and folds with N or S to NW or SE sense of movement. During Miocene-Pliocene the third T3 event is taken place. It is responsible for the high angle normal fault dismembered the Eocene-Oligocene molassic basin into Neogene grabens. A local T4 event has been recorded affecting also the Neogene sediments of the basin with minor reverse strike slip faults as well as normal faults. The following T5 event is related to big normal active faults. They are coincided to the active tectonic of the study area defined by the earthquake focal mechanisms.

Sedimentary setting of Adriatic flysch formation (Middle Eocene-middle Miocene), Southeastern Montenegro as revealed by turbidite sequences

Kilibarda Z.[1], Čadjenović D.[2], Milutin J. [2] and Radulović N.[2]

[1]*Indiana University Northwest, Gary, IN 46408, United States, zkilibar@iun.edu*
[2]*The Geological Survey of Montenegro, 81000 Podgorica, Montenegro, geozavod@cg.yu*

A 750 m long outcrop of Middle Eocene-Miocene flysch is exposed in an asymmetrical syncline in Crnjak Cove, south of Bar, Montenegro. Texture, physical sedimentary structures, petrography, and trace fossil studied in these sediments allowed the recognition of turbidite facies that display various members of the Bouma sequence (Ta,b,c,d,e). These are interpreted in order to reconstruct the depositional setting of these gravitational deposits. Predominantly clastic lihologies in this 300 m thick sequence are arranged in seven distinct turbidite facies, which represent three superimposed submarine fans. The oldest fan consists of: 1) basal marl (T_1: 0-30 m), which indicate basin to marginal-fan deposits; 2) thin to medium bedded graywackes intercalated with thin mudstones (T_2: 30-140 m), which represent mid fan; and 3) thinly bedded graywackes intercalated with mudstones (T_3: 140-160 m), which indicate outer fan deposits. The second fan is comprised of: 1) thin to medium bedded, coarsening upward graywackes (T_4: 160-190 m) that represent mid fan environment; 2) conglomerates (T_5; 190-200 m) which, in addition to carbonate clasts, also contain large rip-up clasts of siltstones, indicating locally derived channel deposits; and 3) thinly bedded graywackes intercalated with mudstones (T_6; 200-230 m), which represent outer fan deposits. The youngest submarine fan is made of thin bedded graywackes intercalated with mudstones (T_7: 230-300 m) that represent mid fan environment. The graywackes from mid fan facies consist of Bouma's Tb,c,d sets, and at their bases contain flute casts, prod casts, and scour marks. Thin greywackes from outer fan facies contain abundant and diverse *Nereites* ichnofacies.

Mineralogical evolution of contaminated granitic pegmatites hosted in marbles. The role of CO_2 rich fluids on phase relationships of crystallizing granitic melts. An example from the Intermediate Unit of the Central Rhodope Metamorphic Province, Greece

Kipouros N.

Department of Mineralogy-Petrology-Economic Geology, School of Geology, Aristotle University of Thessaloniki, 54124, Thessaloniki, Greece, nkipouro@geo.auth.gr.

The Intermediate Unit of the Rhodope Metamorphic Province in Greece intervenes between the Lower (Pangaion) Unit with continental passive margin affinities, composed of orthogneisses of Permo-Carboniferous magmatic age overlain by amphibolite facies marbles and minor schists, and the Upper Unit dominated with 150 Ma metagranites. The Intermediate Unit is an assemblage of strongly deformed and variably migmatized lithologies of oceanic and trench affinities. An important component of the Intermediate Unit is a migmatized (diatexitic) biotite-plagioclase gneiss, intercalated with marbles, calc-silicate rocks and minor garnet-amphibolites. The leucosome components of the migmatites, representing in situ melts, with granitic and quartz monzinitic compositions and of pegmatitic or aplitic textures, are hosted in the surrounding parental gneisses or in the neighbouring marbles. In the cases they

are hosted in marbles they have the anhydrous assemblage: quartz + plagioclase + Kfs + diopside-hedenbergite cpx + titanite + scapolite + zircon. This paragenesis is interpreted to arise from the interaction of silicic magma with the carbonate host rock. In carbonate rich environments the fluid phase composition should be rich in CO_2. Fluid phase compositions $X_{CO2}fl>0.5$ have been reported in analogous cases where silicic melts are in contact or intrude carbonate rocks. Under these circumstances, imposing nearly anhydrous conditions of crystallization, silicic liquids of extremely high temperature are required in order to crystallize rocks with pegmatitic texture It has been experimentally established that for P=5 to 10 kb and $X_{CO2}fl=0.7$ the granitic Ts is 800 ºC, whereas it is above 950 ºC for $X_{CO2}fl=0.9$. This implies that melting of the gneisses took place at a temperature well above the wet granitic solidus. It is suggested therefore that (HP?) granulite facies conditions existed during the partial melting of the gneisses and the formation of the studied granitic and monzonitic leucosomes in this part of the Rhodope.

Partial melting and genesis of HP graphite-bearing granulites in the Intermediate Unit of the Central Rhodope Metamorphic Province, Greece

Kipouros N. and Dimitriadis S.

School of Geology, Aristotle University of Thessaloniki, 54124, Thessaloniki, Greece, nkipouro@geo.auth.gr, sarantis@geo.auth.gr

Three main tectono-lithostratigraphic Units are pilled up in the Greek part of the Rhodope Metamorphic Province. The Lower Unit (Pangaion complex), with continental passive margin affinities, is composed of orthogneisses of Permo-Carboniferous magmatic age overlain by amphibolite facies marbles and minor schists. The Intermediate Unit is an assemblage of strongly deformed -in parts ultramylonitic- and variably migmatized lithologies of oceanic and trench affinity (amphibolites, eclogites and metatrondjemites bearing MORB and arc signatures, metacherts, phengitic quartzites, biotite gneisses, pelites, psammites and calcsilicates), into which large pods of ultrabasites and ~300 Ma orthogneisses are tectonically intercalated. Biotite (± amphibole) gneisses, dominating the upper part of the Intermediate Unit, are interpreted as trench filling metagreywakes of mainly volcanic origin, dragged down and accreted to the overriding plate of a subduction zone active during the Late Jurassic. Above them, the Upper Unit is composed of orthogneisses of Late Jurassic magmatic age, probably the edifice of a volcanic arc built above this subduction zone.

Although HP (kyanite field) amphibolite facies parageneses characterise the ITU, some evidence of UHP metamorphism has been reported from ex-eclogitic pods and some pelites in it. These may represent samples of deeply subducted material returned by some mechanism from mantle depths and tectonically emplaced at shallower levels. Evidence however also exists that the dominantly HP amphibolite facies parageneses in the ITU overprint earlier HP (kyanite, cpx) granulite facies ones, which were imposed coevally with partial melting in this unit. For the now exposed subducted oceanic and trench lithologies of the ITU, this implies a prolonged residence and thermal relaxation near the base of an overthickened crust, apparently after continental collision. This could only be achieved by an abnormally slow collapse and levelling of the orogen above, probably as a result of preserving a high crustal relief due to Cretaceous shortening (?thrusting) in the Rhodope.

Focused in an area near Sminthi village, partial melting phenomena in the ITU related with the HP granulite event are examined in some detail. The dominant rock type in this area is a migmatized dark coloured Bt-gneiss. Leucosomes of variable sizes and distribution forms have been separated from the mesosomatic gneisses and are interbedded with or cut as veins the surrounding gneisses and marbles. (?)Syn- to post-melting intense deformation affects both the mesosomatic gneisses and the leucosomes forming boudins and tight isoclinal folds. From the migmatitized gneisses two representative rock types bearing evidence of an early HP granulite facies event have been studied in more detail. The first is a medium grained, mesosome dominated metatexitic migmatite with Bt + Pl + Qtz + Kfs + Cpx(Amp) + Gt + accessories (All, Ttn, Ap, Gr, Py(Ght), rounded zircons). The second is a coarse grained