



# BEACON BUZZ

BEACON  
An NSF Center for the Study of  
Evolution in Action

BI-MONTHLY NEWSLETTER  
DECEMBER 2014

## BEACON GOES TO NABT!

The Evolution Symposium held at the annual professional development conference of the National Association of Biology Teachers (NABT) marked its 11th year, and featured BEACON scientists highlighting **Evolution in Action!** Dr. Robert Pennock kicked off the symposium with an introduction to how evolutionary processes that shape the biological world can also be instantiated in virtual environments, making possible new sorts of evolutionary experiments and exciting new approaches for inquiry-based learning. Dr. Zachary Blount explained how the novel Cit+ trait evolved in the Long Term Evolutionary Experiment, and Dr. Danielle Whittaker shared her novel research on how birds use odors to communicate, and the implications for understanding mate choice, speciation, and evolution. The session culminated with Dr. Terry Soule talking about using evolutionary computation to evolve complex behaviors in robots and educational video games, showing that evolution isn't just biological. Jay Bundy recorded all talks and we will have these available for viewing very soon.

As a point of historical interest, the first NABT Evolution Symposium, organized by the Biological Science Curriculum Studies (BSCS) and the American Institute of Biological Sciences (AIBS), was held in 2004 and was titled Evolutionary Science and Society: Educating a New Generation. The following year, the National Evolutionary Synthesis Center (NESCent) opened its doors and partnered with AIBS and BSCS on the 2005 symposium, Evolution and the Environment. In subsequent years, topics have included Molecular Evolution, Human Evolution, and Evolution in Extreme Environments. A full list, as well as videos of the talks, information on speakers, and collections of educational resources, can be found at <http://nescient.org/media/NABT.php>. Sponsorship and organizational responsibilities for the Evolution Symposium have evolved over the years, and three years ago BEACON joined NESCent in organizing the event.

With NESCent closing in June of 2015, the 2014 symposium on Evolution in Action represented



NABT attendees (left to right): Wendy Johnson, Emily Weigel, Jay Bundy, Dr. Terry Soule, Fred Hingst, Dr. Rob Pennock, Dr. Zachary Blount, and Dr. Louise Mead. Not pictured is Dr. Danielle Whittaker. Hingst is a high school biology teacher who was a Evolution Scholar, receiving travel support from BEACON NESCent to attend NABT.

NESCent's last year as a sponsor/organizer, with BEACON taking the lead in organizing and running future versions of the NABT Evolution Symposium.

The Evolution in Action Teacher Workshop the following day shared educational resources associated with the Evolution Symposium and featured Emily Weigel presenting a recent lesson published by Emily and her colleagues in *American Biology Teacher* (Weigel et al. 2014. Oh Behave! Behavior as an interaction between genes and the environment. *The American Biology Teacher* 76:460-465). The lesson instructs students to review primary literature, and make predictions about, and model the relationships between, the roles of the environment, genes, and evolution in forming behaviors.

Also at NABT: For the third year in a row, BEACON collaborated with NESCent on the Evolution Scholars program. This travel award sent enthusiastic and dedicated biology instructors from high schools and community colleges to the conference to acquire new knowledge and pedagogical skills, which they will then share with their students (through classroom activities) and colleagues (through professional development activities).

# Beyond ThisABILITY

## MAKING BEACON A MODEL FOR INCLUSIVE EXCELLENCE!

Throughout BEACON's history, the organization has strived to be a leader in research and outreach. Under the direction of BEACON's Diversity Director, Dr. Judi Brown Clarke, it is once again establishing itself as leader in STEM education by creating a best-practice model for inclusive and adaptive learning environments.

Many individuals with disabilities state they underreport their status due to feelings of vulnerability and/or the concern that it will bias people against them. BEACON continues to work hard to provide safe and adaptive environments for individuals with disabilities. Currently 2.7% of our participants self-reported as having a disability; this rate exceeds the National Norms at 1.1% by 152%. While we are pleased that more individuals have self-reported, we acknowledge that our numbers are still underreported.

As a result, the Disability Action Plan was formed. The goal of this project is to provide safe, inclusive and adaptive environments for individuals with disabilities. The enablers of this plan are BEACON's Diversity Committee, the graduate students/post-doc representatives, and YOU, who will share and implement best practices at the respective partner schools. There are many ways to help, including helping to populate the webpage, filming examples of BEACONites with disabilities, creating opportunities to blog on the issues around disabilities, facilitating sessions at BEACON Congress addressing adaptive labs and classrooms, and creating methods to measure & capture success. We will also create a repository of best practices and adaptive software in an effort to provide scalable models and tools. Our outreach efforts will include the creation of a portable museum display about scientists with disabilities and adaptive science strategies. BEACONites who attended this past annual Congress were given the opportunity to view the first film called "ThisAbility" at the opening session. The Di-



Home About BEACON People Research Education & Outreach Knowledge Transfer International Events For Current Me

### External Resources for Diversity and Inclusion

#### Corporate websites

Many of the companies in DiversityInc Magazine's "Top 50 Companies for Diversity" have publicly accessible materials on their diversity and inclusion initiatives. Of the top five companies for 2014, four (Sodexo, PricewaterhouseCoopers, Ernst & Young, and MasterCard Worldwide) made their most recent diversity and inclusion reports openly accessible online at the date of publication. PricewaterhouseCoopers offers a free publication (*Leveraging The Power of Our Differences*) that is widely used in academia.

- Ernst & Young (EY). "A diverse and inclusive workforce" website. Access: <http://www.ey.com/US/en/About-us/Our-people-and-culture/Diversity-and-Inclusion>
- MasterCard Worldwide. "Diversity and Innovation Go Hand-in-Hand" website. <http://www.mastercard.com/corporate/careers/diversity-inclusion.html>
- PricewaterhouseCoopers. Diversity and Inclusion websites. Access: <http://www.pwc.com/us/en/diversity-inclusion/index.html> and <http://www.pwc.com/us/en/diversity-inclusion/index.html>



What's new  
Postdoc p  
Avida-ED  
education  
MSU ann  
R. Koza E  
Program  
Michigan  
North Ca

*Inclusion is an important part of both corporate and academic workplaces. Dr. Brown Clarke has compiled a list of external resources to start our journey to excellence. The list can be viewed at <http://beacon-center.org/diversityandinclusion/> or by scanning the QR code.*

versity Committee also invited all attendees to help shape what an adaptive learning environment across multiple universities will look like. These initial steps resulted in several additional BEACONites self-reporting. Also, a graduate student has committed to starting a blog about her experiences navigating graduate school with a disability.

Over the next few months Dr. Brown Clarke (jbc@msu.edu) will get representatives from each partner school to assist in populating the website. This is a collective process that we all own; please be sure to share any experiences,

## OPPORTUNITIES FOR OUTREACH

Throughout the year BEACONites are invited to participate in various outreach events to share Evolution in Action! In the past these have included giving short talks to K-12 students, helping with museum exhibits, training teachers and even designing software to help explain evolution.

All BEACON members are encouraged to participate. There are currently two events on the calendar: Darwin

Discovery Day at the MSU Museum (Feb. 8th) and the MSU Science and Engineering Festival (April 17th and 18th).

To help out with either of these events, email Dr. Louise Mead at lsmead@msu.edu for more details. Dr. Mead will also send out BEACON-wide notices as more opportunities to share your passion for science arise.

# DATA CARPENTRY

## MODULES

*Researchers should be able to retrieve, view, manipulate, analyze and store their and other's data in an open and reproducible way.*

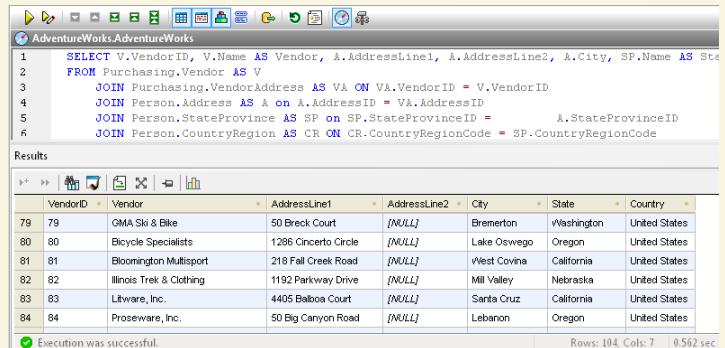
Attendees come because they:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
1																			
2	One	\$1.43	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	—	—	—	—	—	—	—	\$32.36		
3	Jan	\$1.43	\$0.12	\$0.08	\$0.08	\$0.09	\$0.08	\$0.08	\$0.08	—	—	—	—	—	—	—	\$1.43		
4	Feb	\$0.43	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	\$0.04	
5	Mar	\$1.43	\$0.12	\$0.08	\$0.08	\$0.09	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	
6	April	\$0.76	\$0.20	\$0.14	\$0.14	\$0.15	\$0.14	\$0.14	\$0.14	\$0.14	\$0.14	\$0.14	\$0.14	\$0.14	\$0.14	\$0.14	\$0.14	\$0.14	
7	May	\$1.78	\$0.40	\$0.21	\$0.20	\$0.20	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	
8	June	\$0.22	\$0.21	\$0.17	\$0.09	\$0.09	\$0.09	\$0.09	\$0.09	\$0.09	\$0.09	\$0.09	\$0.09	\$0.09	\$0.09	\$0.09	\$0.09	\$0.09	
9	July	\$0.49	\$0.77	\$0.48	\$0.48	\$0.49	\$0.48	\$0.48	\$0.48	\$0.48	\$0.48	\$0.48	\$0.48	\$0.48	\$0.48	\$0.48	\$0.48	\$0.48	
10	Date	\$0.43	\$0.20	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	\$0.16	
11	Percent	22.58%	24.44%	28.39%	21.42%	19.09%	14.12%	26.64%	23.29%	13.19%	22.86%	4.15%							

- are tired of feeling out of their depth on computation and want to increase their confidence
- want to manage data and analysis in a sustainable way
- want to teach best data practices, but need to learn it myself first

## MODULE 1:

Using databases, including managing and querying data in SQL.



```
1  SELECT V.VendorID, V.Name AS Vendor, A.AddressLine1, A.AddressLine2, A.City, SP.Name AS StateProvinceName
2  FROM Purchasing.Vendor AS V
3  JOIN Purchasing.VendorAddress AS VA ON VA.VendorID = V.VendorID
4  JOIN Person.Address AS A ON A.AddressID = VA.AddressID
5  JOIN Person.StateProvince AS SP ON SP.StateProvinceID = A.StateProvinceID
6  JOIN Person.CountryRegion AS CR ON CR.CountryRegionCode = SP.CountryRegionCode
```

Results

VendorID	Vendor	AddressLine1	AddressLine2	City	State	Country
79	OMA Skis & Bike	50 Brock Court	[NULL]	Bremerton	Washington	United States
80	Bicycle Specialists	1296 Concerto Circle	[NULL]	Lake Oswego	Oregon	United States
81	Bloomington Multisport	218 Fall Creek Road	[NULL]	West Covina	California	United States
82	Illinois Trek & Clothing	1192 Parkway Drive	[NULL]	Mill Valley	Nebraska	United States
83	Litware, Inc.	4405 Balboa Court	[NULL]	Santa Cruz	California	United States
84	Proseware, Inc.	50 Big Canyon Road	[NULL]	Lebanon	Oregon	United States

Execution was successful. Rows: 104, Cols: 7 | 0.592 sec

## MODULE 3:

Workflows and automating repetitive tasks, in particular using the command line shell and shell scripts.



## MODULE 2:

- Getting data out of Excel and into more powerful tools — using R or Python
- Using R or Python for reproducible data analysis and visualization.

Want to get involved??? Visit [datacarpentry.org](http://datacarpentry.org) for more information!  
Data Carpentry needs:

Instructors

Materials

Development

Data enthusiasts

# CONGRATULATIONS, BEACONITES!

Celebrating recent efforts around BEACON

## Awards:

Verónica S Di Stilio was funded by the NSF for “Functional Evolution of Flower Organ Identity Genes in the basal Eudicot *Thalictrum*: Implications for transitions in breeding and pollination systems.”

The Alfred P. Sloan Foundation & National Action Council for Minorities in Engineering awarded Dr. Judi Brown Clarke for underrepresented minority Ph.D production in STEM Fields at MSU.

Dr. Colin Kremer was awarded a NSF Postdoctoral Research Fellowship for his work on the eco-evolutionary effects of climate change in spatio-temporally complex marine environments.

## Publications:

Patrick Haley, et al. published, “Exploring conditions that select for the evolution of cooperative group foraging” in *Artificial Life* 14.

*Trends in Ecology and Evolution* included Dr. Hans Hofmann’s, “An evolutionary framework for studying mechanisms of social behavior.”

“Three-dimensional reconstructions of the bacteriophage CUS-3 virion reveal a conserved coat protein I-domain but a distinct tailspike receptor-binding domain,” by Dr. Kristin Parent was published in *Virology*.

Padmini Rajagopalan, et al. published “The evolution of general intelligence” in *Artificial Life* 14.

## Outreach:

Carina Baskett enjoyed sharing basic science stories on MSU’s radio station, WKAR.

Middle school students were allowed to “Shadow a Scientist,” hosted by Katherine Klein.

With the help of many BEACONites, Melissa Kjelvik and Elizabeth Schultheis continue to work to bring real scientific data into high school classrooms through Data Nuggets.

## Media Coverage:

Several media outlets featured Dr. Xiaobo Tan for his research project aimed to improve MSU’s Robofish.

## CURIOS ABOUT SUBMITTING CONTENT?



New to BEACON? Veteran BEACONite? Here's how to submit possible content to the newsletter:

1. Do what you're already doing: Log into the BEACON Intranet (accessible through the BEACON site: <http://beacon-center.org>, at the “For Current Members” tab.) Then go to the “Outputs and Activities” tab at the top banner, and fill in information

about your papers published, grants received, etc. New entries will be flagged automatically.

2. Tweet about it. Tweet about what you'd like to cover as it happens to @BEACON\_Center with the hashtag #news. We'll see it, and so will others!
3. Email content directly. Please email [leighs@msu.edu](mailto:leighs@msu.edu) if you've got content you'd like to highlight that doesn't fit into the website categories.