Notice of Meeting

UNIVERSITY OF HAWAI‘I

BOARD OF REGENTS COMMITTEE ON RESEARCH AND INNOVATION
Members: Regent Eugene Bal (Chair), Regent Ben Kudo (Vice Chair), and Regents Higaki, Higa, and Putnam

Date: Thursday, February 9, 2017
Time: 10:30 a.m.
Place: University of Hawai‘i at Mānoa
Information Technology Building
1st Floor Conference Room 105A/B
2520 Correa Road
Honolulu, Hawai‘i 96822

AGENDA

I. Call Meeting to Order

II. Approval of Minutes of the November 3, 2016 Meeting

III. Public Comment Period for Agenda Items: All written testimony on agenda items received after posting of this agenda and up to 24 hours in advance of the meeting will be distributed to the board. Late testimony on agenda items will be distributed to the board within 24 hours of receipt. Registration for oral testimony on agenda items will be provided at the meeting location 15 minutes prior to the meeting and closed once the meeting begins. Written testimony may be submitted via US mail, email at bor@hawaii.edu, or facsimile at 956-5156. Oral testimony is limited to three (3) minutes.

IV. Agenda Items

A. For Information

1. Update on Advancing Research at UH Mānoa
2. Update on UH System Research and Innovation Long Range Plan
3. FY17 Q2 Extramural Awards Report and R&I Performance Metrics
4. Update on University of Hawai‘i Patent and Copyright Policies
5. UH-RCUH Internal Agreement Update

V. Adjournment
MEMORANDUM

TO: Eugene Bal III, Chairperson
BOR Committee on Research and Innovation

VIA: David Lassner
President

FROM: Vassilis L. Syrmos
Vice President for Research and Innovation

SUBJECT: BOR COMMITTEE ON RESEARCH AND INNOVATION AGENDA MATERIALS FOR FEBRUARY 2017 MEETING

February 1, 2017

Please find attached the following materials that will be discussed at the February 17 BOR Committee on Research and Innovation meeting:

A. For Information:
   - Update on UH System Research and Innovation Long Range Plan
     - A Vision for a New Innovation Ecosystem: Research and Innovation Long Range Planning Roadmap (report)
     - A Vision for a New Innovation Ecosystem: Research and Innovation Long Range Plan Roadmap (ppt)
   - Update on Advancing Research at UH Mānoa (M. Bruno ppt)
   - FY17 Q2 Extramural Awards Report and R&I Performance Metrics
     - FY17 Q2 Research and Innovation Performance Metrics
     - FY17 Q2 Extramural Awards Analysis (report)
     - FY17 Q2 Extramural Awards Analysis (ppt)
     - FY17 Q2 Technology Transfer Analysis (report)
     - FY17 Q2 Technology Transfer Analysis (ppt)
   - Update on UH Patent and Copyright Policies (ppt)
   - Update on UH-RCUH internal agreement/relationship (ppt)

Attachments
Update on Advancing Research at UH Mānoa

- Mānoa Strategic Plan - Research
  - Faculty research development support (across all units and ORUs)
  - Reduce the faculty research administrative burden
  - Improved use and support of core research facilities
  - Enabling and supporting student research
  - Understanding – and communicating – the impact of research
  - Final recommendations due in April

- Comprehensive External Review of Research @ Mānoa – April 26-28

- Resource Management Matters
  - New faculty appointments
  - Increasing grant funding of faculty salaries
  - Strategic hiring
  - ORUs and organization
  - Space – Sharing and Campus Management
A Vision for a New Innovation Ecosystem

Long Range Plan Roadmap
The Broader Impact of UH Research

• UH research impacts the quality of life in the islands and around the world
• UH has a greater role to help diversify the state’s economy through the Hawai‘i Innovation Initiative
• Future of university research: complex problems resolved by multi-disciplinary teams of researchers both internally and externally
• UH campuses should use this roadmap to assist with their advancement of the UH research enterprise for the future
Guiding Principles

• UH System sets a roadmap; provides means (e.g., tools; policies)

• Individual campuses implement actionable strategic plans compatible with their strengths, capabilities, aspirations and metrics

• Campuses collaborate with each other and stakeholders for the betterment of Hawaiʻi, the nation and the world
Core Elements

• Five priority innovation hubs
  – Maintain commitment to faculty research, especially projects that address Hawai‘i challenges and opportunities
  – Additional hubs may be identified or modified in the future

• Innovation workforce

• Dynamic innovation and entrepreneurship ecosystem

• Strengthening the UH research enterprise
HUB: Ocean and Climate Sciences

- Continue study of microbes and their important role in the ecosystem process
- Advance conservation biology utilizing inter-disciplinary collaboration and indigenous knowledge
- Continue efforts in management-driven research and outreach to tackle various marine issues
- Expand climate change research efforts
HUB: Astronomy

- Utilize solar astronomy research to help manage disruptions to power grids and communications by solar flares
- Panoramic surveying of near-earth objects and space debris
- Instrumentation/adaptive optics applications outside of astronomy where remote monitoring and image stabilization/corrections are required
- Stewardship of the mountain summits through relationship building with key stakeholders to protect and maintain cultural, educational, environmental and recreational uses
HUB: Health and Wellness

• Utilize knowledge of ethnic/racial differences in phenomena such as cancer incidence to open avenues for Hawai‘i’s multi-ethnic population to gain benefits from clinical research or socio-cultural factors that promote well-being
• Expand and strengthen research into heart disease, diabetes and other health problems prevalent in Hawai‘i and the Pacific Region
• Advance natural product research
• Advance knowledge of infectious diseases to mitigate spread and develop vaccines
HUB: Digital Economy and Civil Infrastructure Security

- Data visualization
- Cybersecurity research, training and workforce development
- High performance computing
- Engage in research to improve the strength and resiliency of digital networks to prevent disruption
- Expand programs in digital and creative media production
- Continue training and research in disaster preparedness
HUB: Sustainable Ecosystems and Energy

• Utilize Hawai‘i’s location and natural resources to conduct renewable energy, grid optimization and energy storage research, which are vital due to our distance from alternate power grids

• Utilize inter-disciplinary research and indigenous knowledge to identify sustainable agriculture products to aid local food production

• Conduct research to fill critical gaps knowledge about water supply

• Continue efforts to protect natural and managed ecosystems and create sustainable urban environments
Innovation Workforce

Vision: Citizens well-educated, “work ready” and equipped to solve problems

– Obtain information on workforce needs of employers and skills needed by graduates
– Coordinate STEM and vocational educational offerings to meet needs
– Develop and offer programs to address work-life balance and adaptation to rapid change in workplace
– Expand and strengthen programs to address underrepresented groups
– Target areas of immediate need (e.g. teachers, MDs, etc.)
Innovation & Entrepreneurship

Actively promote innovation culture and improve commercialization in Hawai‘i

– Integrate innovation & entrepreneurship throughout UH educational experience
– Expand proof-of-concept/accelerator programs
– Engage local community and identify collaboration opportunities
Strengthening the Enterprise

• Leverage faculty expertise and staff for grant development
• Implement best practices to minimize administrative burden of meeting regulatory requirements
• Monitor key metrics/performance measures
• Provide guidelines for addressing resource allocation issues
• Communicate broader impact of research and innovation to key stakeholders
Funding & Regulatory Environment

• Increased administrative burden
  – Unfunded, mandated federal regulations

• Increased financial burden
  – Federal shift of research costs to states
  – State government prioritization of other needs (Medicaid supplements; pensions; K-12 education; infrastructure) over higher education

• Increased competition for stagnant or slow growing research budget
Current Assessment

• Major programs: oceanography (96th percentile) and astronomy (94th percentile) based on federal R&D expenditures (among the top)

• Other programs: medical sciences (76th percentile) and Dept. of Energy funding (81st percentile) (encouraging)

• Under current federal funding climate
  – Strive to maintain its ranking in oceanography and astronomy
  – Aim to increase its percentiles by three points by 2020 in other programs
Due to funding environment, strategies include

– Increasing revenue
  • Out-of-state and foreign students
  • Foundation or international grants and contracts
  • Endowment campaigns

– Containing costs

– Improving efficiencies
High Performance Strategies

Administration will work with faculty, staff and other key stakeholders to evaluate and recommend solutions that work for UH

- Intellectual capital profile
- Strategic investments
- Facilities optimization
- Organizational/geographic realignment
- Organized Research Units
Moving Forward

Within next 18-24 months
– Strategic hiring (position management)
– Incentives (strategic investments)
– Measurement (determining impact)
– Innovation space (promote culture of innovation)
– Organizational structure review (planning for the future)
Implementation Guide

• Compilation of best practices and suggested metrics for consideration by campuses
• Campuses to customize their own strategies and select metrics to supplement administration’s metrics
• Under consultation
Topics Covered

• Strategic hiring
• Return of overhead (RTRF) investment
• Space management
• Grant development offices
• Innovation spaces
University of Hawai‘i System

A Vision for a New Innovation Ecosystem

RESEARCH AND INNOVATION LONG RANGE PLANNING ROADMAP
An magnetic resonance image of a child’s brain at The Queen’s Medical Center-University of Hawai‘i MR Research Center. PHOTO: JABSOM
CONTENTS

1) Summary: The Broader Impact of UH Research ................................. 5

2) Planning Roadmap ................................................................. 6
   Guiding Principles
   Core Elements
   Priority Innovation Hubs
   Innovation Workforce
   Dynamic Innovation and Entrepreneurial Ecosystem
   Strengthening the UH Research Enterprise

3) Implementation ................................................................. 15
   Funding and Regulatory Environment
   Current Assessment
   New Normal
   High Performance Strategies
   Dialogue and Cooperation

4) Moving Forward ................................................................. 21
   Strategic Hiring – Position Management
   Incentives – Strategic Investments
   Measurement – Determining Impact
   Innovation Space – Promoting a Culture of Innovation
   Organizational Structure Review – Planning for the Future

The University of Hawai‘i is an equal opportunity/affirmative action institution.
Summary: The Broader Impact of UH Research

Research conducted by the University of Hawai‘i (UH) impacts the quality of life in the islands and around the world. Because of Hawai‘i’s tremendous geographic diversity that encompass erupting volcanoes, frozen summits, tropical rain forests and the deep ocean, UH research is equally as diverse with its world-renowned research programs in astronomy, medicine, oceanography, genetics, biosciences and tropical agriculture. Cutting edge research facilities like the Daniel K. Inouye Center for Microbial Oceanography: Research & Education, Institute for Biogenesis Research, John A. Burns School of Medicine, UH Cancer Center, the soon-to-be constructed Daniel K. Inouye College of Pharmacy at the University of Hawai‘i at Hilo and the Haleakalā-based Daniel K. Inouye Solar Telescope that is slated for completion in 2019 – provide UH researchers with the necessary tools to conduct competitive research in science, technology and innovation. University of Hawai‘i researchers are actively engaged in leading roles in ocean acidification and coastal erosion mitigation, alternative energy studies, heart disease and bladder cancer therapy development, big data/data visualization enterprise development, cybersecurity workforce development, and food security and sustainable agriculture technologies.

The University of Hawai‘i has taken on a greater role to help diversify the state’s economy through the Hawai‘i Innovation Initiative (HII). Through this bold and proactive effort, UH has partnered with the Hawai‘i business community to help leverage its research to create and attract new companies, cultivate talent for a knowledge-based economy and to encourage the development of future technologies. The common goal is to build a thriving research enterprise that will be driven by the growth of new industries in Hawai‘i – fueled by UH’s plans to employ and develop top researchers in several focus areas over the next decade.

The future landscape of university research is evolving. In that future, the increasingly complex problems faced by the region, the nation and the planet will primarily be resolved by multi-disciplinary teams of researchers – some formed from within the UH System, while others will involve collaboration with other universities and institutions. University research, the innovative solutions derived from it and the ability to rapidly translate a good idea into purposeful products and services are key factors that will drive economic prosperity and support the quality of life here in Hawai‘i and around the world.

Each UH campus should take an introspective look at its current research operations and use A Vision for a New Innovation Ecosystem as a roadmap to assist with their individual planning process to help advance the UH research enterprise for the future.
Planning Roadmap
Guiding Principles

- The UH System sets the overall vision for research and innovation and provides the tools, policies and processes for the campuses to achieve their missions.
- The individual campuses should be responsible for implementing actionable plans toward the strategic goals that are compatible with their unique strengths, capabilities, aspirations and metrics.
- The campuses should collaborate with each other, government, business and industry in implementing their plans for the betterment of Hawai‘i, the nation and the world.

Core Elements

- Five priority innovation hubs to nurture prosperity and broaden social impact
- The innovation workforce
- A dynamic innovation and entrepreneurship ecosystem
- Strengthening the UH research enterprise

Priority Innovation Hubs
To utilize on its existing strengths and capabilities and to capitalize on emerging opportunities, UH should continue to explore new avenues to better leverage its location and existing talent in ocean sciences, astronomy, energy, sustainable agriculture, health sciences, digital/creative media, data intensive sciences and engineering. These areas were identified as national science and technology funding priorities in which the extramural funding growth is occurring. In some cases, strategic hires will be necessary to address critical gaps to participate in these areas.

Based on the rationale listed in the previous paragraph, below are five innovation hubs that the campuses should consider. In the future, additional hub areas may be identified as opportune in response to regional, national and/or international developments.

It should be noted that UH’s focus on these hubs will not reduce its commitment to supporting faculty research in other disciplines – especially on research that address Hawai‘i-related challenges, opportunities and needs. Such research will benefit from efforts to strengthen the research enterprise overall.
HUB: Ocean and Climate Sciences
As an island community that depends on its climate and environment for tourism, and the ocean for food and recreation, research and outreach on problems such as coral bleaching, coastal erosion, sea level rise, rainfall prediction, fisheries management and invasive species management will continue to be high priority areas. The University of Hawai‘i will continue to enhance humankind’s understanding of the issues and uncover possible solutions by:

- Studying relevant microbes and their role in the ecosystem process. Since microbes perform important functions such as producing and consuming greenhouse gases and composing the base of the marine food web, understanding how they work could provide insight on how to mitigate climate change and preserve the food chain.
- Utilizing inter-disciplinary collaboration and indigenous knowledge to advance conservation biology research on environmental stressors and how animals, plants and microbes adapt. This could provide future generations with the understanding necessary to effectively manage Hawai‘i’s fragile natural resources.
- Continuing efforts in management-driven research and outreach to tackle problems such as marine debris, marine resource usage and catastrophic event response.
- Expanding research in climate change issues of particular interest and immediacy to the Pacific Region.
HUB: Astronomy
Hawai’i is an ideal site for astronomical research due to the high altitude and dryness of its observing sites and its unique geological features which make it ideal for planning manned and unmanned missions to the Moon, Mars and beyond. The University of Hawai’i will strive to elevate its standing in the astronomical community and bring benefits to the state and the world by expanding and strengthening research in:

- Solar astronomy, which is important in predicting and utilizing precautions to manage disruptions to power grids and communications caused by solar flares.
- Panoramic surveying, which is relevant to many different science areas such as asteroids and cosmology. It is as equally important in tracking near-earth objects and space debris whose deteriorating orbits could pose threats to life and property.
- Instrumentation/adaptive optics, which has application in a variety of disciplines or applications outside astronomy where remote monitoring and image stabilization/corrections are required.
- Stewardship by building relationships and coordinating with kūpuna, the local community, state agencies, and other key stakeholders to protect and maintain cultural, educational, environmental and recreational uses of the mountain summits.
HUB: Health and Wellness

Geographic isolation makes Hawai‘i particularly sensitive to changes in the availability, as well as the quality, of healthcare. In addition, Hawai‘i’s popularity as a tourist destination and status as a key military asset make it a vector for infectious disease and other potential health issues.

The University of Hawai‘i is committed to research and service toward the improvement of the health and wellness of the Hawai‘i community – especially in Native Hawaiians, Pacific Islanders, the rural community and its diverse multi-ethnic population. The University of Hawai‘i will advance healthcare research by:

- Utilizing knowledge of ethnic/racial differences in phenomena such as cancer incidence (e.g., higher rate of breast and colorectal cancer than the national average) to open avenues for Hawai‘i’s multi-ethnic population to gain benefits from clinical research such as clinical trials, new diagnostic tests and interventions. This advantage could also lead to participation in future therapies such as personalized precision medicine.
- Expanding and strengthening research into heart disease, diabetes and other health problems that affect the local community and the Pacific Region.
- Expanding research and knowledge of the unique socio-cultural factors in Hawai‘i’s multi-ethnic communities and families that promote well-being, good nutrition and health.
- Advancing natural products research into potential drugs for treating various diseases or afflictions such as heart disease or cancer.
- Advancing knowledge of infectious diseases, such as mosquito-borne viruses, and the means of mitigating their spread and vaccinating against them.
HUB: Digital Economy and Civil Infrastructure Security
The ability to process and move large quantities of data securely across global networks and to create, manipulate and present content will play a vital role in Hawai‘i’s economy and way of life. The University of Hawai‘i can take the lead in many of these efforts, including:

- Utilizing data visualization to manage, manipulate and interpret large data sets in various scientific disciplines as well as towards simulation and game development.
- Engaging in cybersecurity research, training and workforce development to prevent and mitigate cyberattacks against critical systems in a variety of industries.
- Guiding the expansion of Hawai‘i’s computing capabilities and global connectivity through research in high performance computing.
- Engaging in research to improve the strength and resiliency of digital networks which prevent and mitigate disruption of critical communication and civil infrastructure systems.
- Expanding and coordinating programs in digital and creative media production, which could help diversify Hawai‘i’s economy by empowering its citizens to create, manipulate and present digital content.
- Continuing training and research in disaster preparedness, including better ways to track and minimize the impact of natural and man-made threats, as well as the handling of post-disaster recovery efforts.
HUB: Sustainable Ecosystems and Energy

Food, water and energy security is very important to a geographically isolated island community like Hawai‘i. The state relies heavily on imported food and oil and has a limited aquifer, so finding solutions to meet current and future needs is vital to the survival of its inhabitants.

The University of Hawai‘i will seek to engage in research and development activities that will help achieve some form of sustainability and inform key decision makers and stakeholders on policies and practices on how it can be accomplished through:

- Utilizing Hawai‘i’s location and natural resources to conduct renewable energy research on various methods like solar power, wave energy, wind, hydrogen, etc.
- Utilizing inter-disciplinary research and indigenous knowledge to identify appropriate sustainable agriculture products to help increase local food production.
- Conducting research in grid optimization and energy storage, which are particularly vital for a place like Hawai‘i that is thousands of miles away from an alternate power grid.
- Conducting research to fill critical gaps in knowledge about water supply.
- Enhancing the living environment of all Hawai‘i’s citizens by protecting the natural and managed ecosystems, and creating sustainable urban environments.

Innovation Workforce

To compete in the local and global workplace, Hawai‘i’s citizens need to be well-educated, well-prepared for work and well-equipped to solve problems. At the same time, they will also need to become more adept in life management skills to achieve the necessary balance and harmony of a healthy and productive member of the workforce.

The University of Hawai‘i will apply new technologies and methods to improve, tailor, expand and increase access to its academic and vocational educational programs to better prepare its students and graduates to enter the workforce by:

- Utilizing surveys and data mining to become better informed about the workforce needs of government, business, industry and non-profits, as well as graduates to identify emerging
personnel needs and critical gaps in knowledge transfer for UH graduates to be work-ready in cybersecurity, energy, nursing and other emerging fields.

- Addressing the state’s critical shortage of doctors and health care professionals by working with the federal and state government, hospitals, and other key stakeholders on increasing graduate medical education and funding for medical residency programs, especially in rural and neighbor island communities.

- Coordinating Science Technology Engineering and Math (STEM) curriculum and vocational education offerings to address workforce needs, enable graduates to enter the workforce at any stage, and assist displaced workers to enter new careers.

- Integrating innovation into educational programs so that UH graduates will gain new knowledge and learn skills to creatively solve problems collaboratively in their chosen field.

- Invigorating professional and vocational programs so that graduates have sound, practical and theoretical, industry-relevant know-how to meet key national or international qualifications in strategically important fields.

- Developing and offering life skills courses to prepare UH students with “real world” skills for thriving in college and beyond. Knowledge and skill development are essential for students to succeed in college and are also necessary to help graduates achieve work-life balance to thrive in the workplace and to sustain well-being in life.

- Developing and offering programs that prepare graduates to be resilient and able to adapt to rapid change in the workplace by acquiring the mindset that learning and acquiring new skills is a lifetime process.

- Expanding and strengthening programs to address underrepresented groups such as Native Hawaiians and Pacific Islanders in college and the innovation workforce.
Dynamic Innovation and Entrepreneurial Ecosystem

In order to promote a culture of innovation and entrepreneurship and to better commercialize discoveries and inventions, UH will take a fresh, active role in addressing these issues which are critical to Hawai‘i’s economy and future by:

- Coordinating and integrating innovation and entrepreneurship throughout the UH educational experience (curricular, extra-curricular and co-curricular) to provide students, graduates and others the tools to create new businesses or innovate in their chosen field.
- Expanding proof-of-concept/accelerator programs to nurture new technologies and innovation in niche markets and to better inform graduates and others on what will actually sell.
- Engaging the local community, including Native Hawaiians, to access these services to pursue their own interests in innovation and entrepreneurship.
- Engaging with key stakeholders and subject matter experts to update UH intellectual property and commercialization policies and process with best practices that work for Hawai‘i.
- Developing networks within the local community, abroad and within UH to collaborate on projects such as SBIR/STTR grants, or provide opportunities for UH to apply its expertise to help solve critical problems affecting government, business and industry.
- Utilizing the principles of innovation and entrepreneurship to stimulate the creation of social enterprises that will help address social issues and other critical problems to the community.
- Strengthening business community (e.g., Hawai‘i Business Roundtable; Chamber of Commerce) and K-12 educational community engagement to more widely promote and permeate the culture of innovation and entrepreneurship in the state.
Strengthening the UH Research Enterprise
The last ten years were marked by the expansion of research administrative and compliance services to better address critical needs and coverage in vital areas. The University of Hawai‘i will continue its efforts to become more efficient and effective in handling the transactions that matter to its customers, managing resources wisely and mitigating regulatory and administrative burden by:

- Pursuing extramural funding that leverages expertise of seasoned faculty and staff that have a record in receiving and managing large awards to provide effective models for establishing grant development offices throughout the UH System.
- Engaging key stakeholders and subject matter experts to implement best practices to minimize administrative burden while meeting regulatory requirements.
- Monitoring key metrics on important transactions and to encourage process improvement where practicable.
- Initiating the dialogue and providing guidelines for addressing resource allocation issues such as positions, funds, core facilities, space and incentives.
- Addressing performance measurement and how to communicate the broader impact of research and innovation to key stakeholders.
- Restructuring research administration and services to relieve regulatory and compliance requirements by the federal government.
Implementation
Funding and Regulatory Environment

There is a general consensus that the federal-state-public research university partnership is misaligned. What began with the understandable premise that states benefit from federal investment in research and thus each state should bear its “fair share” of the costs of doing research – has resulted in a precarious situation. Decades of cost sharing requirements, facilities and administrative (F&A) recovery caps, salary caps, cost containment accounting changes, and unfunded mandates have saddled colleges and universities with a larger share of the financial burden of conducting research – even before the investments in physical plant and faculty recruitment necessary to remain competitive are applied.

For public universities, there are added pressures. Federal regulations were increased with the expectation that they would not result in additional costs and research costs were shifted toward the states. However, it didn’t occur to the federal government that the states would push back and refuse to shoulder the financial burden associated with research.

Similar to the federal view that states with their tax bases could bear the costs, states are now viewing the federal government in the same light. Federal grants are viewed as being fungible and states are expecting public universities to use these grants to absorb research costs, such as faculty salaries. However, many state legislatures are not aware (or choose to ignore) that the majority of sponsoring agencies either cap the size of awards or have imposed arcane salary caps to limit costs to their agencies.

Federal agencies and state legislatures are now faced with choosing how to allocate stagnant or decreasing budgets. The American Academy of Arts & Sciences (AAAS) Public Research Universities: Changes in State Funding (2015) identified the major competitors for resources in state budgets: 1) Medicaid; 2) state and local government employee pensions; 3) primary and secondary education; and 4) infrastructure. In fact, within states, public universities are viewed as having greater flexibility in meeting financial challenges because they have more control over their budgets and revenue streams (e.g., tuition; endowments; grants) that can be modified or enhanced unlike the other competitors for resources in state budgets.

Although vigorously advocating for the restoration of federal and state budget cuts and cutting unnecessary administrative burden remain a necessity, public research universities can no longer expect the federal government or state legislature to be willing to provide funding.
Current Assessment

Due to its long history and status as the flagship research campus, an assessment of where the University of Hawai‘i at Mānoa (UH Mānoa) currently stands in the five innovation hubs was done through the use of government funding data.

UH Mānoa was ranked 58th in total federally-financed research expenditures during the National Science Foundation’s (NSF) Higher Education Research & Development expenditures survey (HERD) for the FY 2014 reporting period. This reflects its steady performance (91st percentile) as one of the top 100 institutions of higher education that perform federally funded research under this metric.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>UH Mānoa NSF Ranking for Federal R&amp;D Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiscal Year</td>
<td>FY 10</td>
</tr>
<tr>
<td>Ranking</td>
<td>62</td>
</tr>
</tbody>
</table>

Although the NSF HERD subfields do not exactly match the selected innovation hubs, NSF HERD subfields are associated with those hubs to estimate relative rankings: 1) astronomy with astronomy; 2) oceanography with ocean and climate sciences; and 3) medical sciences with health and wellness. Instead of a subfield, funding from the Department of Energy (DOE) will be used for energy. Cybersecurity is a relatively new field and the NSF Computer Sciences subfield is not sufficient to estimate a relative ranking.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>UH Mānoa NSF Ranking for Federal R&amp;D Expenditures by Selected Subfields and Dept. of Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subfield/Agency</td>
<td>FY 10</td>
</tr>
<tr>
<td>Astronomy</td>
<td>7</td>
</tr>
<tr>
<td>Oceanography</td>
<td>5</td>
</tr>
<tr>
<td>Medical Sciences</td>
<td>66</td>
</tr>
<tr>
<td>Dept. of Energy</td>
<td>74</td>
</tr>
</tbody>
</table>

The data supports the idea that UH Mānoa is a leading astronomy (7 out of 115 – 94th percentile) and oceanography (5 out of 125 – 96th percentile) institution, in its ability to attract federal funding.

Although the medical sciences (69) and DOE (55) numbers are low in comparison to UH’s strengths, the data are encouraging since the FY 2014 rank is out of 286 institutions (76th percentile) reporting medical sciences expenditures, and out of 380 institutions (81st percentile) reporting DOE expenditures.

Due to the current federal funding climate, UH strives to maintain its overall ranking and its rankings in astronomy and oceanography in terms of percentile. For the other subfields, UH strives to increase its percentiles by three points by 2020.
New Normal
Public universities and their faculty and staff are faced with three questions: 1) how does the university increase revenue, 2) how can it contain costs and 3) how can it improve efficiencies? Current trends indicate that the response to the revenue question is being addressed in three ways: 1) relying on out-of-state and foreign enrollments to increase tuition revenue; 2) seeking foundation or international funding to increase research revenue; and 3) engaging in fundraising campaigns to increase endowments. However, these approaches are not the proverbial “silver bullet” and come with their own set of challenges.

First, because of the public outcry about the high cost of education, there is much debate on how the tuition revenue will be used to help defray the costs for in-state students. Thus, efforts to reprogram some of the tuition revenue to support research could meet strong resistance unless public universities can demonstrate the connection between leading-edge research and education outcomes – especially via experiential learning through undergraduate research opportunities.

Second, every public university is seeking limited private, foundation or international funding. Substantially increasing revenue is unlikely due to increased competition. Also, the uses of these funds are restricted and come with additional administrative burden.

Finally, if a public university is one of the “have nots” with respect to endowments – it will be difficult to raise funds for research. Unless there is a concerted effort to make research one of the main thrusts of UH and the University of Hawai‘i Foundation, it will become lost in a long line of other priorities, some of which may be served first (e.g., undergraduate instruction, athletics).

Since these trendy revenue-generating approaches come with certain caveats that most institutions may find difficult or impossible to overcome, the most feasible option that public universities have available is cost containment and/or improving efficiencies by the reallocation of resources.
High Performance Strategies

Intellectual Capital Profile
Oceanography and astronomy are two of UH’s strongest research programs. However, they are considered sectors with low growth potential. Instead, the National Science Board recommends investing a larger share of the nation’s research budget into other sectors such as data intensive science and engineering and cybersecurity.

If UH’s goal is to substantially increase its extramural funding it must decide whether to pursue growth sectors like these and to make the necessary investments in infrastructure and faculty hires to fill gaps in its talent pool. However, it is just as important for UH to determine the proper allocation of funds and new faculty positions to maintain its established excellence and its world-renowned status in these two programs – while pursuing the recommended areas of growth. A careful evaluation to allocate vacant and new general funded positions will need to occur for each major research program and targeted growth area.

Strategic Investments
Research and training revolving funds (RTRF) are currently allocated so that 75 percent goes to the respective campus that recovered them. In the case of the UH Mānoa campus, 50 percent goes to the school or organized research unit. Although such an arrangement makes it easier to budget, the utilization of the funding may not be strategic and does not provide an incentive to investigators responsible for recovering the funds. It is also not clear whether metrics are used to guide or evaluate investments for the portion of RTRF that is utilized for start-up funds or seed grants.

The distribution formula may need to be revised to address some of these issues. For example, a “set aside” for incentives could be incorporated to reward consistently successful investigators. This might help reduce negativity about the use of RTRF for start-ups when there are perceived neglect of existing investigators.

For investments of RTRF in new faculty or projects, metrics that encompass more than just extramural award numbers and related facilities and administrative (F&A) cost recovery could be used to evaluate or guide investments. For short-term analysis, it would still be based on financial benefit as publications and impact on the discipline occur farther down the road and are more difficult to measure. For example, direct salary dollars brought in on an award might be viewed more favorably than an award where most of the budget is sub-awarded. This secondary analysis could also be used for an award where there is low to no F&A recovery.
Facilities Optimization

Another area that needs attention is space allocation. The University of Hawai‘i’s physical plant woes are well known. However, what is not known is how well UH utilizes its existing space – in particular, whether laboratory space is underutilized with respect to extramural awards. Other universities are using extramural dollars and F&A recovery per square foot to evaluate space utilization. Some are also implementing measures to replace occupants with more productive occupants.

The University of Hawai‘i should invest in efforts to determine how research space is currently utilized and how it can be best allocated to maximize usage. This could be more important for high-cost facilities such as wet labs. For example, increasing productive use of the lab could be tied to increasing the share of RTRF returned to subsidize facilities costs. It could also result in rethinking how new facilities are configured or designed. As an example, mixed-use buildings may no longer be viable. Instead, dedicated laboratory buildings with shared core facilities and temporary, long-term occupants may be the way of doing business in the future.

Organizational/Geographic Realignment

Periodically, UH should review whether the research interests and strengths of its departments, research units, centers, programs and institutes align properly. What worked a decade or more ago may not work today. To enhance productivity and gain efficiencies, it may be better to reorganize into new units.

For example, would it make more sense for information and computer sciences to be part of the College of Engineering rather than the College of Natural Sciences? In another example, should research programs in various schools or colleges studying various aspects of renewable energy be attached to the Hawai‘i Natural Energy Institute or a successor unit?
If there is resistance to organizational change, another possibility is to geographically realign key programs around shared facilities to eliminate duplication where possible. This would allow units to retain their identity but gain access to labs and specialized equipment. This might also encourage multi-disciplinary collaborations due to their proximity.

**Organized Research Units (ORU)**

Another topic that should be revisited is the concept of an organized research unit (ORU). There is a perception that this designation brings special benefits, however, this may not always be the case.

Some institutions use the ORU designation for research programs that are intended to receive internal budget allocations for a short time frame during their formation (3 – 5 years). After that period is over, an ORU is supposed to be “self-sufficient” and operate primarily on extramural funding. Whether or not an ORU continues to receive allocations is at the host campus’ discretion and is according to its budgetary process.

It appears that the current RP 12.206, *Establishment and Review of Organized Research Units*, was modeled after this concept since ORUs “are expected to generate significant grant and contract funding.” On the other hand, RP 5.206, *Establishment and Review of Centers and Institutes*, recognizes that centers or institutes could “require significant current or future commitments of institutional financial, human or physical resources….” This implies that centers and institutes might never be “self-sufficient” and could continue to receive allocations.

The ORU designation might be used only for those very few units that are self-sufficient or willing to lobby its host campus for funds, while others should be designated as centers or institutes. Or maybe the ORU designation should be discontinued for certain units because the original intent is not being followed when new ORU designations are developed to focus on today’s needs.

**Dialogue and Cooperation**

Because addressing these issues will have a wide and lasting impact on personnel and processes, the administration will need to work with faculty and staff focus groups, and/or task forces to assist in evaluating and recommending solutions that would work for UH. For example, faculty would be better suited to help establish a rubric to evaluate and prioritize research programs. Or a group including faculty representatives and central office staff from units such as the Environmental Health and Safety Office, facilities, space planning, Export Controls and Public Safety would be able to identify problems that could arise from attempting to consolidate laboratory space for what appears to be similar research.

In any scenario, it would be in the best interest of the administration, faculty and staff to work together in addressing these issues, develop solutions and facilitate the implementation of any changes.
Moving Forward
With a large task ahead, key conversations should take place to set the foundation for achieving the research and innovation long range plan. To provide a way forward, the UH Office of the Vice President for Research and Innovation has identified five topics that the UH System and its 10 campuses can work on within the next 18 to 24 months.

Strategic Hiring – Position Management
In place of, or to supplement requests for additional positions, it would be prudent to set aside a portion of vacant positions that result from retirements or attrition toward strategic hiring needs, whether it is to strengthen/build capacity in research or in innovation and entrepreneurship. The campuses should determine what “set asides” will work for their respective situations. This would demonstrate to stakeholders, such as the Legislature, governor and the public that UH is serious about the research endeavor and is carefully and deliberately utilizing its resources.

Incentives – Strategic Investments
Similar to position management, UH should be investing part of the RTRF toward strategic development. Discussions should take place about the amount to set aside and how to invest the funds, such as partial salary coverage for strategic hires, start-up packages, bridge funding, rewards for engaging in collaborative research in the targeted areas, etc. The campuses should decide on the mix of strategic uses to achieve their priority goals as well as the methods in which funds are invested (e.g., competitive as opposed to formula based).
Measurement – Determining Impact
Because there will be significant investment of positions and funds toward a goal, UH will need to demonstrate that the investments created results, whether good or bad. Aside from traditional metrics such as new extramural awards and increased F&A recovery, discussions should take place so that UH can offer a more balanced scorecard. Participating colleges and campuses could propose appropriate alternative metrics to demonstrate the impact in their disciplines. Another measure might be to monitor and report on changes. For example, UH might see an increase in the number of cybersecurity proposals as a result of efforts to actively pursue funding opportunities by matchmaking faculty and providing grant writing/proposal support services.

Innovation Space – Promoting a Culture of Innovation
If the UH i-Lab and sPACE on the UH Mānoa Campus prove to be successful, UH should expand use of these models by creating innovation spaces on at least four (4) more campuses to help nurture and promote a culture of innovation throughout the UH System. Discussions should take place on which campuses should be next and how to tailor the programs to meet the needs of the campuses and their communities. Although tailoring might be required to address local interests, effort should also be on building and coordinating the curriculum system-wide so that all students learn core skills and concepts.

Organizational Structure Review – Planning for the Future
 Discussions should take place on assessing whether UH’s current research programs are set up to prosper in the future. In addition to reviewing whether programs can continue to thrive in their current or future states, UH needs to seriously look at whether the way it utilizes space, equipment and other resources makes sense and is effective. This will inform the process of renovating existing space and building new spaces to minimize duplication, and sub-optimal usage, as well as policies and practices for allocating space.
From distant galaxies to the ocean depths …
and everywhere in between™
Extramural Sponsor Awards
Quarterly Summary

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Count</th>
<th>Amount</th>
<th>Count</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>240</td>
<td>$39,437,891</td>
<td>200</td>
<td>$34,496,622</td>
</tr>
<tr>
<td>Non-Research</td>
<td>147</td>
<td>$20,770,168</td>
<td>172</td>
<td>$23,964,696</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>387</strong></td>
<td><strong>$60,208,059</strong></td>
<td><strong>372</strong></td>
<td><strong>$58,461,318</strong></td>
</tr>
</tbody>
</table>

Note: The detailed award listing is available at:

http://www.ors.hawaii.edu/index.php/bor-reports

The FY 2015 year-to-date total was: $222,733,286
The unofficial FY 2016 year-to-date total is: $241,295,427
Contracts and Grants Awards
As of Quarter Two – FY 2017

Contracts and Grants Awards
Amount Awarded by Quarter

[Bar chart showing quarterly and cumulative awards for FY 2016 and FY 2017]
Contracts and Grants Expenditures
As of Quarter Two – FY 2017

Contracts and Grants Awards
Expenditures by Quarter

- FY 2016 Quarterly Expenditures
- FY 2017 Quarterly Expenditures
- FY 2016 Cumulative Expenditures
- FY 2017 Cumulative Expenditures
Contracts and Grants F&A Recovery
As of Quarter Two – FY 2017

Contracts and Grants Awards
F&A Recovery by Quarter

Quarterly

Millions

Quarter 1
Quarter 2
Quarter 3
Quarter 4

Cumulative

Millions

FY 2016 Quarterly F&A
FY 2017 Quarterly F&A
FY 2016 Cumulative F&A
FY 2017 Cumulative F&A
## OTTED Research & Innovation Metrics
### FY 2017 – Second Quarter Summary

<table>
<thead>
<tr>
<th>Metric</th>
<th>FY 2017 10/1/16 – 12/31/16</th>
<th>FY 2016 10/1/15 – 12/31/15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention Disclosures</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>U.S. Provisional Patents Filed</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>U.S. Non-Provisional Patents Filed</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>U.S. Non-Provisional Patents Issued</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>License Agreements</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Royalty Revenue</td>
<td>$58,800.23</td>
<td>$5,735.30</td>
</tr>
</tbody>
</table>
Invention Disclosures
As of Quarter Two – FY 2017

Inventions Disclosed

Quarterly

<table>
<thead>
<tr>
<th>Quarter</th>
<th>FY 2017 Quarterly</th>
<th>FY 2016 Quarterly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Q2</td>
<td>27</td>
<td>22</td>
</tr>
<tr>
<td>Q3</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>Q4</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

Cumulative

<table>
<thead>
<tr>
<th>Year</th>
<th>FY 2017</th>
<th>FY 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2017</td>
<td>60</td>
<td>50</td>
</tr>
</tbody>
</table>
U.S. Provisional Patents Filed
As of Quarter Two – FY 2017

![Bar chart showing U.S. Provisional Patents Filed by quarter for FY 2017 and FY 2016. The chart includes a line graph for cumulative filings and demonstrates a comparison between the two fiscal years.]
U.S. Non-Provisional Patents Filed
As of Quarter Two – FY 2017

U.S. Non-Provisional Patents Filed

![Bar chart showing quarterly and cumulative patents filed for FY 2017 and FY 2016. The chart indicates a slight increase in filings from Q1 to Q2 for FY 2017, with a cumulative total of 11 by Q3 and 12 by Q4.]
U.S. Non-Provisional Patents Issued
As of Quarter Two – FY 2017

<table>
<thead>
<tr>
<th>Quarter</th>
<th>FY 2017 Quarterly</th>
<th>FY 2016 Quarterly</th>
<th>FY 2017 Cumulative</th>
<th>FY 2016 Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>9</td>
<td>7</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Q2</td>
<td>3</td>
<td>2</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Q3</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Q4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Cumulative

FY 2017: 11
FY 2016: 9
License/Option Agreements
As of Quarter Two – FY 2017

License/Option Agreements Executed

FY 2017 Quarterly  FY 2016 Quarterly
FY 2017 Cumulative  FY 2016 Cumulative
Q217 Extramural Award Analysis

BOR Research & Innovation Committee
February 9, 2017
Overview

• Q217 Recap
• Significant Awards by Campus
• Award Amounts by Location
• Non-federal Awards Analysis
• FY 2017 Forecast vs. Actuals
Q217 Recap

• Q217 total is $59 million, 3.5% more than Q216 ($57 million)

• As expected, seasonal drop off after Federal Q4 has occurred
  – Many campuses largest awards in Q217 came from non-federal sponsors
  – Three campuses accounted for vast majority of change in Q217

• FY 17 still on track to exceed $400 million
### Quarterly Extramural Awards

*$\$ millions, inflation-adjusted*

<table>
<thead>
<tr>
<th>Year</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>FY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>202</td>
<td>92</td>
<td>66</td>
<td>131</td>
<td>492</td>
</tr>
<tr>
<td>2011</td>
<td>265</td>
<td>83</td>
<td>72</td>
<td>94</td>
<td>515</td>
</tr>
<tr>
<td>2012</td>
<td>210</td>
<td>49</td>
<td>47</td>
<td>144</td>
<td>450</td>
</tr>
<tr>
<td>2013</td>
<td>181</td>
<td>76</td>
<td>58</td>
<td>102</td>
<td>417</td>
</tr>
<tr>
<td>2014</td>
<td>167</td>
<td>75</td>
<td>56</td>
<td>96</td>
<td>393</td>
</tr>
<tr>
<td>2015</td>
<td>191</td>
<td>77</td>
<td>53</td>
<td>105</td>
<td>426</td>
</tr>
<tr>
<td>2016</td>
<td>166</td>
<td>57</td>
<td>66</td>
<td>102</td>
<td>391</td>
</tr>
<tr>
<td>2017</td>
<td>182</td>
<td>59</td>
<td>--</td>
<td>--</td>
<td>241</td>
</tr>
</tbody>
</table>

**Chart:**

- **Q1+Q2 Extramural Awards**
- *$\$ millions, inflation-adjusted*
- 2010 to 2017
- *Q1*, *Q2*, *Inflation*
## Significant Awards by Campus

<table>
<thead>
<tr>
<th>Campus</th>
<th>Sponsor Type</th>
<th>Sponsor</th>
<th>Project Title</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mānoa</td>
<td>Business and Other</td>
<td>Merck Sharp &amp; Dohme Corp</td>
<td>A Phase III Study of Pembrolizumab (MK-3475) vs Best Supportive Care as Second-Line Therapy in Subjects with Previously Systemically Treated Advanced Hepatocellular Carcinoma (KEYNOTE-240)</td>
<td>2,605,461</td>
</tr>
<tr>
<td>Hilo</td>
<td>Non-profit</td>
<td>UH Foundation</td>
<td>Coral Reef Fish and Breeding Project</td>
<td>227,331</td>
</tr>
<tr>
<td>West O‘ahu</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Hawai‘i CC</td>
<td>Hawai‘i – Gov’t</td>
<td>Department of Transportation</td>
<td>Hawai‘i Community College Motorcycle Safety Education</td>
<td>40,899</td>
</tr>
<tr>
<td>Honolulu CC</td>
<td>Business and Other</td>
<td>Alu Like, Inc.</td>
<td>Poi Na Nalu NHCTEP</td>
<td>303,053</td>
</tr>
<tr>
<td>Kapi‘olani CC</td>
<td>Non-profit</td>
<td>UH Foundation</td>
<td>KCC Project OLONA Research</td>
<td>60,350</td>
</tr>
<tr>
<td>Kaua‘i CC</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Leeward CC</td>
<td>Federal</td>
<td>Department of Education</td>
<td>Leeward EOC: Career Pathways to a Living Wage</td>
<td>236,000</td>
</tr>
<tr>
<td>Maui College</td>
<td>Hawai‘i – Gov’t</td>
<td>Department of Human Services</td>
<td>Hawaii Child Welfare Continuous Quality Improvement Project</td>
<td>1,860,888</td>
</tr>
<tr>
<td>Windward CC</td>
<td>Hawai‘i – Gov’t</td>
<td>Department of Human Services</td>
<td>Learning to Grow</td>
<td>748,044</td>
</tr>
<tr>
<td>UH System</td>
<td>Federal</td>
<td>Department of Defense</td>
<td>Additional Tasking for ARL/HNEI Wave Energy Test site (WETS) Research</td>
<td>3,747,990</td>
</tr>
</tbody>
</table>
Award Amounts by Location
($ millions, inflation-adjusted)

<table>
<thead>
<tr>
<th>Campus</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2017-16 Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mānoa</td>
<td>58</td>
<td>50</td>
<td>51</td>
<td>42</td>
<td>-17.6%</td>
</tr>
<tr>
<td>Hilo</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>West O’ahu</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Hawai‘i CC</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Honolulu CC</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Kapi‘olani CC</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Kaua‘i CC</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Leeward CC</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Maui College</td>
<td>0</td>
<td>11</td>
<td>1</td>
<td>3</td>
<td>200.0%</td>
</tr>
<tr>
<td>Windward CC</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>UH System</td>
<td>6</td>
<td>9</td>
<td>3</td>
<td>12</td>
<td>300.0%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>75</td>
<td>77</td>
<td>57</td>
<td>59</td>
<td>3.5%</td>
</tr>
</tbody>
</table>
Major Changes by Location

• Increases were attributed as follows
  – Maui College - $1.8 million award (timing compared to Q1/Q2 FY 16)
  – UH System - $6.7 million in awards to Applied Research Laboratory; $2.2 million to Pacific Disaster Center (timing compared to Q2/Q3 FY 16)

• Decreases were attributed as follows
  – UH Mānoa – Decrease in awards in both the $500,000 to $999,999 and $1 million or over ranges
Non-federal Awards Analysis

• Five sponsors account for nearly 37% of non-federal awards, including Federal passthroughs, over past seven years
  – Hawai‘i Dept of Land and Natural Resources (DLNR)
  – University of Hawai‘i Foundation (UHF)
  – Hawai‘i Dept of Health (DOH)
  – Hawai‘i Dept of Human Services (DHS)
  – Hawai‘i Dept of Education (DOE)
Top Five Non-federal Awarding Agencies
Including Federal Passthrough Awards
$ millions, inflation adjusted

[Graph showing data for DLNR, UHF, DOH, DHS, and DOE from 2010 to 2016]
Non-federal Awards Analysis

• Trends
  – For three sponsors, slightly upward; two, slightly downward (DOH; DHS)
  – Where Federal passthrough is involved, tied to increased investments in climate sciences and environment or difficulty in getting US Dept of Health and Human Services funding

• Takeaways
  – State government sponsor awards reflect UH’s role in promoting health, welfare and education of Hawai‘i’s citizens as well as protecting Hawai‘i’s natural resources through research, instruction and service
  – A number of private foundations make grants only to 501(c)3 organizations; agreements between UHF and UH to perform work are the result
Q2 results are 20.3% off from forecast. However, year-to-date results are only 3.6% off from forecast ($241m vs. $250m). Assuming Q3 and Q4 are close to forecast, FY 17 will be over $400m.
Extramural Awards Q217 Report

Summary

UH’s extramural awards for the second quarter of FY 2017 totaled $59 million, about 3.5% more than the amount received during Q2 last year. FY 2017 year-to-date totals ($241 million) are 8.0% more than FY 2016 year-to-date totals ($223 million) at the same time last year. Although the result is 3.6% short of the projected year-to-date total ($250 million), we maintain our forecast that the year-end total will be over $400 million.

I. Quarterly Performance Metrics

Extramural awards for Q217 totaled $59 million, which is 3.5% more than the Q216 total. See Section III. Award Trends by Campus for an explanation of major increases or decreases that contributed to Q217 results.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>202</td>
<td>265</td>
<td>210</td>
<td>181</td>
<td>167</td>
<td>191</td>
<td>166</td>
<td>182</td>
</tr>
<tr>
<td>Q2</td>
<td>92</td>
<td>83</td>
<td>49</td>
<td>76</td>
<td>75</td>
<td>77</td>
<td>57</td>
<td>59</td>
</tr>
<tr>
<td>Q3</td>
<td>66</td>
<td>72</td>
<td>47</td>
<td>58</td>
<td>56</td>
<td>53</td>
<td>66</td>
<td>--</td>
</tr>
<tr>
<td>Q4</td>
<td>131</td>
<td>94</td>
<td>144</td>
<td>102</td>
<td>96</td>
<td>105</td>
<td>102</td>
<td>--</td>
</tr>
<tr>
<td>FY</td>
<td>492</td>
<td>515</td>
<td>450</td>
<td>417</td>
<td>393</td>
<td>426</td>
<td>391</td>
<td>241</td>
</tr>
</tbody>
</table>

Q1+Q2 Extramural Awards

$ millions, inflation-adjusted
II. Significant Awards by Campus

During Q217, UH received 387 awards from 176 different sponsors. The following table reports the largest awards received this quarter by campus. As expected, the seasonal drop off following Federal Q4 has occurred. Thus, it is not surprising that the largest awards for many of the campuses are from non-Federal sponsors.

<table>
<thead>
<tr>
<th>Campus</th>
<th>Sponsor Type</th>
<th>Sponsor</th>
<th>Project Title</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mānoa</td>
<td>Business and Other</td>
<td>Merck Sharp &amp; Dohme Corp</td>
<td>A Phase III Study of Pembrolizumab (MK-3475) vs Best Supportive Care as Second-Line Therapy in Subjects with Previously Systemically Treated Advanced Hepatocellular Carcinoma (KEYNOTE-240)</td>
<td>2,605,461</td>
</tr>
<tr>
<td>Hilo</td>
<td>Non-profit</td>
<td>UH Foundation</td>
<td>Coral Reef Fish and Breeding Project</td>
<td>227,331</td>
</tr>
<tr>
<td>West O’ahu</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Hawai’i CC</td>
<td>Hawai’i – Gov’t Business and Other</td>
<td>Department of Transportation</td>
<td>Hawaii Community College Motorcycle Safety Education</td>
<td>40,899</td>
</tr>
<tr>
<td>Honolulu CC</td>
<td>Other</td>
<td>Alu Like, Inc.</td>
<td>Poi Na Nalu NHCTEP</td>
<td>303,053</td>
</tr>
<tr>
<td>Kapi’olani CC</td>
<td>Non-profit</td>
<td>UH Foundation</td>
<td>KCC Project OLONA Research</td>
<td>60,350</td>
</tr>
<tr>
<td>Kaua’i CC</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Leeward CC</td>
<td>Federal</td>
<td>Department of Education</td>
<td>Leeward EOC: Career Pathways to a Living Wage</td>
<td>236,000</td>
</tr>
<tr>
<td>Maui College</td>
<td>Hawai’i – Gov’t Human Services</td>
<td>Department of Human Services</td>
<td>Hawaii Child Welfare Continuous Quality Improvement Project</td>
<td>1,860,888</td>
</tr>
<tr>
<td>Windward CC</td>
<td>Hawai’i – Gov’t Human Services</td>
<td>Department of Human Services</td>
<td>Learning to Grow</td>
<td>748,044</td>
</tr>
<tr>
<td>UH System¹</td>
<td>Federal</td>
<td>Department of Defense</td>
<td>Additional Tasking for ARL/HNEI Wave Energy Test site (WETS) Research</td>
<td>3,747,990</td>
</tr>
</tbody>
</table>

III. Award Trends by Campus

Award totals for the second quarter of FY 2017 were greater than last year by 3.5%. The vast majority of the activity occurred in three campuses.

Major dollar increases and decreases are attributed as follows:

UH Mānoa decrease: Decrease in awards between $500,000 and $999,999 (Q216: 13 awards, $687K average; Q217: 6 awards, $622K average). Decrease in awards of $1 million or more (Q216: 7 awards, $1.8 million average; Q217: 5 awards, $1.9 million average).

¹ UH System represents units under Vice Presidents that receive extramural funding. Examples include the P20 and Gear Up grants under the VP for Academic Affairs; Maui High Performance Computing Center and Pacific Disaster Center contracts under the VP for Information Technology; EpSCOR grant and Applied Research Laboratory task orders under the VP for Research and Innovation; and the Pacific Business Center Program under the VP for Community Colleges.
Maui College increase: Attributed to timing of a $1.8 million award. Instead of being received in Q1 like FY 2016, the award was received in Q2 of FY 2017.

UH System increase: Increase in awards of $1 million or more, including two to the Applied Research Laboratory totaling $6.7 million and one to the Pacific Disaster Center totaling $2.2 million. The Pacific Disaster Center award may have been received a quarter earlier this year (Q217) compared to last year (Q316).

### Q2 Award Amounts by Location

<table>
<thead>
<tr>
<th>Campus</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2017-16 Change²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mānoa</td>
<td>58</td>
<td>50</td>
<td>51</td>
<td>42</td>
<td>-17.6%</td>
</tr>
<tr>
<td>Hilo</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>West O'ahu</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Hawai'i CC</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Honolulu CC</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Kapi'olani CC</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Kaua'i CC</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Leeward CC</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Maui College</td>
<td>0</td>
<td>11</td>
<td>1</td>
<td>3</td>
<td>200.0%</td>
</tr>
<tr>
<td>Windward CC</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>UH System</td>
<td>6</td>
<td>9</td>
<td>3</td>
<td>12</td>
<td>300.0%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>75</td>
<td>77</td>
<td>57</td>
<td>59</td>
<td>3.5%</td>
</tr>
</tbody>
</table>

² The percent change over the prior year is calculated using the actual figures not the rounded figures.

### IV. Non-federal Awards Analysis

In the Q117 report, the top five Federal awarding agencies (direct Federal awards) over the past seven years were identified. For the Q217 report, we applied the same analysis to nonfederal sponsors.

During the past seven years, the top five non-federal sponsors have accounted for nearly 37% of the University's non-federal awards (including Federal passthrough awards). They are the: 1) Hawai‘i Department of Land and Natural Resources (DLNR); 2) University of Hawai‘i Foundation (UH Foundation or UHF); 3) Hawai‘i Department of Health (DOH); 4) Hawai‘i Department of Human Resources (DHS); and 5) Hawai‘i Department of Education (DOE).

The state government sponsors reflect the University’s role in promoting the health, education and welfare of Hawai‘i’s citizens as well as protecting Hawai‘i’s natural resources through research, training and service. For the UH Foundation, there are non-profit organizations such as private foundations that will make grants only to 501(c)3 organizations or donors have provided funding to support specific research or instruction programs. When certain transactions can only be processed through UH, UH Foundation executes an agreement with UH to fulfill the research or instruction related requirements.
Top Five Non-federal Awarding Agencies
(including Federal passthrough awards)
$ millions, inflation-adjusted

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DLNR</td>
<td>10.0</td>
<td>10.6</td>
<td>10.0</td>
<td>14.2</td>
<td>14.9</td>
<td>18.6</td>
<td>19.6</td>
<td>14.0/#1</td>
</tr>
<tr>
<td>UHF</td>
<td>7.7</td>
<td>4.7</td>
<td>7.3</td>
<td>16.6</td>
<td>12.3</td>
<td>17.2</td>
<td>15.2</td>
<td>11.6/#2</td>
</tr>
<tr>
<td>DOH</td>
<td>10.8</td>
<td>10.5</td>
<td>19.1</td>
<td>6.1</td>
<td>6.4</td>
<td>9.5</td>
<td>9.1</td>
<td>10.2/#3</td>
</tr>
<tr>
<td>DHS</td>
<td>14.1</td>
<td>6.2</td>
<td>8.3</td>
<td>10.7</td>
<td>7.0</td>
<td>6.7</td>
<td>8.0</td>
<td>8.7/#4</td>
</tr>
<tr>
<td>DOE</td>
<td>3.1</td>
<td>5.3</td>
<td>4.0</td>
<td>8.0</td>
<td>5.5</td>
<td>6.5</td>
<td>8.2</td>
<td>5.8/#5</td>
</tr>
</tbody>
</table>

There is a slight upward trend for three agencies (DLNR, UHF and DOE). In contrast, there is a slight downward trend for DOH and DHS. Where Federal passthrough awards are involved, the results were probably positively impacted by the outgoing US Presidential administration’s investments in climate sciences and the environment and negatively impacted by overall difficulties in obtaining US Department of Health and Human Services funding since 2008.
V. Forecast vs. Actuals

Although Q217 actuals were 20.3% off from the forecast, year-to-date actuals are 3.6% off from forecast ($241 million actual vs. $250 million projected). Thus, we believe that the FY 2017 total will still exceed $400 million. Assuming the last two quarters’ performance is on par with Q316 and Q416, final results could be close to the FY 2017 forecast.

<table>
<thead>
<tr>
<th>FY 2017</th>
<th>Forecast</th>
<th>Actual</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>176</td>
<td>182</td>
<td>+3.2%</td>
</tr>
<tr>
<td>Q2</td>
<td>74</td>
<td>59</td>
<td>-20.3%</td>
</tr>
<tr>
<td>Q3</td>
<td>57</td>
<td>—</td>
<td>TBD</td>
</tr>
<tr>
<td>Q4</td>
<td>103</td>
<td>—</td>
<td>TBD</td>
</tr>
<tr>
<td>Total</td>
<td>410</td>
<td>241</td>
<td></td>
</tr>
</tbody>
</table>
Overview

• Q217 Recap
• Disclosures
• Patent filings
• Executed licenses & options
• Royalty revenue
• Outreach efforts
Q217 Recap

• Increase in disclosures over Q1
• Increase in non-provisional patent applications
• Increase in executed licenses & options
Disclosures

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>15</td>
<td>9</td>
<td>7</td>
<td>14</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Q2</td>
<td>10</td>
<td>5</td>
<td>10</td>
<td>18</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td>Q3</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>13</td>
<td>11</td>
<td>--</td>
</tr>
<tr>
<td>Q4</td>
<td>16</td>
<td>15</td>
<td>10</td>
<td>14</td>
<td>13</td>
<td>--</td>
</tr>
<tr>
<td>FY Total</td>
<td><strong>53</strong></td>
<td><strong>35</strong></td>
<td><strong>39</strong></td>
<td><strong>59</strong></td>
<td><strong>50</strong></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>
Disclosures by Unit

FY 2016

- SOEST: 30%
- Engineering: 28%
- Natural Sciences: 6%
- JABSOM: 8%
- Nursing/Dental: 2%
- Architecture: 2%
- Business Administration: 2%
- CAFNRM: 2%
- Cancer Center: 10%

FY 2017

- SOEST: 31%
- Engineering: 37%
- Natural Sciences: 22%
- UH System: 4%
- CAFNRM: 4%
- Cancer Center: 7%
- Pharmacy: 4%

UNIVERSITY of HAWAIʻI SYSTEM
U.S. Patent Applications Analysis

• Decrease in filed provisional patent applications
  – Received disclosures of several software inventions, which may not be patentable

• Increase in filed non-provisional patent applications
  – Reflection of provisional patent applications filed in FY 2016
U.S. Patent Applications

U.S. Provisional Patent Applications Filed

<table>
<thead>
<tr>
<th>Year</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>4</td>
<td>13</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>2013</td>
<td>15</td>
<td>15</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>2014</td>
<td>12</td>
<td>12</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>2015</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>2016</td>
<td>11</td>
<td>16</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>2017</td>
<td>6</td>
<td>12</td>
<td>6</td>
<td>12</td>
</tr>
</tbody>
</table>

U.S. Non-Provisional Patent Applications Filed

<table>
<thead>
<tr>
<th>Year</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>11</td>
<td>2</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>2013</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2014</td>
<td>11</td>
<td>2</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>2015</td>
<td>11</td>
<td>4</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>2016</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2017</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>
## Executed Licenses & Options

- **4 new agreements in Q217**

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Q2</td>
<td>3</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Q3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>--</td>
</tr>
<tr>
<td>Q4</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>5</td>
<td>--</td>
</tr>
<tr>
<td>FY Total</td>
<td>8</td>
<td>3</td>
<td>9</td>
<td>3</td>
<td>13</td>
<td>6</td>
</tr>
</tbody>
</table>
Royalty Revenue Analysis

- Royalties are slightly behind FY 2015 & FY2016
- Expect to receive most royalty payments in Q3
Outreach Efforts

• Tech Showcase every semester
  – Next Showcase on Feb. 22, Banker’s Club
• Seminars & workshops for UH researchers & community
• One-on-one meetings with patent attorneys
• Meetings with commercialization experts
• Continued outreach
  – Presentations at Department & Faculty meetings
  – Future events for faculty & researchers
Technology Transfer Q217 Report

Summary

The University of Hawai'i's (UH) invention disclosures for the second quarter of FY 2017 totaled 17, which is an increase from Q2 last year, as well as Q1 this year. In addition, the number of U.S. non-provisional patent applications and executed licenses has increased.

I. Disclosures

Disclosures for Q217 totaled 17, an increase of 54.5% from Q2 of last year. The majority of disclosures have been submitted by the College of Engineering.

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>15</td>
<td>9</td>
<td>7</td>
<td>14</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Q2</td>
<td>10</td>
<td>5</td>
<td>10</td>
<td>18</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td>Q3</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>13</td>
<td>11</td>
<td>--</td>
</tr>
<tr>
<td>Q4</td>
<td>16</td>
<td>15</td>
<td>10</td>
<td>14</td>
<td>13</td>
<td>--</td>
</tr>
<tr>
<td>FY Total</td>
<td>53</td>
<td>35</td>
<td>39</td>
<td>59</td>
<td>50</td>
<td>27</td>
</tr>
</tbody>
</table>

Disclosures by Quarter

Disclosures
II. Patent Application Filings

There is a decrease in U.S. provisional patent applications from Q216. The decrease can be partly attributed to the fact that more computer software/programs are being disclosed, where a patent may not be the best way to protect the IP. U.S. non-provisional patent applications have increased from Q2 last year, with a majority filed by licensees of the technologies.

### U.S. Provisional Patent Applications Filed

<table>
<thead>
<tr>
<th>Year</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>15</td>
<td>10</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>2013</td>
<td>11</td>
<td>8</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>2014</td>
<td>15</td>
<td>10</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>2015</td>
<td>6</td>
<td>6</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>2016</td>
<td>8</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>2017</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

### U.S. Non-Provisional Patent Applications Filed

<table>
<thead>
<tr>
<th>Year</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2013</td>
<td>11</td>
<td>11</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>2014</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2015</td>
<td>2</td>
<td>7</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>2016</td>
<td>1</td>
<td>7</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2017</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

III. Licenses & Options

In Q217, four new license agreements were executed.

<table>
<thead>
<tr>
<th>Year</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>2013</td>
<td>3</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>2014</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>2015</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>2016</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>2017</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>FY Total</td>
<td>8</td>
<td>3</td>
<td>9</td>
<td>3</td>
<td>13</td>
</tr>
</tbody>
</table>
IV. Royalty Revenue

Royalties are slightly behind Q1 and Q2 in 2015 and 2016. The slight decrease is due to one-time payments received in 2015 and 2016 during the first 2 quarters. The majority of royalties are expected to be received in Q3.

![Royalty Revenue Chart]

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>$38,073.03</td>
<td>$95,253.71</td>
<td>$46,910.63</td>
<td>$76,313.52</td>
<td>$89,277.84</td>
<td>$408,513.00</td>
</tr>
<tr>
<td>Q2</td>
<td>$23,717.99</td>
<td>$38,852.33</td>
<td>$20,070.65</td>
<td>$9,067.82</td>
<td>$5,735.30</td>
<td>$300,000.00</td>
</tr>
<tr>
<td>Q3</td>
<td>$79,148.62</td>
<td>$124,287.84</td>
<td>$19,974.24</td>
<td>$124,091.68</td>
<td>$285,260.33</td>
<td>--</td>
</tr>
<tr>
<td>Q4</td>
<td>$10,010.53</td>
<td>$12,670.31</td>
<td>$32,035.24</td>
<td>$56,501.10</td>
<td>$28,239.41</td>
<td>--</td>
</tr>
<tr>
<td>FY Total</td>
<td>$150,950.17</td>
<td>$271,064.19</td>
<td>$118,990.76</td>
<td>$265,974.12</td>
<td>$408,512.88</td>
<td>$72,040.29</td>
</tr>
</tbody>
</table>

Q1 decrease/Q2 increase: Royalties normally received in Q1 were received in Q2.

Note: It may be difficult to match Q316 royalties, which included a one-time payment of $150,000 received as part of a license agreement.

V. Outreach Efforts

Various events for the community and UH researchers have been held to increase awareness of UH research and discoveries. These include: 1) a tech showcase each semester; 2) seminars & workshops open to UH researchers and the community; 3) one-on-one meetings with patent attorneys; and 4) meetings with commercialization experts to assist researchers with various IP issues. Efforts to increase awareness continue with presentations at department and faculty meetings, as well as other future events for UH faculty and researchers.
Update on University of Hawai‘i Patent and Copyright Policies

BOR Research & Innovation Committee
February 9, 2017
Chronology of Milestones

• **September 8, 2016** – VPRI Syrmsos submits action memo to BOR Committee on Research and Innovation requesting approval to migrate content of Hawai‘i Administrative Rules Title 20, Chapter 3 (UH Patent and Copyright Policy) to regent policies, executive policies, and administrative procedures, and thereafter repeal HAR Title 20, Chapter 3 and update and reformat the executive policies and practices. Committee recommended full Board approval of the “2 Track” plan.

• **September 22, 2016** – Full Board of Regents approved proposal to proceed with repeal of HAR Title 20, Chapter 3 and updating regent and executive policies and administrative procedures.
Chronology of Milestones - Continued

- **September 30, 2016** – Small Business Regulatory Review Board confirms UH’s view that repeal of HAR Title 20, Chapter 3 will not affect small business and therefore waives submission of a small business impact statement for consideration by the Small Business Regulatory Review Board.

- **October 25, 2016** – President Lassner sends Memorandum to Governor Ige pursuant to Governor’s Administrative Directive No. 09-01, requesting approval to proceed with process to repeal HAR Title 20, Chapter 3 by publishing Notice of Repeal.

- **November 17, 2016** – Governor Ige approves UH’s request to proceed to give public notice of intent to repeal HAR Title 20, Chapter 3.

- **December 2, 2016** – Notice of Repeal of Administrative Rule published in Star Advertiser, commencing 30 day public comment period.
• **December 9, 2016** – UHPA notifies VPRI that it has no objection to the repeal of Chapter 20-3. UHPA notes that these topics are included in the collective bargaining agreement with the faculty and that bargainable items may arise as the executive polices are being revised.

• **January 4, 2017** – Public Comment period expires; no objections received from public.

• **January 26, 2017** – Board of Regents authorize UH administration to seek Governor approval to repeal HAR Title 20, Chapter 3.
Next Steps

• Request Governor to approve repeal of Chapter 20-3. Repeal of Chapter 20-3 is effective 10 days after filing of the “Repeal” with the Lt. Governor.

• Regent Policies 12.205 and Executive Policies 12.205 (submitted in draft form with September 2016 Action Memo to BOR Committee on Research and Innovation) to be reviewed, vetted in consultation with affected UH unions/faculty senates/appropriate offices, and approved by Board of Regents (Regent Policies) and President (Executive Policies).
Housekeeping Changes

• Update references to Hawai‘i Revised Statutes (HRS) from Chapter 307 to Chapter 304A-3000 series

• Update articles to conform with current Chapter 304A-3000 series (Act 288, L 2013)
  – List of HRS chapters RCUH is exempt from
  – Composition of RCUH Board
  – Elimination of UH President as RCUH President
Housekeeping Changes - Continued

• Incorporate active amendments into agreement
  – Article 6 for current management fee formula
  – Article 8.2 as to status of RCUH employees as UH employees in certain situations

• Definition changes
  – Added “Management fee” to replace “Service fee” and added “RCUH direct project” definition for use with updated management fee formula
  – Replaced “FMIS” with generic “FS” to describe UH financial system, which is the official financial system of record for UH
Substantive Changes

• Change
  – From UH directing RCUH to provide services to mutual agreement (Article 2 and Article 10)

• Clarifications
  – Principal Investigator’s (PI) responsibility, as the primary contact for their project, is to comply with RCUH personnel and procurement procedures;
  – also, as primary supervisor, responsible for ensuring RCUH employees comply with applicable UH research policies and procedures (Article 4)

• Expanded management fee reporting to UH (Article 6)