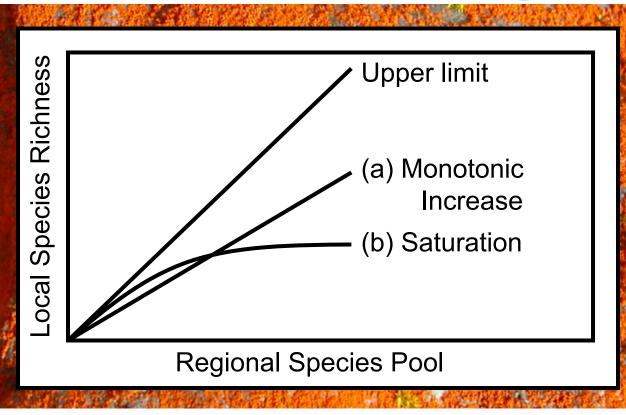




Local-Regional Plots:





Saturation should occur:

MacArthur 1972 (niche)
Tilman 1985 (resources)
Chesson & Huntly 1989.
Huston 1979 (disturbance)
(Hutchinson/Gause)

Saturation should not occur:

Hubbell & Foster '86 (random)
Sale 1977 (lottery)
Janzen 1970 (spec. pred.)

Caswell 1976 (non-interactive)

Theory predicts both patterns.

Empirical data show that...

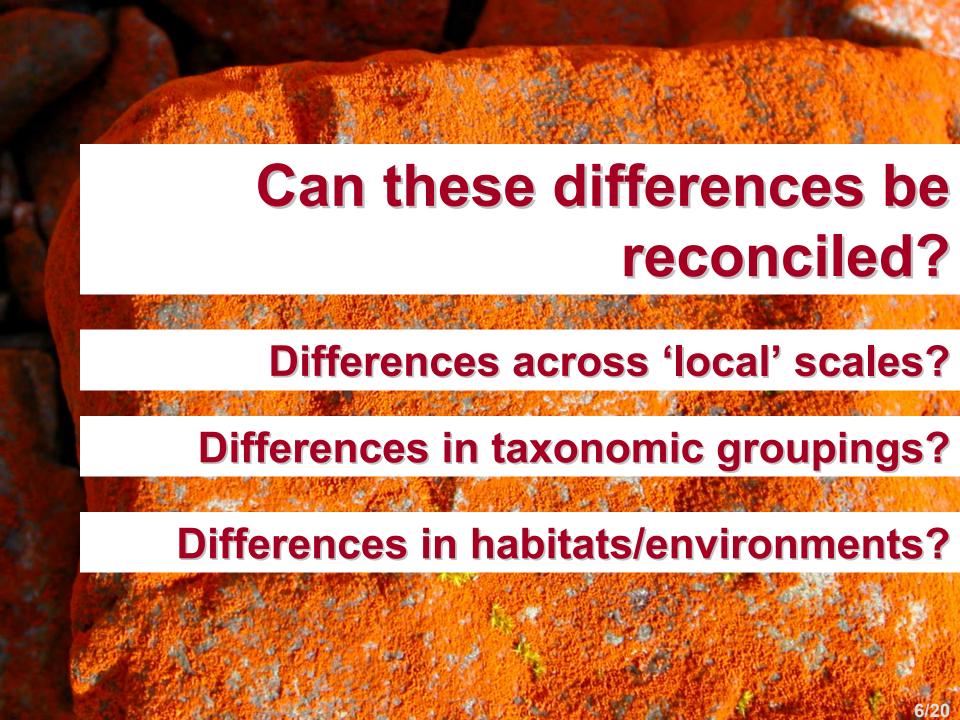
Saturation does occur:

leaf miners (Opler '74)
crustaceans (Abele '84)
fish (Westoby '85)
birds – West Indies
(Terborgh & Faaborg '80)

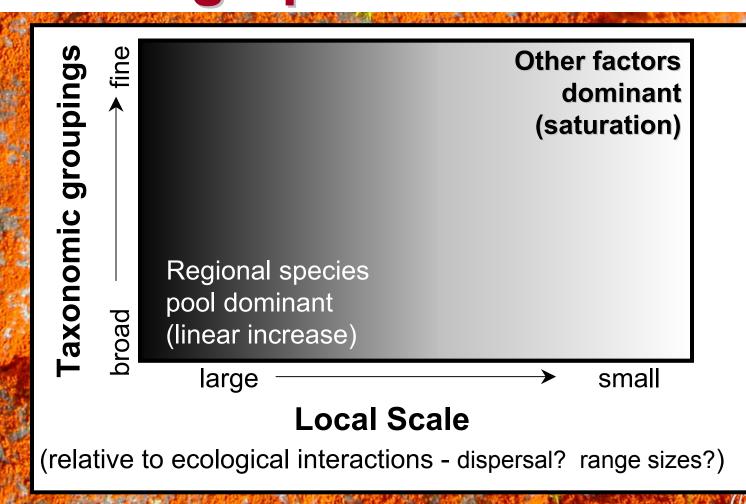
Saturation does not occur:

fig wasp parasitoids – Africa (hawkings & Compton '92) birds – West Indies (Ricklefs '87; Weins '89) oak gall wasps – (Cornell)

Data support both patterns.



A graphical framework



~ methods ~

field work

NESTED SURVEYS: 10 quadrats within 3 transects within 3 sites within 18 areas (across west coast of the US).

RESPONSE: Abundance of all algae and invertebrates (macroscopic) estimated.

~ methods ~

data analyses

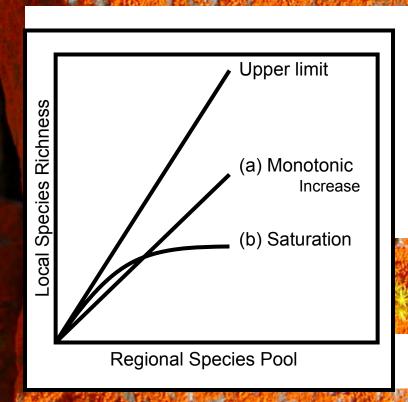
REGIONAL POOL: Cumulative species richness (some species complexes) calculated for each transect, site, and area on the West coast.

LOCAL RICHNESS: counts of total numbers of species within each <u>quadrat</u>, <u>transect</u>, and <u>site</u>.

NONLINEAR REGRESSION: of local species richness on the regional species pool.

~ methods ~

data analyses



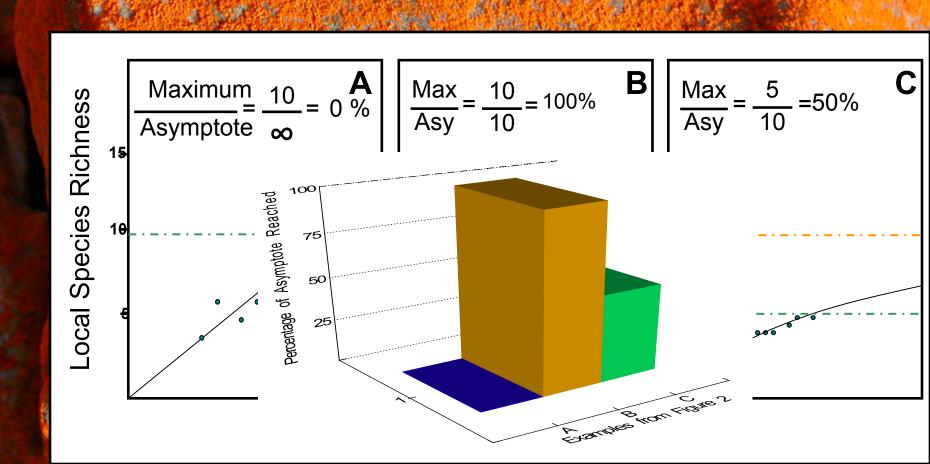
MODEL (M-M):

Local Richness = Intercept +

(Vmax*Regional Richness)/

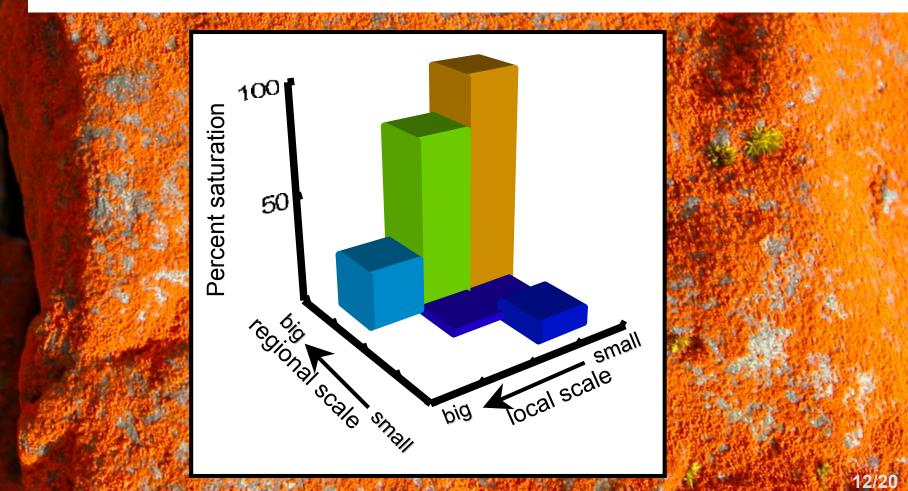
(Km + Regional Richness)

~ methods ~ data analyses (a saturation metric)

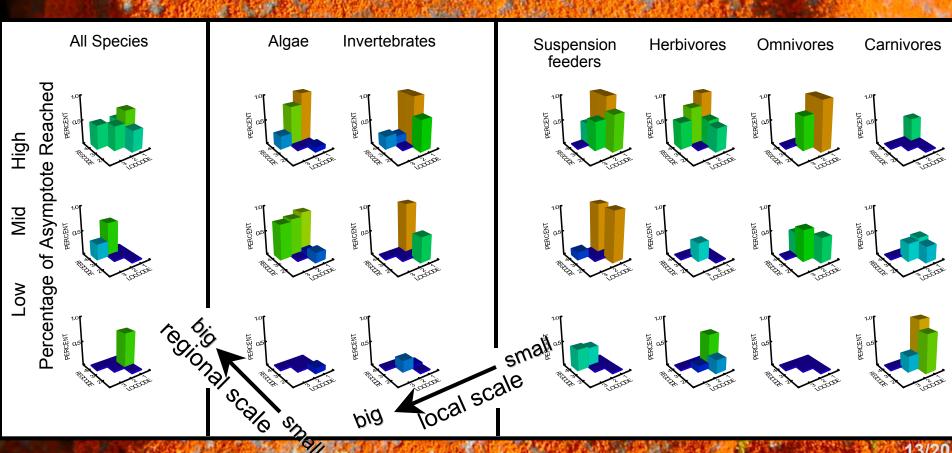


~ results ~

across scales



results ~ across scales & taxa & habitats



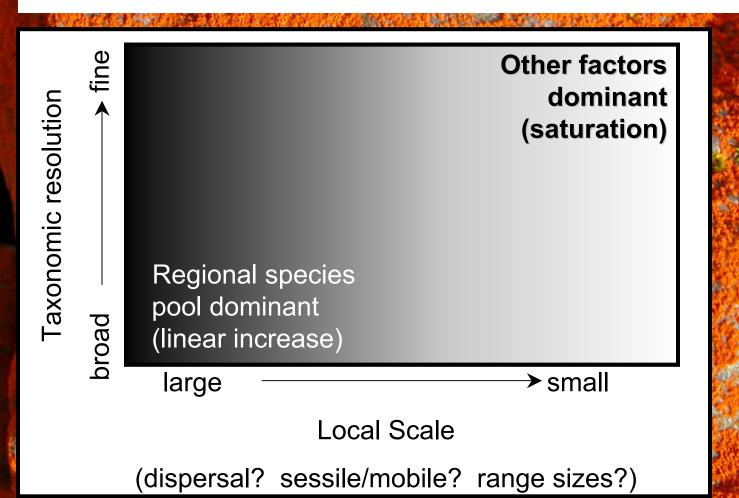


smaller local scales are more saturated.

<u>finer</u> taxonomic resolutions are more saturated.

higher intertidal habitats are more saturated.

Recap with the contextual framework...



DISCUSSION

Tests of ecological theory *must* be appropriately matched with the context within which the experiments take place.

By explicitly recognizing environmental context when testing theory, we are able to build more robust theoretical frameworks upon which to better understand how ecological systems work.



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