ANNUAL REPORT INSTITUTE FOR INTERDISCIPLINARY DATA SCIENCES
UNIVERSITY OF IDAHO

EXECUTIVE SUMMARY

The Institute for Interdisciplinary Data Sciences at the University of Idaho empowers researchers to harness the full potential of modern data science. We provide cutting-edge research infrastructure for high performance computing, data management, and genomics. This infrastructure is supported by highly trained scientific staff who work directly with researchers at all phases of the research project lifecycle.

IIDS is also a vibrant home for interdisciplinary research. Faculty, student, and postdoctoral participants originate from 9 colleges, 30 departments, and 10 centers and Institutes at the University of Idaho. In this report, we describe the activities and accomplishments of IIDS researchers for fiscal year 2021.

FY21 QUICK METRICS

TRAINEES
5 doctoral research staff
65 postdoctoral researchers
196 graduate students
204 undergraduate researchers

DISSEMINATION OF RESEARCH FINDINGS
4 invention disclosures
99 invited seminars & keynotes
137 conference presentations
232 publications
44,347 citations since 2011

GRANT ACTIVITY
24 proposals submitted
12 faculty submitting proposals
$3.1M research expenditures
$20M research funds requested
$13M awarded

63%
OF REQUESTED RESEARCH FUNDS WERE AWARDED

MISSION

IIDS empowers researchers to harness the full potential of modern data science.

VISION

IIDS helps researchers maximize the impact of their work by providing cutting-edge research infrastructure for high performance computing and genomics, along with expert scientific staff.

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LETTER FROM THE DIRECTOR

This year, we made a big transition by reorganizing and rebranding the Institute for Bioinformatics and Evolutionary Studies (IBEST) into the Institute for Interdisciplinary Data Sciences (IIDS). It is difficult for me to understate the significance of this change, and equally difficult to describe the struggle associated with this decision. After all, the name IBEST represented the cumulative hard work and accomplishments of many dedicated, innovative, and creative people. IBEST had recruited and retained a remarkable group of researchers in evolutionary science who now represent one of the core areas of research strength at our university. The research infrastructure in high performance computing and genomics that was built by IBEST has become centrally important to the U of I research mission. The accomplishments of IBEST faculty made moving away from the name IBEST a very difficult decision. However, over the past few years it became increasingly apparent that the functions and services provided by IBEST were no longer adequately described by our name.

The first significant expansion of our services occurred when IBEST merged with Northwest Knowledge Network (NKN). At the time, NKN was providing full-service Data Lifecycle Management while the IBEST Computational Resources Core was offering research computing hardware commonly used by “big data” researchers. The merger just made sense. However, by merging these units we added a large portfolio of researchers that simply didn’t fit under “Bioinformatics” or “Evolutionary Studies”.

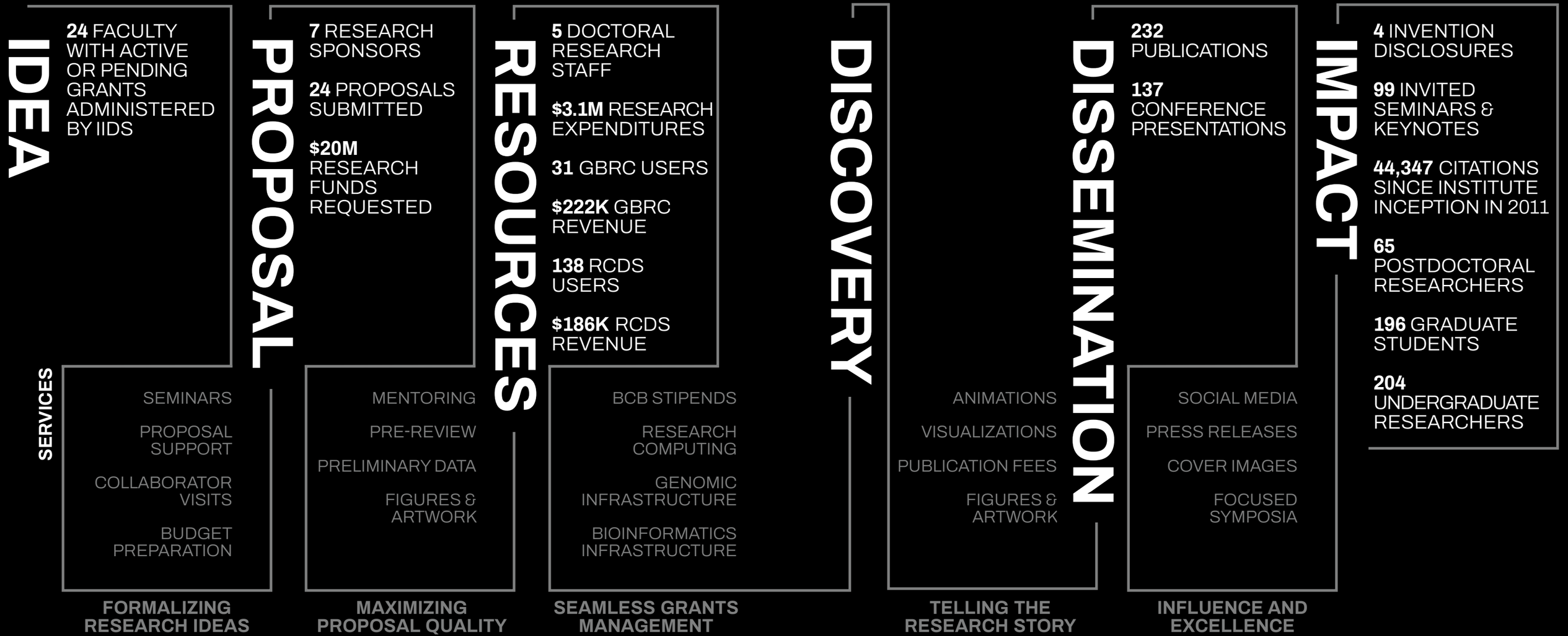
The second reason we outgrew the name IBEST is related to the rapid increase in demand for genomics and research computation. These core facilities were built by IBEST researchers over the past 20 years because capacity in genomics and computation was critically important to their research objectives in evolutionary science. Over time, however, the user base for these cores expanded well beyond bioinformatics and evolution. In fact, the majority of our users now fall outside these areas.

So, after many conversations with the faculty who created IBEST and helped it grow into its current form, we changed our name. Naming things is really hard, but in the end, the Institute for Interdisciplinary Data Sciences embodies the spirit of both IBEST and NKN and more fully captures what we offer and who we serve.

One last note on the new name. Unlike IBEST, which can be pronounced as though it were a word, IIDS cannot. Just say the letters (as in CIA, FBI, or AAAS) and please stop asking how the acronym is pronounced.

DR. BARRIE ROBISON, IIDS DIRECTOR

LEFT: IIDS DIRECTOR BARRIE ROBISON PHOTOGRAPHS TICK COLLECTION IN UTAH BY RESEARCHERS FROM THE UNIVERSITY OF NEVADA, RENO. TICKBASE.NET



THE IIDS LOGIC MODEL

IIDS looks for ways to help faculty and their trainees at every stage of the research process, from nascent ideas to impact. The logic model shows how we track metrics associated with research, and the types of investments we make to improve the rate at which research proceeds.

Our institute seeks to maximize the research impact of participating faculty. Impact can take many forms, from applied solutions for specific problems to basic research that illuminates the processes that govern the world around us. We focus on the potential impact of our participant's research because it is that impact that ultimately motivates the work and is the true measure of its merit.

FORMALIZING RESEARCH IDEAS

PROPOSAL SUPPORT

IIDS seeks to maximize the time faculty spend writing about their science and minimize the time they spend on paperwork. IIDS administrative staff support faculty in all phases of proposal development, including RFA review, proposal initiation, budget development, document management (such as current and pending support, biosketches), sub-award coordination, VERAS, Grants.gov, Research.gov and Fast Lane support, and coordination with the Office of Sponsored Programs and Office of Research and Faculty Development. These services are restricted to proposals that will be submitted through IIDS.

IIDS SEMINARS

IIDS collaborates with the Bioinformatics and Computational Biology (BCB) graduate program to offer a seminar series of visiting speakers each semester. Speakers are nationally and internationally recognized scientists and are selected and hosted by the students in the BCB graduate program.

EVENTS

IIDS hosts events that help researchers meet potential collaborators, learn about new techniques, and generally help researchers view their work in new ways. Examples include our recent AI workshop and Sketch your Science.

MAXIMIZING PROPOSAL QUALITY

PROPOSAL PRE-REVIEW

IIDS funds stipends to reviewers to pre-review some proposals before their submission. We reserve this process for new investigators or large programmatic proposals.

TEACHING RELEASE

IIDS can support teaching buyouts for faculty working on large programmatic proposals that will be submitted through the institute.

ART AND GRAPHIC DESIGN

IIDS staff can support the development of high-quality figures and artwork for publications and grant proposals.

METHODS DEVELOPMENT

The staff in RCDS and the GBRC routinely help faculty develop new research methods and write relevant pieces of methods sections for both proposals and manuscripts.

RIGHT: POLYMORPHIC GAMES LEAD DESIGNER LANDON WRIGHT MODELS A DEER FOR AN EDUCATIONAL VIDEO GAME ON TICK-BORNE DISEASES. TICKBASE.NET

GRANTS MANAGEMENT AND PROJECT EXECUTION

GRANTS SERVICES

IIDS provides fiscal management of resources by overseeing all post-award grant functions such as early budget setups, advance funding requests, sub-award initiation and monitoring, sponsor pre-approvals for no-cost extensions and re-budgets, expenditure reviews and compliance, budget transfers, payroll cost transfers, comprehensive financial reports, and project closeouts. Working one on one with faculty researchers, IIDS staff proactively manage grant budgets by providing accurate projections and fiscal advice and assuring compliance with university, state, and federal guidelines.

BCB FELLOWSHIPS

IIDS has funded many Bioinformatics and Computational Biology (BCB) fellowships, which allow graduate students to work full time on funded research projects.

RCDS INFRASTRUCTURE

Fully described on pages 24 and 25, Research Computing and Data Services (RCDS) provides a variety of research computing infrastructure, data services, and software development support.

GBRC INFRASTRUCTURE

Fully described on pages 26 and 27, the Genomics and Bioinformatics Resources Core (GBRC) provides next-generation sequencing and bioinformatics support.

TELLING THE RESEARCH STORY

VISUALIZATIONS

IIDS staff are available to collaborate with faculty on complex data visualizations, which can be deployed in print or online. Online visualizations can be interactive and can draw on dynamic data sets.

ANIMATIONS

IIDS has supported the development of animated visualizations, interactive displays, and virtual reality demonstrations that can be used for data exploration or outreach activities.

PHOTOGRAPHY AND VIDEO

IIDS staff are available for photography and video production to support the dissemination of faculty and student research.

DATA REPOSITORIES

RCDS staff can support the creation of high-quality online data repositories to make your research data findable, accessible, interoperable, and reproducible.

WEB DEVELOPMENT

RCDS staff are available to create research related web sites and data driven web portals.

INFLUENCE AND EXCELLENCE

PRESS RELEASES

IIDS administrative staff coordinate with faculty and U of I Marketing and Communications to publicize important research discoveries. This includes the writing of articles and production of visual collateral.

SYMPOSIA

IIDS organizes regional symposia on topics related to our research mission. These symposia typically feature distinguished keynote speakers, poster sessions, and platform presentations.

SOCIAL MEDIA

IIDS publicizes events and research discoveries through social media channels.

IIDS CORES STAFF

RCDS

Research Computing and Data Services (RCDS) is the central provider of research computing infrastructure and services for the University of Idaho. They offer state-of-the-art high performance computing, data storage and management, and a range of software and web development expertise. They provide researchers with the establishment and curation of quality data and metadata, as well as access to high performance computing, tools, modeling, and visualization. They also cultivate connections to relevant national and international data repositories.

GBRC

The Genomics and Bioinformatics Resources Core (GBRC) houses the equipment and personnel necessary to aid researchers in every aspect of high-throughput genomics research. It provides the molecular equipment needed for the most high-throughput sequencing studies and the expertise in bioinformatics to acquire, analyze, and visualize data generated from those studies. The core also develops partnerships with other service facilities around the U.S. when additional capacity or specialized equipment are warranted.

ADMIN

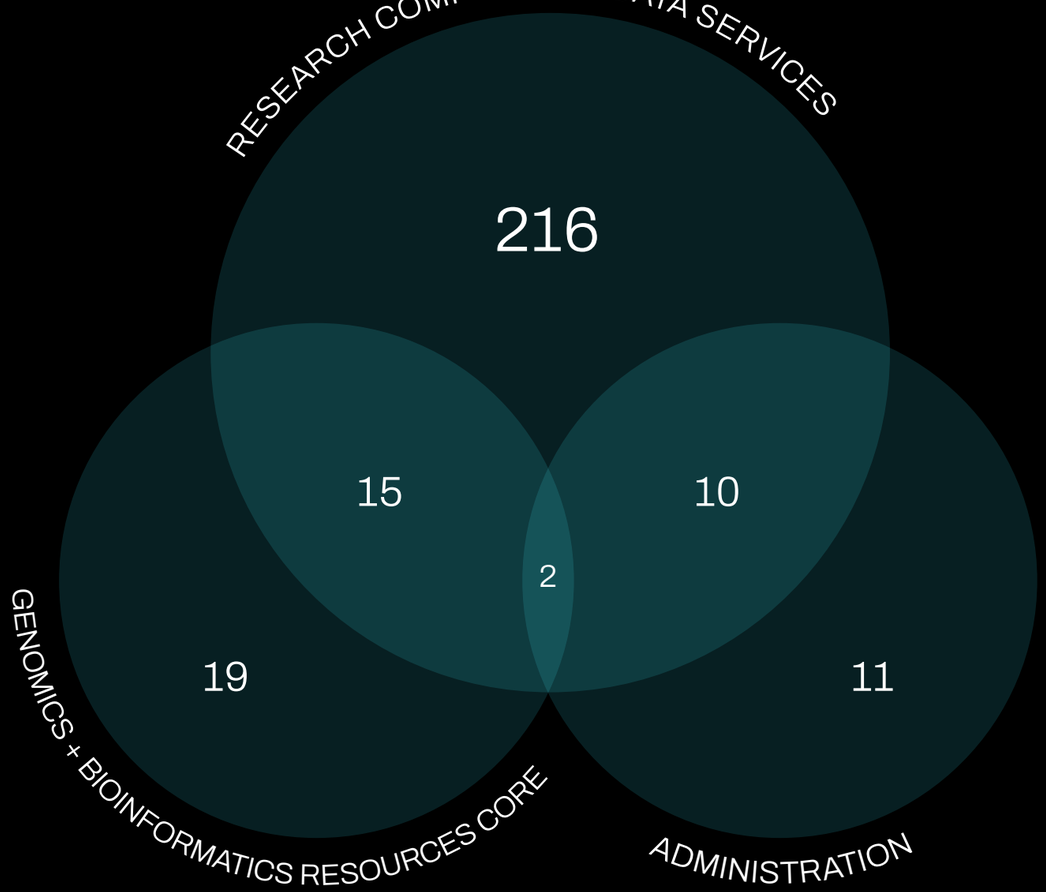
The administrative team performs research support functions and is a crucial point of interaction between faculty and other administrative units on campus. They assist with proposal development including budgets, documentation, and figures, as well as purchases, travel, and other research expenditures for awarded grants. This includes the management of large program grants such as COBRE and NSF EPSCOR Track II awards.

FACULTY

PARTICIPATION

Faculty who are the most integrated with IIDS are those who submit grant proposals through the institute, and/or for whom IIDS administers their budgets. To be submitted through IIDS the research proposal must be aligned with IIDS' intellectual focus or make significant use of IIDS infrastructure.

Adam Jones, Biological Sciences • Onesmo Balemba, Biological Sciences • Larry Forney, • Biological Sciences • Luke Harmon, Biological Sciences • Jennifer Hinds, IIDS • Paul Hohenlohe, Biological Sciences • Kimberly Andrews, IIDS • Michael Overton, Political Science • Marshall Ma, Computer Science • Chris Marx, Biological Sciences • Mike Maughan, Mechanical Engineering • Diana Mitchell, Biological Sciences • Scott Nuismer, Biological Sciences • Christine Parent, Biological Sciences • Ben Ridenhour, Mathematics • Luke Sheneman, IIDS • Deb Stenkamp, Biological Sciences • Jack Sullivan, Biological Sciences • Eva Top, Biological Sciences



CORE FACILITY USERS

IIDS supports the research of 273 participants from across campus.
This diagram shows how these faculty engage with IIDS' various functions.

IIDS core facilities support the research of 83 faculty and 190 trainees from 9 different colleges, 30 academic departments, and 10 centers and institutes. This figure shows how IIDS faculty, postdocs, and students are distributed across the university's academic units.

ACCOMPLISHMENTS + PERFORMANCE METRICS: FY21

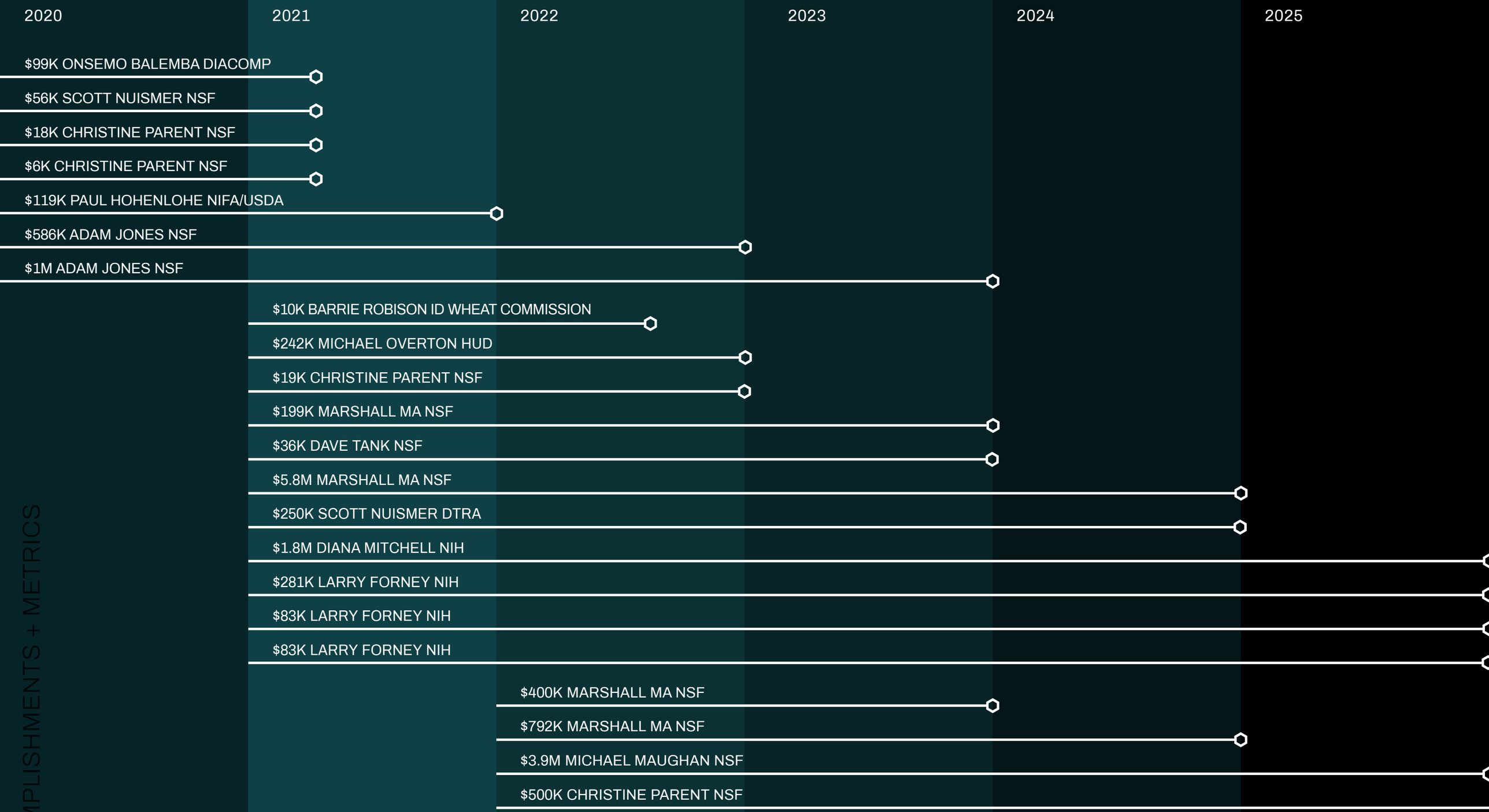
PROPOSALS AND ACTIVE AWARDS

12 FACULTY SUBMITTED 24 PROPOSALS through IIDS this year.

IN FY21, IIDS PIs RECEIVED 15 NEW AWARDS TOTALING $12,935,244.

FY21 PROPOSAL SUBMISSIONS

NAME	COLLEGE/DEPT	SPONSOR	TITLE	AMOUNT	STATUS
Balemba, Onesmo	COS, Bio	NIH	Identification of novel toxic molecules resulting from high fat diet-gut microbiota-host interactions that trigger diabetic gastrointestinal neuropathy and dysmotility	$2,035,841	Declined
Forney, Larry	COS, Bio	NIH	Impact of host genetic ancestry on the vaginal microbiome (WSU RO1)	$280,942	Awarded
Forney, Larry	COS, Bio	NIH	Host-microbiota interactions and Chlamydia trachomatis infection outcomes	$83,133	Awarded
Forney, Larry	COS, Bio	NIH	Structure, immunity and microbiome: Human 3D biomimetics cervicovaginal models for sexually transmitted infections	$83,133	Awarded
Harmon, Luke	COS, Bio	NSF	HDR: Institute Proposal_OSU	$499,924	Pending
Nuismer, Scott	COS, Bio	NSF	Predicting Reservoir Community Composition and Spillover Risk	$2,499,885	Declined
Nuismer, Scott	COS, Bio	DRTA	Role of Camels in Transmission of Brucella spp and Middle East Respiratory Syndrome Coronavirus to Humans in Kenya	$249,749	Awarded
Parent, Christine	COS, Bio	NSF	RCN: Island Systems Integration Consortium	$499,866	Awarded
Parent, Christine	COS, Bio	NSF	Morphological Trade-Offs Balance Predation and Physiology	$19,000	Awarded
Tank, Dave	COS, Bio	NSF	Multifactorial drivers of evolution in co-diversifying lineages with specialized plant-pollinator interactions	$35,909	Awarded
Top, Eva	COS, Bio	NIH	The Origin and Spread of Mosaic Plasmids Encoding Multi-Drug Resistance	$191,066	Pending
Robison, Barrie	IIDS, Bio	NIH	EvoHealth: Improve pathways to STEMM careers in Idaho	$1,298,599	Declined
Robison, Barrie	IIDS, Bio	NSF	BEE: Ecological and coevolutionary feedbacks in multi-mutualist communities	$234,493	Awarded
Robison, Barrie	IIDS, Bio	ID Wheat Commission	Effects of the cereal seed microbiome on amylase activity and falling numbers	$10,000	Awarded
Soule, Terry	COE, Comp Sci	NSF	RET Site: Raising STEM in Rural Idaho	$599,997	Declined
Soule, Terry	COE, Comp Sci	NSF	Salmon Run	$210,904	Declined
Ma, Marshall	COE, Comp Sci	NSF	RII Track-2 FEC: Leveraging Big Data to Improve Prediction of Tick-Borne Disease Patterns and Dynamics	$5,830,709	Awarded
Ma, Marshall	COE, Comp Sci	NSF	EarthCube Capabilities: OpenMindat	$792,475	Awarded
Ma, Marshall	COE, Comp Sci	NSF	TickBase Track-2 Supplement	$399,983	Awarded
Ma, Marshall	COE, Comp Sci	NSF	RII Track-4:NSF: Incorporate Knowledge Graph and Reasoning Capability in the Visual Data Exploration of Mineral Evolution	$264,642	Pending
Ma, Marshall	COE, Comp Sci	NSF	TickBase Track-2 Supplement	$199,486	Awarded
Maughn, Mike	COE, ME	NSF	Track 2: Science and Education Framework for Developing a Circular Bio-based Building Economy	$3,974,309	Awarded
Overton, Michael	CLASS, PolySci	HUD	Toward Equity: An Assessment of the Community Development Block Grant and HOME Activities	$242,057	Awarded
Overton, Michael	CLASS, PolySci	RWJ Foundation	Place- Versus Person-Oriented Development: Impacts on Neighborhood Equity and Displacement	$67,286	Declined



ACTIVE GRANTS TIMELINE

This figure shows research grants submitted and awarded through IIDS that were active in FY21.
Also shown are some of the grant proposals that have been awarded in FY22.

SERVICE USAGE, RESEARCH EXPENDITURES, AND TRAINEES

$3,184,314 IN TOTAL RESEARCH EXPENDITURES.

5 DOCTORAL RESEARCH STAFF called IIDS administrative home in FY21.

10 NEW WEB APPLICATIONS were developed, launched, or redesigned by RCDS in FY21. These are interactive, data-driven, research-oriented web/ mobile applications.

RESEARCH COMPUTING AND DATA SERVICES HAD 138 USERS AND $185,807 GENERATED IN REVENUE.

THE GENOMICS AND BIOINFORMATICS RESOURCES CORE HAD 31 USERS AND GENERATED $222,539 IN REVENUE.

LEFT: MECHANICAL ENGINEERING GRADUATE STUDENT ROBERT CARNE ADJUSTS THE EXTRUDER ON THE 3D PRINTER CAPABLE OF PRINTING MODULAR WALL, FLOOR, AND ROOF PANEL PROTOTYPES FOR INDUSTRIAL CONSTRUCTION. PRINTIMBER.ORG

DISSEMINATION AND IMPACT

1,304 PUBLICATIONS WERE CITED 44,347 TIMES since our formation as an institute in 2011. Citations of publications that are associated with IIDS are quantified using the web of science databases at the U of I Library.

IN FY21, TOTAL CITATIONS INCREASED BY 11,896 FROM THE PREVIOUS YEAR.

YEAR	IIDS PUBLICATIONS	CITATIONS
2011	82	6,910
2012	110	12,007
2013	94	5,906
2014	68	3,367
2015	107	3,824
2016	105	3,733
2017	106	2,819
2018	89	1,956
2019	174	2,270
2020	137	1,135
2021	232	420
TOTAL	1,304	44,347

99 INVITED PRESENTATIONS were reported by IIDS faculty in FY21. Invitations to speak at conferences, department seminars, or deliver keynote or other prestigious addresses are an indication that researchers are considered thought leaders in their disciplines. The locations of these activities are represented on the map above.

137 CONFERENCE PRESENTATIONS were reported this year. We track submitted conference presentations (poster or talk). These are self-reported in aggregate by faculty, and typically do not include student presentations.

RESEARCH COMPUTING + DATA SERVICES

RCDS IS THE CENTRAL RESOURCE FOR RESEARCH COMPUTING SUPPORT AT THE UNIVERSITY OF IDAHO. WE PROVIDE INVESTIGATORS WITH STATE-OF-THE-ART COMPUTING INFRASTRUCTURE AND SERVICES FOR USE IN MODELING, ANALYSIS, AND MANAGEMENT OF RESEARCH DATA.

SERVICES

Research Computing and Data Services provides comprehensive support for data-intensive research throughout the life cycle of a project. This includes collaboration and training at the ideation phase, infrastructure for data acquisition, analysis, and storage, and services related to archival and dissemination of data, tools, and other research outputs.

INFRASTRUCTURE

DATA STORAGE

Our Ceph-based storage system is highly fault tolerant and scales horizontally, allowing us to grow incrementally to meet future storage needs.

VIRTUALIZATION

We currently operate a virtualization cluster which allows the quick provisioning of virtual servers for computation, data processing, and hosting web applications, databases, data dashboards, APIs, and more.

HIGH PERFORMANCE COMPUTING

Our HPC cluster has a variety of compute nodes: MPI enabled nodes for compute intensive jobs, large-memory nodes for large datasets, GPU enabled nodes for machine-learning and image processing jobs, and general-purpose nodes. RCDS staff can also help UI researchers access and utilize regional and national supercomputing resources.

SUPPORT + TRAINING

PROPOSAL DEVELOPMENT

RCDS provides researchers with proposal development support related to research computing and data management. We help investigators write competitive Data Management Plans, a required part of all federal grant proposals. We also help researchers meaningfully integrate usage of our services and cyberinfrastructure into grant proposals, serve as Co-PI or senior personnel, and provide auxiliary documentation such as Letters of Support/Collaboration and Facilities and Other Resources.

DATA SERVICES

DATA MANAGEMENT + PRESERVATION

- **DATA STORAGE:** Secure, fault-tolerant, and performant data storage provided to our research community at no direct cost to them.
- **DATA REPOSITORY:** We operate the U of I's Research Data Repository that makes research data products Findable, Accessible, Interoperable, and Re-Usable (FAIR). This includes helping researchers author metadata for their data collections, minting and managing Digital Object Identifiers (DOIs) and long-term data archival.
- **HOSTING DATABASES, GIS SERVICES, AND OTHER WEB SERVICES:** We host important data management resources such as INSIDE Idaho, VIVO, REDCap, and custom web applications devoted to research data management and dissemination.
- **RESEARCH DATA TRANSPORT MECHANISMS:** In order to move research data efficiently across the internet, we provide Globus Endpoint services within a Science DMZ.
- **SECURE DATA ENCLAVE:** In collaboration with OIT and the Chief Information Security Officer (CISO), we provide standalone secure cyberinfrastructure to U of I researchers that meets or exceeds the requirements for handling high-risk data.

SCIENTIFIC PROGRAMMING + APPLICATION DEVELOPMENT

- **COMPUTE-INTENSIVE MODELING:** For example, a software tools powered by modern machine learning methods to perform computer vision classification of lipid droplets within yeast cells.
- **DATA-DRIVEN DECISION SUPPORT TOOLS:** For example, a mobile application that integrates meteorological, soil, and species data into a decision support tool for agricultural growers and land managers.
- **CITIZEN SCIENCE TOOLS:** For example, a mobile application to collect geotagged water quality data from volunteer citizen scientists.
- **DATA DASHBOARDS:** For example, web-based applications for easily accessing, retrieving, visualizing, and interacting with massive climate model datasets.
- **GEOSPATIAL MODELING AND VISUALIZATION:** For example, a web-based, map-driven interface that integrates remote sensing and meteorological models to explore the interaction of weather and cattle grazing on real-world pastureland.

GENOMICS + BIOINFORMATICS RESOURCES CORE

THE GBRC PROVIDES RESEARCHERS WITH ACCESS TO CUTTING EDGE GENOMICS TECHNOLOGY AND THE BIOINFORMATICS SUPPORT NEEDED TO ACQUIRE, ANALYZE, AND COMMUNICATE THEIR DATA.

SERVICES

BIOINFORMATICS AND DATA ANALYSIS

Bioinformatics data analysis is often the most challenging aspect of any experiment. The GBRC bioinformatics data scientists have experience in areas such as population genomics, microbial community dynamics, differential gene expression, functional and comparative genomics, and systems biology.

The core staff provide investigators with detailed knowledge of the laboratory protocols and bioinformatics methods used so they can be included in reports and publications as needed. As a result, core staff members are often included as co-authors on publications because of their significant intellectual contributions to research projects.

PROJECT CONSULTATION

Core facility staff consult with investigators to discuss project aims, expectations, experimental design, appropriate and best use of technology, sample quantity and quality issues, and data analysis needs. During consultation, a project timeline is formed, expected costs are discussed, deliverables are identified, and a user agreement is reviewed. Having these discussions early in a project provides an opportunity for core personnel to offer their expertise, advice, and assistance to enhance the proposed project and sidestep potential problems. This service is especially important to researchers developing grant proposals, where a detailed quote and sophisticated understanding of the protocols and analysis are likely to increase chances for funding and ensure accurate budgeting.

PROJECT MANAGEMENT

The GBRC offers genomics project management to customers by integrating services in all three phases of genomics research: project planning and consultation, genomic data generation, and bioinformatics data analysis.

GENOMICS DATA GENERATION

The GBRC operates and maintains equipment that allows high throughput sample preparation, quality assurance, and generation of high throughput DNA/RNA sequence data. When projects require technologies that are not present in the facility, the GBRC facilitates access to the technology through cooperation and collaboration with other regional core facilities. For example, when investigators require the additional capacity provided by the Illumina HiSeq platform, the GBRC staff prepares Illumina libraries that are sent to other institutions for sequencing (such as University of California Berkeley or the University of Oregon), and the data are then sent back to the GBRC for processing and analysis.

CORE PERSONNEL HAVE DEVELOPED ANALYTICAL TECHNIQUES AND PIPELINES THAT TRANSFORM AND MANIPULATE RAW DATA INTO A FORMAT THAT CAN BE MINED BY INVESTIGATORS.

NEWS HIGHLIGHTS

UNIVERSITY OF NEVADA, RENO GRADUATE STUDENT MOLLY MCVICAR DRAGS FOR TICKS ON A COLLECTING TRIP IN UTAH. TICKBASE.NET

UNDERSTANDING GENETIC DIFFERENCES WILL HELP MANAGE AN IDAHO PEST **NOVEMBER 23, 2020**

"A wireworm is the small grub-like larva of a click beetle. It's a major pest to Idaho farmers, and poses a continually growing economic threat. Researchers at the University of Idaho and the Idaho Wheat Commission have found that two species of wireworms are actually comprised of multiple genetically distinct groups that are divergent enough to be considered unique species. They found a total of five potential species, which means that managing these pests could be even more difficult.

Kimberly Andrews, a Bioinformatics Data Scientist in IBEST's Genomic Resources Core was lead author on a paper published in the Communications Biology journal in September; the paper outlines their genomic analysis of wireworms and the surprising discovery of multiple potential species."

U OF I-LED STUDY FINDS ONGOING EVOLUTION IN TASMANIAN DEVILS' RESPONSE TO TRANSMISSIBLE CANCER **MAY 26, 2021**

"University of Idaho researchers including biological sciences associate professor Paul Hohenlohe partnered with other scientists from the United States and Australia to study the evolution of Tasmanian devils in response to a unique transmissible cancer.

The team found that historic and ongoing evolution are widespread across the devils' genome, but there is little overlap of genes between those two timescales. These findings, published in Proceedings of the Royal Society B, suggest that if transmissible cancers occurred historically in devils, they imposed natural selection on different sets of genes."

U OF I RESEARCH TEAM EARNS NEARLY $6M TO BATTLE LYME DISEASE, SURGING TICK-BORNE ILLNESSES **AUGUST 31, 2020**

"University of Idaho researchers are leading a nearly $6 million National Science Foundation (NSF) cooperative agreement, using large and complex data sets to improve prediction and response measures for tick-borne diseases.

'Tick-borne disease is widespread, but it's not only a human illness. It can infect animals such as horses and cattle, too,' said Xiaogang 'Marshall' Ma, computer science assistant professor and research team lead. 'For big agricultural states such as Idaho, having the proper response protocols in place is essential to protect our communities as well as our economy.'"

U OF I AND INBRE RESEARCHERS TO STUDY CORONAVIRUS VARIANTS **JULY 29, 2021**

“The Idaho INBRE higher education network and the University of Idaho will sequence COVID-19 samples and study coronavirus variants in the Moscow population in hopes of preparing for and preventing future outbreaks thanks to a $737,000 grant from National Institutes of Health. Principal Investigator and Idaho INBRE Director Carolyn Hovde Bohach said the grant is all about preparing for what is coming.

Researchers will conduct viral genomic sequence analyses to identify variants of the virus and link them to travel patterns, outbreak events and demographic groups in Idaho. Coronavirus variants, especially those that could render vaccines ineffective, are a global concern.”

ZEBRAFISH MAY HOLD CLUES FOR RETINAL REGENERATION IN HUMANS **NOVEMBER 12, 2021**

“What can zebrafish do that humans can’t? They can regenerate damaged neurons in their retina, for starters. Assistant Professor Diana Mitchell in the Department of Biological Sciences recently received $1.25 million of direct funding from the National institutes of Health (NIH) to study specialized immune cells called microglia and macrophages, to determine if the function of these cells could help explain why zebrafish have this ability and humans don’t.”

FLIPPED SEX ROLES IN PIPEFISH, SEAHORSE TOPIC OF U OF I RESEARCH **OCTOBER 21, 2020**

“If seahorses are the ampersands of the fish world, pipefish are the long dash — with a snout. The small, slim fish that live in tropical and frigid waters around the globe have been Adam Jones’ target of study for decades.

The male and female versions of pipefish — they average about 7 inches — change sexual roles, which means that the male pipefish are impregnated with the female’s eggs. Males carry the developing embryos in a pouch, with a placenta-like connection between father and offspring, until the young are released.”

U OF I PRESIDENT AWARDS MEDALLION TO UNIVERSITY, GRITMAN MEDICAL CENTER PANDEMIC RESPONSE TEAMS **MAY 18, 2021**

“Pandemic response teams from the University of Idaho and Gritman Medical Center that set up and operated testing facilities were presented the U of I President’s Medallion last weekend during Spring 2021 Commencement ceremonies in Moscow.

‘In a testament to an unshakable community spirit dedicated employees of both organizations often put themselves in harm’s way to allow U of I students access to a transformational in-person educational experience throughout the 2020-21 academic year,’ U of I President Scott Green said.

U of I and Gritman partnered during Summer 2020 to build a coronavirus testing operation that has been instrumental in managing the pandemic on campus and in the community. Efforts included applying for federal certification of the testing lab, administering nasal tests, sharing equipment and personal protective resources and processing samples in the lab in addition to other duties beyond a typical workday.”

A POSITIVE COVID SAMPLE IS INSPECTED IN THE U OF I TESTING LAB AT GRITMAN MEDICAL CENTER.

GRIZZLY BEARS WITH CUBS NEED ‘BATHS’ TO STAY COOL
JANUARY 25, 2021

“Taking a bath to relieve stress isn’t unique to humans. Bears do it too, and although they appear to luxuriate in taking a dip, it likely functions to help them cool down and conserve energy, researchers at the University of Idaho learned.

In a study led by U of I graduate student Savannah Rogers and Associate Professor of Wildlife Sciences Ryan Long, researchers found that grizzly bears in Yellowstone National Park take cool water ‘baths’ to help prevent overheating.

‘Because body temperature of mammals rises during lactation, bath-taking by female grizzly bears in the park may help enable increased milk production and ensure offspring survival,’ according to the findings published in Functional Ecology, a journal of the British Ecological Society.”

FUNCTIONAL ECOLOGY

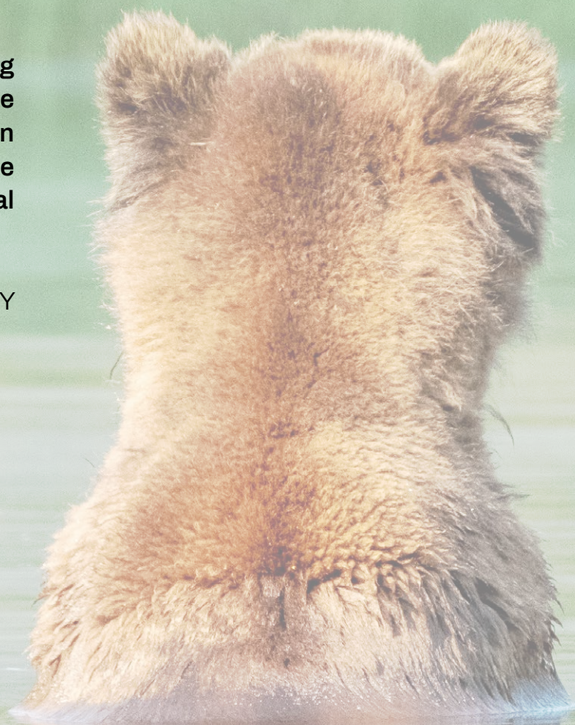


PHOTO: LEILA BOUJNANE, UNSPLASH

RESEARCH PROJECT EXAMINES MALE PREGNANCY AND MICROBES IN FISH **APRIL 30, 2021**

“A research project from the lab of University of Oregon evolutionary biologist Bill Cresko is setting out to explore the effects of a remarkable evolutionary innovation: male pregnancy in seahorses, pipefish and seadragons.

The research is funded through a four-year, $1.6 million grant from the National Science Foundation. Conducted in partnership with the biologist Adam Jones at the University of Idaho, the project is part of the NSF’s Rules of Life initiative. Its purpose is to further the understanding of the evolutionary and ecological processes across different scales that produce the range of biological systems across the planet.”

TECHNOLOGY.ORG

NEWLY DISCOVERED SPECIES OF EHU NAMED AFTER UH BIOLOGIST **APRIL 16, 2021**

“A new species of Ehu, or deepwater snapper, was discovered and named “Etelis boweni” in recognition of the contributions of Brian Bowen, a researcher at the University of Hawai’i at Mānoa Hawai’i Institute of Marine Biology (HIMB), who has spent more than three decades studying marine fishes. The team was led by Kim Andrews from the University of Idaho, a former UH postdoctoral researcher who studied under Bowen

A paper in the Journal of Fish Biology named the new species, which looks nearly identical to the species found in Hawai’i, but is genetically different. Both species are strikingly bright pink in color and occur at a depth of 650-1300 feet, and both are widely found across the Indian and Pacific Oceans.”

UNIVERSITY OF HAWAI’I NEWS

CARNEGIE POSTDOC WINS FELLOWSHIP TO STUDY PLANTS’ ADAPTATION TO CLIMATE CHANGE **JUNE 22, 2021**

“Carnegie’s Megan Ruffley was awarded a prestigious Plant Genome Postdoctoral Research Fellowship in Biology from the National Science Foundation to study the genetics underpinning a plant’s ability to adapt to a changing climate. Ruffley is an alumna of the U of I Bioinformatics and Computational Biology doctoral program.”

CARNEGIE SCIENCE

NOVEL SENSOR DISCOVERED THAT HELPS BACTERIA DETECT AND RESPOND TO FORMALDEHYDE **MAY 26, 2021**

“Bacteria called methylotrophs can use methane and methanol as fuel; in doing so, they produce large amounts of formaldehyde during growth, but until recently no one knew how they detected and responded to this toxic compound. Publishing on 26th May, 2021 in the Open Access journal PLOS Biology, Christopher Marx of the University of Idaho and colleagues describe their discovery of a novel formaldehyde sensor in the bacterium Methylorubrum extorquens, and other methylotrophs.”

EUREKALERT

IMMERSIVE VIDEO GAME HELPS STUDENTS ANALYZE SPREAD OF TICKS **AUGUST 4, 2021**

“Sporting glasses with black rims and a yellow jacket, a boy with blue hair swims through a river next to a forest. He jumps off cliffs and bounces on large mushrooms. He can whip out a net to capture the opossum, which flips over to play dead when someone gets too close.

If kids did this outside, they might get covered in ticks. University of Idaho game designers instead created a video game that would let students experience and analyze the spread of tickborne diseases, without the risk — and time — it would take in the real world.

Barrie Robison, a professor in the Department of Biological Sciences at the University of Idaho, co-founded Polymorphic Games to incorporate evolutionary and ecological principles into video games.”

IDAHO STATESMAN

DECODING THE GENOMIC MAKE-UP OF SHEEP **OCTOBER 23, 2020**

“An international research consortium involving CTLGH scientists has identified where the majority of genes are found in the new reference genome for sheep.

The Ovine Functional Annotation of Animal Genomes (FAANG) group have built a high quality map of the location of genes in the genome. This information, which is available freely to researchers, will support future genetic research to improve the health and productivity of sheep around the world. Brenda Murdoch from the University of Idaho is the coordinator of the Ovine FAANG project.”

CTLGH

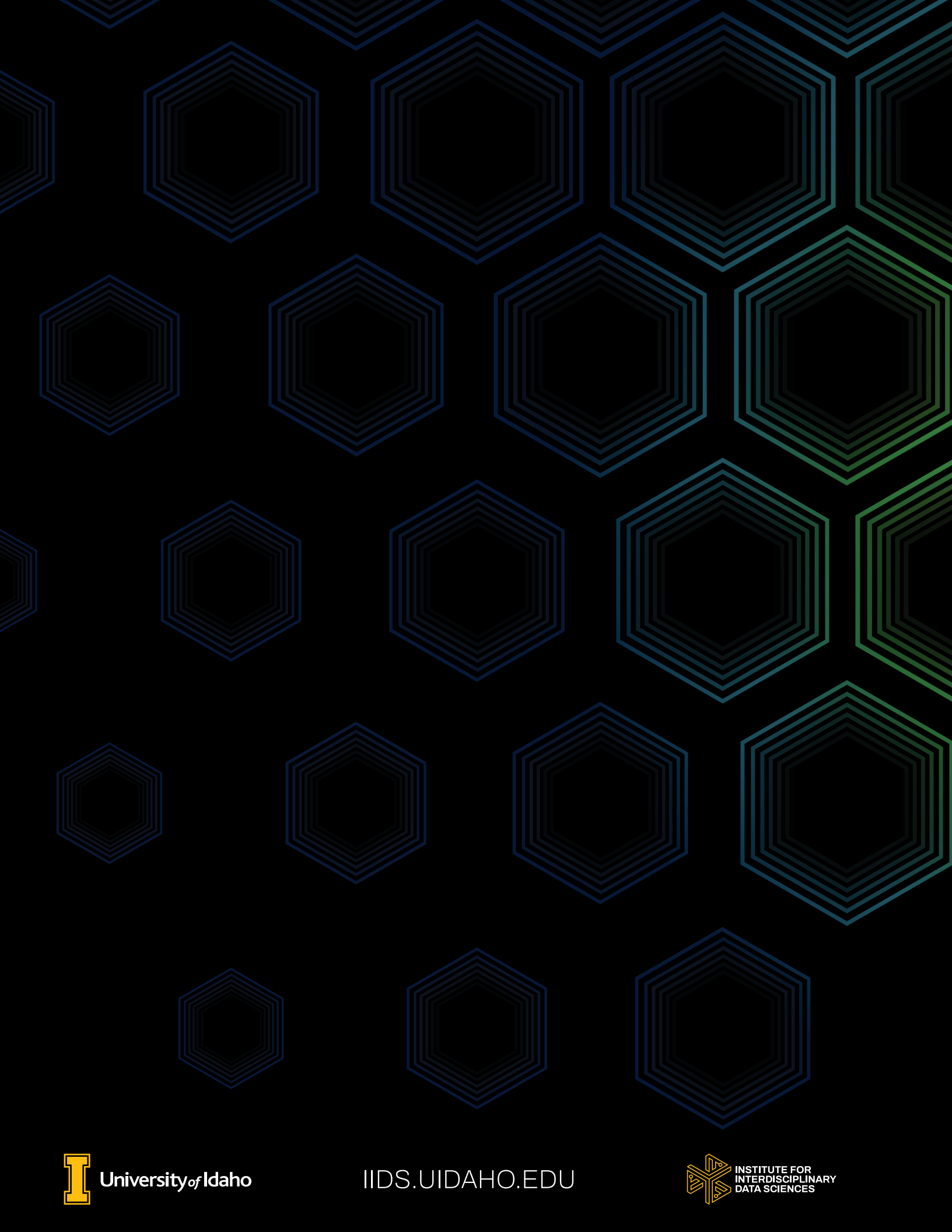
SELF-SPREADING ANIMAL VACCINES COULD COMBAT HUMAN PANDEMICS **JUNE 4, 2021**

“Currently designed strictly for animal populations, self-disseminating vaccines are meant to spread in their natural environments without the need to directly apply them one-by-one.

Several pioneering studies inspired Scott Nuismer, a computational biologist at the University of Idaho, to sing the technologies’ praises and collaborate with other researchers to develop transmissible vaccines for the hemorrhagic fever-causing Ebola and Lassa viruses. While these technologies remain in the early lab stages, Nuismer says they may provide a superior alternative to current disease control methods like time-intensive traditional vaccine campaigns or depopulation. ‘The beauty of a transmissible vaccine is that, if it works, it can be used in a way that has no negative impact on the [animal] reservoir,’ Nuismer says. ‘In general, it’s a potentially ecologically safe way to eradicate human disease without messing with the ecology of the broader community of animals.’”

DISCOVER MAGAZINE

PHOTO: NILS BOUILLARD, UNSPLASH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