SCWIBLEs

Santa Cruz-Watsonville Inquiry-Based Learning in Environmental Sciences

NSF GK-12

...PRESENTS:

CALEB BRYCE

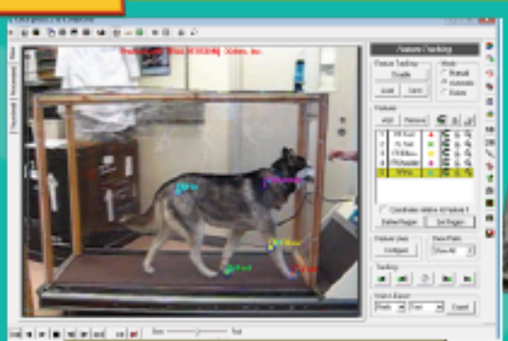
WHS SCIENTIST IN RESIDENCE, 2013-2014

I work with dogs (and soon wolves and coyotes!) in order to study the mechanics of how they run and how much energy each behavior (sleeping, eating, moving) takes. This means I train the animals to run in an enclosed chamber on a treadmill, which isn't as easy as it sounds... it sure is fun though!

Some stuff about me:

- **Age:** 25
- **Where I grew up:** Boston, Massachusetts
- **High School:** Whitinsville Christian School
- **Favorite subjects in high school:** Anatomy & Physiology, AP Genetics
- **College (undergraduate):** Point Loma Nazarene University (San Diego)
- **Some of my favorite things:** Rock climbing, cycling, outdoor adventures with my wife Carli, and of course eating!
- **Something weird about me:** I get <u>really</u> excited about certain things, especially rock climbing. One time, on a 6 month trip to New Zealand, I was so thrilled to climb that I packed *entirely* rock climbing equipment (ropes, helmets, carabiners...) and forgot to bring a single article of clothing... all I had was literally the shirt on my back!
- **What I think or do when I get frustrated:** I usually go out for a long run or bike ride. Then I'll chat with someone about what's on my mind as soon as I get back to get their thoughts and advice.

Wolves doing what they do best: chasing prey!



Video analysis of dog running on a treadmill

With a steak, even mountain lions are motivated!

My wife Carli and I love horses, too!

By running animals on treadmills, I can monitor how the concentration of oxygen in the air they breath changes as a result of various forms of exercise. I can then determine how much energy any given behavior cost that animal and ultimately create an **energy budget**, which tells me how much energy an animal used over time based on each behavior it performed. Energy budgets allow me to predict how much (and how often) an animal will eat, if it is likely to move very far to find food, etc. All of this information is important for conserving enough habitat for large predators like wolves and pumas.

What I study

How do mountain lions pounce on their prey? How many rabbits would a wolf need to eat in order to run for a mile? How would that change if it were running in two feet of snow?

These are some of the questions I'm interested in as an animal exercise physiologist. Basically, my research seeks to understand how large carnivores move and how they operate in their natural environment. In order to understand how these animals behave in the wild, I need to bring them into the lab first! I use a combination of techniques and equipment to train these amazing predators to wear a high-tech wildlife collars, run on treadmills, and occasionally smile for the camera!

This year will be my first year as a SCWIBLES fellow. I have visited WHS a few times to help with the native plant garden but I'm most excited about getting to know you as we do science together! Science is so much more than just what's found in textbooks—it can be fun, exciting, and full of opportunities to learn about the world around us!

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http://scwibles.ucsc.edu