

## Maryland Master Naturalist Handbook - Natural History Chapter

### I. INTRODUCTION

### II. GEOLOGY

#### A. Formation of the Earth

1. Inner core
2. Outer core
3. Mantle
4. Crust

#### B. Plate tectonics

1. Lithosphere
2. Continental drift

#### C. Pangaea

#### D. Formation of the Appalachians

#### E. Rocks

1. Igneous
2. Sedimentary
3. Metamorphic

#### F. The Geological Time Scale

#### G. Maryland Geology

1. Physiographic regions
  - a. Coastal plain
  - b. Chesapeake Bay crater
  - c. Piedmont
  - d. Mountains

### III. ATMOSPHERE

#### A. Layers of the atmosphere

1. Troposphere
2. Stratosphere
3. Mesosphere
4. Thermosphere
5. Ionosphere
6. Exosphere

#### B. Evolution of our atmosphere

#### C. Air

### IV. CLIMATE AND WEATHER

#### A. Climate

1. Historical climate
2. Current climate

- a. Seasons
- b. Climate zones
- 3. Future climate
  - a. Warmer winters and summers
  - b. Wetter autumns and springs, drier summers
  - c. Increase in storm severity
  - d. Sea level rise
  - e. Maryland's response to climate change

#### B. Weather

- 1. Highs and Lows
- 2. Fronts
- 3. Land and sea breezes
- 4. Clouds
- 5. Fog
- 6. Hurricanes

### V. WATERSHEDS AND THE CHESAPEAKE BAY

- A. What is a watershed?
- B. Maryland watersheds
- C. Chesapeake Bay
  - 1. Physical characteristics
  - 2. Dissolved oxygen
  - 3. Dead zones
  - 4. People and the Bay
    - a. Erosion and sedimentation
    - b. Nutrient pollution

### VI. HUMAN IMPACTS

- A. Historical
  - 1. Paleo Indians
  - 2. Archaic Period
    - a. Shell middens

3. Woodland Period
    - a. Small scale agriculture
    - b. Depopulation after European arrival
- B. Modern
1. Hydrological cycle
    - a. Groundwater
    - b. Surface water
  2. Soils
    - a. Compaction
    - b. Removal of topsoil
    - c. Pollution
    - d. Introduced species
  3. Natural resource use and abuse
    - a. Industrial minerals
    - b. Fuel minerals
      - i. Coal
      - ii. Natural gas
    - c. Forests
      - i. Wood products
      - ii. Old growth forests
    - d. Wildlife
      - i. Hunting
      - ii. Fishing
  4. Loss of habitat -
    - a. Human population growth
    - b. Forest loss
    - c. Wetlands loss

## VII. NATURALIST SKILLS

- A. Observation
- B. Recording observations
  1. Nature journals
  2. Field notes
  3. Data sheets
- C. Research and Reporting
  1. Field guides
  2. Scientific
  3. Online databases
    - a. iNaturalist

- b. Project BudBurst
- c. Feeder Watch
- d. NASA, Globe at Night
- e. Mid-Atlantic Early Detection Network

#### VIII. NATURALISTS IN MARYLAND

- A. Hugh Jones (~1671-1702)
- B. Benjamin Banneker (1731-1806)
- C. John, Andrew and Joseph Ellicott (1739-1794;1733-1809; 1732-1780)
- D. Charles Wilson Peale (1741-1827)
- E. André Michaux (1746-1804)
- F. Almira Hart Lincoln Phelps (1793-1884)
- G. Mary Elizabeth Banning (1822 - 1903)
- H. George Huntington Williams (1856-1894)
- I. Rachel Carson (1907-1964)
- J. Chandler S. Robbins (1918- )
- K. George Abbe (1943- )

#### IX. REFERENCES AND RESOURCES