ESA and QUBES Spring 2017 Faculty Mentoring Networks

Data Discovery
and
DIG into Data for the Biology Classroom

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esa

QUBES
The Power of Biology × Math × Community

Data Discovery Faculty Mentoring Network

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ESA Liaison

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QUBES Postdoc

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Augustana College

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Roanoke College

DIG into Data Faculty Mentoring Network

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Alison Hale
Sam Donovan

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St. John Fisher College

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University of Richmond

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ESA Liaison

Christopher Beck
TIEE Liaison

Megan Jones
NEON Liaison

Todd Vision
DryadLab Liaison

Context for the ESA and QUBES partnership

- In Biology, there has been an explosion of data from data collected by individual students or scientists to data collected by sophisticated instruments year round such as the National Ecological Observatory Network (NEON)
- We have the technology and tools today to process and analyze large volumes of data that were just not possible before
- Data literacy or quantitative literacy is a core component in Vision and Change for Undergrad Bio Education and in the Next Generation Science Standards

Context for the ESA and QUBES partnership

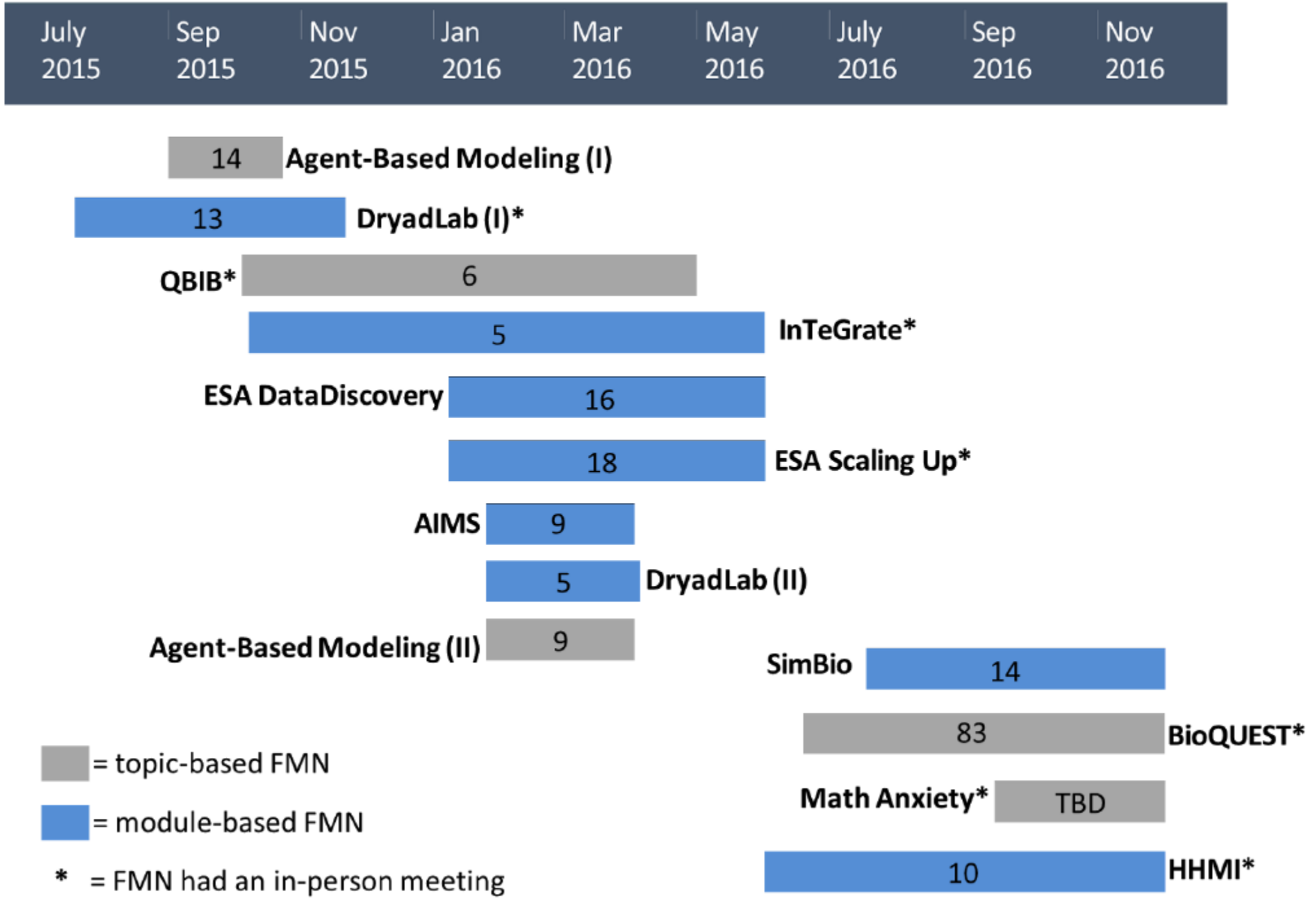
- There is a need to scaffold student experiences with Data and to support faculty on effective ways to implement modules for various audiences in various settings
- ESA has been involved in preparing the education community for the advent of Big Data science and education especially associated with NEON since 2008
- We have found partnering with QUBES an effective way of delivering this support through the Faculty Mentoring Networks.

What are Faculty Mentoring Networks (FMNs)?

- Online groups of ~10-15 faculty members, focused on a specific topic or material
- Led by expert content mentors, peer mentors, and QUBES liaisons
- Meet weekly or biweekly over several months

What are Faculty Mentoring Networks (FMNs)?

- Long-term support through the difficult implementation phase of reform
- A community of peers that provide social support
- Bringing together individuals to build a rich resource base to work from
- Encouraging individuals to publicly share teaching materials


July 2015
Sep 2015
Nov 2015
Jan 2016
Mar 2016
May 2016
July 2016
Sep 2016
Nov 2016
14
Agent-Based Modeling (I)
13
DryadLab (I)*
QBIB*
6
5
InTeGrate*
ESA DataDiscovery
16
18
ESA Scaling Up*
AIMS
9
5
DryadLab (II)
Agent-Based Modeling (II)
9
SimBio
14
83
BioQUEST*
Math Anxiety*
TBD
10
HHMI*
= topic-based FMN
= module-based FMN
* = FMN had an in-person meeting


All QUBES FMNs
Styled by Institution Type
Doctoral Research University (80)
Baccalaureate College (61)
Master's College (35)
Associate's College (26)
Other (25)
High School (2)
Tribal College (1)
Google My Maps
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Terms
United States
Mexico
Gulf of Mexico
Gulf of California
Cuba
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
MISSOURI
ILLINOIS
NEVADA
UTAH
COLORADO
CALIFORNIA
ARIZONA
NEW MEXICO
TEXAS
OKLAHOMA
ARKANSAS
MISSISSIPPI
LOUISIANA
IDAHO
Las Vegas
San Diego
Houston
Philadelphia
Ottawa
NOVA SCOTIA
Mexico City
Puerto Rico

Data Discovery

www.qubeshub.org/groups/datadiscovery_2017

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DRYAD LAB

TIEE

neon National Ecological Observatory Network

DIG into Data for the Biology Classroom

www.qubeshub.org/groups/dig

Benefits of participating in these FMNs

- Support for further development of pedagogical material focused on bringing research data into the biology/ecology classroom

- Access to peer mentors on lecture/classroom/lab effective tips and strategies in small group virtual meetings every two weeks

- Recognition as an ESA Education Scholar upon completion of all network requirements. http://esa.org/fed/2016scholars/
  - Check out this blog post about last year's Education Scholars!

Kevin Geedey

Augustana College

Kevin is a professor of biology and chair of the natural sciences division at Augustana College in Rock Island, Illinois. In addition to his administrative duties, Kevin teaches undergraduate courses in ecology, evolution, and aquatic biology.

Module 1: Performing a population viability analysis from data students collect on a local plant

http://ecoed.esa.org/index.php?P=FullRecord&ID=541

https://qubeshub.org/collections/post/1493

Module 2: Demography from physical cemeteries, "virtual cemeteries," and census data

http://ecoed.esa.org/index.php?P=FullRecord&ID=451

https://qubeshub.org/collections/post/1472

Kristen Genet

Anoka-Ramsey Community College

I am an ecologist with interests in community and landscape level phenomena, particularly as they apply to conservation and management of amphibians and reptiles. I obtained my degrees from Michigan State University (M.S., 1999; Ph.D, 2004), and I have been teaching in the Biology Department of Anoka-Ramsey Community College in Coon Rapids, MN (suburb of Minneapolis) since 2003. I teach a wide variety of courses, including courses for non-majors (Unifying Concepts of Biology, Medical Terminology, Environmental Science, Field Biology), and majors (Principles of Biology I and II, General Ecology, Directed Research). In the last few years, we have been working on infusing undergraduate research into the community college setting, and I have been working to build a research program and mentor first and second year undergraduates in projects in the areas of amphibian landscape ecology, aquatic ecology, and turtle population ecology, as well as collaborating with faculty in other disciplines to increase the undergraduate research opportunities throughout our college and programs.

Module 1: Performing a population viability analysis from data students collect on a local plant

http://ecoed.esa.org/index.php?P=FullRecord&ID=541

Module 2: Investigating the footprint of climate change on phenology and ecological interactions in north-central North America

http://ecoed.esa.org/index.php?P=FullRecord&ID=539

https://qubeshub.org/collections/post/1485/comment

Similarities and differences between the FMNs

Data Discovery

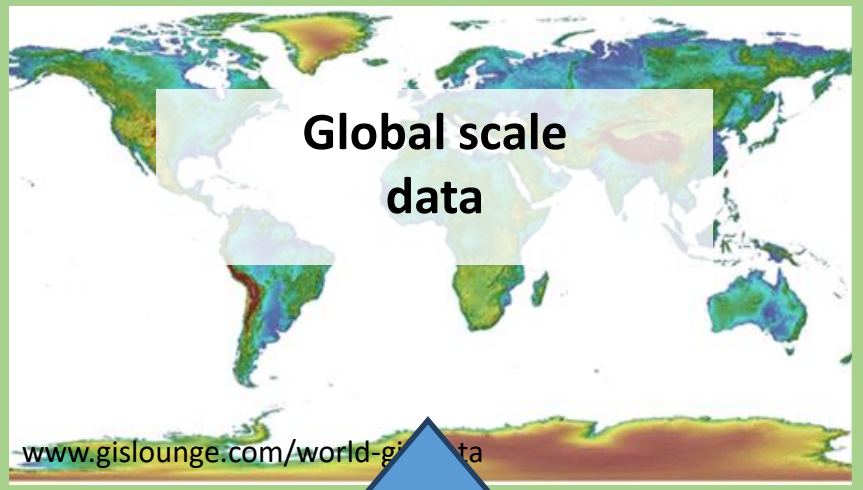
- Working with existing TIEE modules
- Online only, including a 2 hour kick-off meeting in January (time and date TBD)
- Plan to meet virtually in small groups every other week for 30-45 mins

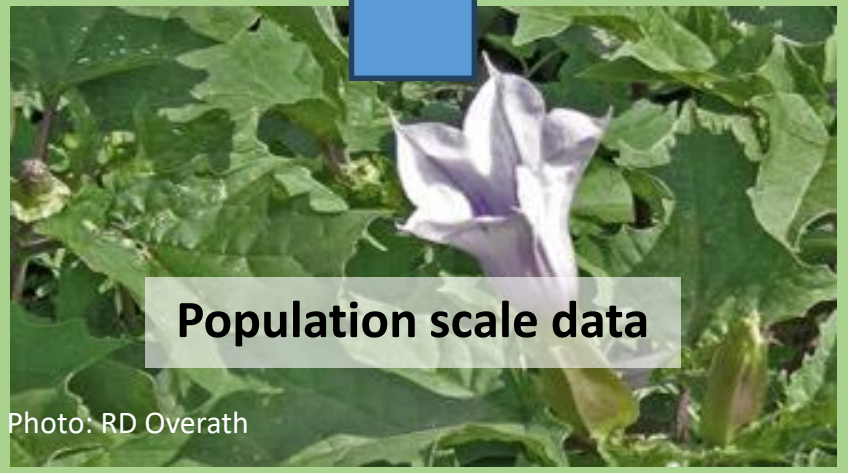
DIG into Data for the Biology Classroom

- Working on developing or polishing new classroom materials
- Online only

Expectations of participants – Data Discovery

- Participate in the full FMN (Jan-May 2017)
- Implement at least two of the selected TIEE modules in their course(s)
- Share materials on the QUBES Hub
- Share teacher notes and applicable classroom materials to receive the ESA Education Scholar title





TIEE

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Global temperature change
(Taub & Graham 2011)

Lake ice and global change
(Bohanan et al. 2005)

Climate change effects on phenology
(Calinger 2014)

Population dynamics of bald eagles
(Beckstead et al. 2011)

Cemetery demography
(Lanza 2012)

Insect predator prey evolution
(Hoback & Smith 2006)

Expectations of participants – DIG into Data for the Biology Classroom

- Identify an authentic dataset that could be used to enhance an existing teaching material/topic
- Participating in active discussions on the QUBESHub site
- Provide feedback to other participants on drafts of their datasets and teaching materials
- Share all materials developed in the FMN

Data Discovery:
https://qubeshub.org/groups/datadiscovery_2017/apply_now

Deadline - November 28th

DIG into Data for the Biology Classroom:
https://qubeshub.org/groups/dig/application

Deadline - December 2nd

Sign up for the QUBES newsletter to stay informed of upcoming opportunities

www.qubeshub.org/register