Population Studies

Population Studies

- **Population**
  - same species
  - same area
  - using same resources
  - interbreeding

What are population studies?

- Study and explain factors related to population:
  1. Density
  2. Distribution
  3. Size

ALL RELATED TO THE **BIOTIC** and **ABIOTIC** FACTORS IN THE ENVIRONMENT

Population Characteristics

1. **Population size**-# of organisms in population
2. **Population density**- how crowded is the population?
3. **Population distribution**- spatial arrangement of members
   - Spread out or clumped together in groups

Population Density

- **Population density** - how crowded population is

- **Depends on two factors**
  1.

  2.

Population Density
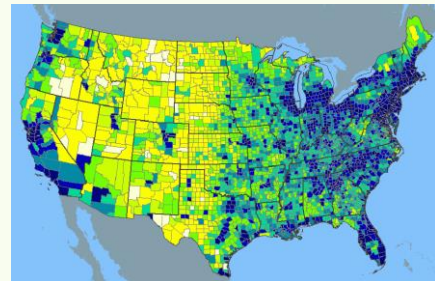
Population Distribution
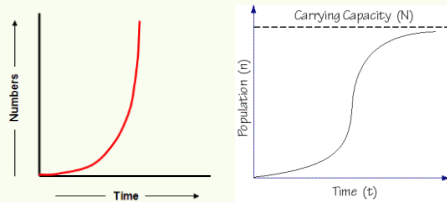
- Tells us more than numbers...

Population Size

If **birth rate** is higher than **death rate**→

If **death rate** is higher than **birth rate** →

Population Growth Rate

- change in population size OVER TIME.
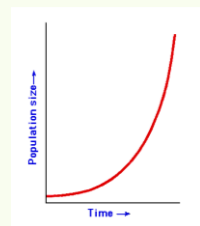 – slope of line
  – Ex.

Population Growth Model #1
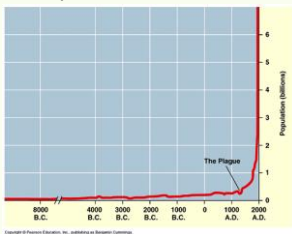
Exponential Growth   **"J"-shaped curve**

- ideal environmental conditions
- maximum growth rate
- the larger the population gets, the faster the rate increases.

Limits to Growth

- Populations cannot grow exponentially forever….WHY?

Limits to Growth

- Resources are limited
- Limiting factor
  – resource in the shortest supply; determines how many organisms environment can support
  – Ex: food, clean water, disease, hurricane, etc.

Limiting Factors

Density Independent
- Effect does not depend on population size (density)
- Ex: earthquake, tornado

Density Dependent
- Effect increases as population size (density) increases
- Ex: disease, predation

Carrying Capacity

- Population size the ENVIRONMENT can support for a LONG PERIOD TIME without DAMAGE TO THE ENVIRONMENT
  - determined by <u>limiting factor</u>
  - can be seasonal

Population Model #2

Logistic Model
- Populations increase in size
- Limiting factor puts pressure on population
- Growth slows and levels off
  - Carrying capacity

"S" curve