# Desert Terrain Analysis

Alan Gillespie, Rivka Amit, Yehouda Enzel

The desert terrain program at the Desert Research Institute was funded by the Army Research Office under the guidance of Russ Harmon, and directed by Eric McDonald. Specific research tasks were directed to subcontractors at the Geological Survey of Israel, the Hebrew University, and the University of Washington, and researchers there involved others from the organizations shown at the bottom of the page.

The main goal of the research was to develop a model that summarized hundreds of man-years of geological experience in deserts in order to predict what characteristics unfamiliar surfaces might have, ultimately from the viewpoint of vehicular traffic. Applications include predicting the impact of dust on civilian areas adjacent to military training bases.
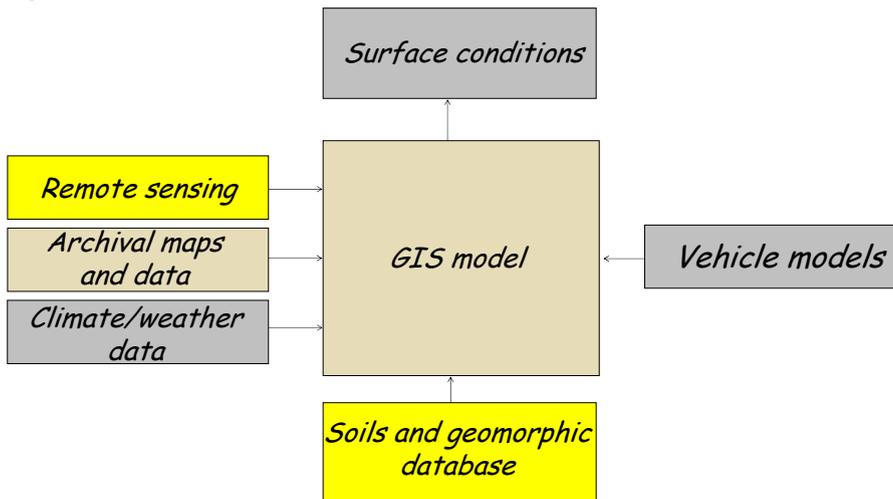
The flow diagram to the left shows the ultimate design of the project. Work has been done in the colored boxes; the subcontracts fit in the yellow ones, developing data and research tools for later integration into the predictive model.

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The pages that follow give an overview of the subcontract research and details on specific projects.

Overview of subcontract research on Desert Terrain Analysis

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1) **University of Washington**: **Alan Gillespie** (*partly funded by NASA Terra/ASTER*), **Iryna Danilina** (funded by DOE/LANL), **Amit Mushkin** (*partly funded by NASA Terra/ASTER*), **Don Sabol**
2) **Geological Surevy of Israel**: Rivka Amit, Michael Byeth
3) **Geological Survey of Israel** and **The Hebrew University**: **Ariel Cohen, Onn Crouvi, Ori Simhai**
4) **The Hebrew University**: **Dov Avigad, Yehouda Enzel, Ari Matmon**
5) **Tel-Aviv University**: **Eyal Ben-Dor**
6) **Desert Research Institute**: **Todd Caldwell, Eric McDonald, Kenneth McGwire, Tim Minor**
7) **Jet Propulsion Laboratory** (NASA/Caltech): **Elsa Abbott** *(funded by NASA Terra/ASTER)*
8) **Johns Hopkins University**: **Charles Hibbitts** *(funded by OGA)*

TASKS

    A) support DRI
       1) Database population (Crouvi et al.)
       2) Lithologic mapping with spectral remote sensing (Gillespie and Mushkin)
       3) Parent material mapping using ASTER (Sabol et al.)
       4) Parent material mapping with airborne MASTER – YPG (Minor et al.)

    B) investigate remote sensing to supplement data base
      1) Mapping
         i) Compositional mapping of playas – Yotvata (Gillespie et al.)
         ii) Compositional mapping – Raham Fan (Crouvi et al.)
         iii) Relative dating – Plains of Paran (Amit et al.)
         iv) Basin hydrology – Qom Playa (Gillespie et al.)
         v) Loess (Crouvi)
      2) Surface properties
         i) Subpixel roughness (Mushkin & Gillespie)
         ii) Soil moisture – Soda Lake (Sabol et al.)
         iii) Differential thermal inertia (Gillespie et al.)
         iv) Rock varnish (Hibbitts et al.)

Research Tasks

Detailed summaries