

2. It is close to the thermal material pathway in the deep part, with more volcanic activities and high geothermal gradient; 3. Adjacent to large source area, it developed sets of favorable reservoir rocks; 4. It also developed the large inherited uplift there; 5. The large fault provided the good hydrocarbon migration pathway benefiting the hydrocarbon accumulation. Therefore, abundant hydrocarbon resources accumulated in this kind of pull-apart basins.

234-33 Poster Paton, Douglas

INTEGRATING PASSIVE MARGIN EVOLUTION, HYDROCARBON GENERATION AND MIGRATION, AND THE OCCURRENCE OF HYDROCARBON SEEPAGE FEATURES THROUGH 3D BASIN MODELLING IN THE ORANGE BASIN, SOUTH AFRICA

PATON Douglas¹; VAN DER SPUY Dave²

1 - GFZ-Potsdam

2 - Petroleum Agency South Africa

Keywords: passive margins; hydrocarbon migration; sea-floor gas seepage; basin modelling; Orange Basin, South Africa

Integrating the evolution of passive continental margins with the generation and migration of hydrocarbons is commonly undertaken. In addition, seafloor expressions of gas seepage, including mud volcanoes, pock-marks and carbonate mounds, have been identified in most passive margin settings and have been attributed to either thermogenic gas sourced from the underlying hydrocarbon system or to in-situ biogenic gas generation. However, there has been no attempt to integrate passive margin, and associated hydrocarbon system, evolution with either present-day or paleo- seepage events. This paper presents data from the Orange Basin, South Africa. This is a suitable area to investigate the interaction of margin evolution, hydrocarbon systems and the occurrence of sea floor expressions of gas leakage because of 1) the high quality sub-surface data available, 2) the presence of an active hydrocarbon system and 3) the occurrence of a number of well documented sea floor features and seismic gas chimneys. In this area the occurrence of hydrocarbon seepage has also been associated with the development of gas hydrate deposits. 3D basin modelling in the Orange Basin is being undertaken to model the development of the margin, and to attempt to quantify the volume of hydrocarbons generated throughout the evolution of the margin. The model comprises a transect across the continental margin from deep marine to shallow shelf and includes the entire margin time-frame from syn-rift through post-rift to the present. For each time-step in the model the volume of hydrocarbons generated is calculated, and direction and volume of fluid flow of hydrocarbons within the system assessed. Through this type of modelling a mass-balance of hydrocarbon generation is attempted in order to estimate the proportion of fossil carbon being input into the atmosphere during basin evolution. The model results are used to determine the timing of possible leakage events and the results calibrated against the presence, or absence, of present- or paleo-seafloor surface features. It is envisaged that the application of such a model will lead to a better understanding of the role of hydrocarbon seepage on a number of key issues of passive margins including margin slope stability, interplay between margin development and climate change, and the presence and stability of hydrates through time.

234-34 Poster Morelli, Danilo

MORPHOLOGY AND EVOLUTION OF THE SIDERNO AND BOVALINO CANYONS (IONIAN MARGIN)

MORELLI Danilo¹; CUPPARI Angela¹; FANUCCI Francesco¹; COLIZZA Ester¹

1 - DISGAM - University of Trieste

Keywords: Calabrian Ionian Margin; Canyons; Coastal erosion; Neotectonics
New seismic data and samples collected offshore Bovalino and Siderno allow to infer the main morphological and sedimentary dynamic processes occurring in the Southern Calabrian Ionian Margin. In this area the interaction among the "fiumare" (periodic ephemeral rivers), the coastal dynamics and the submarine canyons is particularly evident and controlled by the tectonic activity. Seismic and bathymetric data analysis suggest that the origin and evolution of the canyons is affected by the structure and recent kinematics of the Calabrian Arc. Sedimentary analysis from cores along the canyons indicate a sediment transport prevalently offshore with a minor longshore component. The sediments are remobilized as turbidite currents, in response of the gravitational failure of the margin. The result of this study suggest that the tectonic lineaments within the margin controlled the origin and evolution of Bovalino and Siderno canyons and their interaction with the coastal sedimentary dynamic.

234-35 Poster Ioganson, Lidia

ABOUT NATURE OF THE MEDITERRANEAN SEDIMENTARY BASINS

IOGANSON Lidia¹

1 - Institute of the Physics of the Earth RAS

Keywords: sedimentary basin; anomalous mantle source; migration; relationship; asthenosphere

The Mediterranean area is a cradle of European civilization. That is why it would be desirable to understand the nature of this region which states a lot of enigmas to the researchers, especially to the geologists. There are the hundreds of the geological paper on the nature of Mediterranean Sea. This is one more attempt to explain the peculiarities of the Mediterranean sedimentary basins. The peculiarities of the Mediterranean sedimentary basins demonstrate a distinct relation between a depth of the anomalous mantle source and consolidated crust thickness. The minimal thickness of the consolidated crust as much as 5 km corresponds to the asthenosphere uplift up to 30 km. The available data set testifies in favor of the origin of the sedimentary basins influenced by immense body of the anomalous mantle source fixed by the asthenosphere surface. The uplifts of the latter acted in different geological time migrating from East to West and during Cenozoic time - from West to East.

234-36 Poster Karam, Marcia Rosane Kuhn

TRIDIMENSIONAL ARCHITECTURE OF A PALEOCANYON AND GENERATION TURBIDITES FLOWS OF LOW CAPACITY IN ALMADA BASIN, BRAZIL

KARAM Marcia Rosane Kuhn¹; BRITO Ademilson Fagundes¹; BEDREGAL Ricardo Peres¹; CUNHA Gerson G.¹; LANDAU Luiz¹

1 - Laboratório de Métodos Computacionais em Engenharia -

COPPE/UFRJ/BRASIL

Keywords: ALMADA BASIN; PALEOCANYON; CENOMANIAN; TURBIDITES; TRIDIMENSIONAL VISUALISATION

The Almada Basin is located between parallels 14° 30' (Taipus High) and 15° 00' S (Olivença High) and meridians 38° 20' and 39° 14' W, extending towards offshore until ocean crust, reaching about 9000 meters of sediments. This basin is integrated to the rift system that was established in Lower Cretaceous when the separation between the South-American and African plates began. The

structural framework of Almada Basin shows two main faults systems, a main NE and a subordinate NW, both established during the rifting fase. Based on seismic data and wells, a wide erosional feature after Cenomanian located in the offshore portion of the basin was interpreted, with about 80 kilometers of width and filled with campanian/maestrichtians and tertiary sediments called Urucutuca Formation, which thickness vary from 500 up to 2000 meters. Thus, the erosional feature can be identified at a paleocanyon. Structurally, this paleocanyon is partially subordinated to the NW faults system. The origin of the paleocanyon can be related to lowering sea level as much as to tectonics events associated with faults system. The *sui generis* paleogeomorphological features of the paleocanyon is characterized by its wide U shape with gentle dipping borders derived from the structural control itself. We propose that this singular paleogeomorphological feature could contribute to a large sedimentary influx but without strong transportation of capacity, where the sedimentary load is deposited in the proximal regions. The absence of a U or V shaped channel with steep walls can suggest that the analysed paleocanyon according is not related to classical models, *a priori*, with turbidity currents of high density and with large erosional capacity, which could deposit its sedimentary load in distal places. In the Brazil, about 83% of petrolierous reservoirs of Campos Basin are related to turbidites deposits, and in the world, about 90% the petroleum comes from reservoirs related to these deposits, both associated with canyons. The first approach for understanding the analysed paleocanyon was the tridimensional visualization of this paleogeomorphological feature integrated to the spacial distribution of the turbidites, with the support of a mesh of points created from the seismic information. The knowledge of the evolution of these turbidite deposits comes from understanding that process which originated the canyon were active simultaneously in both settings, the continental platform and the upper slope.

234-37 Poster Mahiques, Michel

HYDRODYNAMICALLY-DRIVEN PATTERNS OF RECENT SEDIMENTATION IN THE SHELF AND UPPER SLOPE OFF SOUTHEAST BRAZIL

MAHIQUES Michel¹; TESSLER Moysés¹; CIOTTI Aurea Maria¹; SILVEIRA Ilson¹; Carlos Almeida¹; SÓUSA Silvia Helena Mello¹; FIGUEIRA Rubens Cesar Lopes²; TASSINARI Colombo Celso Gaeta¹; FURTADO Valdenir Veronese¹; PASSOS Raquel Fernanda¹

1 - Institute of Oceanography - University of São Paulo

2 - University Cruzeiro do Sul

3 - Institute of Geosciences - University of São Paulo

Keywords: Sedimentation; Hydrodynamics; SW Atlantic shelf; Continental shelf
Sedimentological parameters of 206 box-core tops and 387 van Veen grab samples were analysed so as to understand the distribution, source, and sedimentation rates in the shelf and upper slope of Southeastern Brazilian

margin. Most of the parameters (bulk organic matter constituents, $\delta^{13}\text{C}$, ϵNd) can be grouped on northern and southern sectors, separated by a sharp boundary. This indicates that sediment sources and sedimentary processes are different in both regions. The southern sector of the study area is more influenced by cold waters coming from the southern portion of the South American shelf and the organic fraction revealed an important role played by the primary productivity in the sedimentation. Also, ϵNd values indicate that part of the inorganic fraction of the southern sector sediments are allochthonous, probably coming from younger rocks of the Andean chain; reaching the shelf through the La Plata river runoff. In the northern part, the sedimentation is controlled almost exclusively by the meandering of the Brazil Current. Compositional and isotope bulk organic parameters showed a more complex mixing of terrigenous and pelagic fractions. Also, ϵNd values are associated to the precambrian rocks of the Brazilian shield. The whole area exhibits very low sedimentation rates, varying from 5 to 190 mm/kyr.

234-38 Poster Mardanian, Inna

PECULIARITIES OF THE LATE CENOZOIC SEDIMENT REMOBILIZATION ON THE EASTERN FAROE MARGIN

MARDANIAN Inna¹; IVANOV Mikhail¹; NIELSEN Tove²; KUIJPERS Antoon²; TJEERD Van Weering¹; THOMAS Richter¹; NIELS Poulsen²

1 - Lomonosov Moscow State University

2 - Geological Survey of Denmark and Greenland

3 - Netherlands Institute for Sea Research

Keywords: mud diapirism; eastern Faroe margin; diatom ooze

Mud diapir fields on the continuation of the Fugloy ridge (eastern Faroe margin) were studied during 12th cruise of "Training through research" (TTR) Programme onboard R/V "Professor Logachev" in 2002, with the use of single-channel seismic, side scan sonar and underwater TV system. The material which forms the diapir bodies was recovered at several bottom sampling sites. Additionally, a diapir from the area was sampled during R/V "Pelagia" cruise in 2001. The material was studied and the results of visual and micro description, XRF, XRD analyses and microfossil investigation are presented. Seismic data showed five units overlaying an acoustic basement formed by basalts. Structures with chaotic internal refractions were observed within the Miocene sedimentary succession formed by biosiliceous deposits and within the upper units (Plio-Pleistocene; L; Pleistocene-Holocene). Structures piercing sea-floor form diapirs up to 100 meters high. The diapirs are characterized by medium and high backscatter on the side-scan sonogram. Bottom sampling revealed that diapir structures are formed by diatom ooze. The lower part of a gravity core is formed by a 15-cm interval of green diatomic ooze with glauconite admixture. A fragment of light olive ooze was obtained by dredge. Similar fragments embedded in silty clayey matrix were observed in the gravity core from the diapir slope. Dinoflagellate assemblage of the green diatom ooze with glauconite indicates Langhian-Serravallian age (Middle Miocene). A piston core taken onboard R/V "Pelagia" showed 4.5-m diatomaceous interval overlaid by 2.5-m hemipelagic sediments presented by silty clays and marl. Diatom oozes of different colours were reported in the core. They include greyish green, yellowish brown, olive brown and olive grey units. Several intervals contain angular clasts of the ooze up to 15 cm in size, sometimes the fragments are embedded in more water-saturated matrix. Fragments of silty clay and marl, MnO patches were randomly scattered within the diatomaceous interval. Different types of diatom ooze, fragments of silty clay and calcareous sediment observed in the core imply different sources of material involved into extrusion. Water saturation of the several ooze intervals possibly reflects high water content of the Miocene diatomaceous sediments covered by dense and impermeable silty clayey deposits. Buoyancy and density inversion could be main factors responsible for diapirism on the Eastern Faroe margin.

234-39 Poster Weaver, Philip

HOLOCENE TURBIDITY CURRENTS IN THE LATEST INDUS FAN CHANNEL

WEAVER Philip¹; KENYON Neil¹

1 - Southampton Oceanography Centre