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MANAGEMENT REPORT

Covering period: June 2002 – November 2003

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ASSESSMENT AND MONITORING OF DESERTIFICATION PROCESSES IN MONGOLIA USING GEOGRAPHIC INFORMATION SYSTEM

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Grantee Institution: Ben-Gurion University of the Negev, Israel

Principal Investigator: Dr. Compton Tucker

Grantee Institution: NASA - Goddard Space Flight Center, USA

Collaborators: Ms. M. Baysgalan
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Institution: National Remote Sensing Center, Ministry of Nature and Environment,
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Project Number: C20-010

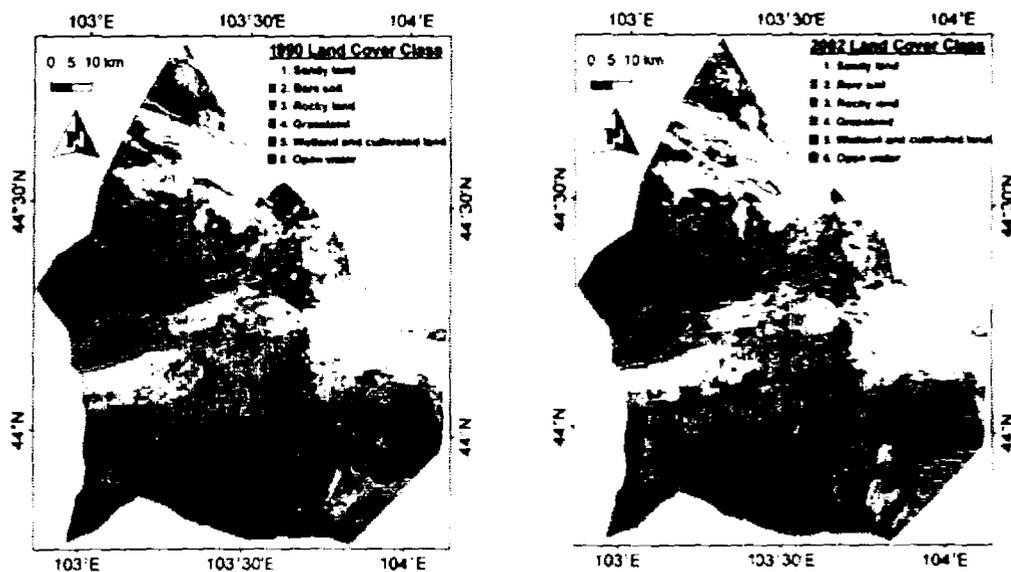
Grant Number: TA-MOU-00-C20-010

Grant Project Officer: William H. Crane,
American Embassy, Tel-Aviv

Project Duration: June 1, 2001 – May 31, 2004

1. SCIENTIFIC SUMMARY

Remote sensing change detection analysis is applied to detect changes of vegetation cover over Bulgan Soum of South Gobi, Mongolia, for 12-year period between 1990 and 2002. Bulgan Soum is located in desert-steppe environments of Mongolia, where the vegetation is sparse and highly sensitive to climatic variability. Since the area is heterogeneous with signs of other ecosystems such as desert and mountain-steppe rather than desert-steppe environments, identification of changes in vegetation cover was diverse in terms of change intensities and spatial extend by different change detection methods. Despite the widespread use of change detection techniques to assess vegetation cover in similar ecosystems, we believe that in an area like Bulgan Soum, combining the results of change detection methods may give better result in study of vegetation degradation than any single methods of change detection. By combining the results of four change detection methods, areas that have varying levels of degradation were identified. Results of this study indicate that the land cover change activities that include drying up of a water lake, dune movement, and re-vegetation in dune footprint, were revealed. These are caused by the climate variations in rainfall and wind regimes integrated to the human activities in increased numbers of livestock grazing and overexploitation of water resources of river that was a source of dried lake for infrastructure development and some plant species for animal fodder as massive harvesting.



2. SCIENTIFIC ISSUES

Due to the limited time for field work in the Gobi Desert, only along the summer months, we would like to have another session of field work in order to complete the scientific goals of the project. In summer 2004 we propose to investigate anthropogenic land (especially vegetation) degradation along a cross section that includes different ecosystems and climatic zones. The idea is to move along the railways from the Russian border in the north, all the way across Mongolia via Ulaanbaatar, to the Chinese border in the south. It happened to be that the railway is well protected with fences and there is a high fine to people who damage the fences or coming inside. Therefore, for many years (about 60) there has been no grazing inside the fences and the area can serve as reference for the degradation processes outside. When the train is winding, the length between the fences can be as wide as 4 km. In addition, along the railway there are several abandoned Russian military camps and radio transmission stations which also can be used for the same purpose. Consequently, the wide areas between the fences and the close-by exlosures can be excellent sites for studying human-induced vegetation degradation in different ecosystems.

In order to implement this workplan, we ask for a non-cost extension of the project for half a year, until November 2004.

3. MANAGERIAL ISSUES

Due to some changes in the workplan (see Section 2 above) and addition hardware and software that contributed (free of charge) by NASA (Section 5 below) we would like to have a non-cost extension of the project for additional half a year and some revisions of the Mongolian budget.

4. SPECIAL CONCERNS

No special concerns.

5. COLLABORATION, TRAVEL, TRAINING AND PUBLICATIONS

During the last year Ms. Bayasagalan visited Ben Burion University for a training period of 2 months between Feb. 1 and Mar. 30, 2003. Mr. Bayarjargal has enrolled for a PhD

in the Jacob Blaustein Institute for Desert Research. Dr. Karnieli visited Mongolia in Summer 2003 for a fieldwork and discussions.

Three scientific papers are in a process of writing:

- Bayasgalan M., Khudulmur, S., Karnieli, A., Bayarjargal, Y. and Tucker, J.C. Evaluating of vegetation phenological changes in Mongolia using NOAA data
- Bayarjargal, Y., Karnieli, A. and Tucker, J.C. Comparison Study of NOAA-AVHRR Derived Drought Indices using Change Vector Analysis Technique
- Bayarjargal, Y., Karnieli, A. and Tucker, J.C. Change Detection of Vegetation Cover in Bulgan Soum of South-Gobi Aimag, Mongolia

The American Co-PI, Dr. Tucker, has contributed a set of 200 Landsat-TM images, covering the entire territory of Mongolia. In addition, he purchased and installed in Ulaan-Bataar, a direct-broadcast receiving station for two spaceborne sensors - SeaWiFS and NOAA, along with their processing software and peripherals. All the above, have not purchased from the US-AID budget. This donation has a significant help with the satellite imagery acquisition and processing.

6. REQUEST FOR AMERICAN EMBASSY TEL-AVIV OR A.I.D. ACTIONS

As explained before, we would like to have a non-cost extension of the project for additional half a year. We believe that this work will have an important impact on understanding desertification processes in the different ecological zones of Mongolia.

Also, we would like to assign the leftover "Material" money to "Equipment". The reason is that NASA covered all the satellite images, we had planned to buy for the project, at no cost. Also, since NASA donated a satellite receiving station to our partners in Mongolia, there is a real need for a mass storage to store all the images acquired by the station.