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SAUDI GEOLOGICAL SURVEY

THE ARABIAN SHIELD STRATIGRAPHIC COMMISSION

The Arabian Shield Stratigraphic Commission (ASSC) was established in 2023. Its primary purpose is to support the Geological Mapping of the Arabian Shield (GMAS) at a scale of 1:100,000. This initiative is a subprogram of the Saudi Arabian Regional Geological Program (RGP), which is a component of the National Industrial Development and Logistics Program (NIDLP). The NIDLP is one of the thirteen programs stated in Saudi Vision 2030. The main role of the ASSC is to provide a modern lithostratigraphic framework and expert scientific oversight for the geological mapping of the Arabian Shield.

The ASSC membership includes international and national academic experts, senior staff from the Saudi Geological Survey, and the Technical Partner (TP, International Geoscience Services, IGS), all of whom possess extensive knowledge and experience in the geology of the Arabian Shield. The ASSC membership comprises the chairman, Dr. W. Kashghari, and the secretary, Prof. M. Abu El-Enen. The international members include Prof. A. Collins from Australia, Prof. C. Passchier from Germany, Prof. M. Whithouse from Sweden, Prof. J. Jacob from Norway, Dr. P. Nehlig from France, Dr. P. Macey from South Africa, Dr. P. Johnson, and Prof. R. Stern from the USA. The national members are Dr. R. Bakhsh from the King Abdulaziz University and Mr. Fayek Kattan. The academic membership of the ASSC is assembled and administered by the China National Geological and Mining Corporation (CGM), represented by Dr. M. Elkomi as the CGM project manager and geologist S. Al-Garni as the SGS project manager.

To formalize the ASSC and initiate its activities, a virtual inception meeting was conducted at the start of 2023. The commission is organized into five task groups: tectonostratigraphic and lithostratigraphic, geochronology, the Arabian Shield stratigraphic database and digital library, and the research, mentorship, and training. In 2023, the ASSC carried out three field transects in the Arabian Shield's middle, north, and south sectors. Field guidebooks were created for these three transects to provide an overview of the Arabian Shield's geology, a concise description of the terranes' geology, and a brief account of the visited sites' geology. These guidebooks are illustrated with maps and figures and supplemented with comments and issues.

Throughout 2023 and later, the ASSC meetings and workshops were organized. At the start of 2024, a meeting was convened to review the current state of the Arabian Shield's lithostratigraphy and tectonostratigraphy. This meeting aimed to address any issues, consider suggestions, and discuss recommendations that could assist the mapping contractor with the detailed geological mapping project of the Arabian Shield.

For the first time, a compiled draft of the Arabian Shield Lithostratigraphic and Lithodemic Code (ASLLC) has been developed specifically for the current GMAS. It is currently under review, and it will be presented at international conferences. Additionally, the geochronology database of the Arabian Shield has been compiled, its age reliability has been verified, and it is now ready for use by all parties.

A workshop involving the mapping contractor, technical partner, client, and ASSC members is scheduled for mid-2024. This workshop aims to transfer the stratigraphic products and discuss the ASSC's recommendations. By the end of this year, and over the next four years, the mapping contractor's results will be evaluated within the framework of the ASLLC's lithostratigraphy. The ASSC members have contributed their expertise through workshops, on-the-job training, the development of scientific skills, and the understanding of application-oriented methodologies.

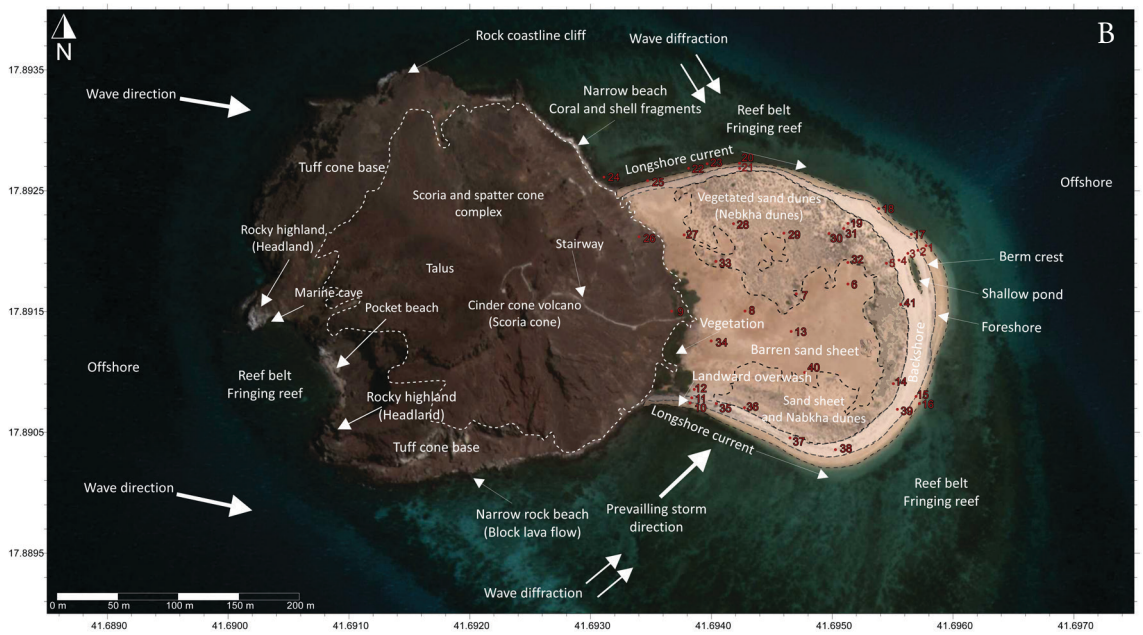
ASSC members on a field excursion to the southern Arabian Shield sector.

Workshop meeting for the ASSC members.

SEDIMENTOLOGICAL AND GEOMORPHOLOGICAL CHARACTERISTICS OF JABAL KUDUMBUL ISLAND, SOUTHEAST RED SEA, SAUDI ARABIA

A marine geological survey of the Quaternary volcanic island of Jabal Kudumbul in the rifted southeastern Red Sea in Saudi Arabia has been conducted for the first time. The survey aimed to document sedimentological and geomorphological characteristics from sample collection and interpretation of high-resolution satellite images taken in the last decade. Beach, sand dune, and sand sheet sedimentary facies types were identified. The volcanic mountain in the western zone of the island and the low-lying sandy shorelines in the eastern zone represent the main geomorphic landforms related to wave and current processes in the study area. The volcanic cone showed three volcano-stratigraphic facies units: basalt rocks, phreatomagmatic lapilli tuff, and vesicular basalt/scoria, indicating that they might have been formed during eruption and interaction between rising magma and shallow seas. The coastline constantly changes over time due to longshore processes and spring tides. A suite of complex wind, wave diffraction, longshore current, and biological processes and episodic synrifting in the area played dominant roles in facies and landscape creation and the overall development of Jabal Kudumbul Island. These findings provide important information for future studies on the arid islands in the Red Sea region beyond modern surficial deposits.

The Jabal Kudumbul volcanic island area is a part of the Red Sea rift and is located offshore on the southeast margin of the rift between latitude 17°53′19″N. and longitude 41°41′33″E. This area sits on a shallow N-NW–oriented platform. The cinder is one of 200 cinder cones that appear to have been less than 150 m high and associated with Pleistocene basaltic flows extruded along the southeast Red Sea coast (Coleman, Gregory, and Brown, 1983). This basaltic flow has been called the Al Birk basalts (Harrat Al Birk) (Bakhsh, 2017). Rifting initiated ~25 million years ago, separating the Arabian and African plates (Stern and Johnson, 2010). This volcanic field has resulted in rift shoulder uplift, basin subsidence, and deposition of shallow to deep marine facies (As-Saruri, Sorkhabi, and Baraba, 2010; Coleman et al., 1977; Nabhan and Yang, 2018; Prinz, 1984). In the Paleogene and Neogene periods, tectonic movements along the southern Red Sea coast were accompanied by widespread volcanic activity, which resulted in layered gabbro, granophyre, and rhyolitic dikes occupying the NW-trending faults (Jado and Zotl, 1984). Proterozoic metamorphic and igneous rocks constitute the basement exposed behind the basaltic escarpment farther to the east of the coast (Hadley, 1981) (**Article published inthe *Journal of Coastal Research, 39(6), 1114–1123, Survey and Exploration Center, Geological Survey Program***).



A: Location map of Jabal Kudumbul Island, Saudi Arabia; B: Facies and geomorphologic characteristics and sample locations.