

Annual Report (1995-96)
of the Centre for Earth Observation Science (CEOS)
A Level 1 Centre of the Faculty of Arts, Department of Geography

Report Prepared By:
Dr. David G. Barber
Director

1.0 Personnel:

1.1 Faculty Members

Dr. D.G. Barber

Dr. M. Benbow

Dr. J. Brierley

Dr. L. Stene

Dr. W. Norton

Dr. G. Smith

Dr. P. Bullock (Internal Partner, Geography Adjunct)

Dr. R. Van Acker (Internal Partner, Soil Science)

Dr. N. Kenkel (Internal Partner, Botany)

1.2 Research Associates - None

1.3 Postdoctoral fellows - None

1.4 PhD Students

Mr. V. Kumar

Mr. K. Hochheim

Mr. J. Yackel

Mr. D. Walker

Mr. G. Ash

Mr. P. Cooley

Mr. J. Hanesiak

Ms. G. Sylvestre

Ms. H. Anderson Ramsay

1.5 Masters Students

Mr. R. Brook
Mr. D. Hamilton
Mr. J. Iacozza
Mr. F. Kaletski
Ms. T. Nichols
Mr. C. Medieros
Mr. S. Drobot
Mr. M. Shymanski
Ms. C. McPherson-Scott

1.6 Technical support staff

Mr. D. Mosscrop

1.7 Support Staff - None

2.0 Academic Contributions

- Began a five year experiment working with a team of international scientists on the Lake Malawi Biodiversity Conservation Project funded by World Bank and CIDA.
- Competed for and was successful in contributing to a National Research Network grant to NSERC to study the North Water Polynya in Baffin Bay.
- Hosted East German Scientists interested in our work on agricultural remote sensing
- Hosted Province of MB Ag. departmental members interested in Precision Farming.
- Participated in the Development of the Geomatics Industry Association of Manitoba.
- Lead a multidisciplinary team of researchers in an Arctic Global Change Project called the Collaborative - Interdisciplinary Cryosphere Experiment (C-ICE'96)
- Began a field experiment in Southern Manitoba dealing with Agrometeorology and Agricultural Earth Observations.
- Participated in various conferences and workshops related to individual members research aims.

- Participated in a National Research Organization (CRYSYS) headed by the Canadian Climate Centre which focuses on the role of the Cryosphere in Global Change

2.1 Faculty Research Publications (for the year Sept'95 to Sept'96)

Dr. D.G. Barber

- Barber, D.G., Klaus P. Hochheim, Roy Dixon*, David R. Mosscrop and Michael J. McMullan. 1995. The Role of Earth Observation Technologies in Flood Mapping; A Manitoba Case Study. *Canadian Journal of Remote Sensing*. 22(1):137-143.
- Barber, D.G., and A. Thomas. The Influence of Cloud on the Radiation Balance, Physical Properties and Microwave Scattering of First Year and Multi-Year Sea Ice *IEEE Transactions on Geoscience and Remote Sensing*. In Second Review.
- Barber, D.G., C. Livingstone, F. Spiring, and M. Shokr. Polarimetric Signatures of Sea Ice and Their Role in Geophysical Inversion and Scene Classification. *IEEE Transactions on Geoscience and Remote Sensing*. In review.
- Thomas, A. and D.G. Barber. Estimating the Climatological Albedo of Sea Ice from Microwave Scattering. *International Journal of Remote Sensing*. In review.
- Barber, D.G., A. Thomas and T. Papakyriakou. The role of synthetic aperture radar (SAR) in surface energy flux measurements over sea ice. Invited Chapter in Tsatsoulis, C. and R. Kwok. *Synthetic Aperture Radar Remote Sensing of Sea ice*. John Wiley and Sons. In Press.

Dr. M. Benbow

- Benbow, S. M. P., 1995, Getting Close From Far Away: Zoos on the Internet, *Internet Research: Electronic Networking Applications and Policy*, Vol. 5, pp. 32-36. in press.
- Benbow, S. M. P., 1995, A view through the glass: aquariums on the Internet, *Internet Research: Electronic Networking Applications and Policy*.

Dr. G. Smith

- Smith, G.C. and Ford, R.G. Geographical Change in the Provision of Residential Care Resources for the Elderly in England, 1988-93, Health and Place. In Press.
- Smith, G.C., Change in elderly Residential Segregation in Canadian Metropolitan Areas, 1981-91, Canadian Journal on Aging, In Press.
- Smith, G.C., Geographical Aspects of Intergenerational Exchange., progress in Human Geography. In Review.

2.2 Degrees Completed

- Thomas, A. On the relationship between microwave scattering and climatological albedo. M.A. thesis. Aug'96.
- Sylvestre, G.M. An Exploratory Study of the Spatially Dispersed Urban Elderly. M.A.

3.0 Sources of Funding Authorized

For the year Sept. 95 to Sept. 96

Principal Investigator	Grant Description
Barber, D.G.	Canadian Climate Centre, Atmospheric Environment Service. Relationship between physical, electrical and microwave scattering characteristics over snow covered sea ice.
Barber, D.G.	Ice Centre Environment Canada, Grant in support of the purchase of a surface based scatterometer
Barber, D.G.	Canada Centre for Remote Sensing - Radar Data Development Programme (RDDP). Grant in support of the purchase of a surface based scatterometer
Barber, D.G.	Office of Naval Research, U.S.A. Research Grant to participate in the Snow/Sea Ice Electromagnetics Accelerated Research Initiative (ARI).
Barber, D.G.	Ice Centre, Environment Canada. Grant to support Arctic Sea Ice Research
Barber, D.G.	Canadian Space Agency ADRO research grant to support research into agricultural remote sensing with RADARSAT (3 year grant)
Barber, D.G.	Canadian Climate Centre, Toronto, Ont. Travel Grant to present a seminar on

- research results of
CRYSYS research projects.
- Barber, D.G. Canadian Space Agency
ADRO research grant to
support research into sea ice
remote sensing with
RADARSAT (3 year grant)
- Barber, D.G. C-ICE'96 - Polar
Continental Shelf Project,
Energy Mines and
Resources. This is a grant
of in-kind support for
helicopter, twin otter and
snow machine rental;
room and board; field
equipment, etc.
- Barber, D.G. Canadian Space Agency.
Research support grant for
access to RADARSAT
satellite data (both sea ice
and agricultural projects =
45 scenes@1000/scene)
- Barber, D.G. World Bank and CIDA
grant to support research
work on the Lake Malawi
Biodiversity Conservation
Project, Malawi Africa. (4
year grant)
- Barber, D.G. Province of Manitoba.
Research support grant for
access to RADARSAT
satellite data (22
scenes@1000/scene)
- Barber, D.G. Geomatics Canada, Ottawa,
Ont. Travel Grant to
participate in the National
Advisory Council to the
Canada Centre for Remote
Sensing (May'96)
- Barber, D.G. Northern Studies Trust

Fund for Support of 4 graduate students in the C-ICE'96 program

- Barber, D.G. Canadian Space Agency and Canada Centre for Remote Sensing. Research Grant for flying hours using the Itres Inc. Compact Airborne Spectral Imager (CASI) - [10 hours of flying time @ 2K/hour in July of 1996]
- Barber, D.G. Program Development Fund of the Faculty of Arts. Grant to help support the purchase of a large format colour plotter
- Barber, D.G. Canadian Climate Centre, Atmospheric Environment Service. Research Grant to investigate development of a SWE algorithm for snow covered sea ice
- Barber, D.G. Canadian Climate Centre, Atmospheric Environment Service. Linking remote sensing data with a one-dimensional thermodynamic model of snow covered sea ice.
- Barber, D.G. Ice Centre, Environment Canada. Grant to support analysis of passive microwave signature of sea ice from the C-ICE'96 experiment
- Benbow, M. Faculty of Arts Programme Development Fund
- Smith, G.C. Canadian Association on Gerontology National

subtotal

Total Grants Held

The Faculty of Arts provides a baseline budget to CEOS which is used to support research and equipment requirements of CEOS. The Director is provided with a 0.5 course remission from the Faculty. We have computer labs located in rooms 229, 205 and 203 Isbister and a physical science lab in room 104 Isbister

4.0 Financial Stability

The survival of CEOS remains tenuous at best. Problems relate to lack of teaching staff, support staff and hours in the day. We are working on the problems with the Faculty of Arts.

5.0 Objectives Met?

I believe that we have met most of the objectives that were set forth in our terms and objectives. We have attracted several more faculty to the centre. This means that the academic workload can be distributed more broadly. We require new faculty members, teaching/research staff and some support staff.

6.0 Future Growth?

Growth is not really feasible in the current financial climate of the University or that of our external funding agencies. We are focusing instead, on substantiating our existing physical and intellectual resources in the hopes of weathering the difficulties we face in the next several years.

7.0 Difficulties

These are rather numerous and have not changed from last years report:

a) CEOS requires another (presumably new) faculty member from the Department of Geography to take an active role in the Centre. This person is essential for both teaching and research in the quantitative and physical geography sides of both the Centre and the Department.

b) CEOS requires an administrative structure that is more responsive to the notion of securing external funds to run the Centre. It is clear that the University simply cannot afford to run something like CEOS. I do believe, however, that the University does have tremendous leverage potential to compete for funds (both nationally and internationally). To realize this potential the University should encourage excellence and focus on vertical rather than horizontal cuts in support.