

Desert Research Institute Applied Innovation Center

Quarterly Progress Report

Reporting Period: November 1st to Dec 31th, 2015
January 15, 2016

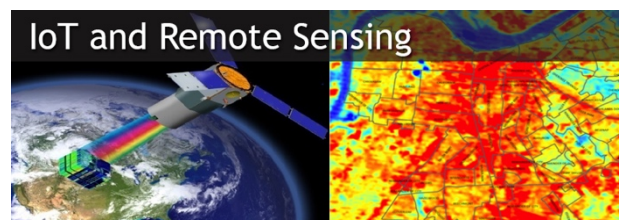
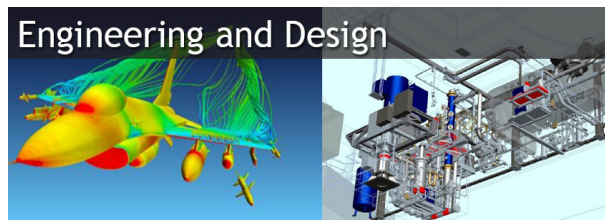
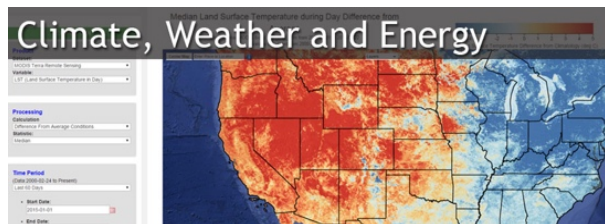


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Project Purpose

The Applied Innovation Center at DRI is a Knowledge Fund sponsored start-up in the data and analytics space. We leverage the intellectual capital of more than 100 DRI faculty and 60 years of environmental science research to focus on four main areas of applied research: Climate, weather and energy nexus; Internet of things and remote sensing; Engineering and design, and; Life Sciences and informatics. From these 4 core areas we are able to: 1) Build platforms (hardware and software) for industry; 2) leverage these platforms for sponsored projects; 3) Create jobs; 4) write new and more competitive grants, and; 5) build or help build high tech companies in NV.

These activities encompass 6 of the 7 core KF Metrics and 3 of the 5 secondary KF Metrics. In Q4, the AIC was focused on releasing a WINDS 1.0 version to a potential client and developed a relationship with Renown Health that will focus on health data science. The Renown Health work will commence in Q2 2016 with the hiring of 2 health data scientists and an additional programmer onto the AIC team. In Q1 of 2016 we are leveraging our WINDS platform to expand relationships with a major software company and are helping the City of Las Vegas compete for DOT funding. We are expanding on the concept of creating an “urban” toolkit for solving pressing needs in climate/weather/energy.

In Q4, the AIC was approximately 14 FTE strong (9 FTE hired because of KF support). In Q1-Q2 2016, the AIC will grow to ~ 16 FTE (~12.5 supported by KF, the other 3.5 from other sources). We are focusing intensively on leveraging work at DRI that we identified as having a need in industry. This includes building two new pieces of instrumentation for high throughput data collection in the climate/weather/energy nexus. In the IoT/Remote Sensing space we continue to develop technology and know-how in transportation data analytics, tracking and visualization. In the engineering and design space we are upgrading our technical capabilities around highly distributed file systems and database design and in machine learning. In the life sciences/informatics space we are focused on drug discovery, diagnostics and health care data analytics. The latter focus is in partnership with Renown Health.

Section I: Proposal Progress

The AIC focused on a public launch for WINDS and a potential large software client and building a proposal for Renown Health. These two large projects harness DRI expertise and combine analytics and programming capabilities of the AIC. The deliverables would then be used in our business development pipeline around the 4 core areas of the AIC.

During the reporting quarter, the AIC has made significant progress toward meeting proposed metrics. Major accomplishments for the current reporting period include:

1. Public deployment of WINDS for a major consulting/business intelligence client.

In the 4th quarter of 2015 the AIC released a public version of its WINDS platform for a business opportunity with a large consulting company. This was made possible in part due to the arrival of



Dr. Ming Liu – our technical leaders of software and hardware engineering. Ming is transforming our vision of WINDS to include state-of-the-art database and analytics design. This will ensure the scalability and extensibility of our product. In Q4 we completed phase I of our WINDS skill calculations. This allows us to say that our weather forecasting model is better than the competition.

2. Strategic development of a health data science program with Renown Health.

One of the major objectives of Renown Health’s strategic plan is to improve population health in Northern Nevada. In part, this requires access to top care and top medical facilities. Another part of the equation is modern health data science analytics and statistics. AIC engaged in many meetings with Renown to build a proposal for leveraging our expertise in data analysis and programming. In Q4, we began the recruiting process for a new health data science faculty member.

3. Further integration of DRI science into the AIC mission.

DRI has a 50-year record of exceptional work in environmental science. It has numerous assets that the private sector would benefit from in the climate/energy/water nexus. In Q4 we began developing a few more of these to integrate into the AIC – these include a new aerosol detector, an IoT sensor/network platform, a particulate/aerosol model for urban planning and a new detector for measuring growth in anaerobic bioremediating organisms.

4. Support and follow-up on DRI’s \$3bn DOE ORISE proposal.

In Q4, the AIC continued its role in support and follow-up on DRI’s \$3bn DOE proposal. This would be a transformational grant for the State of Nevada and NSHE.

5. Began a relationship with the logistics company AVA logistics.

AVA logistics is a Reno based company in the logistics business. They booked ~\$15m in revenue in 2015 and hope to continue to grow by 30% in 2016. The AIC is going to help them automate and streamline data analysis and shipment tracking with a long-term goal of turning AVA into a \$50m company.

6. Commercialization / Partnering

The AIC sales sheet represents a list of companies in our pipeline. Companies highlighted in peach are additions in Q4.

7. Intellectual Property

Three pieces of IP have come out of KF work and collaboration. A disclosure was filed in Q3 for a specific military application, the drawings were initiated in Q4 and two applications are in the final stages of submittal. The WINDS™ platform has potential IP associated with it and we are evaluating how to proceed with this IP.



Disclosures

System and method for a specific military application	Decker and Grzymiski	design and process	Drawings are being produced
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Applications

System for the controlled manipulation of single-celled organism physiology and bioproduct production	Grzymiski and Staub	instrumentation and method	at attny for final review
System and method for the experimental annotation of microbes	Grzymiski, Read and Neveux	system and method	at attny for final review

Issued

8. Programmatic & Project Changes

[Section is reserved and will be used only if needed. Summary of material changes to project scope and mission, e.g. addition or removal of job roles, any unforeseen needs, changes in budget, or other material changes in direction]

9. Looking Forward

We are extremely optimistic about Q4-Q1 for the AIC. We will publicly launch WINDS™. We will begin the search for our Renown Health Data Science fellow. We will consolidate our business development pipeline around WINDS™ and begin to expand in the IOT/Remote Sensing and Engineering/Design core areas of AIC. In life sciences and informatics we are optimistic that expanded funding for EMS Genomics, LLC will yield more jobs in Nevada. This deal is expected to close Q4-Q1. We intend to continue to develop diagnostics and analytics applications that leverage our expertise in informatics and couple that with DRI subject matter expertise in air sampling and analysis. This latter application can ultimately be coupled to WINDS™ as well.



Section II: Performance

Table 2: Progress Toward Metrics

Knowledge Fund Report Metrics

Primary Categories	Q4 2015	Q4 2016	Q4 2017
Companies Moved to NV	N/A	0	1
Start-up companies	1	1	2
Jobs Created	1	5	20
IP Licenses	1	2	5
IP Revenue	0	\$100,000	\$230,000
Grants Received/Affiliated	0/0	\$250,000	\$700,000
Sponsored Research (Contracts/\$)	2/\$35,000	\$250,000	\$500,000
Secondary Categories			
Patents (Filed/Awarded)	0	2/0	2/1
Students placed with Companies	N/A	N/A	N/A
Impact Faculty Hired	0	2	2
Gifts/Donations to KF Projects	N/A	N/A	N/A
Student Internships	0	4	5

Notes: All Values are for booked amounts in Q4.

Start-up Companies:

Desert Research Corporation. In Q4 the DRC continued its development as a start-up company within DRI. The DRC is able to submit grants through SBIR/STTR program to commercialize DRI technology.

Jobs Created:

Since AIC inception there have been 11 jobs created. In Q4 AIC hired a new postdoctoral scholar in microbiology.

Intellectual Property Licenses:

The AIC is currently structuring the IP License of the WINDS™ platform.

Intellectual Property Revenue:

Revenue from the WINDS™ platform, from logistics work and from health data science innovation is projected for Q2.

Grants received:

Since inception the AIC has received \$442,996 worth of research grants directly and ~\$750,000 as co-PIs or as SMEs. However, no grants were booked in Q4, instead, the AIC submitted grants in excess of \$600,000.

Sponsored research:

AIC and DRI did sponsored research with the DRC and with EMS Genomics.

Impact Faculty hired:

Dr. David Vuono, a postdoctoral scholar in microbiology began work at DRI in Q4.

Student Internships:

Student internships are focused during the summer.



Section III: Budget

AIC General Salary in Q4 supported 11 FTE including the senior director, business development leader, 2 technical leads, 4 programmers, 2 post-docs and 1 faculty member. In Q1 the expenditure increases slightly due to the addition of an added FTE in engineering and modeling to complete some AIC projects before the phase I close-out.

Asset and faculty development increased with the push to launch WINDS and develop some new capabilities. We will continue to invest in building out a few more projects in Q1 of 2016. There will be a major allocation in Equipment in Q1 as we build out the infrastructure necessary to launch the commercial version of WINDS and host Renown’s health data analytics platform. Travel reflects increased FTE attending meetings and business development events.

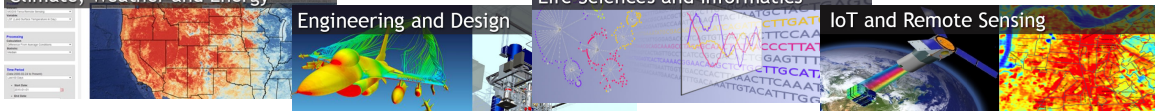
AIC Expenditures			
For Reporting Period			
October 1 – December 31, 2015			
	Q4 Actual	To Date	Q1 Estimate
	Current period	Inception to Date	Jan 1-Mar 30, 2016
		April 1, 2014 – Dec 31, 2015	
AIC General Salary	\$353,030	\$1,341,466	\$443,000
DHS Oversight/Leadership	\$47,344	\$68,793	\$43,157
DAS Oversight/Leadership	\$12,267	\$52,556	\$26,334
DEES Oversight/Leadership	\$11,180	\$33,000	\$46,000
Asset Development	\$19,453	\$39,546	\$94,000
Faculty Development	\$26,598	\$59,628	\$48,485
Software, Tech & Equipment	\$17,636	\$175,739	\$174,439
Travel	\$11,470	\$34,243	\$20,000
Total	\$498,977	\$1,804,972	\$895,415

PROJECTED BUDGET TO END OF Q1 2016= \$2.7m

The numbers below reflect amounts of money booked related to KF investment, projects and because of our impact faculty. We received public sector grant money related to work in weather, transportation and military work. Private sector revenue came from continued R&D with EMS Genomics, LLC. We are anticipating approximately 20% quarterly growth rate income in the near future based on our pipeline, deal maturity and outstanding grants/contracts.



AIC INCOME			
For Reporting Period			
October 1 - December 31, 2015			
	Q4 Actual Current period	To Date Inception to Date April 1, 2014 - Dec 31, 2015	Q1 Estimate Jan 1-Mar 30, 2016
Federal Grants / Contracts	\$80,000	\$499,996	\$96,000
Private Sector Contracts	\$34,285	\$375,306	\$65,000
IP Revenue	\$-	\$-	\$25,000
Gifts	\$-	\$-	\$-
Other Contributions	\$-	\$7,000	\$5,000
Knowledge Fund	\$-	\$-	\$-
Total	\$114,285	\$882,302	\$191,000



Section IV: Monthly Logs of AIC Activities for Reporting Quarter

These follow.

Section V: Appendix

Appendix 1 – Sales Pipeline

Attached in Excel.

[Only include opportunities that are new or have progressed in the sales pipeline. List multiple opportunities with the same company separately. Include the TOTAL previous and current number (#) of opportunities in each stage of the sales pipeline. Company names may be anonymized with unique identifiers only if required by confidentiality agreements. Attach spreadsheet if needed]



AIC monthly report

October, 2015

Business/project development
General activity

Business/project development

LOADIQ

Two meetings with Hampden Kuhns to discuss AIC collaboration and revamping their system

AECOM

Teleconference with John Ruggieri of AECOM to discuss climate modeling and built environments.

AVA LOGISTICS

Met with principals of AVA Logistics to discuss software development

APEX LOGIC

Met with Pourya Dehnadi to discuss software development collaboration

INVEST LEIPZIG

Met with Invest Leipzig representatives concerning technology partnerships in Germany

BILD ALTERNATIVE INVESTMENTS

Teleconference with David Clark-Joseph

FORECAST WATCH

Teleconference with Eric Fluehr founder of ForecastWatch to discuss weather forecasting accuracy

RISKY BUSINESS

Teleconference with Megan Kaiko of the climate change advocacy group Risky Business to discuss partnership opportunity

DESCARTES LAB

Teleconference with Mark Johnson of Descartes Labs to discuss weather forecasting as a service

DRONE AMERICA

Met with Drone America and DRI faculty Adam Watts to discuss UAV deployment in cloud seeding

AIC monthly report

XXX

- Conference call with XXX. Reviewed their business presentation on how to integrate WINDS to their platform. Ready to engage with them for live demo and further business discussion.

DRI/UNR

Had several internal meetings with Shey to explore water meter idea. Made suggestions ranging from device selection, architecture, apps to data analytics

Commercialization breakfast with UNR

RENOWN

Meeting with Tony Slonim and Ron Fuschillo

General Activity

Teleconference with Karsten Heise and Chris Erb to discuss participation in the National Innovation Summit

NPR interview

Meeting with Travis Schwieger

AIC monthly report

November, 2015

Business/project development
General activity

Business/project development

WEATHER UNDERGROUND

Teleconference with Alan Steremberg, founder of Weather Underground to discuss private meteorology market and emerging trends

AVA LOGISTICS

Follow-up meeting with AVA Logistics to discuss software development project opportunities

HACK4RENO

Ming Liu attended Hack4RENO and met with Lynne Barker, sustainability manager in the office of the Reno City Manager. Also met with Matt Betram of Filament. They provide low power areail wireless network

RENOWN HEALTH

4 meetings with Renown Health group. There are many fronts we can contribute our expertise ranging from system architecture to data analytics. We are waiting for followup meeting with relevant people to discuss the 5 key questions they would like to answer.

DRI/UNR

Had a 2 hour meeting with Judy and John. They expressed interest in collaborating with AIC to develop next generation air quality analyzer.

UNSOM

Meeting with Dr. Karen Schlauch

HUDSON ALPHA INSTITUTE

Joe had 2 phone calls with HAI

General Activity

Follow-up teleconference with Karsten Heise and Chris Erb concerning participation in the National Innovation Summit

Joe met with Michael Kos and Nathan Slotnick

AIC monthly report

December, 2015
Business/project development General activity
Business/project development
CITY OF RENO Met with City of Reno sustainability manager Lynne Barker to discuss her new role and to discuss potential collaboration on Reno's sustainable development process.
AVA LOGISTICS Met with AVA Logistics to continue a dialogue around a software development partnership
FILAMENT Invited Matt Bertram, CTO, from Filament, a censor network startup company in Reno, to discuss what their company is up to in order to gauge whether there will be collaboration possibility down the road.
SEMPRA Teleconference with Sempra government affairs contact Tiffany East to discuss the WINDS platform
QILING NATIONAL BOTANICAL GARDEN Ming started initial engagement with Qiling National Botanical Garden in China on potential consulting service to help them build a CAVE platform.
XXX Released WINDS 1.0 and presented architecture design for future 2.0 release, that serve as basis to engage with XXX on a conference call.
NURIX PHARMA Joe met with Nurix Pharma
RENOWN Joe met with Renown
CHILD HEALTH INSTITUTE Joe met with members of CHI
General Activity
Ming has the VES software development project plan in place. VES is a software that will be used to guide well drilling in Africa with inexpensive instrument.

AIC monthly report

Brian met with the Certified Public Managers graduating class touring DRI, provided overview of Applied Innovation Center

Brian provided an overview of intellectual property claims to group of WINDS project team

Brian met with DRI Foundation Trustee and DRC board member Leonard LaFrance to discuss DRI, AIC and the status of the DRC

Brian represented DRI at the AGU annual conference in San Francisco, CA

Joe met with Names Withheld to discuss investments in Genetics and Genomics Consortium