The Research Office accomplishes its mission of advancing excellence in research, scholarship, and creative activities (collectively, “research”) by providing the essential infrastructure and resources to support dynamic and growing research programs across all University of New Hampshire (UNH) academic disciplines. Our major goals are to increase external research funding that advances UNH scholarship and innovation, and to increase recognition of UNH faculty.

Despite the challenging budget environment, Fiscal Year 2014 (FY14) was an extraordinary one for research at UNH. Many of our indicators showed positive growth over FY13, with increases of 17% in proposal submissions, 10% in dollars requested, and 16% in award dollars received.

Proposal submissions grew from 743 in FY13 to 872 in FY14:

Proposal dollars requested from external sponsors increased from $301 million in FY13, to $332 million in FY14. Awards to UNH in FY14 totaled $110.5 million, up from $95.8 million in FY13.

As in previous years, federal awards made directly to UNH in FY14 represented the majority of sponsored program awards (56.9%) and were provided by 16 federal agencies. The National Science Foundation, the U.S. Department of Commerce (in particular, the National Oceanic and Atmospheric Administration), and the National Aeronautics and Space Administration continued as UNH’s largest federal sponsors. The New Hampshire Departments of Health and Human Services, Fish and Game, and Transportation were UNH’s largest state sponsors during FY14.

Awards from State of New Hampshire agencies and other universities and colleges amounted to $15.8 million and $9.5 million, respectively. Other sectors providing significant support to UNH in FY14 were non-profits ($11.5 million) and business and industry (nearly $10 million).
The Research Office conducts various activities and initiatives that promote UNH’s continued growth as a research-intensive university. In FY 2014 these included:

**Investing In Researchers and Facilitating Sponsored Research Funding**

- Presented programs focused on improving competitiveness for funding from federal agencies including “UP-2-NIH” for proposals to the National Institutes of Health and, in collaboration with UNH Cooperative Extension, “Making Your NSF-Forts Count” for proposals to the National Science Foundation. The latter helped UNH faculty continue its winning record for NSF CAREER awards, with new FY14 awards for the three faculty pictured below.

![FY14 UNH NSF CAREER Award Recipients](image1)

- Conducted a review of existing UNH centers and institutes, leading to a new FY15 initiative to strengthen existing or create new centers and institutes to be more competitive for external funding.

- Provided one-on-one support to researchers developing proposals to external sponsors, including: strategizing and targeting to optimize match with sponsors; proposal planning, compiling, editing and polishing; budget development assistance; and submitting 872 proposals requesting over $330M in external support.

- Continued a successful strategy with the UNH Office of National Fellowships and the Graduate School to encourage and support undergraduate and graduate student applications for research fellowships and prestigious funding opportunities. One outcome has been an increase since FY12 from 4 to 34 applications to the National Science Foundation Graduate Research Fellowship Program and an increase since FY12 from 1 to 5 awards in FY14.

- In partnership with the NH Small Business Development Center, conducted **NH Inspires Innovation**, a program providing specific training on preparing grant applications to the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) grant programs of the National Institutes of Health, the National Science Foundation, the Department of Defense, and the Department of Energy. The program has trained over 120 individuals and companies, and is tracking proposal development and growth by trainees.

- Provided support for creation of new Carsey School of Public Policy and School of Marine Science and Ocean Engineering.

**Raising Awareness of the Depth, Breadth, and Quality of UNH Research**

- Hosted USDA Climate Change Program Director William Hohenstein, USDA Northeast Regional Climate Hub Director David Hollinger, NH Agriculture Commissioner Lorraine Merrill, and representatives from NH’s Congressional delegation in an all-day event, attended by over 50 participants, to acquaint the visitors with climate change research conducted at UNH, and the work of UNH Cooperative Extension and the New Hampshire Agricultural Experiment Station to successfully apply the research.

- Published print and online versions of the 2013 **UNH Research Digest**, a compilation of the 352 research news stories reported by various UNH news media and campus publications, referencing 533 URLs covering all eight research areas displayed on the UNH Research web site.

- Featured 58 research projects in the “Research Spotlight” on the UNH Research web page.

- Submitted 11 nominations of outstanding faculty for prestigious external recognition or awards and for service on national-level panels or committees. Cooperative Extension’s Jeff Schloss was one of four national finalists for the C. Peter Magrath University Community Engagement Awards. Semra Aytur, College of Health & Human Services (pictured at left), was the regional winner of the Ernest A. Lynton Award for the Scholarship of Engagement for Early Career Faculty.

- Presented the **Faculty Research Excellence Seminar Series**, a showcase for research by UNH faculty and selected non-UNH research collaborators, designed to foster interdisciplinary discussion and encourage new collaborations with University and community partners. Series seminars included: Impact of the Deepwater Horizon Oil Spill; Science Learning and Assessment for the Next Generation; Research and the Media; Research in Sustainability Science: The Emerging Field of Applied Theatre; and Climate Change and the Rising Microbial Tide.

**Facilitating Commercial Ventures, Intellectual Property and Corporate Engagement**

- Launched UNHInovation (UNHI), a restructuring of the former Office for Research Partnerships and Commercialization, to harness UNH’s economic development components into a coordinated and highly effective organization designed to leverage UNH’s intellectual and physical assets and services.

- Created a new “corporate engagement” website to serve as a central entry point for companies to work with UNH faculty and students, to use UNH facilities and equipment, and to form new collaborations.
Finalized new policies on intellectual property, equity, and facilities use to enhance the protection and fair use of UNH assets.

Experienced record breaking levels of number of licenses issued and number of invention disclosures received. The chart below is one indication of the growth and success of the UNH commercialization enterprise since FY11.

- Expanded functionality of the online UNHCEMS® system to improve document and data management processes for biological safety programs.
- Developed or improved online training modules and live training for the revised Hazard Communication/ Globally Harmonized System of Classification and Labeling of Chemicals (GHS) Standard, and for Responsible Conduct of Research and Scholarly Activities.
- Continued leadership for review of new protocols and management of ongoing protocols overseen by UNH’s Institutional Review Board for the Protection of Human Subjects in Research (IRB) and Animal Care and Use Committee (IACUC); and for the Chemical, Radiation, Occupational and Institutional Biosafety Committees.
- Provided educational programs for undergraduate and graduate students, faculty, and staff to promote research integrity and to meet NSF’s and USDA NIFA’s responsible conduct of research training requirements.
- Worked with the UNH Responsible Conduct of Research and Scholarly Activity Committee to update two UNH policies (Misconduct in Scholarly Activity and Ownership and Management of Research Data) and worked with the UNH Faculty Senate to better align the UNH policy on Misconduct in Scholarly Activity with the Student Rights, Rules, and Responsibilities document.
- Established a UNH-wide “Uniform Guidance Working Group” and a webpage to keep the UNH community informed about major administrative changes to the administrative requirements of federal grants and contracts. Changes will take effect on December 26, 2014.
- Ensured appropriate and coordinated compliance across UNH with the updated federal Health Insurance Portability and Accountability Act (HIPAA) regulations by:
  
  Implementing an interim policy; appointing a HIPAA Privacy Officer who provides in-person training and consulting regarding HIPAA issues; chartering a “HIPAA Team” to provide a regular discussion forum and resource regarding HIPAA-related issues and processes, and to encourage a continuing culture of compliance regarding health information privacy and security; and beginning development of web-based HIPAA training for the UNH community.

Ensuring compliance with Federal, State and UNH policies and regulations regarding health, safety, and the responsible conduct of research

- Implemented UNH-wide strategy for public sharing of research data as required by federal agencies.
- Passed, and often exceeded, requirements for unannounced inspections of University facilities, processes, and activities for management of hazardous wastes, radiation safety, and housing of vertebrate animals.
- Partnered with UNH Facilities to implement a UNH Asbestos Operations and Maintenance (O&M) Plan.
- Adopted use of iPad minis and commercial safety inspection software during laboratory safety inspections to enhance access to information during inspections and improve the quality of the inspection reports.

Strengthening the Research Infrastructure

- Secured research analytics software to help UNH administrators and faculty better understand faculty research strengths and strategic competitiveness.
- Supervised design and construction of an imaging facility to house all but one of the University Instrumentation Center (UIC) core instruments and personnel within the Parsons/Iddles building, allowing for improved customer experiences as well as increased teamwork and managerial effectiveness for UIC staff.
• Continued to pursue new instrumentation through the National Science Foundation’s Major Research Instrumentation program and received awards for two new instruments – a focused ion beam scanning electron microscope and an isotope ratio mass spectrometer.

UNH’s new focused ion beam scanning electron microscope (pictured above) is located in the University Instrumentation Center.

• Implemented an online repair service request form for the UIC that allows users to more easily request engineering services for repairs or calibrations, resulting in an improved level of customer service and more accurate expense and billing processes.

• Secured a grant through the National Science Foundation’s Campus Cyberinfrastructure – Network Infrastructure and Engineering program to build out point-to-point dedicated networks for UNH research projects that require high bandwidth for transferring and/or accessing large data sets. Projects or facilities advantaged include: Sun-to-Ice (Harlan Spence), Living Bridge (Erin Bell), Flow Physics Facility (Joseph Klewicki), Hubbard Center for Genome Studies (Kelley Thomas), and Ocean Mapping & Visualization (Brian Calder).

• Provided leadership for the New Hampshire EPSCoR program through which federal grants totaling more than $117.4 million have been received since 2004 by New Hampshire higher education institutions, including community colleges, to build on existing research strengths and to broaden competitiveness through development of: human capital (STEM education pipeline and a highly skilled science and engineering workforce); cyber-infrastructure (high-speed Internet and computing resources); physical capital (facilities and instrumentation for scientific experimentation and testing); and social capital (an interactive network among UNH, other NH higher education institutions, and NH stakeholders, policymakers and citizens).

• Conducted internal “Limited Submission Program” peer-reviewed competitions to select the most competitive proposals to represent UNH at the federal level.

Looking Ahead

The Research Office is taking several steps to sustain the excellence of the UNH research enterprise and to position UNH for future growth. Consistent with UNH’s Strategic Plan, “UNH 2020,” these steps include the following:

• Submit proposals for larger projects that build on innovative partnerships and UNH’s interdisciplinary strengths. Hiring a director of large center/program development in FY15 will facilitate this initiative.

• Sustain (National Science Foundation, National Institutes of Health, U.S. Department of Energy) and implement new (U.S. Department of Agriculture and U.S. Department of Education) agency-specific faculty development programs to increase the number and competitiveness of proposals submitted to those agencies.

• Strengthen industry outreach, re-tool UNH’s corporate relations strategy, and create an entrepreneurship center.

• Seek elevation in UNH’s Carnegie Classification designation to “Research University / Very High Research Activity”.

• Strengthen relationships with UNH Foundation Relations to make funding opportunity searches seamless regardless of sponsor type and to increase funding to UNH by non-profits.

• Enrich international partnerships and facilitate international research in coordination with UNH’s Center for International Education.

• Increase efficiency and effectiveness of sponsored programs administration through better tools and process improvements that will reduce administrative burden for researchers and streamline the proposal submission process.

• Design, implement, and broadcast an annual report on UNH research excellence in order to raise UNH’s visibility as a major research university.

• Implement Symplectic’s “Elements” to provide an efficient method for faculty to deposit their research and scholarly activity outputs, in particular, publications.

UNH has much to be proud of as the flagship research institution of the University System of New Hampshire. The Research Office is privileged to contribute to the UNH mission, and is well-positioned to enable further growth in UNH’s research enterprise and, in turn, help UNH researchers to solve the major problems facing the region and the world in the coming decade.
The Research Office is composed of a central administrative office and 7 service units, and is the New Hampshire EPSCoR Program home. Visit http://www.unh.edu/research/about to learn more about the Research Office and its units.

Office of the Senior Vice Provost for Research (OSVPR)
The OSVPR provides leadership and services to support UNH faculty, students, and staff in their research, scholarship, and creative activities; facilitates cooperation between UNH and the business community; supports technology transfer and commercialization of UNH's intellectual property; and communicates and promotes the breadth and depth of UNH research and discovery and the resulting impacts within and beyond the University.

Research Development & Communications (RDC)
RDC helps faculty and other UNH researchers enhance their strategies and skills for grant seeking, coordinates UNH responses to special funding and award programs, facilitates institution-wide and multi-disciplinary proposal development, and promotes communication of UNH research and discovery activities to the general public and within UNH. RDC also nominates faculty for prestigious prizes and awards.

Sponsored Programs Administration (SPA)
SPA facilitates proposal submission, award, and post-award processes with external sponsors, and mediates among the interests of the institution, sponsors, and UNH researchers. SPA’s Grant and Contract Administrators assist with budget development and compiling proposal components, and have signature authority to submit proposals and receive awards on behalf of UNH. SPA’s Financial Research Administrators are responsible for award financial management and compliance.

UNHInnovation (UNHI)
UNHI advocates for, manages, promotes, and commercializes UNH’s intellectual assets. UNHI facilitates transfer of UNH research results to the public, while retaining the innovators’ rights to publish those results and pursue their research programs. Based on UNH’s intellectual property, UNHI supports start-up companies and facilitates partnerships between UNH and the business community. UNHI also supports the UNH-IOL and the NHIRC.

The UNH InterOperability Laboratory (UNH-IOL) is a neutral third-party entity dedicated since 1988 to testing data networking technologies through industry collaboration. UNH-IOL is one of the technology industry's premier independent proving grounds for new technologies, providing high-caliber interoperability and conformance testing for member companies. The lab fosters multi-vendor interoperability while preparing students for careers in industry.

Established in 1991, funded by the NH Legislature, and administered by UNHI on behalf of the State, the NH Innovation Research Center (NHIRC) is a matching grant program that connects NH companies with expertise at research universities to solve the companies’ scientific or technical problems. Since inception, the NHIRC has awarded over $6.3 million in State funds to support research for 135 NH companies, with leverage of nearly 18:1 on State dollars; enabled creation of 650 NH jobs; and assisted NHIRC awardees to receive over $32 million in federal Small Business Innovation Research awards and over $900 million in follow-on capital.

Research Integrity Services (RIS)
RIS provides services to the UNH community through information and education programs, review and monitoring, technical consultation, and direct services in these areas: Humane Care and Use of Vertebrate Animals; Human Subjects Protections; Responsible Conduct of Research and Scholarly Activity; Financial Conflict of Interest in Research; and Compliance with the Health Insurance Portability and Accountability Act (HIPAA). RIS collaborates with units across UNH to promote and foster an institutional culture of integrity in research and scholarship.

Research Computing Center (RCC)
RCC provides information technology (IT) support to the UNH sponsored research community and collaborates with higher education, industry, and government to create innovative technologies to address today’s social, environmental, and economic needs. RCC’s Operations Group provides system, network, and database administration; IT security; and help-desk support for the Research Office and for faculty research. RCC’s Software Development Group supports the research community, corporate partners and government agencies by developing custom web, mobile, desktop, and HPC programs.

University Instrumentation Center (UIC)
The UIC supports UNH researchers, faculty and staff by supplying the following services: operating shared instruments within UIC’s physical space; expert analytical guidance to support multi-disciplinary fields; instrumentation operation and analysis training; and instrument repair and calibration services. The UIC also facilitates access to UNH-based instrumentation and support services for businesses and others in the external research community.

Office of Environmental Health & Safety (OEHS)
OEHS promotes safe and healthful environments for the entire UNH population through information and education programs, review and monitoring, technical consultation, and direct services. OEHS also develops and manages programs to ensure compliance with applicable UNH policies and state and federal health, safety, and environmental regulations; manages the UNH Chemical, Radiation, Occupational, and Institutional Biosafety Committees; manages a web-based Chemical Environmental Management System (UNHCEMS®); and represents UNH during inspections and reviews by external entities.

New Hampshire EPSCoR Program (NH EPSCoR)
NH EPSCoR advances New Hampshire’s science and engineering competitiveness by strategically investing in research infrastructure, promoting education in STEM disciplines, and fostering partnerships with technology-based businesses that enhance job creation and economic development. To learn more about NH EPSCoR, see: http://www.epscor.unh.edu/.
On the Cover:

Graduate student working on Professor Dale Barkey's process for chemically-resistant anodized aluminum
Image Credit: Mike Ross

Pumpkins developed by UNH Emeritus Professor of Plant Biology and Genetics, Brent Loy
Image Credit: Lisa Nugent

Cray supercomputer housed at the UNH Research Computing Center

Image of the Mariana Trench developed by scientists at the UNH Center for Coastal and Ocean Mapping/Joint Hydrographic Center (CCOM/JHC)

Confocal microscope housed at the UNH Instrumentation Center
Image Credit: Chelsey DiGiuseppe

High school students participating in NH EPSCoR 2014 Girls Technology Day