Virginia Cooperative Extension
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Virginia Master Naturalist Program Basic Training: Citizen Science and Research Skills Presentation Handout

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Overview

This handout is meant to be used with Citizen Science and Research Skills training as part of the Virginia Master Naturalist Basic Training Course. It is designed to align with other Citizen Science and Research Skills curriculum materials.

Outline

What is science?

- A process for answering questions about the natural world that uses a logical order of steps to draw conclusions.
- May include experiments, observational studies, modeling, and other forms of investigation.
- Steps include observing, questioning, hypothesizing, gathering evidence, analyzing and interpreting data, drawing conclusions, and sharing findings.

What is citizen science?

- Science that involves people who may not be professional scientists in the scientific process.
- A powerful tool for scientific research, education, and community development. Involves a spectrum of volunteer engagement, from contributory to co-created.

Types of natural resource studies

- Inventory – Effort to document the current status of a resource, including the presence, distribution, and status of plants, animals, water, soil and other elements. May be short- or long-term, and may focus on one taxon or many.
- Monitoring – Collecting and analyzing repeated observations to evaluate changes in condition and responses to management strategies.
- Experimental Research – Testing hypotheses by methodically changing conditions/treatments and comparing outcomes to a control.

Tools

- CitSci.org – An online tool and community for creating and managing citizen science projects.
- iNaturalist – An online tool used for BioBlitzes and general observations that crowdsources species identifications based on photos.

Scientific ethics

- Keep good records and follow designated protocols.
- Never fabricate or falsify data.
- Report data to appropriate people and include negative data as well as positive.
- Obtain all necessary permits for research and collecting and for property access.
- Follow through on commitments but still have fun!

Sample Citizen Science Activities for Virginia Master Naturalists

Note: This is not a comprehensive listing of all citizen science activities, or even all citizen science activities that might be appropriate for VMN volunteer hours. These listed activities are examples of activities that are organized by one of our

sponsors or partners, that other VMNs already do, or that we have promoted through training sessions. If you are seeking other projects, visit www.scistarter.org, a clearinghouse of citizen science projects.

I. Virginia-based or Regionally-based Citizen Science Projects

a. **Stream Monitoring in VA:** Citizen Water Quality Monitoring https://www.deq.virginia.gov/water/water-quality/monitoring/volunteer-monitoring
Measure physical, chemical, and/or biological properties of streams to document water quality trends. May be directly with DEQ or with numerous local organizations that partner with DEQ.

b. **Vernal Pools Cooperative of Virginia:** https://citsci.org/projects/vernal-pool-cooperative-of-virginia-2016-2025/
Monitor amphibian populations and other characteristics of temporary wetland habitats.

c. **VDWR Site Visits and Birdability Projects:** https://www.virginiamasternaturalist.org/volunteer/virginia-bird-and-wildlife-trail/.
Document birds and other wildlife observations and accessibility features at designated sites of the Virginia Bird and Wildlife Trail for the Virginia Department of Wildlife Resources.

d. **Virginia Working Landscapes:** https://www.vaworkinglandscapes.org/how-to-get-involved/become-a-community-scientist/
Collect data on birds, insects, and plants in field habitats in the Piedmont.

e. **Digitizing Virginia's Herbaria:** *https://www.notesfromnature.org/active-expeditions/Herbarium* (choose VA-specific projects), Transcribe herbarium labels online to create digital records of plant samples.

f. **Bluebird Box Monitoring**: https://www.virginiabluebirds.org/monitoring-nest-boxes
Monitor artificial habitats for cavity-nesting birds.

II. National/International Projects

a. Weather, Climate, and Phenology

i. **Community Collaborative Rain, Hail, & Snow Network (CoCoRaHS):** http://www.cocorahs.org/
Measure and map precipitation in your locality.

ii. **Nature's Notebook:** http://www.usanpn.org/, Document phenology in plants and animals to understand how they are responding to climate change and other environmental changes.

iii. **JourneyNorth:** https://journeynorth.org, Document animal migrations seasonally.

b. Birds

i. **Cornell Lab of Ornithology:** https://www.birds.cornell.edu/engagement-in-science-and-nature/participatory-science/
Many different bird-focused citizen science projects, including e-Bird (online birding checklist), FeederWatch (feeder bird counts), and Great Backyard Bird Count (short-term count of winter birds)

ii. **Christmas Bird Count:** http://birds.audubon.org/christmas-bird-count
Document bird observations in designated count circles.

iii. **North American Breeding Bird Survey:** https://www.pwrc.usgs.gov/bbs/
Collect bird population data along designated roadside routes.

c. Butterflies

i. **North American Butterfly Counts:** https://naba.org/butterfly-counts/
Document butterfly observations in designated count circles.

ii. **Monarch Larva Monitoring Program:** https://mlmp.org
Monitor monarch populations in milkweed patches and measure milkweed characteristics.

iii. **MonarchWatch:**
http://www.monarchwatch.org/tagmig/tag.htm
Track monarch migrations through tagging individual butterflies.

d. Frogs

i. **FrogWatch:**
https://www.akronzoo.org/frogwatch
Monitor frog populations by listening to their calls at a site of your choosing.

e. Pollinators

i. **Bumblebee Watch:**
http://www.bumblebeewatch.org
Document bumblebee diversity by sharing photos with experts.

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Virginia Master Naturalists

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