

Coordinating and integRating state-of-the-art Earth Observation Activities in the regions of North Africa, Middle East and Balkans and Developing Links with GEO related intiatives toward GEOSS

### GEO-CRADLE pre-Kick-Off Meeting Friday, 18<sup>th</sup> of February, 2016

Gerardo Herrera, EuroGeoSurveys



{Logo of Institute}

IONIC Centre, 11 Lysiou Street Athens, Greece

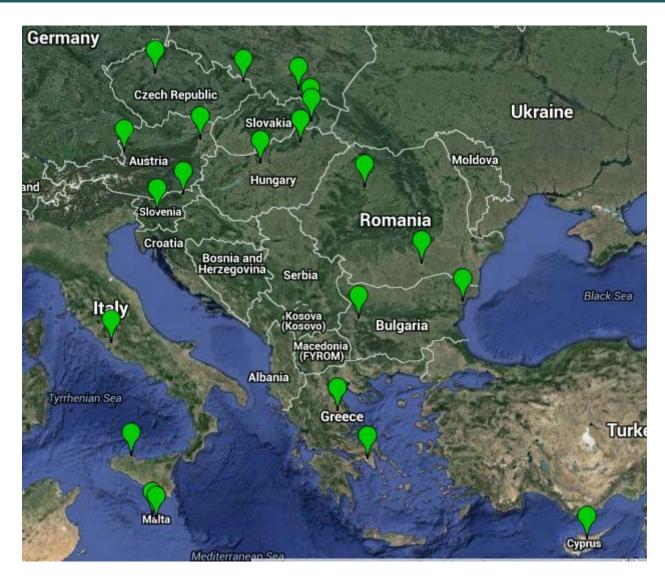














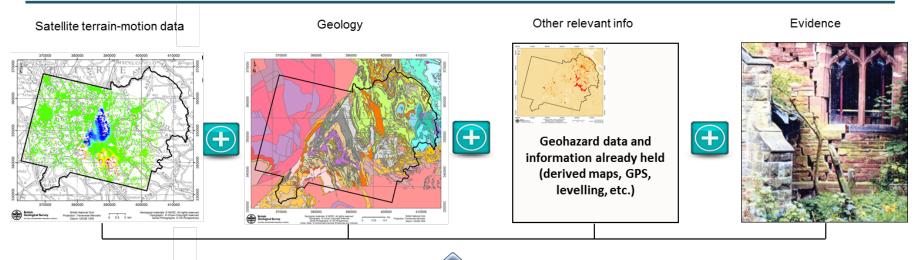


- 1. Free and open access to geohazard information in support of Copernicus
- 2. Free to view, download and use pan-European geohazard information service; standardised geohazard information across 52 towns
- Delivered via the One Geology Europe portal, Google Earth and as direct download – inspire compliant





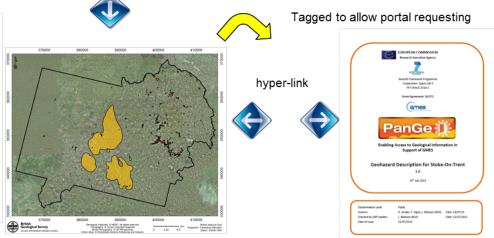




The 'Ground Stability Layer' is a **vector** layer to be made by the Surveys. They will make it by importing into their GIS and interpreting:

- Satellite terrain-motion data,
- Basic geology (that they hold),
- Any other pertinent spatial information, e.g. borehole data that they hold.

From this on-screen analysis, the Surveys will digitise around the main hazard areas, assigning a tag to each, facilitating a hyperlink from the *Ground Stability Layer* to text within the *Geohazard Summary* document.



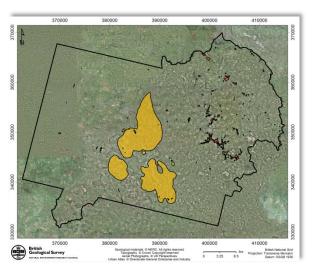
**Ground Stability Layer** 

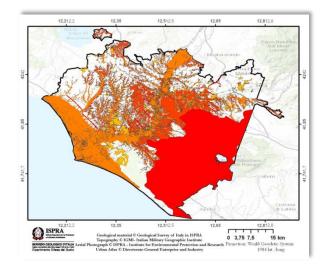
**Geohazard Description** 

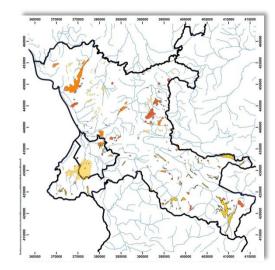




- Attributed vector polygons for each PanGeo town indicate areas of ground instability, which can be caused by a number of natural and anthropogenic processes or phenomena
- 2. Attributes are compliant with the INSPIRE Natural Risk Zones specification











- Polygons only
- 1: 10 000 scale
- Polygons are attributed according to INSPIRE
- Polygons are styled according to the Geohazard category

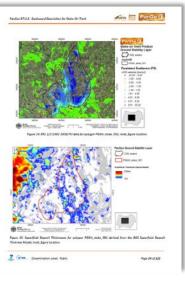
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- a) A document describing the geological interpretation for each GSL polygon
- b) Each GSL polygon has a corresponding section in the Geohazard Description explaining the polygon
- c) Also contains background geological information about the PanGeo town; therefore the Geohazard Description can be used as a standalone document
- d) Contains maps and evidence of Instability such as photographs of damage











Deep Ground MotionEarthquake (seismic hazard)Tectonic MovementSalt TectonicsVolcanic inflation/deflation	Man Made (Anthropogenic) Ground InstabilityGroundwater Management - Shallow compactionGroundwater Management - Peat oxidationGroundwater abstractionMiningUnderground constructionMade groundOil and Gas production
Natural Ground InstabilityLandslideSoil CreepGround DissolutionCollapsible GroundRunning Sand/Liquefaction	<u>Other</u>
Natural Ground Movement Compressible Ground Shrink-swell clays	<u>Unknown</u>





PanGeo Ground Stability Layer

532000

534000

#### GSL extent London; tunnelling PGGH\_London\_009 Station Name Jubilee Line Extension (Page 1995) PS motion velocity [mm/yr] • -26.65 - -25.00 • -24.99 - -15.00 .14.99 - -8.00 -7 99 - -3 00 -2.99 - -1.00 .0.99 - 1.00 1.01 - 3.00 PanGe . 3.01 - 8.00 . 8.01 - 15.00 • 15.01 - 25.00 • 25.01 - 30.50 Underground Construction Hazard report: English or Local Man Made (Anthropogenic) Hazard 532000 Ground Instability Category: Hazard Type: Underground Construction Determination Observed PSI Method: Confidence: High Area (sq km): 1.317 Observed 06/19/1992 Start Date: Observed End 09/17/2010 Date: emple Estimated 10,001 - 50,000 Population: PGGH\_London\_003 InspireID: London Town: United Kingdom Country: Hazard Categories **Deep Ground Motions** Natural Ground Instability Natural Ground Movement Anthropogenic Ground Instability PanGeo Licence Google ear Other Unknown mage © 2013 Bluesky 10 TI I Date: 6/27/2010 51º30'19.72" N 0º06'48.58" W elev 15 m eye alt 1.03 km 1945 Tour Guide





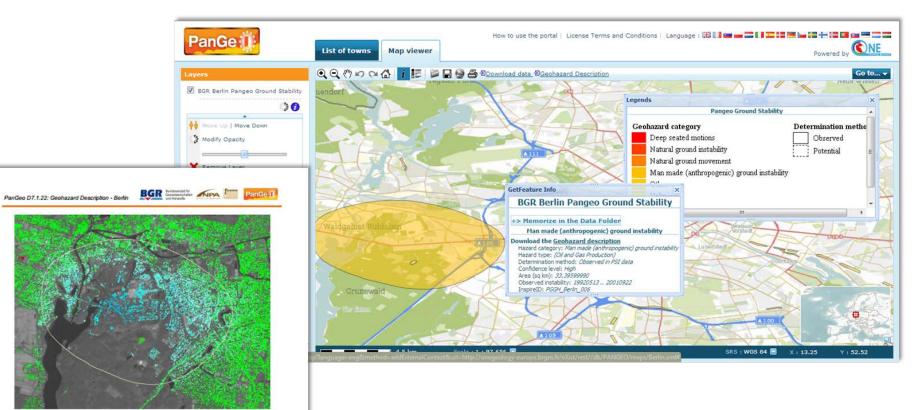
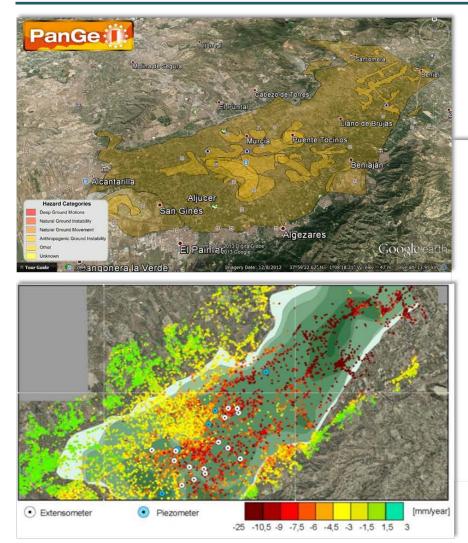


Figure 8.3a: Screenshot with PSI measurement points (green: stable; blue: up to 6 cm uplift between May 1992 and September 2001; yellow line: boundary of polygon 'PGGH\_BERUN\_OOG' (Background: Pan image of Landsat 7 taken on April 7, 2003 (download via http://glovis.usgs.gov/l).

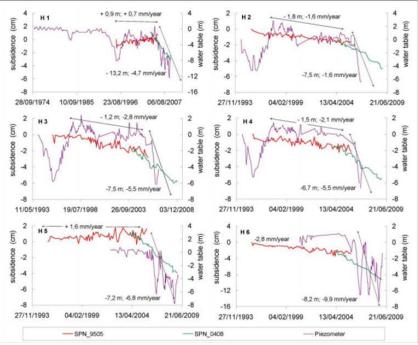
## Berlin; Oil and gas Production







# Ground water abstraction; Murcia







#### Shrink-Swell Clays

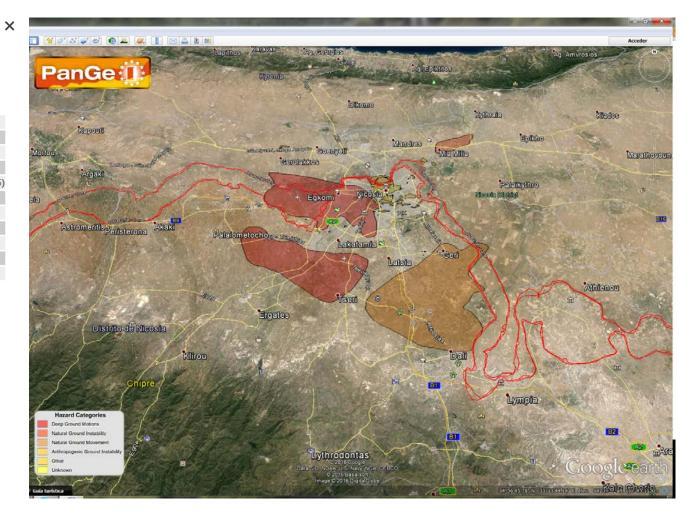
Geohazard Document: English or Local

Open in PanGeo Portal to view with Urban Atlas

Hazard Category:	Natural Ground Movement
Hazard Type:	Shrink-Swell Clays
Determination Method:	Observed PSI
Confidence:	High
Area (sq km):	69.606 (InspireID area: 69.725)
Observed Start Date:	
Observed End Date:	
Estimated Population:	Not yet computed
InspireID:	PGGH_Lefkosia_005
Town:	Lefkosia
Country:	Cyprus



PanGeo Licence







#### Mining

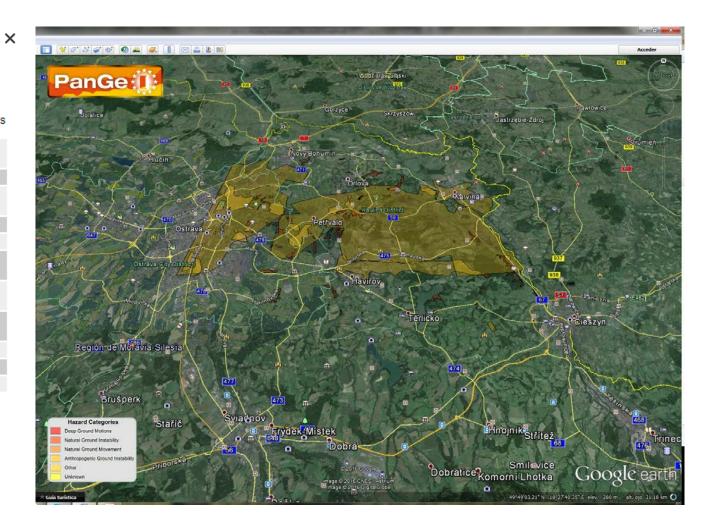
Geohazard Document: English or Local

Open in PanGeo Portal to view with Urban Atlas

Hazard Category:	Man Made (Anthropogenic) Ground Instability
Hazard Type:	Mining
Determination Method:	Observed PSI
Confidence:	Medium
Area (sq km):	1.648
Observed Start Date:	05/30/1995
Observed End Date:	11/15/2000
Estimated Population:	Not yet computed
InspireID:	PGGH_Ostrava_109
Town:	Ostrava
Country:	Czech Republic

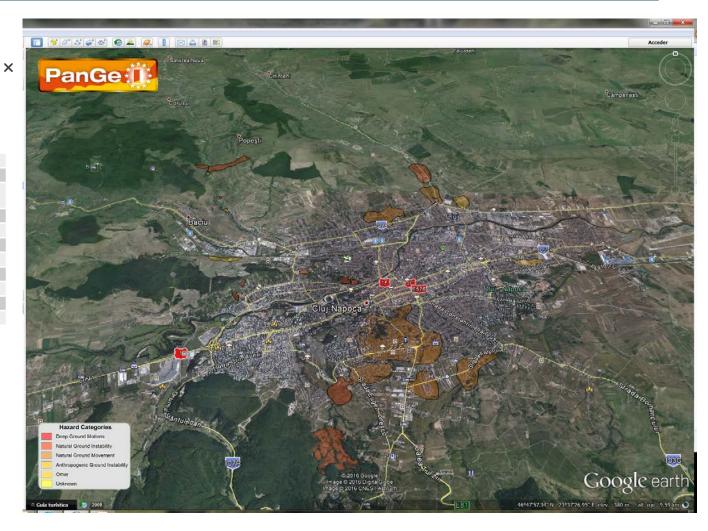


PanGeo Licence









#### Land Slide

Geohazard Document: English or Local

Open in PanGeo Portal to view with Urban Atlas

Hazard Category:	Natural Ground Instability
Hazard Type:	Land Slide
Determination Method:	Observed Geology Field Campaigns
Confidence:	High
Area (sq km):	0.535
Observed Start Date:	08/13/2012
Observed End Date:	10/30/2012
Estimated Population:	Not yet computed
InspireID:	PGGH_CLUJ-NAPOCA_009
Town:	Cluj-Napoca
Country:	Romania





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PanGe



#### **Groundwater Abstraction**

#### Geohazard Document: English or Local

Open in PanGeo Portal to view with Urban Atlas

Hazard Category:	Man Made (Anthropogenic) Ground Instability
Hazard Type:	Groundwater Abstraction
Determination Method:	Observed Geology Field Campaigns
Confidence:	High
Area (sq km):	79.899 (InspireID area: 80.029)
Observed Start Date:	08/01/1990
Observed End Date:	07/05/2013
Estimated Population:	Not yet computed
InspireID:	PGGH_Larissa_001
Town:	Larissa
Country:	Greece





#### PanGeo Licence

All are related to Anthropogenic activities.

001 Observed Geology Field Campaigns, high confidence, in addition to observed PSI.

002 Observed Geology Field Campaigns, External sources, in addition to observed PSI.





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#### Unknown

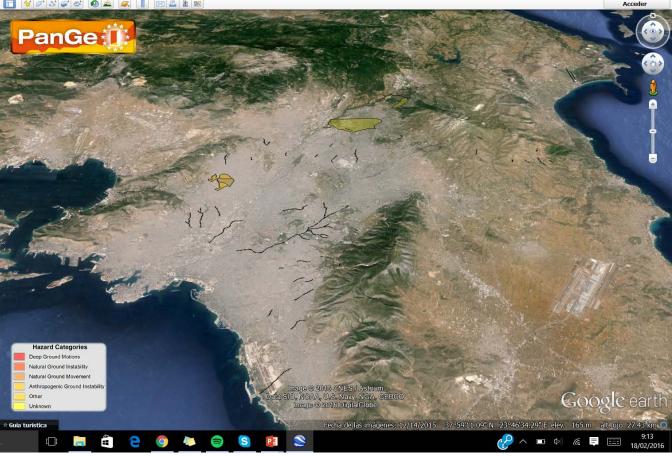
Geohazard Document: English or Local

Open in PanGeo Portal to view with Urban Atlas

Hazard Category:	Unknown
Hazard Type:	Unknown
Determination Method:	Observed PSI
Confidence:	Low
Area (sq km):	5.327 (InspireID area: 6.147)
Observed Start Date:	
Observed End Date:	
Estimated Population:	Not yet computed
InspireID:	PGGH_ATHENS_004
Town:	Athens
Country:	Greece



PanGeo Licence



#### All are related to Anthropogenic activities.

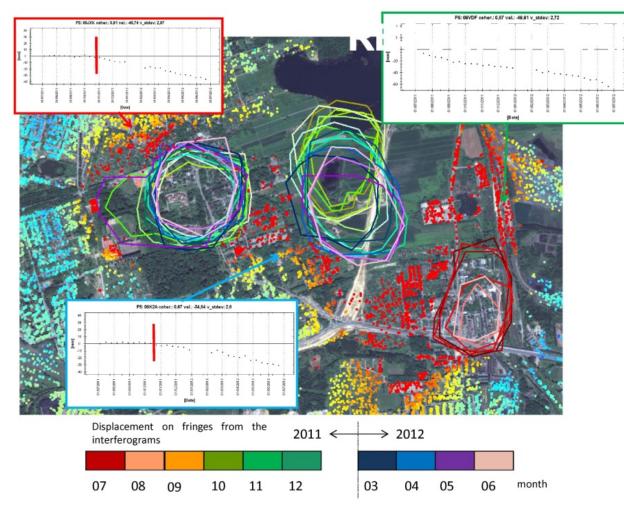
1,2 Related to abandoned lignite mines. Observed Geology Field Campaigns, high confidence, PSI no indications.

3 Buried hydrographical network Observed Geology Field Campaigns, PSI no indications.

4 Only observed PSI, Not any evidence - Unknown



### Determine the state of activity of subsidence phenomena

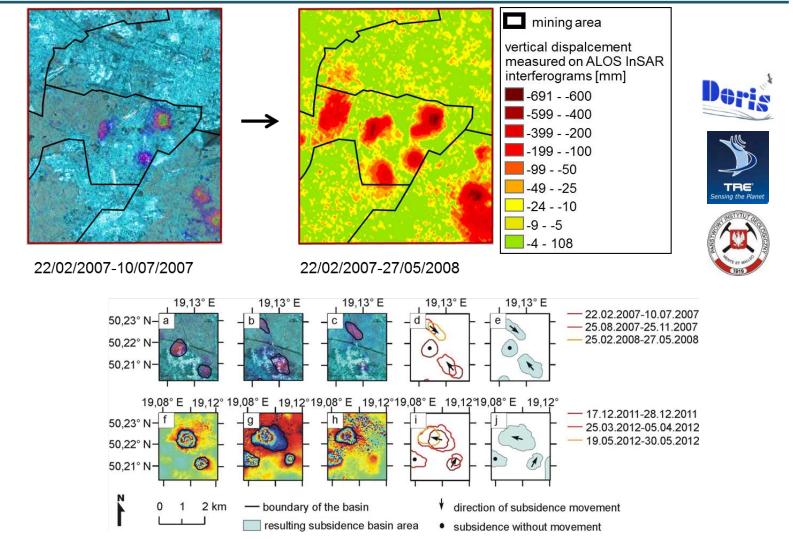






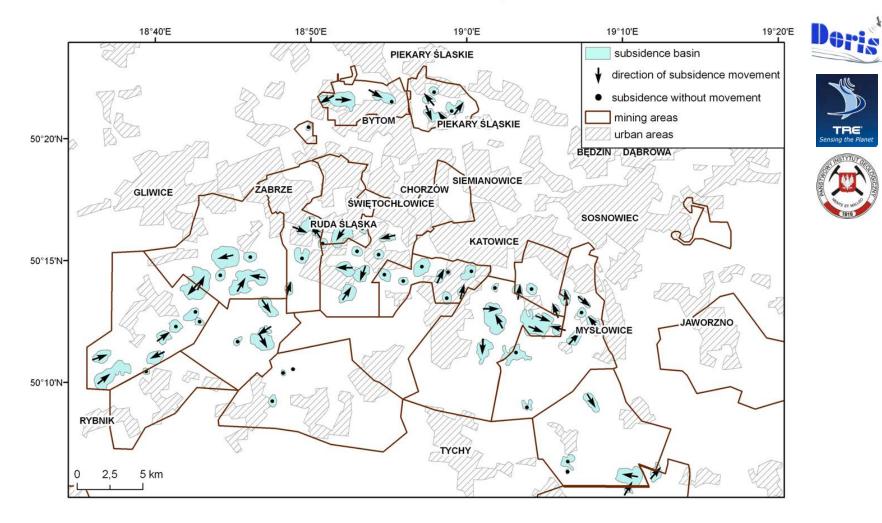
TRE<sup>®</sup> Sensing the Planet







#### Subsidence movement based on ALOS-PALSAR data, period 22/02/2007-27/05/2008



# Thank you!