Seminario 4 RESBA

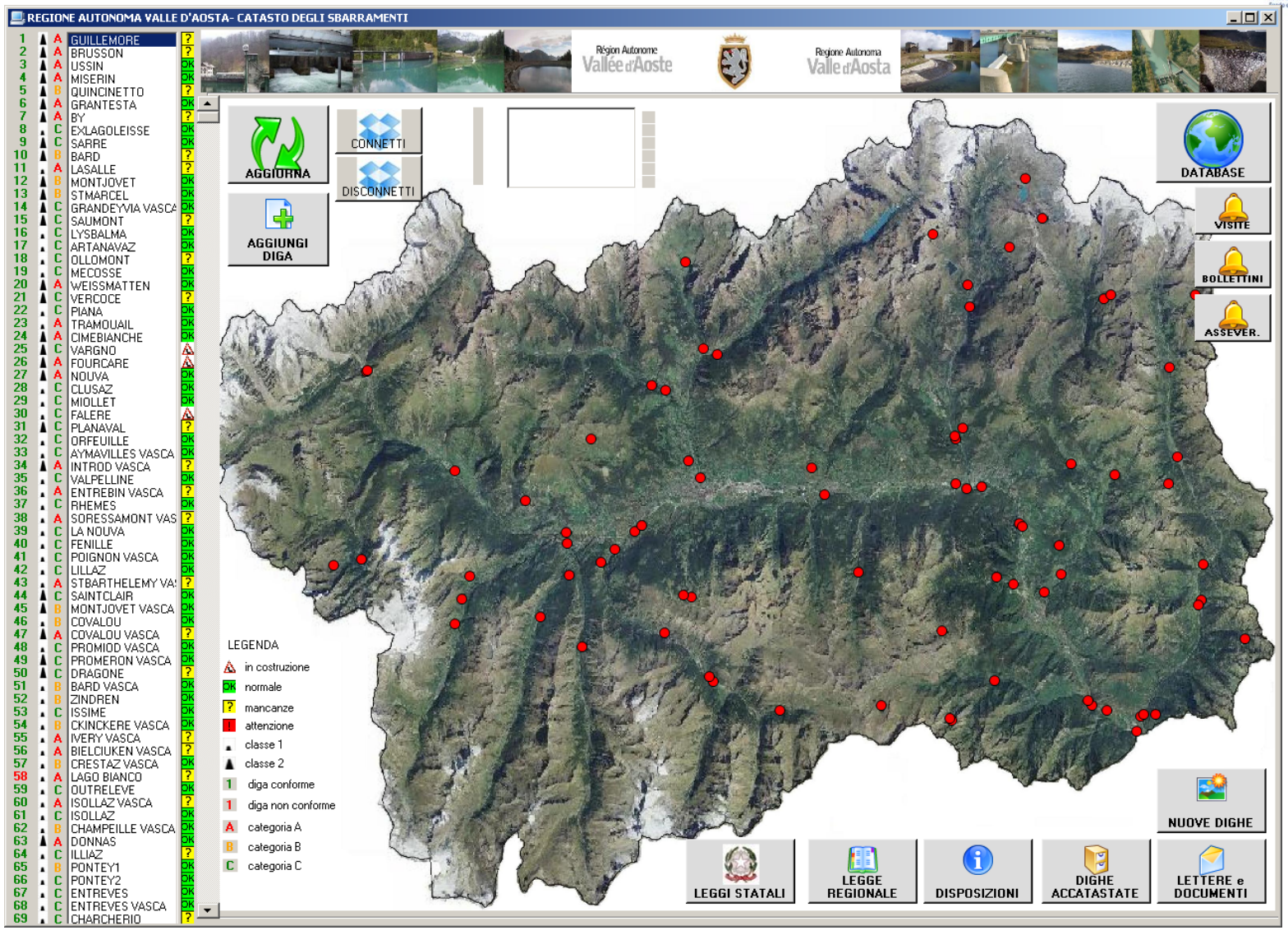
Interferometria satellitare

Regione Autonoma Valle d'Aosta – ing. Franco Collé

Politecnico di Torino

27 novembre2019

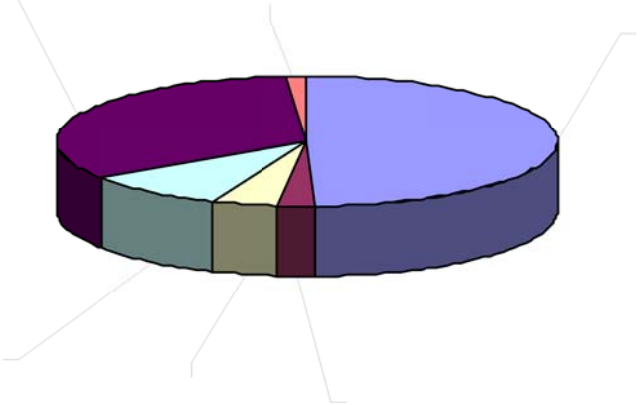
LE DIGHE IN VALLE D'AOSTA



LE DIGHE IN VALLE D'AOSTA

TIPOLOGIA

DIGA MURARIA A GRAVITA'



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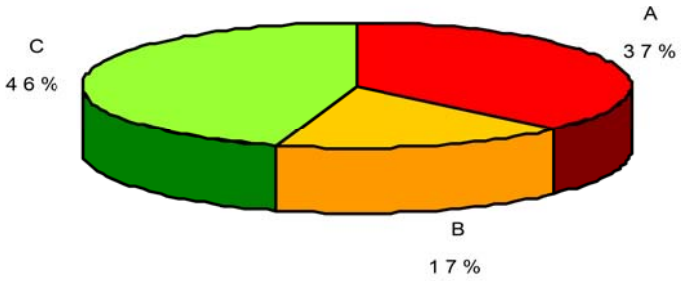
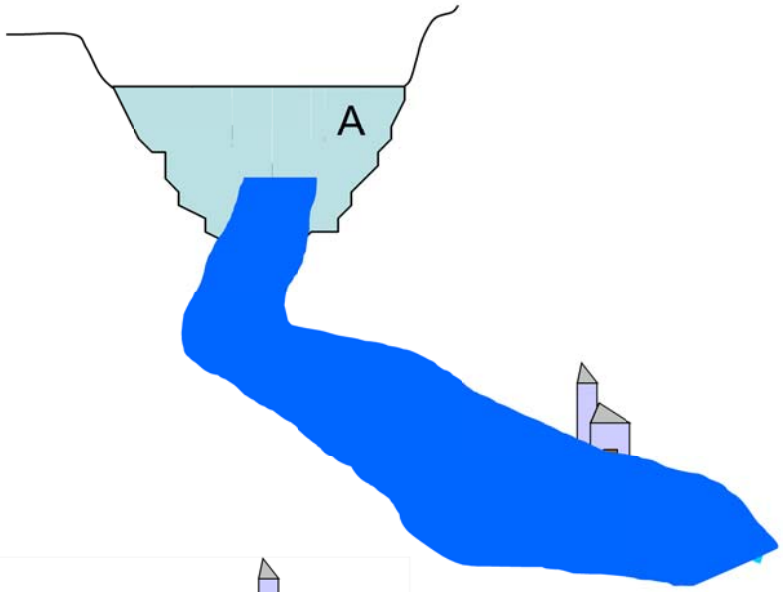
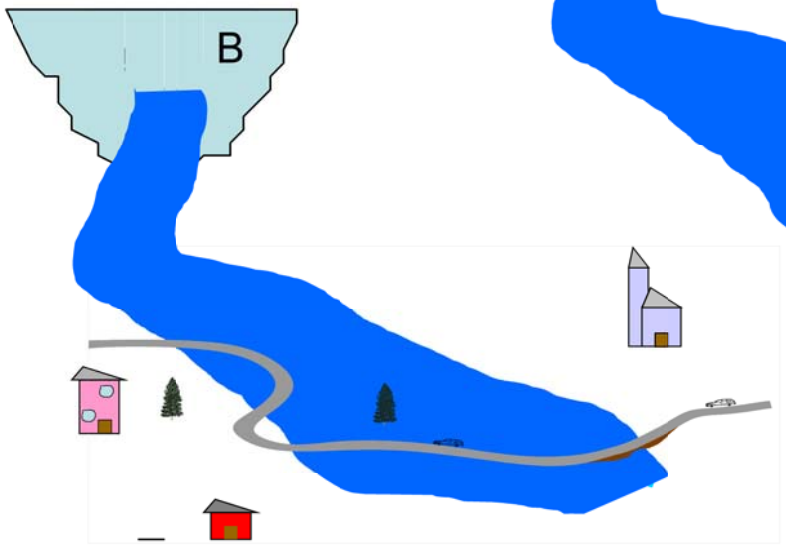
Regione Autonoma Valle d'Aosta

MONITORAGGIO: PRIORITA’

CLASSI DI RISCHIO



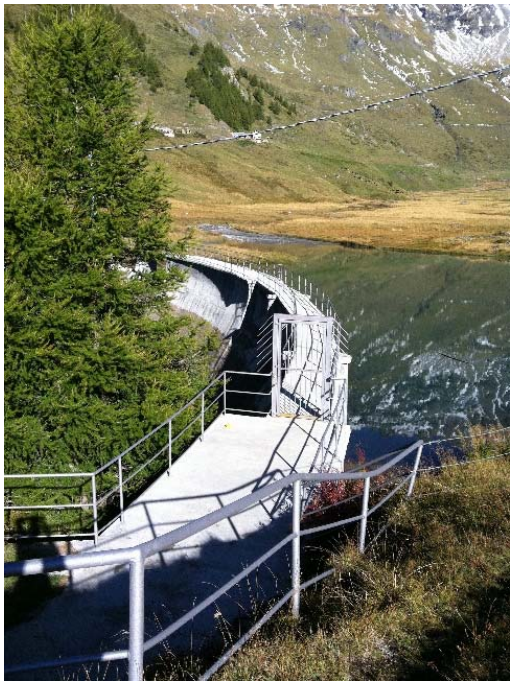




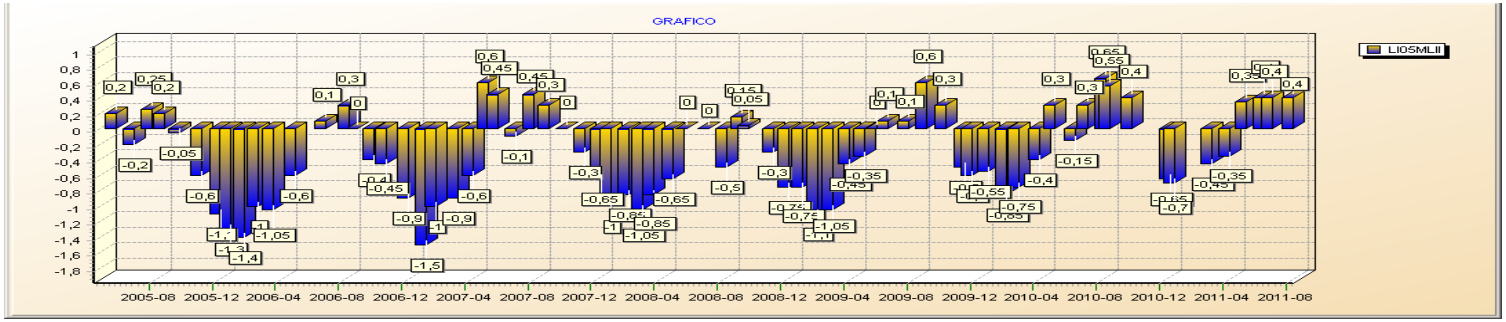
MONITORAGGIO: TIPOLOGIE

Mis. perdite

Estensimetri

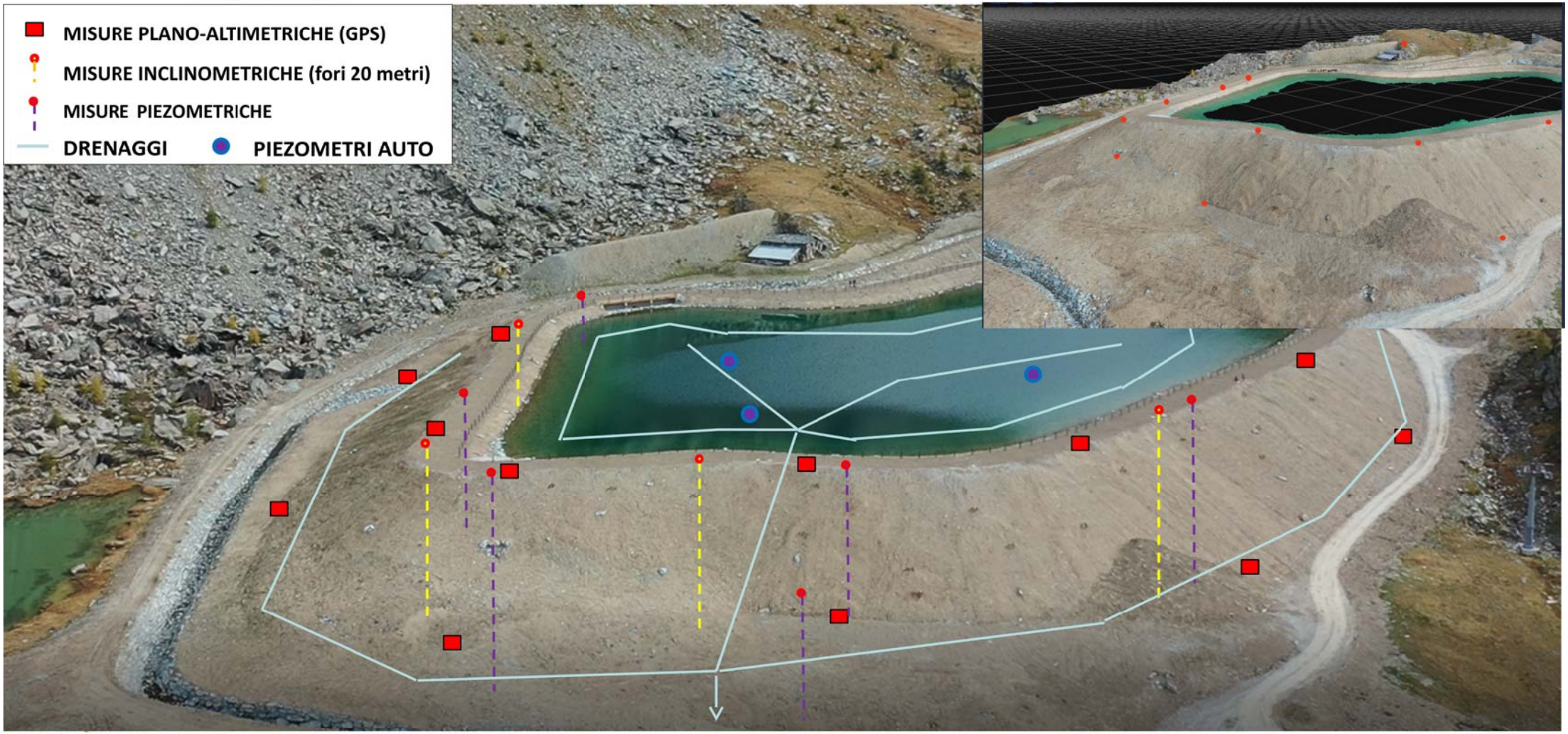


Livellazione



MONITORAGGIO: BACINI INNEVAMENTO

CLASSI DI RISCHIO



Interreg ALCOTRA

RESBA
Résilience des barrages
Resilienza sugli sbarramenti

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Regione Autonoma Valle d'Aosta

MONITORAGGIO: BACINI INNEVAMENTO

PROBLEMATICHE

Région Autonome Vallée d'Aoste
Regione Autonoma Valle d'Aosta

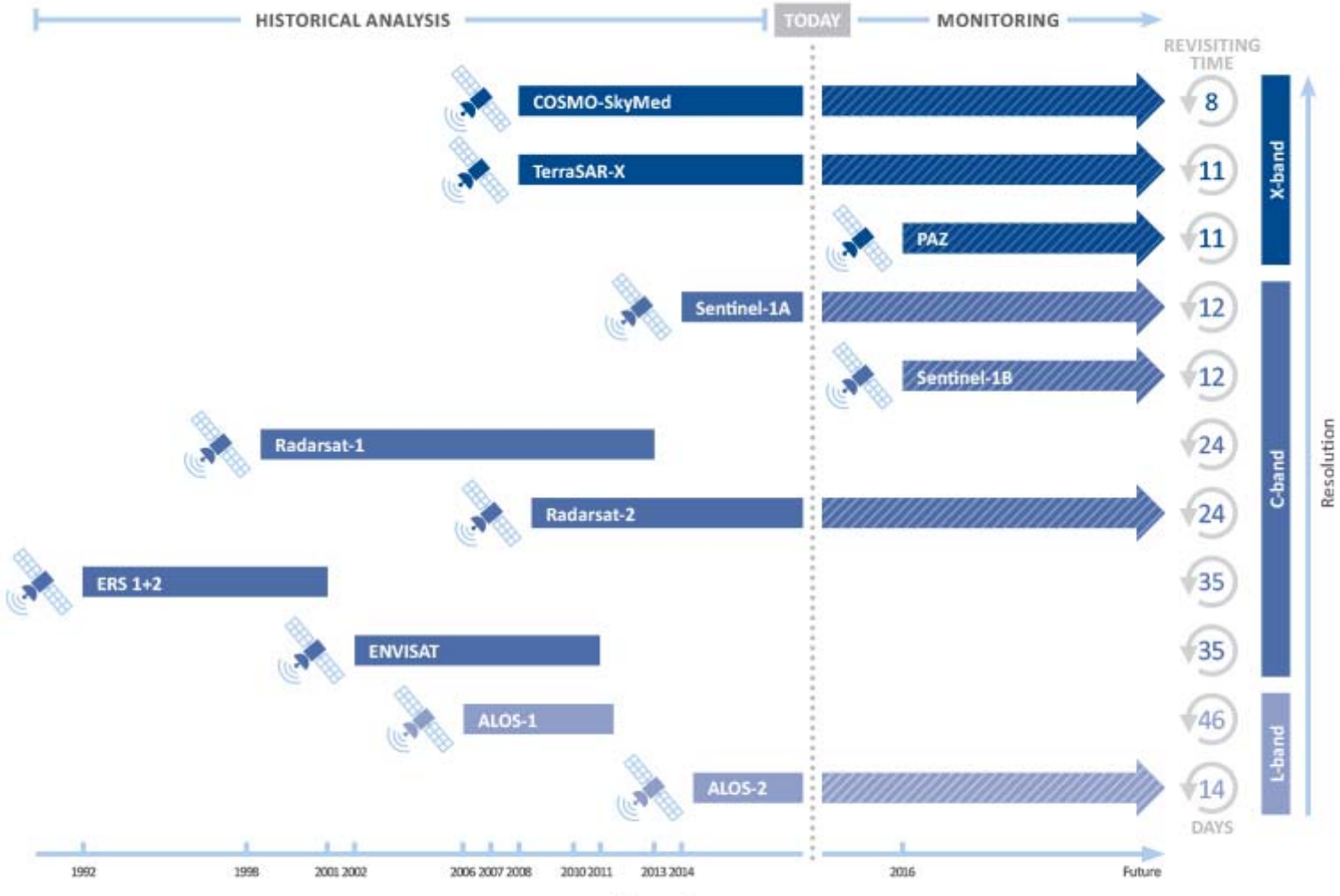
NO: GPS + INCLINOMETRI + PIEZOMETRI + FOTOGRAMMETRIA DA DRONE

SI: DRENAGGI, PIEZOMETRI AUTOMATICI

QUINDI: STRUMENTI INNOVATIVI (FREQUENZA DI MISURA, ANCHE CON NEVE, NON NECESSITA DI ACCEDERE)

INTERFEROMETRIA SATELLITARE

BANDE E COSTELLAZIONI



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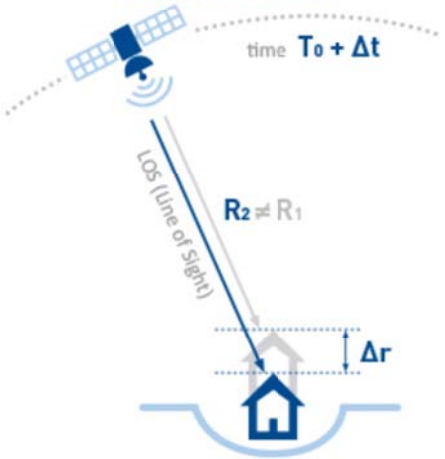
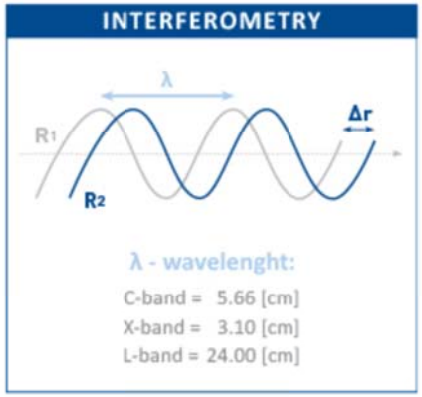
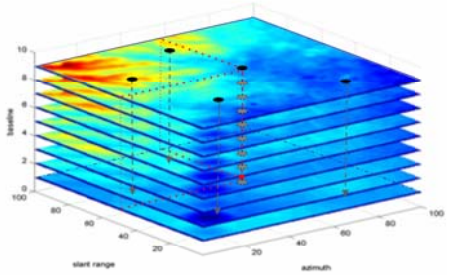
INTERFEROMETRIA SATELLITARE

METODOLOGIA PSINSAR™

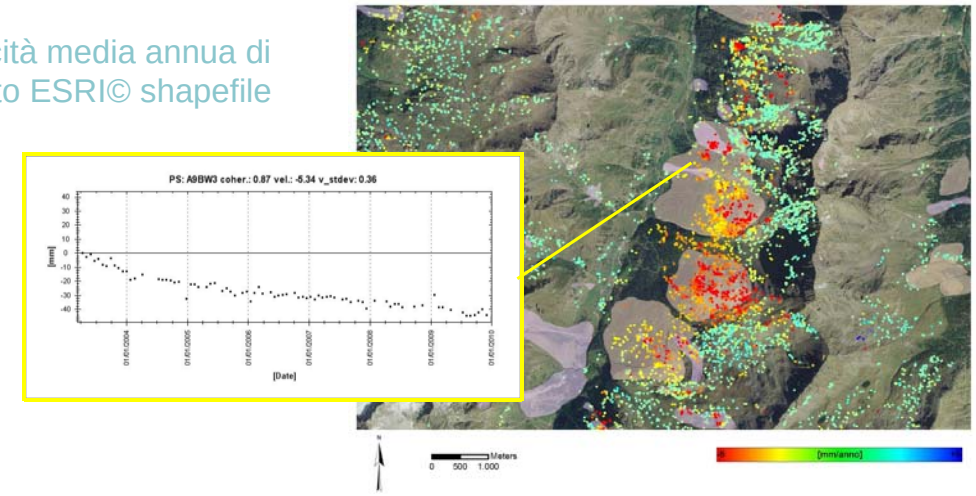






Valori puntuali di velocità media annua di spostamento in formato ESRI© shapefile

Serie storiche di spostamento



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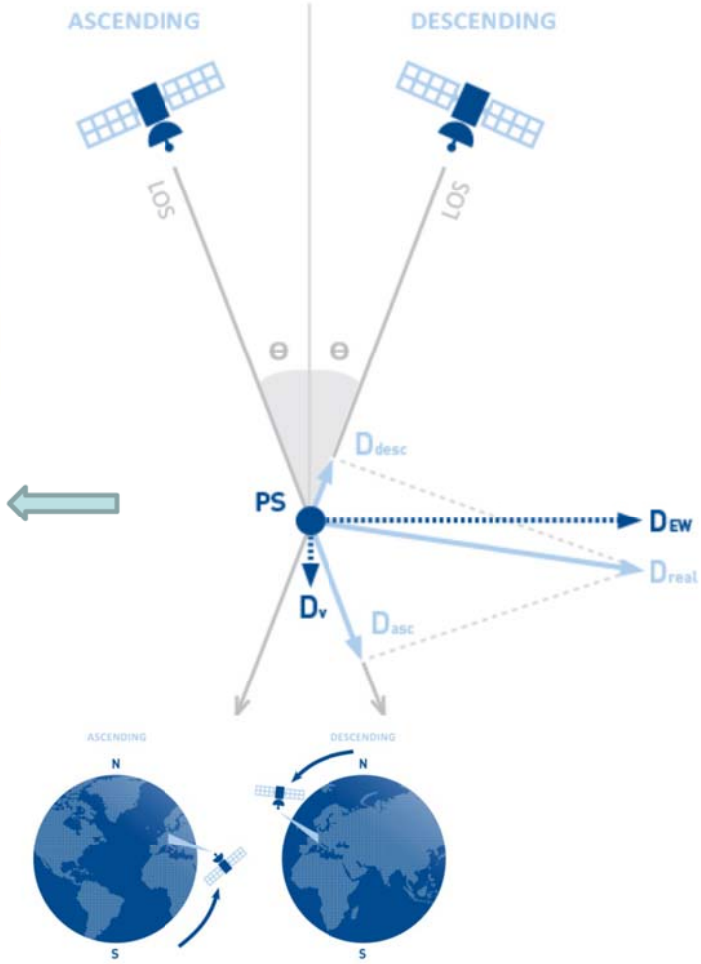
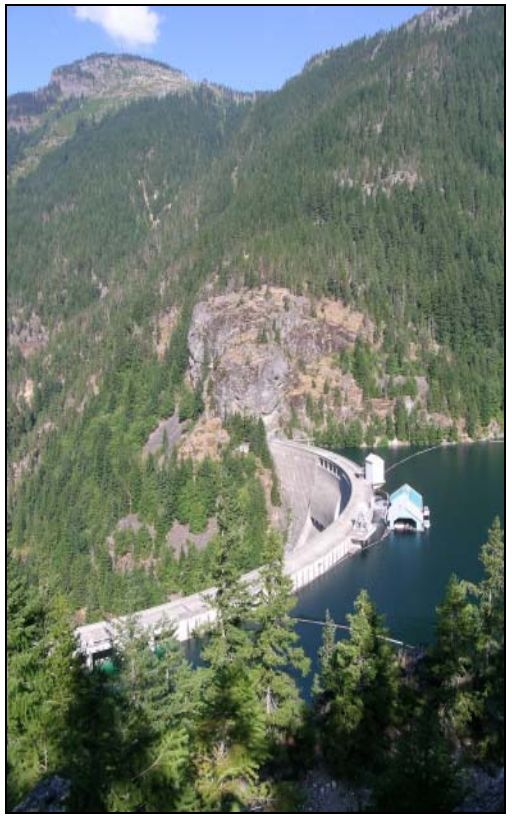
INTERFEROMETRIA SATELLITARE

METODOLOGIA

PERMANENT SCATTERERS

Bersagli radar "costanti" nel tempo:
edifici, monumenti, viadotti, condotte, rocce esposte...





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Regione Autonoma Valle d'Aosta

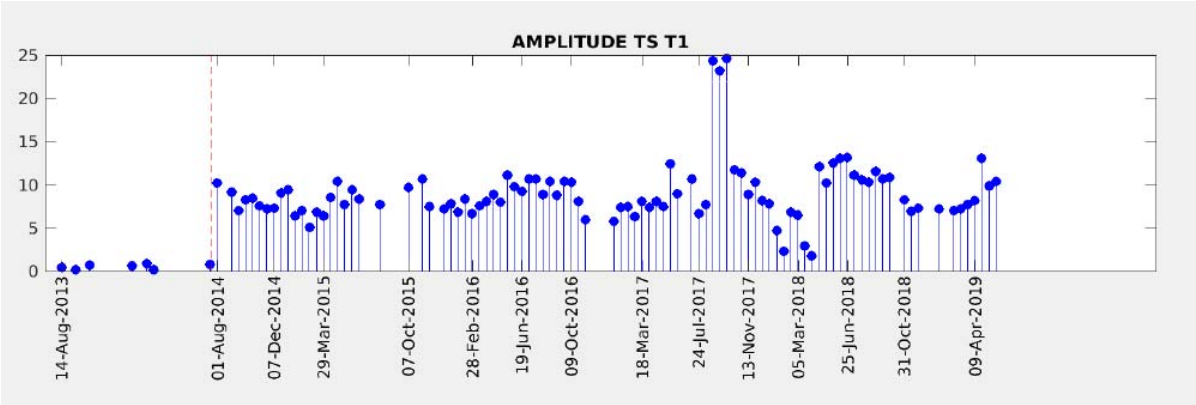
INTERFEROMETRIA SATELLITARE

RIFLETTORE ARTIFICIALE

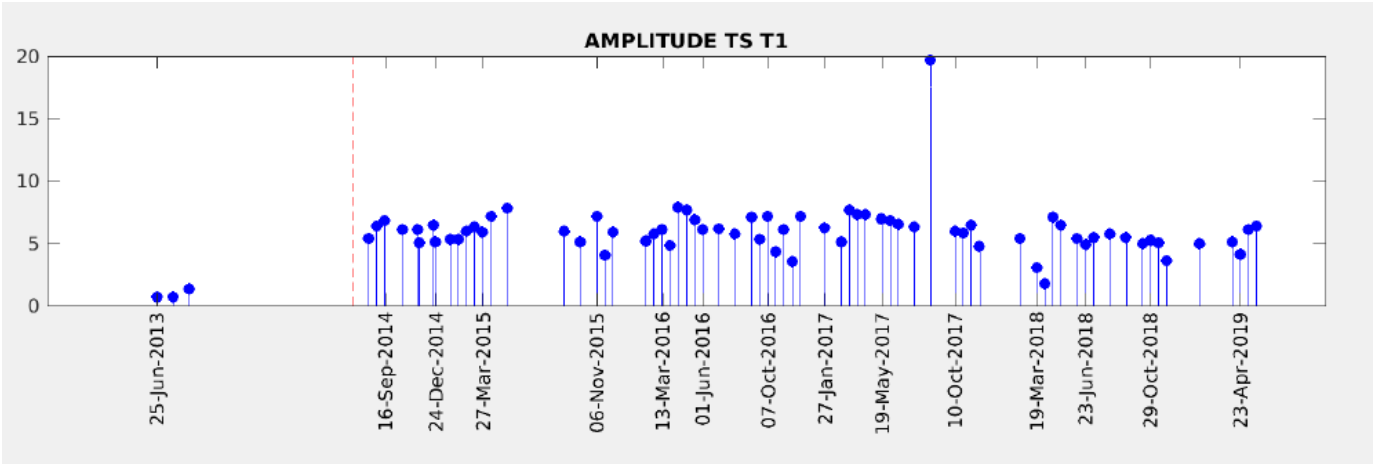
INTERFEROMETRIA SATELLITARE

TEST DI VISIBILITA'

GEOMETRIA ASCENDENTE



GEOMETRIA DISCENDENTE

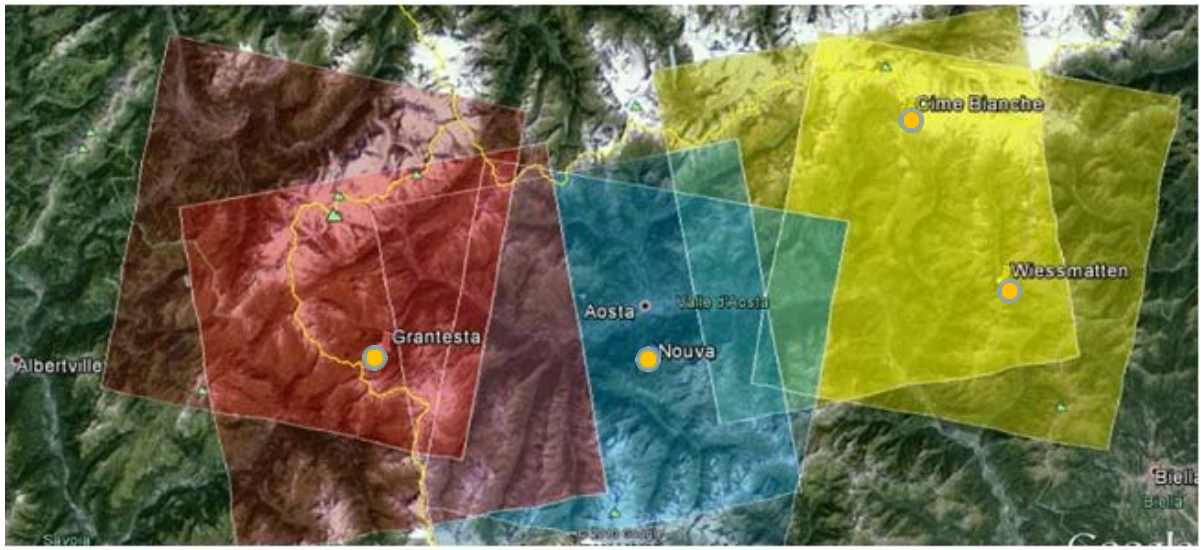


INTERFEROMETRIA SATELLITARE

IMMAGINI E SBARRAMENTI

Nouva - Pila Gressan

La Grantesta- La Thuile



AOI	CONSTELLATION	GEOMETRIA	SAT	MODE	TRACK
Nouva	COSMO-SkyMed	ascending	sar1	H4-01	2
		descending	sar1	H4-03	128
Weissmatten Cime Bianche	COSMO-SkyMed	ascending	sar2	H4-03	2
		descending	sar2	H4-01	128
Grantesta(*)	COSMO-SkyMed	ascending	sar2	H4-05	165
		descending	sar3	H4-04	128

Cime Bianche - Cervinia

Weissmatten - Gressoney

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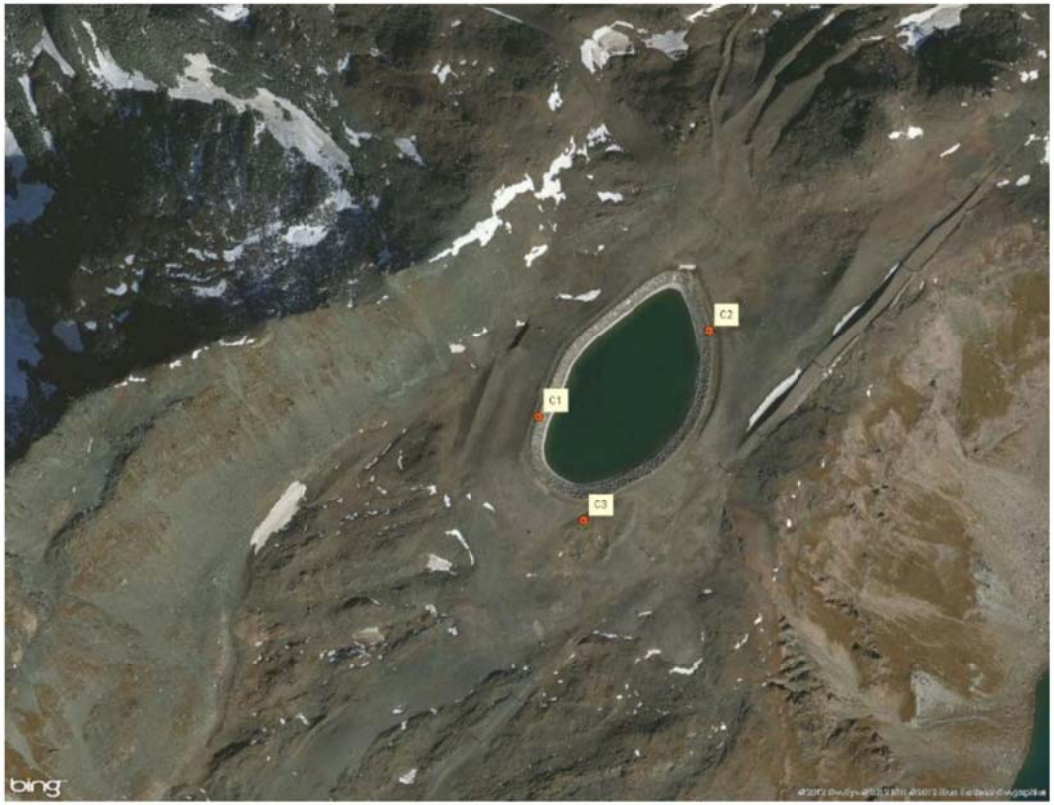
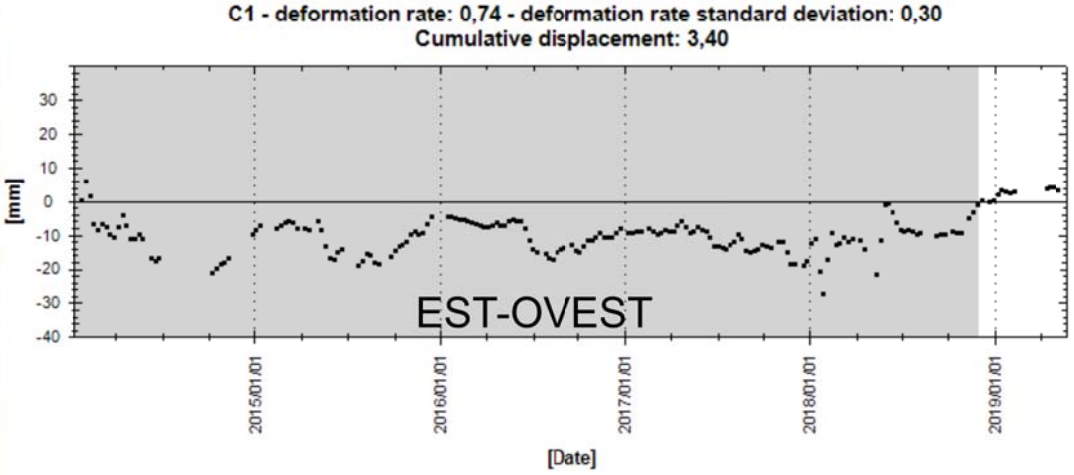
Regione Autonoma Valle d'Aosta

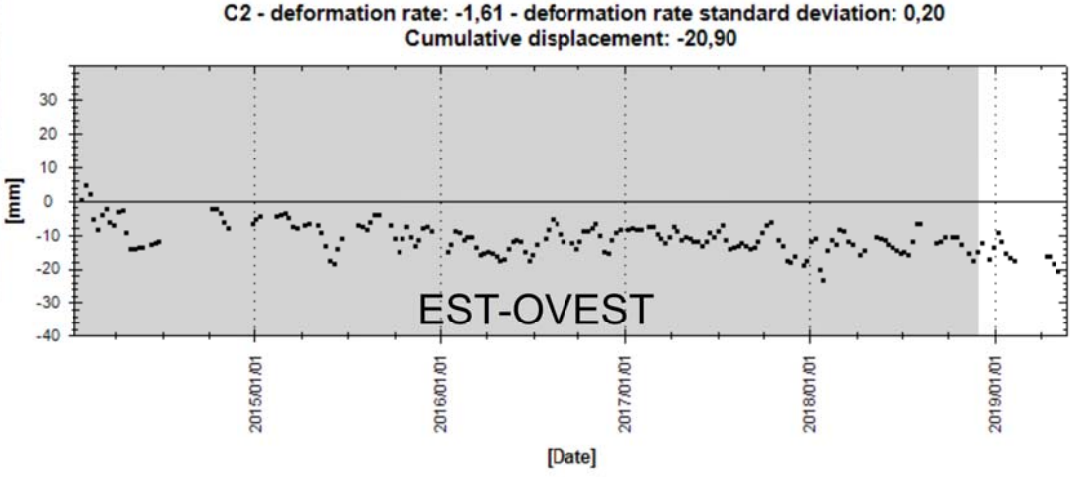
INTERFEROMETRIA SATELLITARE

CIME BIANCHE - VALTOURNENCHE



AR	LAT	LON	QUOTA (elliss)
C1	45,91655572	7,68542569	3042,252
C2	45,91722087	7,68724555	3042,62
C3	45,91577821	7,68592775	3043,897

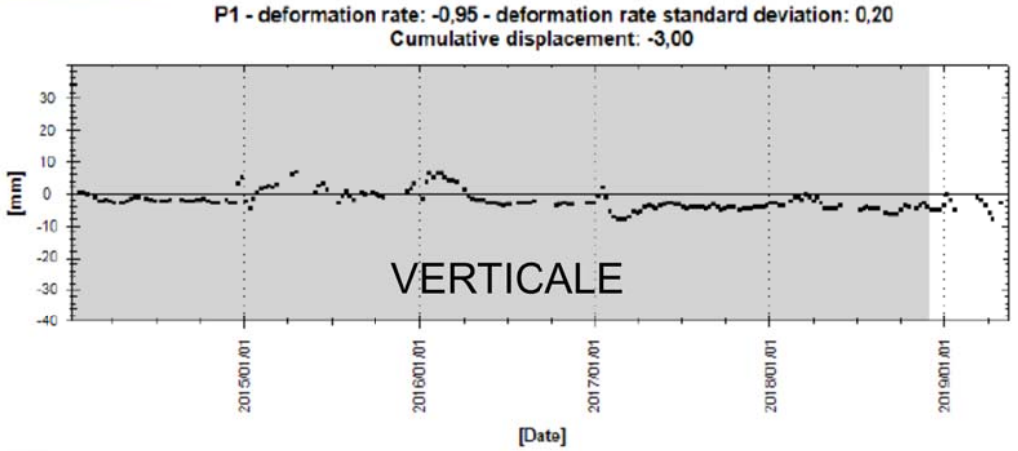


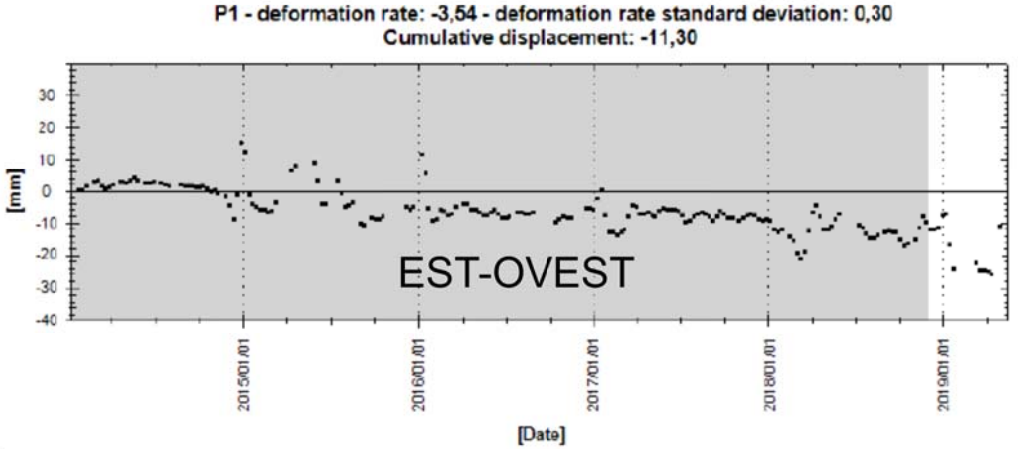


INTERFEROMETRIA SATELLITARE

NOUVA-PILA

AR	LAT	LON	QUOTA (elliss
P1	45,66830248	7,31530796	2230,07
P2	45,66781518	7,31501022	2229,949
P3	45,66881129	7,31446053	2214,498

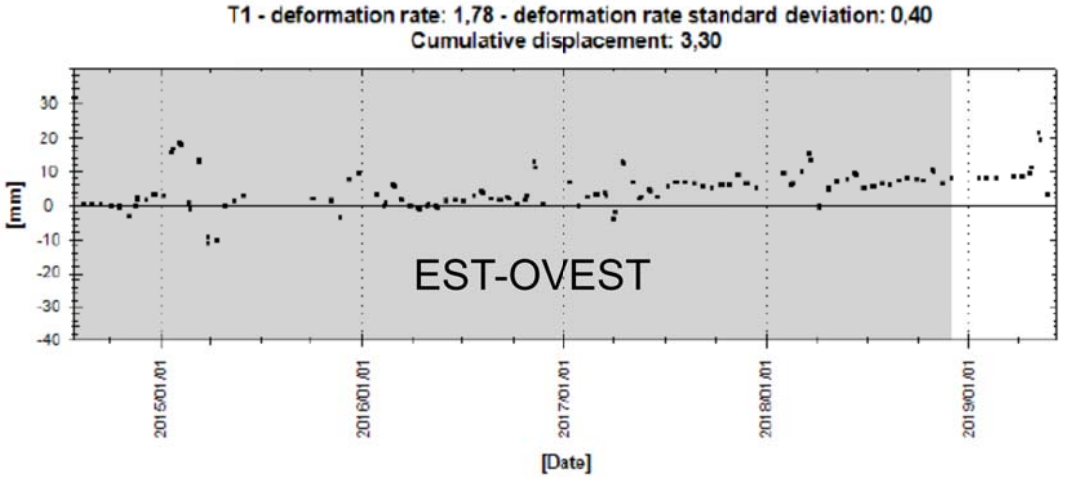


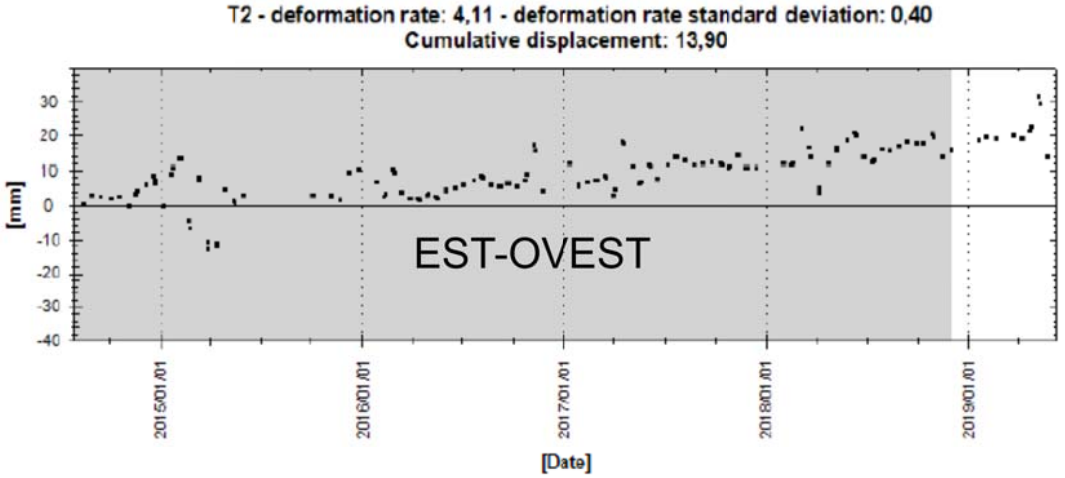


INTERFEROMETRIA SATELLITARE

GRANTESTA – LA THUILE

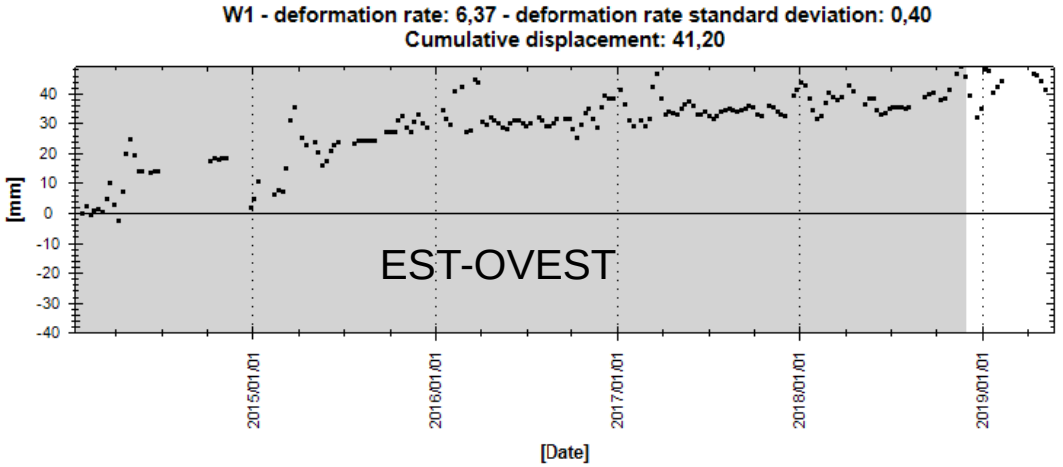
AR	LAT	LON	QUOTA (elliss)
T1	45,682128	6,931426	2281,64
T2	45,682535	6,931539	2281,41
T3	45,681288	6,932840	2263,87

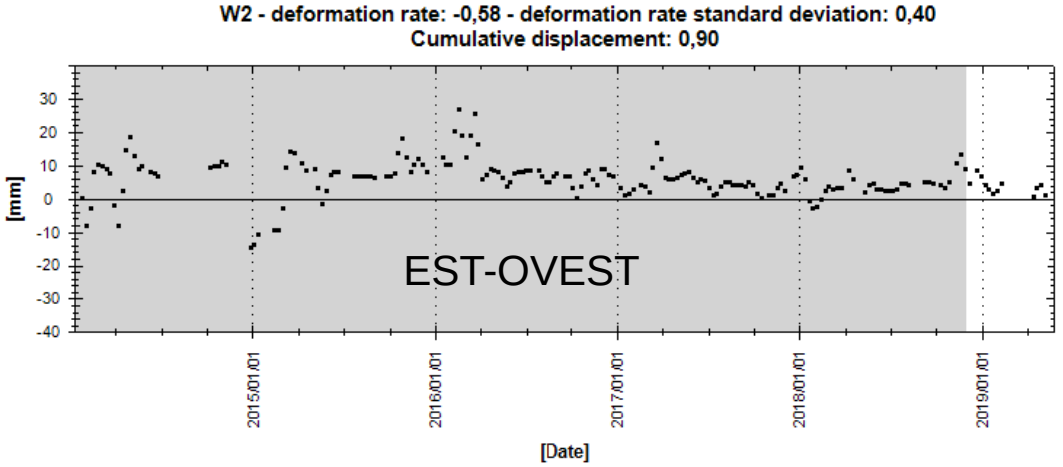




INTERFEROMETRIA SATELLITARE

WEISSMATTEN – GRESSONEY ST. JEAN





INTERFEROMETRIA SATELLITARE

TECNICA PSINSAR™ CONCLUSIONI

PREGI:

- **NON RICHIEDE ACCESSIBILITA'**
- **MISURE CONTINUA (8 giorni)**
- **SCOMPOSIZIONE DELLO SPOSTAMENTO (H e V)**
- **BUONA PRECISIONE PER SPOSTAMENTI PICCOLI**
- **IMMAGINI GRATUITE PER ENTI PUBBLICI**
- **IMMAGINI DISPONIBILI ANCHE IN PERIODI NON DI INDAGINE**

DIFETTI:

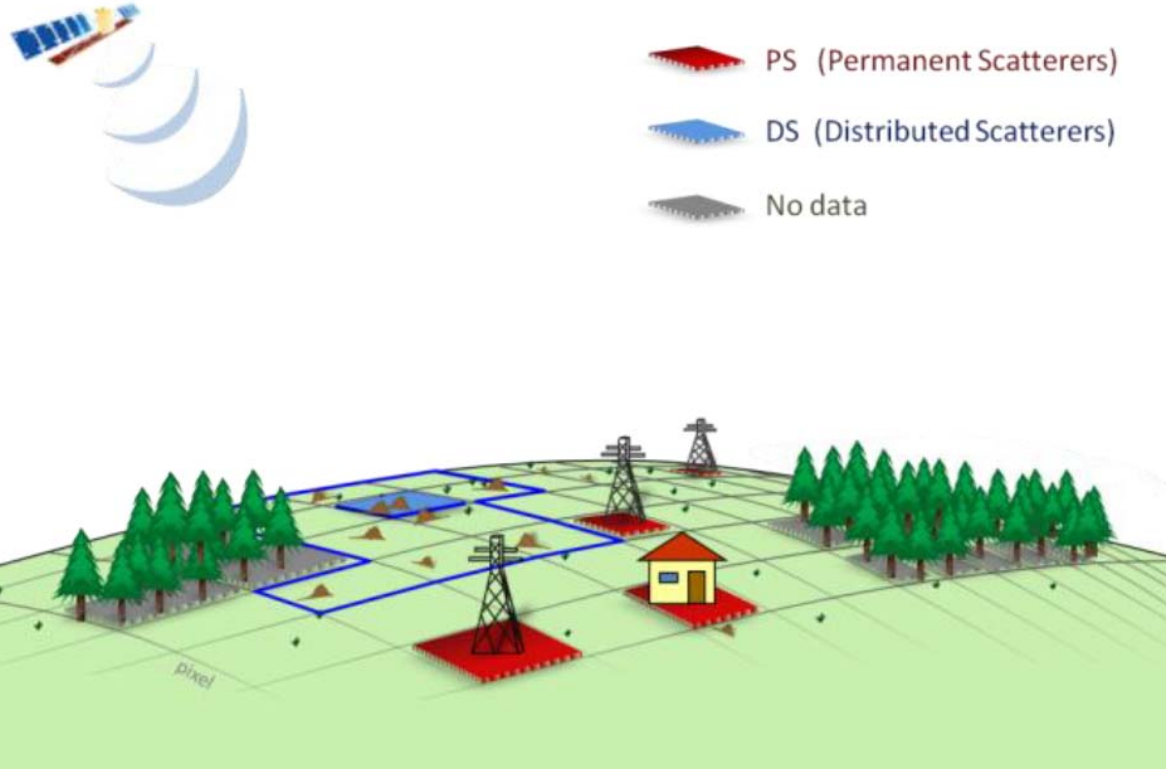
- **LE MISURE NON SONO IN TEMPO REALE (necessitano elaborazione)**
- **COSTO ELABORAZIONE**
- **COMPONENTE ORIZZ. RUMOROSA (elevata inclinazione della LOS rispetto verticale-26°)**
- **CALI DI RIFLETTIVITA' CON NEVE E GHIACCIO**
- **NECESSITA' DI AVERE UN PS VISIBILE**

Région Autonome Vallée d'Aoste
Regione Autonoma Valle d'Aosta

INTERFEROMETRIA SATELLITARE

TECNICA SQUEESAR™

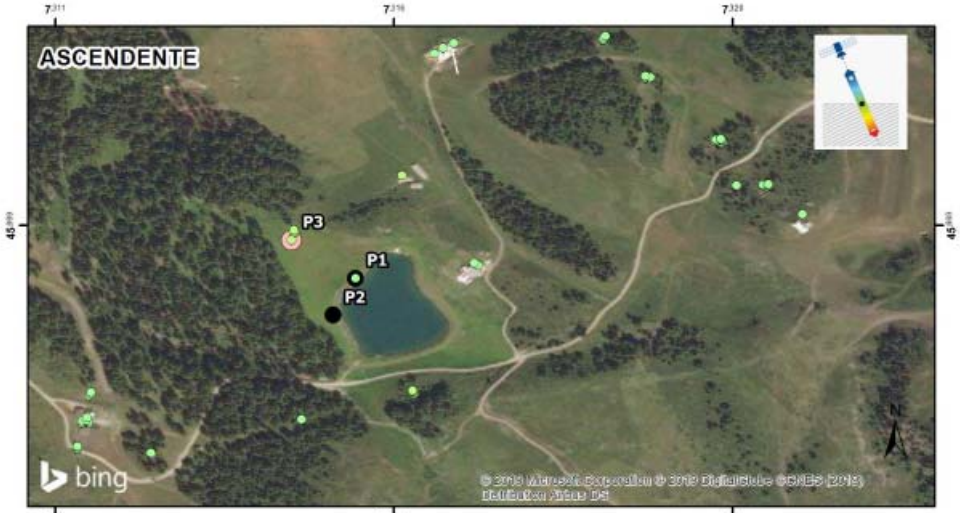
Distributed Scatterers (DS): bersagli distribuiti, che caratterizzano tutto un gruppo di pixel e che generano caratteristiche pressoché identiche del segnale radar riflesso.

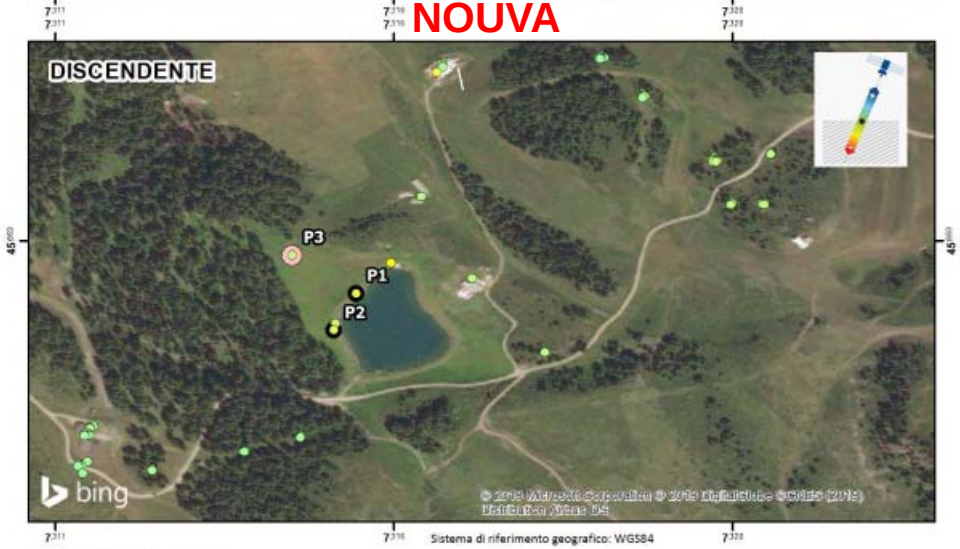


CSK 2014- Mag 2019
Velocità media lungo LOS [mm/anno]
≤-10 0 ≥+10

INTERFEROMETRIA SATELLITARE

GRANTESTA

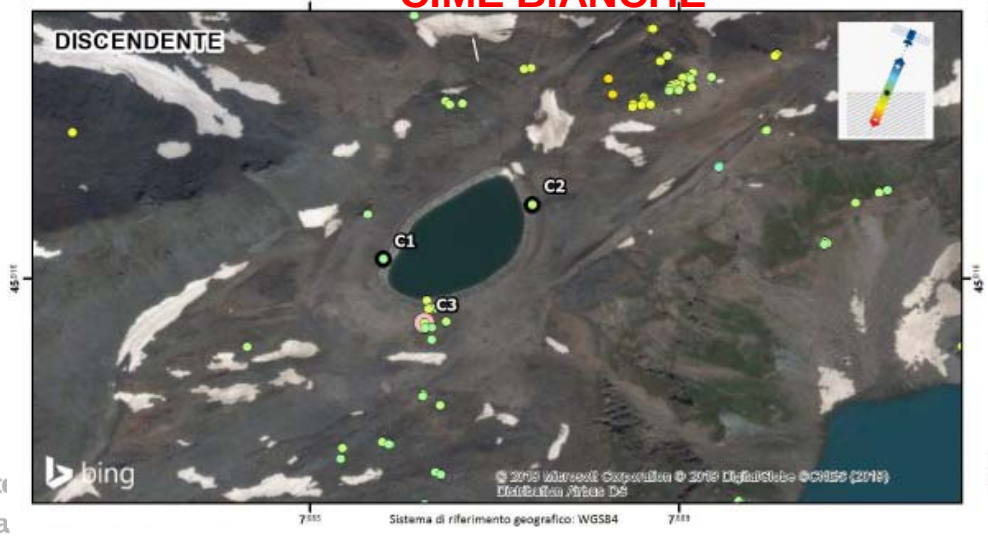




NOUVA

CSK 2014- Mag 2019
Velocità media lungo LOS [mm/anno]
≤-10 0 ≥+10

INTERFEROMETRIA SATELLITARE



CIME BIANCHE

WEISSMATTEN

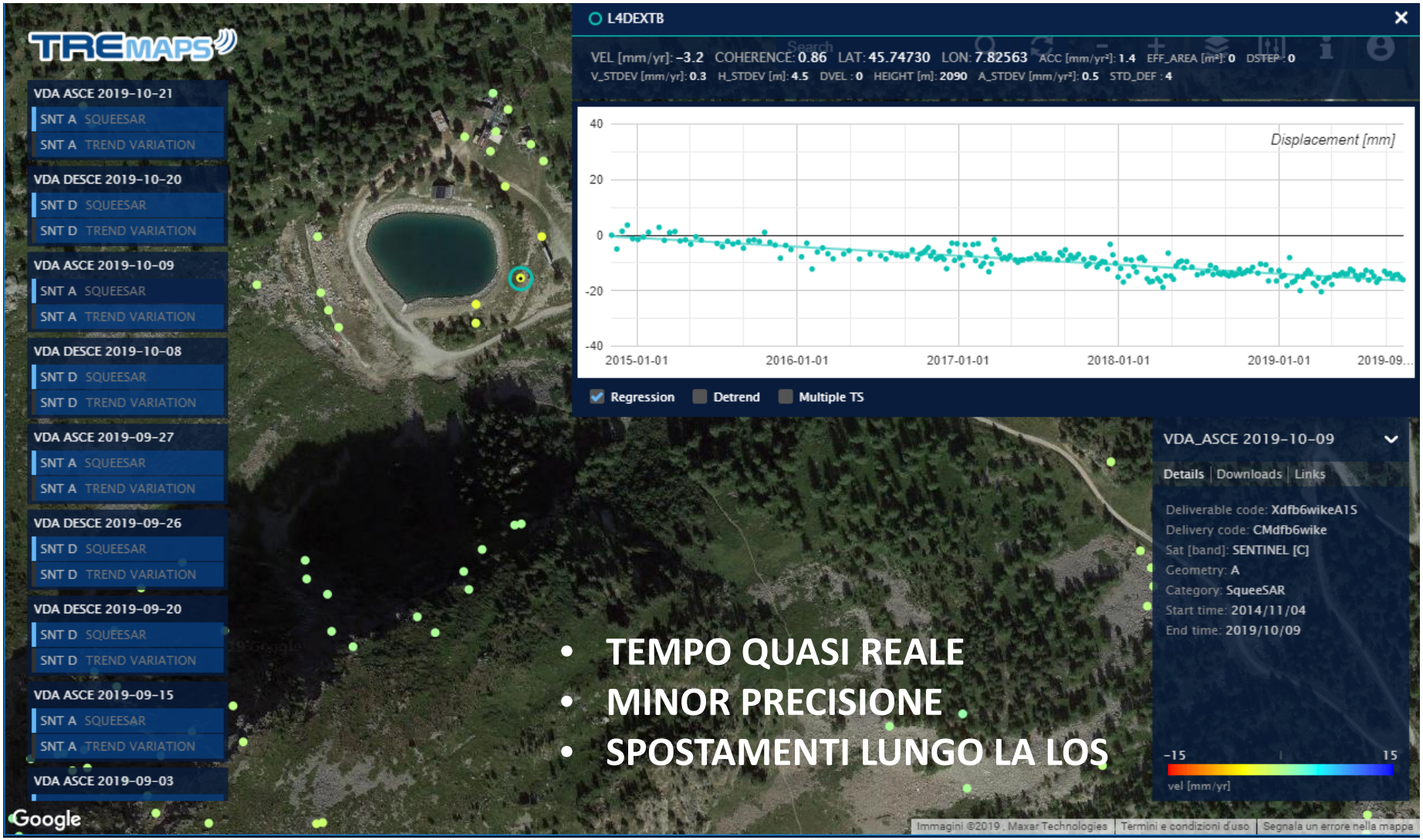
Sistema di riferimento geografico: WGS84

Région Autonome Vallée d'Aoste
Regione Autonoma Valle d'Aosta

Interreg ALCOTRA
RESBA Résilience des barrages Resilienza sugli sbarramenti

INTERFEROMETRIA SATELLITARE

SENTINEL



- TEMPO QUASI REALE
- MINOR PRECISIONE
- SPOSTAMENTI LUNGO LA LOS

Région Autonome Vallée d'Aoste
Regione Autonoma Valle d'Aosta

Interreg ALCOTRA

RESBA
Résilience des barrages
Resilienza sugli sbarramenti

Région Autonome
Vallée d'Aoste
Regione Autonoma
Valle d'Aosta