



RETERURALE
NAZIONALE
20142020

Prospettive della ricerca a supporto della pianificazione forestale

Giorgio Vacchiano, Piermaria Corona



L'assetto su tre livelli

L'assetto della pianificazione su 3 livelli (PFR- PFIT- PGF) pone ottime opportunità ma va sostanziato.

La gestione della biodiversità, la prevenzione incendi, la viabilità si collocano meglio al **livello territoriale** piuttosto che a quello aziendale.

La **pianificazione aziendale** deve invece fare scelte conciliare le emergenze territoriali con le esigenze della proprietà.

L'aspetto tecnico-forestale

Armonizzazione dei tre livelli
per snellire le procedure

L'aspetto tecnico-informatico

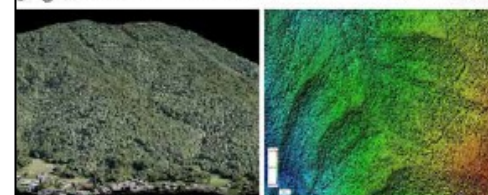
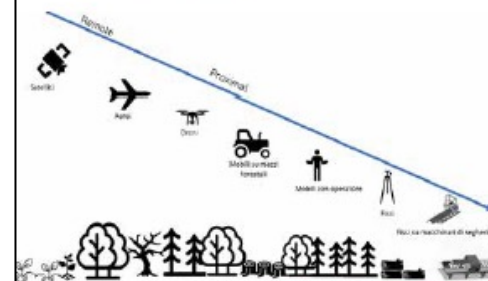
Non appesantire la redazione
dei piani con troppi dati
I dati non sono il piano, il piano
non è i dati





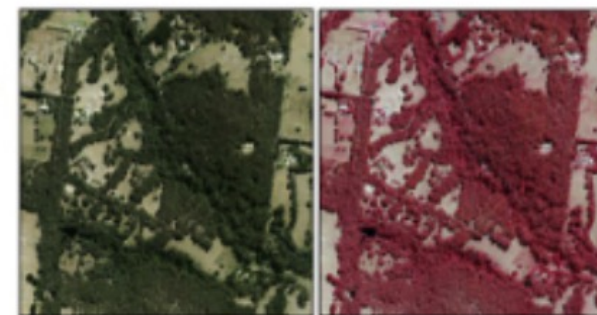
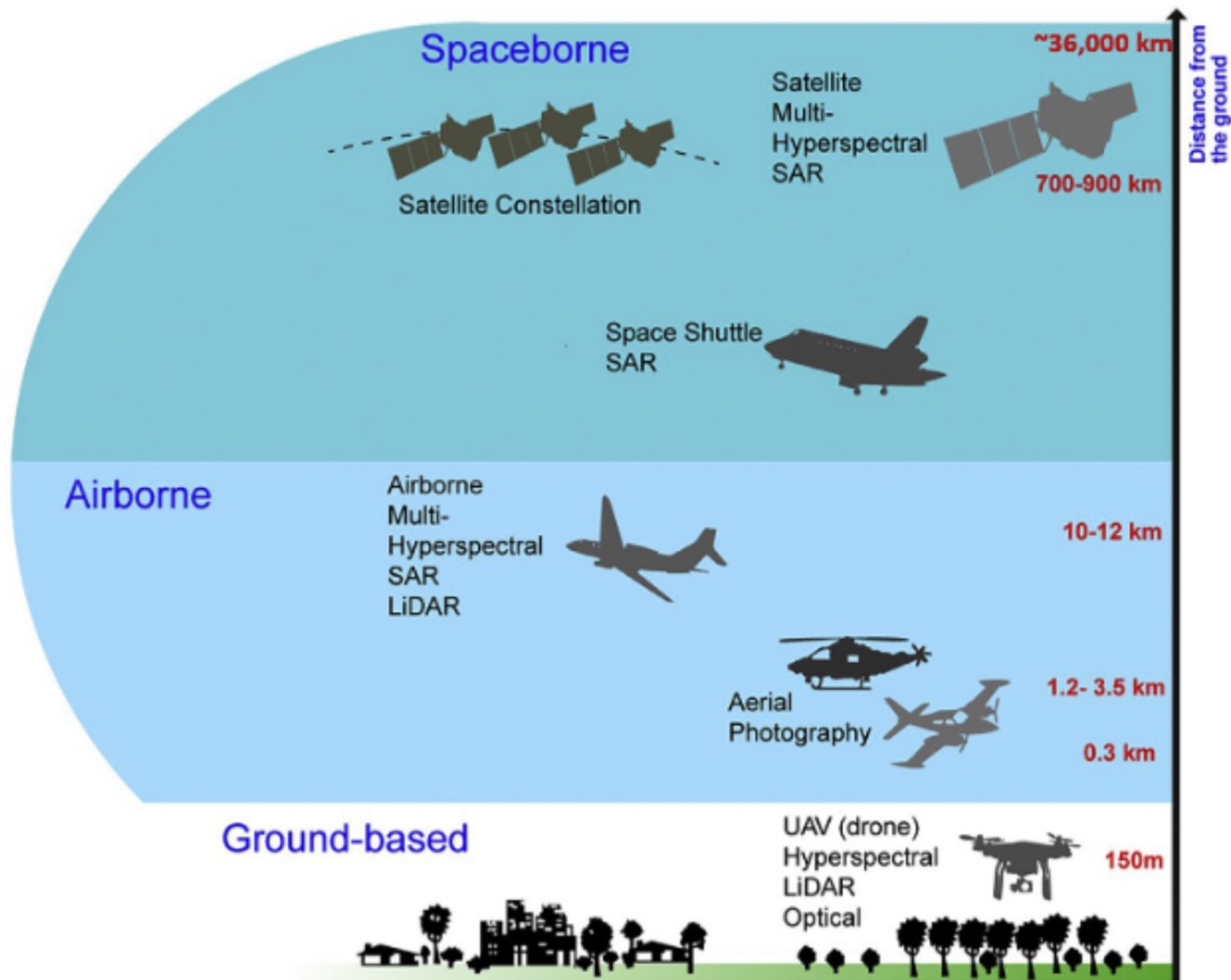
Elementi di orientamento per la pianificazione forestale alla luce del Testo Unico in materia di foreste e filiere forestali

PIERMARIA CORONA, CLAUDIA BECAGLI, PAOLO CANTIANI,
FRANCESCO CHIANUCCI, LUCA DI SALVATORE, UMBERTO DI SALVATORE,
RAOUL ROMANO, GIORGIO VACCHIANO, FABRIZIO FERRETTI



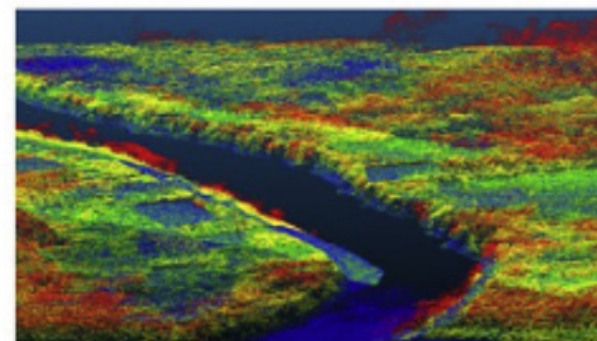
Prospettive e potenzialità della digitalizzazione del settore forestale in Italia

PIERMARIA CORONA, ENRICO MARCHI, GHERARDO CHIRICI, ELENA MARRA,
ALESSANDRO ALIVERNINI, ROBERTO BARBETTI, SARA BERGANTE, LEONARDO BIANCHINI,
SIMONE CANTAMESSA, RAFFAELE CAVALLI, FRANCESCO CHIANUCCI, PIER MARIO CHIARABAGLIO,
CORRADO COSTA, VALERIO DI STEFANO, CARLOTTA FERRARA, CRISTIANO FODERI,
MASSIMO GENNARO, FRANCESCA GIANNETTI, GIACOMO GOLI, STEFANO GRIGOLATO,
ANTOINE HARFOUCHE, ANDREA LASCHI, BRUNO LASSERE, FRANCESCO LATTELLI,
MAURO MAESANO, MAURIZIO MARCHI, BARBARA MARIOTTI, FRANCESCO NERI,
ALESSANDRO PANSECCO, DANIELE PENNA, GIANNI PICCHI, RODOLFO PICCHIO,
MANUELA PLUTINO, FEDERICO PRETI, NICOLA PULETTI, MANUELA ROMAGNOLI,
MAURIZIO SABATTI, SANDRO SACCHELLI, FABIO SALBITANO, DAVIDE TRAVAGLINI,
GENNARO VASSALINI, RACHELE VENANZI, MICHELA ZANETTI

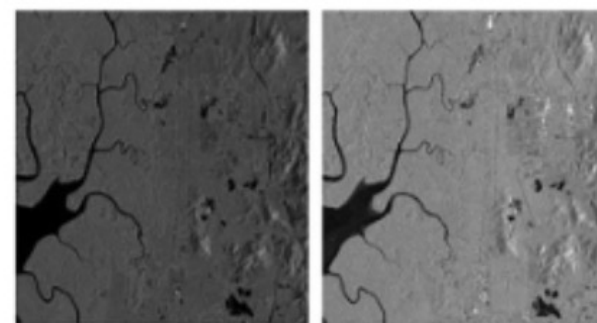


True-colour
Multi-spectral

False-colour
Multi-spectral

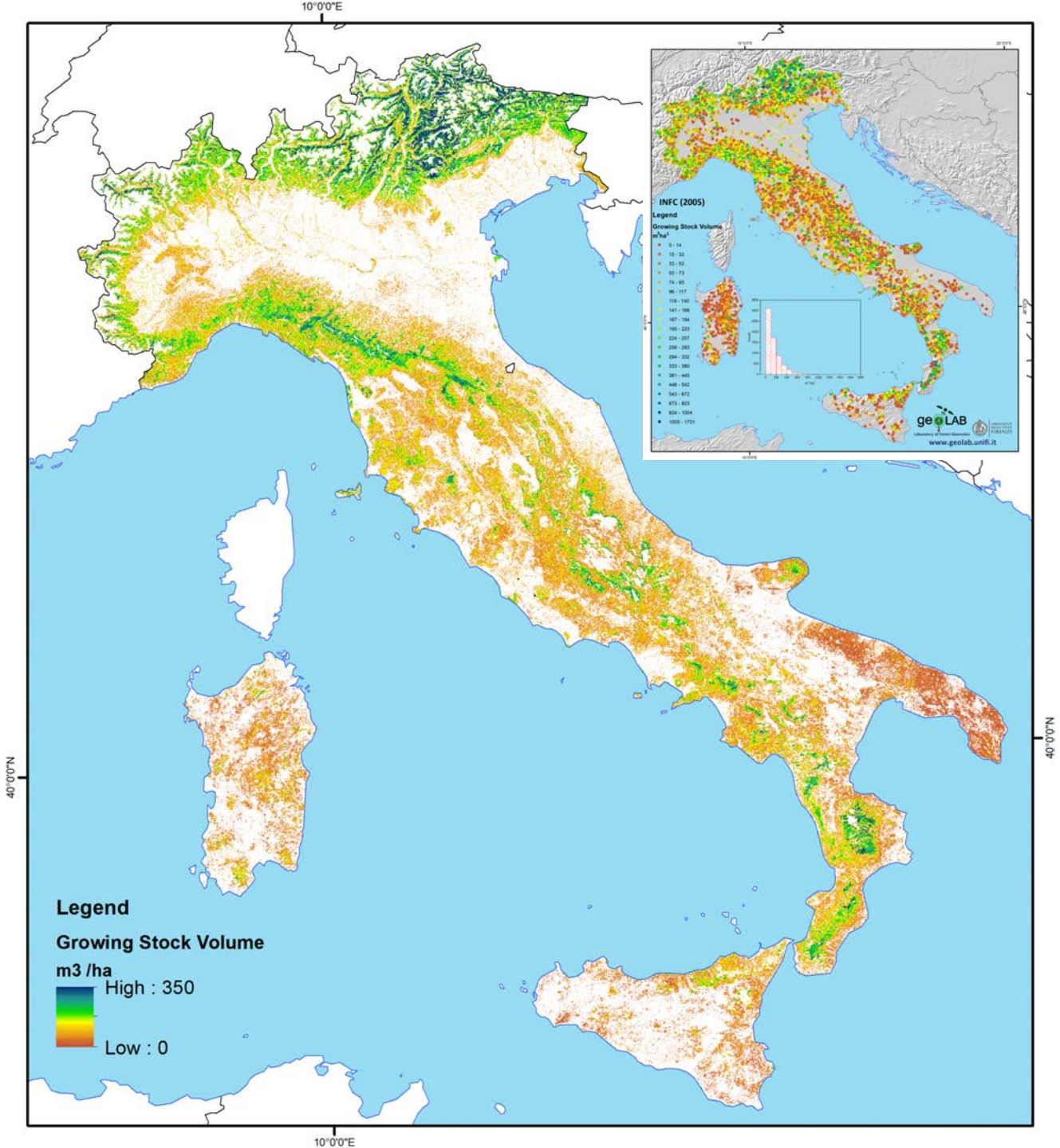
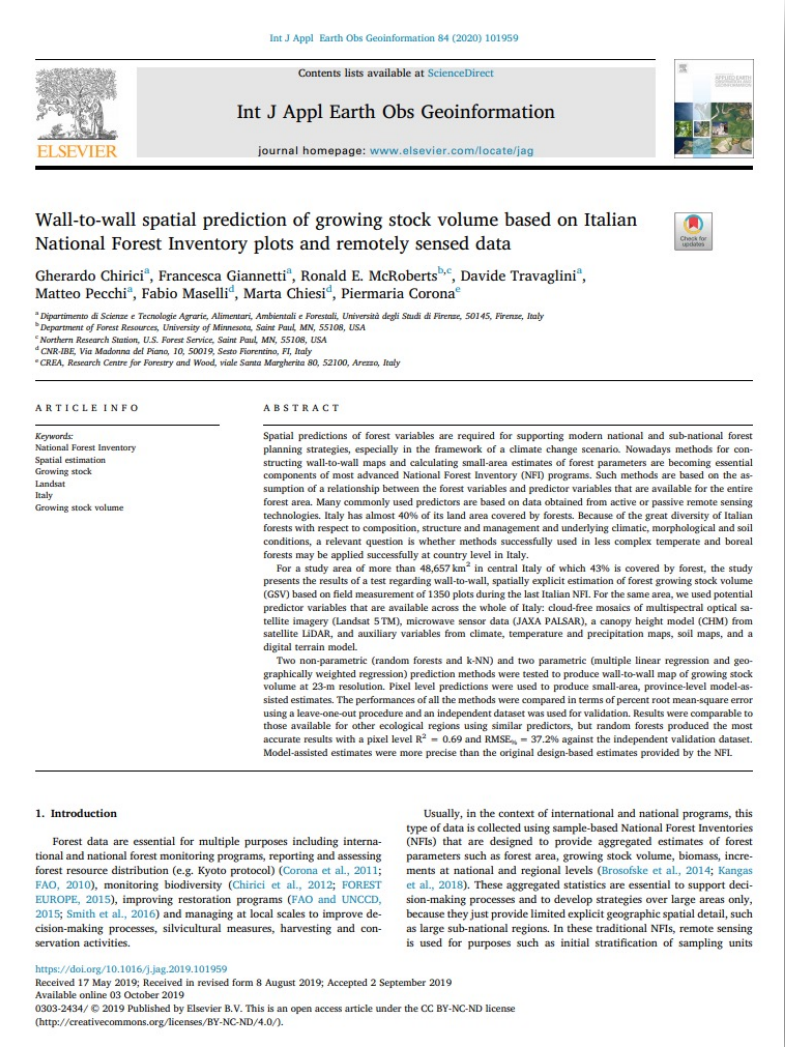


LiDAR 3D point cloud



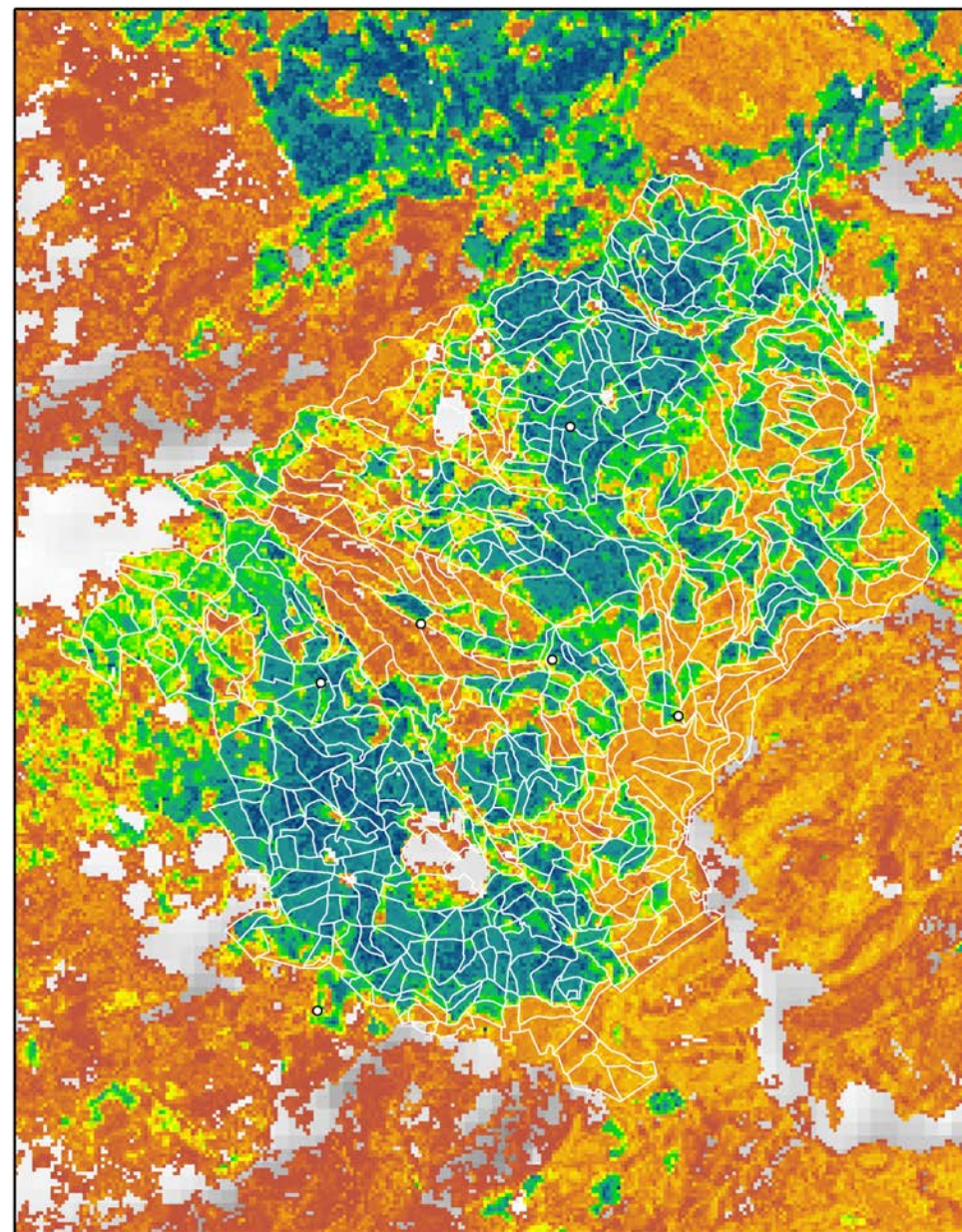
Synthetic Aperture Radar

Fusione tra dati telerilevati e dati inventariali



Le stime per pixel possono essere aggregate a livello di particellare forestale.

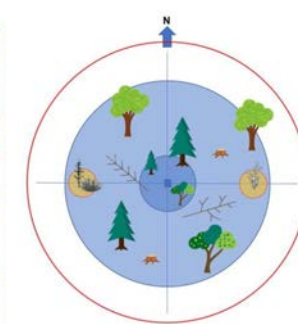
Le mappe derivanti dalla spazializzazione possono essere utilizzate a supporto della gestione e della pianificazione forestale.



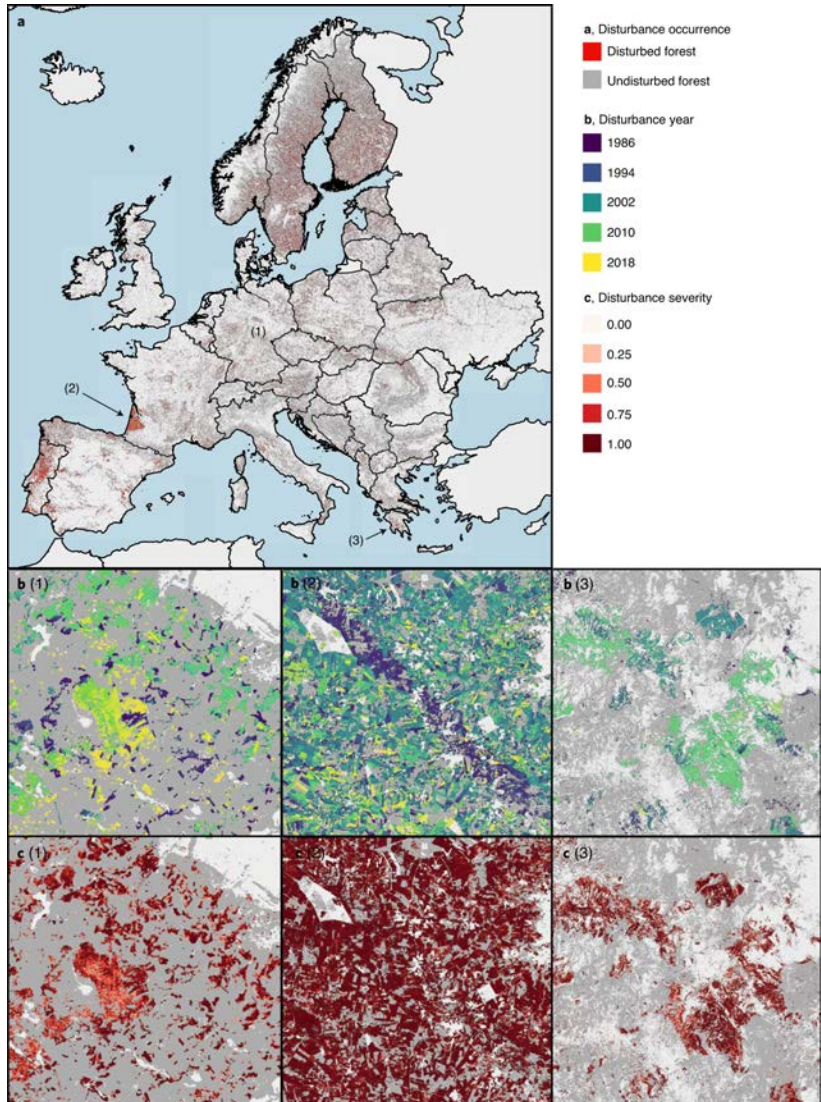
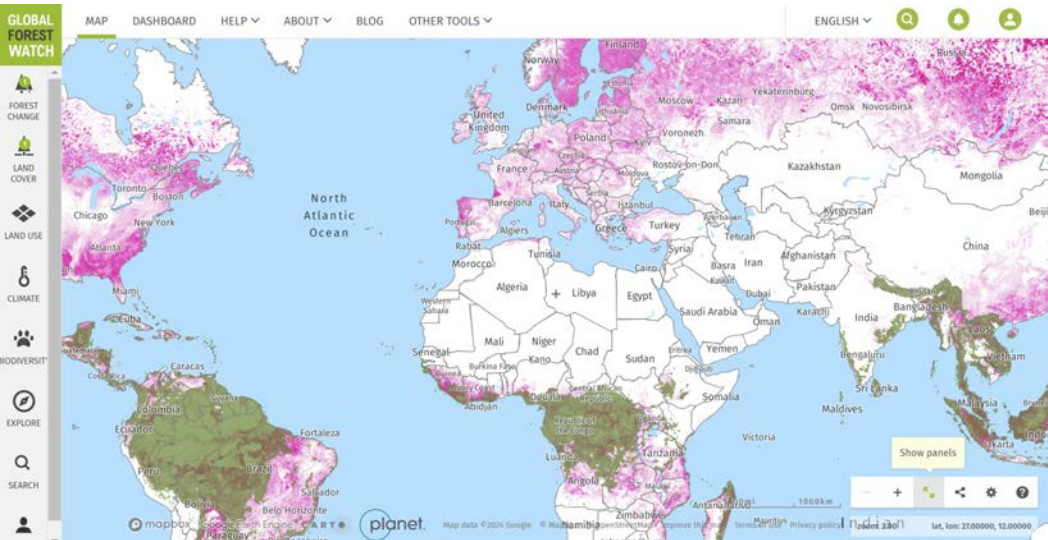
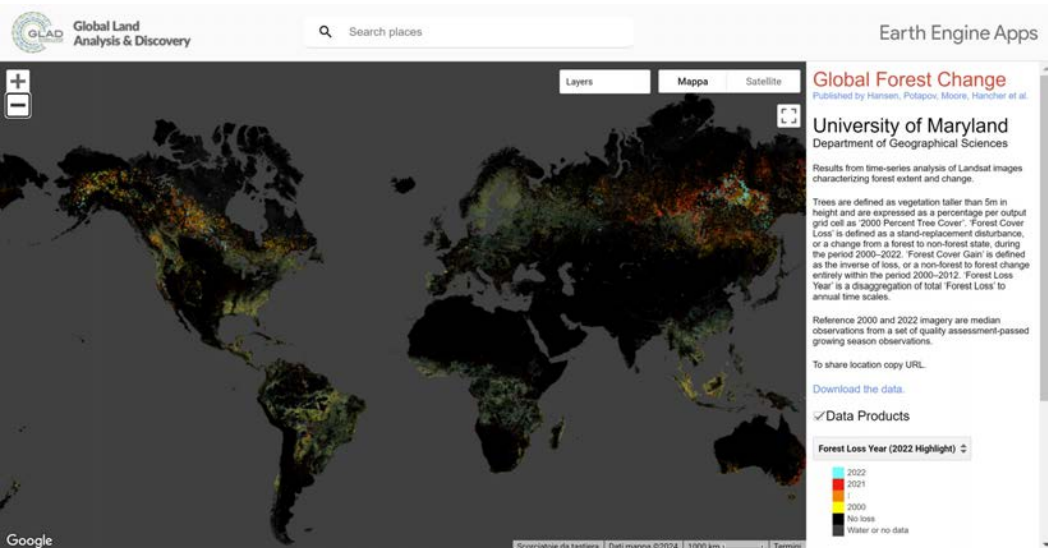
Legend

test_ghera_knn.rst
m3 ha-1
High : 1261.75
Low : 0

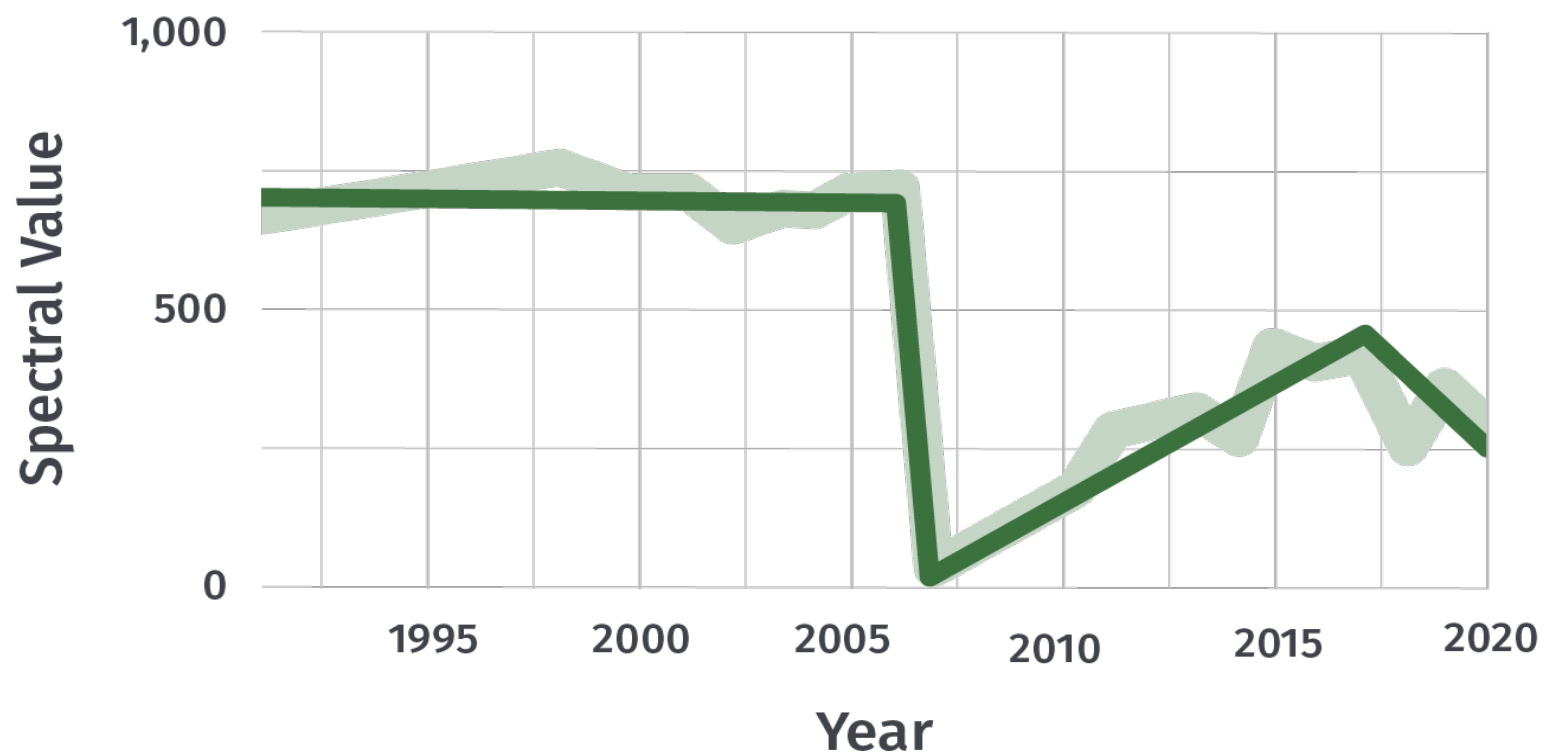
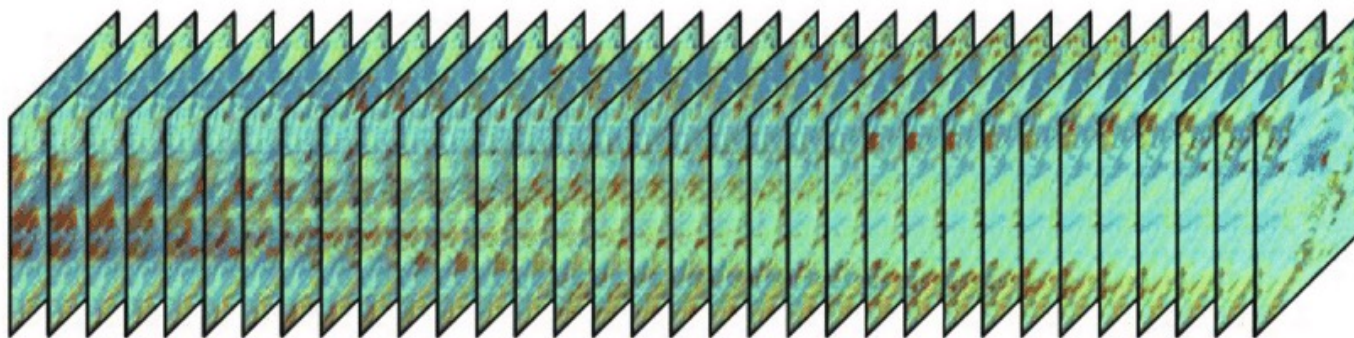
Stima della provvigione da INFC (pixel di 23 m) sul particellare della foresta demaniale di Vallombrosa (FI)



Mappatura dei disturbi forestali



Mappatura dei disturbi forestali



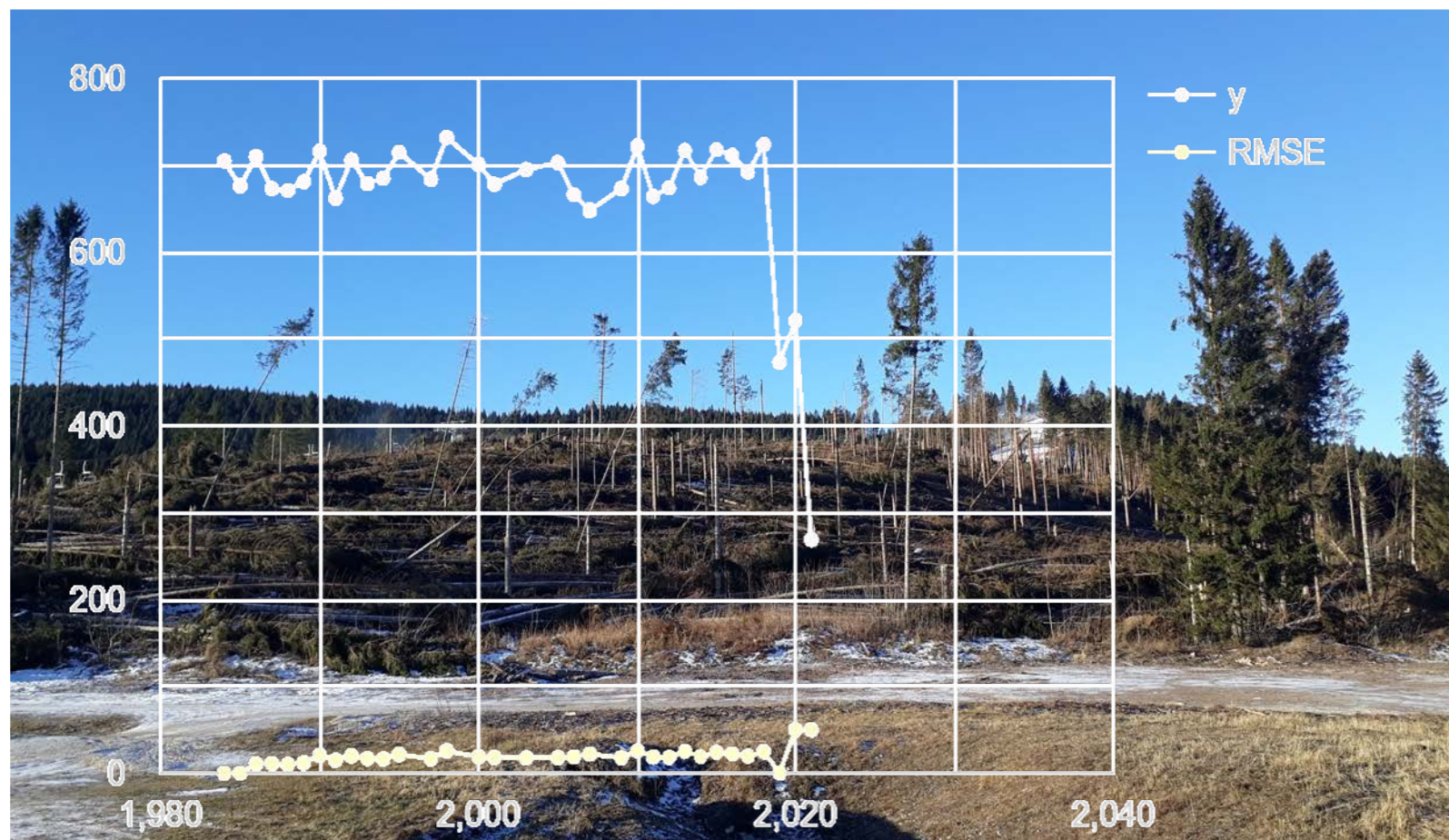
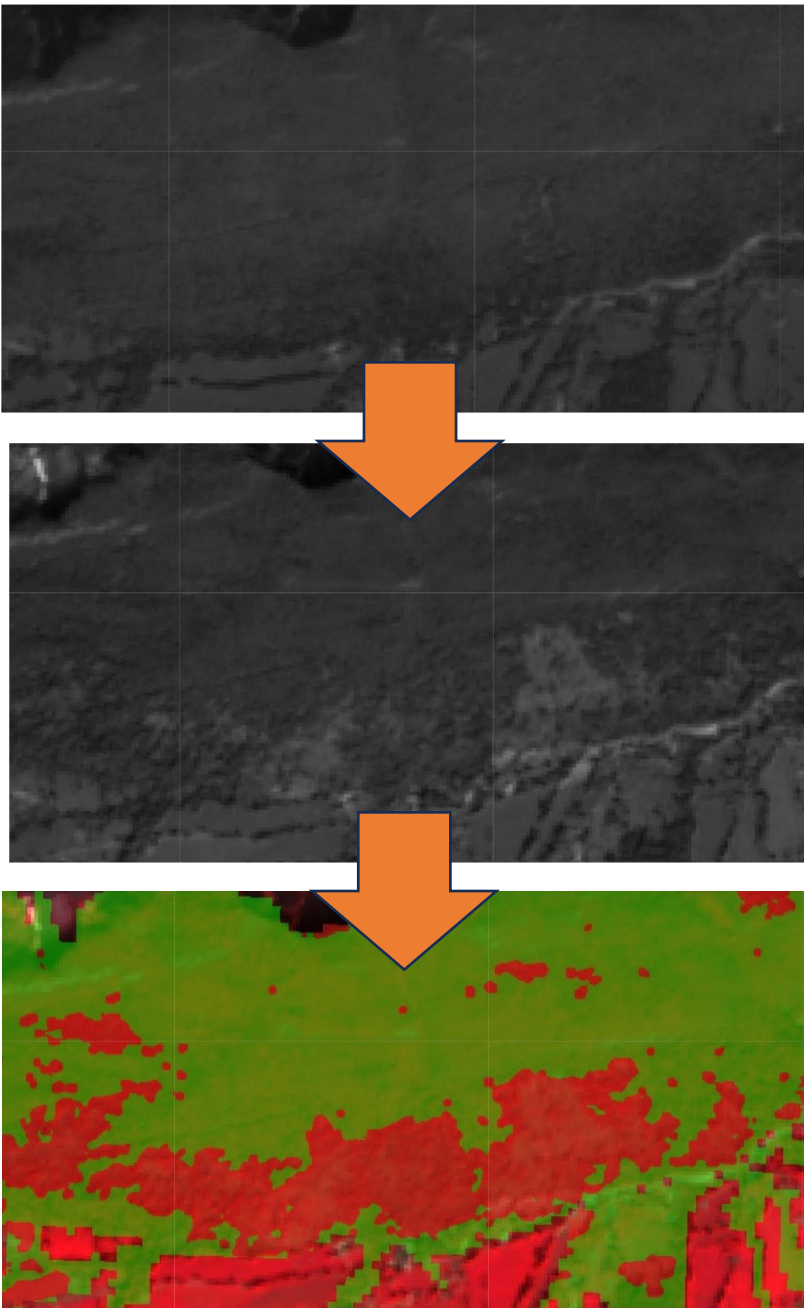
ORIGINAL

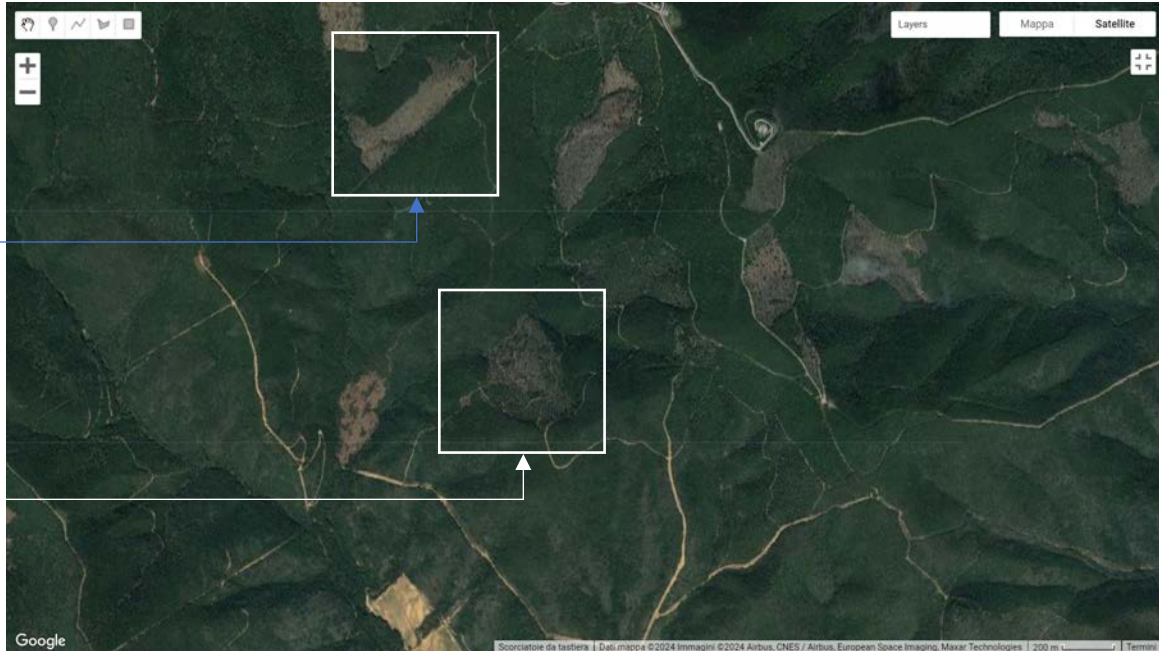
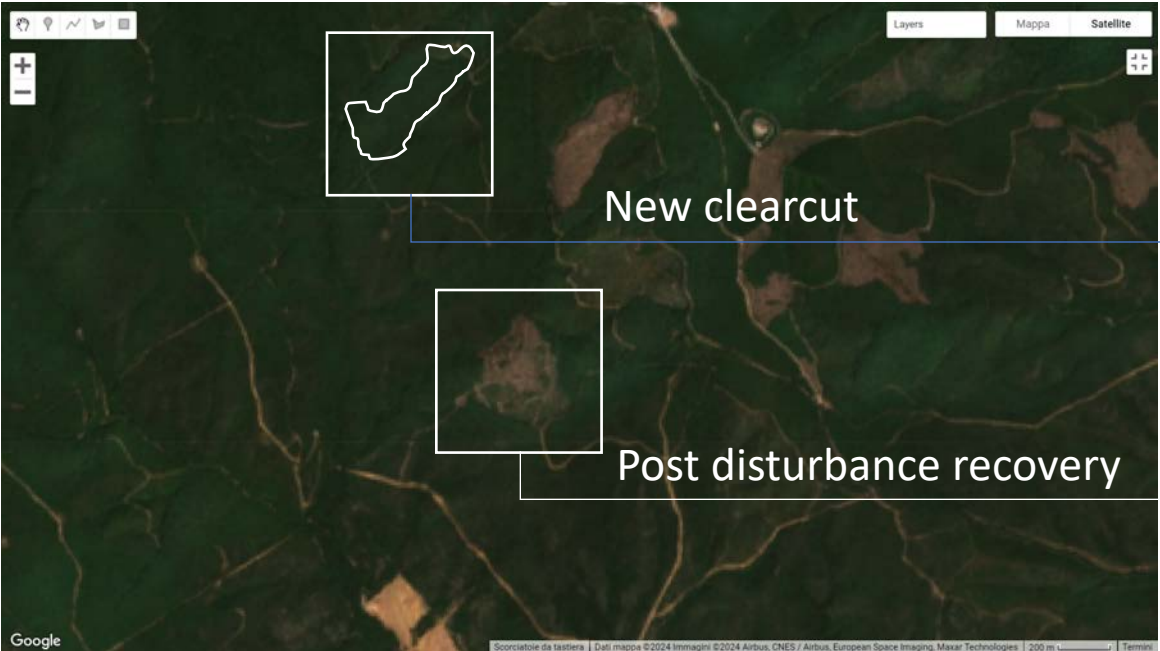
Observed spectral reflectance
signal, with year-to-year variability

FITTED

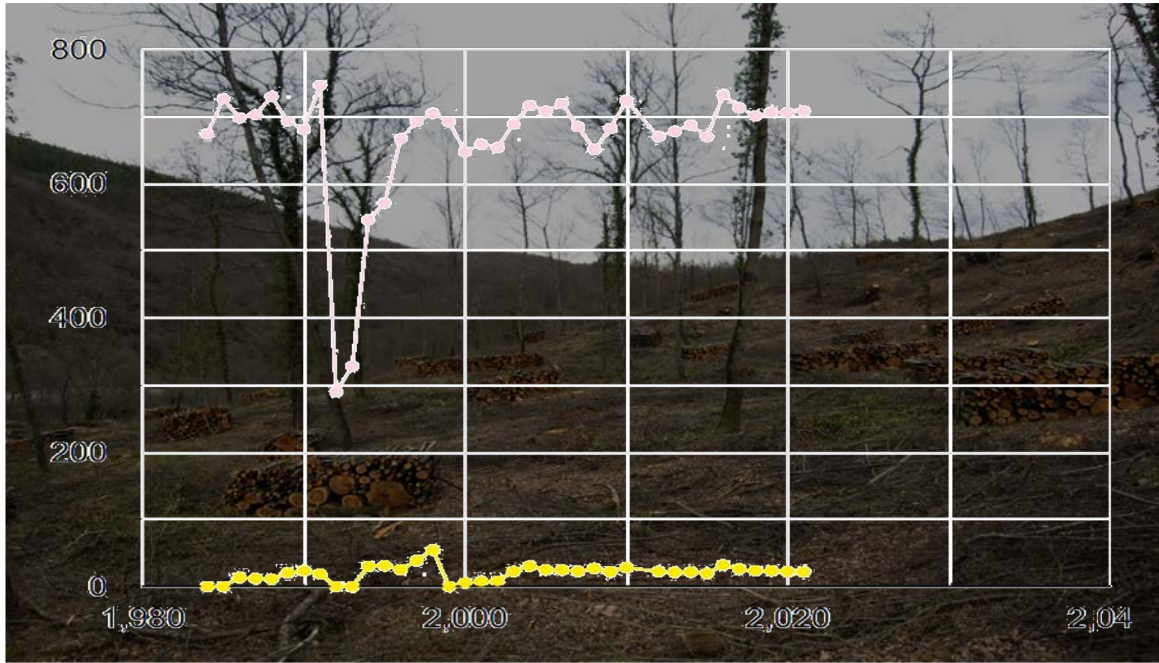
LandTrendr temporal segmentation

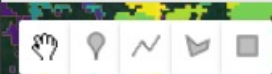
Ricostruzione area colpita dalla tempesta Vaia





Ricostruzione aree soggette a taglio

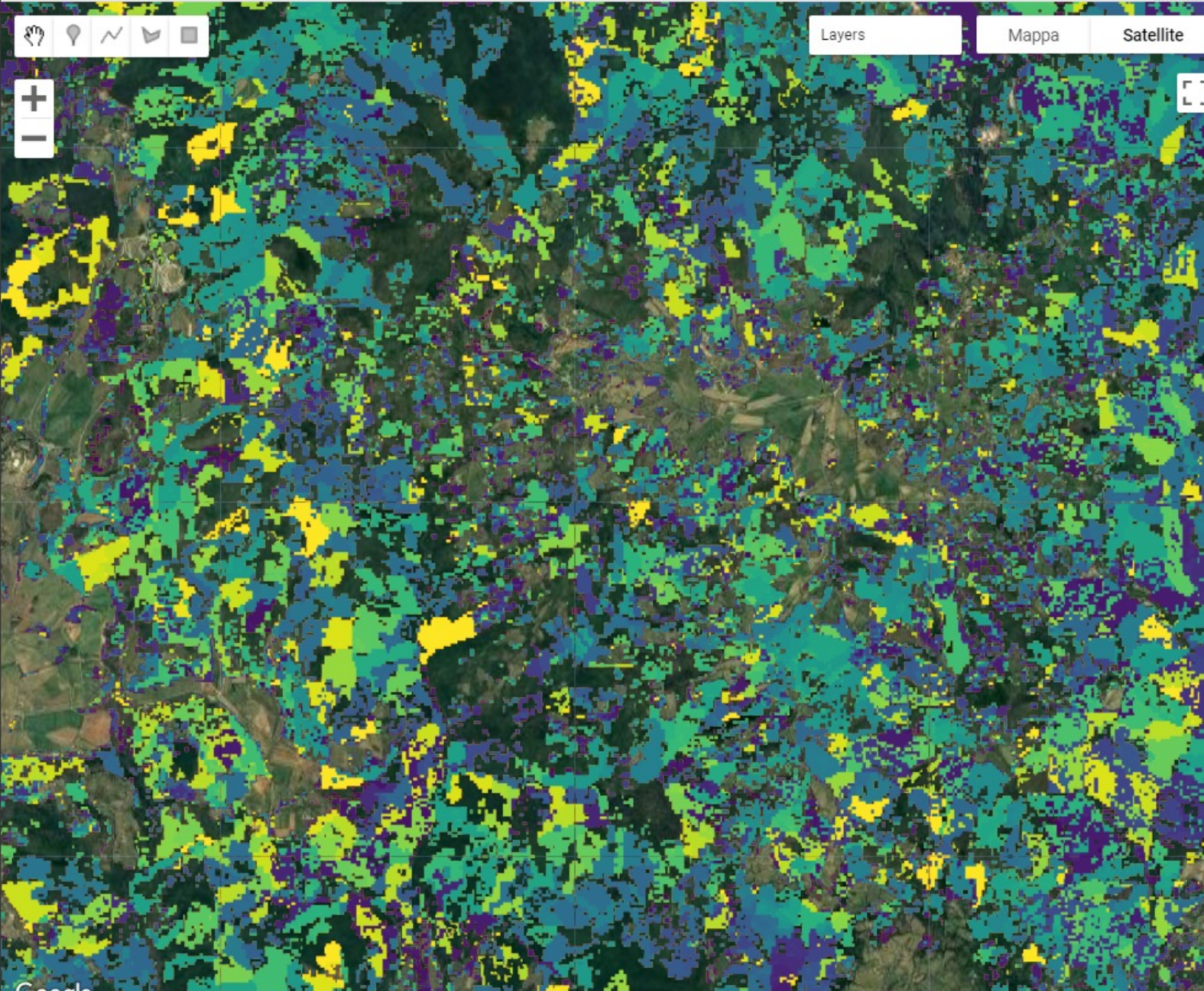




Layers

Mappa

Satellite



The European Forest Changes Information System

Visualise changes with the greatest magnitude

Filter changes by:

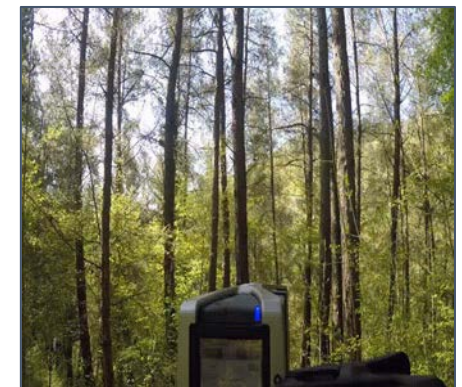
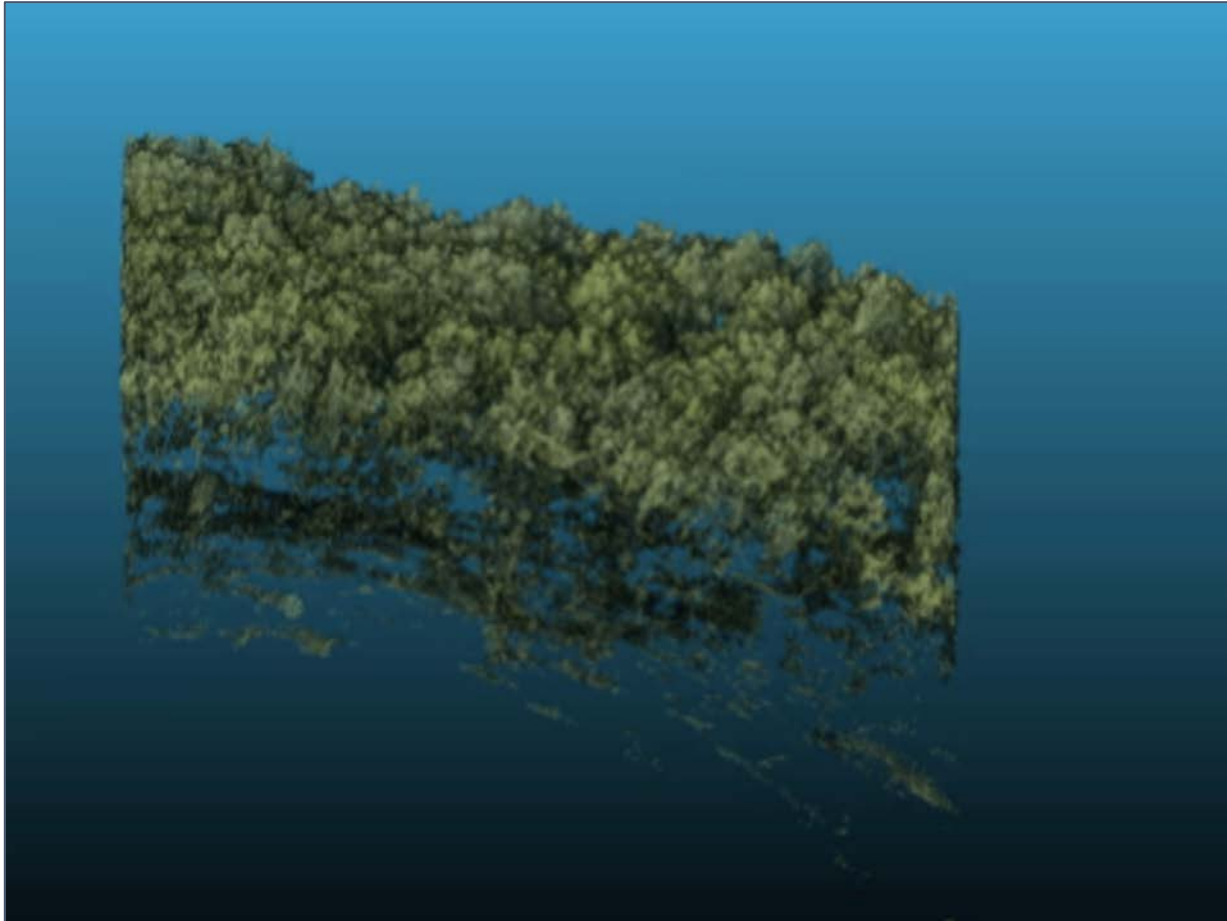
Maximum duration 40Maximum persistence 40Minimum magnitude 200Minimum recovery 0Minimum loss rate 0Minimum recovery rate 0Visualise yearGoogleDrive output folder outputs

Run

Reset

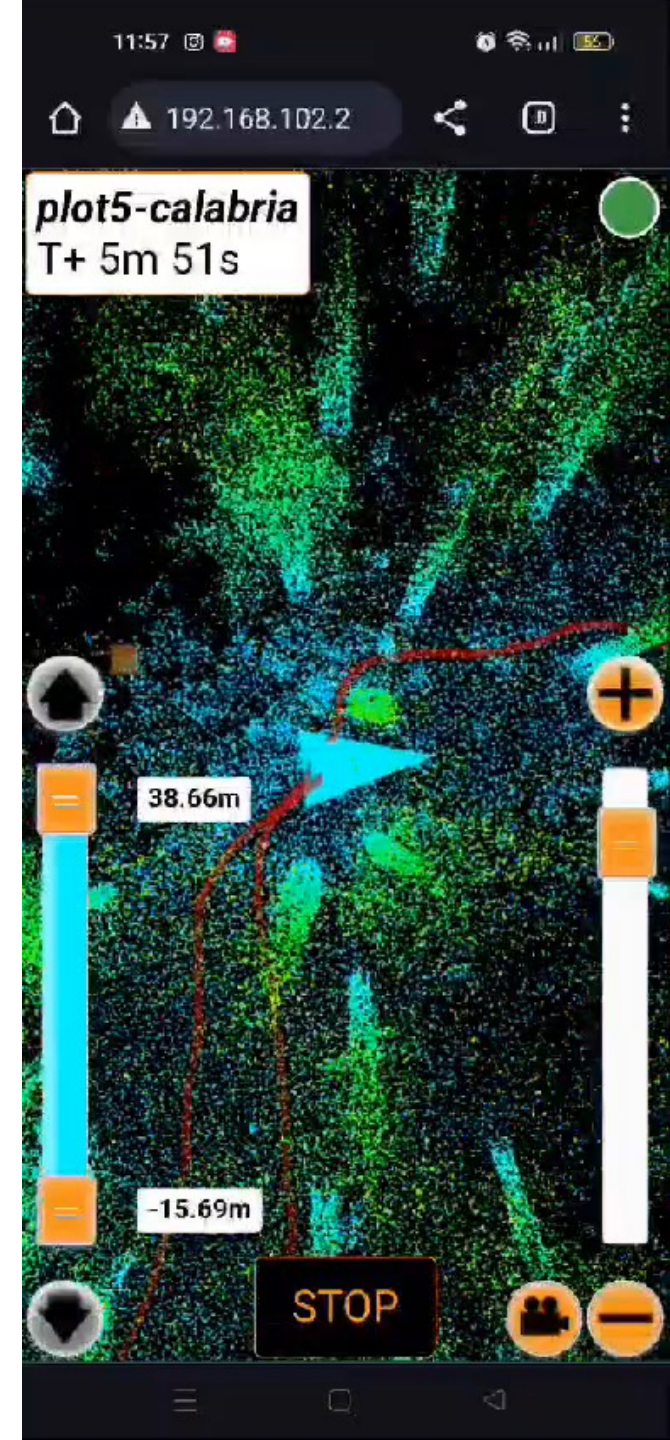
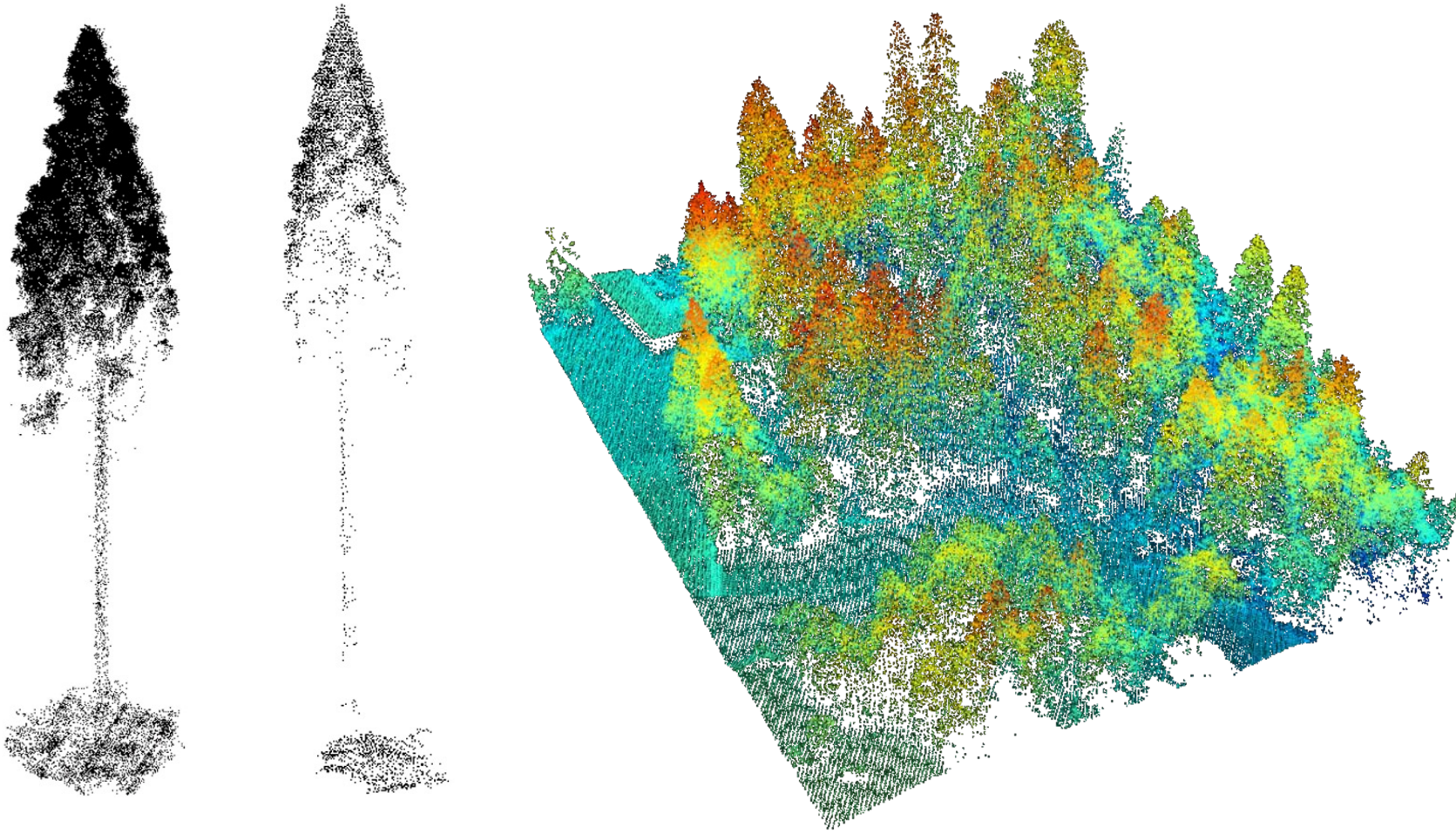
LIDAR

mobili o fisse, aeree o terrestri

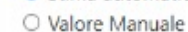


Integrazione tra rilievi Terrestri (TLS) e Aerei (ALS)

Coord. xy e stima servizi ecosistemici per singolo albero







i Tasto destro sui singoli layer per accedere alle funzionalità aggiuntive

▼ SCEGLI TEMA

- ▼ ☒ Progetto base UMCM

▼ ☒ **Dati**

▼ ☐ Elaborazioni

☒ ADS elaborate☒ Alberi elaborati

parametri

▼ ☒ **Rilievo**

☒ Ads rilevate☒ Alberi rilevati

▼ ☒ Carte di base

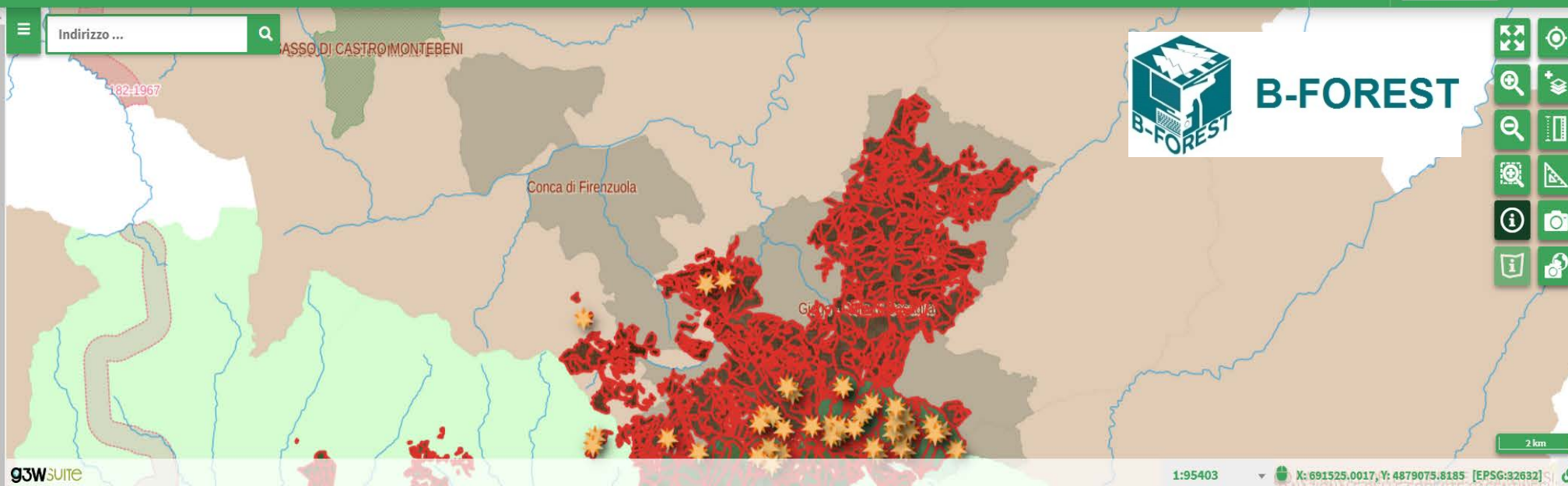
☒ Tagliate☒ Particelle☒ Sottoparticelle☒ CTR multiscala☒ Idrografia

▼ ☒ Vincoli

☒ Immobili ed aree di notevole interesse pubblico - DCR n. 46 del 23/07/2019

☒ Zone soggette a vincoli naturali o ad altri vincoli specifici

▼ ☒ Aree protette

☒ ANPIL☒ Parchi Nazionali

ADS elaborate

Visualizza 10 ▾

Cerca

	clc_tipo	governo	sup_ads	lato_ads	raggio_ads	tosc_tipo	tosc_sotto	v	bio_w1	bio_w2	bio_w3	bio_w4	bio_tot	carbonio
	clc_tipo	governo	sup_ads	lato_ads	raggio_ads	tosc_tipo	tosc_sotto	v	bio_w1	bio_w2	bio_w3	bio_w4	bio_tot	carbonio
etti	3112	2	530000		13	10	10.4	0.0001	0.00006177924528301888	0.00000789575471698113	0.000002978915094339623	0.00007265990566037739	0.07273255957547174	0.03636627978773587
etti	3122	1	530000		13	18	18.2	0.0001	0.000017819622641509437	-0.00000568301886792453	0.0000021149811320754717	0.000014257358490566065	0.014271610075471727	0.007135805037735863
	3115	1	530000		13	22		1.3942	0.8876142911037739	0.1872082160013208	0.027899609591509434	1.1027292650471696	1103.8319871638664	551.9159935819332
	3131	1	530000		13	22		1.8034	1.1472341088735853	0.24368309106086786	0.03606090192320754	1.4269873447264156	1428.414322828273	714.2071614141365
	3115	1	530000		13	22		1.1799	0.7511681520764153	0.15841019388435848	0.02361080622933962	0.9331952016367919	934.1283907889823	467.06419539449115
	3115	1	530000		13	22		1.2231	0.7775575463179253	0.16622671540541495	0.0244414443968868	0.9682319729198106	969.2001986259312	484.6000993129656
	3115	1	530000		13	22		1.3343	0.8489979108301892	0.17995084841283013	0.02668627300754717	1.0556418715094331	1056.697506541684	528.348753270842
	3115	1	530000		13	22		1.3337	0.8473548866838916	0.18014803515138625	0.026647437361438692	1.054558888948855	1055.6136511186786	527.8823355582352

Visualizzazione 1 a 9 su 9 righe

Precedente

1

Successivo

- 70% cippato- 30% pallets/imballaggi
- 70% cippato-30% pallets/imballaggi
- 70% pallets/imballaggi - 30% travame/travi
- 70% pallets/imballaggi- 30% travame/ travi
- cippato
- legna da ardere
- paleria
- pallets/imballaggi
- travame/travi
- tronchi

accessibilita

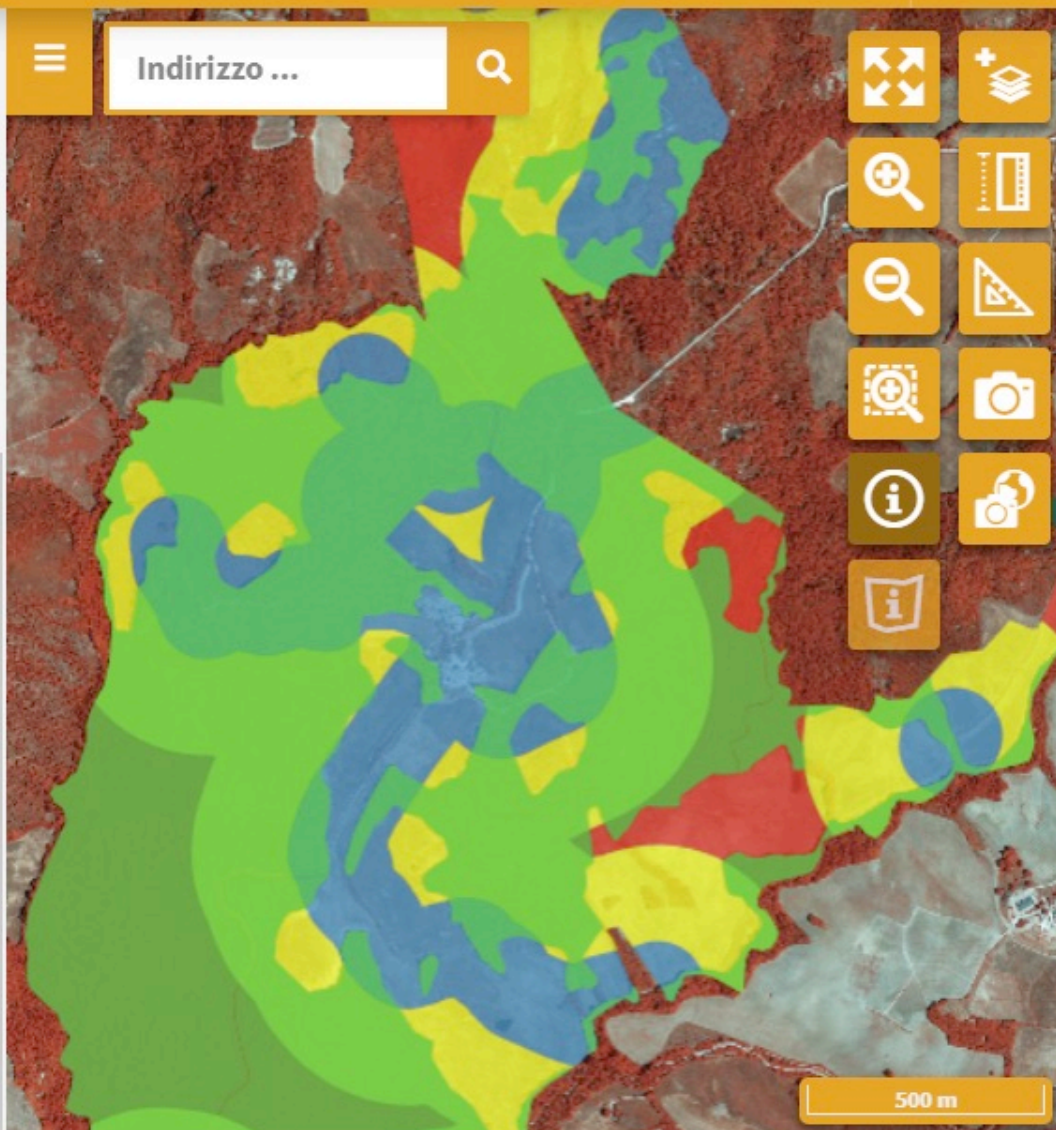
- Accessibile
- Poco accessibile
- Non accessibile

Incremento

17.99724
0

Biomassa

374.585999
22.199879



g3wsuite 1:18479

X: 663776.2053, Y: 4794033.4604 [EPSG:3

Risultati

664395.6751846761,
4793661.876150408

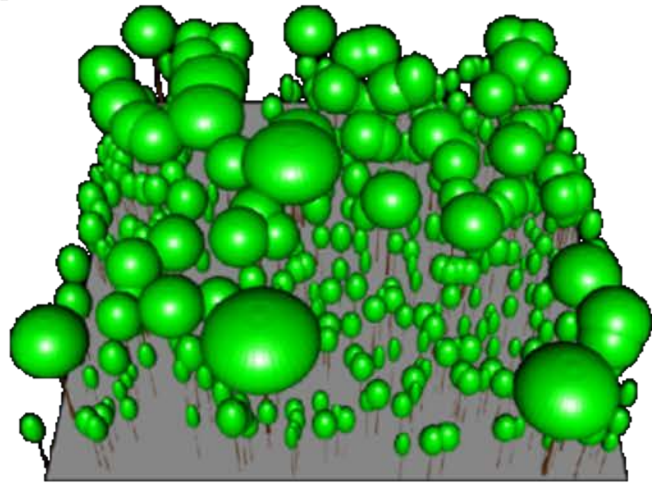
assortimenti (1)

	id	us	con_ lat
	9	B...	L...

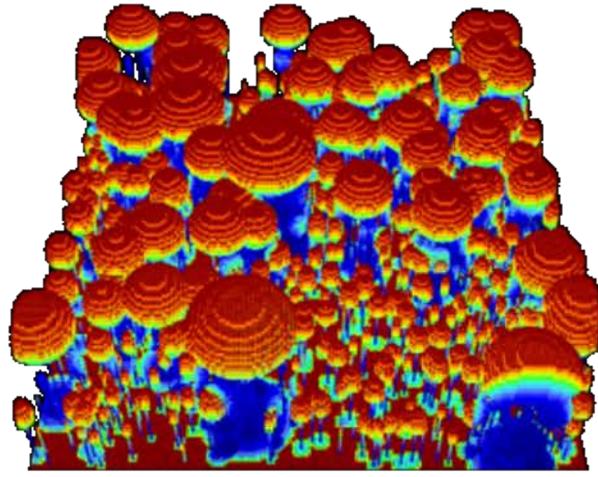
id	9
us	Bosco
con_la t	Latifoglie
tipo_f or	10.2
tipo_d escr	Querceto mesofilo di roverella e cerro
sup_h a	33.47
assort	legna da ardere

Modelli di simulazione

a

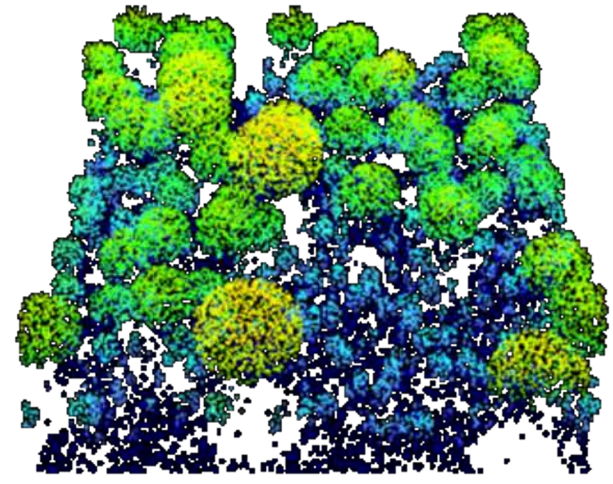


b



0 0.3
Return probability

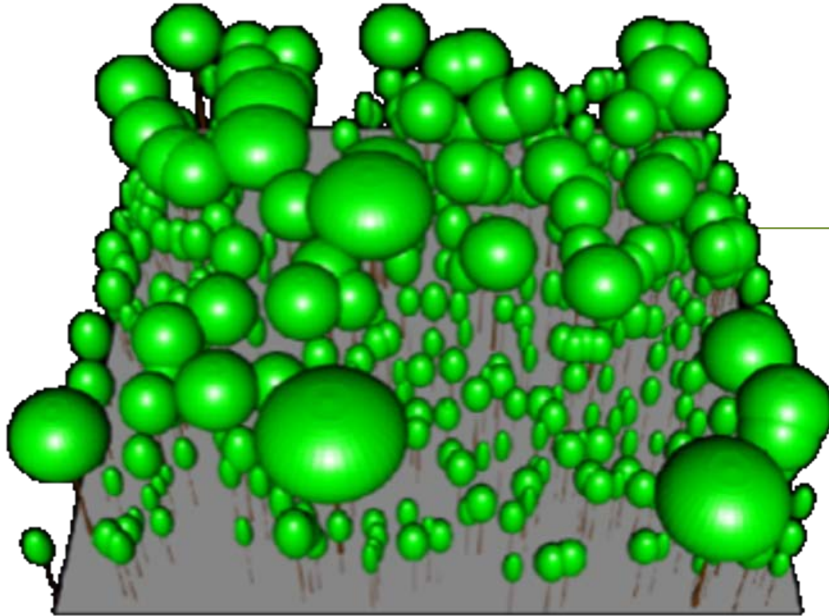
c



0 35
Height [m]

Modelli di simulazione

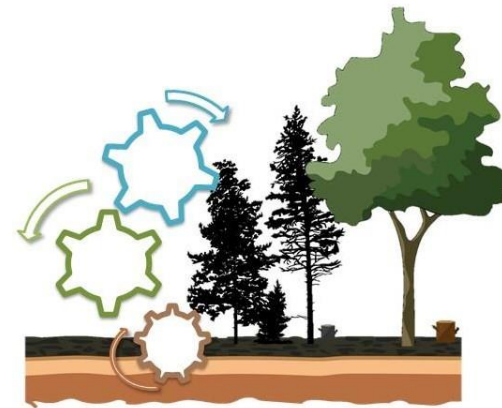
a



3D-CMCC-FEM

(Coupled Model Carbon Cycle)
BioGeoChemical and Biophysical
Forest Ecosystem Model

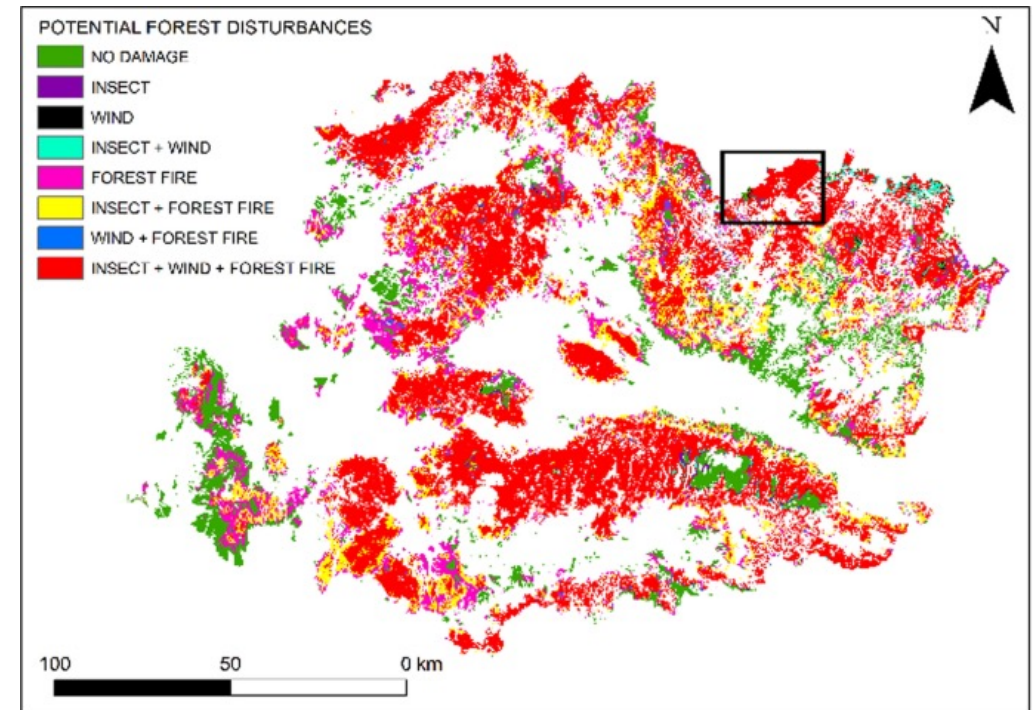
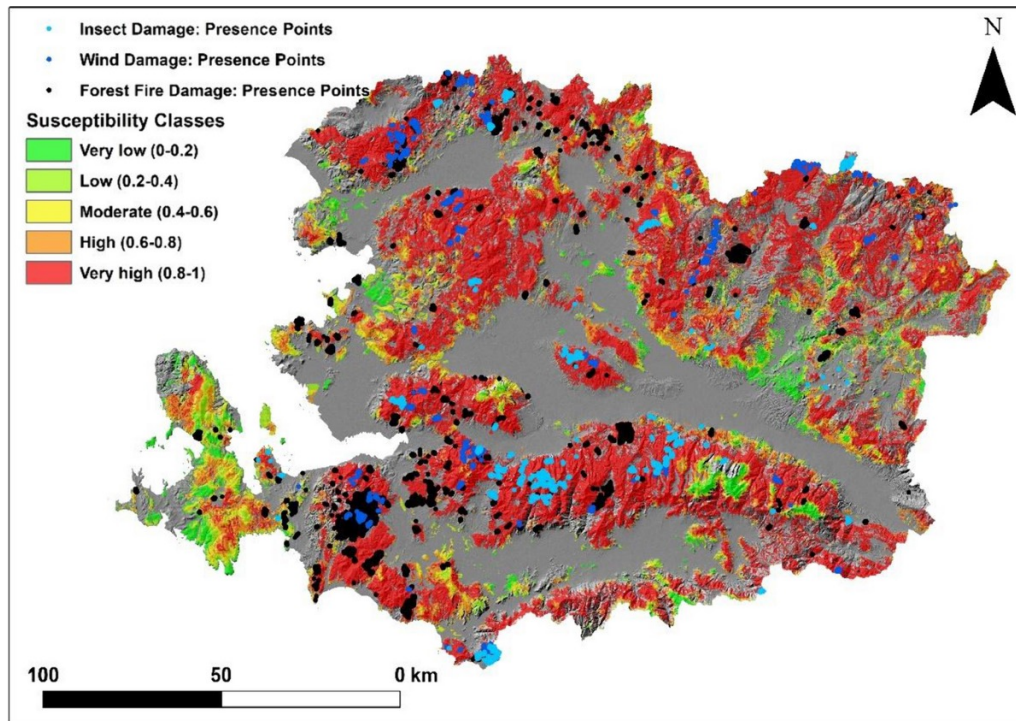
[User's Guide \(v.5.5-ISIMIP, v.5.6\)](#)



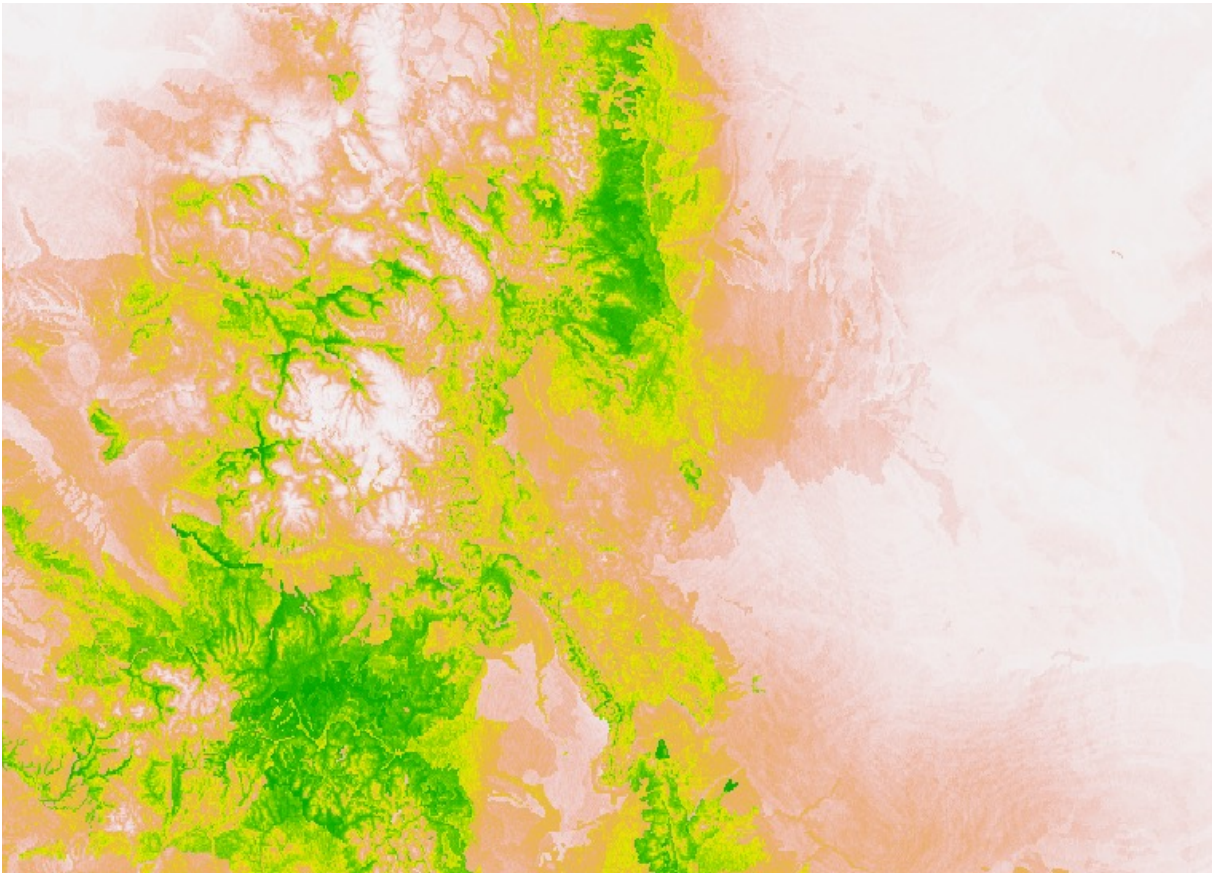
Forest Modelling Lab.

 National Research Council of Italy

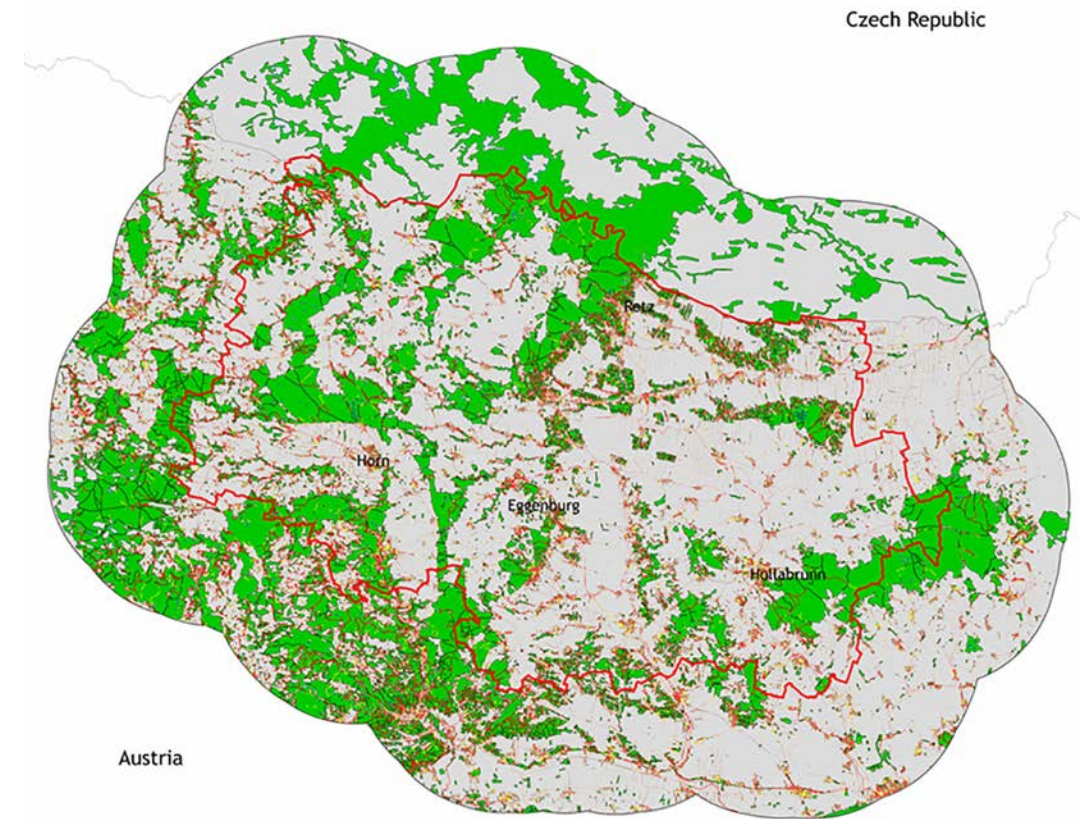
Vulnerabilità ai disturbi



Modellistica spazialmente esplicita

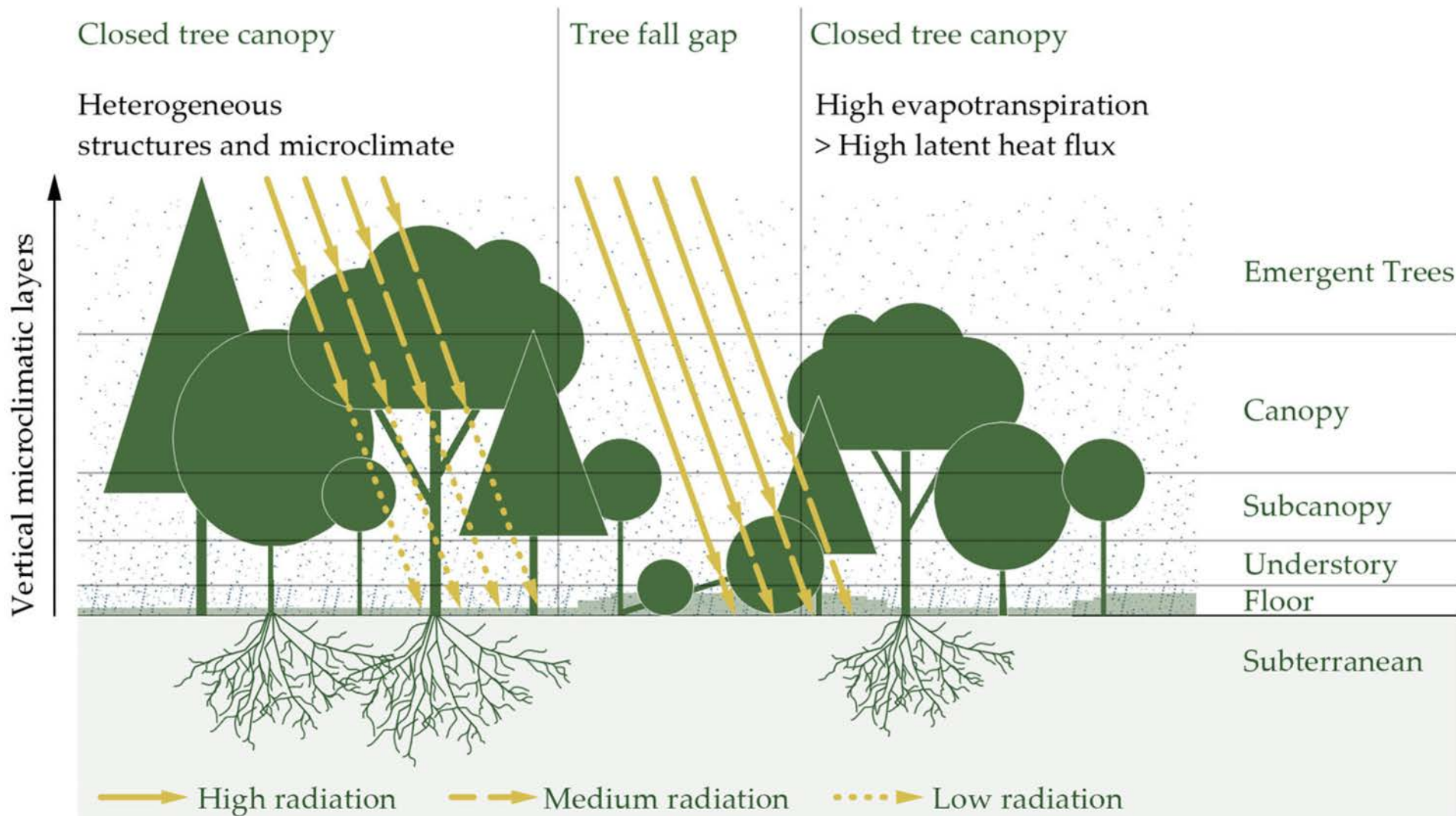


Modelli di distribuzione delle specie

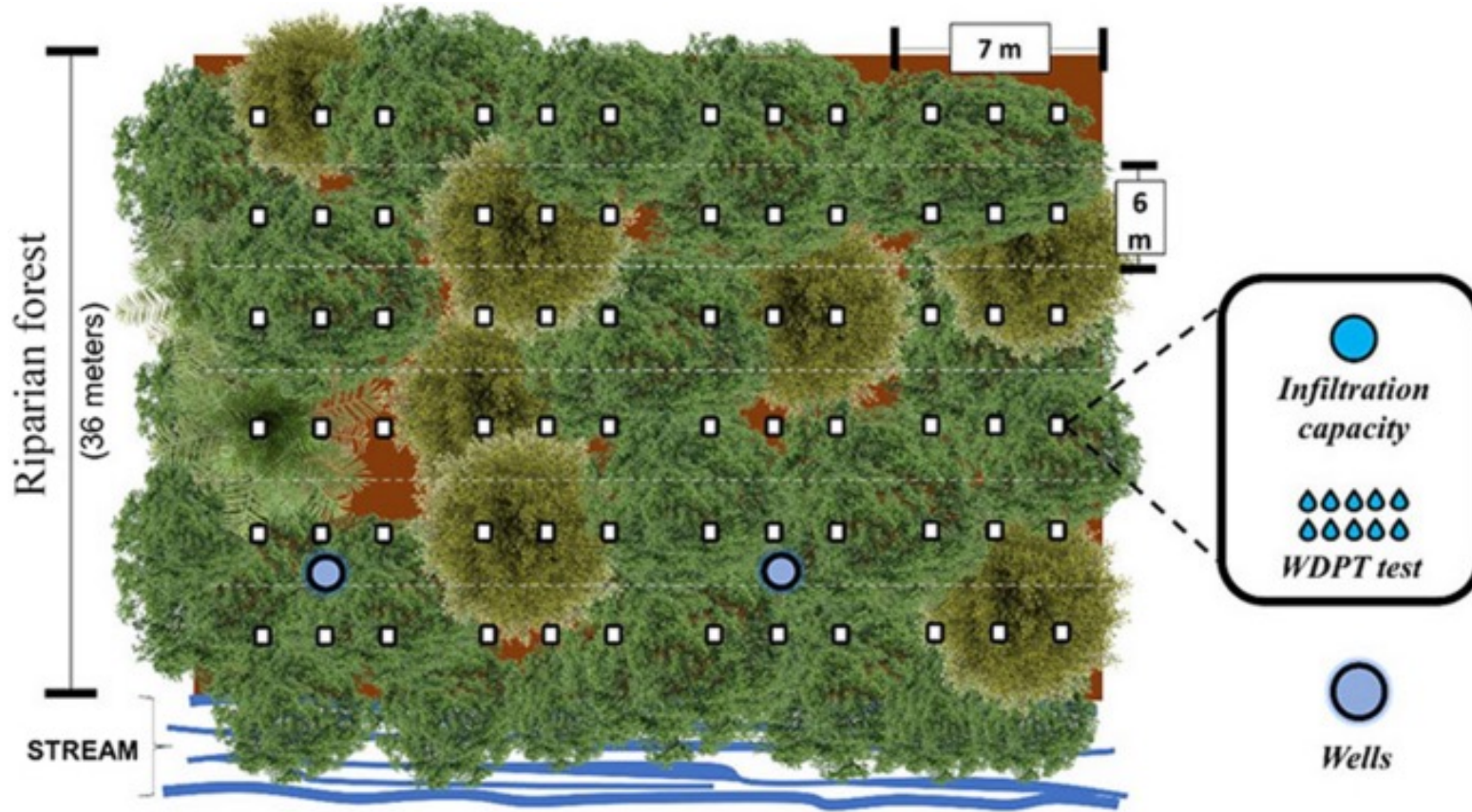


Connettività ecologica

Effetti meso- e microclimatici della foresta



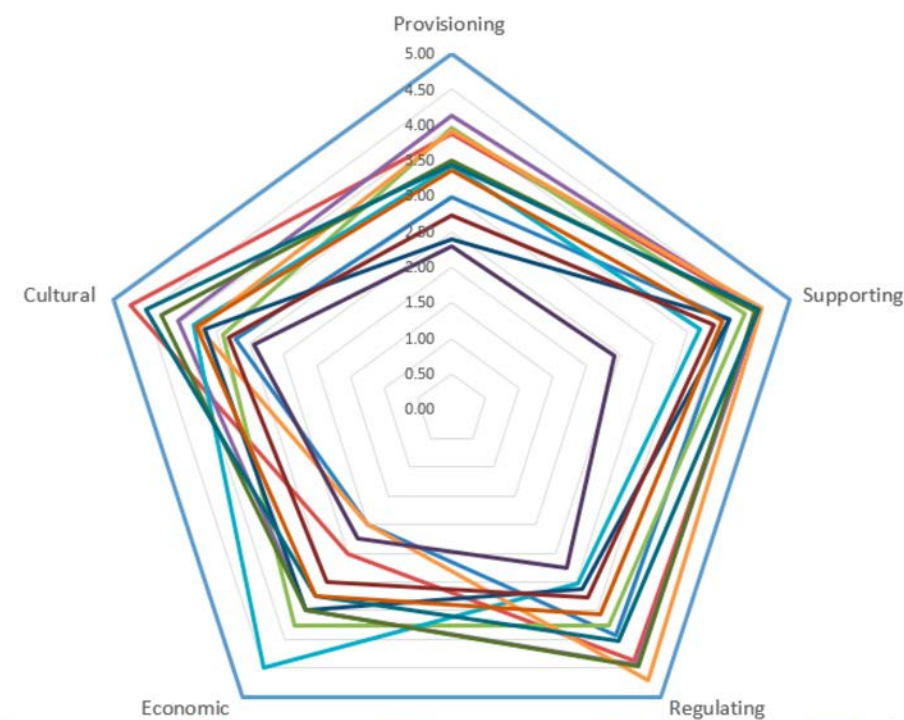
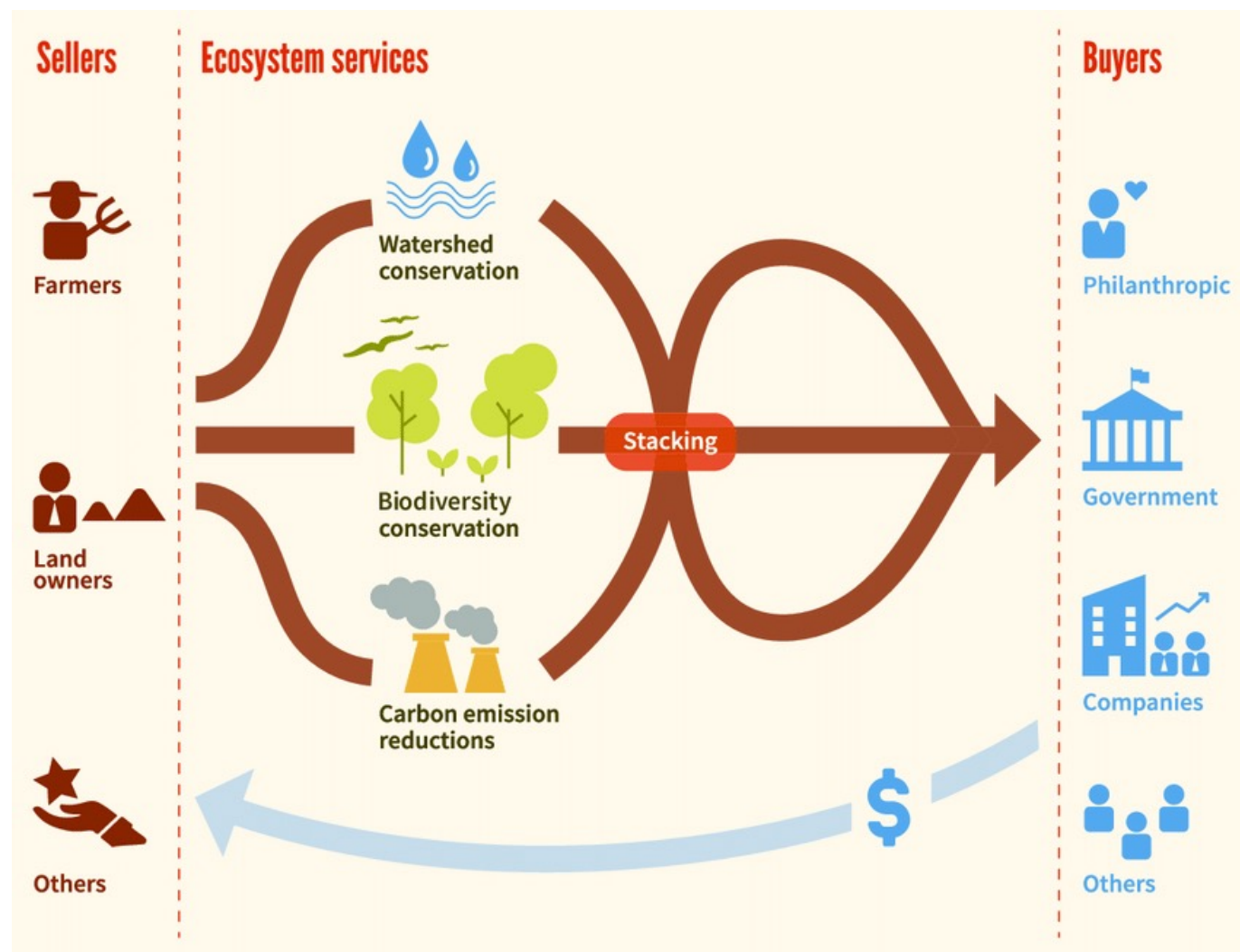
Foreste e conservazione dell'acqua



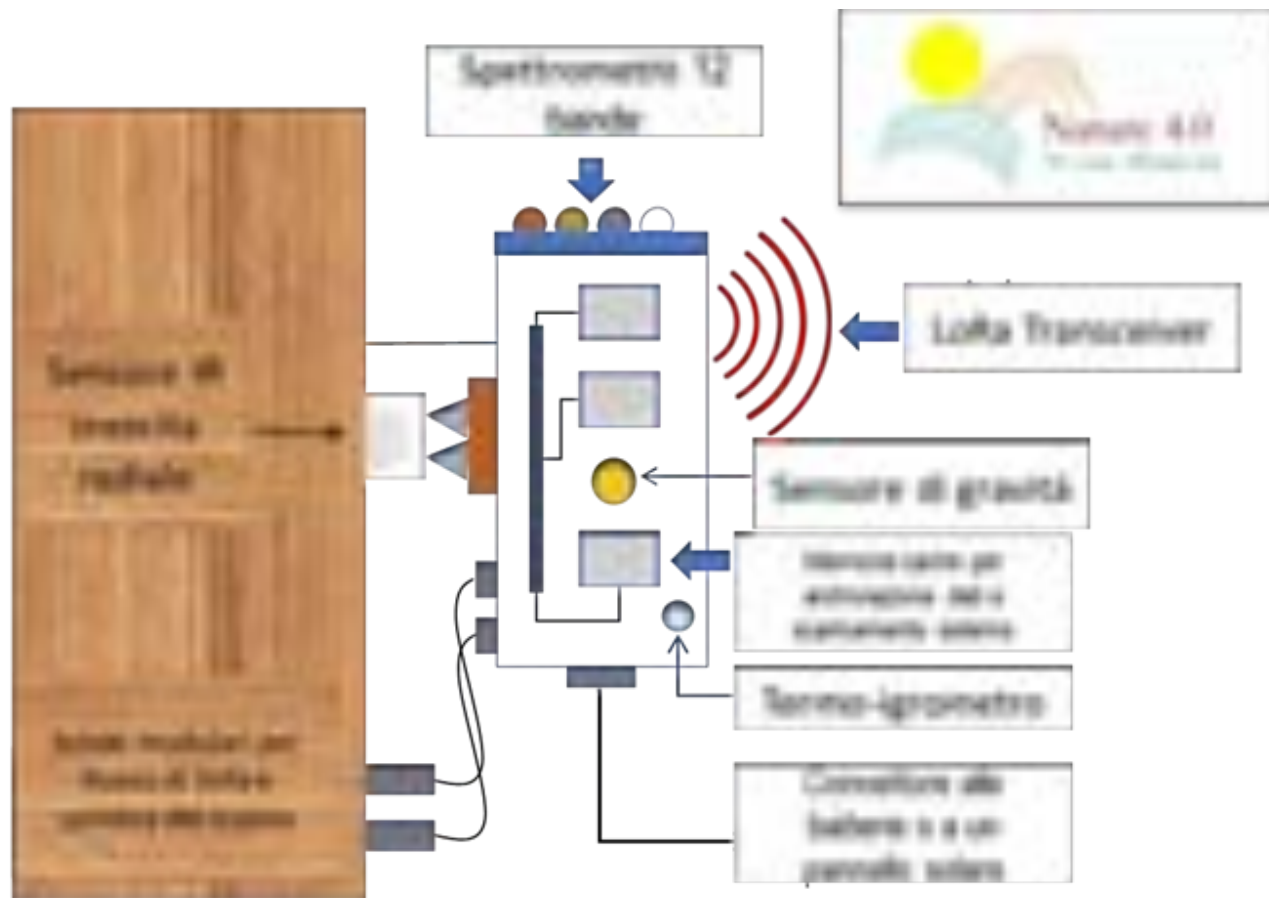
Innovazione in bioeconomia



Misura, ottimizzazione e pagamento dei servizi ecosistemici



Tree talker

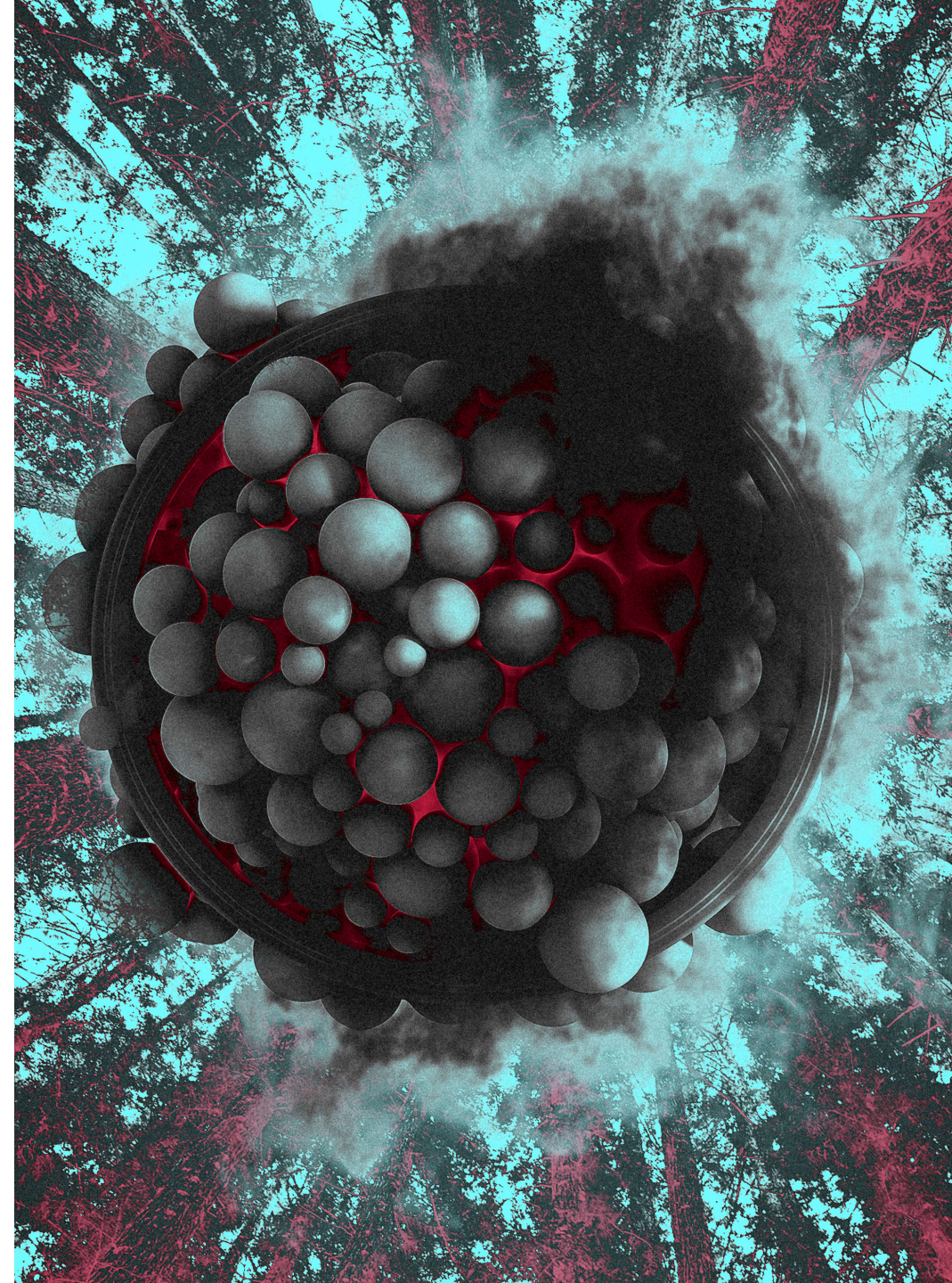
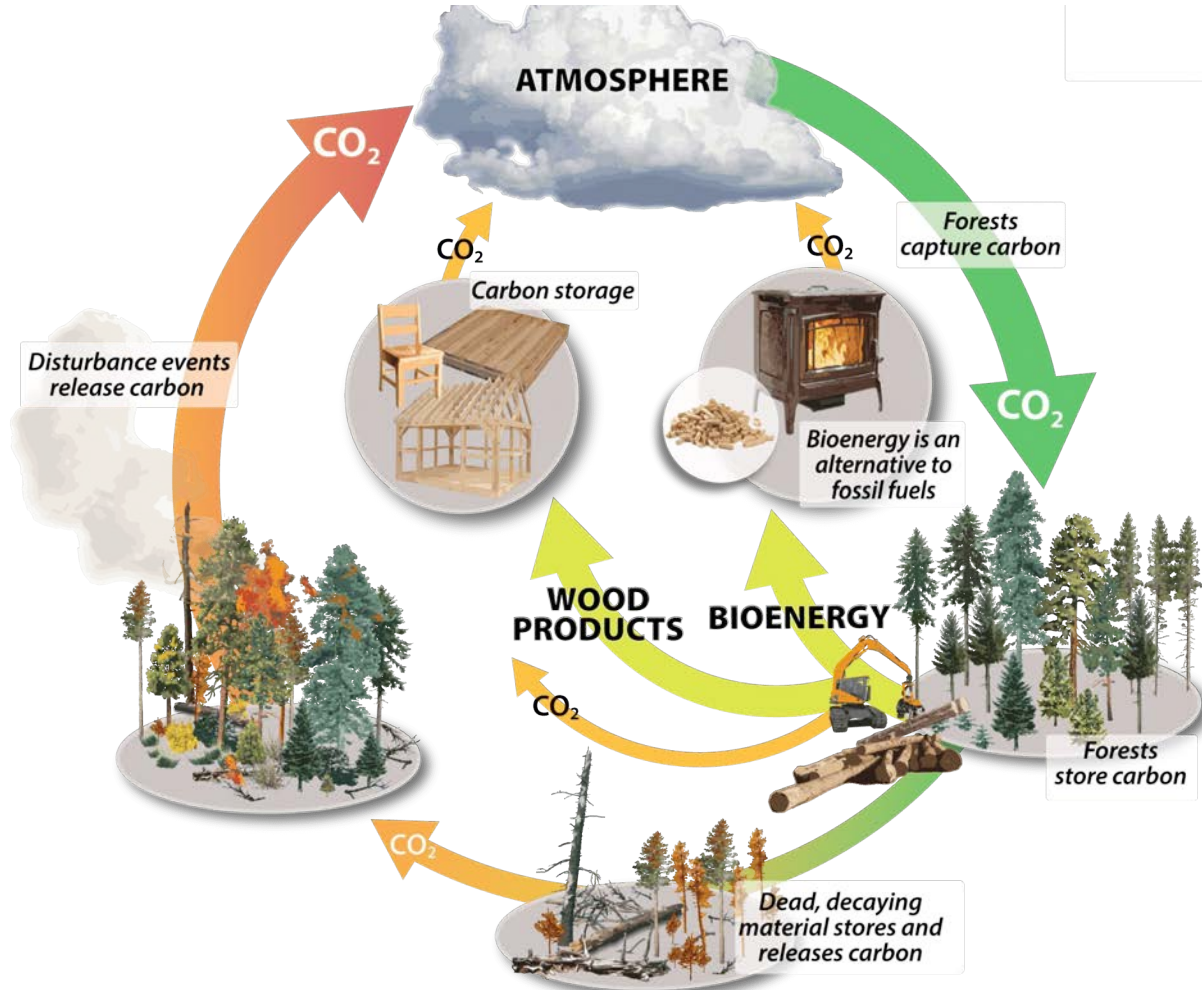


Misure micrometeorologiche



True carbon offsetting

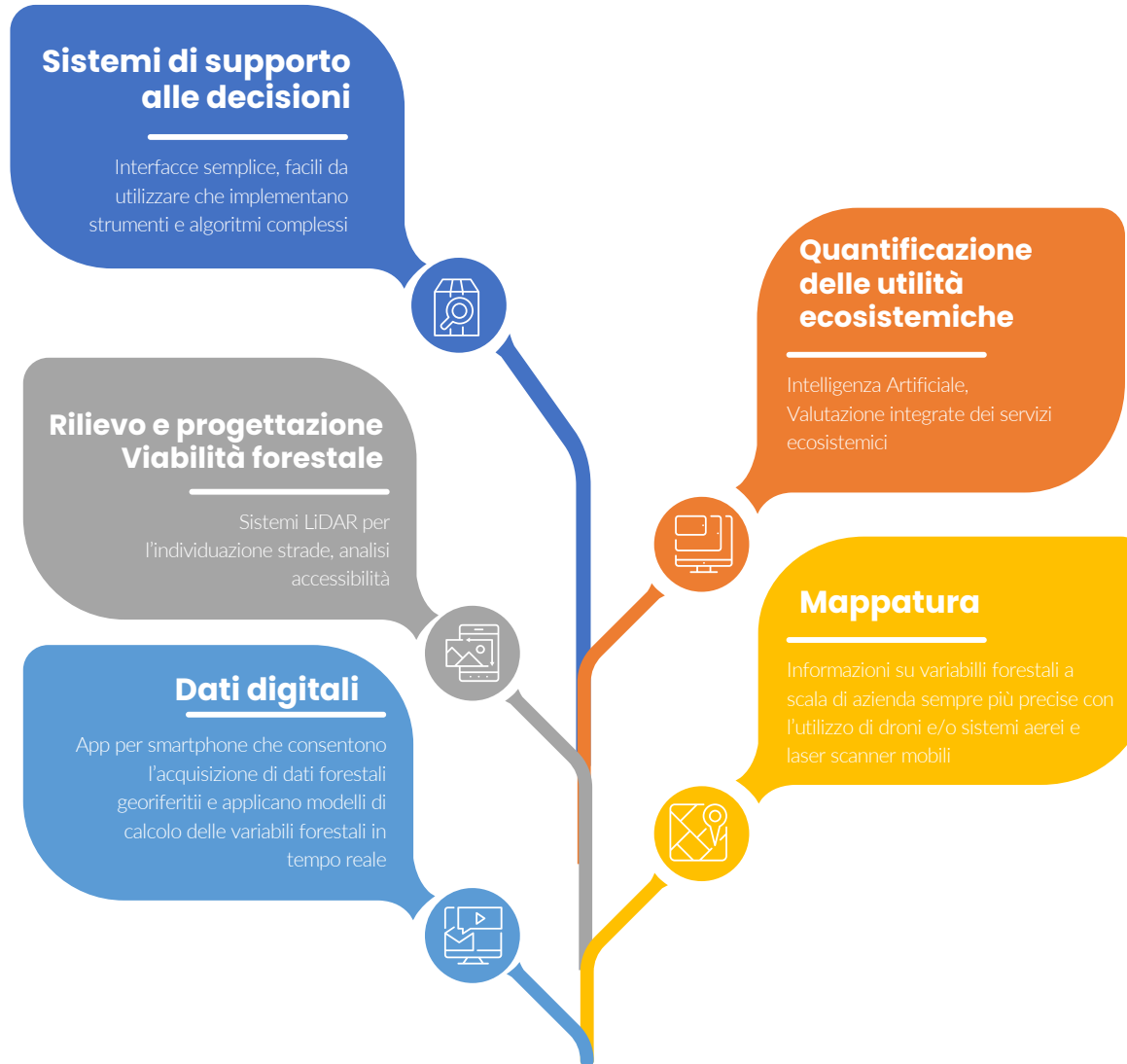
Impermanenza, tracciabilità

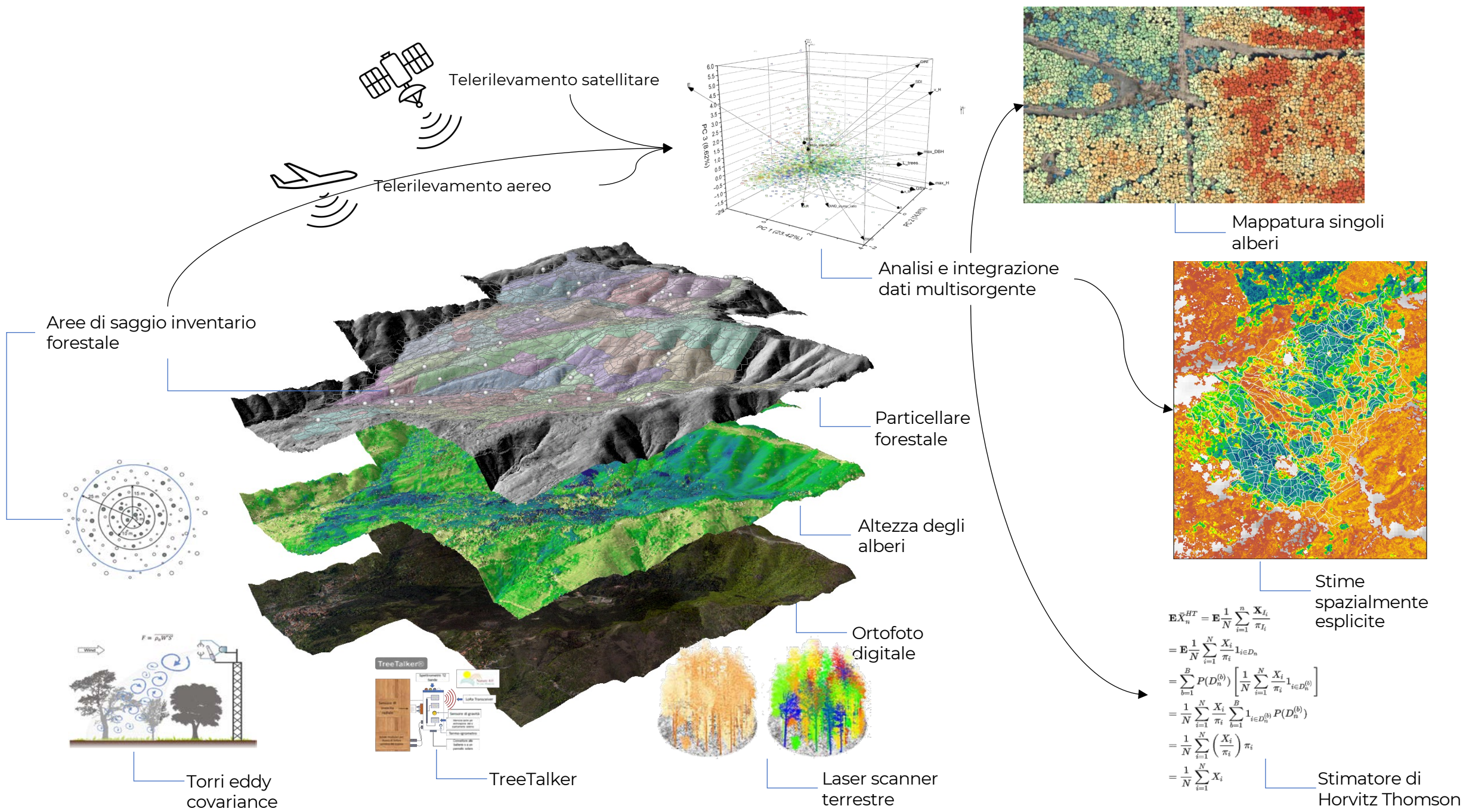


Monitoraggio della biodiversità eDNA, bioacustica



Gestione Forestale Sostenibile





$$\begin{aligned}
 \mathbf{E} \bar{X}_n^{HT} &= \mathbf{E} \frac{1}{N} \sum_{i=1}^n \frac{\mathbf{X}_{I_i}}{\pi_{I_i}} \\
 &= \mathbf{E} \frac{1}{N} \sum_{i=1}^N \frac{\mathbf{X}_i}{\pi_i} \mathbf{1}_{i \in D_n} \\
 &= \sum_{b=1}^B P(D_n^{(b)}) \left[\frac{1}{N} \sum_{i=1}^N \frac{\mathbf{X}_i}{\pi_i} \mathbf{1}_{i \in D_n^{(b)}} \right] \\
 &= \frac{1}{N} \sum_{i=1}^N \frac{\mathbf{X}_i}{\pi_i} \sum_{b=1}^B \mathbf{1}_{i \in D_n^{(b)}} P(D_n^{(b)}) \\
 &= \frac{1}{N} \sum_{i=1}^N \left(\frac{\mathbf{X}_i}{\pi_i} \right) \pi_i \\
 &= \frac{1}{N} \sum_{i=1}^N \mathbf{X}_i
 \end{aligned}$$

Innovazione sociale e partecipazione

