



Terrafirma

*Pan-European ground motion hazard information service in support
of policies aimed at protecting the citizen*

Co-Location 1

**6-8 December 2005
ESRIN, Frascati**

Stage 1 achievements

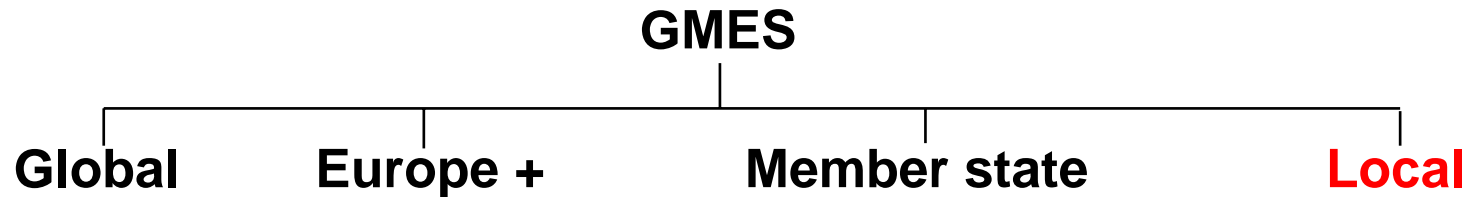
Features of Stage 1 output

- ◆ Reached target of ESA metric (10-20% of service coverage):
 - ◆ Service currently offers 36 sites (15 funded by ESA) = 19% of proposed coverage.
- ◆ Terrafirma currently offers 47 products!
- ◆ Developed a partnership protocol which has worked.
- ◆ Expanded service provider network (4 InSAR providers).
- ◆ Expanded the user network (32 in 20 countries).
- ◆ Conducted two successful user workshops.
- ◆ First operational SAR-ASAR monitoring service.

Key user segments

- ◆ **1: Public sector (regulators, local, regional, national authorities).**
- ◆ **2: Mineral extraction.**
- ◆ **3: Oil and gas abstraction.**
- ◆ **4: Engineering.**
- ◆ **5: Utility operators.**
- ◆ **6: Transport providers.**
- ◆ **7: Development initiators and property owners.**
- ◆ **8: Geo-information providers.**
- ◆ **9: Insurers.**

Policy Foundation Review



◆ National

- ◆ Environment assessment, e.g. UK Town & Country Planning Act 1990.
- ◆ Public participation, e.g. Freedom of Information Act 2000.
- ◆ Emergency response & civil protection.

◆ Local

- ◆ Mining, e.g. F: Loi no. 99-245 du 30 mars 1999.
- ◆ Planning law specific to each local country.

◆ European

- ◆ Aarhus Convention.
- ◆ 6th Environmental Action Programme.
- ◆ Directive on Assessment of Effects of Public & Private Projects on Environment.

TOWN	VAC	H1a	H1b	H1c	H2a	H2b	H3a	H3b	U1	M1	
1	Berlin	Altamira			1						
2	Brussels	TRE			1						
3	Amsterdam	TRE			1	1					
4	Athens	TRE, BRGM		1	1	2					
5	Barcelona	Altamira			1					1	
6	Bologna	TRE			1						
7	Catania	TRE			1						
8	Edinburgh	NPA			1						
9	Firenze	TRE			1						
10	Glasgow	NPA			1						
11	Haifa	TRE			1	1					
12	Istanbul	TRE			1	1					
13	London	NPA			1						
14	Milan	TRE			1						
15	Newcastle	NPA			1						
16	Oslo	TRE			1						
17	Palermo	TRE			1	1					
18	Paris	BRGM			1						
19	Prato	BRGM	1								
20	Rome	TRE			1						
21	Sosnowiec	TRE			1	1					
22	Stoke-on-Trent	TRE			1	1					
23	Thessaloniki	BRGM	1			1					
24	Trondheim	TRE			1						
25	Venzia	TRE			1						
26	Moscow	NPA			1						
27	St. Petersburg	NPA			1						
28	Lisbon	TRE			1						
29	Sofia	TRE			1						
30	Roncourt, Lorraine	BRGM	1								
	Montceau-les-Mines										
31		BRGM	1								
32	Mexico City	BRGM	1					1			
33	Hanoi	BRGM	1								
34	Jakarta	BRGM	1								
35	Dublin	NPA			1	1					
36	Lyon	Altamira			1						
	Totals		7	1	28	10	0	1	0	0	1

Product status ⁶

7 H1a products

1 H1b product

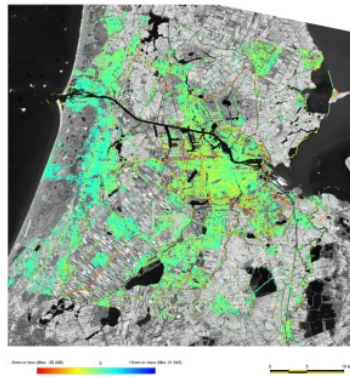
27 H1c products

10 H2a products

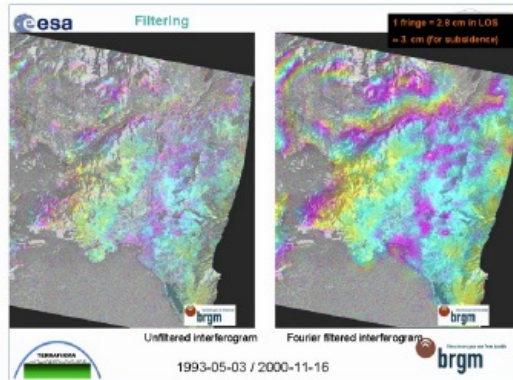
1 H3a product

1 M1 product

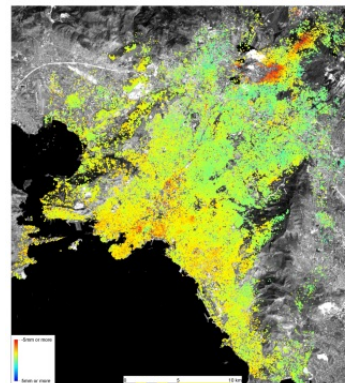
= 47 PRODUCTS!



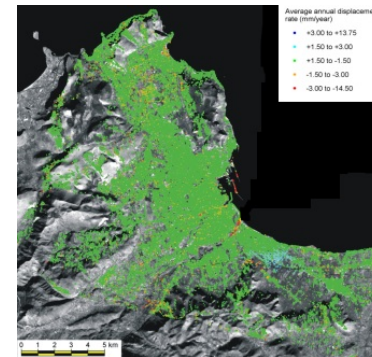
Amsterdam (H1c)



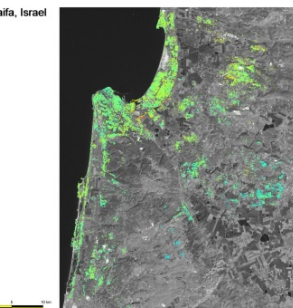
Athens (H1a)



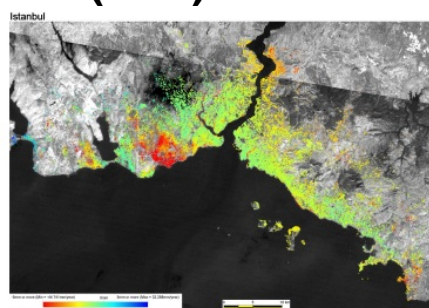
Athens (H1c)



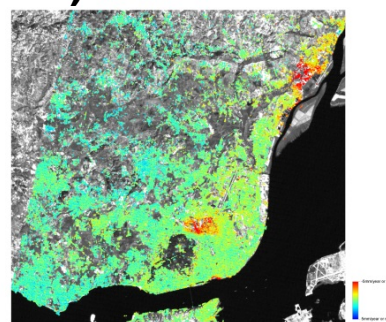
Palermo (H1c)



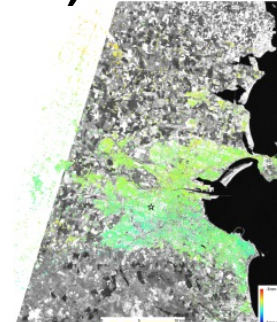
Haifa (H1c)



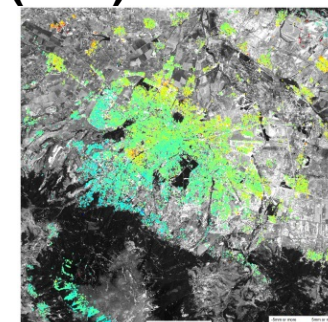
Istanbul (H1c)



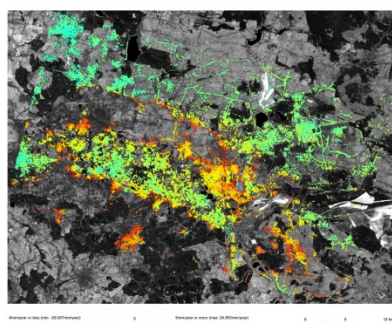
Lisbon(H1c)



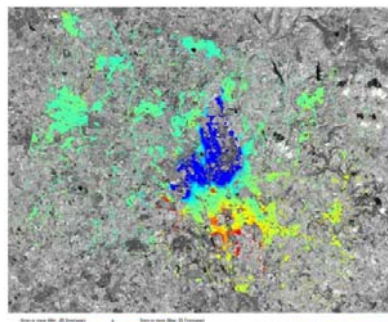
Dublin (H1c)



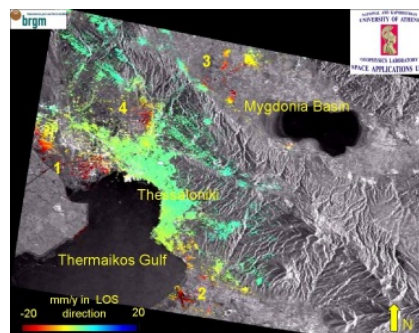
Sofia (H1c)



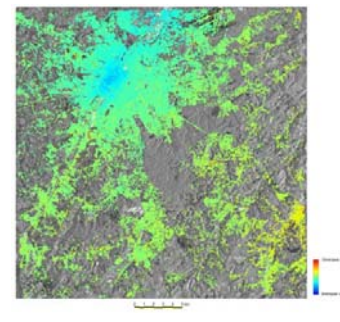
Sosnowiec (H1c)



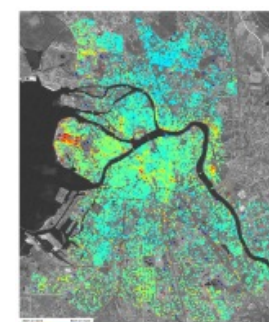
Stoke-on-Trent(H1c)



Thessaloniki(H1b)



Brussels (H1c)



St. Petersburg (H1c)

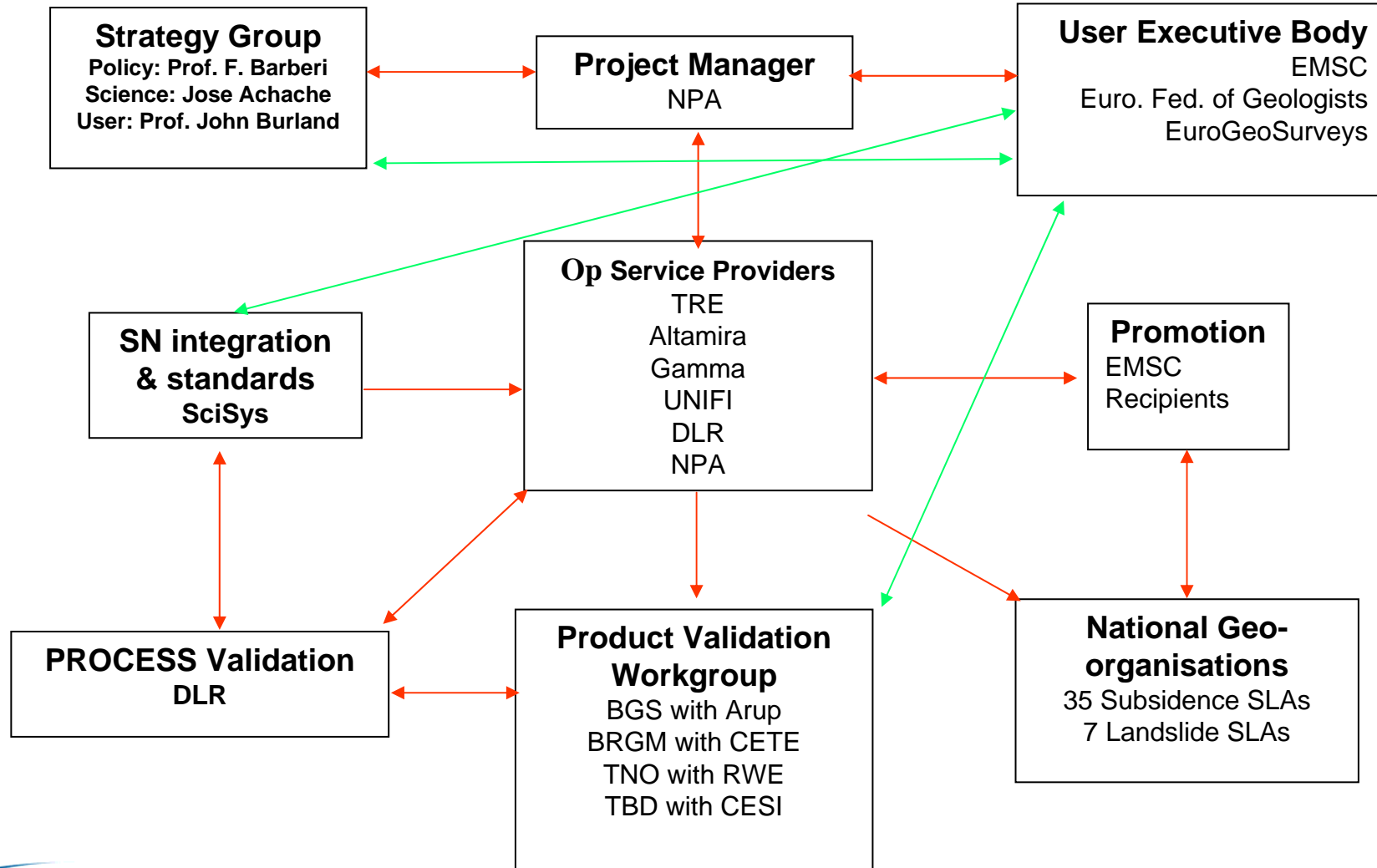
Sosnowiec (H1c) Stoke-on-Trent(H1c) Thessaloniki(H1b) Brussels (H1c) St. Petersburg (H1c)

Stage 2

Stage 2 objectives

- ◆ **Roll out services that were consolidated in Stage 1 to the EU25.**
- ◆ **Expand portfolio to include landslide services.**
- ◆ **Provide service validation to the satisfaction of users.**
- ◆ **Provide 43 products in total.**
- ◆ **Foster further engagement with horizontal and downstream users.**
- ◆ **Collaboration with other projects and programs.**

Stage 2 team

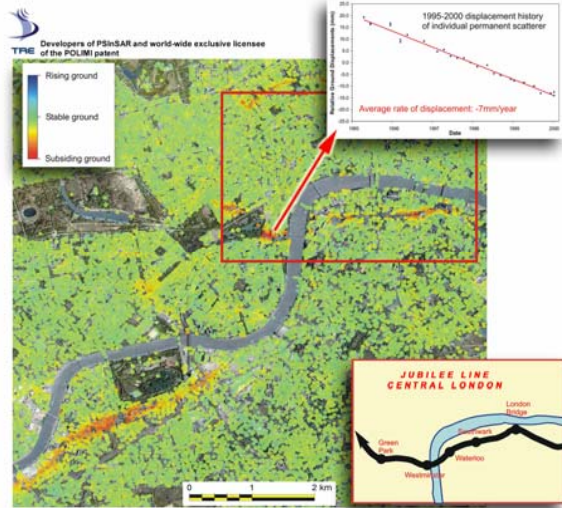


Service portfolio

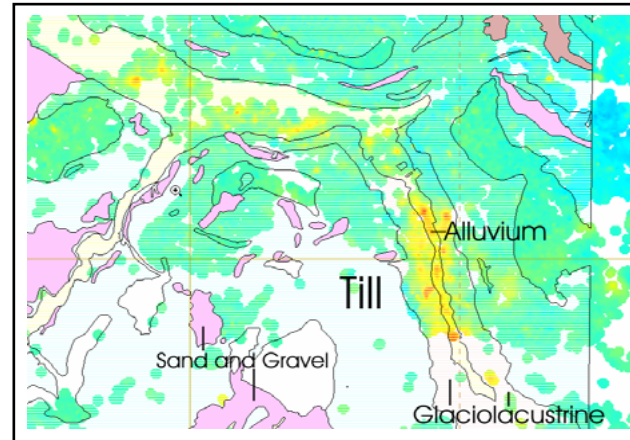
- ◆ Two types of product: Historical and Monitoring.
- ◆ Historical Products:
 - ◆ Integrations of ERS-1/2 SAR and ENVISAT ASAR data **already in archive.**
- ◆ 3 levels of sophistication:
 - ◆ H-1: Base product - 'raw' PSI output **(X 22).**
 - ◆ H-2: Causal Product **(X 8).**
 - ◆ H-3: Modelled Product **(X 4).**
- ◆ Monitoring Products: Implies specific satellite tasking, or ordering of next 'visible' acquisition(s) **(X 2).**
- ◆ Landslide Inventory Product: Basin analysis **(X 3).**
- ◆ Landslide Monitoring Product: Specific landslide event **(X 4).**

Stage 1 product examples

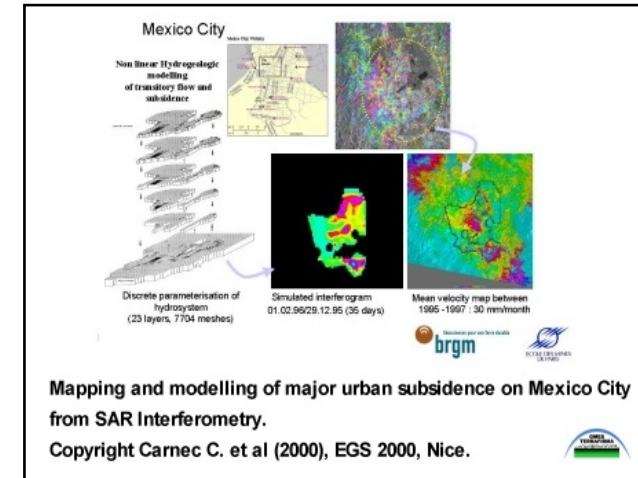
Basic



Causal



Modelled



Who?

- ◆ **22 Confirmed EU Associate Partners, representing 15 of the EU25 countries**

Confirmed EU APs		
Number	Country	Company/Institution
1	Austria	Geological Survey of Austria
2	Belgium	Geological Survey of Belgium
3	Cyprus	Geological Survey (CGS)
4	Czech Rep	Czech Geological Survey (CGS)
5	Czech Rep	Institute of Rock Structure and Mechanics (IRSM-CAS)
6	Czech Rep	Gisat
7	France	Bureau de Recherches Geologique et Minieres (BRGM)
8	Germany	BGR
9	Greece	Earthquake Planning & Protection Office (EPPO)
10	Greece	Institute of Geology and Mineral Exploration. Greece (IGME)
11	Greece	National & Kapodistrian University of Athens
12	Ireland	Geological Survey of Ireland (GSI)
13	Italy	Agency for Env Protection and Technical Surveys (APAT)
14	Italy	University of Palermo
15	Lithuania	Lithuania Geological Survey (LGT)
16	Netherlands	Netherlands Institute of Applied Geosciences TNO (NITG-TNO)
17	Poland	Polish Geological Institute (PGI)
18	Portugal	(IST-UJL)
19	Spain	Institut de Geomatica (IG)
20	Spain	Institute of Earth Sciences/European Seismological Commission
21	Spain	Institute of Geology and Mineral Exploration, Spain (IGME)
22	UK	British Geological Survey (BGS)

Who?

- ◆ **10 Prospective EU Associate Partners, representing the 10 remaining EU25 countries**

Prospective EU APs		
Number	Country	Company/Institution
1	Denmark	Danish Space Centre (DSC)
2	Estonia	Estonian Geological Survey (EGK)
3	Finland	Finnish Geotechnical Institute (FGI)
4	Hungary	Geological Institute of Hungary (MAFI)
5	Latvia	Latvian Environment, Geology and Met Agency (LEGMA)
6	Luxembourg	Geological Survey of Luxembourg
7	Malta	University of Malta
8	Slovakia	Geophysical Institute, Slovak Academy of Sciences
9	Slovenia	ARSO
10	Sweden	Swedish Geotechnical Institute (SGI)

- ◆ **10 (Voluntary) Non-EU Associate Partners**

(VOLUNTARY) NON-EU APs -Stage 1		
Number	Country	Company/Institution
1	Country	Company/Institution
2	Bulgaria	Ministry of Environment and Water (MOEW)
3	Bulgaria	University of Mining and Geology
4	Bulgaria	Geophysical Institute
5	Israel	Geological Survey of Israel (GSI)
6	Israel	The Geophysical Institute of Israel (GII)
7	Norway	Geological Survey of Norway (NGU)
8	Russia	National Geophysical Survey (GSSC)
9	Russia	St Petersburg State University
10	Turkey	Bogazici University - Kandilli Observatory and Earthquake Research Institute (KOERI)

Collaborations & other funding

- ◆ **SLA driver: Recipients understand the need to promote and exploit in search for investment.**
- ◆ **SAR.net (UNIFI): Italian CPA.**
- ◆ **Roma and Italian national CPAs involved: Will make new H-1 of Rome.**
- ◆ **ASSIST (Alpine Safety): FP6. TF partners already involved. Attempting more formal collaboration.**
- ◆ **GEOLAND (GMES): Question as to relevance. TF presentation in Brussels.**
- ◆ **EuroRisk/PREVIEW: EC Integrated Project concerned with all aspects of risk and its mitigation in Europe.**
- ◆ **LESSLOSS: EC Integrated Project focusing on landslides and seismicity.**
- ◆ **LEWIS: EC project focusing on application of EO to landslide risk management.**

Strategy Group

- ◆ **Member for Science: Professor José Achache:**
 - ◆ Institut de Physique du Globe, Paris.

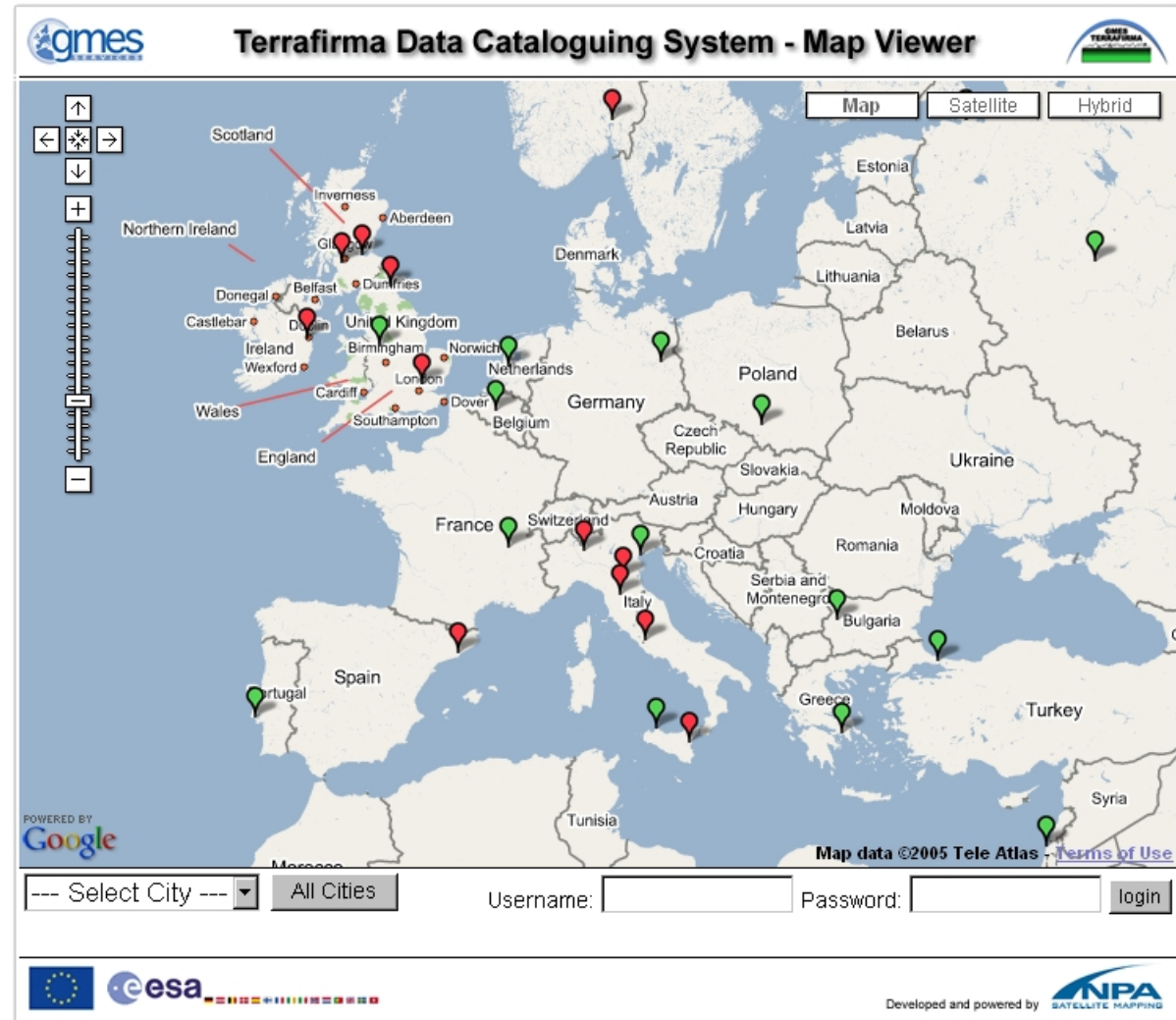
- ◆ **Member for Policy: Professor Franco Barberi:**
 - ◆ University of Pisa and Roma, Italy

- ◆ **Member for Users: Professor John Burland**
 - ◆ Imperial College of Science & Technology, London.

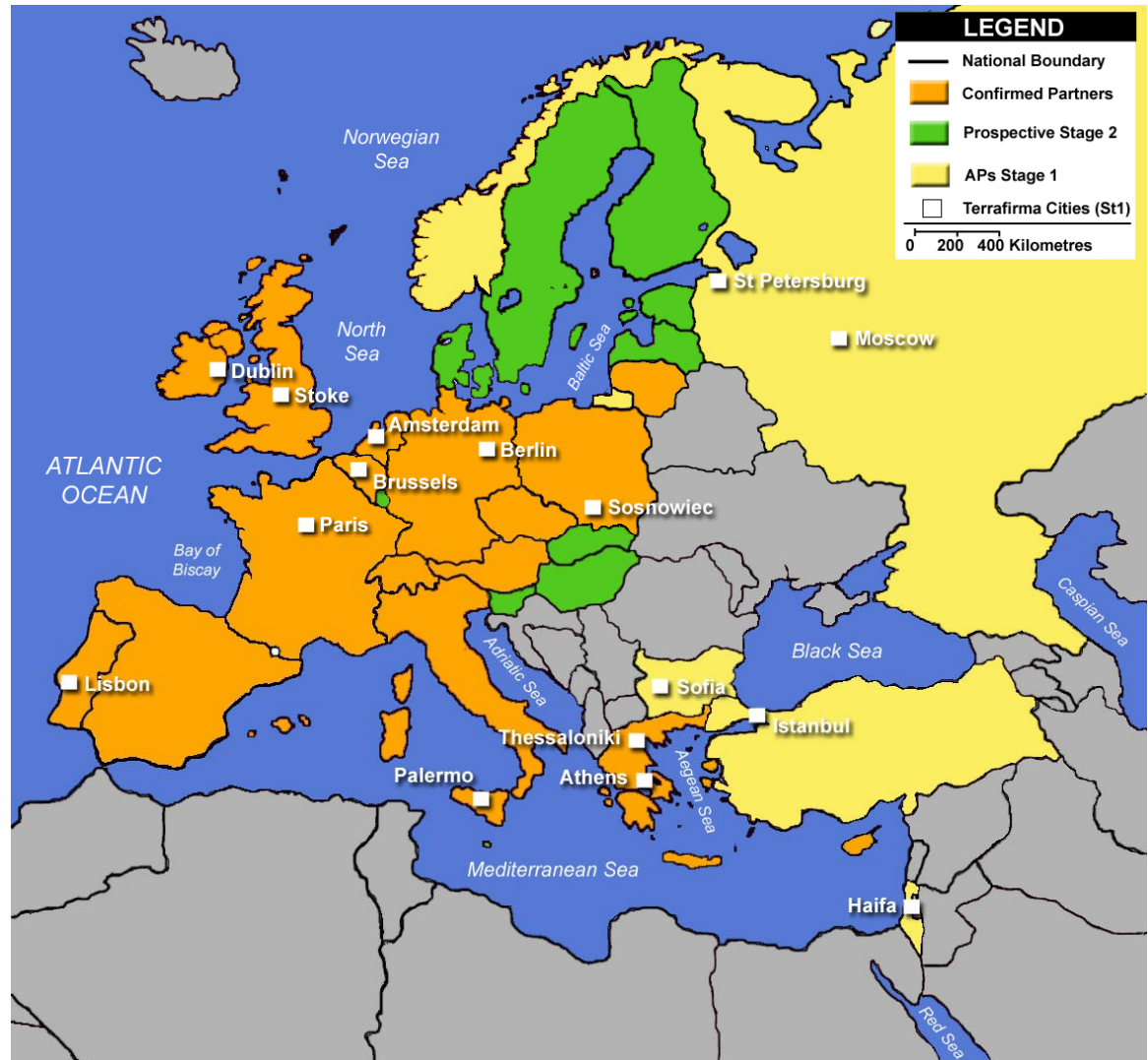
Where?

◆ Terrafirma Stage 1 Coverage

- ◆ ESA-funded 📍
- ◆ Non-ESA funded 📍



Where?



Where?

◆ Terrafirma Stage 2 Planned Coverage

gmes **Terrafirma Data Cataloguing System - Map Viewer**

Map Satellite Hybrid

Map data ©2005 Tele Atlas

--- Select City --- All Cities Username: Password: login

POWERED BY Google

Developed and powered by **NPA** SATELLITE MAPPING

When?

- ◆ **Half in year 1 (~20 products).**
- ◆ **Half in year 2 (~20 products).**
- ◆ **Year 3 to clear up any issues.**

Thanks for your attention...