ASSESSMENT OF NON-ACADEMIC OUTCOMES (FALL 2003 – SPRING 2004)

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Unit: CENTER FOR REMOTE SENSING **Date 4 February 2004**

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I. Mission:

The Center for Remote Sensing was established in 1988 as a means of utilizing the rapidly evolving technology of satellite imaging to contribute to the scientific knowledge of environmental resources, ecosystems and human communities. The Center trains specialists in the theory and techniques of remote sensing, and provides scientific advice to local, regional, national and international communities, thereby supporting the University's mission of teaching, research and service. Dr. Sam Atkinson has been the Director since its inception. It has been a successful research organ, conducting or collaborating on over $3.7 million in funded research and contributing to scientific knowledge with more than 90 publications.

The Center serves as a primary mechanism to integrate and enhance the expertise at UNT for digital image processing, satellite remote sensing, and geographic information systems to study address many types of environmental questions. Its goals are to:

1. To conduct basic and applied research on quantitative remote sensing technologies for monitoring land and water environments;

2. To develop new and innovative techniques for managing the multiple, diverse types of spatial information required to make informed and balanced decisions about resources, ecosystems and human communities;

3. To promote regional analyses for environmental management questions;

4. To develop and provide educational opportunities to individuals interested in computer aided analyses of remote sensing and spatial information data.

Remote sensing techniques are used by the Center to collect and assess valuable, often unique information about the Earth's land, water, atmosphere, and biological resources. Remote sensing systems, such as cameras, scanners, radars, and lasers can be employed to inventory, evaluate, and monitor landuse, water resources, cropland and rangeland, conservation practices, and urbanization. This information has scientific importance in understanding how environmental systems work and is exceptionally valuable in making informed and balanced decisions about human impacts on the environment. In addition to research, CRS supports graduate course work and graduate theses/dissertations where remote sensing techniques are used to examine environmental issues. Scientific research conducted by CRS has been supported by entities such

as NASA, EPA, the U.S. Army Corps of Engineers, local, regional and state governments and commercial companies

II. Previous Evaluations of the Unit:

There were no formal evaluations of CRS between 1999 and 2003.

Informal evaluations can be based on contributions to scientific knowledge, typically indirectly measured by the number and quality of publications and presentations of research results, and the number and quality of external research funding. Although the CRS underwent a 2-year period of hiatus (January 2002 through December 2003) while its Director, Dr. Sam Atkinson was working as Chair of the Department of Environmental and Occupational Health at the UNT Health Science Center's School of Public Health, the CRS was none-the-less, still active. Between 1999 and 2003, CRS activities generated 15 scientific papers and technical reports, 7 presentations at national and international scientific conferences, and 8 research grants totaling $551,154.

PAPERS:

15. Waller W.T., Dickson, K.L. and Atkinson, S.F., Ammann, L.P., 2002, "An Analysis of Phytoplankton Abundance, Zooplankton Abundance and Chlorophyll *a* Data Collected During the Water Quality Surveys of Lake Texoma, 1999-2001 with Comparisons to 1996-1997 Data", prepared for the U.S. Army Corps of Engineers, Tulsa District, 78 pgs.
14. Waller W.T., Allen, H.J., Dickson, K.L. and Atkinson, S.F., 2002, "Time Relevant Physical Chemical Monitoring in Lake Texoma", prepared for the U.S. Army Corps of Engineers, Tulsa District, 15 pgs.
13. Dickson, K.L., Waller W.T., Atkinson, S.F., Ammann, L.P., Doyle, R.D., Clyde, G.A., Jr., Mabe, J.A. and Baugher, T.W., 2002, "Assessment of Lake Texoma Phytoplankton Production Using Community Analysis, Chlorophyll Monitoring, Chlorophyll Mapping and Measurements of Primary Productivity", prepared for the U.S. Army Corps of Engineers, Tulsa District, 473 pgs.
12. Dickson, K.L., Martin, H., Acevedo, M.F., Atkinson, S.F., Kennedy, J.H. and Waller, W.T., 2002 "Environmental Conditions Online DFW Metroplex (ECOPLEX): Real Time and Near Real Time Monitoring for Public Information, Decision making and Education", prepared for the U.S. Environmental Protection Agency, 31 pgs.
11. Atkinson, S.F. and Smith D.P., 2001, "Ground Control Points for Satellite Imagery Rectification: Comparing Topographic Map versus GPS Derived Points" GIM International, Vol. 15, No. 11, pp. 211-216.
10. Atkinson, S.F., Waller, W.T. and McDonough, T.J., 2001, "Assessing Atrazine Pollution Potential to Drinking Water Reservoir Using Remote Sensing and Geographic Information System Modeling" Aquatic Ecosystem Health and Management, Vol. 4, pp. 327-338.
9. Smith, D.P and Atkinson, S.F., 2001, "Accuracy of Rectification Using Topographic Maps versus GPS Ground Control Points", Photogrammetric Engineering and Remote Sensing. Vol 67, No. 5, pp. 565-570.
8. Atkinson, S.F., Waller, W.T., Dickson, K.L., Sanmanee, S. and Moreno, M.C., 2001, "Atrazine Monitoring and Modeling in the Lake Lavon Watershed", prepared for the Trinity River Authority of Texas, 199 pgs.
7. Atkinson, S.F., Waller, W.T., Dickson, K.L., Sanmanee, S. and Moreno, M.C., 2001, "Atrazine Monitoring and Modeling in the Lake Lewisville Watershed", prepared for the Trinity River Authority of Texas, 243 pgs.
6. Waller, W.T., Dickson, K.L., Atkinson, S.F. and Ammann, L.P., 2001, "An Analysis of Phytoplankton Abundance Data Collected During the Water Quality Survey of Lake Texoma: August 1996-September 1997", prepared for the U.S. Army Corps of Engineers, Tulsa District, 68 pgs.
5. Atkinson, S.F., Bhatia, S., Schoolmaster, F.A, and Waller, W.T., 2000, "Treatment of Biodiversity Impacts in a Sample of U.S. Environmental Impact Statements" Impact Assessment and Project Apprasial, Vol. 18, No. 4, pp. 271-282.
4. Atkinson, S.F., 1999, "Water Impact Assessment" in Petts, J (ed). Handbook of Environmental Impact Assessment, Blackwell Science, Oxford, England, pgs. 273-300.

3. Dickson, K.L., Zimmerman, E.G., Atkinson, S.F., Schoolmaster, F.A. and Fitzpatrick, L.C., 1999, "Post-Impoundment Study of Ray Roberts Lake, Year Ten", prepared for Fort Worth District Corps of Engineers, Fort Worth, Texas, 230 pgs. plus appendices.
2. Neal, D.M. and Atkinson, S.F., 1999, "Emergency and Crisis Management: A Remote Sensing Application - Final Report", NAG5-2905, National Aeronautics and Space Administration, Goddard Space Center, Greenbelt Maryland, 60 pgs.
1. Atkinson, S.F., Dickson, K.L., Waller, W.T., Ammann,L., Franks, J., Clyde, T., Gibbs, J. and Rolbiecki, D., 1999 "A Chemical, Physical and Biological Water Quality Survey of Lake Texoma: August 1996 - September 1997", prepared for the U.S. Army Corps of Engineers Tulsa District, University of North Texas, Denton, Texas, 2113 pgs.

PRESENTATIONS:

7. Atkinson, S.F., "Atrazine Modeling and Monitoring", presented at the 2002 Baylor University Environmental Science Seminar Series, October 2.
6. Atkinson, S.F., "Mitigation and Monitoring of Cumulative Effects", presented at the 2000 Council on Environmental Quality's Cumulative Effects Workshop, Olympia, Washington, September 18-20.
5. Atkinson, S.F., "Case Study of Cumulative Effects Assessment for Resource and Ecosystem Management - The Tusayan (Grand Canyon) EIS", presented at the 2000 Council on Environmental Quality's Cumulative Effects Workshop, Olympia, Washington, September 18-20.
4. Atkinson, S.F.,"Documentation of Biodiversity Impacts (Including Cumulative Biodiversity Impacts", presented at the 1999 International Association of Impact Assessment, Glasgow, Scotland, June 14-19.
3. Atkinson, S.F.,"The Challenge of Changing Attitudes about Air Quality - Challenge #1 Understanding the Fundamentals", presented at the 1999 Sustainable Communities Conference, Denton, Texas, May 27-28.
2. McDonough, T.J., Atkinson, S.F., and Waller, W.T. "Analysis of Atrazine Runoff Risk Potential in a Regional Watershed Using Remote Sensing and GIS",presented at the 1999 Meeting of the American Society of Photogrammetry and Remote Sensing, Portland, Oregon, May 17-21.
1. Atkinson, S.F., and Rolbecki, D.A. "On Determining Chlorophyll-a Concentration from Overall Turbidity for Establishing the Trophic State Index Using Hyperspectral Data", presented at the 1999 Annual Meeting of the American Society of Photogrammetry and Remote Sensing, Portland, Oregon, May 17-21.

RESEARCH GRANTS

No.	Date	(PI or Co-PI, Title, Sponsor, Length)	Level ($)
8.	2003	(PI) Public Health Traineeships, Health Resources and Services Administration, 1 year	11,050
7.	2003	(Co-PI) Breast Cancer Modeling for Tarrant County, Texas, Susan B. Komen Foundation, 1 year	64,000
6.	2002	(PI) Public Health Traineeships, Health Resources and Services Administration, 1 year	9,006
5.	2002	(Co-PI, joint UNT and SPH) Lake Texoma Watershed Assimilative Capacity, Environmental Protection Agency, 1 year.	165,000
4.	2001	(Co-PI) Cumulative Risk Assessment Protocol, Environmental Protection Agency, 1 year.	7,500
3.	2000	(PI) Atrazine Pollution Potential Modeling, Trinity River Authority of Texas, 1 year.	99,668
2.	2000	(Co-PI) Automated Water Quality Mapping, U.S. Army Corps of Engineers, 1 year.	65,000
1.	1999	(Co-PI) System Assimilative Capacity of Lake Texoma, U.S. Environmental Protection Agency, 2 years.	129,930

III. Statement of Expected Outcomes:

In the next five years the CRS will continue to focus on adding to the scientific knowledge through research efforts, and the contribution that its research activities have on graduate education and community outreach. CRS will also continue to support training for UNT students, staff and faculty interested in using satellite imaging technology.
Over the next five years CRS expects:

- To continue seeking and garnering research support in order to contribute to the scientific knowledge of satellite imaging technology for understanding environmental resources, ecosystems and human communities.

- To continue training graduate students in the art and science of satellite imaging.

- To continue disseminating scientific results to the remote sensing community.

- To continue supporting local, regional, national and international communities in understanding how satellite remote sensing can help them address environmental issues.

IV. Measuring Expected Outcomes:

Assessment measures of CRS's expectations include:

- Tracking the number and value of research proposals submitted individually or collaboratively with other research units.

- Tracking the number and value of research grants and contracts awarded.

- Tracking the number of graduate students trained in the art and science of satellite imaging.

- Tracking the number of professional papers, technical reports and other methods of information dissemination.

- Tracking the number of outreach activities extended to local, regional, national and international communities.

Frequency of Measurement: Annually

IV. Use of Assessment Results:

Results of tracking CRS's expected outcomes will be used to assist the Director in making decisions about research directions that the CRS might pursue. For example, success in garnering research support for certain types of projects should lead to the development of additional proposals addressing those types of research questions. Likewise, interest in published scientific reports should help the Director understand trends in research activities, assisting him in efforts to stay at the leading edge of the field. These assessment should also

shed light on potential collaborative efforts with others pursuing scientific knowledge whose interests are indirectly related to satellite remote sensing, but partnership would improve the collective scientific knowledge in more than one scientific field. Finally, assessment results should assist the Director in recruiting outstanding graduate students interested in the field of remote sensing.

VI. Changes Made Based on Assessment Results:

The informal process of tracking contributions of CRS has lead to continuing adjustments to research, education and outreach activities. As new remote sensing knowledge or technologies appear (e.g. Global Positioning Satellite systems), CRS devotes substantial efforts to incorporate that knowledge and technologies in its research activities. Both basic and applied research proposals include the latest scientific knowledge, so that success likelihood is maximized. Basic research proposal focus on expanding the scientific knowledge base, while applied research proposal focus on how research results can assist in making informed and balanced decisions about resources, ecosystems and human communities at regional scales. As research projects begin to incorporate the latest knowledge, the knowledge become part and parcel of the educational activities of graduate students and faculty who utilize remote sensing.

Signature of Person Completing the Form:

_____ Date: 4 February 2004

Signature of Unit Head after Reviewing the Form:

_____ Date: 4 February 2004