Ecology for Garden Design

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This presentation was originally created for use in the fall of 2013 for the Cornell Garden-Based Learning Regional Training for Cornell Cooperative Extension educators and Master Gardener Volunteers. This training kicked off our CCE 2014 Growing Season Educational Campaign: Designing for Garden Ecosystems.

Garden design is critical for setting the stage for garden success and environmental stewardship. In this training we consider a **polycultures** approach to garden design. The concept embraces growing multiple crops in the same space, in imitation of the diversity of natural ecosystems.

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Cornell Garden Based Learning

Ecology Defined

- Oikos = home
- Study of the relationship between organisms and their environment
- Study of the relationship between organisms, their environment, ***and each other***

PARADISE LOT

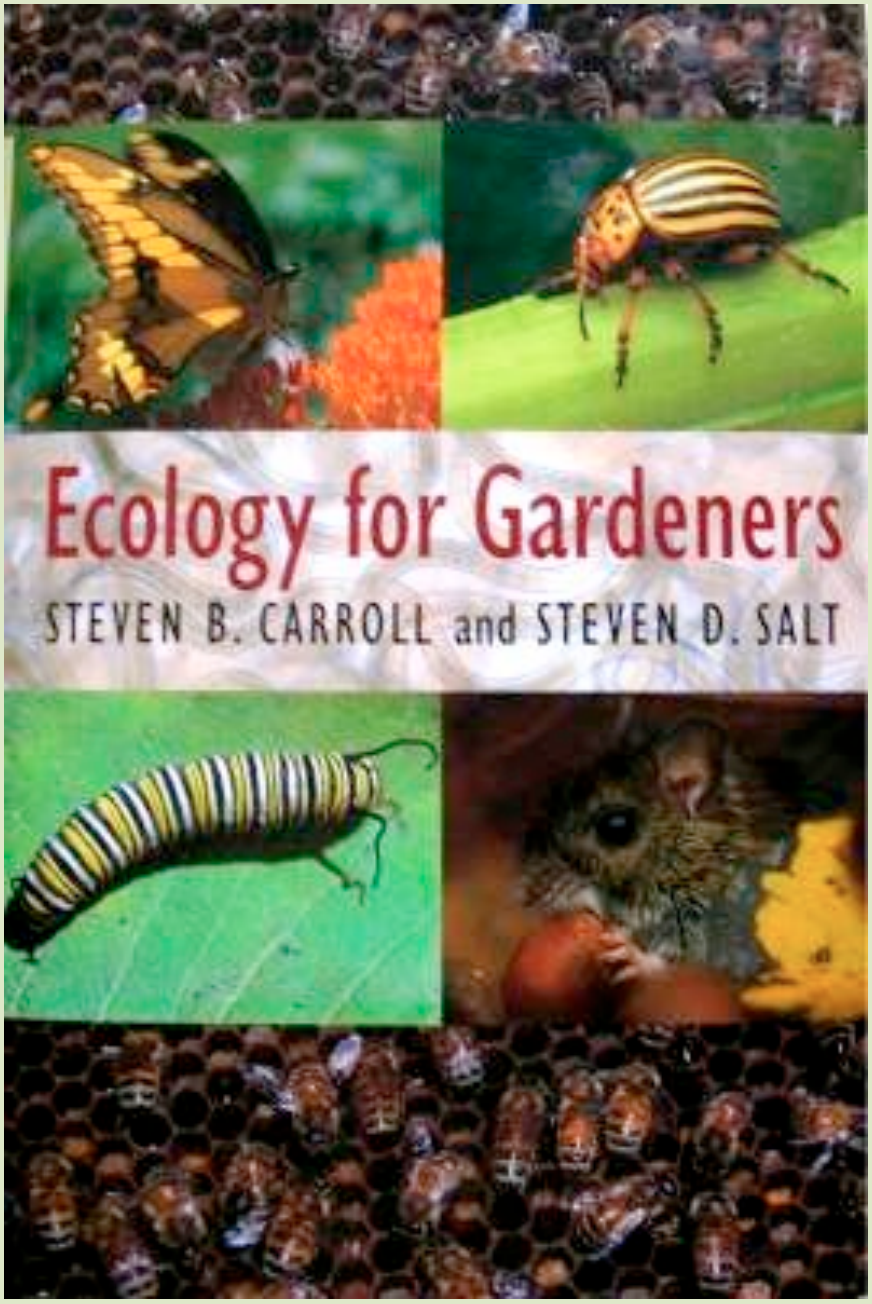
TWO PLANT GEEKS, ONE-TENTH OF AN ACRE

and

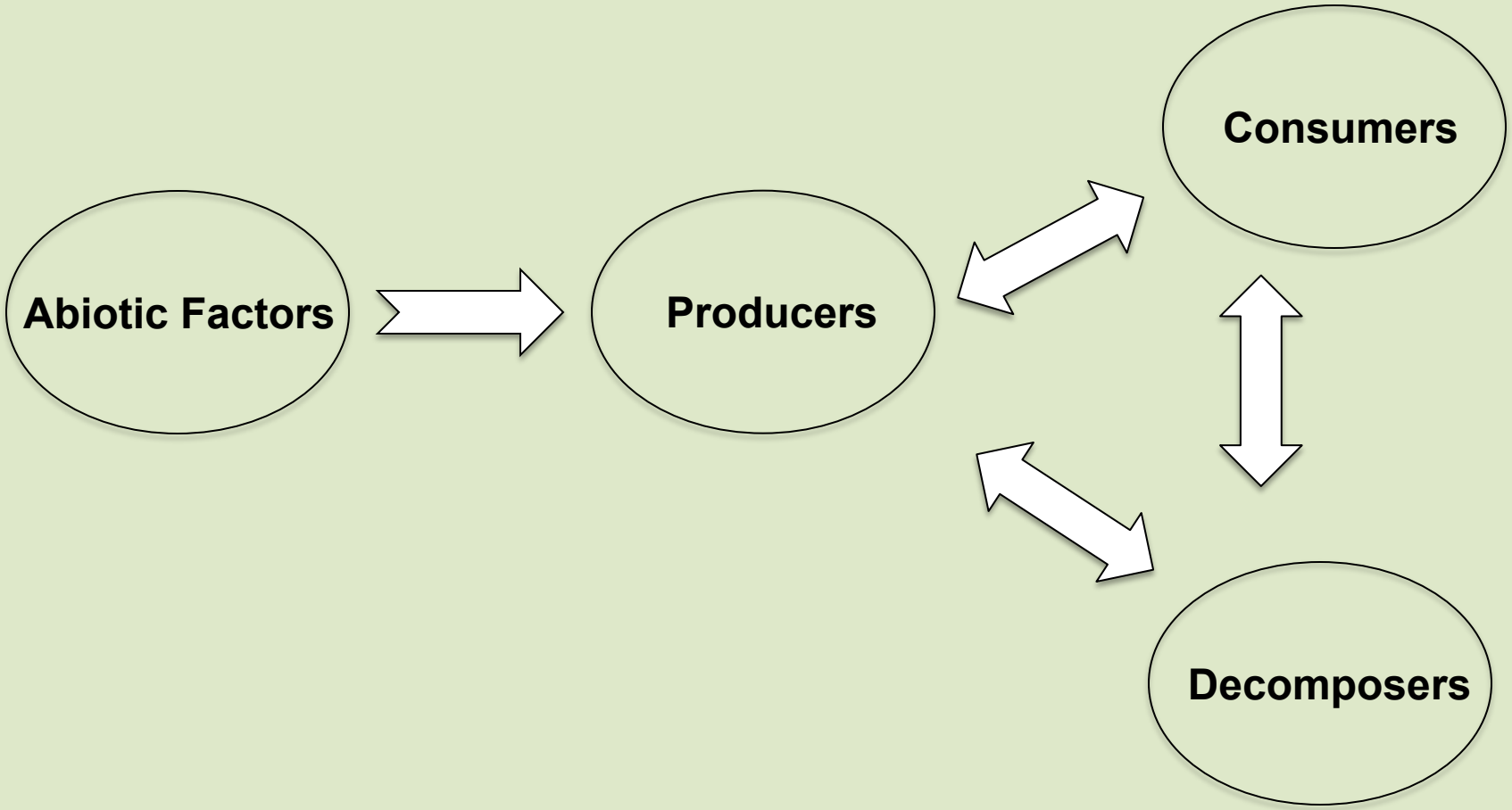
THE MAKING OF AN EDIBLE GARDEN OASIS IN THE CITY

ERIC TOENSMEIER

WITH CONTRIBUTIONS FROM JONATHAN BATES


Ecology for Gardeners
STEVEN B. CARROLL and STEVEN D. SALT

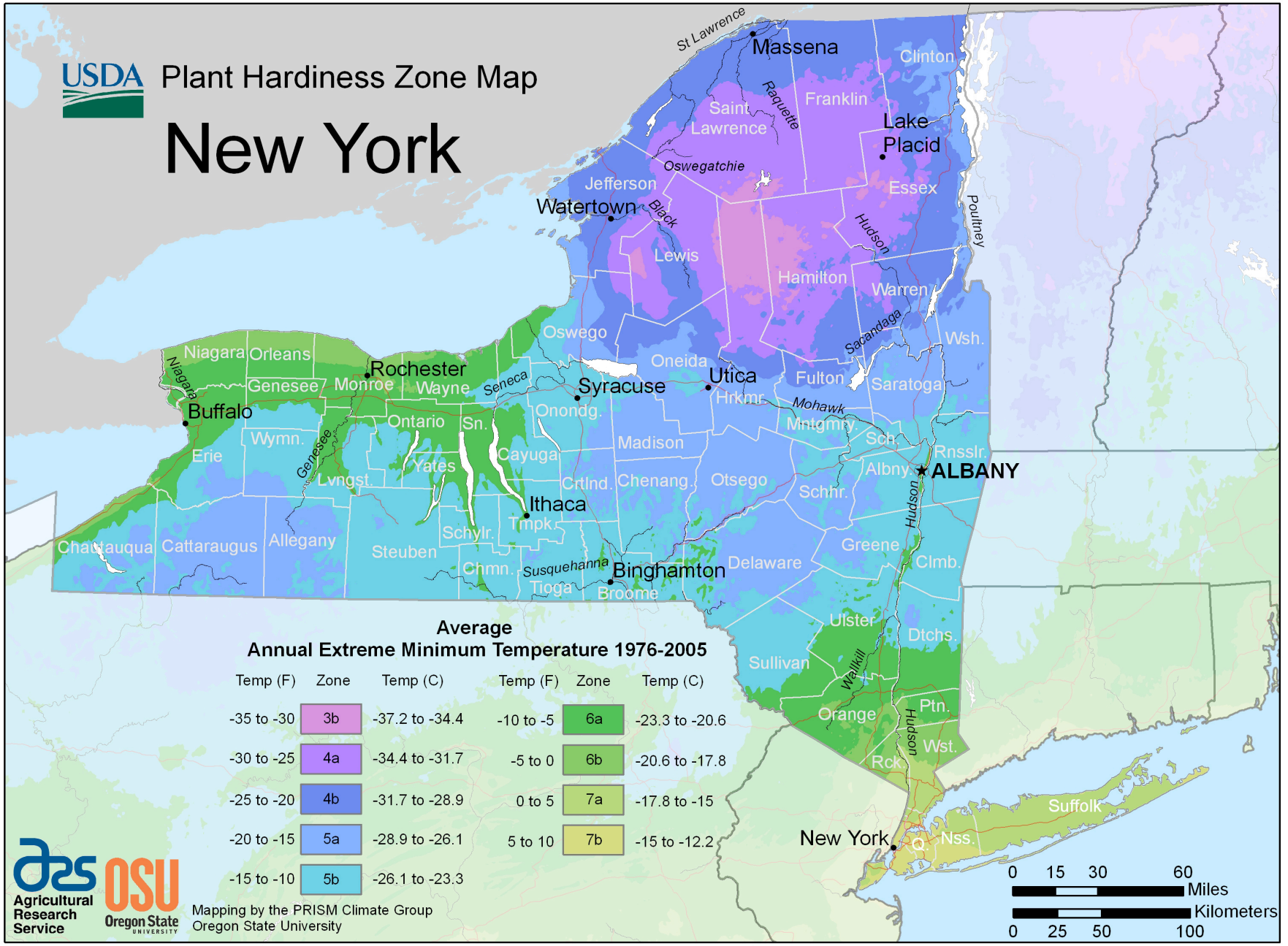
Nature is a web



Abiotic Factors

- ***Non – living* elements of the ecosystem**
- *Precipitation, Landform, Sun, Soil, Geology, Climate, Microclimate, Wind, Water, etc*

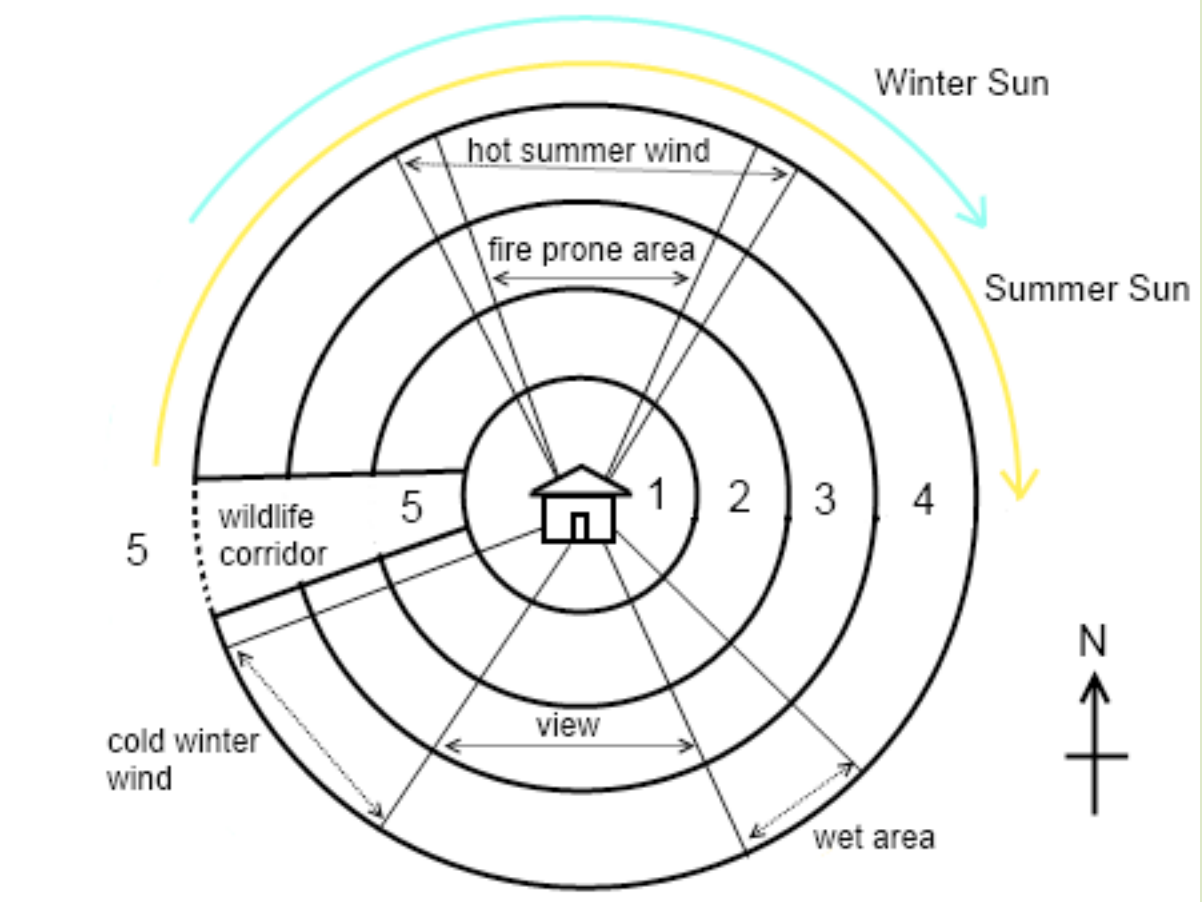
- **"Limiting Factor"**
  - An environmental variable that limits or slows the growth of an organism/system:
  - ***Sets limits to what we can do!***


USDA
Plant Hardiness Zone Map
New York
St Lawrence
Massena
Clinton
Franklin
Saint Lawrence
Raquette
Lake Placid
Oswegatchie
Jefferson
Watertown
Black
Essex
Poultney
Hudson
Lewis
Hamilton
Warren
Sacandaga
Wsh.
Oswego
Oneida
Utica
Fulton
Saratoga
Niagara
Orleans
Rochester
Niagara
Genesee
Monroe
Wayne
Seneca
Syracuse
Hrkmr.
Mohawk
Buffalo
Onondg.
Mntgmry.
Ontario
Sn.
Sch.
Rnsslr.
Wymn.
Madison
Erie
Genesee
Yates
Cayuga
Albny.
ALBANY
Lvngst.
Crtlnd.
Chenang.
Otsego
Schhr.
Hudson
Ithaca
Tmpk.
Schylr.
Chautauqua
Cattaraugus
Allegany
Steuben
Greene
Clmb.
Chmn.
Susquehanna
Delaware
Binghamton
Tioga
Broome
Ulster
Dtchs.
Sullivan
Wallkill
Orange
Ptn.
Hudson
Wst.
Rck.
Suffolk
New York
Nss.
Average
Annual Extreme Minimum Temperature 1976-2005
Temp (F) Zone Temp (C)
-35 to -30 3b -37.2 to -34.4
-30 to -25 4a -34.4 to -31.7
-25 to -20 4b -31.7 to -28.9
-20 to -15 5a -28.9 to -26.1
-15 to -10 5b -26.1 to -23.3
Temp (F) Zone Temp (C)
-10 to -5 6a -23.3 to -20.6
-5 to 0 6b -20.6 to -17.8
0 to 5 7a -17.8 to -15
5 to 10 7b -15 to -12.2
Agricultural Research Service
OSU Oregon State University
Mapping by the PRISM Climate Group
Oregon State University
0 15 30 60
Miles
0 25 50 100
Kilometers


ACU-RITE
5 in.
4
1/2
3
1/2
2
1/2
1
1/2

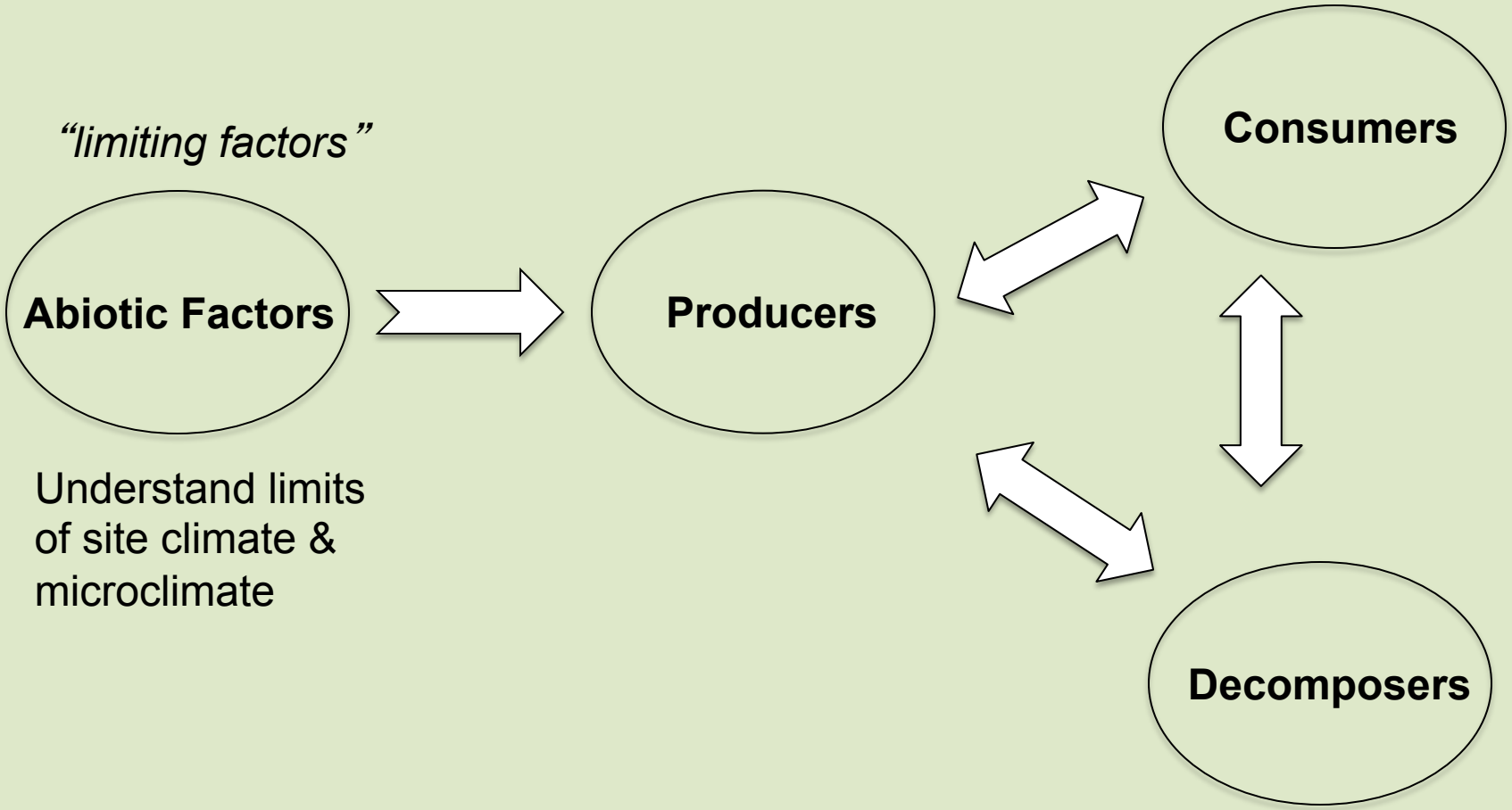
gardening.cornell.edu/sectors

- **Sun**
- **Shade**
- **Wind**
- **Water**
- **Noise**
- **Visual**
- **Wildlife**
- **Pollution**
- **Traffic**



Microclimate

Basic Ecology



Producers = plants

Only organisms that can Photosynthesize sunlight

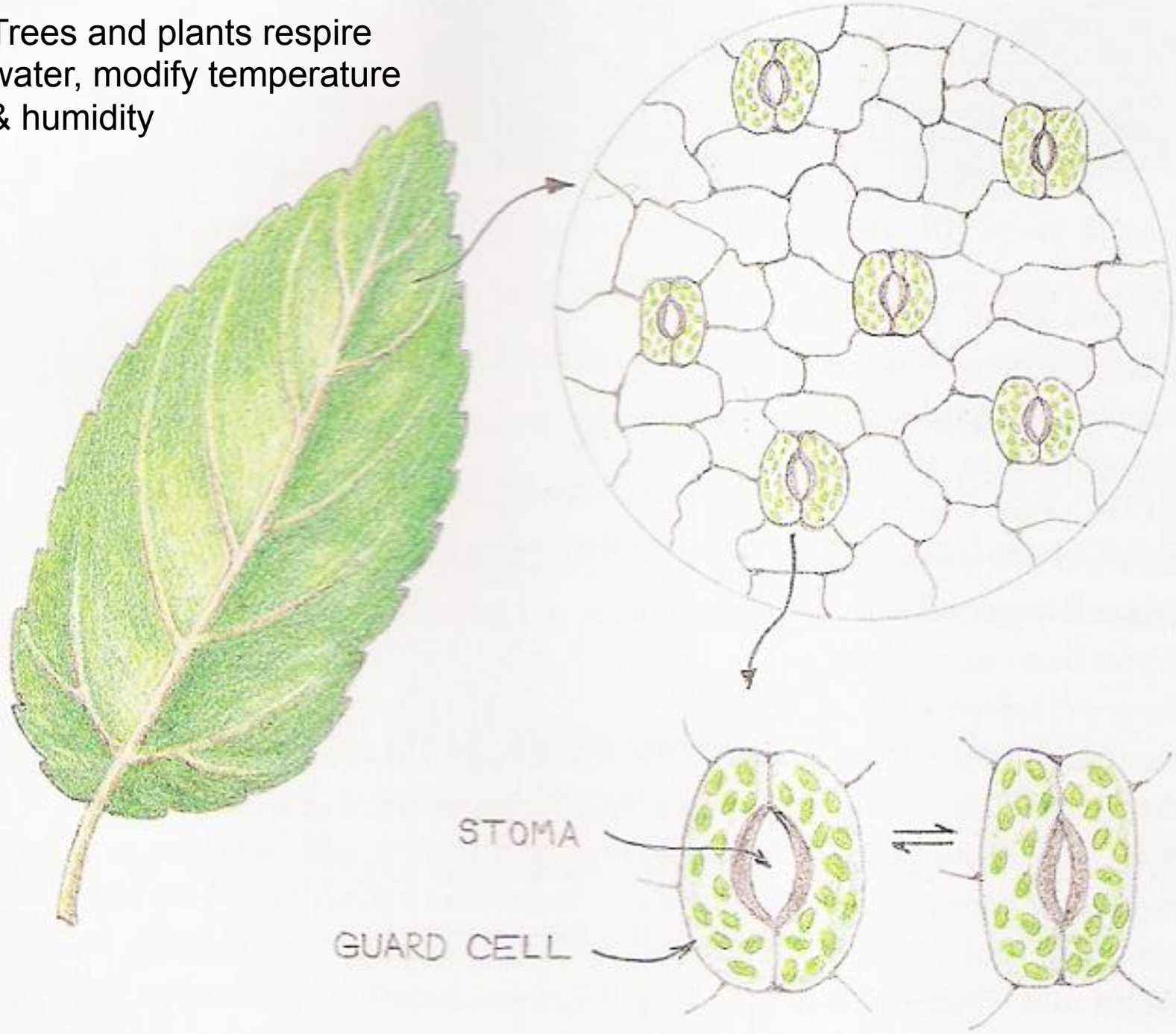
Producers = plants

Only organisms that can Photosynthesize sunlight

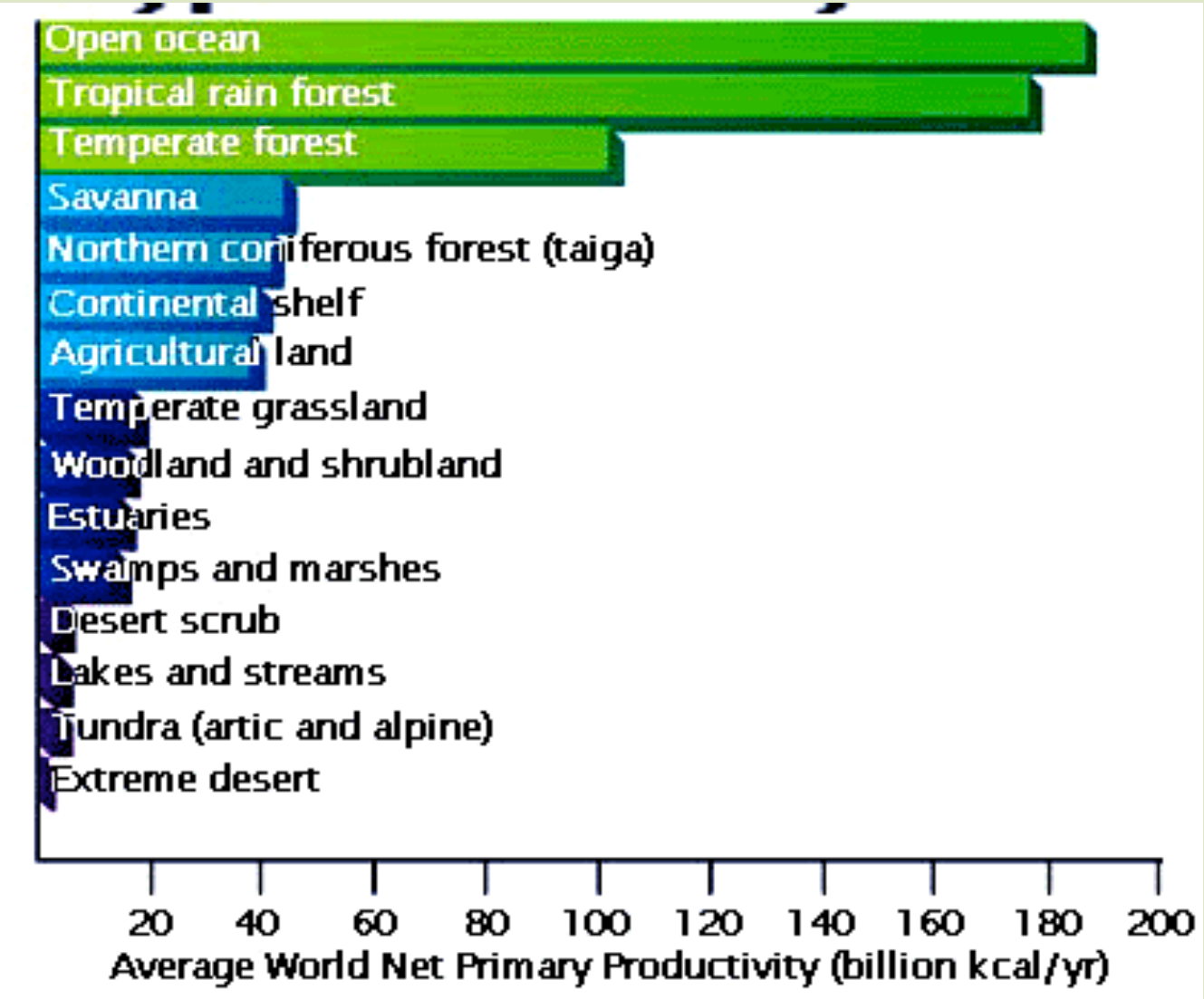
"Catch & Store Energy"

Plants transform sun energy to wood, seeds, fruits, roots, & shoots

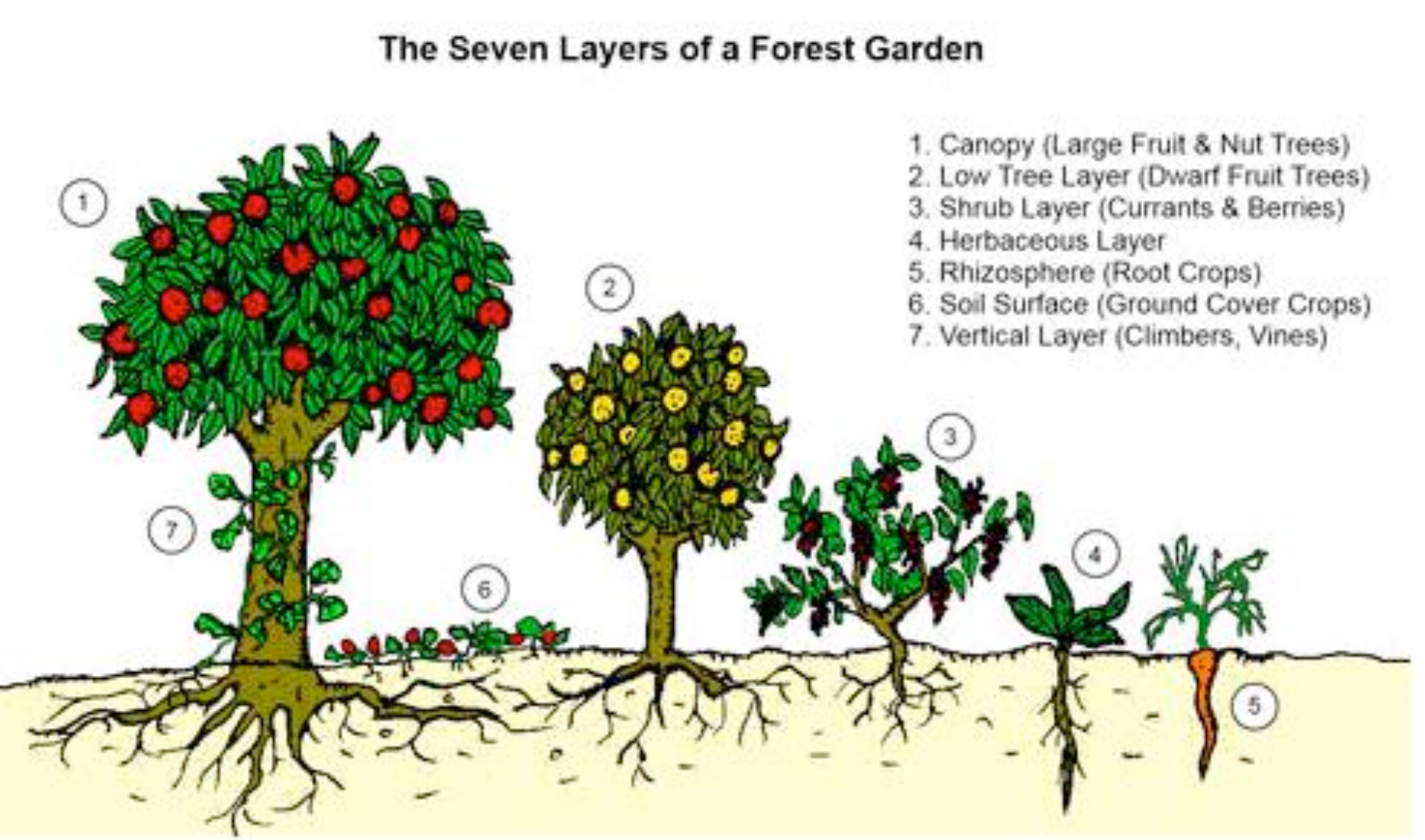
Trees and plants respire water, modify temperature & humidity

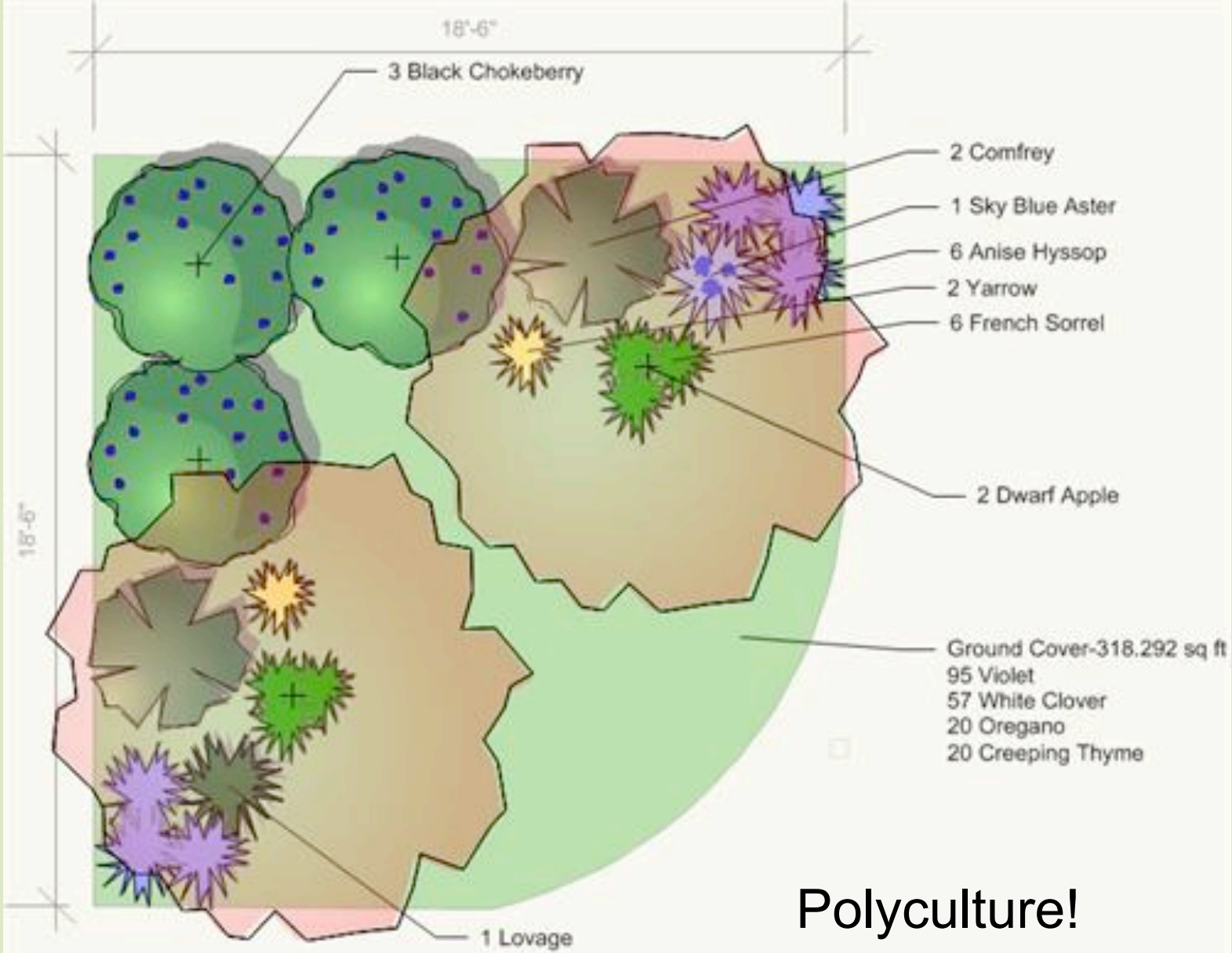


Biomass production – the ***root of ecosystem wealth***



The forest as our model



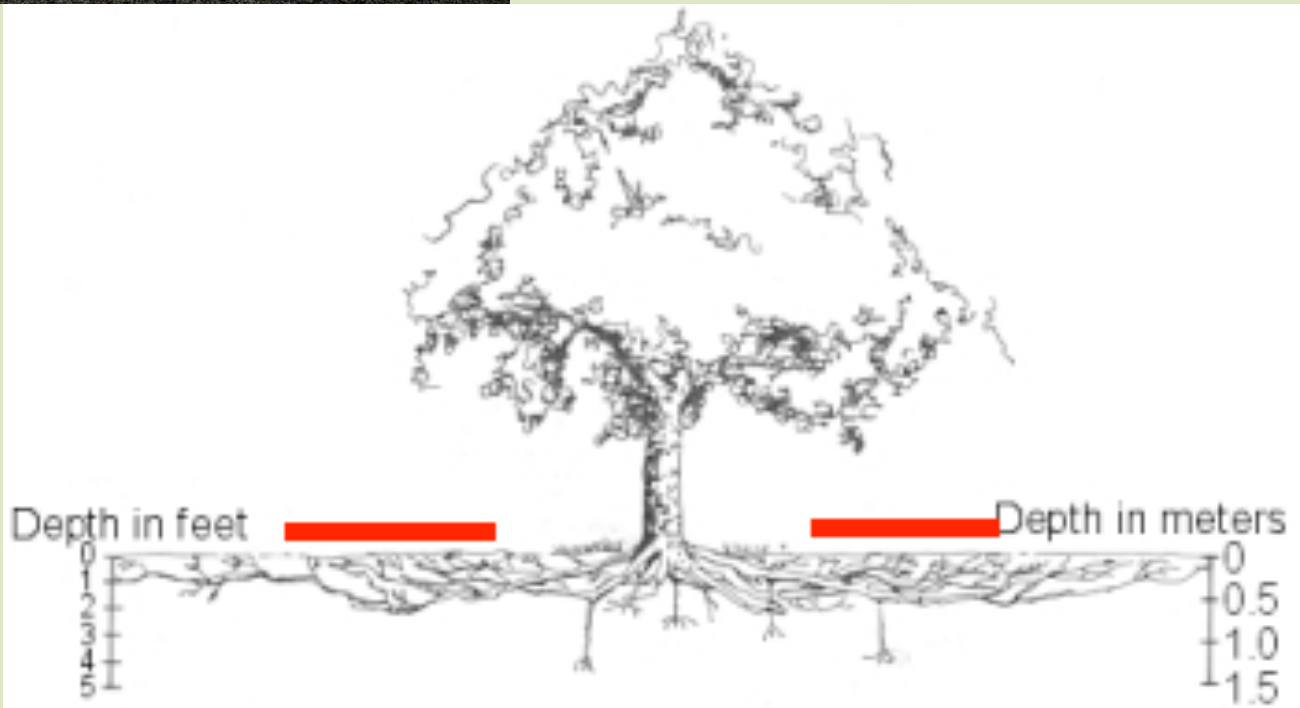


Polyculture!

Backyard Abundance

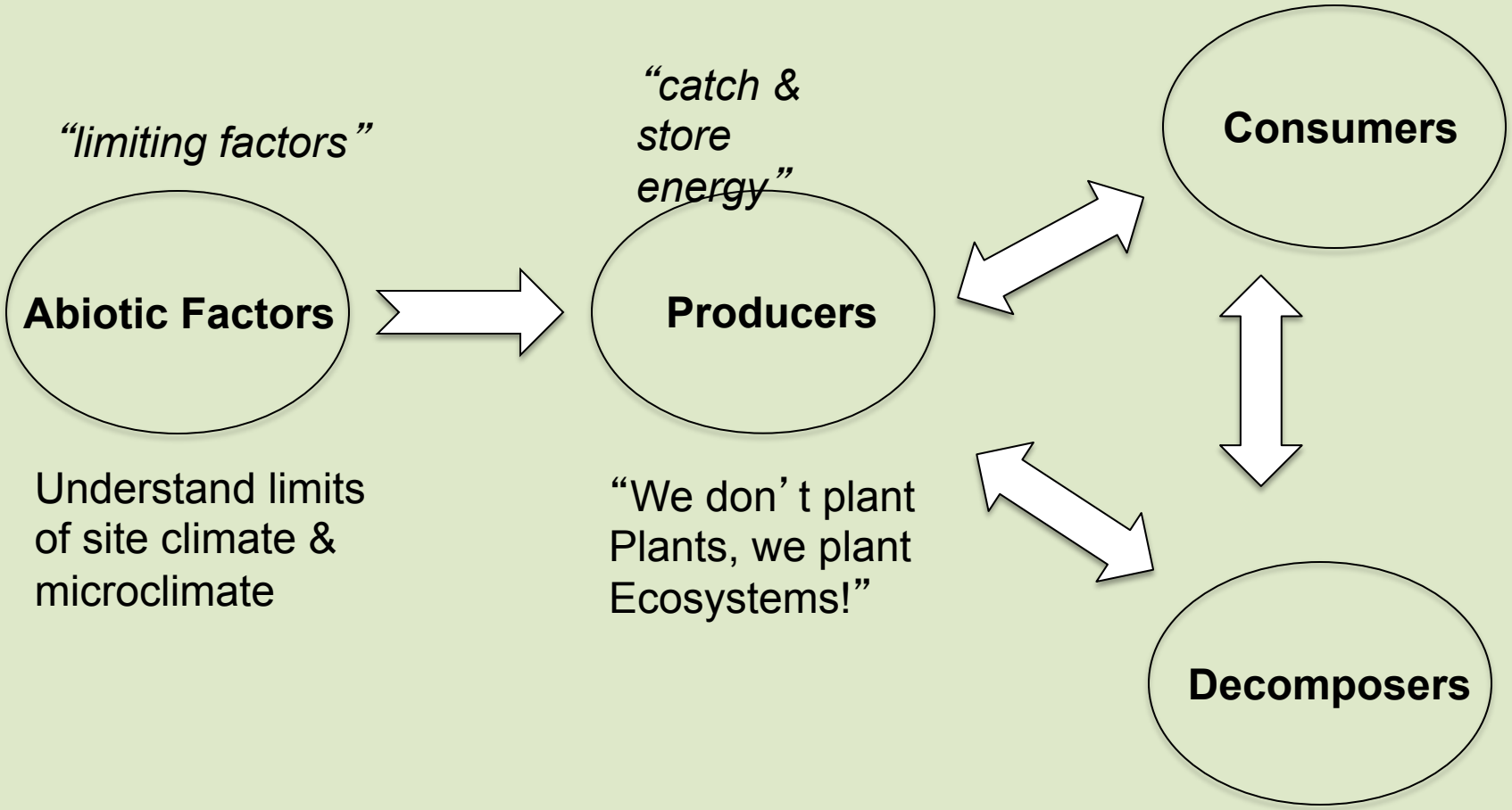
www.BackyardAbundance.org
www.facebook.com/BackyardAbundance

VS.



“We don’t plant plants,
we plant ecosystems”

Basic Ecology



Consumers = Animals

- Move **fertility**, seed, pollen, materials

Pollination

Not just honey bees

THE XERCES SOCIETY GUIDE

Attracting NATIVE POLLINATORS

Protecting North America's Bees and Butterflies

FOREWORD BY DR. MARLA SPIVAK

Domestic animals cycle fertility

Importing fertility from offsite

- 

“Importing” fertility

Winter food sources, diverse plantings & edges, nesting habitats

- Bluebirds
- Chickadee
- Nut Hatches
- Sparrows
- Swallows
- Woodpeckers

Edge, Structure, Texture is Key