

# CURRICULUM VITAE

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**Santhosh K. Seelan**

**Professor, Department of Space Studies**

**John D. Odegard School of Aerospace Sciences**

**University of North Dakota**

**Grand Forks, ND 58202-9008, U.S.A.**

**E-mail: [seelan@space.edu](mailto:seelan@space.edu), Telephone: 701 777 2355**

**SUMMARY OF CAREER EXPERIENCE:** In a career spanning three decades, I have **worked in the academia, government, private industry, and nongovernmental organizations** as a scientist, manager, executive, and administrator. I have had the opportunity to **work/study in five countries and four continents**, which enables me to bring in both national and international perspectives to the positions I hold. My career experience includes initiating, executing and or directing large national science application projects aimed at providing direct societal benefits, such as the Technology Mission on Drinking Water, Indian Remote Sensing Satellite Data Utilization Program, and regional programs such as the Crop and Range Alert System Project in the US Upper Midwest that aims to promote the use of geospatial technology among farmers and ranchers. The senior executive positions I have held in the past have provided me with wide experience in managing technical and non technical staff, initiating and managing change, budget management, articulating a vision for applying science and technology for practical human benefits, and negotiating international agreements (such as the India-EOSAT agreement for global distribution of IRS data) and inter-agency collaborative projects.

**STATUS:** US Citizen

## EDUCATIONAL BACKGROUND

### **Ph.D. Remote Sensing**

(Jawaharlal Nehru Technological University, Hyderabad, India, 1994)

Dissertation Title: "Remote Sensing Applications and GIS Development for Groundwater Investigations"

### **Practical Training in Remote Sensing for Geosciences**

(Free University of Berlin, Germany, May-July 1979)

### **Post Graduate Diploma in Groundwater Research**

(Hebrew University of Jerusalem, Israel, 1975)

### **M.Sc. Applied Geology**

(Indian Institute of Technology, Bombay, India, 1974)

Thesis Title: The Mineralogy and Geochemistry of Fluorite Deposits of Kahela-Manokipal Region, Rajasthan, India.

### **B.Sc. Geology** (with Math, Chemistry, **English** and **French** as ancillary subjects)

(Annamalai University, Tamil Nadu, India, 1971)

## PROFESSIONAL EXPERIENCE

### **1998 - to present: University of North Dakota (UND)**

2009 – spring semester only - Interim Associate Dean, John D. Odegard School of Aerospace Sciences

2006 – to current, Professor (tenured), Department of Space Studies, John D. Odegard School of Aerospace Sciences. Also serve as Graduate Director since April 2007.

- 2005 - 06 Associate Professor, Department of Space Studies.
- 2003 - 05 Associate Professor and Chair, Department of Earth System Science and Policy, John D. Odegard School of Aerospace Sciences
- 2000 - 2005 Lead Scientist, Crop and Range Alert System Project, Upper Midwest Aerospace Consortium (UMAC), John D. Odegard School of Aerospace Sciences
- 1999 - 2003 Research Associate Professor, Upper Midwest Aerospace Consortium, John D. Odegard School of Aerospace Sciences
- 1999 – 2003 Director, UMAC - Earth Science Information Partners
- 1998 - 1999 Research Associate, Upper Midwest Aerospace Consortium, John D. Odegard School of Aerospace Sciences
- 1997 - 1998: Terralink New Zealand Ltd**, a New Zealand government owned geospatial enterprise.  
Land Monitoring Consultant
- 1995 - 1996:** Worked as General Manager, **ESRI India**, briefly. Coordinator, **ATLA, Wellington, New Zealand** - a Non Governmental Organization promoting sustainable living.
- 1977 - 1995: National Remote Sensing Agency (NRSA), Department of Space, Govt. of India, Hyderabad, India**
- 1990 - Appointed Head, NRSA Data Center and Director IRS Data Dissemination
- 1984 - 1990 Principal Investigator of Groundwater Projects
- 1988 - Promoted as Scientist, Grade SF
- 1983 - Promoted as Scientist, Grade SE
- 1980 - Promoted as Scientist, Grade SD
- 1977 - Joined as Scientist, Grade SC
- 1975 - 1977: Operations Research Group, Baroda, India** – a natural resources consultancy group
- 1976 - Promoted as Senior Research Analyst
- 1975 - Joined as Research Analyst

**REGULAR TEACHING INTERESTS:** Teaching interests include remote sensing, global change and international space programs. Have taught or teach the following courses at the University of North Dakota.

1. SpSt 435: Global Change
2. SpSt 450: International Space Programs. Co-taught with five other faculty
3. SpSt 501: Survey of Space Studies I. Co-taught with other faculty
4. SpSt 522: Remote Sensing Fundamentals
5. SpSt 523: Remote Sensing Applications
6. SpSt 545: Space and the Environment. Co-taught with five other faculty
7. SpSt 575: Remote Sensing in Developing Countries
8. SpSt 590: Colloquium
9. SpSt 593: Individual Research in Space Studies
10. SpSt 595: Space Studies Capstone
11. SpSt 997: Independent Study
12. SpST 998: Thesis
13. ESSP 501: Earth System Science and Policy I
14. ESSP 501R: Earth System Science and Policy Recitation
15. ESSP 501L: Earth System Science and Policy Lab
16. ESSP 540: Advanced Topics in Geospatial Technologies
17. ESSP 594: Directed Study
18. Geog 575: Seminar in Remote Sensing: Remote Sensing in Developing Countries

## **NON FORMAL TEACHING:**

As Lead Scientist of the Crop and Range Alert System project, designed, developed and taught at “hands-on” remote sensing training programs for the farmers, ranchers and other end users. Between year 2000 and 2006, 33 day long training sessions were held at UND and other locations in South Dakota and Wyoming and a total of 564 end users were trained through these non-traditional teaching programs.

Transfer of technology and technology promotion formed an integral part of the groundwater targeting projects carried out at NRSA, India. Organized and taught at a number of training programs for practicing hydro-geologists, at NRSA and at the National Geophysical Research Institute to expose them to the potential applications of remote sensing. In addition, taught at a number of training courses organized by UNICEF, UNDP and FAO in India and Nepal.

## **CONTRIBUTIONS TO RESEARCH**

### **Applied Remote Sensing Research**

***Farming and ranching:*** As the Co PI and Lead Scientist for the Crop and Range Alert System Project, Upper Midwest Aerospace Consortium (UMAC), University of North Dakota, responsible for providing scientific and technical lead for the Crop and Range Alert System Project (<http://www.umac.org/express/index.html>). This project promotes the use of geospatial technology by end users through near real time delivery of products and services derived from satellites and aerial platforms to farmers and ranchers, application development, user networking through a “learning community” approach, and training. The project has grown from 10 end users participating in 1999 to over 600 in 2005. During the same period, 504 end users have been trained in the use of geospatial tools in various training programs at UND.

Current research interests include detection and mapping of Rhisomania, a disease affecting sugarbeets, precision farming, mapping of leafy spurge and impact of declining water tables on irrigated land area and food production in developing countries.

Power point presentations and videos of lectures describing these projects in more detail can be found at: <http://www.space.edu/aerospace/staff/seelan.php>

### ***Landcover mapping and change detection:***

As a Land Monitoring Consultant at Terralink New Zealand, was responsible for creating a landcover data base for the entire country. Recent study on irrigated landcover change in Bangladesh and current projects on irrigated cropland inventory, and impact on mining involve study of landcover change over 30 year period.

***Geological/ geomorphologic mapping and groundwater targeting:*** As remote sensing applications scientist at NRSA, India, was responsible for research and development on the use of remote sensing techniques for groundwater investigations through pilot projects and later through user paid consultancy projects in various parts of India. Notable among these were projects executed in Tamil Nadu state in Southern India and Bundelkhand in Central India. Interpretation keys and techniques for integration of various parameters were developed during this time. Later as Principal Investigator of Groundwater projects at NRSA, was responsible for operationalisation of remote sensing applications for ground water investigations in the country and execution of large nation-wide projects. Notable among these projects were the Technology Mission on Drinking Water aimed at providing water

supply to the rural population of India and the Maharashtra and Karnataka State ground water projects carried out during the drought of 1987 to provide timely support for drought relief programs. During this period also carried out geological and geomorphologic mapping as part of several multi-disciplinary thematic projects.

### **Other Applied Research**

**Management information systems for agriculture sector:** At Operations Research Group, India, was a core member of a national level study on Management Information Systems for agriculture sector.

**Surface water resources:** At Operations Research Group, India, was a member of a core team on a state level systems study on water resources and a district level planning study projecting the use of water resources. Current research interests include land cover dynamics as a result of changing water availability, particularly in large food producing areas, and study of impact of climate change on water availability and food production in India.

### **Recent Student Research Projects:**

1. David Hartzell: Microwave Remote Sensing Techniques for Investigating the Impact of Palm-oil Plantations and Other Risks to the Tanjung Putting National Park, Indonesia.
2. Bethany Kurz: Evaluation of Temporal Trends in Irrigated Agriculture overlying the Ogallala Aquifer, United States.
3. Lisa Kuchy: Remote Sensing-based Study of Land-Cover Changes Related to Mining and its Impacts on Marine Fauna: A Case Study in Goa, India.
4. Noel Aloysius: Climate Change and its Impacts on Evapotranspiration: A Temporal and Spatial Analysis for India.
5. Shahriar Pervez: Land Cover and Vegetation Dynamics, and Conversion of Agricultural Land in Bangladesh, 1973-2003.

### **GRANT AWARDS RECEIVED**

#### **As Principal Investigator**

1. 2005-2007. NSF-EPSCOR Faculty Start Up Grant. \$100,000.
2. 2001. NASA Scientific Data Purchase, Stennis Space Centre, High Resolution, Multispectral Aerial Imaging for Sustainable Rangeland Management, Mortenson's Ranch, South Dakota. Task 1250, \$43,068.
3. 2001. NASA Scientific Data Purchase, Stennis Space Centre, High Resolution, Multispectral Aerial Imaging for Study of Nutrient Uptake in Plants, Hoveland, South Dakota. Task 1222, \$45,732.
4. 2001. NASA Scientific Data Purchase, Stennis Space Centre, High Resolution, Multispectral Satellite Imaging for Land Management in East Iron, Rosebud Indian Reservation, South Dakota. Task 1087, \$2,784.
5. 2001. NASA Scientific Data Purchase, Stennis Space Centre, High Resolution, Multispectral Satellite Imaging for Flood Inundation Study in Nelson County in North Dakota. Task 1072, \$5,283.
6. 2001. NASA Scientific Data Purchase, Stennis Space Centre, High Resolution, Multispectral Satellite Imaging for Teepee Village Location Studies, Rosebud Indian reservation, South Dakota. Task 1023, \$2,142.

7. 2001. NASA Scientific Data Purchase, Stennis Space Centre, High Resolution, Multispectral, Satellite Imaging for Land management in Rosebud Indian reservation, South Dakota. Task1021, \$5,997.
8. 2001. NASA Scientific Data Purchase, Stennis Space Centre, High Resolution, Multispectral, Satellite Imaging for Crop Studies in Red River Valley, North Dakota. Task 1020, \$29,278.
9. 2000. NASA Scientific Data Purchase, Stennis Space Centre, High Resolution, Multispectral, Satellite Imaging for Leafy spurge Detection in Wyoming. Task 624, \$6,925.
10. 2000. NASA Scientific Data Purchase, Stennis Space Centre, High Resolution, Multispectral, Satellite Imaging for Fire Fuel Prescribed Burn Project in Wyoming. Task 622, \$6,568.
11. 2000. NASA Scientific Data Purchase, Stennis Space Centre, High Resolution, Multispectral, Satellite Imaging for Crop Disease Studies in Red River Valley, North Dakota. Task 620, \$12,899.
12. 1999. NASA Scientific Data Purchase, Stennis Space Centre, High Resolution, Multispectral, Aerial Imaging for Weed detection in Range Lands, Wyoming. Task 224, \$97,946.
13. 1999. NASA Scientific Data Purchase, Stennis Space Centre, High Resolution, Multispectral, Aerial Imaging for Crop studies in Red River Valley, North Dakota. Task 217, \$139,149.

#### **As Co-PI/Lead Scientist**

1. 2004. NASA EPSCoR, Vegetation Dynamics in Bangladesh, \$4,975
2. 2004. NASA/Raytheon, Building a Crop and Range Alert System – Year V, \$275,000
3. 2003. NASA/Raytheon, Building a Crop and Range Alert System – Year IV, \$500,697
4. 2002. NASA/Raytheon, Building a Crop and Range Alert System – Year III, \$527,716
5. 2001. NASA/Raytheon, Building a Crop and Range Alert System – Year II, \$238,880
6. 2000. NASA/Raytheon, Building a Crop and Range Alert System – Year I, \$326, 019

#### **As Co-Investigator/Project Scientist**

1. 2009. Alaska SAR Facility , Utilizing ALOS data for monitoring oil-palm and forest changes to the Tanjung Puting National Park, Indonesia – no grant money, data products only.
2. 2004. NASA, Northern Great Plains Centre for People and Environment, \$2,149,000
3. 2003. NASA, Northern Great Plains Centre for People and Environment, \$2,682,000
4. 2003. USDA-ARS, Agricultural Research Service, \$347,000
5. 2002. NASA, Northern Great Plains Centre for People and Environment, \$1,996,000
6. 2002. NASA, A Public Access Resource Centre – Implementation Phase, \$1,000,000
7. 2001. NASA, Northern Great Plains Centre for People and Environment, \$1,496,000

#### **Travel Grants Received**

1. 2007. Full travel grant from United Nations to participate in the 17<sup>th</sup> UN/IAF Workshop. Hyderabad, India.
2. 2006. Full travel grant to visit Haiti to explore research opportunities. Costs covered by the Haitian American Engineers and Scientists Association.
3. 2005. Travel grant to attend International Conference on Environmental Management, Hyderabad, India. UND Senate Scholarly Activities Committee. \$939.35
4. 2004. Full travel grant to attend INSAR Workshop, Oxnard, CA. Costs covered by NASA.
5. 2002. Full travel grant to attend meeting of Haitian American Engineers and Scientists Association at Washington DC. Costs covered by the Haitian American Engineers and Scientists Association.

All the projects carried out at Terralink New Zealand were based on competitive bids. Projects carried out at the National Remote Sensing Agency, India, were based on both competitive bids and budget appropriations by the Department of Space.

## PUBLICATIONS

### Peer Reviewed Articles

1. Kurz, B and S. Seelan. 2009. Use of Remote Sensing to Map Irrigated Agriculture in Areas Overlying the Ogallala Aquifer, United States. Book Chapter. Remote Sensing of Global Croplands for Food Security, *Taylor and Francis Series in Remote Sensing Applications*. Pages 199-215.
2. Seelan, S, D. Baumgartner, G. Casady, V. Nangia, G. Seielstad. 2007. Empowering Farmers and Ranchers with Geospatial Knowledge: A Success Story from the U.S. Upper Midwest. *Geocarto International*. Vol 22, No. 2,
3. Savant, S and S. Seelan. 2006. India's Remote Sensing Program. *Space Flight*. Vol 48, No. 8 pp 308-314.
4. Casady G, R. Hanley and S. Seelan. 2005. Detection of Leafy spurge (*Euphorbia esula L.*) With the Use of Multi-Date High Resolution Imagery. *Weed Technology*. 19:462-467.
5. Seelan, S, S. Laguette, G. Casady and G. Seielstad. 2003. Remote sensing applications for precision agriculture: a learning community approach. *Remote Sensing of Environment*. Vol 88/1-2 pp 157-169. **Adjudged the second most requested paper** by the publisher for the period October 2003 to September 2004  
(<http://www1.elsevier.com/pub/14/12/show/index.htm?issn=00344257>)  
**Adjudged the fifth most requested paper** by the publisher for the period April 2004 to March 2005 <http://www1.elsevier.com/homepage/sad/downloads/00344257.html>  
**22<sup>nd</sup> on the science direct's list of hottest articles** for the period Oct-Dec 05.  
[http://top25.sciencedirect.com/?journal\\_id=00344257](http://top25.sciencedirect.com/?journal_id=00344257)
6. Sharda, D, D. Kaveri Devi, S. Prasad, and S. Seelan. 1997. Modelling Flash Flood Hazards to a Railway Line: A GIS Approach. *Geocarto International*, Vol. 12 No. 3.
7. Seelan, S. 1996. Cost Benefit Aspects of Remote Sensing for Groundwater Exploration – Two Case Studies. Book Chapter. Economics of Remote Sensing, *Manek Publications Pvt Ltd*, New Delhi.
8. Seelan, S, S. Muralikrishnan, R.J. Arokiadas, A.S. Manjunath. 1994. SAR Images for Mapping Volcanic Flows. *Interface*, Volume 5, No. 1, January-March.
9. Seelan, S, D. Kaveri Devi and D. Sharda. 1992. IRS-1A for Studies on Salt Farming, Shifting Cultivation and Ravine Management. Natural Resources Management - A New Perspective, *Bulletin of the National Natural Resource Management System*, ISRO, Bangalore.
10. Seelan, S. 1991. IRS-1A Data Dissemination. *Current Science*, Special Issue: Remote Sensing for National Development. Volume 61, no 3 & 4.
11. Thillaigovindarajan, S, S. Seelan, M. Jayaraman and P. Radhakrishnamoorthy. 1985. Evaluation of Hydro-Geological Conditions in Southern Part of Tamil Nadu using Remote Sensing Techniques. *International Journal of Remote Sensing*. NNRMS Special Volume 6, Nos. 3 and 4.
12. Seelan, S. 1984. Circular Geological Anomaly around Jhansi. *Bulletin of the National Natural Management System*. ISRO, Bangalore.
13. Seelan, S, G.Ch. Chennaiah and N.C. Gautham. 1983. Study of Landform Control over Land Utilisation Pattern in Parts of Southern U. P. - A Remote Sensing Approach. *Photonirvachak Journal of Indian Society of Photo Interpretation and Remote Sensing*, Volume II, No. 1.

14. Chakraborty, A.K, S. Seelan and K.R. Rao. 1982. Assessment and Management of Land and Water Resources in Drought Prone Areas from Satellite Derived Data – an Indian Example. *NRSA Technical Reports Series Volume VI*.
15. Seelan, S. 1982. Landsat Derived Geomorphic Indicators of Groundwater in Parts of Central India. *Photonirvachak - Journal of Photointerpretation and Remote Sensing*, Vol 10, No. 2.
16. Seelan, S. 1981. Remote Sensing Approach for Targeting Groundwater in Hard Rock Areas. *Indian Geohydrology*, Volume XV, Part I-IV.
17. Seelan, S and S. Thiruvengadachari. 1980. An Integrated Regional Approach for Delineation of Potential Groundwater Zones using Satellite Data - An Indian Case Study. *NRSA Technical Report Series 0789*, Volume IV.
18. Seelan, S, R.S. Ayyangar. 1979. Remote Sensing – Does it have a role in Management Information Systems for Agriculture Systems in India. *NRSA Technical Reports Series 0740*. Volume III.
19. Seelan, S and Balasubramaniam. 1974. Beneficiation of Fluorite on Large Scale from Kahela-Mandoki-pal Region, Rajasthan. *Journal of Mines, Metals & Fuels*. 9-75, pp 275-76

### **Book**

Arokiadas, J.R, D.K. Devi, Chandrasekaran, E. Elango, V. Ganesh, J.V. George, B.H. Kumar, B.P, Kumari, K.P.R Menon, V. Raghu, G.P. Rani, S. Seelan and A.R. Swarna. 1995. Indian Remote Sensing Satellite - 1C Data Users Handbook. *National Remote Sensing Agency*, Hyderabad.

### **Popular Articles**

1. Savant, S and S. Seelan. 2005. India's Remote Sensing Program – A Historical Perspective. *Quest*. Vol 12, No.4 pp 26-33.
2. Seelan, S. 1995. Remote Sensing: an Eye on the World. *Dominion*, Wellington. Daily Newspaper
3. Seelan, S. 1984. Water Witching from Space. *Bulletin of the National Natural Resources Management System*, ISRO, Bangalore. Monthly bulletin.
4. Seelan, S. 1976. Conservation of Storm Water. *The Indian Express*. Daily Newspaper

### **Editorship of a Newsletter**

Edited *Interface*, a quarterly newsletter on remote sensing, from 1990 to 1994. The newsletter carried peer reviewed articles and had a worldwide circulation of 4000 at that time.

### **Editorship of Conference Proceedings**

Initiated and organized the National Remote Sensing agency Data Center's **User Interaction Conferences I through V** during 1990-94 and edited the conference proceedings.

1. National Remote Sensing Agency Data Center's User Interaction Conference V. 1994.
2. National Remote Sensing Agency Data Center's User Interaction Conference IV. 1993.
3. National Remote Sensing Agency Data Center's User Interaction Conference III. 1992.
4. National Remote Sensing Agency Data Center's User Interaction Conference II. 1991.
5. National Remote Sensing Agency Data Center's User Interaction Conference I. 1990.

### **Contributions to Project Reports as Lead Author**

1. Team Express: Crop and Range Alert System – Phase III Report. NASA Synergy Program. Upper Midwest Aerospace Consortium. 2003

2. Team Express: Crop and Range Alert System – Phase VI Report. NASA Synergy Program. Upper Midwest Aerospace Consortium. 2004
3. Team Express: Crop and Range Alert System – Phase V Report and Final Report. NASA Synergy Program. Upper Midwest Aerospace Consortium. 2005
4. A Public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS – Implementation. NASA Grant NAG5-3616. Progress Report. Upper Midwest Aerospace Consortium. 2000
5. A Public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS – Implementation. NASA Grant NAG5-3616. Progress Report. Upper Midwest Aerospace Consortium. 2001
6. A Public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS – Implementation. NASA Grant NAG5-3616. Progress Report. Upper Midwest Aerospace Consortium. 2003
7. A Public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS – Implementation. NASA Grant NAG5-3616. Final Report. Upper Midwest Aerospace Consortium. 2004
8. A Public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS – Phase III Operations. NASA Grant NAG5-310. Progress Report. Upper Midwest Aerospace Consortium. 2000
9. A Public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS – Phase III Operations. NASA Grant NAG5-310. Progress Report. Upper Midwest Aerospace Consortium. 2001
10. A Public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS – Phase III Operations. NASA Grant NAG5-310. Progress Report. Upper Midwest Aerospace Consortium. 2002
11. A Public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS – Phase III Operations. NASA Grant NAG5-310. Progress Report. Upper Midwest Aerospace Consortium. 2003
12. A Public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS – Phase III Operations. NASA Grant NAG5-310. Final Report. Upper Midwest Aerospace Consortium. 2004
13. ISO 9000 Certification Report: Land Monitoring Unit. Terralink NZ. 1998.
14. Report of the Indian National Satellite Data Archival Committee. National Remote Sensing Agency. Prepared for the Department of Space, India. 1993.
15. Hydrogeomorphological mapping of Mizoram state, India. National Remote Sensing Agency. Prepared for the National Drinking Water Mission. 1988.
16. Hydrogeomorphological mapping of Nagaland state, India. National Remote Sensing Agency. Prepared for the National Drinking Water Mission. 1988.
17. Hydrogeomorphological mapping of Agra district, U.P, India. National Remote Sensing Agency. Prepared for the National Drinking Water Mission. 1988.
18. Groundwater targeting in Chowra Island, Andaman and Nicobar islands, India. National Remote Sensing Agency. Prepared for the Andaman and Nicobar State Public Works Department. 1988.
19. Hydrogeomorphological mapping of Goa state, India. National Remote Sensing Agency. Prepared for the National Drinking Water Mission. 1987.
20. Hydrogeomorphological mapping of Cachar district, Assam, India. National Remote Sensing Agency. Prepared for the National Drinking Water Mission. 1987.

21. Report on the Karnataka state groundwater project. National Remote Sensing Agency. Karnataka State Government. 1987.
22. Report on the Maharashtra state groundwater project. National Remote Sensing Agency. Prepared for the Maharashtra State Government. 1987.
23. Report on Airborne SAR acquisition over three test sites in India. National Remote Sensing Agency. Prepared for the Department of Space. 1986.
24. Groundwater investigations in Sullurpeta, India. National Remote Sensing Agency. Prepared for the Department of Space. 1985.
25. Groundwater consultancy project report for Raymond's Woollen Mills Ltd, Dhulia district, Maharashtra, India. National Remote Sensing Agency. 1979.
26. Groundwater Consultancy Report for Bundelkhand Vikas Nigam, U.P, India. National Remote Sensing Agency. 1979.
27. Integrated remote sensing survey of natural resources of Bundelkhand region, U.P, India. Prepared for the government of Uttar Pradesh. National Remote Sensing Agency. 1978-82.
28. Integrated remote sensing survey of natural resources of Tamil Nadu state, India. National Remote Sensing Agency. Prepared for the government of Tamil Nadu. 1977-80.

**Contributions to Project Reports as Co-author** (items 7 to 19 were in the form of map and meta data)

1. Regional Earth Science Applications Center. NASA Grant NAG 13-9906. Progress Report. Upper Midwest Aerospace Consortium. 2001
2. Regional Earth Science Applications Center. NASA Grant NAG 13-9906. Progress Report. Upper Midwest Aerospace Consortium. 2002
3. Regional Earth Science Applications Center. NASA Grant NAG 13-9906. Progress Report. Upper Midwest Aerospace Consortium. 2003
4. Northern Great Plains Center for People and Environment. NASA Grant NAG13-01006. Progress Report. Upper Midwest Aerospace Consortium. 2002.
5. Northern Great Plains Center for People and Environment. NASA Grant NAG13-02047. Progress Report. Upper Midwest Aerospace Consortium. 2003.
6. Northern Great Plains Center for People and Environment. NASA Grant NAG13-03024. Progress Report. Upper Midwest Aerospace Consortium. 2004.
7. Report on Landcover Mapping of Rest of North Island regions, New Zealand. Prepared for Department of Environment, New Zealand. Terralink, NZ. 1998.
8. Report on Landcover Mapping of Rest of South Island regions, New Zealand. Prepared for Department of Environment, New Zealand. Terralink, NZ. 1998.
9. Report on Landcover Mapping of South Island Transect area, New Zealand. Prepared for Department of Environment, New Zealand. Terralink, NZ. 1998.
10. Report on Landcover Mapping of Waikato region, North Island, New Zealand. Prepared for Department of Environment, New Zealand. Terralink, NZ. 1998.
11. Report on Landcover Mapping of West Coast region in South Island, New Zealand. Prepared for Department of Environment, New Zealand. Terralink, NZ. 1998.
12. Report on Landcover Mapping of Canterbury region in South Island, New Zealand. Prepared for Department of Environment, New Zealand. Terralink, NZ. 1998.
13. Report on Landcover Mapping of Stratford district, North Island, New Zealand. Prepared for Department of Environment, New Zealand. Terralink, NZ. 1998.
14. Report on Landcover Mapping of Wellington Region, North Island, New Zealand. Prepared for Department of Environment, New Zealand. Terralink, NZ. 1998.

15. Report on Landcover Mapping of Waipa district, North Island, New Zealand. Prepared for Department of Environment, New Zealand. Terralink, NZ. 1997.
16. Report on Landcover Mapping of Ruapehu district, North Island, New Zealand. Prepared for Department of Environment, New Zealand. Terralink, NZ. 1997.
17. Report on Landcover Mapping of Dunedin district, South Island, New Zealand. Prepared for Department of Environment, New Zealand. Terralink, NZ. 1997.
18. Report on Landcover Mapping of Tasman region, South Island, New Zealand. Prepared for Department of Environment, New Zealand. Terralink, NZ. 1997.
19. Report on Landcover Mapping of Hawke's Bay region, North Island, New Zealand. Prepared for Department of Environment, New Zealand. Terralink, NZ. 1997.
20. IRS utilization program - pre launch preparation for IRS 1A satellite program. Prepared for Department of Space. National Remote Sensing Agency. 1986.
21. Integrated Remote Sensing Survey of Natural Resources of Upper Barak Watershed, North-East India. Prepared for North East Regional Council. National Remote Sensing Agency. 1984.
22. Integrated Remote Sensing Survey of Natural Resources of West Coast region, India. Prepared for Central Water Commission. National Remote Sensing Agency. 1983.
23. Integrated Remote Sensing Survey of Natural Resources of North Karnataka State, India. Prepared for Central Water Commission. National Remote Sensing Agency. 1982.
24. Indo-German Pilot Project to Evaluate Temporal, Multistage Remote Sensing Techniques. North-East India. Prepared for German Agency for Technical Cooperation. National Remote Sensing Agency. 1981.
25. Management Information Systems for Agriculture Sector in India. Development Planning Cell, Operations Research Group, India. Prepared for National Informatics Center. 1977.
26. Surat District Planning Study. Development Planning Cell, Operations Research Group, India. Prepared for the Gujarat State Planning Commission. 1977.
27. Systems Study on Water Resources Planning for Gujarat State in India. Development Planning Cell, Operations Research Group, India. Prepared for Narmada Water Commission. 1976.

### **Report Prepared for the United Nations**

Report of the workshop on the applications of remote sensing techniques to water resources development. 1986. United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). Seoul.

### **Conference Presentations with Full Paper Accepted into Proceedings**

1. Hartzell, D, S.Seelan, L. Bolick. 2009. Monitoring Palm-Oil and Other Threats to Tanjung Putting National Park, Indonesia, With Synthetic Aperture Radar. 60<sup>th</sup> International Astronautical Congress, Daejeon, South Korea.
2. Rao, U.R, S. Seelan, 2007. The Challenges and Prospects of Introducing Space Based Precision Farming for Enhanced Agricultural Productivity. 58<sup>th</sup> International Astronautical Congress. Hyderabad, India.
3. Kulkarni, A, S. Seelan. 2005. Knowledge Discovery from Multispectral Satellite Images. Presented at the International Conference on Environmental Management, Hyderabad.
4. Seelan, S, O. Beerli, D. Baumgardner, G. Casady, S. Laguetta, and G. Seielstad. 2002 "A Crop and Range Alert System in the U.S. Northern Great Plains" 9<sup>th</sup> International SPIE Symposium on Remote Sensing, Agia Pelagia, Greece.

5. Seielstad, G.A, S. Laguette, S. Seelan, L. Welling. 2002. Applications of Remote Sensing to Precision Agriculture with Dual Economic and Environmental Benefits. Presented at the 29<sup>th</sup> International Symposium on Remote Sensing of Environment. Buenos Aires.
6. Seelan, S, R. Green, S. Laguette and C. Wivell. 2001. Assessment of Damage to Sugarbeet Crop Due to Errant Defoliant Chemical Drift. Presented at the Third International Conference on Geospatial Information in Agriculture and Forestry (ERIM), Denver.
7. Seielstad, G.A, S. Laguette, S. Seelan, R. Lawrence, G. A. Nielsen, D. Clay, K. Dalsted. 2001. Applications of Remote Sensing to Precision Agriculture with Dual Economic and Environmental Benefits. 8<sup>th</sup> International Conference on Remote Sensing, SPIE, Toulouse
8. Laguette, S, G. Casady, S. Seelan, C. Wivell and E. Wyatt. 2001. Helping Farmers and Ranchers to use Remote Sensing as a Basic Tool: Development of an Interactive Remote Sensing and Image Processing Tutorial. Presented at the International Geoscience and Remote Sensing Symposium, Sydney.
9. Laguette, S, G. Seielstad, C. Wivell, D. Olsen, S. Seelan, L. Welling, R. Lawrence, G. Nielson, J. Rattling Leaf, D. Clay and K. Dalstad. 2001. Precision Farming Management via Information Dissemination. Presented at the International Geoscience and Remote Sensing Symposium, Sydney.
10. Seelan, S, G.A. Seielstad, P.C. Carson, A.W. Cattanach and S.A. Bassingthwaite. 2001. High Resolution, Multispectral Imaging for Precision Sugarbeet Farming in St. Thomas Township, North Dakota. Paper presented at the ASPRS annual conference, St. Louis.
11. Laguette, S, S. Seelan, C. Wivell, D. Clay, K. Dalstad, C. Reese, R. Lawrence, C. Maynard and J. Rattling Leaf. 2001. Rapid Integration of Remote Sensing Data into In-Field Management Decisions: From Acquisition to Use of Data. Paper presented at the ASPRS annual conference, St. Louis.
12. Muralikrishnan, S, R.J. Arokiadas and S. Seelan. 1993. Data Merging Techniques for Better Spatial Resolution. Proceedings of the National Symposium on Remote Sensing Applications for Resource Management with Special Emphasis on North-Eastern Region, Indian Society of Remote Sensing, Guwahati.
13. Ramadevi, D, S. Muralikrishnan, R. J. Arokiadas, C.B.S. Dutt and S. Seelan. 1993. Automated Change Detection using Multidate Satellite Data for Forestry Applications. Proceedings of the National Symposium on Remote Sensing Applications for Resource Management with Special Emphasis on North-Eastern Region, Indian Society of Remote Sensing, Guwahati.
14. Seelan, S. 1990. Mapping Groundwater Controlling Factors in a Mountainous Sedimentary Terrain in North-East India using Data from Indian Remote Sensing Satellite. Presented at the International Conference on Groundwater in Large Sedimentary Basins, Perth.
15. Seelan, S, A. Bhattacharya and R. Venkataraman. 1988. Remote Sensing for Identification of Fresh Water Zones around Coastal Sullurpeta Town in Andhra Pradesh. Proceedings of the National Seminar on Groundwater Development in Coastal Tracts, Trivandrum.
16. Seelan, S. 1987. Remote Sensing in the Context of the Technology Mission on Drinking Water. Presented at the First Regional Seminar on Technology Mission on Drinking Water, Ghandigram.
17. Seelan, S. 1985. Detection and Monitoring of Groundwater Systems Under Stress - Can Remote Sensing Help? Proceedings of the AWRS Conference on Groundwater Systems under Stress, Brisbane.
18. Narayan, L.R.A, N.V.M. Unni, S. Seelan and P. Manavalan. 1985. Statistical Data Inputs from Remote Sensing for Resources Management. Proceedings of the 7th Conference of Central and State Statistical Organisations, Hyderabad.

19. Narayan, L.R.A, A.S. Ramamoorthy, N.V.M. Unni, L. Venkatratnam, I.V. Muralikrishna and S. Seelan. 1985. Application of Remote Sensing Technology to Environmental Problems An overview with Special Reference to India. Proceedings of the 2nd World Congress on Engineering and Environment, New Delhi.
20. Narayan, L.R.A and S. Seelan. 1985. Resource Management Trends in India Using Remote Sensing Techniques. Presented at the International Conference on Integration of Remote Sensing Data in Geographic Information System for Processing of Global Resource Information, Washington DC.
21. Seelan, S. 1983. Satellite Data in Aid of Groundwater Exploration - a Case Study from Karnataka, India. Proceedings of the International Groundwater Conference - Groundwater and Man, Sydney.
22. Seelan, S. 1983. Timely Generation of Groundwater Information using Satellite Data to Aid Drought Relief in Bundelkhand Region of Uttar Pradesh. Proceedings of National Seminar on National Natural Resources Management System, Hyderabad.
23. Chakraborty, A.K, S. Seelan and K.R. Rao. 1982. Assessment and Management of Land and Water Resources in Drought Prone Areas from Satellite derived data – an Indian Example. Proceedings of the International Symposium on Remote Sensing of Environment, First Thematic Conference on Remote Sensing of Arid and Semi-Arid Lands, Cairo.
24. Seelan, S. 1982. Remote Sensing in Oil Exploration - NRSA Capabilities. Workshop on Remote Sensing Applications to Petroleum Geology- Indian Experience, Dehradun.
25. Seelan, S and S. Thiruvengadachari. 1981. Satellite Sensing for Extraction of Groundwater Resources Information. Proceedings of the Fifteenth International Symposium on Remote Sensing of Environment, Ann Arbor.
26. Seelan, S. 1980. Role of Satellite Remote Sensing in Groundwater Exploration Programme. Proceedings of the Workshop on Management of Groundwater for Rural Development Programmes, Hyderabad.
27. Seelan, S, A.K. Kulkarni and K.R. Rao. 1980. Utility of Image Enhancement, in Geologic Interpretation of Remotely Sensed Data - An Indian Example. Proceedings of the Colloquium on Remote Sensing in Subsurface Exploration, 6th Annual Convention of AEG, Bangalore.
28. Seelan, S and R.S. Ayangar. 1979. Remote Sensing - Does it have a Role in Management Information Systems for Agriculture Sector in India? Proceedings of the International Symposium on Resources Engineering, Bombay.
29. Seelan, S and L.R.A. Narayan. 1978. Remote Sensing for Exploration and Development of Groundwater Resources. Proceedings of the Seminar on Development of Groundwater Resources in Tribal and Rural Areas, Waltair.
30. Seelan, S, S. Ragunathan and L.R.A. Narayan. 1977. Applications of Thermal Infrared Sensing to Hydrology. Proceedings of the Joint Indo-US Workshop on Remote Sensing Applications to Hydrology, Hyderabad.
31. Balasubramaniam, K.S, and S. Seelan. 1974. The Mineralogy and Geochemistry of Fluorite Deposits of Kahela-Mandoki-pal Region, Rajasthan. Proceedings of the Symposium on Fluorosis, Indian Academy of Geosciences, Hyderabad.

#### **Conference/Workshop Presentations with Abstracts only, in Proceedings**

1. Seelan, S, P. Carson, G. Wagner and U.R. Rao. 2007. Application of Precision Farming Techniques for Increased Food Grain Production. 17<sup>th</sup> UN/IAF Workshop. Hyderabad, India.

2. Kuchy, L, B. Rundquist, S. Seelan and R. Nigam. 2007. Remote Sensing-based Study of Land-Cover Changes Related to Mining and its Impacts on Marine Fauna: A Case Study in Goa, India. AAG. Annual meeting. San Francisco.
3. Kurz, B, S. Seelan, T. Justham. 2006. Evaluation of Temporal Trends in Irrigated Agriculture Overlying the Ogallala Aquifer, United States. Global Irrigated Area Mapping (GIAM) International Workshop, Colombo, Sri Lanka.
4. Pervez, M, S. Seelan, and B. Rundquist. 2006. Land Cover Vegetation Dynamics and Conversion of Agricultural Land in Bangladesh, 1973-2003. Joint Assembly of AGU, San Francisco.
5. Current issues in global resources and environment. Keynote address, Technical Session on Environmental Geo-Informatics and Modeling, International Conference on Environmental Management, Hyderabad, Oct 28, 05.
6. Seelan, S, C.S. Sommers-Austin, D. Baumgartner, D. Clay, R. Lawrence, C. Reese and G. Seielstad. 2005. Empowering Farmers and Ranchers With Near Real Time Geospatial Information – a Regional Cooperation Experience from the US Upper Midwest. Presented at the International Conference on Environmental Management, Hyderabad.
7. Provenza, V, S. Samson and S. Seelan. 2005. Panel presentation - A Multidisciplinary approach to Geospatial Curriculum. American Society for Photogrammetry and Remote Sensing, Annual Conference, Baltimore.
8. Seelan, S, N. Aloysius, D. Baumgartner, O. Beeri, B. Dahlen, S. Eggleston, C. Enger, T. Janke, S. Laguette, V. Nangia, S. Pervez, J. Peterson, P. Pettit, I. Ramfjord, P. Sardesai, G. Seielstad, and X. Zhang. 2005. A Crop and Range Alert System for the Northern Great Plains. Scholarly Activities Forum, University of North Dakota.
9. Shahriar, P, B. Rundquist and S. Seelan. 2004. Mapping Land Cover Change in Northern Bangladesh between 1973 and 1996 using Multitemporal Landsat Multispectral and Thematic Mapper Imagery. Annual meeting of Great Plains/Rocky Mountain Division of the Association of American Geographers, Sioux Falls.
10. Seelan, S, D. Baumgardner, O. Beeri. 2004. Remote Sensing of Rhizomania – a Killer Disease in Sugarbeets. Scholarly Activities Forum, University of North Dakota.
11. Seelan, S, D. Baumgardner, O. Beeri, G. Casady, M. Schull, C. Shumake and A. Cattanaach. 2003. Remote Sensing of Rhizomania in the Red River Valley. 30<sup>th</sup> International Symposium of Environment, Honolulu, Hawaii.
12. Seielstad, G.A, O. Beeri, P. Carter, B. Dahlen, R. Hanley, A. Johnson, G. Johnson, S. Laguette, A. Melesse, D. Olsen, R. Phillips, R. Schultz, S. Seelan, W. Semke, C. Won, X. Zhang. 2003. Applications for Crop and Range Management with New Sensors. 30<sup>th</sup> International Symposium of Environment, Honolulu, Hawaii.
13. Laguette, S, S. Seelan, P. Carter and J. Peterson. 2003. Training Producers to Use Remote Sensing for Farming. Scholarly Activities Forum, University of North Dakota.
14. Casady, G.M, R.S. Hanley, S.K. Seelan, C.A. Shumake and T.J. Sandstrom. 2003. Surveying Leafy Spurge on the Ground and from Space. 56<sup>th</sup> Annual meeting of Society for Rangeland Management. Casper, Wyoming.
15. Seielstad, G.A, S. Laguette, S. Seelan, R. Lawrence, M. Henry, C. Maynard, K. Dalsted, J. Rattling Leaf. 2001. Applications of Remote Sensing to Precision Agriculture. Invited paper presented at the 2001 spring meeting of the American Geophysical Union, Boston.
16. Seelan, S. 2001. IKONOS Derived Inputs for Precision Farming. Invited paper presented at the High Resolution Commercial Imagery Workshop, Greenbelt.

17. Seelan, S. 2001. Precision Farming with High Resolution Imagery. Invited, keynote paper presented at the International Conference on Remote Sensing and GIS/GPS, Hyderabad.
18. Wagner, G.A, P.C. Carson, and S. Seelan. 2001. Earth Science Applied to Precision Agriculture. Presented at the 6th ESIP Federation meeting, Tucson.
19. Seelan, S, 1989. Satellite Derived Geomorphic Indicators of Groundwater in Goa. Presented at the Regional Workshop on IRS-1A Mission and Applications, Goa.
20. Seelan, S, V.S. Hegde, P.R. Reddy, R.S. Rao, R.K. Sood, A.K. Sharma, A.K Gupta, G. Raj, A. Perumal and L.R.A. Narayan. 1986. Groundwater Targeting in a Drought Situation in Maharashtra State, India, Using Landsat TM Data. Presented at the 7th Asian Conference on Remote Sensing, Seoul.
21. Seelan, S and S. Thiruvengadachari. 1981. Satellite Sensing for Extraction of Groundwater Resources Information. Proceedings of the Fifteenth International Symposium on Remote Sensing of Environment, Ann Arbor.
22. Seelan, S and S. Thiruvengadachari. 1980. An Integrated Regional Approach for Delineation of Potential Groundwater Zones using Satellite Data - An Indian Case Study. Abstracts of Proceedings, 26th International Geological Congress, Paris.

In addition to the above, made several professional presentations at internal meetings in UND and at the Department of Space, India.

#### **Conference and Workshop Poster Presentations**

1. Aloysius, N, Zhang, X, Seielstad, G, Seelan, S, Zubair, L. Climate Change and Water Stress: A Spatial and Temporal Analysis over the Indian Subcontinent. Poster presented at the Global Environmental Change: Regional Challenges Conference, 9-12 Nov, 2006, Beijing, China. Organized by the Earth System Science Partnership.
2. Kuchy, L, B. Rundquist, S. Seelan and R. Nigam. 2006. Assessment of Land-cover Changes Related to Mining using Remote Sensing Data: A Case Study in Goa, India. AAG Regional meeting.
3. Aloysius, Noel and S. Seelan. 2006. Climate Change: Temperature trends and its implications to the Agriculture Sector in India. Scholarly activities forum. University of North Dakota.
4. Seelan, S, D. Baumgardner, O. Beerli, S. Bylin, C. Carlson, R. Ferguson, T. LaRoque, T. Larson, S. Laguette, V. Nangia, G. Seielstad, J. Wahl, D. Will, and J. Waltz. 2004. Taking Satellite Imagery to Farmers and Ranchers – UMAC experience. Scholarly Activities Forum, University of North Dakota.
5. Seelan, S, D. Baumgartner, O Beerli, P. Carter, G. Casady, S. Laguette and G. Seielstad. 2003. Remote Sensing for Risk Management and Sustainable Development – Experiences from an End User Oriented Crop and Range Alert System. 30<sup>th</sup> International Symposium of Environment, Honolulu, Hawaii.
6. Seelan, S, R. Hanley, G. Casady, C. Shumake and T. Sandstrom. 2002. Early Detection and Predictive Modeling of the Noxious Weed Leafy Spurge. 26<sup>th</sup> Annual meeting of the Prairie Division of the Canadian Association of Geographers, Neepawa, Manitoba, Canada.
7. Welling, L, J. Rask, S. Laguette, S. Seelan, and G. Seielstad. 2001. The Northern Great Plains Center for People and the Environment: Building Learning Communities toward a Sustainable Future. Presented at the Global Change Science Conference: Challenges of a Changing Earth, Amsterdam.

8. Seelan, S and R. Green. 2001. High Resolution Imaging for Mapping Desiccant Damage to a Sugarbeet field in North Dakota. Poster paper presented at the 6<sup>th</sup> ESIP Federation meeting, Tucson.
9. Guidry, B and S. Seelan. 2001. Monitoring inundation in Nelson County, North Dakota. Poster paper presented at the 6<sup>th</sup> ESIP Federation meeting, Tucson.
10. Seelan, S. 1999. Monitoring Changes in Devils Lake, North Dakota. Poster paper presented at the workshop on Impact of Climate Variability and Climate Change on the Northern Great Plains, Grand Forks.
11. Seelan, S. 1999. High Resolution, Multispectral, Aerial Imaging for Identifying Stress in Sugarbeet Crops in St. Thomas Township, North Dakota. Poster paper presented at the workshop on Impact of Climate Variability and Climate Change on the Northern Great Plains, Grand Forks.
12. Seelan, S and S. Babu. 1985. Hydrogeological Investigations of Part of Andhra Pradesh State in India using Satellite and Airborne Remote Sensing Data. 18th Congress of IAH, Cambridge.

### **Other Presentations**

In addition to the above, made numerous professional presentations at internal meetings at UND, at Department of Space, India, and at various business meetings and training programs.

## **CONTRIBUTIONS TO SERVICE AND OUTREACH**

### **Service to the University of North Dakota**

1. Elected to represent the Aerospace area in the **UND Graduate Committee** for the period Fall 2005 to Spring 2008. The committee meets every Monday from 3:05 PM to 5:00 PM.
2. In keeping with the University's and Space Studies Department's strategic plans, leading an effort to **establish a UND-India collaboration** to promote, research, student and faculty exchanges, student recruitment, study abroad programs and exporting UND degree programs. The effort has so far resulted in UND becoming a partner along with several other leading universities in the US, in a major INDO-US initiative in higher education spearheaded by Amrita University in India, Department of Science and Technology and Department of Space in India and corporate partners such as Microsoft. This initiative opens up tremendous opportunities for UND faculty to teach short courses in India, build research collaboration and recruit suitable students. Another result of this initiative is the MOU with Goa University in India which offers potential "study abroad" opportunities for UND students in India.

These and other efforts have resulted so far in developing the following international collaborative research projects. i) North American Component of the Global Irrigated Cropland Inventory in collaboration with the International Water Management Institute, Sri Lanka, ii) Remote Sensing based methodology development for wetland inventory and monitoring in the Prairie pothole region, as part of a global wetland inventory initiative, in collaboration with the International Water Management Institute, Sri Lanka, iii) Remote sensing based study of impact of mining activity on marine fauna, in Goa coast, India, in collaboration with National Institute of Oceanography, India, and iv) Land Cover and Vegetation Dynamics, and Conversion of Agricultural Land in Bangladesh. **All these projects have provided UND graduate students with opportunities for participating in international collaborative research projects and travel overseas for field work and internships.**

The connections made through the UND-India initiative are also assisting UND's Medical School in developing a collaborative project on telemedicine. The relationships established through these initiatives also helped Dr. Pablo de Leon of the Space Studies Department to **launch Pehuensat-1, an Argentinean satellite using India's Polar Satellite Launch Vehicle.** This has also triggered the building of a receiving station by Space Studies students at UND.

The ongoing relationship with the International Water Management Institute (IWMI) in Colombo, Sri Lanka has also been strengthened and more student exchanges and research collaboration are taking place. UND is now a part of the **Global Irrigated Cropland Inventory Consortium**, led by the IWMI.

Collaborations have also been established with **Haiti** with a potential to develop research projects on resource development and environmental management.

3. Advisor, Student Association of India, a UND student organization, from 2007 to 2009
4. Co-advisor, International Organization (IO), a UND student organization, from 2008 to present
5. Helped IO organize the "Feast of Nations" a major international event on campus
6. Full Member, UND graduate faculty. 2004 to current.
7. Associate Director, NDView project, funded by AmericaView Consortium. 2005 to current.
8. Proposal reviewer for NDView research project proposals (Fall 05, 07).
9. Adjunct faculty, Department of Space Studies from 2001 to 2005.
10. Proposal reviewer for NDEPSCOR. 2002, 2003.
11. Adjunct faculty, Department of Geography, since 2001.
12. Adjunct faculty, Department of Geology and Geological Engineering since 2001.

#### **Service to the John D. Odegard School of Aerospace Sciences**

1. **Interim Associate Dean**, John D. Odegard School of Aerospace Sciences. Spring semester, 2009. Assisted the Dean with Program Reviews, CGAR Annual Meeting planning, organizing monthly luncheon series, participation in Dean's Council meetings, leadership meetings, representing the college in various meetings and forums, meeting with department Chairs, and other day to day administrative matters.
2. Initiated and coordinated the visit of Prof. U. R. Rao, former chairman of Indian Space Research Organisation to UND in August 2006.
3. Member, John D. Odegard School of Aerospace Sciences Leadership Team, 2004-05.
4. As the Chair of the Earth System Science and Policy Department, was involved with student and faculty recruitment, organizing and implementing the innovative new curriculum and maintaining liaison with external organizations, departmental chairs and others. The ESSP program offers Masters Degrees in Environmental Science and Environmental Management and Ph.D. 2003-05.
5. Organizing committee, UND conference on "Agricultural Technologies for Rural Development" sponsored by Senator Byron Dorgan, February 2002.

#### **Service to the Department of Space Studies, ESSP, and UMAC**

1. **Graduate Studies Director**, Department of Space Studies, since April 2007. Responsibilities included recruitment, admissions, financial aid, initiating and implementing major curriculum changes, revision and publication of the 2009-10 version of the Space Studies Handbook, acting as the temporary academic advisor for all incoming students, and day to day interactions

with the graduate school. Initiated and pursued the recognition and acceptance of International Space University's courses for transfer credits by UND, which is awaiting approval. Also acting as temporary academic advisor for all incoming students.

2. Served on Space Studies department's Ph.D. proposal committee.
3. Member of Chair search committee, Space Studies.
4. Member, faculty search committees, Space Studies Department.
5. Space Studies Comprehensive exam coordinator for Spring 2007 and spring 09.
6. Space Studies Comprehensive exam evaluator
7. Capstone projects evaluator
8. Served on tenure and promotion committees.
9. Served on faculty and staff hiring committees at UMAC and ESSP from 1999 to 2005.
10. Launched an active recruitment initiative for ESSP at the start of the program.
11. Evolved the strategic plan for ESSP.

### **Service to the Community, and Outreach**

1. Helped start, establish and run the modern Geospatial Lab at UMAC. This lab is now an excellent resource for several users from within and outside UND.
2. Community service through project leadership: As Co-PI for the Crop and Range Alert System Project at UND, helped design, develop and manage the project. Other responsibilities under this project included supervising and advising senior scientists, recruiting and managing geospatial staff, and extensive interaction with farmers and ranchers, Native American Communities and other end users.
3. The focus of many of the research projects has been to provide service to the community. The Crop and Range Alert System project started in 1999 with a small group of 10 farmers, now has over 600 farmers, ranchers, and other end users participating and benefiting from the use of technology. Over 500 farmers, ranchers, crop consultants, and other end users from the region and neighboring states have been trained in the use of geospatial technology. The success stories outlining the environmental and economic benefits are highlighted at the project web site at [www.umac.org](http://www.umac.org).

### **National and International Service**

1. Chaired a working group meeting on "capacity Building and International Cooperation" at the 17<sup>th</sup> UN/IAF Workshop. Hyderabad, India. 2007
2. Article reviewer for *Geocarto International*
3. *Environmental Management*
4. Article reviewer for *Journal of Spatial Hydrology*.
5. Member, Peer Review Panel, *Book on Global Irrigated Areas*.
6. Acted as advisor to the Haitian American Association of Engineers and Scientists, visited Haiti, and recommended developmental projects in the area of water and agriculture.
7. Reviewed a proposal for *Belgian Government's Science Policy Office* under their research program on "STEREO: Support to the exploitation and research of earth observation data". 2006
8. Article reviewer for *Journal of Agricultural Science and Technology*.
9. Chaired a technical session at the International Workshop on Global Irrigated Area Mapping, Colombo, Sri Lanka, September, 2006.
10. External reviewer for faculty tenure and promotion, University of Arizona.
11. Book Series reviewer for *American Geophysical Union*.

12. Member of organizing committee for International Conference on Environmental Management, Hyderabad, India, 2005.
13. Chaired a technical session at the International Conference on Environmental Management, Hyderabad, India, 2005.
14. Article reviewer for the journal "*Agriculture, Ecosystems and Environment*". 2004.
15. Chaired a technical session at the ASPRS Annual Meeting 2001. St. Louis.

### **Key Services Rendered prior to joining University of North Dakota**

1. Core member of ISO 9000 certification process at Terralink, New Zealand. 1996-97.
2. Fundraiser, "Water for Survival" a charity organization in New Zealand that supports drinking water projects in developing countries. 1996-97.
3. Served on many recruitment, promotion and purchase committees at NRSA. 1977-1995.
4. Member, Remote Sensing Applications Mission Council of India, 1990-95.
5. Treasurer, Indian National Cartographic Association, 1991-94.
6. Member, Indian Remote Sensing Satellite (IRS) Mission Management Board, 1990-95.
7. Member, IRS Operations Review Board, 1990-95.
8. Member Secretary, Indian National Satellite Data Archival Committee, 1992-93.
9. Member, IRS 1C Ground Segment Critical Design Review Committee, 1994-95.
10. Member, Project Management Board, Dept of Space-European Remote Sensing Satellite-1. 1990-95.
11. Prime Minister's Indian National Task Force on Technology Mission on Drinking Water, 1986-90.
12. Chair, drafting committee, UN-ESCAP International Workshop on Water Resources, Seoul, Korea, October-November, 1986.
13. Science Exchange Visitor, Free University of Berlin, Germany, May-July 1979.
14. The projects on developing methods to use remote sensing to target groundwater (1977-90) have benefited several rural and tribal communities in India. The technology transfer service provided through this project has now ensured that there are a number of trained professionals, and every major groundwater targeting effort in India starts with reconnaissance level mapping using remote sensing.
15. Service through project leadership at NRSA: Notable projects co-coordinated at NRSA, India were: i) the Indian Remote Sensing Satellite (IRS) utilization program that later evolved as the National Natural Resources Management System (NNRMS) and encompasses the entire remote sensing and natural resource information integration in India for sustainable development, ii) as Deputy Coordinator of Indo-German co-operation agreement, was responsible for generating technical and budget proposals, team leadership, work execution and collaboration with multi agencies in India and Germany, iii) helped the Director (Remote Sensing Applications) in setting up state level remote sensing application centers, iv) integrated NRSA's role with that of the National Task Force on Drinking Water and managed NRSA's groundwater targeting efforts to provide timely information to the field survey units, and v) coordinated the first ever, Indo-Canada joint Synthetic Aperture Radar flights over India.
16. Service through management of a national facility: As Head, Data Center and Director IRS Data Distribution, National Remote Sensing Agency (NRSA), Department of Space, India, was responsible for leading a staff of 45 involved with satellite data dissemination. The data center is one of the largest of its type in the world, distributing on an average 15,000 data products (obtained from five different satellite systems), to 1,500 customers annually at that time. Key responsibilities included general management (staff

management, restructuring and change management, leading, training and motivating others, costing, pricing and budget management and regular executive reporting); client relationship management (government, corporate and commercial environments); editing a newsletter, organizing annual user interaction workshops; promotion campaigns and technical workshops, development of customized applications and services and interfacing with satellite data users, satellite data reception, production and spacecraft mission teams. Other responsibilities included the negotiation of international or interagency agreements and the coordination of major international or interagency remote sensing programs. Played a key role in initiating and negotiating the contract with Space Imaging (then EOSAT) for worldwide distribution of IRS products and services. Negotiated annual contracts and executed data reception and distribution agreements for SPOT, Landsat and ERS-1 satellites in India. Policy development, coordination and outreach to key international, interagency, and commercial stakeholders formed an integral part of these activities.

## **PROJECT EXPERIENCE**

**(As core team member and or project leader)**

### **At UMAC, University of North Dakota**

1. Lead Scientist, Remote Sensing of Rhisomania.
2. Remote Sensing of Leafy Spurge. 2002
3. Monitoring Riparian Vegetation in Mortenson Ranch, South Dakota, using high-resolution imagery. 2002
4. Spray drift damage assessment to a sugarbeet field using high-resolution imagery. 2000.
5. Lead Scientist, TeamExpress: Crop and Range Alert System, a web based satellite data distribution to co-operating farmers and ranchers of the Upper Midwest, with training, application development and building a learning community as other major components.
6. Study of flooding and inundation in Nelson County, North Dakota. 2000
7. Temporal landcover study of Devil's Lake region in North Dakota. 1999
8. Director, UMAC-ESIP project.
9. Procurement of high-resolution imagery through NASA's Data Purchase Project and other sources and development of applications related to farming and ranching.
10. Co-Investigator, A public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS – Implementation Phase.

### **At Terralink New Zealand Ltd**

1. Landcover mapping of Rest of North Island regions, New Zealand. 1998
2. Landcover mapping of Rest of South Island regions, New Zealand. 1988
3. Landcover mapping of South Island Transect area, New Zealand. 1988
4. Landcover mapping of Waikato region, North Island, New Zealand. 1998
5. Landcover mapping of West Coast region in South Island, New Zealand. 1998
6. Landcover mapping of Canterbury region in South Island, New Zealand. 1998
7. Landcover mapping of Stratford district, North Island, New Zealand. 1998
8. Landcover mapping of Wellington Region, North Island, New Zealand. 1998
9. Landcover mapping of Waipa district, North Island, New Zealand. 1997
10. Landcover mapping of Ruapehu district, North Island, New Zealand. 1997
11. Landcover mapping of Dunedin district, South Island, New Zealand. 1997
12. Landcover mapping of Tasman region, South Island, New Zealand. 1997

13. Landcover mapping of Hawke's Bay region, North Island, New Zealand. 1997

**At National Remote Sensing Agency, Dept of Space, Govt. of India**

1. IRS 1C Critical Design Review, ground segment. 1994-95
2. IRS 1B Mission Management Board. 1992-95
3. IRS 1A Operations Review Board. 1990-95
4. IRS 1A Mission Management Board. 1990-93
5. ERS-1 Project Management Board. 1990-95
6. IRS data promotion and distribution for sustainable management of natural resources. 1990-95
7. Remote sensing and GIS study on vulnerability of railway lines in Warangal district, Andhra Pradesh, India. 1993
8. Remote sensing applications for salt pan mapping. 1992
9. Remote sensing applications for mapping partially submerged islands. 1992
10. Remote sensing mapping for nationwide targeting of groundwater under "Technology Mission on Drinking Water" aimed at providing drinking water to all villages in India. 1988-90
11. Hydrogeomorphological mapping of Mizoram state, India. 1988
12. Hydrogeomorphological mapping of Nagaland state, India. 1988
13. Hydrogeomorphological mapping of Agra district, U.P, India, 1988
14. Groundwater targeting in Chowra Island, Andaman and Nicobar islands, India. 1988
15. Hydrogeomorphological mapping of Goa state, India. 1987
16. Hydrogeomorphological mapping of Cachar district, Assam, India. 1987
17. Karnataka state groundwater project. 1987
18. Maharashtra state groundwater project. 1987
19. Airborne SAR acquisition over three test sites in India. 1986
20. Groundwater investigations in Sullurpetta, India. 1985
21. Integrated remote sensing survey of natural resources of Upper Barak watershed, North-East India. 1982-84
22. Integrated remote sensing survey of natural resources of West Coast region, India. 1981-83
23. Integrated remote sensing survey of natural resources of North Karnataka state, India. 1981-82
24. IRS utilization program - pre launch preparation for IRS 1A satellite program. 1981-86
25. Indo-German pilot project to evaluate temporal, multistage remote sensing techniques. 1979-81
26. Groundwater consultancy for Raymond's Woollen Mills Ltd, Dhulia district, Maharashtra, India. 1979
27. Groundwater consultancy for Bundelkhand Vikas Nigam, U.P, India. 1979
28. Integrated remote sensing survey of natural resources of Bundelkhand region, U.P, India. 1978-82
29. Integrated remote sensing survey of natural resources of Tamil Nadu state, India. 1977-80

**At Operations Research Group, Baroda, India**

1. Study of Management Information System for Agricultural Sector in India. 1977
2. Surat district planning study. 1976-77
3. Systems study on water resources planning for Gujarat state in India. 1975-76.

**MEDIA CITATIONS** (partial list)

1. "Satellite Sense" – article in spring 2009 issue of Dimensions. University of North Dakota
2. Quoted in a [livemint.com/Wall Street Journal](http://livemint.com/Wall Street Journal) article on "ISRO plans satellite series for mapping climate monitoring". Jan 16, 2008.

3. Mentioned in UND news releases for helping to establish relationships with India's Space Program on behalf of Pablo de Leon, for launch of Argentinean satellite from India.
4. Quoted in "Space News" in article on India's manned space mission.
5. Mentioned in UND news releases for work with Haiti, research collaboration with International Water Management Institute, Sri Lanka, National Institute of Oceanography, Goa, India.
6. Credited in media, and several UND publications for championing the cause for Indo-UND initiatives which resulted in the signing of a major MOU involving UND and other leading US Universities with Indian Universities, Microsoft and India's Department of Science and Technology and Space. Also initiated another separate MOU between UND and university of Goa. This effort was listed as one of the UND highlights for the year 2005 by Grand Forks Herald.
7. UMAC Evaluates DigitalGlobe Products to Mitigate Crop Disease. 10/25/2004. DigitalGlobe Press Release.
8. UMAC Evaluates DigitalGlobe Products to Mitigate Crop Disease. 10/26/2004. Space Daily
9. Imagery Could Help Assess the Health of Sugarbeet Crop to Manage Costly Rhisomania Damage. 10/25/2004. Yahoo Financial News.
10. UMAC Evaluates DigitalGlobe Products to Mitigate Crop Disease. 10/30/2004. Earth Imaging Journal.
11. Exploring Satellite Images for Precision Farming. Dec 2004. Growing Magazine
12. An Eye in the Sky. 07/20/04. The New Farm
13. International Job Swapping. Winter 2004. UND Alumni Review.
14. Experts question India's moon exploration plans. 08/31/2003. TerraGreen, Issue 43.
15. Satellite Precision Farming. August 2001. Geotimes.
16. Interviews/Views – Dr. Santhosh Seelan. March April 2001. GIS India Vol 10 No. 2.
17. Indian Unmanned Moon Exploration to Cost \$90 Million. July 17, 2000. Space News, Vol 11 No 28.
18. Interview – Dr. S.K. Seelan. Jan 1997. GIS India Vol 6, No 1.
19. Eyes in the Sky. Three episodes of television series produced by the University Grants Commission (India) and aired several times by Doordarshan and UGC's educational channels between 1989 and 1994. Provided technical support, script and interviews.
20. Beyond 2000. Australian TV production by Chris Ardill Guinness on India's advancements in Space Technology. Produced and aired in 1985-86. Provided script support.
21. There were several other minor mentions in media, not listed here.

## **PROFESSIONAL ASSOCIATIONS**

### **Memberships**

1. Member, American Society for Photogrammetry and Remote Sensing (ASPRS).
2. Subscriber, *Worldwatch*
3. Life Member, Indian Society for Remote Sensing.
4. Life Member, Indian National Cartographic Association.
5. Life Member, Indian Geophysical Union.
6. Life Member, GIS India.

### **Offices Held**

1. Treasurer, Indian National Cartographic Association, 1991-94.
2. Faculty Advisor, Student Association of India, UND. 2007- 2009
3. Faculty Advisor – International Student Organization, UND. 2008-

## **AWARDS & HONORS**

- Recognized as the “Outstanding Student Organization Advisor” at the UND Memorial Union Leadership Awards Ceremony for work with the Student association of India, International Organization and in helping to organize the “Feast of Nations”
- “Who’s Who” in the World, 2008; “Who’s Who” in Science and Engineering 2007, “Who’s Who” in America 2006.
- Nominee for the “Public Scholar” award. University of North Dakota. 2007.
- Paper published in *Remote Sensing of Environment* on “Remote sensing applications for precision agriculture: a learning community approach” was adjudged the second most requested paper by the publisher for the period October 2003 to September 2004, fifth most requested paper for the period April 2004 to March 2005 and 22<sup>nd</sup> on the Science Direct’s list of hottest articles for the period Oct-Dec 05.
- Noreen Thomas, an Organic Farmer mentored through the Crop and Range Alert System Project was awarded the prestigious Siehl Prize for 2003 by University of Minnesota for her work involving the use of satellite imagery for organic farming
- Invited speaker at many conferences and chaired technical sessions.
- Nominee for the National Mineral Award, 1987, for early work on researching the use of remote sensing for targeting groundwater and later contributions to India’s ‘technology mission on drinking water’ through practical use of the technology
- Elected Chairman of the drafting committee at the UN-ESCAP International Workshop on Water Resources, Seoul, Korea, October-November, 1986
- “Best Speaker of the Day Award” at the 7th Asian Conference on Remote Sensing October 1986. Seoul, South Korea
- Special recognition by the Minister for Science and Technology, India, for executing the Maharashtra Groundwater Project in a short time to help provide timely drought relief.
- UNESCO Scholarship to study groundwater in Israel. 1974-75.
- Institute’s Silver Medal for obtaining 1st rank in the M.Sc. program at the Indian Institute of Technology, Bombay, a leading technical institution in the world.
- Recipient of a merit-cum-means scholarship for the M.Sc. program at the M.Sc. program at the Indian Institute of Technology, Bombay.
- Certificate of Merit for obtaining 1st rank in the B.Sc. Program

## **INTERNATIONAL EXPERIENCE**

India (work, study)

USA (work)

New Zealand (work)

Israel (study)

Germany (advanced training, Indo-German collaborative project))

South Korea (UN workshop)

Nepal (Faculty at UN sponsored workshop)

Sri Lanka (project collaboration)

Haiti (collaborative project development)

Attended workshops/business meetings in Australia, Egypt, Greece, India, Italy, Japan, South Korea, Sri Lanka and U.K, and visited a number of other countries as tourist.

**HOBBIES & OUTDOOR INTERESTS**

Captained of the Annamalai University's track and field team during 1971 and Indian Institute of Technology's basketball team during 1974. Also undertook a bicycle tour of part of South India as a 17 year old. Was an active member of a rowing club during 1967-71 and completed a rock climbing course in 1973. Keen tennis player and enthusiast, and enjoy camping, outdoors and traveling with my family.