

# Charter

## Remote Sensing Institute

### 1 Scope

Remote sensing refers to detection and measurement from a distance. The scope of the Remote Sensing Institute (RSI) includes the science, technology and engineering underlying remote sensing and the application of remote sensing. In addition, since the application of remote sensing requires an understanding of the medium sensed through, RSI's focus includes earth and planetary sciences related to the atmosphere, surface water, and the earth's subsurface. RSI applies a broad definition of the term *remote sensing*, in order to maximize the potential for collaborative research. In the past, RSI members have collaborated on projects involving imaging science, atmospheric sciences, data and signal processing, data visualization, instrumentation development, earth system and global change sciences, ecosystem studies, limnology, oceanography, land use and land cover change studies, subsurface imaging, extraterrestrial imaging, and other fields.

Throughout this document, the term "remote sensing and related fields" is used to indicate the group of topics that falls within RSI's scope. This term includes the following categories:

- Remote sensing physics;
- Imaging sciences;
- Development and application of remotely deployed sensors;
- Space and planetary sciences and their applications; and
- Environmental and ecosystem science applications of remote sensing and earth and planetary sciences.

### 2 Mission

The mission of the Remote Sensing Institute (RSI) is to support research and education in remote sensing and related fields at Michigan Tech, and thereby establish MTU as a national and international leader in these fields.

To serve this mission, RSI has the following objectives:

- to serve as a focal point for instructional and research activities in remote sensing and related fields across MTU's campus;
- to provide an organizational structure that supports continuing growth in remote sensing and related disciplines and that encourages multidisciplinary projects;
- to support interdisciplinary graduate and undergraduate education and research in remote sensing and related fields;
- to pursue external funding opportunities to support these objectives and to facilitate RSI members' efforts to obtain external support; and

- to serve as a model for institutional support of interdisciplinary and multi-unit projects across the MTU campus.

### 3 Activities

In support of the Institute's mission, RSI pursues activities in the following categories. (Examples of typical activities are provided for some of these categories.)

- RSI will support graduate research and education in remote sensing and related fields.  
Example activities:
  - Provide travel grants for RSI graduate students to present their research findings at professional meetings.
  - Provide competitive fellowships for RSI graduate students.
  - Fund campus visits by prospective students.
  - Promote the establishment and maintenance of interdisciplinary graduate programs in RSI focus areas.
- RSI will support undergraduate education and research in remote sensing and related fields.  
Example activities:
  - Maintain and promote the undergraduate Remote Sensing Minor.
  - Provide and support opportunities for undergraduates to participate in RSI research projects.
  - Offer the Remote Sensing Seminar Series (UN4000), which is required for the Remote Sensing Minor.
- RSI will foster interdisciplinary interaction among graduate students, faculty, and research staff in remote sensing and related fields.  
Example activities:
  - Organize the Remote Sensing Seminar Series, and support visits by seminar speakers working on topics of research interest to RSI faculty and graduate students.
  - Offer formal and informal forums for communication and interaction among RSI participants.
  - Provide incentives for researchers to participate in RSI programs and for departments to encourage interdisciplinary activities.
  - Act as a leader in responding to broad-scope requests for proposals that would benefit RSI.
- RSI will support academic faculty, research faculty, and postdoctoral scholars, all of whom are critical to the maintenance and expansion of RSI-related research.  
Example activities:

- Provide research development grants to help faculty and research staff develop new RSI-related research foci.
  - Provide “bridging” funding for research faculty between active grants.
  - Provide cost-share support to enable hiring new research faculty who are expected to quickly become self-supporting.
- RSI will work to enhance the visibility of RSI both on and off campus.
  - RSI will develop and maintain MTU’s infrastructure for remote sensing research, including computers and software, field equipment, and technical support.

## 4 Administration and Governance

RSI is administered as a Michigan Technological University Research Institute, under the Vice President for Research. The heart of RSI is its membership base. Members can contribute to discussions of RSI’s focus or activities through the RSI Advisory Council (RSIAC). The RSIAC oversees changes to the Institute’s priorities and provides guidance to the Director, who is responsible for the day-to-day administration of the Institute with the assistance of support staff.

### 4.1 Membership

Full membership in RSI is open to any academic faculty, research faculty, or research staff member of the Michigan Tech community who has an interest in any aspect of remote sensing or related fields. Prospective members submit an application to the RSI Director. Once approved, membership is reevaluated every five years.

Graduate and undergraduate students are offered student membership, which provides eligibility for RSI student grants and fellowships. Student membership is maintained until graduation.

### 4.2 Advisory Council

**Selection Process.** The RSIAC consists of one designee from each participating department, defined as a department with at least one RSI member. RSI members in each department are responsible for selecting a representative to the advisory council. This selection process must include communication to all RSI full members in the department of the name of the representative who has been selected.

RSI members in each participating department should designate their RSIAC member once each academic year. Consecutive appointment of the same person for multiple years is allowed.

**Responsibilities.** The Advisory Council approves any changes to Institute priorities or governing structure; it evaluates and approves annual reports and self-studies as required; and it evaluates and approves any changes to the Remote Sensing Minor.

### 4.3 Director and Associate Director

**Selection Process.** The RSI Director and Associate Director are selected by the RSI Advisory Council from members of the RSIAC or RSI members nominated by RSIAC members, and approved by the Vice President for Research. These positions are meant to be rotated among RSIAC members and other highly active RSI members. The Director's term is a minimum of one year and a maximum of two years. At the end of the Director's term, the Associate Director is automatically selected as the Director (pending approval by the Vice President for Research), and a new Associate Director is selected.

Once RSI's annual budget exceeds \$200,000, the RSIAC will consider replacing the rotating directorship with a full-time managing director.

**Responsibilities** The job of the Director is to ensure that RSI functions effectively to fulfill its mission. Functions include establishing RSI's priorities in a manner consistent with RSIAC guidance, directing the application and management of RSI's resources, managing RSI-coordinated programs and curricula, directing RSI office staff, and overseeing the RSI web pages, seminar and other functions.

The Associate Director works closely with the Director in these duties and is expected to contribute to an extent sufficient to allow him or her to become familiar with the Director's duties and to reduce the Director's workload. Example duties include overseeing the Remote Sensing seminar series.

### 4.4 Centers within RSI

Research centers may exist within RSI through the approval of the RSIAC and the Vice President for Research. Centers are units organized around collaborative efforts with a focused interest consistent with the RSI mission and within RSI's scope. Each center will have a director responsible for meeting MTU's procedures for center functions and review procedures. The center director reports to the RSI Director, and is appointed in a manner consistent with the center's governance plan.

**Existing center within RSI.** The Center for Lake Superior Ecosystem Research (LaSER) was created in 1990 to provide a basis for creation of a program of graduate education and research in ecosystems within the Lake Superior Basin. The focus of this center is on biogeochemical cycling and the ecological effects of human activities in the basin.

**Establishment of centers.** Proposals for new centers within RSI may be developed following MTU's procedures for new centers, in consultation with the RSI Director and RSIAC. Such proposals require the written approval of the RSI Director upon submission to the Vice President for Research.

## 5 Resources

### 5.1 RSI space

RSI oversees laboratory and office space that is for use by a range of RSI members, as well as office space for visiting researchers and RSI staff. These include the following.

- **RSI High-bay Laboratory:** Dow ESE Building, room 105 and one-half of room 201 mezzanine.  
This high-bay laboratory and the associated mezzanine are used for the development and preparation of field research and may also be used for experiments requiring high-bay space. In the past, it has been used for shipboard field study preparations and the development of an atmospheric laboratory for use at a remote field site.
- **RSI/GMES Computing Laboratory:** Dow ESE Building, room 211.  
This computing laboratory is designed to facilitate interaction and collaboration among RSI-affiliated graduate students. This space was originally assigned as the “LARS/LaSER Lab” at the opening of the Dow ESE Building in 1998, but is also used by GMES students and is outfitted with computing hardware purchased using both GMES and RSI funds.
- **RSI/GMES Visiting Researcher/RSI Staff Office:** Dow ESE Building, room 208.  
This office is maintained for use by RSI support staff, visiting RSI-affiliated researchers, postdocs, and seminar speakers, and is available for use by GMES visitors when not otherwise in use.
- **RSI/GMES Conference Room:** Dow ESE Building room 206.  
This conference room is used for RSI meetings and small courses (*e.g.*, the Atmospheric Sciences Journal and Seminar Club), and is also available to GMES for similar use.
- **Astrophysics Research Offices and Labs:** Dow ESE Building rooms 303, 312, and either 302 or 307.  
These rooms are used for work related to the Pierre Auger Observatory.<sup>1</sup>

In the next few years, RSI expects to oversee expansion in the number of RSI-affiliated research staff and visiting researchers and graduate students. It is expected that additional space will be needed to facilitate this expansion. Should that occur, RSI will seek to make use of currently under-used or unused space not currently assigned to RSI.

### 5.2 Supporting Facilities

**Lakeside Laboratory.** The Lakeside Laboratory makes up a portion of the Facilities quonset hut, and is used for field experiment staging, experiments, and storage of small-boat equipment. Portage Lake water is piped into the facility for use in experiments.

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<sup>1</sup>That work is currently conducted in Dow ESE Building rooms 303, 307, and 311; it will move to rooms 303, 312, and either 302 or 307 when the Mining program moves out at the end of the 2003-2004 academic year.

**Table 1. RSI Funding Mechanism**

	Percent of Indirect Cost Returned				
	RSI	Center	PI	Unit	College
RSI-affiliated grant	25.7	—	12	15	7.3
RSI Center-affiliated grant <sup>a</sup>	5.0	10.7	12	15	7.3

<sup>a</sup>RSI has requested alteration of the funding mechanism for grants affiliated with Centers within RSI, such that the values in the second row of Table 1 would be 15.0, 10.7, 12, 15, and 7.3, rather than those shown above.

**Participating Members.** RSI is affiliated, through its membership, with numerous campus facilities. These include (for example) the EMMAP Laboratory (School of Forest Resources and Environmental Science, SFRES), Hyperspectral Imager Laboratory (Physics), and the Agassiz, the MTU research boat.

**Computing Resources.** RSI maintains a computing support agreement<sup>2</sup> with the GMES-RSI computing network. This agreement provides for the maintenance of several RSI-related software packages (IDL/ENVI, the complete suite of ESRI's Arc GIS software, ERDAS Imagine, and Cadence), poster printing for RSI-affiliated students, faculty, and staff, and access to several computing labs maintained by the GMES-RSI computing network, including the RSI Computing Laboratory noted above. In addition, RSI supports high-performance computing and storage within this network. Access to these resources is provided to all RSI members via remote access from their home units.

## 6 Funding and Budget

### 6.1 Funding

RSI's activities are supported through a return of a portion of the indirect cost recovered from RSI-affiliated grants, as shown in the Table 1. Enhanced indirect cost return on RSI-affiliated grants is also provided to the PI and the department, in order to provide an additional incentive for interdisciplinary research and RSI affiliation, and (in the former case) to allow the PI a larger role in the direction of these funds to enhance research activities.

### 6.2 Budget

Table 2 shows the breakdown of planned RSI expenditures, based on a total RSI income of \$72,000. As RSI-affiliated research activities increase, the total budget will increase. Most of this increase will be directed toward the "Direct research and graduate support" budget category.

<sup>2</sup>As of March 25, 2005, this agreement has not yet been finalized. However, GMES is supporting RSI computing during the finalization of the agreement.

**Table 2. RSI Expenditure Categories**

Category	Annual cost (k\$)
<b>Administration costs</b>	
RSI director support	10.0
RSI 1/5- to 1/4-time staff	7.0
Materials and services	0.5
<b>Subtotal:</b>	<b>17.5 (24%)</b>
<b>Computing Support</b>	
(software available to all RSI members, connect fees for RSI computing stations, available to all RSI members, hardware upgrades, system administration, etc.)	17.0
<b>Subtotal:</b>	<b>17.0 (24%)</b>
<b>Remote Sensing seminar series</b> (for research development by sharing cost for collaborating visitors; MTU publicity; support for Remote Sensing minor)	
	5.0
<b>Subtotal:</b>	<b>5.0 (7%)</b>
<b>Direct research and graduate support</b>	
Proposal matching funds (e.g., equipment, field work/ship time, equipment maintenance or upgrades)	5.5
Graduate assistantships (supplements, cost-splitting with grant support, proposal cost-share)	9.0
Graduate travel awards (for presentation of research on RSI-affiliated or potentially RSI-affiliated projects)	2.0
Research faculty/Postdoctoral associate support (research staff grant-bridging funding, short-term new research faculty funding, support of RSI-affiliated graduate program courses)	11.0
Research development grants (Funds to aid the development of new RSI-affiliated research)	5.0
<b>Subtotal:</b>	<b>32.5 (45%)</b>
<b>Total</b>	<b>72.3</b>

## **7 Evaluation and Review**

RSI will conduct an internal review in spring 2008. As long as the results of that review indicate that RSI is making adequate progress toward meeting its objectives, the RSIAC will develop and submit a plan to renew and continue the Institute beyond December 31, 2008. Presuming that RSI is reauthorized at that time, similar reviews will take place each six years thereafter.