Biology of the Galapagos

Wikelski reading, Web links

26 March 2009, Thurs
ECOL 182R UofA
K. E. Bonine

Student Chapter of the Tucson Herpetological Society

COME JOIN!!!!!!

General Information...
• Herpetology: the branch of zoology having to do with the study of reptiles and amphibians.
• What We Do: Education outreach, Fun Trips, Exposure to reptiles and amphibians.
• Meeting Time and Location: Every third Thursday of every month; outside, on the North side of Biological Sciences East. Except on March 26, 2009 (b/c spring break).

Origins of the Galapagos
(First islands about 10mya, oldest current islands ___)
What happened to the older ones???

Oceanic or Continental Islands?

Stationary ___ creates islands, then tectonic plate "rafts" east
Colonization of the Galapagos
(who got there and how?)

HOW MANY?
- Birds
- Frogs
- Lizards & Snakes
- Mammals
  Marine or Terrestrial?
- Plants

Galapagos difficult to colonize. Some taxa make the journey better than others.

Many _____ species than _____.

... is the diversification of a single or small groups of species into a large number of descendant species that occupy various ecological niches.

This is an evolutionary process driven by natural selection.
**Scalesia spp.**

There are 15 currently recognized species plus five subspecies of *Scalesia*; species are shrubs but four commonly grow into trees. All are endemic to Galápagos. They are an excellent example of adaptive radiation, the development of new species to fill different vegetation zones and islands. There is great diversity between species:

- **Species vary in size, from less than one meter to over 30 meters in height.**
- **Leaves vary in size and shape between species and are mostly hairy.** Leaves clus ter at ends of branches.
- **The flowers are cream to white, daisy-like heads of 25 to 50 (Scalesia ocotea) to 300 to 400 (Scalesia eriostachia) flowers per flower.**
- **Some species grow mainly in the humid zone while others, especially the larger trees, are adapted to the forested zone.**

---

**Mockingbirds**

Daphne Major, Peter and Rosemary Grant, Princeton

---

**El Niño**

is an oscillation of the ocean-atmosphere system in the tropical Pacific

http://kids.earth.nasa.gov/archive/nino/intro.html
Normal Conditions:

El Nino Conditions:

Flooding in Peru and SW US,
Drought in Australia and Indonesia
Wind to East from West

Galapagos

Cold up-welling of Cromwell current brings _____ to western Galapagos.

Without it, much of the marine food web is lost...

Galapagos Marine Iguana

Fernandina/Isabela (W)
- males to 10+ kg
- females to almost 3 kg

Genovesa (NE)
- males only to 1 kg
- females to < 1 kg

Why?
Iguanas bigger on some islands:

1. Water
2. Current strength
3. Food Availability

Males bigger than females:

selection

What are sneaker males?

Video clip about Galapagos and Marine Iguanas
Martin Wikelski with Alan Alda, etc.
Borrowed video from Angela

0-10 min intro and general biogeography
10-18 min ~finches and beak evolution on Daphne Major
18-30 min marine iguanas
30-39 min nazca boobies and siblicide
39-52:40 conservation etc.

Galapagos Conservation

Post office bay
Discovered 1530s

Invase Herbivores

People Bring Problems

The eight-year battle to remove wild goats, donkeys and pigs from Santiago, Pinta and northern Isabela islands has cost at least $5.2 million and is still just shy of completion. The United Nations covered three-quarters of the cost.

The assault against feral goats — along with an ongoing campaign against wild dogs, cats, pigs, donkeys and an array of invasive plants and insects — demonstrates the challenge conservationists face in preserving this hotbed of genetic diversity. Alan Tye, interim director of sciences at the Charles Darwin Research Station on the island of Santa Cruz, said his institute focuses on just two things: "threats and threatened things."

Although 95 percent of the species that were here when humans first arrived still exist in the Galapagos, the International Union for Conservation of Nature and Natural Resources lists dozens on its "red list" of threatened species. These include the Galapagos hawk and the Galapagos fur seal, along with 57 species of Bulimulus snails.

Other species, including plants and insects, are harder to eradicate. At this point, the 720 introduced plants growing in the Galapagos outnumber the island's 380 original plant species. Blackberry bushes, planted by farmers, have spread widely, along with quinine trees. Newer residents are bringing in ornamental shrubs such as lantana, nicknamed "the curse of India" because it drives out other plants, and other garden plants to the Galapagos.

**Galapagos Marine Ecology (ECOL 496O/596O)**

- Spend one month this summer in the Galapagos Islands, Ecuador!
- Visit seven of the most spectacular islands in the archipelago
- Do a service project with children at a local school and the Galapagos National Park
- Do a field ecology project and learn about Galapagos ecology and evolution
- Earn 3-6 units of graduate or undergraduate credit

For more information: www.arizona.edu/courses/galapagos
Katrina Mangin, mangin@email.arizona.edu, 520-626-5076
Thanks for a Great 1/3 Semester