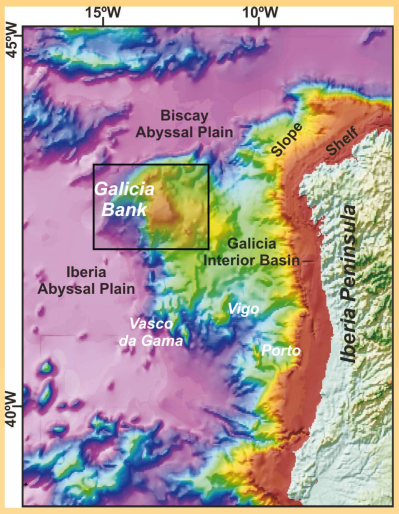
GEOMORPHOLOGY OF THE GALICIA BANK REGION (NW IBERIAN PENINSULA)

LOCATION



G. Ercilla (1), L. Somoza (2), J.T. Vázquez (3), S. García -Gil (4), F. Estrada (1), D. Casas (1) y ERGAP Project and Cruise Team

•Institut de Ciències del Mar, CSIC. Grup de Marges Continentals. Passeig Marítim de la Barceloneta, 37-49. 08003, Barcelona. gemma@icm.csic.es

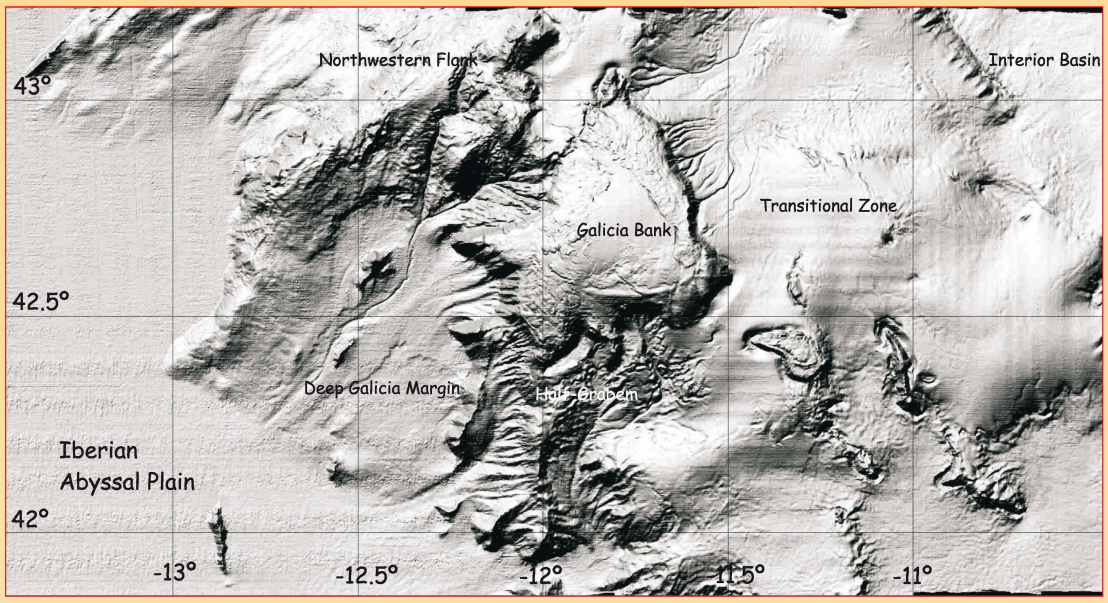
•Instituto Geológico y Minero de España, IGME, Ríos Rosas23, 28003, Madrid

•Instituto Español de Oceanografía – C.O. de Málaga Puerto Pesquero, s/n, 29640 -, Fuengirola, Málaga

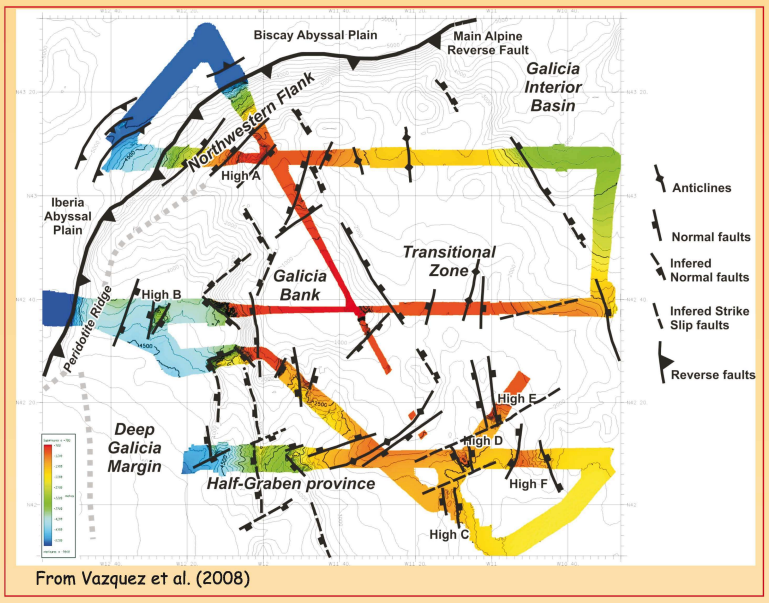
•Dpt. Geociencias Marinas y O.T.Facultad de Ciencias, Universidad de Vigo, 36200 -Vigo

Multibeam bathymetry has been used to study in detail the morphology of the Galicia Bank region (< 700 m down to 5200 m water depth), in the NW Iberian Margin. Five physiographic provinces displaying a complex morphology have been defined. Their geomorphology is characterized by three types of features based on their origin: tectonic, sedimentary and oceanographic. Tectonic features are dominant, comprise fault scarps (normal and inverse) and highs. They condition the general geometry and morphology of the provinces. Sedimentary features (erosive and depositional) are mainly related to tectonic features, both their location and genesis. The erosive features comprise slide scars, gullies, channels, and main channels. The valleys eroding the provinces form turbidity systems that drain radially the region of the Galicia Bank, transporting the sediment toward the Biscay and Iberian abyssal plains. The depositional features comprise slides and wedges and lobes formed by mass-movement deposits; also, coral bioconstructions appear locally associated to the structural highs. All these features and the erosive ones are mostly the product of the faulted flank and structural high activity and erosion by mass wasting, and of the steep gradients (1 to 50°) of the Region. The oceanographic features comprise contourites (moat associated to drifts and sediment wave fields) and sediment wave fields. Their development is conditioned and favoured by the action of bottom currents.

MULTBEAM BATHYMETRIC MAP



MORPHOSTRUCTURAL MAP



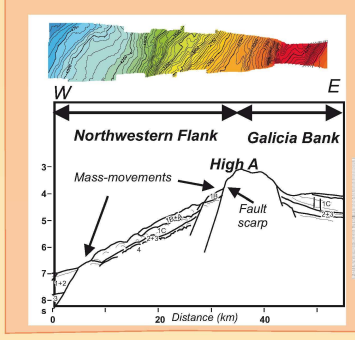
From Vazquez et al. (2008)

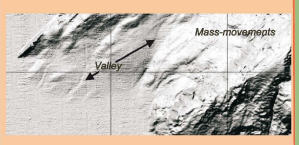
GEMORPHOLOGIC FEATURES

NORTHWESTERN FLANK

Tectonic
- Fault scarps

Sedimentologic
- Valleys
- Mass-movements
- Slide scars



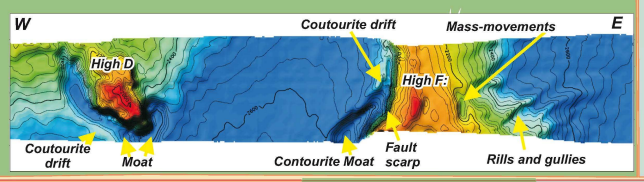


TRANSITIONAL ZONE

Tectonic
- Fault scarps
- Highs
- Volcanoe craters

Sedimentary
- Valleys
- Rills and gullies
- Mass-movements
- Slide scars
- Mass-flows

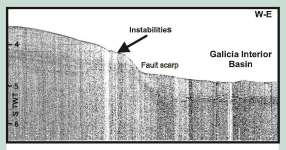
Oceanographic
- Contourite (drift and moat)

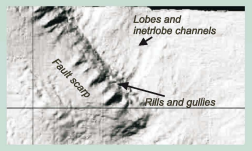


GALICIA INTERIOR BASIN

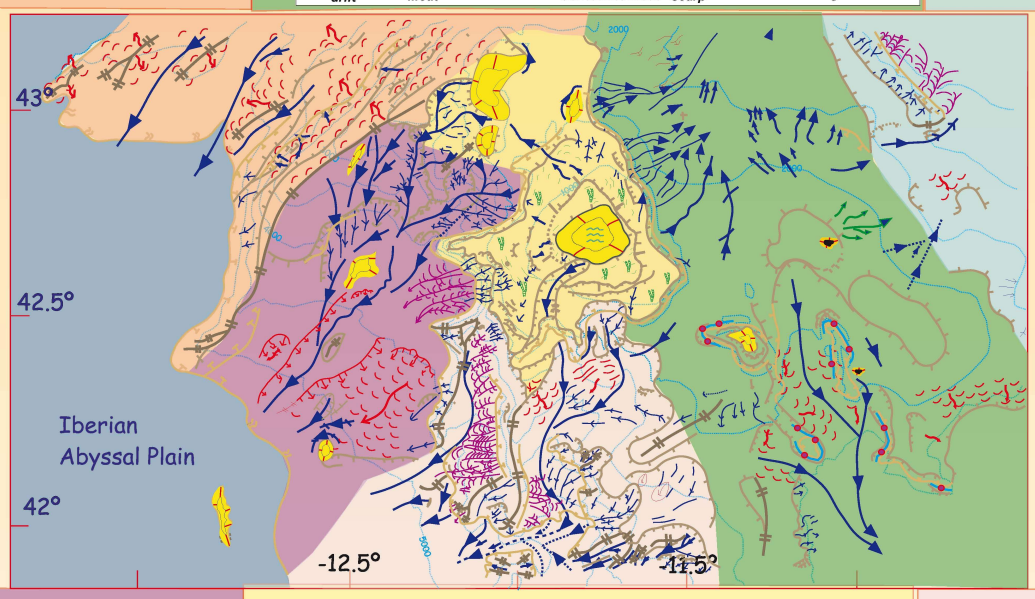
Tectonic
- Fault scarps

Sedimentary
- Valleys
- Rills and gullies
- Lobes and interlobe channels
- Mass-movements





STRUCTURAL PROVINCES
- Galicia Interior Basin
- Transitional
- Half-graben
- Galicia Bank
- Deep Galicia Margin
- Northwestern Flank
- Abyssal Plain

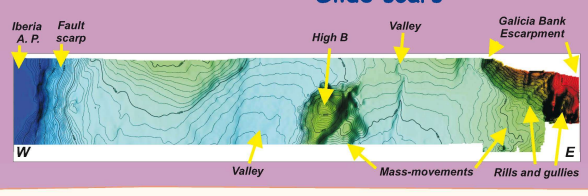


FEATURES
- Valley talweg
- Rill & Gully
- Scarp
- Base of steep scarp
- Crest of scarp
- Failure scar/slide scar
- Mass-movement sediments
- Mass flow deposits
- Bioconstructions (corals)
- Lobes & interlobe channels
- Highs
- Volcanoe crater
- Sediment waves
- Contourite
- Bathymetry lines

DEEP GALICIA MARGIN

Tectonic
- Fault scarps
- Highs

Sedimentary
- Valleys
- Rills and gullies
- Lobes-interlobe channels
- Mass-movements
- Slide scars

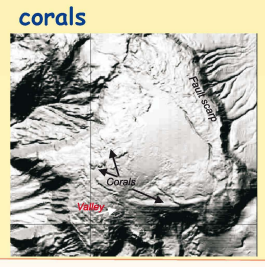


GALICIA BANK

Tectonic
- Fault scarps

Sedimentary
- Valleys
- Rills and gullies
- Bioconstructions of corals

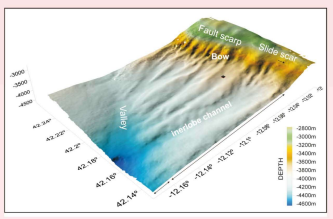
Oceanographic
- Bedforms (ripples/dunes)



HALF GRABEN

Tectonic
- Fault scarps

Sedimentary
- Valleys
- Rills and gullies
- Lobes and interlobe channels
- Mass-movements
- Slide scars



Determinación y valoración de riesgos geoambientales en el área de hundimiento del buque Prestige. Ref. VEM2003-20093-C03-01