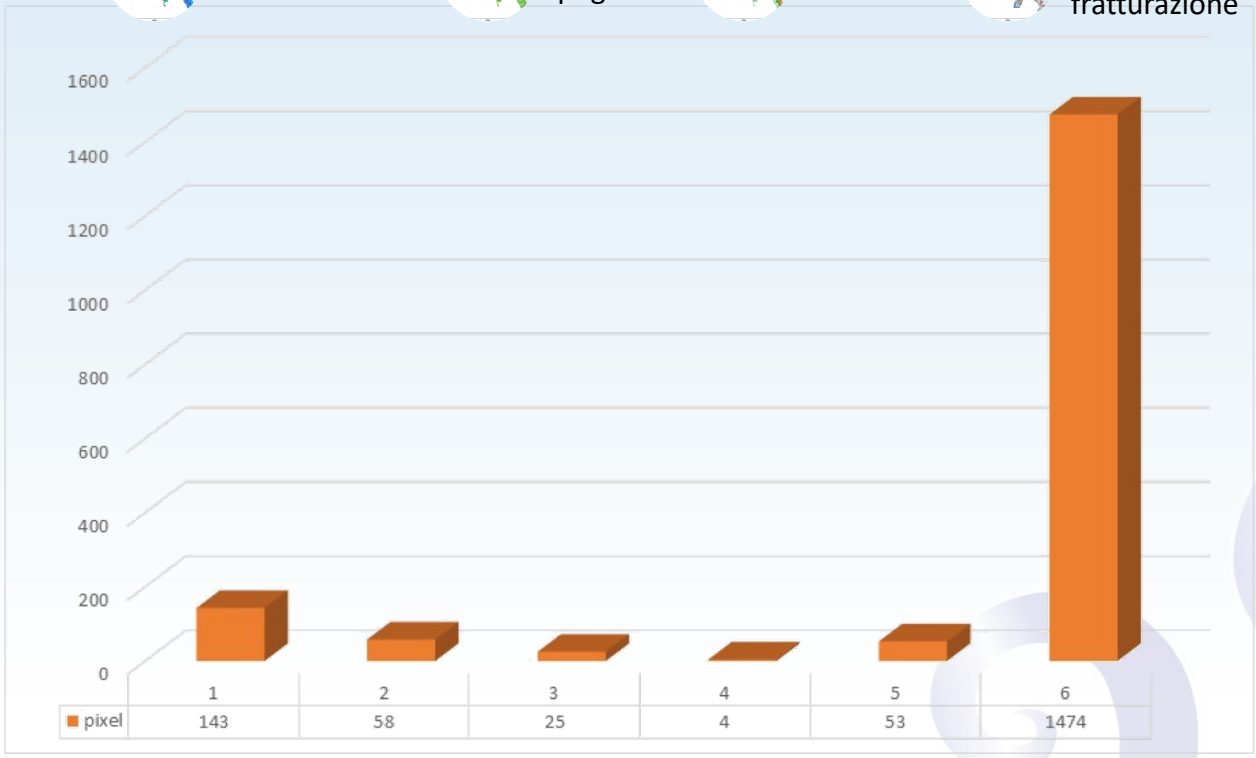
Altimetria



Carta della densità di fratturazione



Carta delle unità geomeccaniche



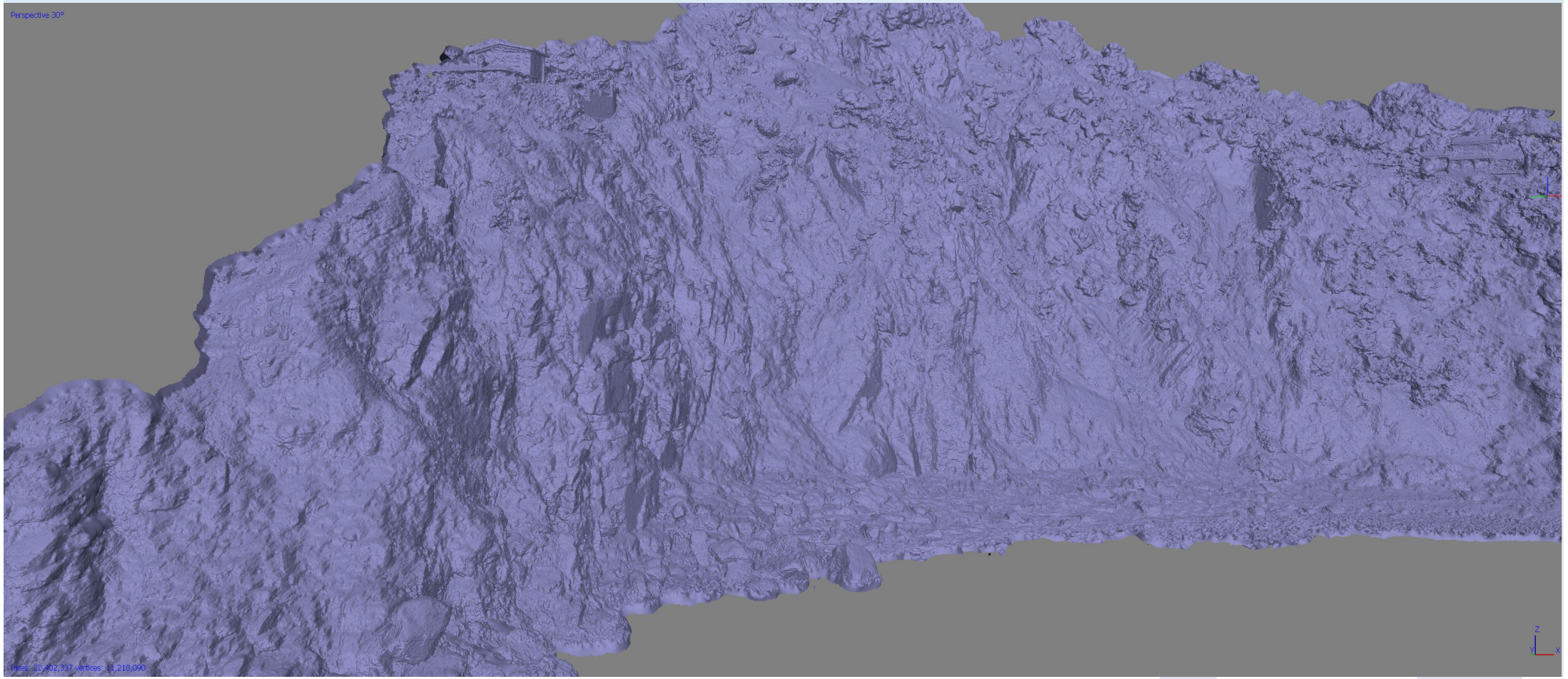
87,14 %

Sviluppo dell'attività

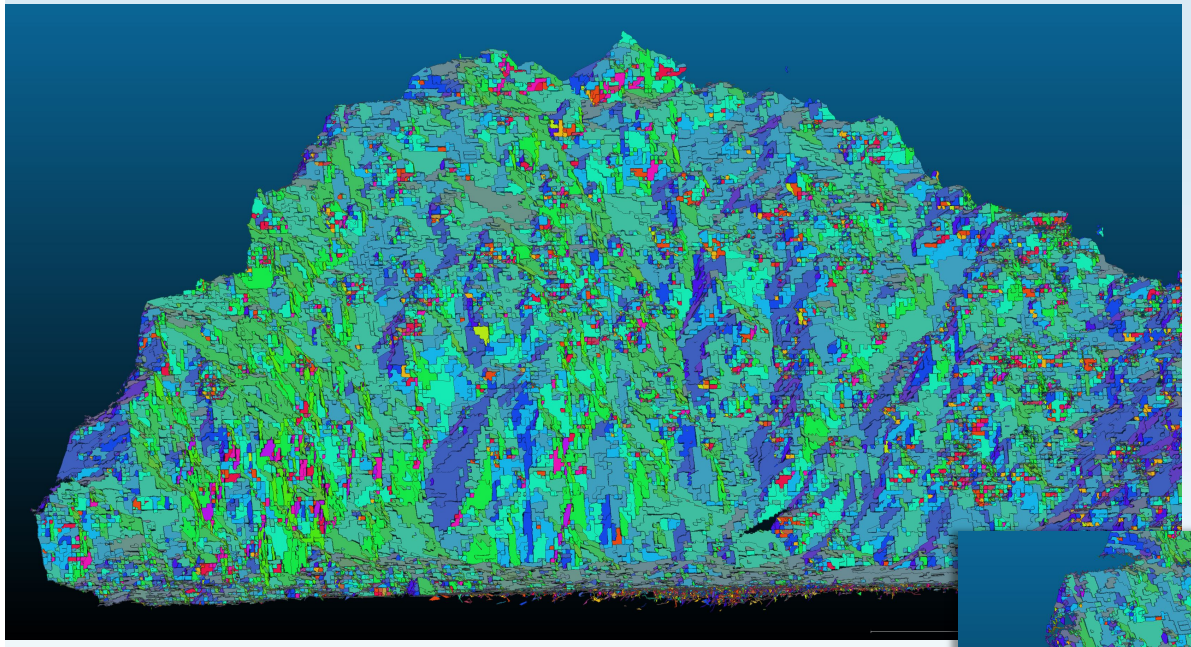


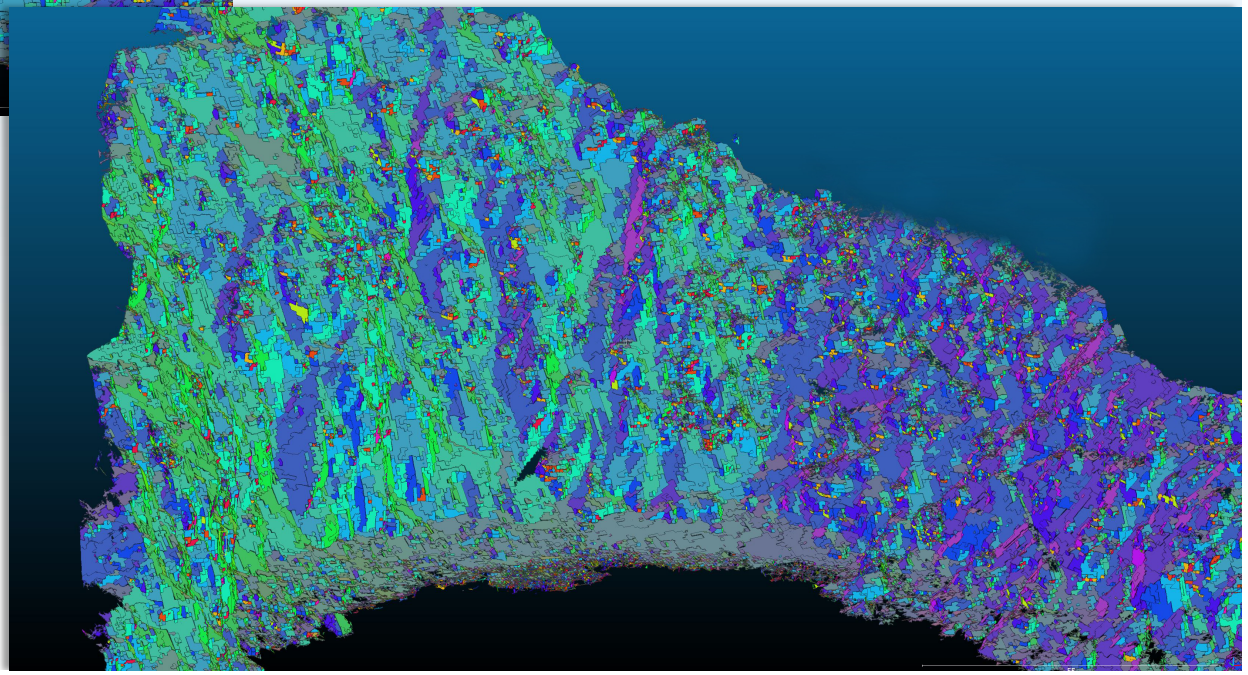
La pianificazione degli interventi non può però prescindere dallo studio dettagliato a scala del singolo versante da parte del geologo

Modello digitale del terreno

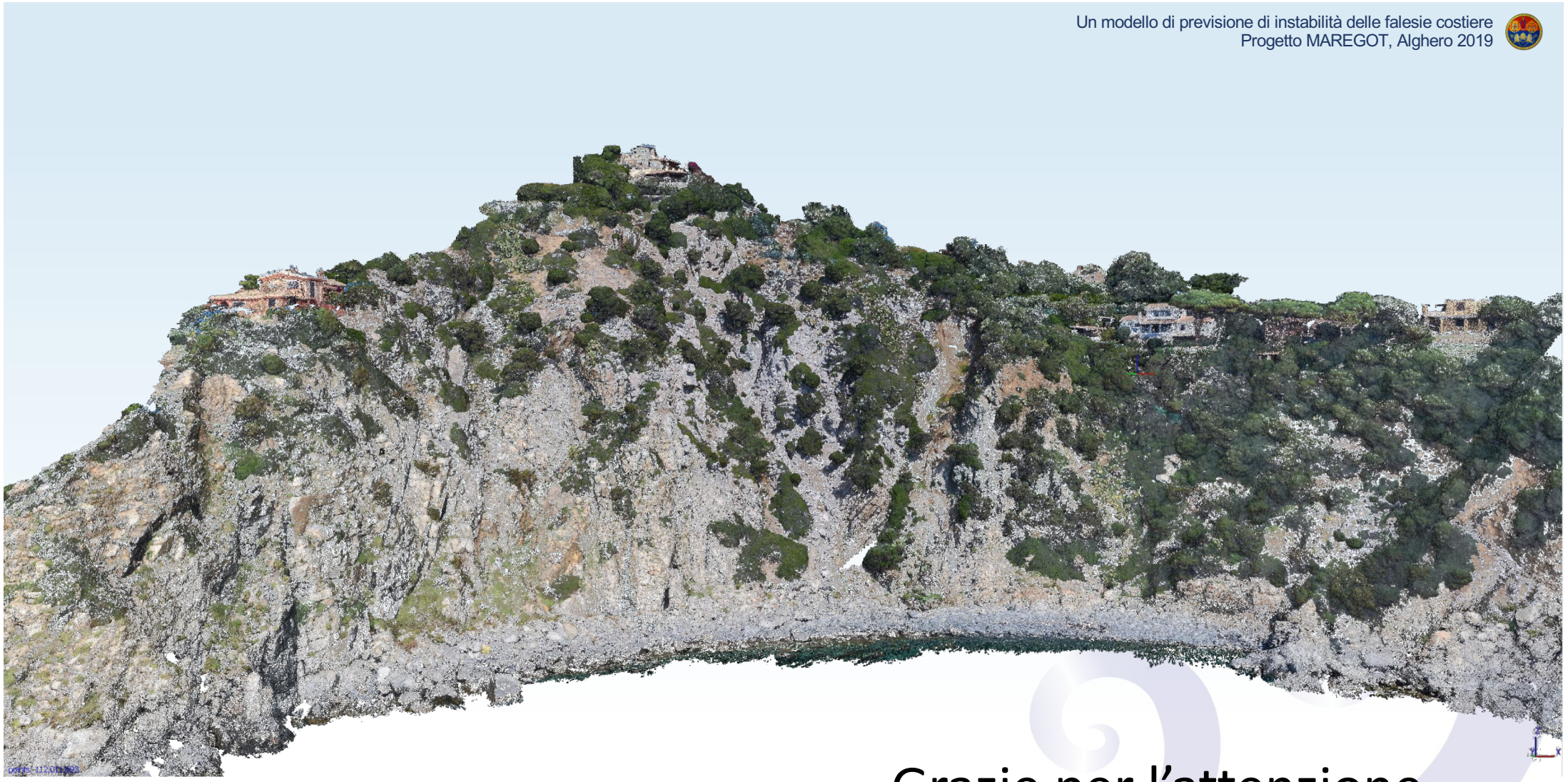


Gli strumenti informatici permettono di ottenere il dettaglio necessario





L’elaborazione del modello restituisce le informazioni necessarie per le valutazioni di stabilità a scala di versante



Grazie per l’attenzione