The ‘Green Walls’ project contributes to this question by drawing together state of the art methods from each of these disciplines, as part of a larger project on sandstone heritage and climate change. The overall aim is to form a multi-faceted analysis of the current and future nature of algal greening on sandstone heritage in north-west Britain.

In order to better understand the interplay between climate change and the growth and impacts of green algae (chlorophyta), three phases of study have been adopted within an integrated overall methodology. Linked field and laboratory experiments, microbial species identification as well as impact and bioreceptivity analyses of sandstone contribute towards achievement of the project aim.

Northern Ireland has an abundance of sandstone heritage and given the likelihood of warmer, wetter winters; algal growth on vulnerable monuments is likely to become a primary conservation concern in the next 50 years. It thus makes an ideal major field location for the project. As a point of comparison, a satellite study is being conducted at Sheffield Cathedral. This will form an interesting comparison given the difference in climatic conditions and pollution history. Key foci for study are the impacts of stone aspect and angle of inclination on degree of algal colonisation.

Phase One of the study involves sampling from purpose-built test walls in Derrygonnelly, Northern Ireland as well as sandstone buildings in central Belfast and Sheffield. Novel, non-destructive biological sampling is conducted twice yearly, alongside measurements of moisture movements within stone facades. The rate, extent and composition of biological coverage is and will be closely monitored over the 3-year assessment period.

Phase Two encompasses laboratory analysis of these samples; standard gene profiling and sequencing techniques are used to establish community composition and abundance.

In order to contextualise this information, Phase Three involves laboratory simulations of algal growth on sandstones under likely, future climatic conditions. Composition and growth rates of algal biofilms and their impacts on sandstone will be compared to results from field studies. In effect, this allows for a comparative simulation-based study between present and future climatic conditions.

Investigation of the nature and impacts of algal soiling, as provided by this project, will supply invaluable information for those managing our sandstone cultural heritage. This will enable more informed decisions to be made over appropriate management and conservation strategies for the future.

Architecture of kinematics and deformation history of the Tertiary supradetachment Thrace basin (NE Greece)

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Detailed tectonic analysis on the Tertiary molassic and volcanosedimentary rocks of the Thrace basin allowed us to reconstruct the architecture and structural evolution of the basin, as well as the orientation of the regional paleostress field. The Tertiary molassic sedimentation of the Thrace basin was linked by a calc-alkaline magmatism associated with the Tertiary syn-orogenic extension in the Rhodope province. The Thrace basin was initially developed on the hanging wall of a low angle extensional detachment fault system of Mid-Late Eocene age simultaneously with uplift and exhumation of the Rhodope metamorphic rocks in the footwall. We interpret the molassic Tertiary Thrace basin as a supra-detachment basin associated with intense magmatism. Five (5) deformational events (T1 to T5) have been distinguished related to the basin evolution from Eocene to Quaternary time. T1 is related to low angle normal detachment faults with a mainly toward SW to SSW sense of movement of the tectonic top and subsidence of the initial Thrace basin during Mid-Late Eocene time. T2 is evolved during Oligocene-Miocene time. It is characterized by transpressional tectonic and formation of big strike slip faults and extensional fractures, as well as conjugate thrust faults

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

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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

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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