

10-13-05

①

Ch 5

## Malthusian Model

- ① Pop Grows geometrically (exponentially)  $\leftarrow \frac{\Delta \text{Pop}}{\text{Pop}} = \text{constant}$
- ② Food Supply grows arithmetically  $\frac{\Delta \text{Food}}{\Delta \text{time}} = \text{constant} \rightarrow$  (linearly)
- ③ Per Capita Food decrease as  
(a consequence of ①, ②)  
 $\rightarrow$  Food/Pop.

## Modern Malthusianism

Any where Per Capita Food Decreases,  
regardless of cause.

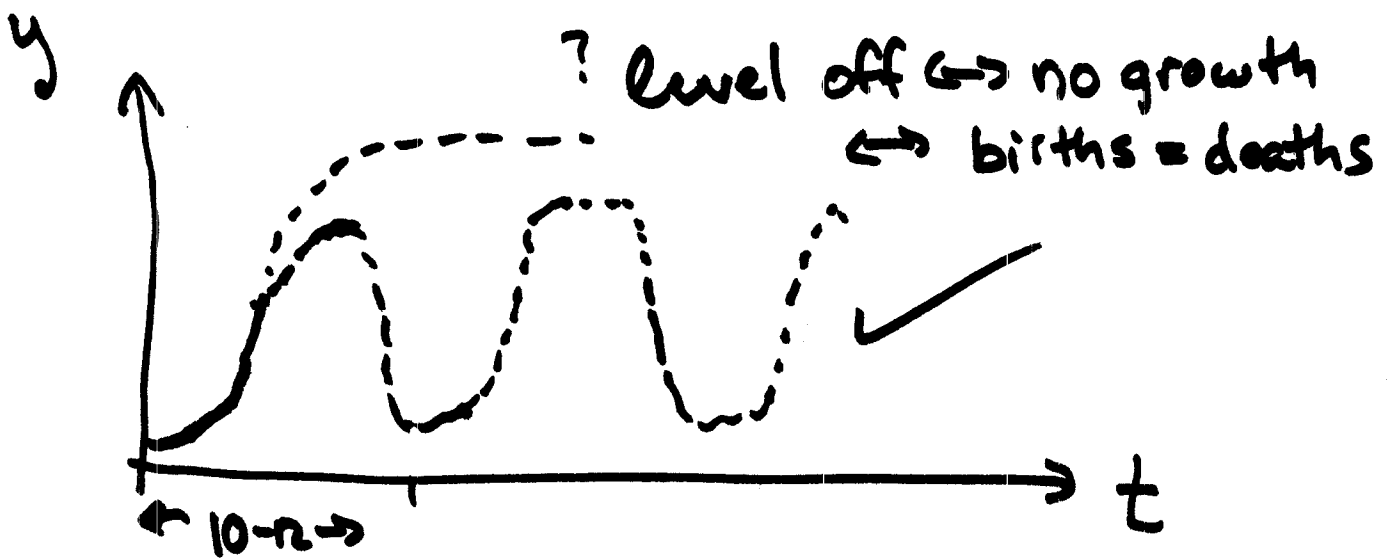
Smoothing - Repeatedly  
average using runs of data.  
Usually for Food / stocks

Indexing - Comparing data  
to one fixed base  $\frac{\text{data}}{\text{base}} \times 100$

# Ch6 - Logistic Model page 120

## - Demographic Transition (3 Stages)

End of Review

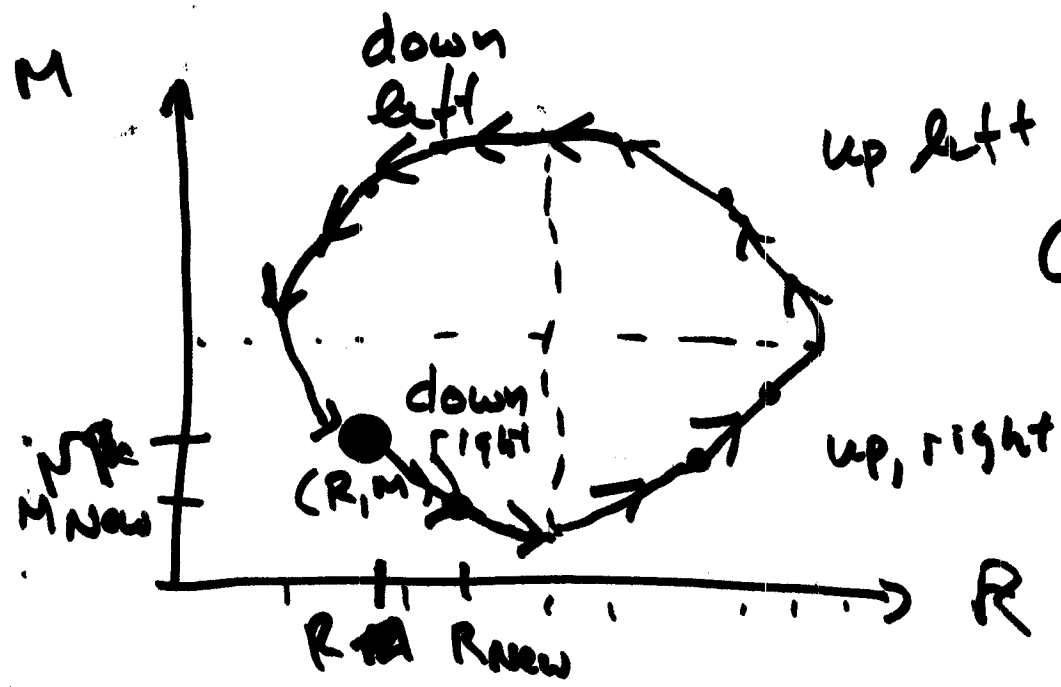
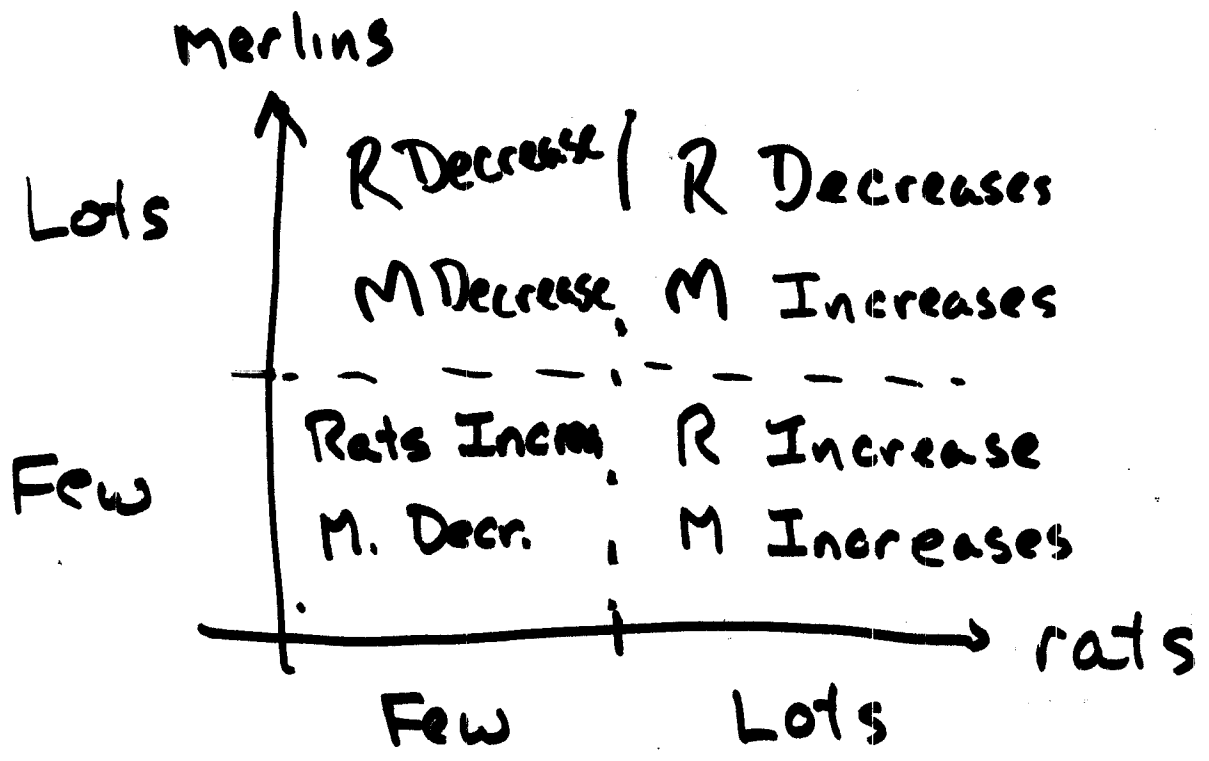


$t = \text{time yrs}$        $y = \# \text{ lynx pelts.}$

Model connection between predators and prey

- |         |      |
|---------|------|
| lynx    | hare |
| sharks  | fish |
| merlins | rats |

3



Cycle.  
 phase plane

$(R, M) = (\# \text{ rats}, \# \text{ Merlins})$  one day  
 $(R_{\text{new}}, M_{\text{new}})$  next day)  
 How does  $R_{\text{new}}$  compare to  $R$ ?  $R_{\text{new}} > R$   
 How does  $M_{\text{new}}$  compare to  $M$ ?  $M_{\text{new}} < M$

