Consiglio Nazionale delle Ricerche
Istituto di Scienze Marine
www.ismar.cnr.it

Marine geohazards and hydrocarbon exploration & exploitation: from risk assessment to resource potential

Marzia Rovere

Ministero dello Sviluppo Economico

DGS-UNMIG
DIREZIONE GENERALE PER LA SICUREZZA ANCHE AMBIENTALE DELLE ATTIVITÀ MINERARIE ED ENERGETICHE - UNMIG

CLYPEA®
INNOVATION NETWORK FOR FUTURE ENERGY

ISMAR Venezia Headquarters

Physical Oceanography, extreme events, marine biology, lagoons

Director Dr. Rosalia Santoleri

Operational units

Bologna & Napoli

Marine Geology – marine **geo-hazards** including active tectonic structures, submarine landslides, volcanoes and hydrothermal processes, plus interaction between sea-floor shaping processes and marine ecosystems. The role of longshore drift, cascading and contour currents, storms, turbidity currents and sediment failure, in shaping the architecture of continental margins.

The influence of climate change on oceanic circulation, acidification, bio-geochemical cycles and marine productivity. Natural and anthropogenic factors producing economic and social impacts on coastal systems from pre-history to the industrial epoch.

Trieste & Pozzuolo di Lerici (SP)

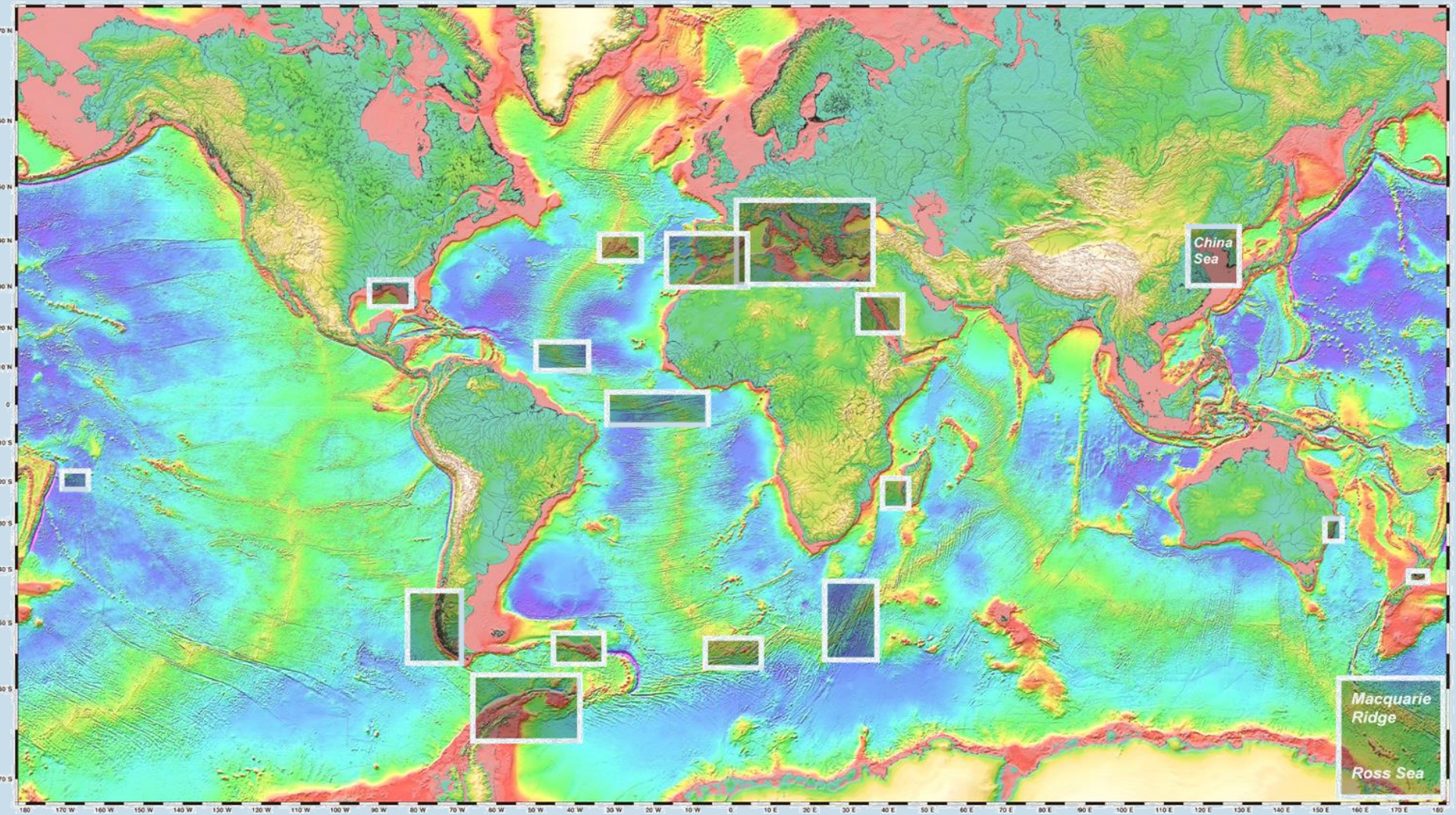
Physical Oceanography

Roma

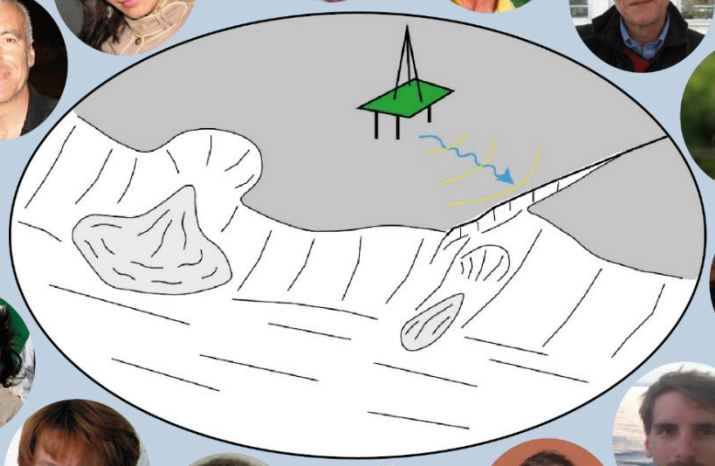
Operational Oceanography

WHERE WE WORK

ISMAR conducts research in polar and oceanic settings with main focus on Mediterranean regions

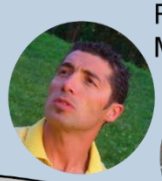


Gruppo di lavoro SPOT ISMAR + DIFA

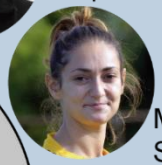


Alberto ARMIGLIATO
Responsabile convenzione ISMAR - DIFA (maremoti)

Filippo ZANIBONI
Modellazione dinamica del moto franoso



Stefano TINTI
Supervisione delle attività



Maria Ausilia PAPARO
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ITN SLATE PhD Student

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Stratigrafia sismica

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Banca dati GIS

Alessandra MERCORELLA
Elaborazione dati sonar

Marco LIGI
Elaborazione MCS

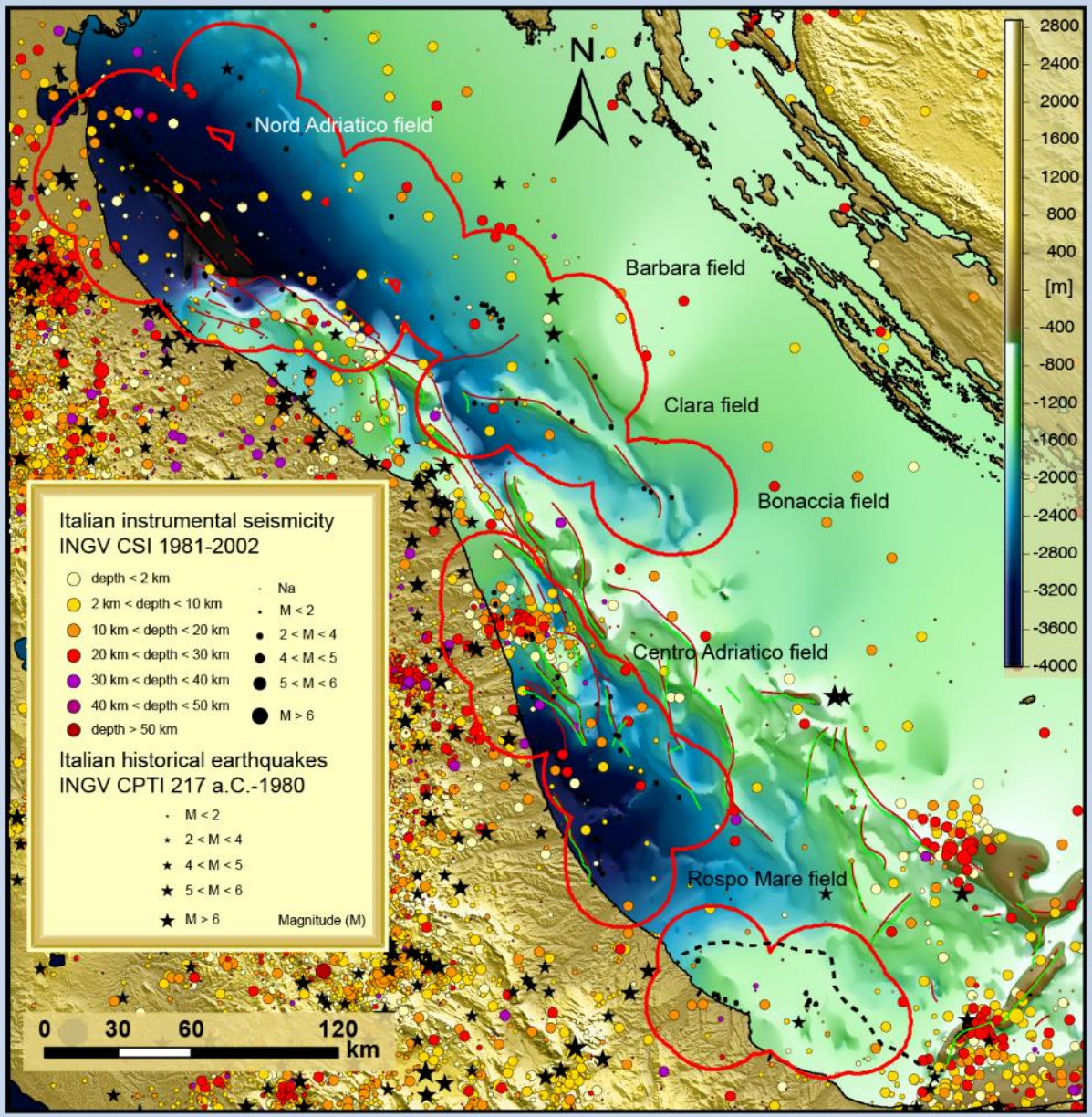
Andrea ARGNANI
Geologia strutturale

Marzia ROVERE
Responsabile dell'accordo

ACCORDO OPERATIVO tra Istituto di Scienze Marine (ISMAR CNR) e Ministero dello Sviluppo Economico DGS-UNMIG. DD del 25/01/2017 Prot. CDC 3280 del 26/01/2017 reg. 10/03/2017 al numero 187

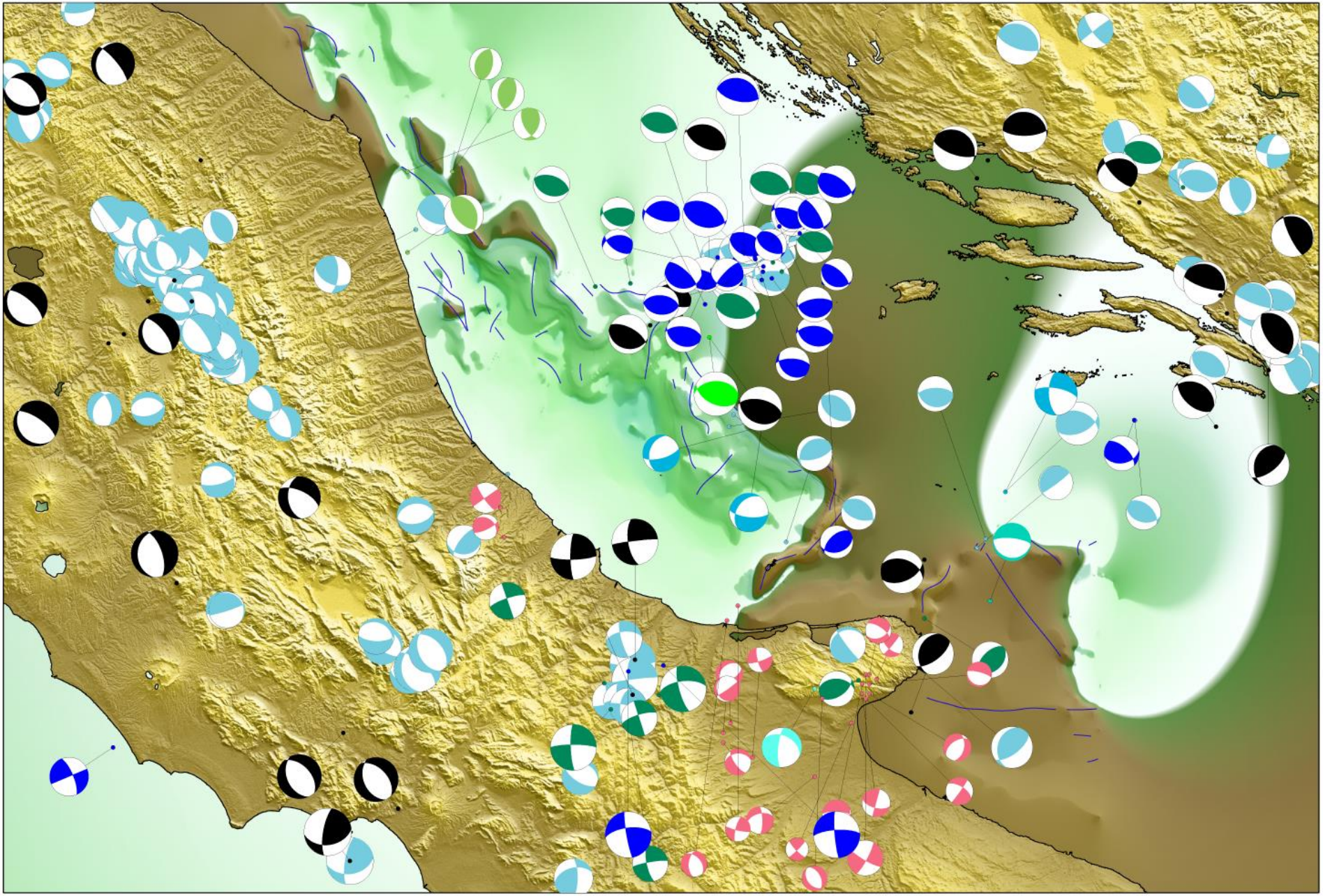
Consiglio Nazionale delle Ricerche
ISTITUTO DI SCIENZE MARINE
ISMAR

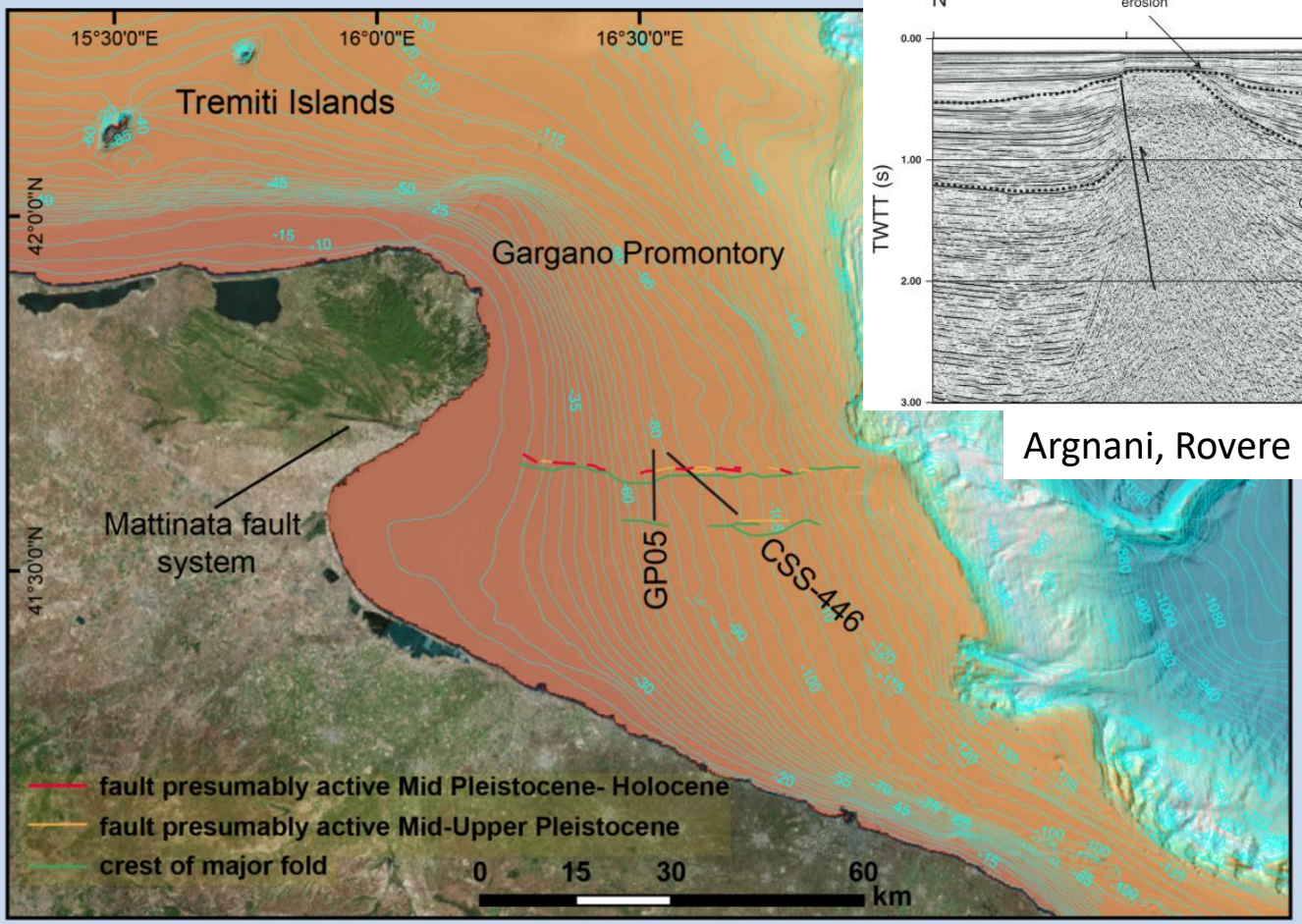
Tectonic structures and offshore oil&gas exploitation



Active structures base Quaternary
Active structures base Pliocene
Apulian Platform margin

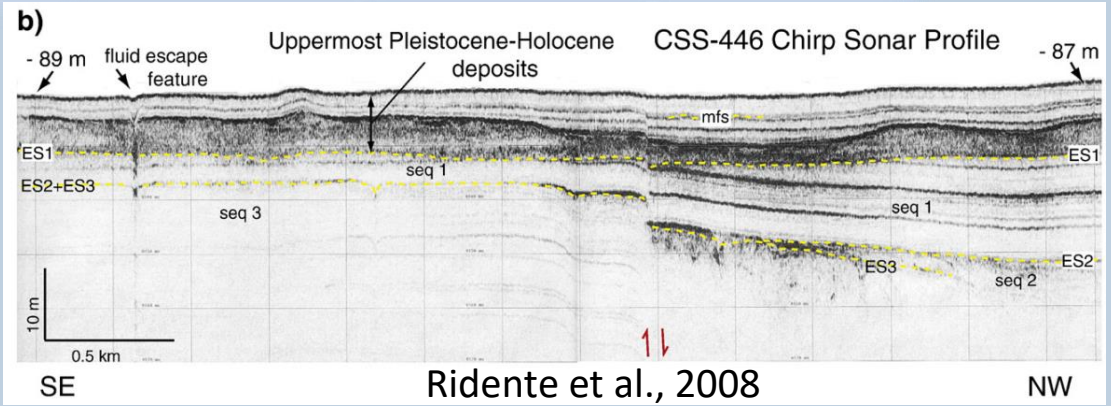
CARTOGRAFIA DEI MARI ITALIANI ALLA SCALA 1:250.000


[m]
−4000 −3600 −3200 −2800 −2400 −2000 −1600 −1200 −800 −400 0 400 800 1200 1600 2000 2400 2800
Strutture attive alla base del Quaternario
CATALOGHI PRINCIPALI
Harvard CMT 1976-2005
INGV MEDNET 2002-2006
INGV 2006 1977-2006
ETH 1999-2005
SOLUZIONI FOCALI DA AUTORI VARI
Riguzzi et al. (1989) 1987
Frepoli e Amato (2000) 1988-1995
Gasparini et al. (1989) 1967-1971
Console et al. (1989) 1986-1988
Herak et al. (2005) 2003
D'Ingeo et al. (1980) 1975



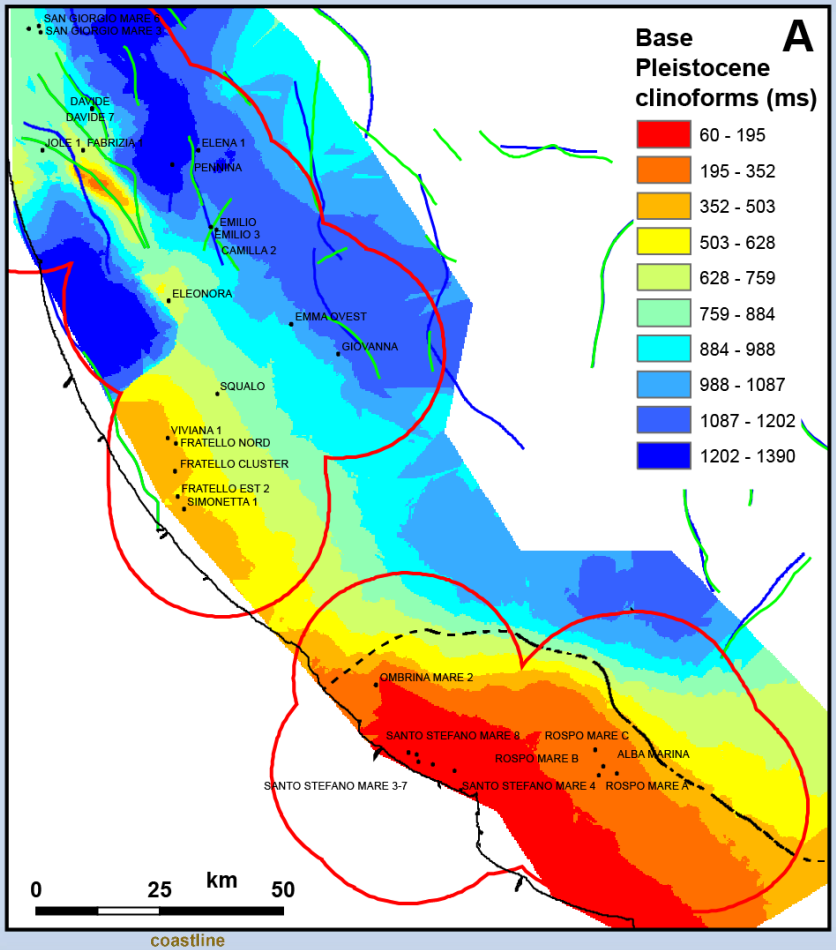
Argnani, Rovere et al., 2009

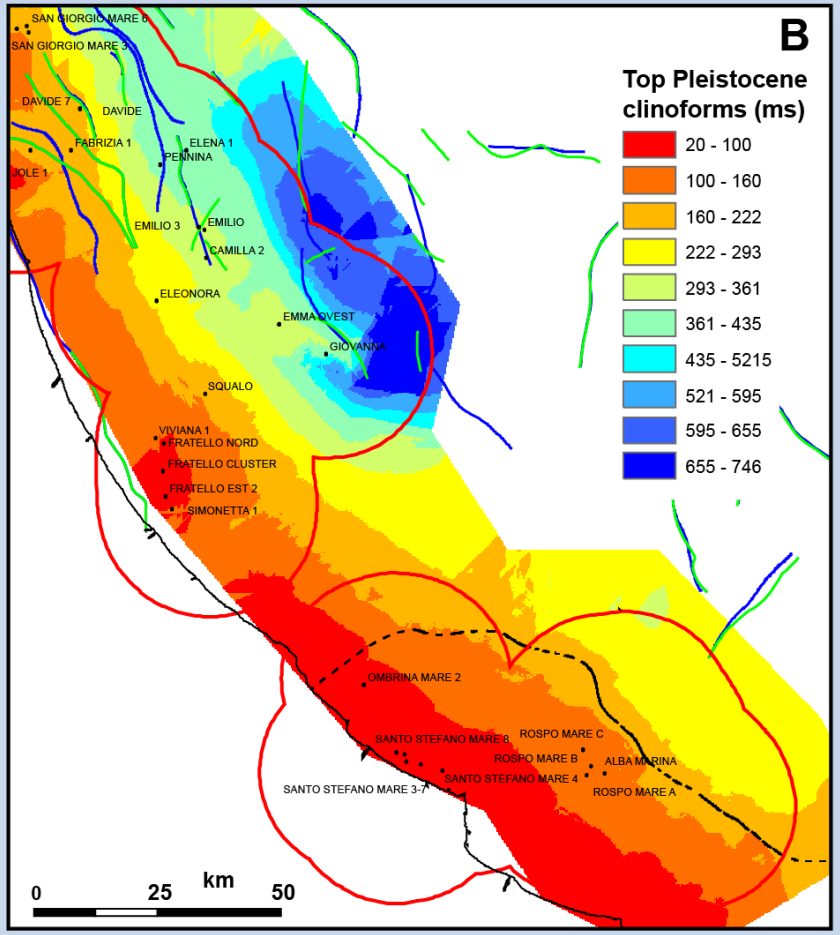
Potentially active faults onshore-offshore: Gondola-Mattinata fault Different scales of observation

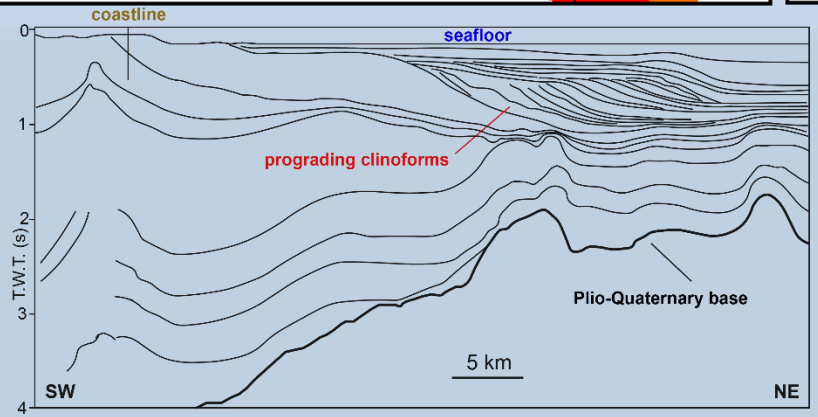


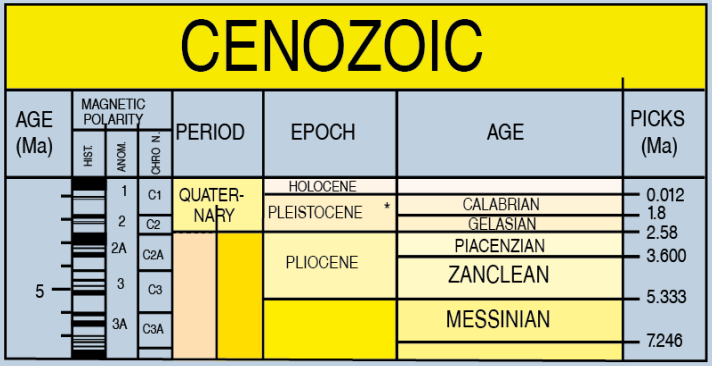
Ridente et al., 2008

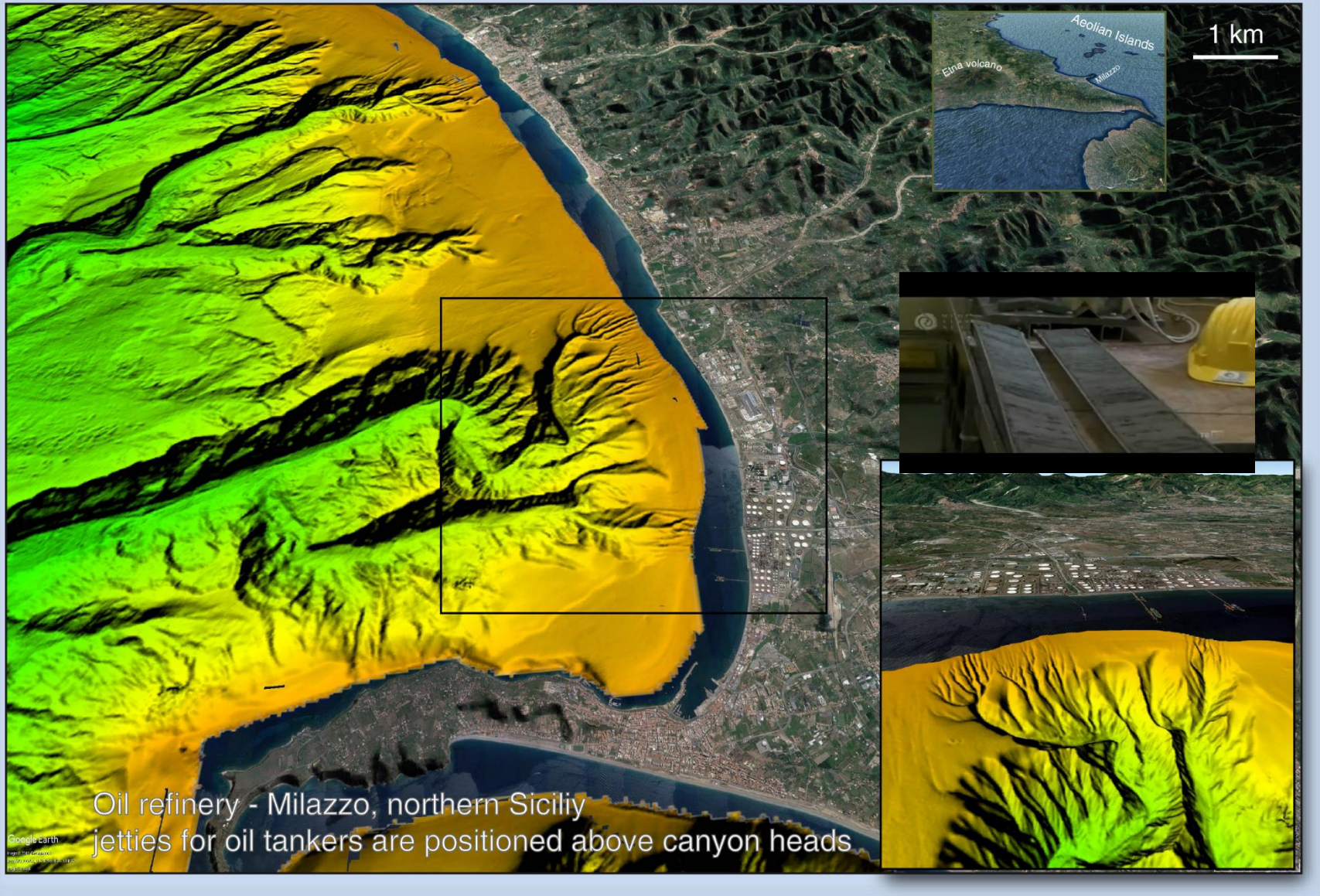
Using depositional units to assess the activity of tectonic structures





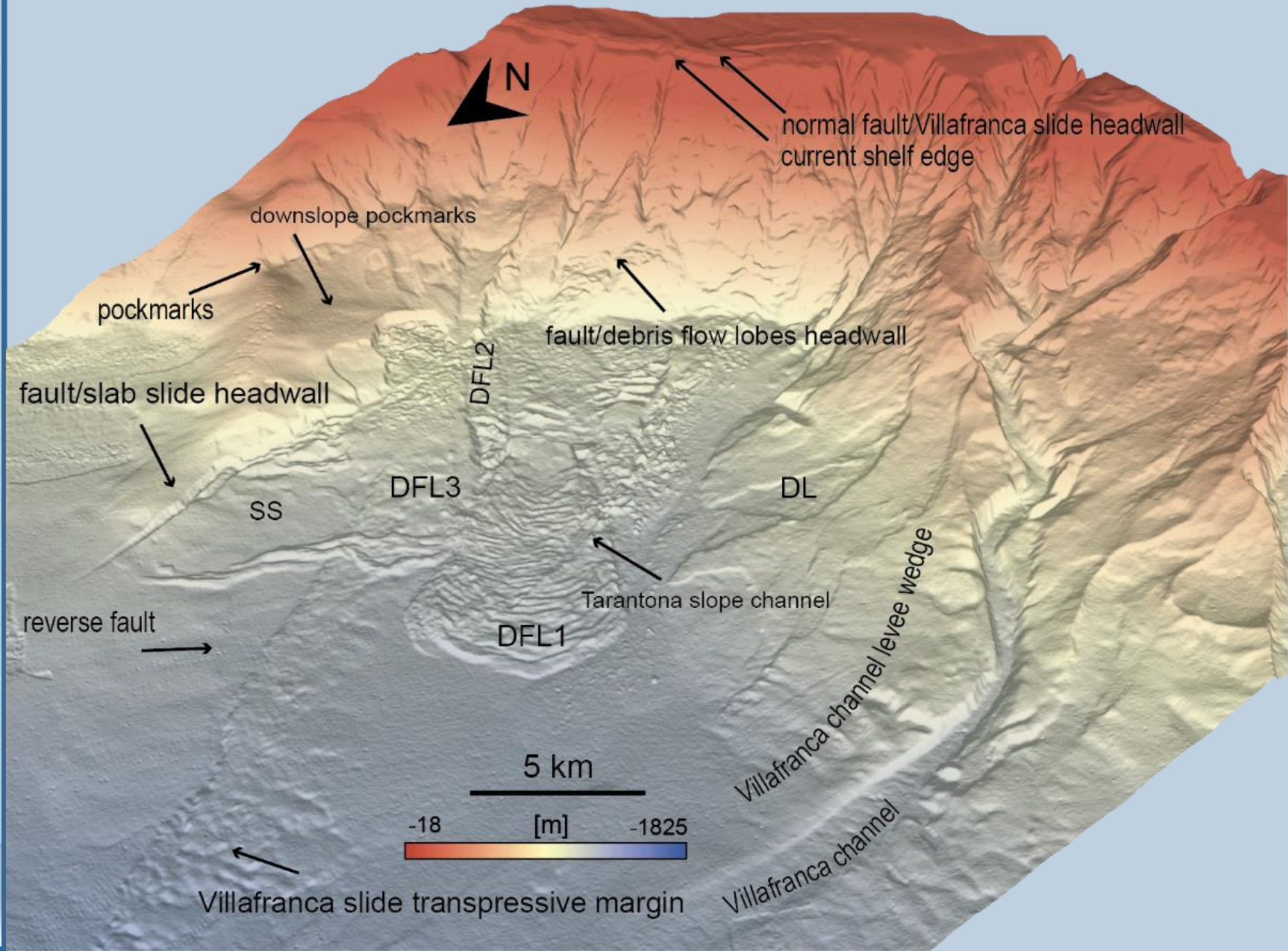


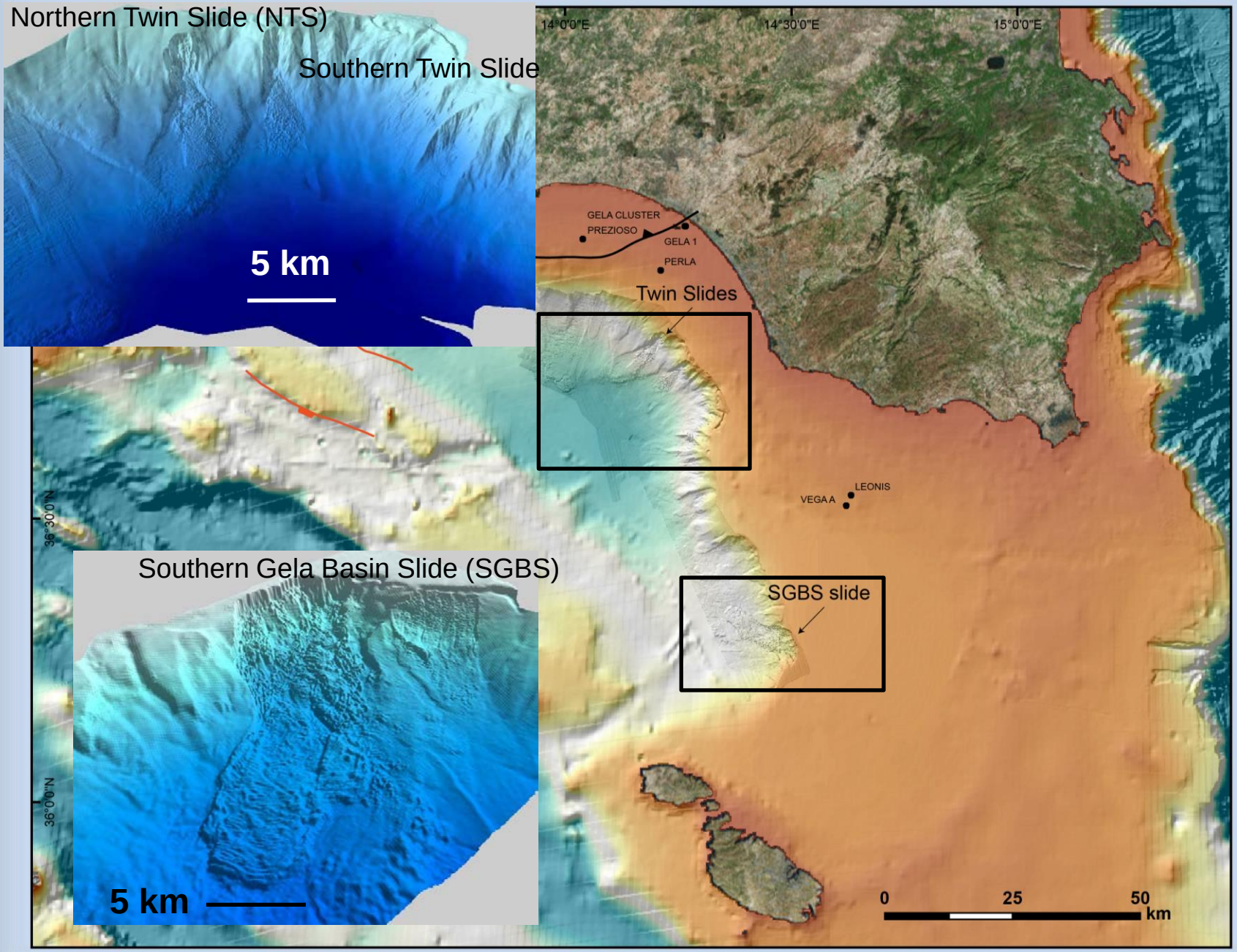




NE Sicily, Milazzo. An oil refinery was built close to the sea and the piers used by oil tankers are built above canyon heads. This area is subject to catastrophic flooding events, when heavy rains swell ephemeral rivers which carry huge volumes of water, sediment and human waste from land down to deep waters through the very well developed system of slope channels and canyons.

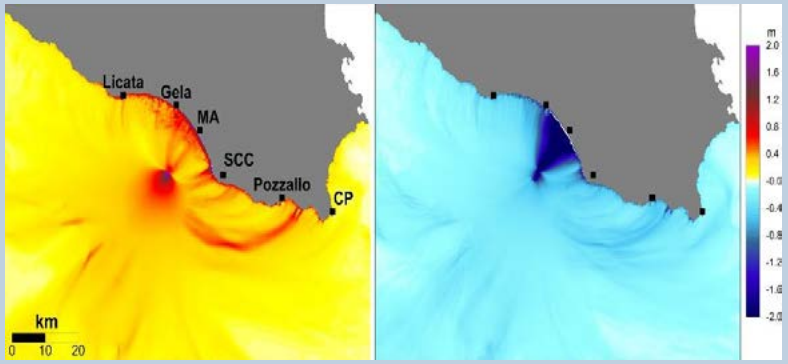
Submarine landslides in slope areas nearby production installations



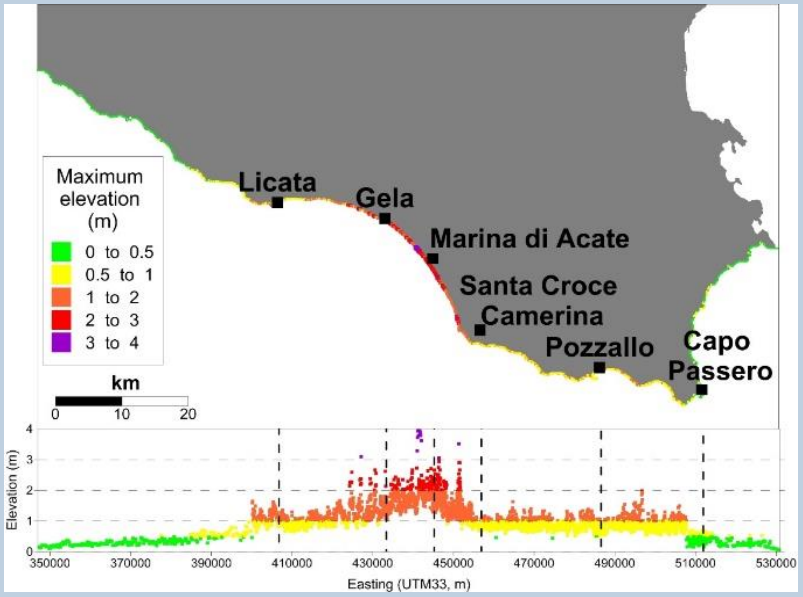


NTS

Maximum wave elevation on the nodes of the grid

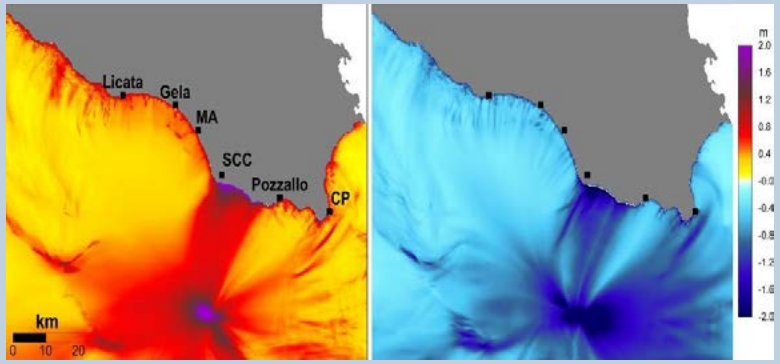


Maximum wave height at coast

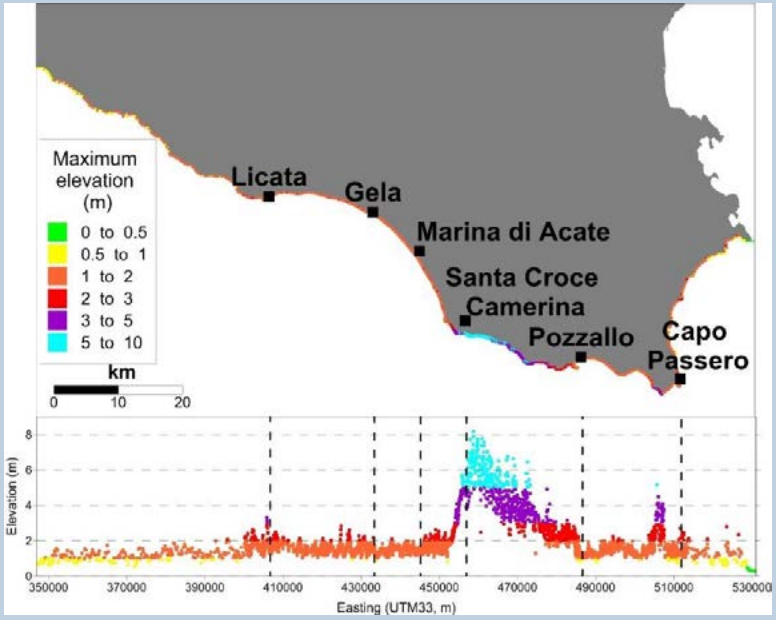


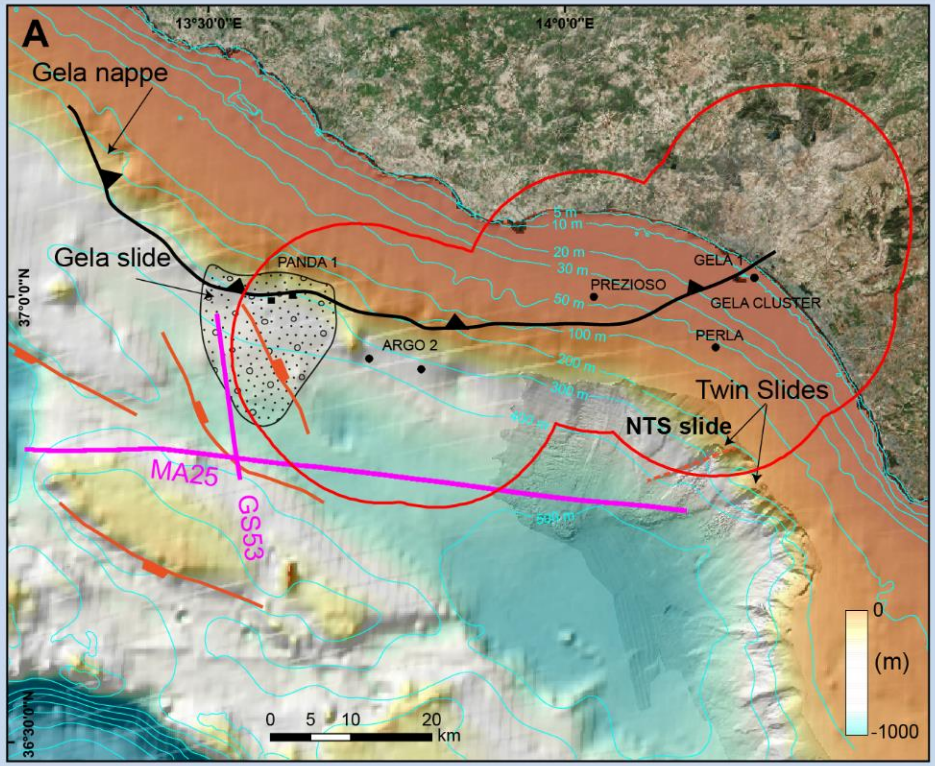
SGBS

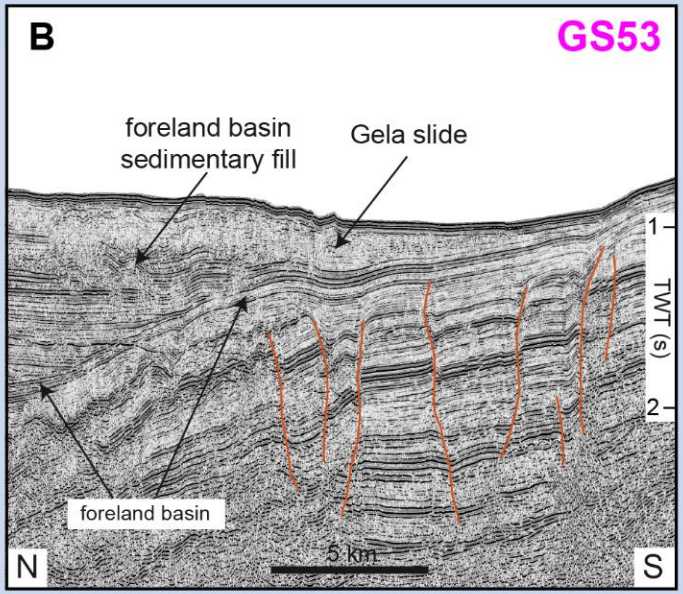
Maximum wave elevation on the nodes of the grid

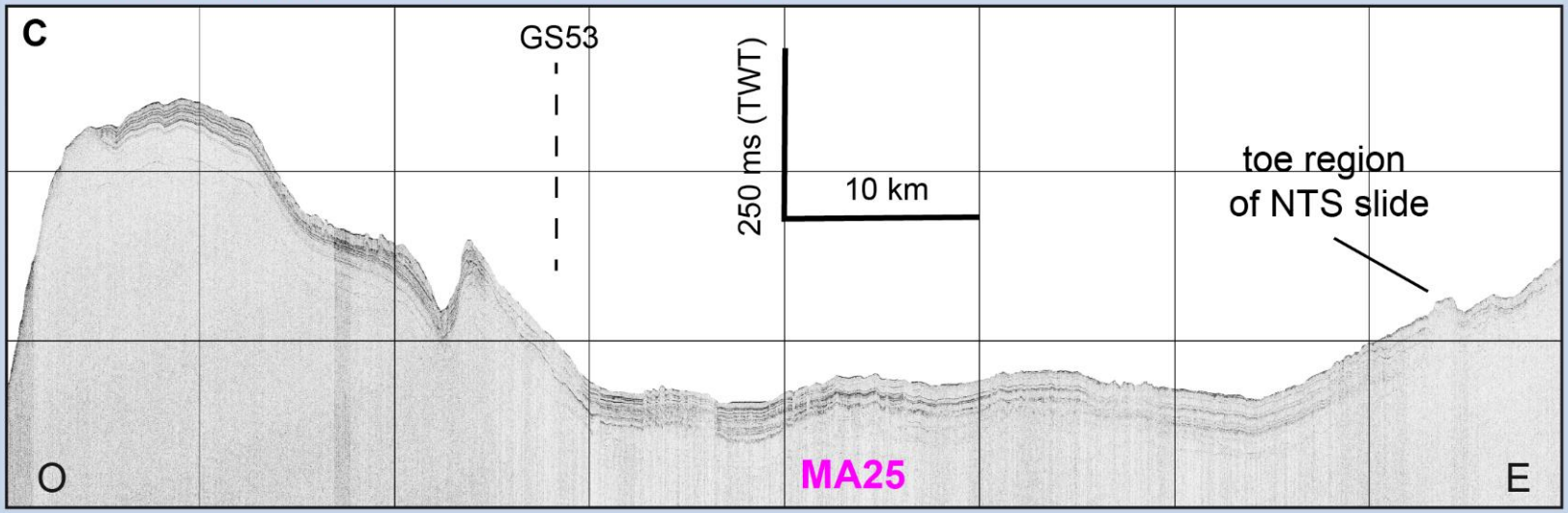


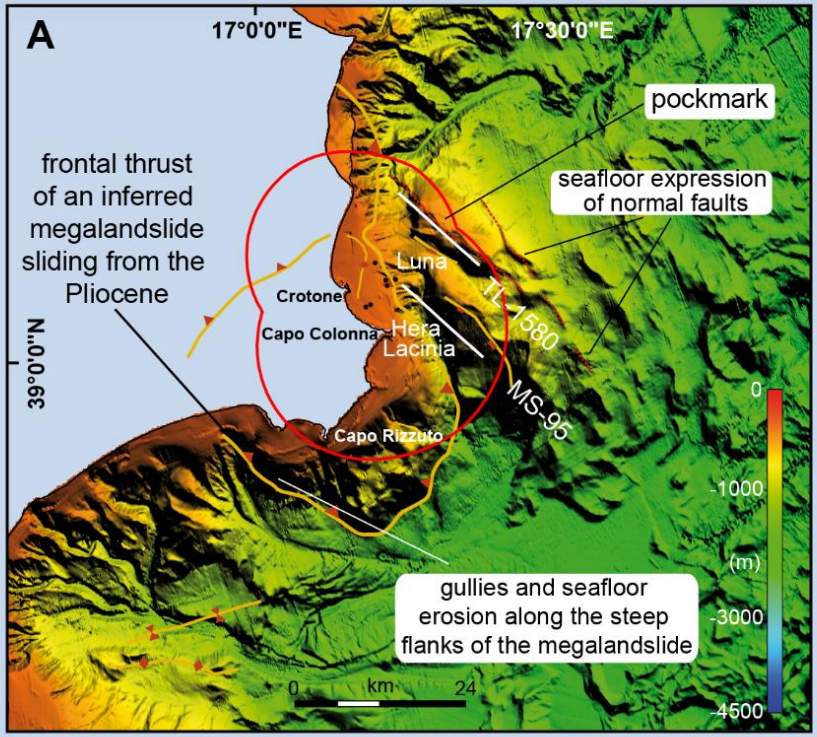
Maximum wave height at coast

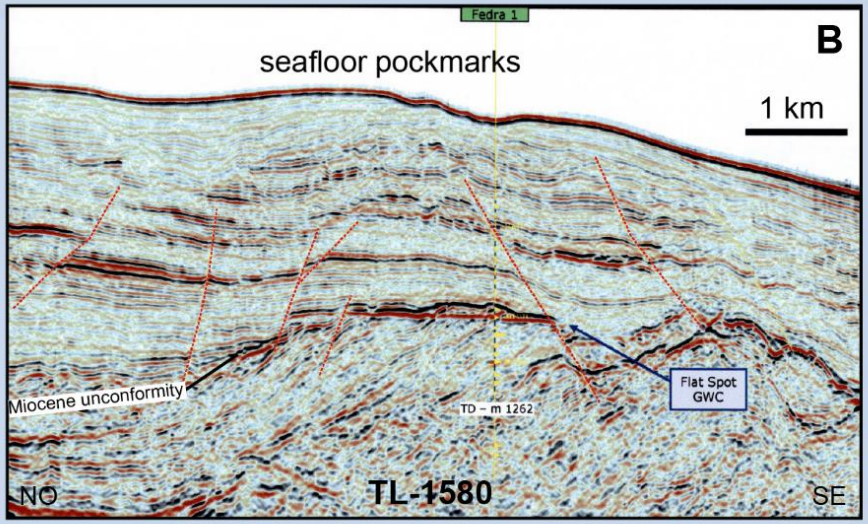


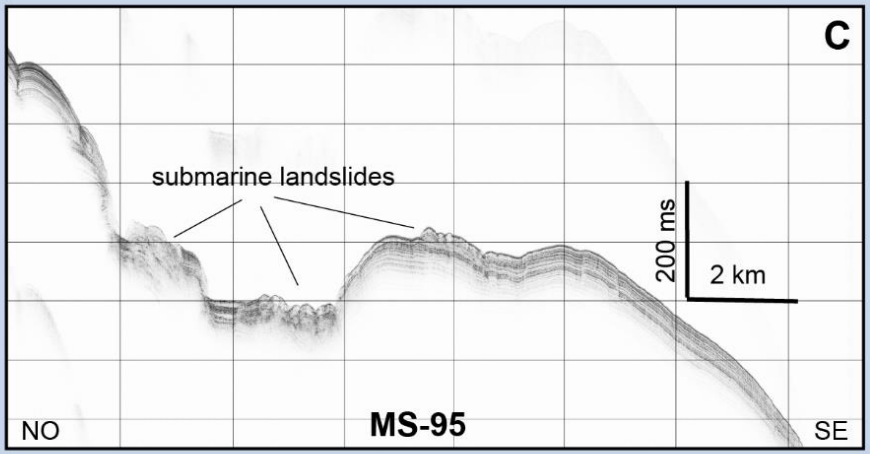


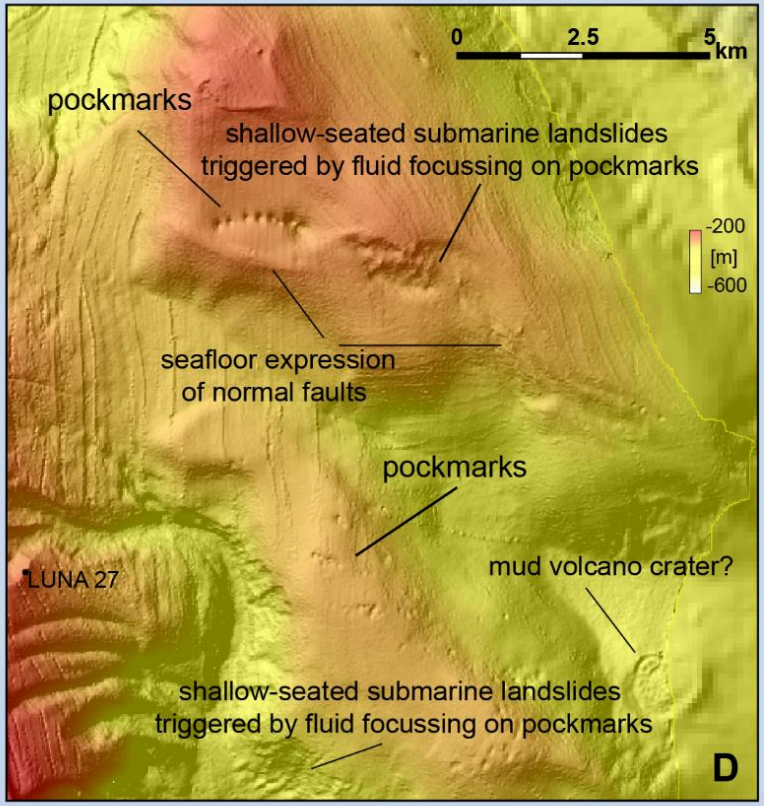












Hydrocarbon and gas plumes in the water colum: from risk assessment to resource potential

Sampling station	CO_2 (%)	N_2 (%)	O_2 (%)	Ar (%)	CH_4 (%)	$\delta^{13}C_{CO_2}$ (‰)
MB14 BC05	98.73	1.08	0.11	0.026	0.056	-1.1
MB14 BC09	98.61	1.26	0.053	0.031	0.051	-1.8