

**ALASKA STATE LEGISLATURE
JOINT MEETING
HOUSE EDUCATION STANDING COMMITTEE
SENATE EDUCATION STANDING COMMITTEE**

February 23, 2018

8:01 a.m.

MEMBERS PRESENT

HOUSE EDUCATION STANDING COMMITTEE

Representative Harriet Drummond, Chair
Representative Justin Parish, Vice Chair
Representative Jennifer Johnston
Representative Chuck Kopp
Representative David Talerico

SENATE EDUCATION STANDING COMMITTEE

Senator Gary Stevens, Chair
Senator Cathy Giessel
Senator Shelley Hughes

MEMBERS ABSENT

HOUSE EDUCATION STANDING COMMITTEE

Representative Ivy Spohnholz
Representative Lora Reinbold (alternate)
Representative Geran Tarr (alternate)

SENATE EDUCATION STANDING COMMITTEE

Senator John Coghill
Senator Tom Begich

COMMITTEE CALENDAR

PRESENTATION: THE POWER OF UNIVERSITY ALASKA RESEARCH

- HEARD

PREVIOUS COMMITTEE ACTION

No previous action to record

WITNESS REGISTER

LARRY HINZMAN, Ph.D., Vice Chancellor for Research
University of Alaska Fairbanks
Fairbanks, Alaska

POSITION STATEMENT: Presented Power of University Research.

PETER WEBLEY, Ph.D., Research Associate Professor
University of Alaska Fairbanks
Fairbanks, Alaska

POSITION STATEMENT: Presented Power of University Research.

GEORGE ROE, Researcher
Alaska Center for Energy and Power
Institute of Northern Engineering
University Alaska Fairbanks
Fairbanks, Alaska

POSITION STATEMENT: Presented Power of University Research.

ACTION NARRATIVE

[8:01:01 AM](#)

CHAIR GARY STEVENS called the joint meeting of the House and Senate Education Standing Committees to order at 8:01 a.m. Present at the call to order were Senators Giessel, Hughes, and Stevens and Representatives Drummond, Johnston, and Talerico. Representative Kopp and Parish joined shortly thereafter.

PRESENTATION: THE POWER OF UNIVERSITY OF Alaska RESEARCH

[8:01:54 AM](#)

CHAIR STEVENS announced the presentation the Power of University of Alaska Research.

LARRY HINZMAN, Ph.D., Vice Chancellor for Research, University of Alaska Fairbanks, Fairbanks, Alaska, said he had three main points:

1. Research is important to Alaska industry. Research is an industry for the state of Alaska and highly relevant. They take on practical issues and resolve important problems for the state.

2. Research and innovation are important to drive the economy and diversification of the economy.
3. Investment in education will drive Alaska's economy.

[8:03:51 AM](#)

DR. HINZMAN said he is advocating for the Board of Regents \$341 million budget request. That includes \$3.7 million to grow world-class research, distributed across the three campuses. They are conducting thousands of research projects. Since FY [fiscal year] 10, research revenue generated by the University of Alaska (UA) has exceeded \$1 billion dollars to the state. That is direct money coming into the state. That is a lot of good jobs, but it is a drop in the bucket compared to the residual impact, the other benefits that come from research.

DR. HINZMAN reviewed information showing that research is an important Alaskan industry:

- In 2017, UA had over \$148 million in external research expenditures
- The \$24 million in state research funding was multiplied by 6
- \$90 million in direct wages and salaries; about 1250 direct jobs
- Another \$27 million indirect income, 350 jobs from multiplier effects of direct employment
- \$70 million in purchases, contracted services, travel, student aid and equipment

DR. HINZMAN said they count expenditures, not income, as a comparison point to other universities across the nation.

He pointed out the multiplier by 6 for state research, and that the base funds of \$24 million are needed to create and maintain research.

He presented a chart that showed the UA research return on investment was 6.2 in FY 17, 6.2 dollars returned for every dollar invested. The return does vary from year to year for each institute.

DR. HINZMAN made the following points to show that research and quality education are completely integrated.

- Research opportunities attract outstanding faculty.

- Research is integral to a curriculum that reflects the most up-to-date knowledge.
- Undergraduate and graduate student involvement in research.
- Quality research institutions attract out-of-state students and retain outstanding resident students. Builds a pipeline of outstanding students who become employees of Alaska businesses and institutions.

He said that the faculty who get the highest reviews from students are the faculty strongly engaged in research because they offer the latest technology, are the most advanced in the sciences.

DR. HINZMAN made the following points to show how central research is to education. He noted that the University of Alaska produces more publications and citations on the Arctic than any other institution in the world.

- Both graduate and undergraduate students are a key part of our research activities.
- 40% of Fairbanks campus undergraduates participate in research. 164 of 964 total UAF graduate students are graduate research assistants.
- UAF Publications with student authors are more than 40% of the total

[8:10:15 AM](#)

DR. HINZMAN said one of the greatest values in engaging students in research is teaching them to think, teaching them to be creative, and teaching them to make things work. One student told him that a day in the field is like watching 24 episodes of MacGyver.

He explained that Undergraduate Research and Scholarly Activity (URSA) was started in 2012 and is dedicated to giving students research opportunities. He gave examples of students who did research in chemistry and biology. URSA also awards grants to arts students. These opportunities bring students to Alaska and keep them in Alaska.

He said that BLaST, Biomedical Learning and Student Training, also began a few years to get more students in biomedical fields. BLaST provides mentored research experiences to

students. Just two days ago they were reviewed by the National Institutes of Health and the reviews were glowing.

DR. HINZMAN said graduate students are essential to research. They play a big role. They bring ideas and enthusiasm. Their training in the latest techniques is good for the state. They come out with a strength and confidence and understanding that benefits local industries.

He described two examples of graduate student research, Thilo Klenz, Ph.D. student in Oceanography, thesis: comparing lagrangian drifter statistics in a numerical model to observations; and Stanley Edwin, Ph.D. student in Atmospheric Sciences, thesis: air quality in Interior Alaska villages.

He shared a map of Alaska showing locations of graduate research on economic geology, many of them related to mining, and geothermal springs and coal, oil, and gas. Some of the research was done before the mines or geothermal springs were developed, which helps with the development of those resources. When done afterwards, they help characterize what processes drove that development to help development in other regions.

[8:17:24 AM](#)

PETER WEBLEY, Ph.D., Research Associate Professor, University of Alaska Fairbanks, Fairbanks, Alaska, said he is an ambassador of the Office of Intellectual Property and Commercialization at UAF. His presentation focus is on the \$1.6 million for Contribute to Alaska's Economic Development in the FY19 Board of Regents budget request. He noted that Dr. Hinzman had said that research revenue generated by the University of Alaska has exceeded \$1 billion dollars to the state since FY10. He added that the commercial potential from university-developed research is astronomically larger than that from the ability to get licensing fees, the ability to transfer technology out of the university environment, to grow new companies and bring new companies to work with Alaskans, and build the economy.

He said that as an ambassador of the Office of Intellectual Property, he connects with the tech transfer office at the university. The idea is to take research projects and move them into the commercial market. These could be working with startup companies directly from academics, students and staff, at the university or working with an existing company to commercialize that work.

DR. WEBLEY said that the aim of the office is to cultivate a culture of innovation at the university, to take research ideas and move them forward. The aim of that is to diversify the economy, to take funded-research projects and develop a capability to bring additional funding into the state and employ people in the state of Alaska.

He shared that he is a transplant who came to Alaska in 2005 as a postdoctoral research scientist. He thought he would stay for two years and then return to the United Kingdom, but Alaska grew on him and he is forming a company. Research brings people here and research keeps people here.

He said the office is starting a Lean Launch Workshop. This is about a new approach on how to take an idea and form a company. In two or three days someone can form a company. In addition to university staff and advisors, someone from Stanford who helped design the process is coming to teach that in Fairbanks. This will foster new collaborations that can lead to new companies.

He said they have also started the Innovation Initiative, which is more internal to the university. It's a place to come and talk about innovation and new ideas. They have had 30-40 people show up to learn about how they can become entrepreneurs. Next week he will be presenting on his story and his company.

DR. WEBLEY said they are looking at developing a new course based on Stanford's Lean Launch.

CHAIR STEVENS asked him to explain the Stanford connection.

DR. WEBLEY replied that a professor at Stanford developed the Lean Launch process. He is coming up to teach that to university faculty. Dr. Webley will be one of the co-teachers of the course with another ambassador of the Office of Intellectual Property.

SENATOR HUGHES asked if there is something similar going on in Anchorage because she would love to promote it.

DR. WEBLEY answered people in Anchorage are coming to Fairbanks for the workshop. They will look at growing this capability, but it is being housed at Fairbanks.

SENATOR HUGHES said that it is worth the drive.

DR. WEBLEY said they had an application process for the March workshop. They had more applicants than space.

REPRESENTATIVE JOHNSTON said there are similar events going on in Anchorage and throughout the state. The blue ocean event just took place in Anchorage and this is the week of the Innovation Summit in Juneau.

[8:24:29 AM](#)

DR. WEBLEY said this is the Year of Innovation and different events are going on throughout that state, such as OTIS (Ocean Technology Innovation Sprint) in Anchorage.

He said the ambassadors are researchers who have gone through the entrepreneurial process. Ambassadors can give advice to students, faculty, and staff interested in entrepreneurship. The Center for Innovation, Commercialization and Entrepreneurship (Center ICE), an incubator, has just been set up. Companies working with the university to commercialize university research or new startup companies that have come out of the university will be housed at Center ICE. People with different backgrounds can foster new ideas by being in the same space.

He showed a graph, Alaska's "Innovation Pipeline," showing the many innovation events and projects in the state.

He explained the history of his company, V-ADAPT, Inc. He is a volcano researcher by training. They had been developing tools to detect and track volcanic ash for about 15 years with a federally funded research program. After support ended, they saw an opportunity to commercialize the technology they had developed. The aviation sector had an interest as aircraft and volcanic ash do not mix. They developed this company from the developed intellectual property from the university with a three-step process: 1. Do an invention disclosure. This is the invention. This is who funded the work. These are the people who worked on it. 2. That becomes declared intellectual property with a list of inventors. They had about 30 inventors working on this project. 3. From that, the university had the ability to license the technology. The company licensed that technology and worked with the market to bring revenue in. Funds come back to the university and the inventors through the licensing system.

[8:30:25 AM](#)

DR. WEBLEY described two projects of ACEP, Alaska Center for Energy and Power. One is the Grid Bridging System where ACEP serves as a liaison to work with utilities across the state. Mr.

Roe will present more on this, but it is an example of the university helping existing companies within the state to evaluate their energy needs. The second example is PuMA, Pump Monitoring Apparatus, targeted at householders to look at trends in fuel use to evaluate when energy use is higher than expected. The aim is savings for house owners by bringing in new technologies to smaller communities.

DR. WEBLEY said that is only a small overview of some of the commercial capabilities going on at the university. He is one example of how academic research can turn into a company based in Alaska.

REPRESENTATIVE JOHNSTON said that she is so excited about this because the state has never gotten to the point of first competition and then cooperation. She asked about the \$14.7 million in fixed costs on slide 2. She asked if that above the administrative cost of the research grants, what does the university charge for research grants.

DR. HINZMAN asked if she was referring to the rate of overhead to conduct the research.

REPRESENTATIVE JOHNSTON answered yes.

DR. HINZMAN said that it depends on the source of the funding. If they are conducting research for the state of Alaska, the rate is 18 percent. If they are conducting research for the National Science Foundation the rate is something like 49.8 percent. It varies depending on what the source allows. The rate of overhead is determined every three years through an agreement with the Office of Naval Research.

REPRESENTATIVE JOHNSTON asked if the discussion about the rate of overhead includes the fixed costs or is that separate.

DR. HINZMAN said the fixed costs are part of the negotiations with the Office of Naval Research. The fixed costs include fuel costs, maintenance, upkeep, janitorial, electrical. All the costs associated with running a university have to be quantified and negotiated with the Office of Naval Research.

REPRESENTATIVE JOHNSTON asked if the \$14.7 million is just what the state pays for fixed costs.

DR. HINZMAN said the research program does not pay for all of the university. The overhead can only be applied to the fixed

costs associated with executing the research itself. The university provides many other services that they do need and welcome state support for.

REPRESENTATIVE JOHNSTON asked for verification that the university produces the most publications on the Arctic in the world.

DR. HINZMAN answered yes.

REPRESENTATIVE JOHNSTON asked if that is true no matter what size the university, is it per capita.

DR. HINZMAN said the university has the largest number of publications in any single year. They did a five-year analysis since the numbers became available. For the last decade the University of Alaska has been the lead in publications on Arctic research.

REPRESENTATIVE JOHNSTON asked if that includes ones the university has partnered with or is it sole.

DR. HINZMAN said they do collaborate with other institutions around the world. If a University of Alaska researcher was included on the author list, that is included in the publication numbers.

SENATOR HUGHES referred to the \$1.6 million for Contribute to Alaska's Economic Development on slide 15 of the FY19 Board of Regents budget request. She prefaced the question by stating this is a big question and he may not want to pin down a number. She asked, in order to have a vision of the potential of commercialization of research for the Alaska economy, if they were to go all in to support this idea, what amount would be needed.

DR. WEBLEY answered that he cannot answer because he is not an economist but research faculty. He can get the information to her from the director of the Office of Intellectual Property. He looks at it for the personal connections and personal growth it would give to the state. It's an area of the Alaskan economy that is untapped. His was the first company developed out of university intellectual property in 2013. Five other entrepreneurs want to do that this year. Once these companies form they can work with larger Alaskan companies and large companies outside of the state. It another way to bring people

into the state who will stay and grow the economy and become the next generation of Alaskans.

SENATOR HUGHES said she is drawn by the potential of diversification for the economy and they all know how important that is to the future of the state.

DR. HINZMAN said it is difficult to quantify what the consequences, the upper limits, are. He gave the example of UAF Professor [Kelly] Drew who has done research on hibernation and who is working with drugs that induce hibernation. If the metabolism of people who have had heart attacks or been injured on the battlefield can be slowed down, the impact of damage to the body can be reduced. The possible consequences are huge. They do not know what the returns on that could be. They have had interest by NASA and the European space agency. This is a business that developed from Arctic science. The sky is the limit of what could come from something like that.

REPRESENTATIVE KOPP commented that historically, there was an internal tug of war with the university system. It seems that the university has a more unified approach, which is good for the state nationally and for aggressively advocating for funding and for projects. It seems that there will be more students attracted to projects. The slide presentation highlighted UAF research and publications, but he knows that the UAA has the INNOVATE Award and brought the National Science Foundation Board to Alaska for the first time two years ago. He asked if Dr. Hinzman is looking at a different set of targets and metrics for each research focus at each campus. He asked how he is making it so that there is synergy vs. not synergy.

DR. HINZMAN said he agreed with Representative Kopp 100 percent. Increasing research capability across the state raises all boats and helps all to become stronger. They've had collaboration for many years throughout the university system statewide, particularly in medical sciences and fisheries. Since they started the Strategic Pathways, they have invested in trying to quantify those metrics. A committee is working on characterizing metrics that would allow comparison of activities across campuses. It is designed to see where resources are needed, where the best return on investment is, where the best potential for growth is.

[8:44:35 AM](#)

CHAIR DRUMMOND asked Dr. Hinzman to describe the agreements with the Office of Naval Research.

DR. HINZMAN replied that overhead rates that institutions are allowed to charge are a negotiated fee. The University of Alaska has negotiated with the Office of Naval Research for at least as long as he has been around, 30 or 40 years. The rates are calculated upon what the cost of doing business is. It's a very detailed process to provide the evidence to quantify the cost of all aspects of research. It's the standard process that every university with federal projects must go through. He does not know why the oversight entity for UA is the Office of Naval Research.

REPRESENTATIVE PARISH said the presentation focused on Grow World-class Research for \$3.7 million and Contribute to Alaska's Economic Development for \$1.6 million over the FY18 base operating budget, but there's another \$19 million in the Board of Regents budget request. He asked whether he can speak to the impact if the legislature just gave the 5.3 million increment. He asked whether he could still get the full benefit from the \$5.3 million increment or would underfunding the other components interfere his mission.

DR. HINZMAN said the amounts on the chart, Investment by Strategic Objective, on slide 15 are different components of the budget for different justifications. Growing world-class research, for example, has many components. One is ADAC, Arctic Domain Awareness Center, out of UAA. The primary sponsor is the Department of Homeland Security. The primary customer is the Coast Guard. The purpose of ADAC is to enable the Coast Guard to be more functional in the Arctic. One project is how to unload a cruise ship rapidly in the Arctic. Unfortunately, ADAC does not have any base funding. They only have Department of Homeland Security funding. Research programs like this come and go. There needs to be some type of base funding to keep that entity whole. If that \$3.7 million were not provided, then some of those programs will be lost. For the \$2.1 million in the regents' budget request for the UAF Engineering Building Operating Costs, much of their research work is being done in the engineering building, which is a new building that is not fully functioning yet. They need support to maintain the research program in that building. They need utilities support because utility costs go up. The budget is very integrated. The resources brought in through research do benefit the other components of the campus, but it goes both ways. The university is an integrated whole.

They need all the components to maintain their status as a fully functioning university.

[8:51:35 AM](#)

REPRESENTATIVE JOHNSTON said it would be interesting for the committee to have the size of Department of Defense grants coming into the university. Earlier she had heard a comment that the Office of Naval Research may not be the administrator of UA grants in the future.

DR. HINZMAN said he's not involved in the negotiations of the overhead rates. The Department of Defense (DOD) has identified the Arctic as an area of heightened strategic importance. There is an incredible amount of activities going on in the Arctic. The Department of Defense has invited them to a workshop in May in New Hampshire to identify what capabilities they need to develop to respond better in the Arctic. The Air Force has invited them to a similar meeting in Seattle in May.

REPRESENTATIVE JOHNSTON said there is a partnership with Hawaii.

DR. HINZMAN said in many respects, yes, particularly with development and application of drones.

REPRESENTATIVE JOHNSTON said she's sure everyone would be interested if there were a slide on it.

REPRESENTATIVE TALERICO asked Mr. Roe to go over the Grid Bridging System.

[8:54:24 AM](#)

GEORGE ROE, Researcher, Alaska Center for Energy and Power, Institute of Northern Engineering, University Alaska Fairbanks, Fairbanks, Alaska, said he was a 36-year veteran of the Boeing Company. He came to Alaska because of the potential for working on resilient energy systems that are aligned with what modern aerospace is doing. Someone flying on a 787 is flying on an electrical grid that has all the functionality of the communities of Alaska and made by the same organizations. They have opportunities for helping not just themselves, but others as they make systems that are reliable and resilient.

He said they have brought in over \$5 million in the last two years from the Office of Naval Research which has been used in combination with other organizations. In aerospace there is no

such thing as a stand-alone element. A system is needed. That is the same for the state of Alaska. They need to work together because they are up against some challenging things and they need to learn from each other, not compete.

MR. ROE said the Grid Bridging System is a direct request from the Alaska Village Electric Cooperative to help them integrate renewable energy more effectively and reduce diesel consumption. There are huge opportunities for replicating and scaling this with the 58 communities of the Alaska Village Electric Cooperative. He is particularly interested in the Rail Belt energy system because the state has nested, intertwined, stand-alone systems that are completely representative of the continental grid in the Lower 48. They can be a test bed for evaluating, determining, and developing the systems that the nation needs, so that when events happen, they can stand up responses quickly and minimize the compromise that results. He believes Alaska can be a living laboratory, as Senator [Lisa] Murkowski refers to the state, of the nation's needs. If they can make energy more affordable, if they build this innovation culture, they need to look at the communities in the state to build local capacity to make sure students and local communities have what it takes to establish businesses, grow them, etc. There is so much they can do together.

[8:58:19 AM](#)

DR. HINZMAN concluded by emphasizing that research helps drive the economy and increases the diversification of economic activities. It provides a talented and capable workforce. And as their [UA] president says, a great state needs a great university.

[8:58:48 AM](#)

There being no further business to come before the committees, Chair Drummond adjourned the joint meeting of the House and Senate Education Standing Committees at 8:58 a.m.