the N-S trending secondary faults in the northern part of the geothermal field also coincide with relatively high-density anomalies, whereas the NE-SW to E-W trending secondary faults are characterized by low-density.

Regional transect across the Quirquincho Arch (NW Argentina)

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The Chaco-Pampean plain of the Argentine Andean foreland covers the Chaco-Paranaense intracratonic basin and the eastern portion of the Cretaceous Salta Rift basin. At surface, there is no direct evidence for a complex tectonic history of this region. Subsurface data, however, document a geological history of magmatic episodes, multiple tectonic events and sedimentation controlled by tectonics. Inherited subsurface structures are characterized by a preferential NE-SW orientation. This orientation is also broadly reflected by the overall trends of the adjacent Sierras Pampeanas broken-foreland province, the Colonia-Aldao High and the Las Breñas depocenter. This study compiles and reviews available subsurface information including borehole data, 2D seismic-reflection lines and topographic data to reconstruct the tectono-sedimentary history along a regional NW-SE transect between Tartagal (Salta province) and Formosa city (Formosa province); key focus is the analysis of the multi-episodic activity of the Quirquincho Arch (also known as the Rincón-Caburé High). This structure is an extensive and prominent basement ridge that constitutes the boundary between the Chaco-Paranaense basin and the Salta Rift depocenters. Tectonic activity along the Quirquincho Arch is interpreted to have controlled the facies distribution of syntectonic sequences in the two adjacent basins during the Paleozoic and Mesozoic.

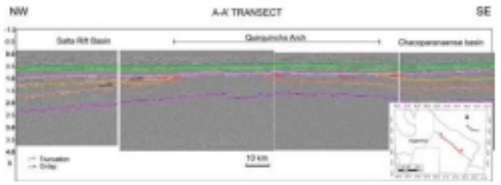

Figure 1. Seismic transect across the Quirquincho Arch.

The interpretation of 2D seismic-reflection data and well-log information allowed to identify the exact subsurface position and shape of the Quirquincho Arch. Its presence is unambiguously reflected on various seismic-reflection lines (Fig. 1). The arch is characterized by multiple reflection terminations at its top and flanks; the interpretation of onlaps and truncations enables the reconstruction of its tectonic history.

Deformation and differential subsidence in the Neuquén Basin, outlines for hydrocarbon exploration

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The Neuquén basin is one of the main hydrocarbon producers in Argentina and also has one of most potentials in the world from the capitalization of its main source rock: the Vaca Muerta Formation. Its history started by the development of a rift system during Late Triassic – Early Jurassic, subsequently filled with sag facies characterized by successive regressions and transgressions of eustatic origin. The Triassic extension was resolved with normal faults of NO-SE to ONO-ESE orientation and transfer zones of NE-SW orientation. Since Cretaceous, it became a foreland basin linked to the Andean orogeny, that printed in the western sector, a N-S fault and thrust belt. However, this apparently simple history has some particular complexities. Towards the south of the basin, a narrow E-W trending fold and thrust belt was developed during Middle Jusrassic – Lower Cretaceous. The inversion of some of the Triassic structures, developed an E-W structural height (Huincul) that controlled the facies distribution during Jurassic and Cretaceous. Both the Jurassic and the Cretaceous-Tertiary (Andean) compressional deformation, invert some of the Triassic structures. However, unlike what was initially assumed, the inversion effect was not as important. This is mainly because, both compression vectors are oblique to the Triassic structures and therefore only some segments of some faults were inverted. The Jurassic compression, from south, printed a dextral component in the southernmost NO-SE Triassic faults, whereas the Cretaceous-Tertiary Andean orogeny, printed a sinistral component over the westernmost NO-SE Triassic faults of the basin. To the southwest of the basin, the extensional structures and both principal compression vectors are overlapped, developing areas with very complex structures. Making things even more complex, the differential subsidence mechanism is over imposed to all deformation process. This is a less spectacular process, however, is very fundamental for hydrocarbon distribution in the basin. The differential compaction between basement and Triassic half grabens infill, controlled a series of normal faults that grew during early Cretaceous grouped above Triassic shoulders. These structures conditioned the migration and accumulation of the hydrocarbon in some of the biggest gas and oil fields of the basin. The effect of differential subsidence is continuous over time, and controls even current basin troughs. Its consequences, are more evident and visible in areas of low compressive deformation, however, there are also recognized in the Jurassic (Huincul) and Cretaceous-Tertiary (Andina) fold and thrust belts. The effect that this mechanism could produce a distortion in the present stress field of the basin that is currently being studied. The understanding of this process is very important for planning developing of non-conventional fields in Vaca Muerta Formation.

Tracing the volcanic and tectonic effects of the Miocene Andean stage along the Patagonian retroarc: an example of the Río Negro system, Argentina

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The Río Negro River system constitutes a drainage network located at the North Patagonian Region (39°S) that connected the Andes with the Atlantic Ocean through more than 600 km long. This corridor is one of the systems that control the transference of materials to submarine shelf, up to sink position, in the Argentina basin. During the Neogene this system was configured in a scenario of profuse arc-explosive volcanism, contractional tilt-block tectonics, the development of the orogenic rain shadow, as well as relative sea level changes. Several fault-bounded exoreic–closed-basins along the retroarc present infill that record endogenous and superficial processes occurred during the birth of the Andean chain, at this latitude, as we observe it today. Even though large-scale stratigraphic scheme and holistic geological models were performed to go forward in the understanding of the system, until now are absent high resolution tectonic-volcano-climatic-eustatic models that allow to understand the sediment supply/accommodation space relationship and the reciprocal stratigraphical effects along the whole system, in which the propagation of the environmental signals be consider. Based on a multidisciplinary approach, which includes structural, stratigraphic, geomorphological and geochronological dataset together with previous surface and subsurface regional surveys, the analysis retroarc basin along Río Negro system is carrying out. The preliminary results indicate that many contractional phases related to out of sequence, thick-skinned tectonics, progressed under explosive volcanism which affected in different way the system, according to the frequency order measured and location along the system. At the foot of the Andes, preliminary geochronological and magnetostratigraphic analysis reveals that the main infill of the basins has a maximum depositional time process of 128 Ky related to PDC as well as resedimented volcaniclastic materials, whereas along the system their show changes in the infill patterns and in the transference systems occurred during middle-upper Miocene. These changes are recorded together with huge climate change related to the uplift and exhumation of the Andes, connection/disconnection of the system with shelf and sea level variations. Future works will aim to the understanding how the subtle interplaying of tectonic-volcano-climatic-eustatic forcing controls determine the reciprocal stratigraphy and its propagational effects from the Andes to the Atlantic sea.

Stratigraphic architecture in early stages of intermontane basin: the Miocene Calchaquí foreland, NW Argentina

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Foreland basins are sensitive recorders of spatiotemporal variations of tectonic and climatic forcing concerning to processes associated with an approaching orogenic front. The analysis of depositional systems, and paleoflows coupled with stratigraphic arrangement of the foreland deposits allows a fairly accurate assessment of extra and intra basin deformational processes. The Calchaquí region, located at ~24-26°S in the Eastern Cordillera of NW Argentina, was once part of the contiguous Andean foreland basin that evolved structurally into a compartmentalized broken foreland during the Mio-Pliocene. This region is ideal for the study of the variations in tectonic, climatic and sedimentary processes, due to very well exposed of basin strata that contain a rich record of flora and vertebrate fossils, and radiometrically datable volcanic ashes. We combined traditional sedimentological methods, U-Pb zircon and K-Ar geochronology, clay mineralogy, and geochemical weathering/climate indices with structural field data and fault modeling to document the stratigraphic response of the former foreland deposits to basin fragmentation. The 14-9 Ma Las Flechas Member (upper Angastaco Formation) and the 9-5 Ma Palo Pintado Formation comprise three depositional systems and transitioned from gravelly braided, sandy braided to anastomosing-river systems. The slow transition from sandy to gravelly braided and the rapid transition from gravelly to anastomosing reveal a prograding-retrograding pattern of the sedimentary sequences highlighting an expansion surface. Thus, the regional sedimentary succession recording the transition between an unrestricted to a compartmentalized