

TCS NEAR-FAULT OBSERVATORIES

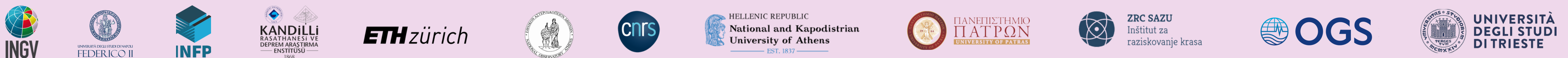
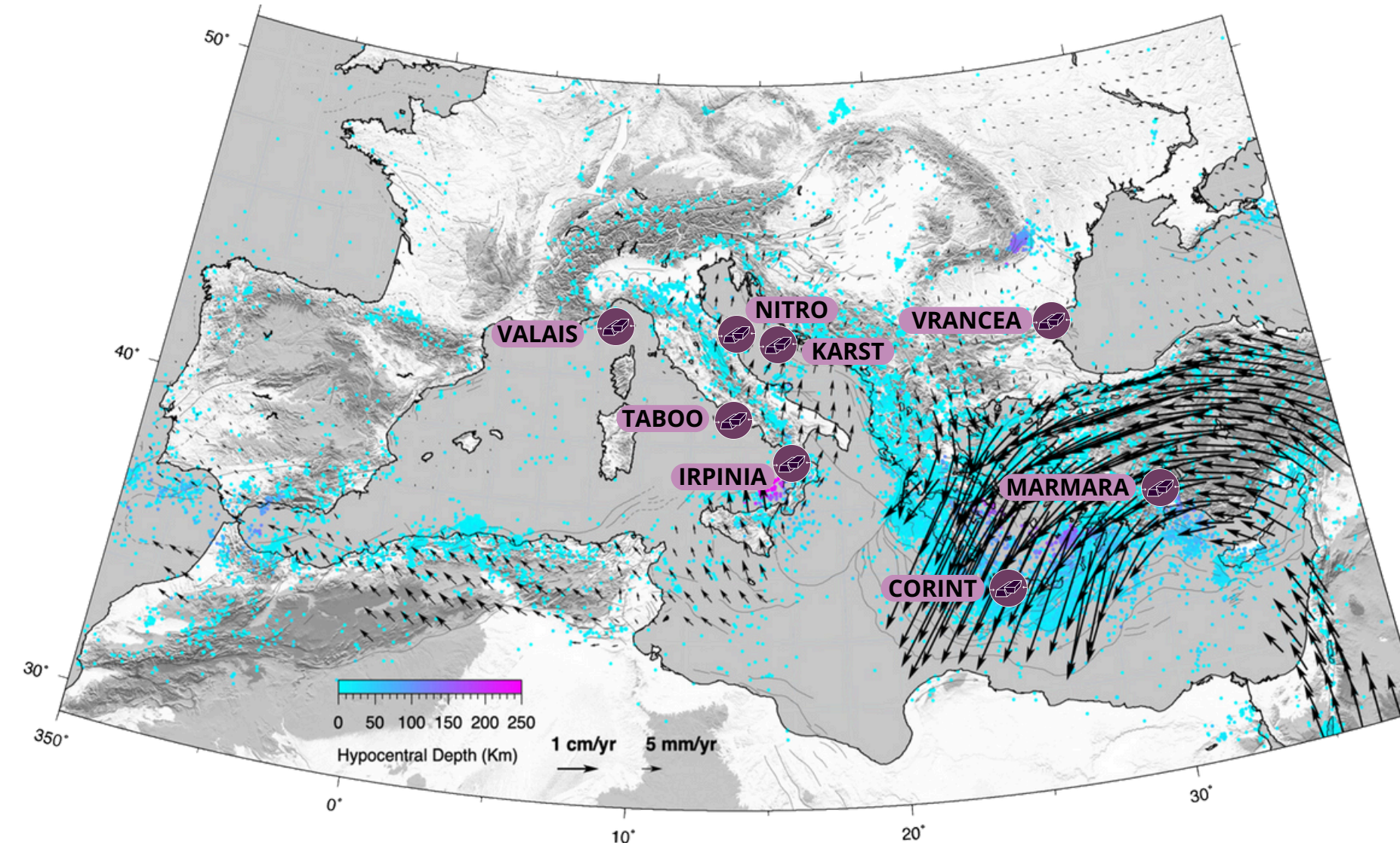
A key multidisciplinary research infrastructure within EPOS

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NFOs are multidisciplinary research infrastructures collecting innovative data and observations near active faults aimed at understanding the physics of faulting and the earthquake preparatory phase.

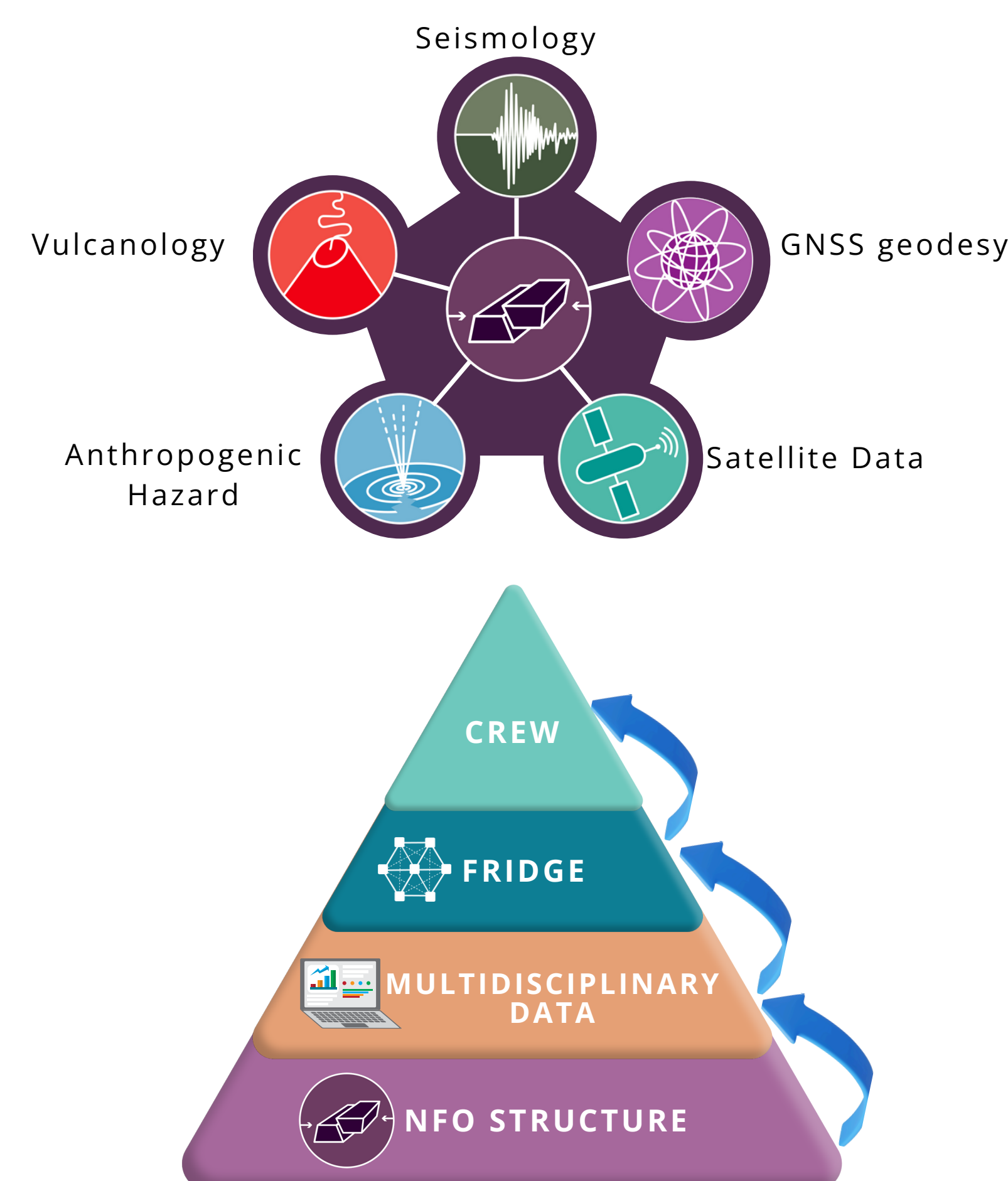
NFO monitoring is based on modern infrastructures hosting geochemical, geodetic, seismic, and geophysical sensors capable of collecting high-resolution data near active faults.

The NFO community in Europe consists of 8 permanent members, located in areas of elevated seismic hazard, which use highly accurate sensors, deployed at the Earth's surface and in boreholes, to monitor the activity in the fault zones over time.



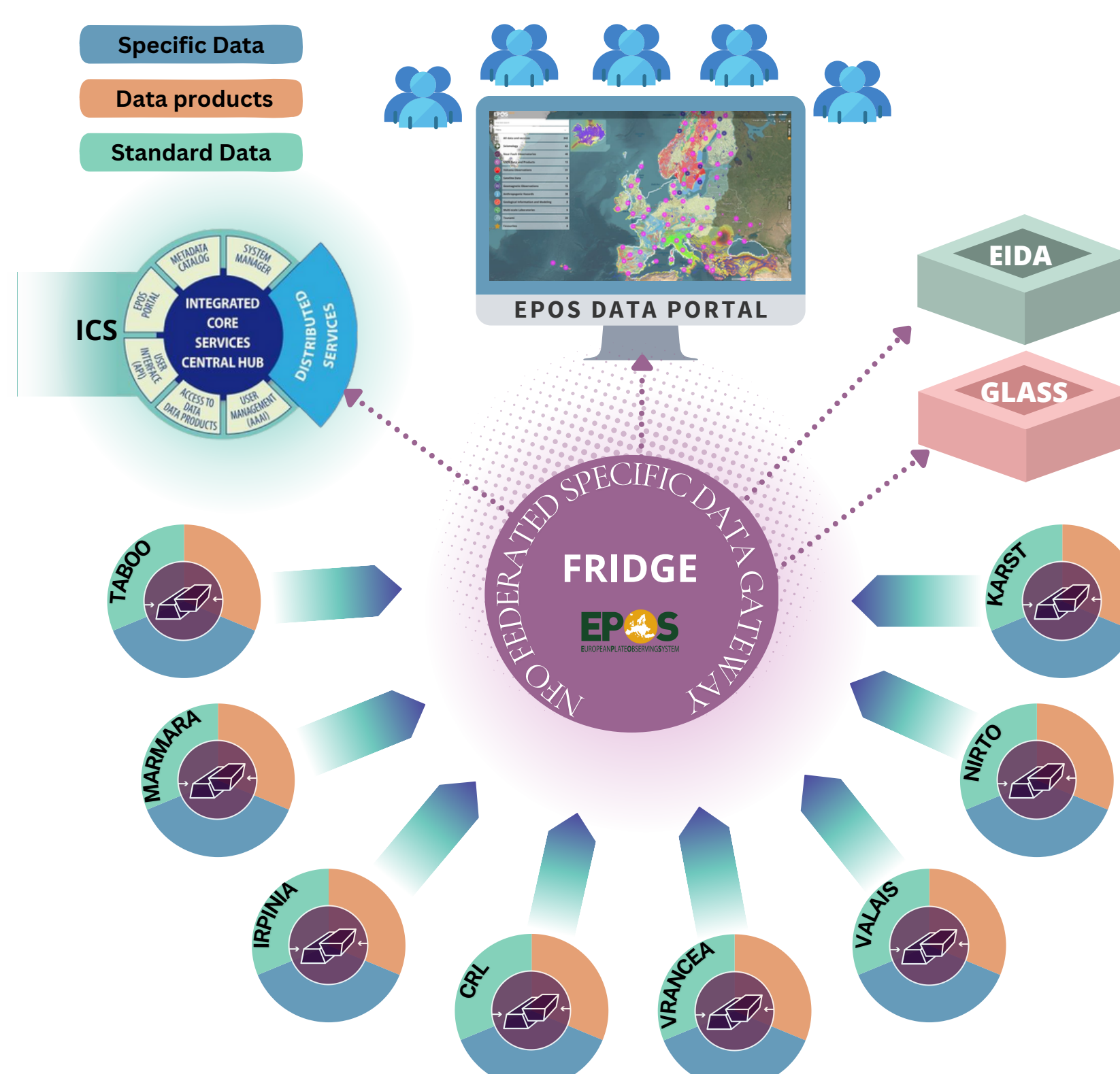
SERVICES

The Near-Fault Observatories TCS integrates seismological, geodetic, geological, geochemical, and satellite data collected by individual observatories into a network with common monitoring standards.

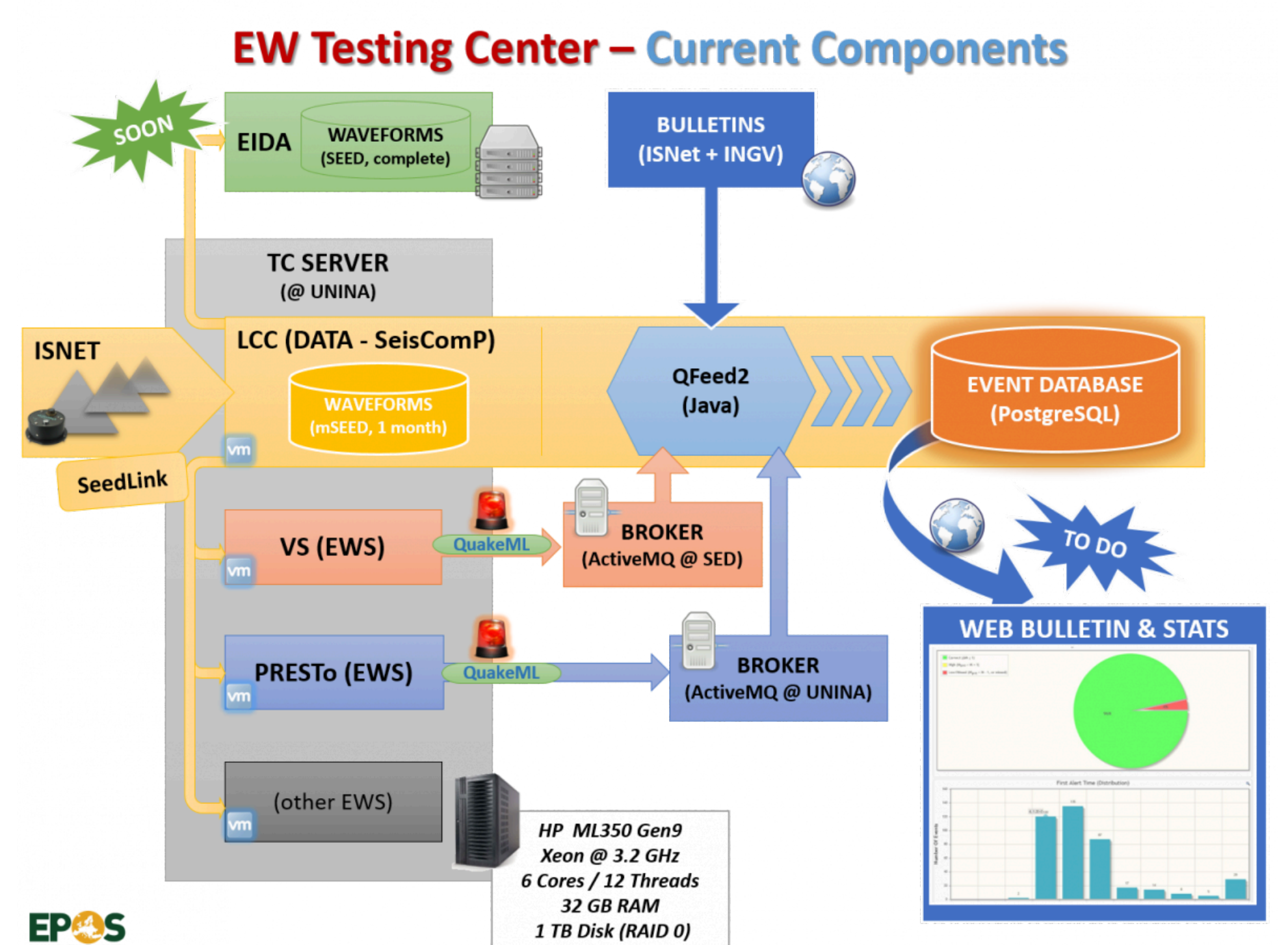


This data is then distributed via two community portals inside EPOS: **FRIDGE & CREW**.

FRIDGE - European NFO Federated specific data and products gateway and Virtual Laboratory - provides users with a common gateway to discover, visualize, and download NFO data and products, integrated into the EPOS DATA PORTAL. <https://fridge.ingv.it/>




CREW - European Testing Centre for Early Warning and Source Characterization - is a facility that receives real-time data and evaluates EEW performance based on the accuracy of earthquake characterization (detection, localization, magnitude estimation, and ground motion prediction). CREW is hosted by Irpinia NFO, based on Virtual Machines. <https://lcepos.fisica.unina.it/>



- DDSS portfolio expansion: Development of velocity and attenuation models (1D-2D-3D);
- Provision, maintenance, and enhancement of access to data and products via web services in compliance with the FAIR data principles (via EPOS portal and FRIDGE);
- Visualization of multidisciplinary time series for comparison and analysis, software for specific data/product quality assurance.




NEAR-FAULT OBSERVATORIES SERVICES




SEISMOLOGY

- Vp/Vs (TABOO, VRANCEA, IRPINIA, MARMARA)
- Seismic stations (MARMARA, NOA, TABOO, IRPINIA, VRANCEA, CORINT)
- Seismic events (CRL, TABOO, IRPINIA, VRANCEA)
- Historical earthquakes (MARMARA, CRL, TABOO, VALAIS, IRPINIA, VRANCEA)
- Seismic velocity and acceleration waveform (CORINT, TABOO, IRPINIA, VRANCEA, MARMARA)



GEOCHEMISTRY

- Meteo at CO2 site (TABOO)
- Rn concentration and local temperature (TABOO)
- CO2 soil dynamic concentration (TABOO)
- Radon stations (TABOO, VRANCEA)
- CO2 stations (TABOO)
- Temperature (VRANCEA)



GEOPHYSICS

- Strainmeter station information (CRL)
- Strainmeter waveforms and water level pressure data (CRL)
- Infrasound station information (VRANCEA)
- Infrasound waveform data (VRANCEA)



GEODESY

- GNSS stations (TABOO, VRANCEA, MARMARA, CRL)
- GNSS data (TABOO, VRANCEA, CRL)

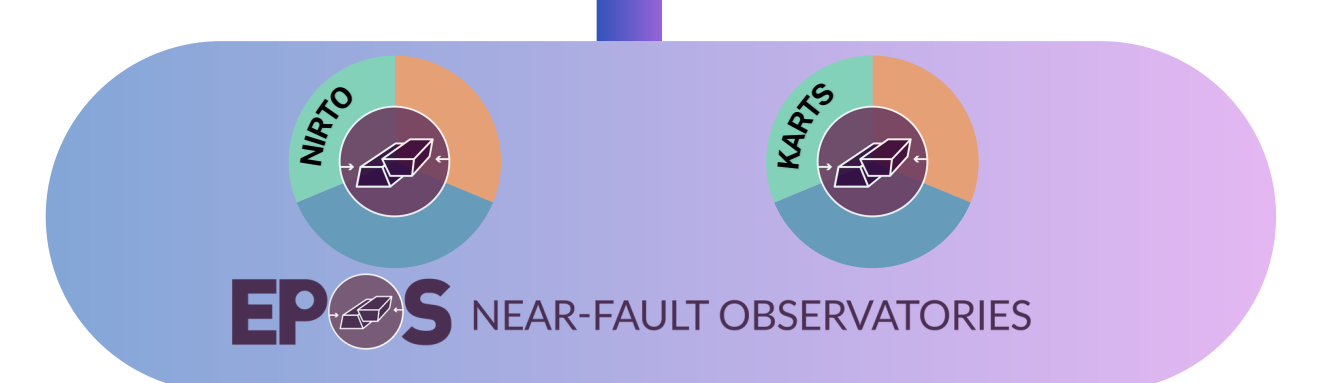


EPOS Optimization and Evolution

- New service for EPOS grounded on innovative geochemical technology and data (isotopes of gases)
 - Extend the TCS participation to new NFOs across Europe (contacts from Spain, and Israel).
 - Interaction with international initiatives **worldwide** (United States Rupture and Fault Zone Observatory (RuFZO))
- Connecting EEW facility CREW with data provision from different NFOs



FRIDGE
NFO Federated Specific Data Gateway
The EU NFO portal for sharing multidisciplinary data and scientific products



TRANSFORM2

TowaRds AdvANced multiDisciplinary Fault ObseRvatory systeMs²

Enhancing the existing NFOs through five concepts:

- Innovative sensors - a new generation of sensors for earthquake research;
- Elevated detectability - automatic workflow for improved earthquakes detection and characterization;
- Early warning - new platforms to support decision-makers during earthquake alerts;
- Test-bed - enhancing accessibility for testing and developing cutting-edge sensors and algorithms;
- Integrating Machine Learning and fiber optic sensing into the NFO community.