

INNOVATION CLUSTERS AND ECONOMIC GROWTH



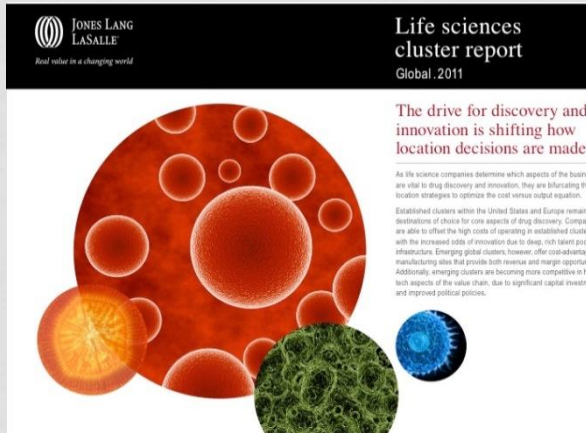
**Feb. 18,
2014**

DR. HELENA S. WISNIEWSKI
Vice Provost for Research and Graduate Studies, UAA
President, Seawolf Holdings, Inc.

TODAY'S PRESENTATION

INNOVATION CLUSTERS & ECONOMIC GROWTH

UAA COMMERCIALIZATION INFRASTRUCTURE



REF: “Life Sciences Cluster Report,” Jones Lang Lasalle. (report not restricted to just life sciences).

Life Sciences: advanced and applied sciences that have the potential to lead to medical advances or therapeutic applications.

- **The drive for discovery and innovation is shifting how industry is deciding** on where to locate or relocate and innovation clusters factor into that decision.
- **Innovation clusters:**
 - Are drivers for economic development.
 - Attract industry, investors, and talent to a region.
 - Universities play a key role.
- **I will present successes** of innovation clusters based on top ranking states in the “Life Sciences Cluster Report.”
- **New Commercialization Infrastructure at UAA** including Seawolf Venture Fund, LP.

LIFE SCIENCES CLUSTER REPORT

TOP RANKED LOCATIONS IN ORDER

- Boston
- New Jersey/New York
- Bay Area
- LA
- Washington DC/Maryland
- Philadelphia
- San Diego
- Minneapolis
- Raleigh-Durham
- Seattle
- Chicago
- Denver
- Houston
- Florida
- Atlanta
- Indianapolis

INNOVATION CLUSTERS

LIFE SCIENCES CLUSTER REPORT

The top ranked states have the following in common.

- **Research & Development (R & D) funding from the state** - as a % of Gross Domestic Product (GDP) – as high as 7%.
- **A State Fund – purpose to** expedite commercialization and attract companies in focused areas.
- **Focused Innovation Zones** with a collaborative approach to Innovation that provide infrastructure –financial support, buildings, access to universities.
- **State and industry supported incubators, technology parks.**
- **Tax incentives – to help attract companies.**
- **Venture Capital (VC) funding.**
- **State provides research funding to universities.**

SUCCESSFUL INNOVATION CLUSTERS

HOW DO THEY DO IT?

- **#1 Boston** – universities, centers, startups, hospitals, all within minutes of each other.
- Receives : **7% R&D funding** from the State; **Venture Capital (VC) funding \$1.1 billion.**
- **2008 - “Massachusetts Life Sciences Center (MLSC)” established** – investment agency - implements a 10-year, \$1-billion, state-funded investment initiative to support its life sciences clusters and commercialization.
 - **Commercialization focused on accelerating treatments and cures.**
 - **Includes financial investments in public and private institutions** advancing life sciences research, development and commercialization.
 - **Accelerator Program** – capital for early-stage biotech companies.
 - **Incubators.**
 - **Matching funds** for: federal grants –small businesses and Universities.
 - **Workforce development program** – enhances talent pipeline by placing students and graduates in paid internships.
 - **Innovation District provides infrastructure for collaborative efforts between startups and established companies.**
- **MLSC Success Examples:**
 - **In Feb. 2014, Vertex Pharmaceuticals** – moved to Boston’s “Innovation District” to open a one million square ft. global headquarters.
 - **Invested \$467 million**, leveraged more than \$1.2 billion in matching investment capital.
 - **Created** thousands of new jobs.
 - **Accelerator** Program provided \$17M in loans, 6/17 paid back early, after generating more than \$100 million in equity or acquisition proceeds.

SUCCESSFUL INNOVATION CLUSTERS

HOW DO THEY DO IT?

- **NJ has the most patents** of any State in the US. **4.2% state R&D support; \$306 million VC funds; \$1.6 billion NIH funding.**
- **I served on the Board of Directors for the NJ State Research & Development Council.**
- **NJ Commission on Science & Technology - promotes economic development by funding collaborative efforts** between universities and industry to commercialize new technologies in:
 - Life Sciences;
 - Nanotechnology/Advanced Materials;
 - Alternative Energy;
 - Telecom;
 - Computational Methods (Big Data).
- **Edison Innovation Zones** – 3 strategically located zones - co-located collaborations by universities, corporations, startups, community efforts for rapid transfer of discoveries.
- **ROI from the 12 state supported incubators from startup companies in the incubators:**
 - Raised ~ \$40 million in 3rd party funding
 - Have revenues of \$154 million
 - Provided more than 1200 jobs
- **University Intellectual Property Program** – Funds universities to accelerate the transfer of innovations to create new businesses and generate new quality jobs.
- **Technology & Entrepreneur Fellowship Programs** – pays salaries of recent graduates to work in small NJ tech companies, provides companies new talent and retains graduates.

SUCCESSFUL INNOVATION CLUSTERS

HOW DO THEY DO IT?

- **Texas – leads the nation in job creation and economic growth.**
- **In 2003 Texas Legislature authorized the \$295 Million Texas Enterprise Fund to:**
 - **Attract new business to the state** or assist with expansion of existing business as part of competitive recruitment - economic development tool.
 - **Expedite commercialization** of new technologies through startups and established companies in:
 - Life sciences;
 - Aerospace & defense;
 - Computer & information technology;
 - Manufacturing.
- **State holds equity in start-ups** – recently received a 46% return on investment.
- **Matching funds:** to universities and industry for federal government grants.
- **Research Superiority Awards** – for universities to recruit best research talent in the world.
- **Attracts companies to Texas** – with tax benefits, relocation resources, support for R&D, access to innovation centers, and other financial resources,
- **Fund Outcome Examples:**
 - Texas home to the **most Fortune 500 companies in the nation.**
 - **Brought thousands of jobs and billions in capital investment to Texas.**
 - **A surge of tech commercialization, including startups.**

SUCCESSFUL INNOVATION CLUSTERS

HOW DO THEY DO IT?

- **Philadelphia** – State formed the **Ben Franklin Technology Partners (BFT)** – to stimulate growth through innovation.
- **BFTP is among the most widely known and emulated state technology-based economic development programs.**
- **It provides capital and expertise** to startups, and established companies. To foster innovation and growth.
- **Promotes infrastructure** favorable to technology businesses.
- **Divided state into sectors** –based on strengths, or revitalizing industries.
- In doing so, created immediate economic gains and a foundation for continued economic growth.
- **Success examples:**
 - From 2007 through 2011, BFTP **produced 20,200 jobs in the state** (Total of 140,000 since 1989).
 - **Provided 3.5-to-1 return** on investment for every state dollar invested.
 - **Boosted the Pennsylvania economy by \$6.6 billion.**
 - **Start up examples: Pharmaceuticals**
 - Yaupon and Protez, **acquired by Novartis for \$400M in 2008.**

UAA

the INNOVATION FRONTIER

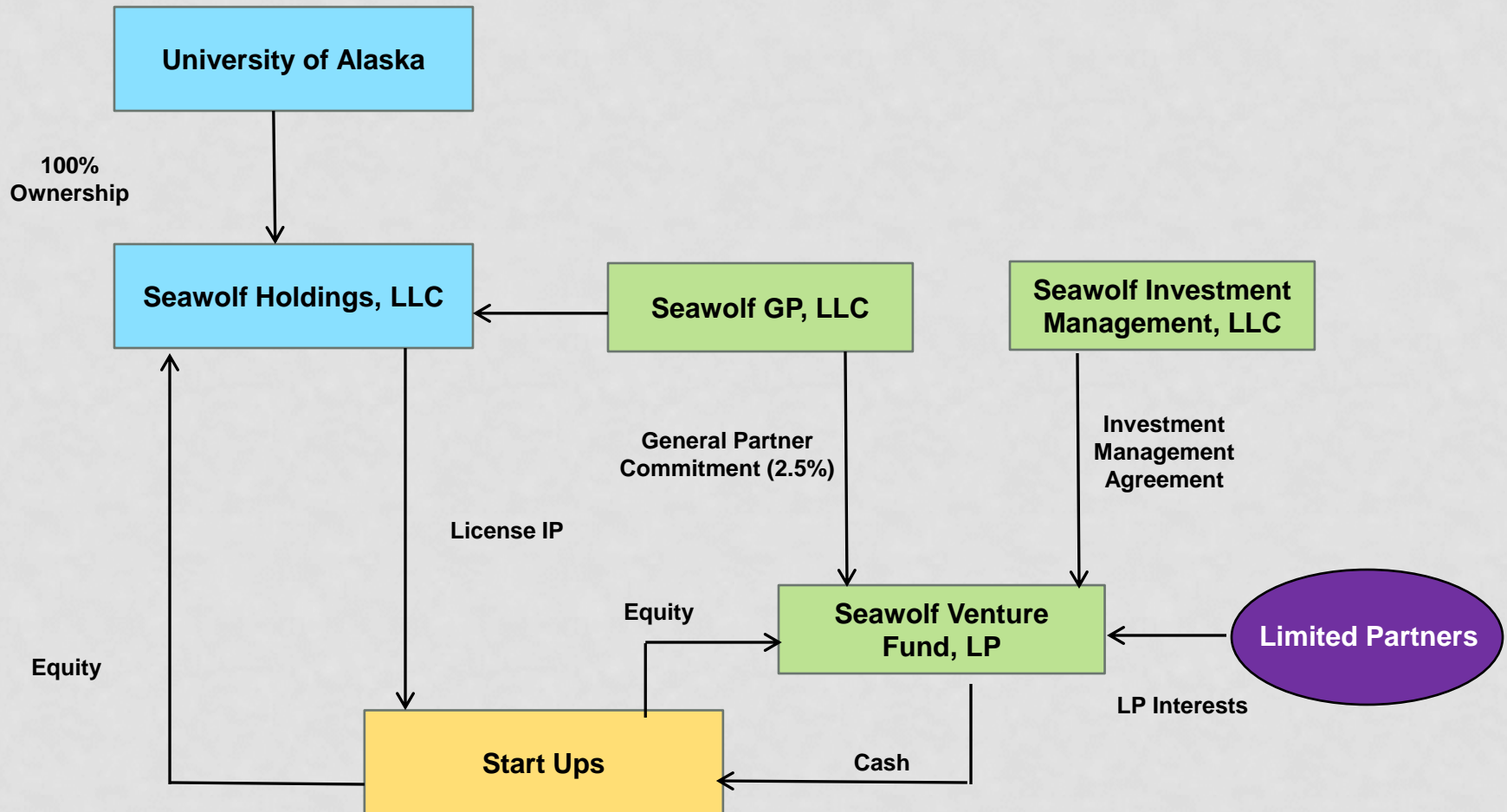


VOLUME 1 /// FALL 2013

UAA TECHNOLOGY COMMERCIALIZATION AND PRIVATE INVESTMENT STRUCTURE

- **In August 2012, the VPRGS created an infrastructure for Technology Commercialization approved by the University of Alaska Board of Regents to:**
 - Leverage faculty and student research at UAA.
 - Build successful start-ups domiciled in Alaska.
 - Achieve above average returns for investors using UAA and affiliates proprietary technologies and innovation.
 - Use successful commercialization to attract innovation leaders to Alaska.

UAA TECHNOLOGY COMMERCIALIZATION AND PRIVATE INVESTMENT STRUCTURE



SEAWOLF HOLDINGS, LLC

BOARD OF DIRECTORS

- **Dr. Helena S. Wisniewski, President Seawolf Holdings, LLC;**

Vice Provost for Research at UAA

- **Senior executive/leadership experience** – government, industry, academia (includes: DARPA, CIA, Lockheed, Titan, Stevens Institute of Technology)
- **Technological entrepreneur** – launched and sold startup companies
- **Serves on Boards of Directors** of public and private companies, and on government committees.



- **Mr. Thomas Hook, President and CEO, and Board Director of Greatbatch, Inc.**

- **A publically traded company on the NYSE (NYSE:GB)**
- Led acquisitions across the globe and successfully integrated them.
- Co-founded the Van Owen Group
- Serves on Boards of Directors of public companies.



- **Mr. Stephen Socolof, Founder and Managing Partner, New Venture Partners**

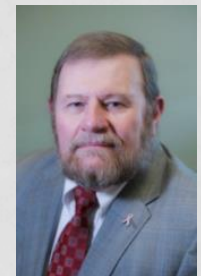
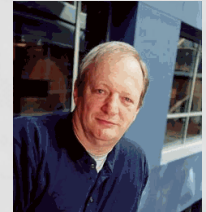
- A global venture capital firm dedicated to corporate technology spin-outs with **over \$700 million under management**
- **Key to launching over 50 companies** built upon innovations from major technology companies (Lucent, British Telecom, Boeing, GE, IBM, Intel).



SEAWOLF HOLDINGS, LLC

BOARD OF DIRECTORS

- **Dr. John Bischoff, Managing Partner of Half Moon Ventures LLC and Adjunct Professor, George Washington University**
 - **Former Vice President of Finance and Operations, America Online, Inc.**
 - Held executive positions at IBM, including IBM Research at Watson Labs
 - Serves on corporate and university boards
- **Mr. John Wanamaker, Alaska Venture Partners**
 - Active angel investment practice investing in companies both in and out of Alaska
 - Serves on public and private Boards of Directors
- **Dr. John Sibert, Founding Chairman, National Association of Seed & Venture Funds**
 - Founding Executive Director, Alaska Science & Technology Foundation
 - Former COO Tech Transfer & Industry Collaboration, California State University Institute
 - Member of private and public Boards of Directors
- **Dr. Elisha Baker, Provost and Vice Chancellor at UAA**
 - Former Dean of the College of Business and Public Policy, UAA
 - Executive positions at Fluor Daniel
 - President and General Manager of Simons Technologies, Inc.



SEAWOLF VENTURE FUND, LP

STRUCTURE

- **Provide investment in early stage companies focused on:**
 - Biomedical devices
 - Sensors for remote monitoring, system management, and surveillance
 - Embedded systems using innovative materials
 - Therapeutic pharmaceuticals
 - Educational software
 - Biometrics
 - Novel approaches to remediation
- **Deal flow from:**
 - **UAA's innovative** technologies and start-up companies.
 - **Technology portfolios from other universities and companies** in Alaska and nationwide.
 - **Opportunities identified** by Seawolf Holdings LLC or GP.
- **Seeking \$10M investment from companies and individuals in and outside of Alaska.**
 - The GP will call the first 25% of the commitments at the First Closing of \$3M.
- **Fund Raising Strategy:**
 - Springwell will assist in raising funds in Lower 48;
 - Under discussion with a local venture group to raise funding in Alaska and Lower 48.
- **Structured as a traditional blind pool format.**
- **A full description of the investment terms in a Term Sheet is available.**

GENERAL PARTNER FOR THE SEAWOLF VENTURE FUND, LP



- **Springwell Capital Partners, LLC** — a private commercial entity **located in Stamford, CT - oversees the fund and makes all investment and divestment decisions.**
 - **Contribute 2.5%** of the total investment in the Fund
 - **Earn a carried interest of 20%.**
- **The partners are successful executives with careers at:**
 - GE Capital, AT&T, Hughes Electronics, and Bain & Company.
- **Principals have \$100B in transactions under belt**
 - Successful investment, acquisitions, start-ups and restructuring.



Mufit Cinali



Gardner L. Grant, Jr.



Kun Lee

PATENTS

SIGNIFICANT GROWTH IN INTELLECTUAL PROPERTY
ACTIVITIES SINCE FY11:

TEN-FOLD INCREASE IN INVENTION DISCLOSURES

31 UP FROM 3 IN FY11

TEN-FOLD INCREASE IN PATENTS PENDING

12 UP FROM 1 IN FY11

THE NUMBER OF PATENTS ISSUED HAS QUADRUPLED

4 UP FROM 1 IN FY11

FIRST 2 START-UP COMPANIES WERE FORMED IN 2013

About 33% of the invention disclosures have evolved into the following Patents pending.

PATENTS

UAA PATENTS ISSUED

Methods and Systems for Multiple Factor Authentication Using Gaze Tracking and Iris Scanning US 7,986,816 B1	Kenrick Mock Bogdan Hoanca
pH-Sensitive Immunoliposomes and Method of Gene Delivery to the Mammalian Central Nervous System US 5,786,214	Eric G. Holmberg
Data Hiding Based Messages and Advertisements US 8,555,052 B2	Helena S. Wisniewski Rajarathnam Chandramouli Koduvayur P. Subbalakshmi
Process for Demineralization of Bone Matrix with Preservation of Natural Growth Factors US 8,574,825 B2	Nancy J. Shelby Steven M. Scott Benjamin P. Luchsinger Gregory A. Juda Kelly R. Kirker Jesus Hernandez Darrel L. Holmes

UAA PATENTS PENDING

Light-Assisted Membrane Treatment and Cleaning	Aaron Dotson
*Long Lifespan Wireless Sensor and Sensor Networks	John Lund Todd Petersen
Compositions Comprising Citric Acid and Malic Acid and Methods and Uses Thereof	Colin McGill
*Vehicle Accessory Engagement Tracking	Tim Menard Jeffrey Miller John Lund
*Mineral Isotopes in Water, Methods and Uses Thereof	Lee Ann Munk Ryan Mathur
*Devices, Systems, and Methods of Determining Linear and Angular Accelerations of the Head	Anthony Paris Jens Munk
*Mouth Guard for Determining Physiological Conditions of a Subject and Systems and Methods for Using Same	Anthony Paris Jennifer Brock John Lund
*Surgical Rod Bender	Anthony Paris
Student Learning Progress Model	Gary Rice
Surgical Cutting Device and Methods of Using Same	Samuel Werner
*Fish Carcass Disposal System	Alexandra West
*Systems and Methods for Heating Concrete Structures	Joey Yang, et al.
*Utility Patent	

In process - 3 filings being prepared; additional invention disclosures being evaluated.

CFT SOLUTIONS: PROVIDING A SNOW & ICE-FREE PATHWAY

CFT SOLUTIONS™ IS PART OF
THE SEAWOLF HOLDINGS, LLC
PORTFOLIO OF COMPANIES.



CFT SOLUTIONS

Alaska Tested





CFT SOLUTIONS, LLC

FORMED MAY 2013

- **Product:** innovative, cost-effective approach to snow removal and deicing using carbon fiber tapes embedded under the surface. **Patent pending: Patent filing 14/024,152.**

Advantages

- **Easy installation at lower costs** 40% the cost of a hydronic system.
- **Significantly less expensive** to operate than hydronic systems - 50% less - \$0.02/ft²/day.
- **Self-monitoring** – sensors control the on/off power based on the surface temperature and moisture.
- **Durable** – carbon fiber tapes have high strength and long term stability.
- **Versatile** – easily customized.
- **Safe** – Operates with 24V AC.
- **Alaska tested** – successfully in Anchorage during a record snowfall in 2011-12.

Applications include

- High pedestrian traffic
- Road intersections; parking lots
- Domestically in driveways/walkways
- Bridges, roofs

Installations & Potential Customers

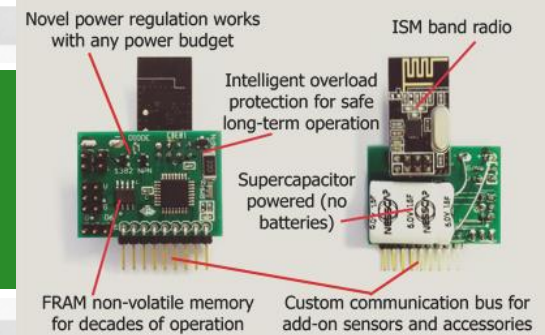
- **Currently a walkway at UAA**
- **UL Site Certified**
- **Commercial bid submitted.**
- **Other installations planned this spring.**





ZENSOR, LLC

FORMED APRIL 2013



- **Product:** a *new generation* of wireless sensors yielding significant improvement for use in remote monitoring, system management (SCADA), surveillance and security.
Patent Pending: Patent Filing 13/891,894.

Market Trend

- **Global wireless sensor market** expected to increase at 43.1% annually to reach \$4.7 billion by 2016. Ref. research firms such as BCC.

Zensor™ meets market needs

- **Industrial installations:** early warning data for various infrastructures; SCADA systems.
- **Surveillance and security:** border activity sensors detect vibrations - movement of persons; submarine and surface vessels.
- **Climate Change and Ecology:** remote sites expanses of difficult-to-reach geographic areas. Environmental changes - ice flow/melt; data collection from animal herds.

Advantages

- **No batteries** required
- **Ultra long life**
- **Low Cost**—Less than \$40 per sensor
- **Distributed Wireless Networked** system- data receipt, transmission and storage
- **Each sensor stores information about every other sensor in network**
- **Multiple Capabilities - data on:** vibrations, tilt, humidity, light intensity, temperature, sound, thermal images. Additional criteria can be added.
- **Arctic Testing** - reliability under extremes.

Featured in Alaska Business Monthly – July 2013.

IN THE PIPELINE

LICENSING, STARTUPS, JOINT VENTURES

From UAA

- **Water remediation for challenging waters** – ceramic membrane with ultraviolet light.
Patent Pending # US 61/884,864.
- **Traumatic Head Injury –Instrumented Mouthguard** with wireless capabilities measures acceleration of the skull upon impact and effects of such blows. **Patent pending # 61/747,411.**
- **Contactless Multi-modal biometric authentication** - for online access.
US Patent 7,986,816.
- **Eye Gazing/Tracking for Music Skill Assessment** - **patent in process.**
- **Therapeutic pharmaceuticals.** For example, Alaskan blueberry: in animal testing phase- received statistically significant results in aged rats and younger rats.
Patent pending #61/770,764.

From Community and Lower 48

- **Medical device** – can pinpoint exact muscle generating back pain - joint with methodology inventor Dr. Marcus (NYC) – UAA building new device using his methodology - **patent in process.**
- **Cognitive radio** – Dynamic Spectrum, LLC – current LLC in NJ received SBIR funds, **patent pending.**
- **Traumatic head Injury:** Non-invasive invention for assessing extent of traumatic head injury due to brain swelling, **Chief Medical Officer – Alaska Native Medical Center.**
- **Medical device:** A new technology to help conduct telehealth – a video otoscope - in discussion **with ANTHC to jointly develop.**
- **CalIDr** – Alaskan startup – a business/tech collaboration – MOA.

INCENTIVES FOR RESEARCH AND INNOVATION

❖ Innovate Awards

- **Purpose:** to inspire faculty research, entrepreneurship and creative works.
 - Funding \$200,000 in 2012, 2013; and \$160,000 - 2014.
 - Total of 113 proposals received and 41 funded.
- **Accomplishments**
 - A 3:1 ROI provided from external research awards for 2012.
 - Projected ROI of 10:1 for external research funding for 2013.
 - **Publications** in Peer Review journals.
 - **Invention** disclosures and patents pending.
 - **Presentations** at international conferences and scholar in residence.

❖ Patent wall of Fame

- **Provides recognition** for faculty who have patents issued.
- Faculty inducted at Innovate presentation ceremony.
- Resides in the Administration Building.

❖ *These awards and recognition, together with the commercialization infrastructure, have helped to contribute to Innovation Successes.*

FINAL THOUGHTS

- **Universities are a good investment for economic growth** – ref. 2012 AUTM report.
 - **\$36.8 billion in product sales**
 - Start up companies up 5.1%;
 - US patent applications – up 11.3%; Issued patents up 9.5%.
 - **Startups which had their primary place of business in the licensing institution's home state up 13.8%** - provided work for 15,741 people.
- **Alaska has a university base that can be leveraged for economic growth**, to help attract & retain talent, companies and investors.

Dr. Wisniewski posing with her lead dog - Onyx. And racing on the trail.
2014 Orville & Doris Lake Memorial sled dog races | Sports Photos | ADN.com

