Questions for TV Program

How are amphibians and reptiles different?
Talk about: moist skin vs. scales, shelled eggs vs. moist unshelled eggs, circulatory system (?), most amphibians have a juvenile stage (tadpole) while reptiles look like miniatures of the adults, etc.
Reptiles include crocodilians, snakes, lizards, turtles, geckos, chameleons, etc.

What are amphibians?

Amphibians are a group of vertebrates whose life cycle includes an aquatic stage and a terrestrial stage. Amphibians have smooth, permeable skin, through which they breathe and absorb moisture. Their skin must remain moist at all times for survival. Amphibians include frogs, toads, salamanders, newts, and caecilians.
In the United States, there are about 280 recognized species of amphibians. Nearly 2/3 of them are salamanders or newts, the remaining 1/3 are frogs or toads, and at least 5-10 more species are currently being described or re-evaluated. Caecilians (slimy Italian guys), legless amphibians, are not found in the United States.
PICTURES OF EACH TYPE (NE ARMI TALK)

- Frogs and Toads (Anura) (88%)
- Salamanders (Caudata) (8.5%)
- Caecilians (Gymnophiona) (3.5%)

How many amphibians are there in the world? US? Maryland?

4,600 amphibian species in the world, though new ones still being found in tropics (e.g., Smithsonian Institution – glass frogs) and even US
280 recognized species in the US (PICTURE OF DIVERSITY IN US – NE ARMI TALK)
39 species in Maryland (21 salamanders, 18 frogs and toads)

- **Which species of amphibians are found in Maryland?**

* state rare
** state threatened
+** state and fed. threatened
*** state endangered
+*** state & fed. endangered
X* state extirpated

Caudata (21):

- Jefferson salamander *Ambystoma jeffersonianum*
- Spotted salamander *Ambystoma maculatum*
- Marbled salamander *Ambystoma opacum*
- *** Tiger salamander *Ambystoma tigrinum*
- *Hellbender *Cryptobranchus alleganiensis*
- *** Green salamander *Aneides aeneus*
- Dusky salamander *Desmognathus fuscus*

- Seal salamander *Desmognathus monticola*
- Mountain dusky salamander *Desmognathus ochrophaeus*
- Two-lined salamander *Eurycea bislineata*
- Longtail salamander *Eurycea longicauda*
- Spring salamander *Gyrinophilus porphyriticus*
- Four-toed salamander *Hemidactylium scutatum*
- Redback salamander *Plethodon cinereus*
- Slimy salamander *Plethodon glutinosus*
- Valley and ridge salamander *Plethodon hoffmani*
- * Wehrle's salamander *Plethodon wehrlei*
- Mud salamander *Pseudotriton montanus*
- Red salamander *Pseudotriton ruber*
- X* Mudpuppy *Necturus maculosus*
- Eastern newt *Notophthalmus viridescens*

Anura (18):

- American toad *Bufo americanus*
- Fowler's toad *Bufo fowleri*
- Northern cricket frog *Acris crepitans*
- Cope's gray treefrog *Hyla chrysoscelis*
- Green treefrog *Hyla cinerea*
- *Barking treefrog *Hyla gratiosa*
- Gray treefrog *Hyla versicolor*
- ** Mountain chorus frog *Pseudacris brachyphona*
- Southeastern chorus frog *Pseudacris triseriata*
- Spring peeper *Pseudacris crucifer*
- *** Eastern narrow-mouthed toad *Gastrophryne carolinensis*
- Eastern spadefoot *Scaphiopus holbrookii*
- Bullfrog *Rana catesbeiana*
- Green frog *Rana clamitans*
- Pickerel frog *Rana palustris*
- Northern leopard frog *Rana pipiens*
- Wood frog *Rana sylvatica*
- Southern leopard frog *Rana sphenocephala*
- * Carpenter frog *Rana virgatipes*

How long do amphibians live? How big/small can they be?
Most people are surprised to learn that some amphibians are long lived. Some live only 1-3 years, but others live 15-20 years (bullfrogs, sallys). Bullfrog is largest frog in North American, the largest frog is the Marine toad. The giant salamanders of Asia, which are aquatic, can be 5-6 ft in length. Any ideas on how small?? (also does everyone agree with these statements, I could have some facts wrong and would like confirmation). Pigmy salamander?

- **Why should we care about amphibians? What do amphibians do for us?**

Predators
    Can be top predators in some ecosystems
    Eat lots of insects, like mosquitoes
Prey for many invertebrates and vertebrates
Chemical Factories
Pest and Disease Control
International Trade (culinary, biological supply, pet market)
Important in nutrient cycling and energy flow
Huge biomass (up to 18,486 individuals/ha and 16.5 kg/ha exceeding that of birds)

Amphibians are some of the oldest vertebrates still roaming the earth. They existed in prehistoric times, and the fact that they are still around demonstrates their hardiness as a group. However, in the last ~100 years, humans have introduced many foreign substances and practices, which have been detrimental to many animal populations. Chemicals are polluting our soil, water, and air. The life cycle of amphibians puts them in direct contact with these three components, thus, potentially in direct contact with pollutants. Amphibians may be able to show us what we can expect – in other words, things in the environment that adversely affect amphibians may also adversely affect us. Amphibians are also helpful, because they eat mosquitoes and their larvae, as well as garden slugs and other insects, and this helps to keep those populations in check….

- **What are some issues that make amphibians vulnerable to population decline? In this area?**

Because most amphibians spend part of their lives in the water, and part of their lives on land, they essentially need two different types of habitat to complete their life cycle. This also exposes them to two different living environments where factors such as habitat destruction or pollutants can compromise their livelihood.
Most amphibians breed in water, such as in ponds and in some cases in streams. Once metamorphosis occurs, they begin to live on land, sometimes quite a distance from their breeding ponds. Thus, if a pond is drained or becomes polluted, it may compromise the ability of certain amphibian species to breed, especially if there are no other possible breeding environments nearby. If land around a pond or stream is developed, this development could alter or destroy the foraging and/or hibernation grounds for the amphibians. Similarly, roads near breeding habitat are a large contributor to amphibian mortality, forcing frogs and salamanders to dodge traffic or get smooshed just to return to their breeding pond or just to leave the pond following metamorphosis.

- **Is there anything I can do to help amphibian populations?**

If you own land, one thing that can help amphibians is to construct a pond in your backyard. It has been said ‘if you build it, they will come.’ However, if you have a pond or decide to build one, please do not put fish predators in your pond! Fish will eat amphibian eggs and larvae and adults if the fish are big enough.
Also, if there are water bodies near where you live, pay attention to what goes on around them. Is there a lot of trash around them? If so, organize a neighborhood

clean-up day and help keep the pond clean. If you have a backyard pond, avoid the use of lawn and garden pesticides, or aquatic herbicides….

Also we should mention fertilizers (and pet waste) can run-off into ponds and cause eutrophication (no oxygen for tadpoles and other critters, smelly). Recommend using native plants that won't need such help to grow. Use fertilizer sparingly and effectively (avoid application before rainfall, as waste of money and hurts amphibians). Consider planting wetland plants or shrubs near pond to capture some of run off that may have pet waste, agrichemicals, etc.

e.g.., bring USFWS brochure: Homeowner's Guide to Protecting Frogs: Lawn and Garden Care

What does the ARMI have to do with amphibians?

Amphibian Research and Monitoring Initiative with the USGS in partnership with other state and federal agencies to:

- Initiate long-term monitoring to determine trends in amphibian populations
- Conduct research into causes of amphibian declines, diseases, and malformations
- Evaluate survey methods for amphibians and examine precision and bias in sampling
- Estimate population sizes of amphibians (e.g., how do we identify individual spotted salamanders – describe)
- Document spatial and temporal variation in amphibian populations and relate this variation to environmental variables
- Help to develop long-term amphibian monitoring programs on Federal lands
- Work intensively at Patuxent, Rock Creek Park, Shenandoah and Acadia
- Streams and Vernal/Ephemeral Pools Focus

What have you found in the past two years in your ARMI research?

- Fewer salamanders and missing species (no DFUS) at streams that receive stormwater runoff in Rock Creek Park
- Fewer salamander species and lower abundance at streams in Maryland that have less forested watersheds
- New species at Rock Creek Park, and species not seen there for 15 years
- Extreme variation in recruitment in 2001 vs 2002 at Laura's Pond (over 500 juveniles in 2001 vs 6 in 2002)

How can I volunteer to help monitor amphibian populations?

Frogwatch USA & NAAMP. Describe each, what purposes same/different. Who best suited to each program (e.g., NAAMP is an adult activity). Explain calling is a breeding call to attract mates and defend territories, that we humans are eavesdropping.