

Impact of Mass Sponge Mortality and Juvenile Density on Spiny Lobster Recruitment in Florida Bay

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Clemson University



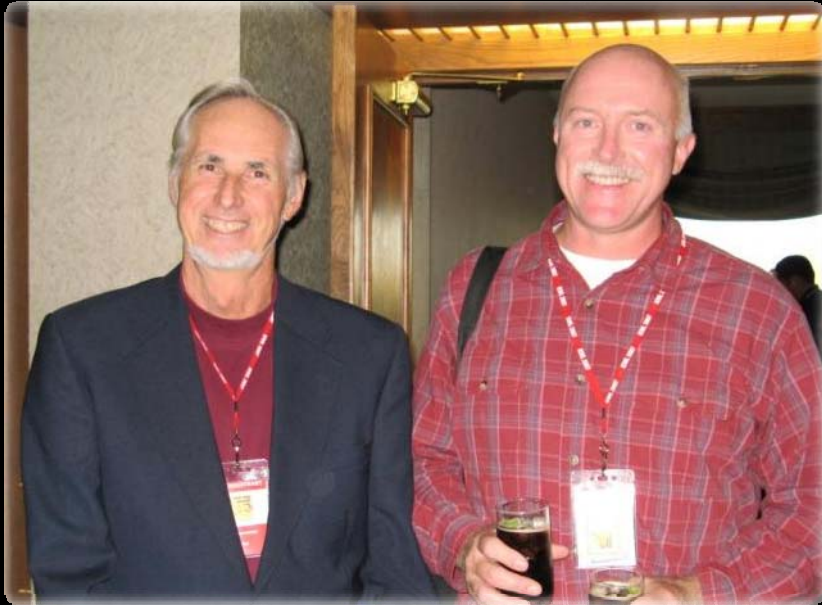


Open ocean

Patch reefs

Florida Bay

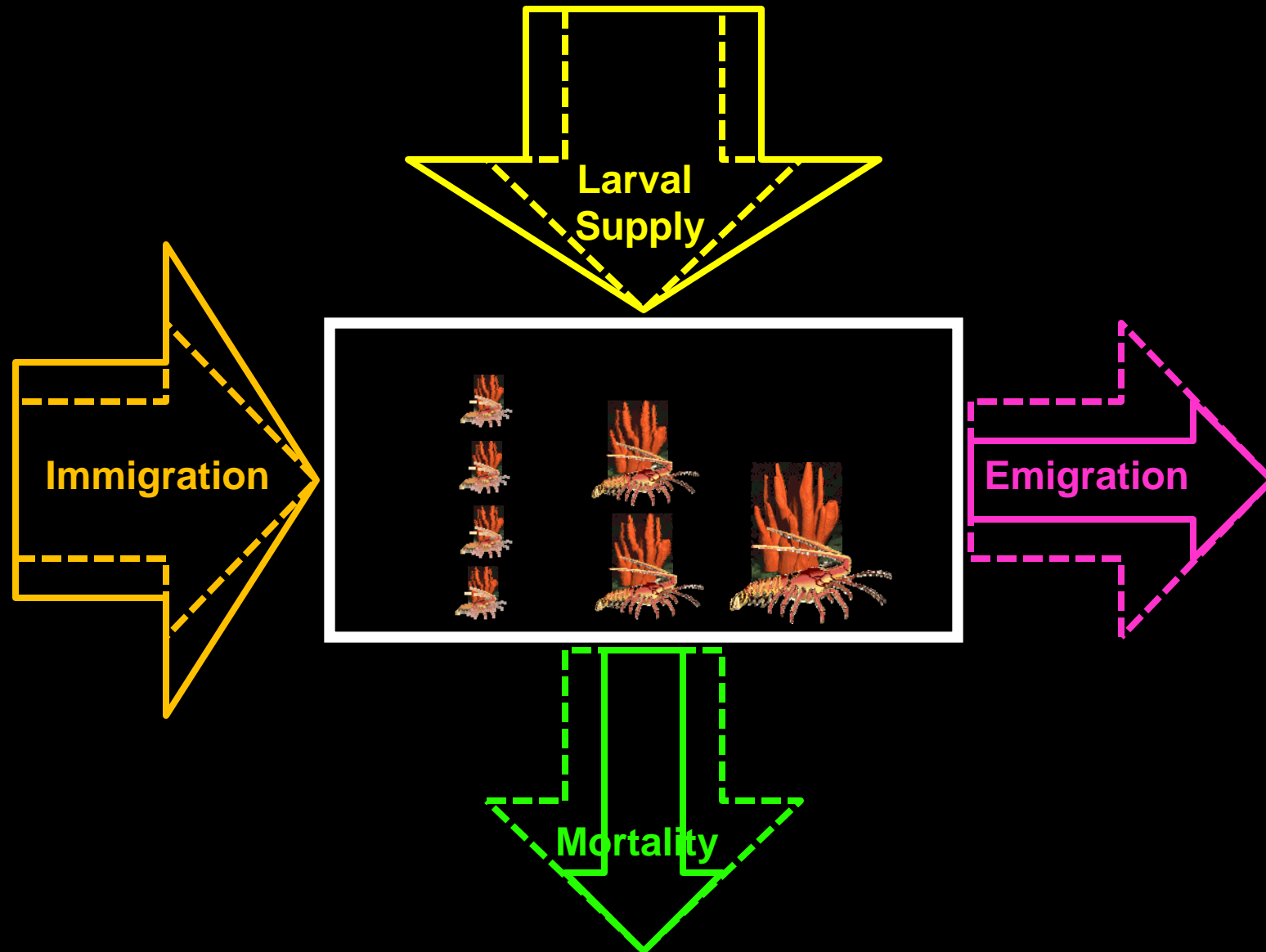




Herrnkind et al. 1997 Mar Fresh Res

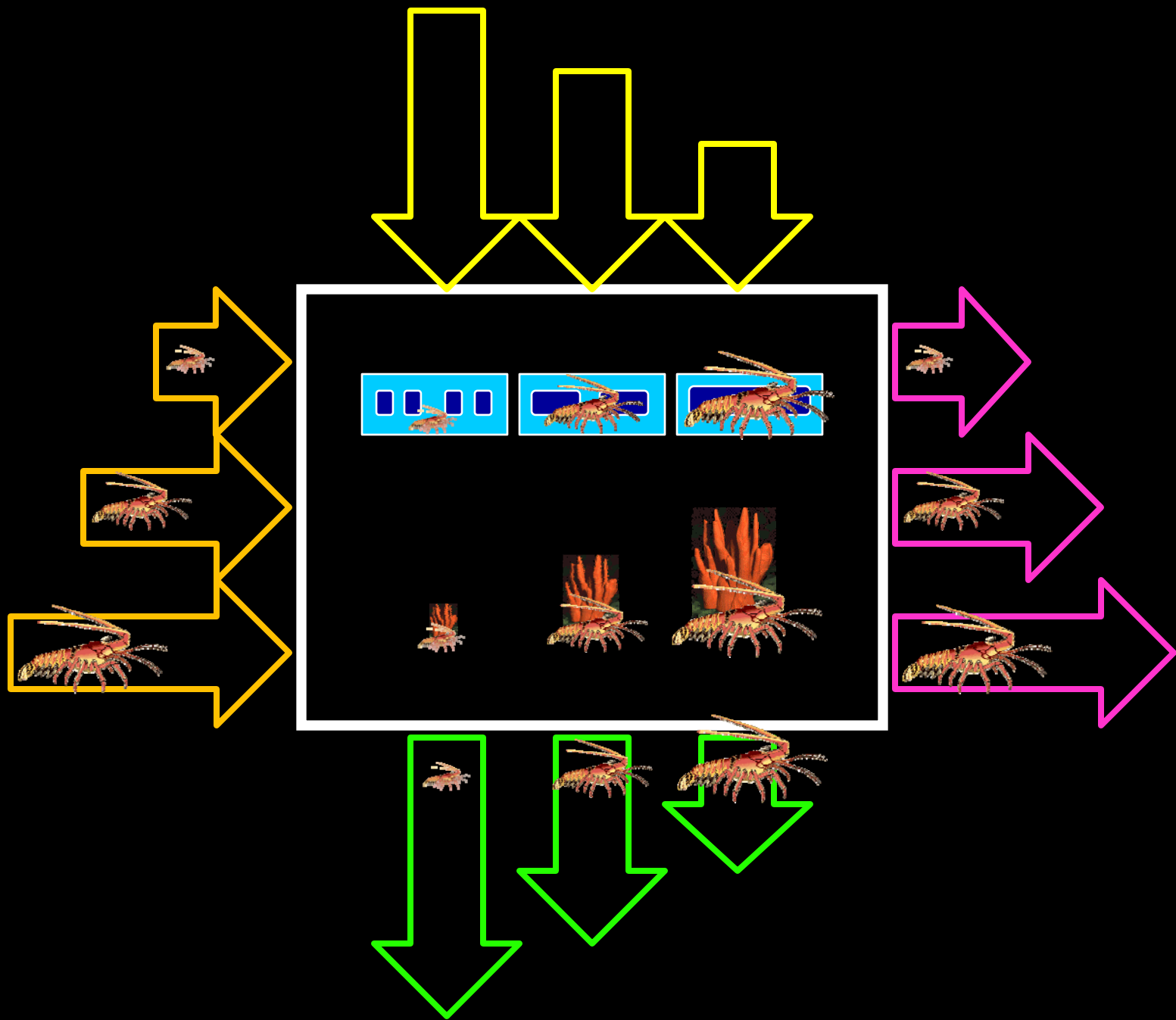


Potential Allee Effects

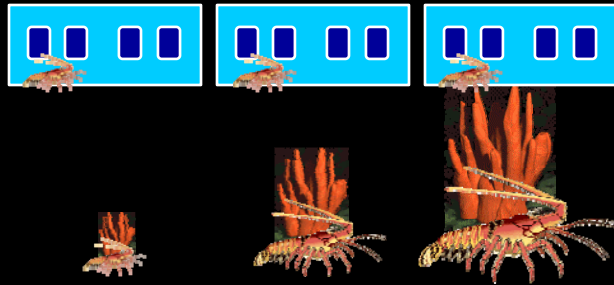


Questions

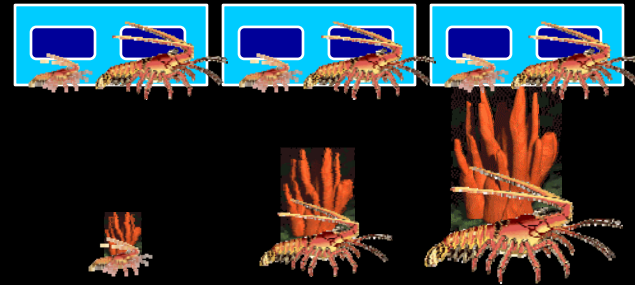
- ◆ Does conspecific density increase postlarval settlement or decrease post-settlement mortality?
- ◆ Does conspecific density increase immigration or decrease emigration after a sudden loss of shelter?

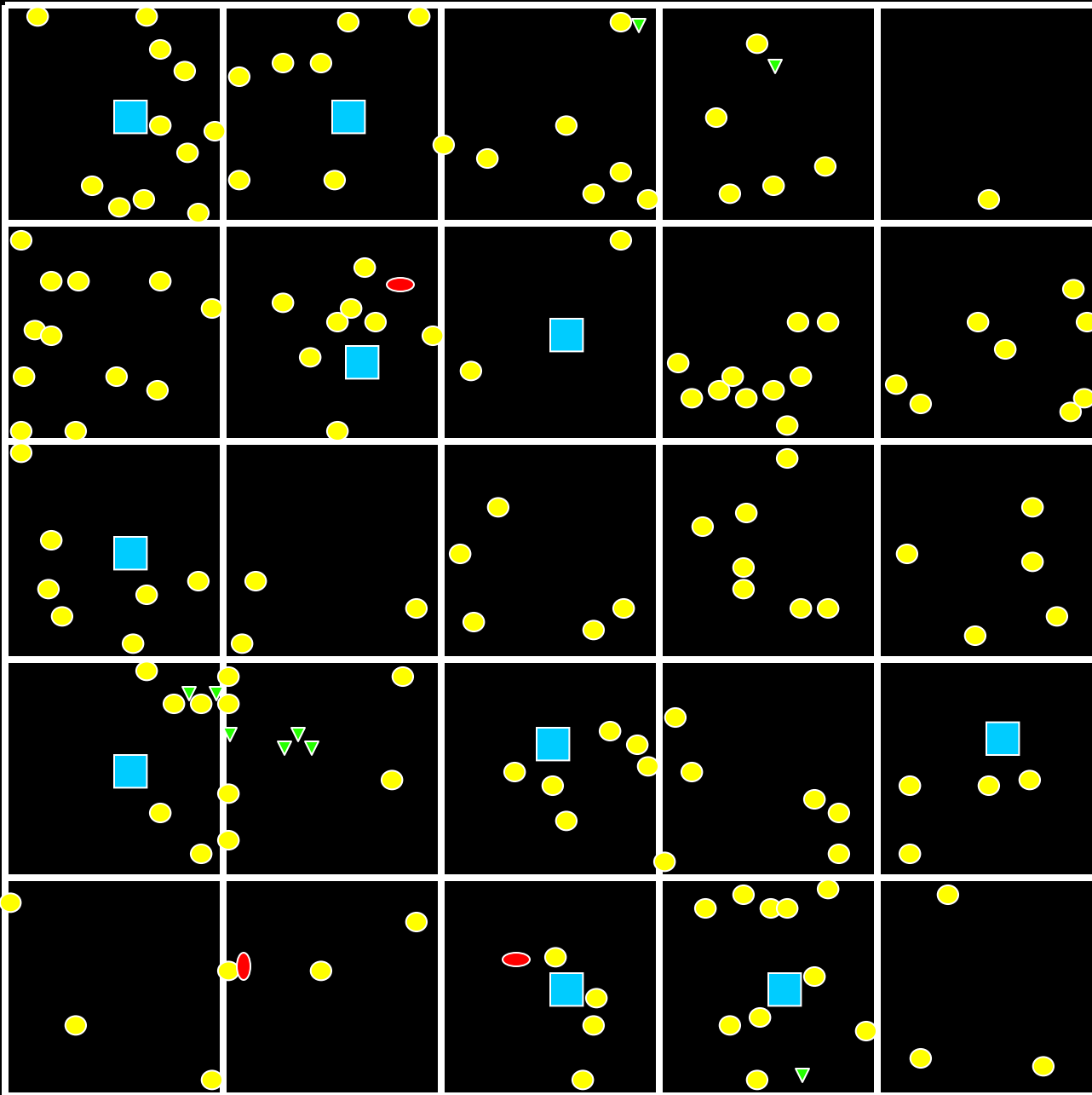


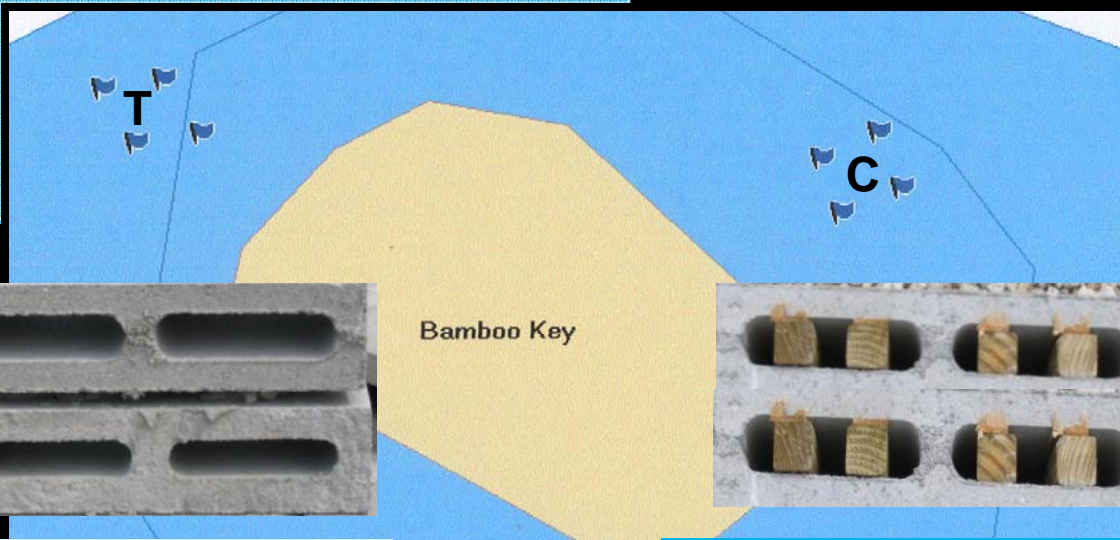
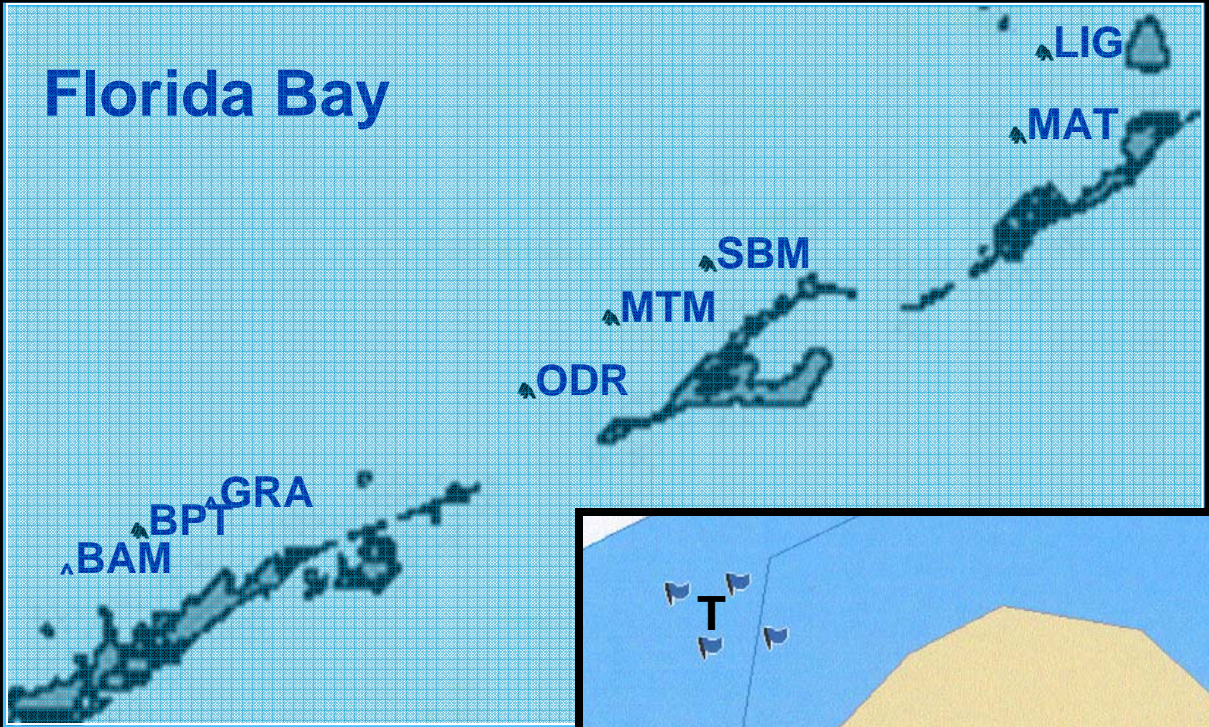
Small Shelters



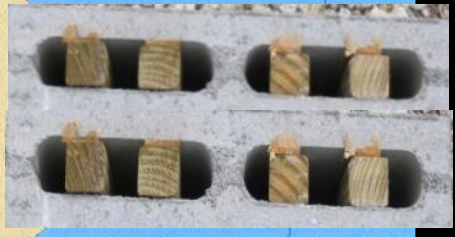
Large Shelters





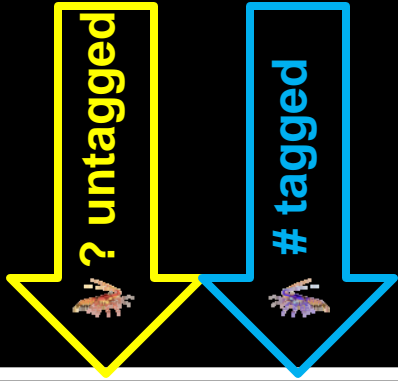


Large Shelter Block



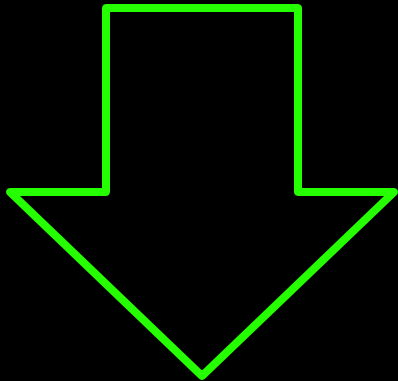
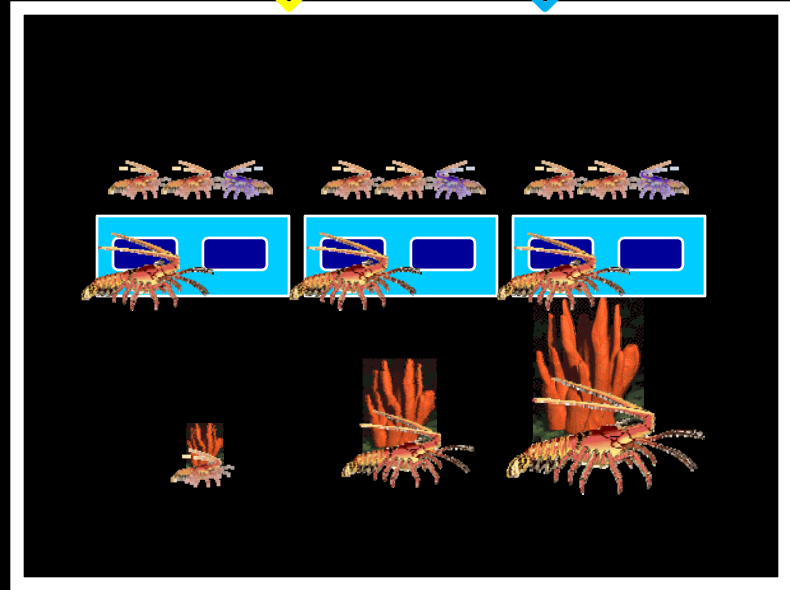
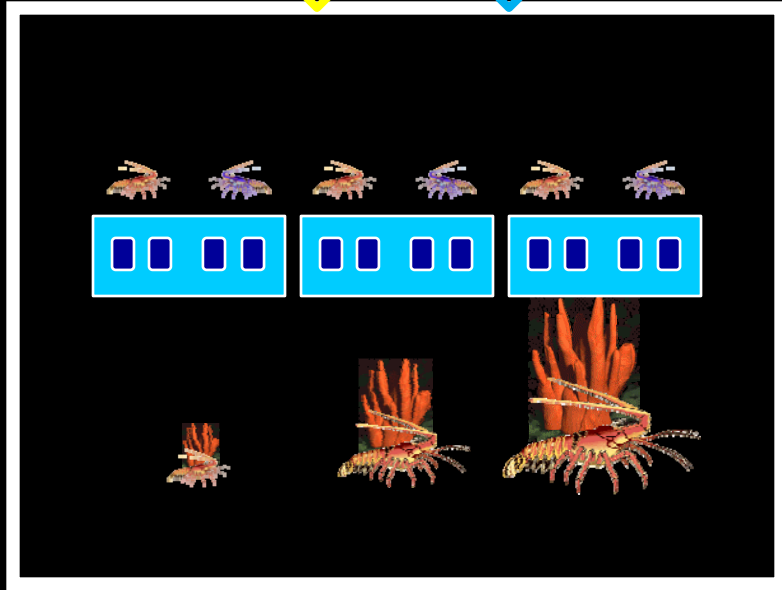
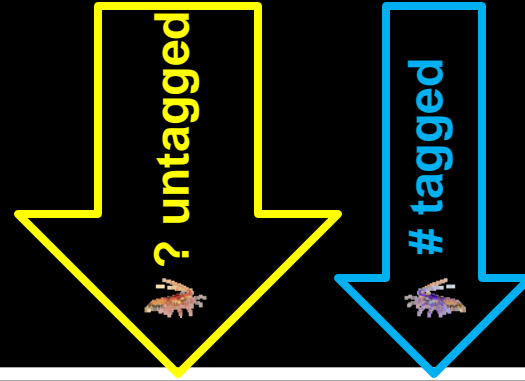
Small Shelter Block



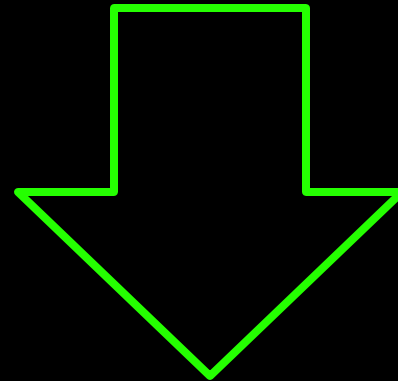


Larval Supply

Settlement Hypothesis



Mortality



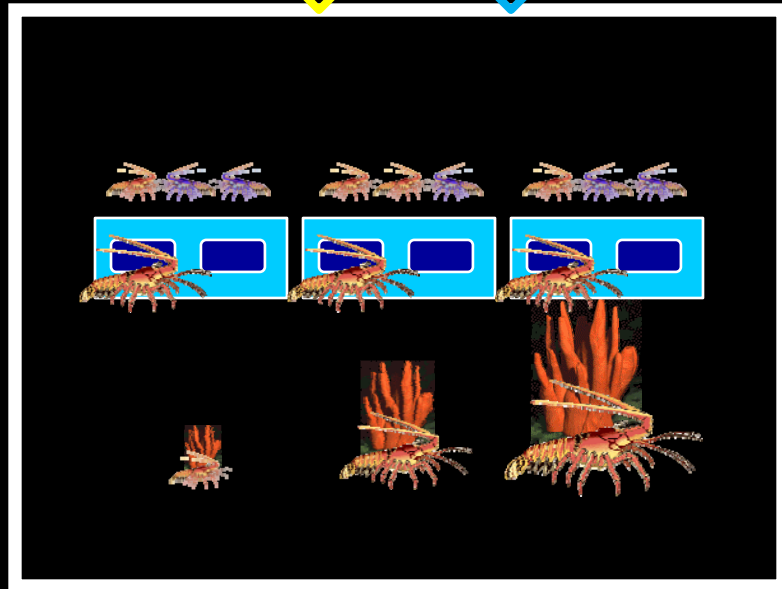
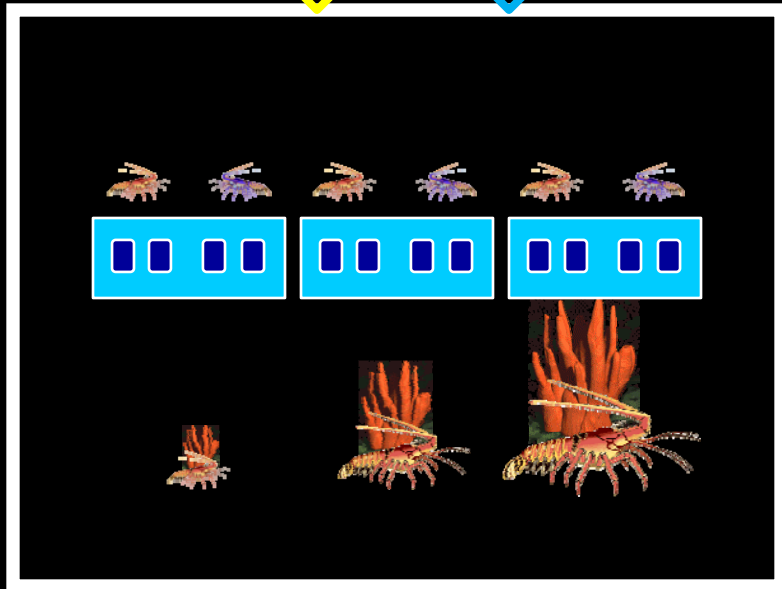
Larval
Supply

? untagged

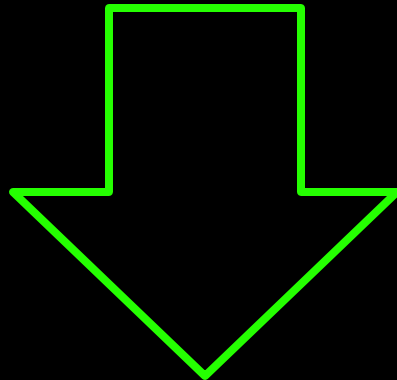
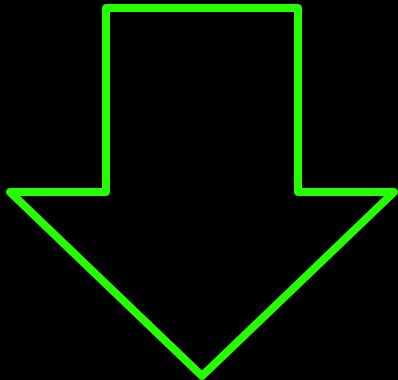
tagged

? untagged

tagged



Mortality



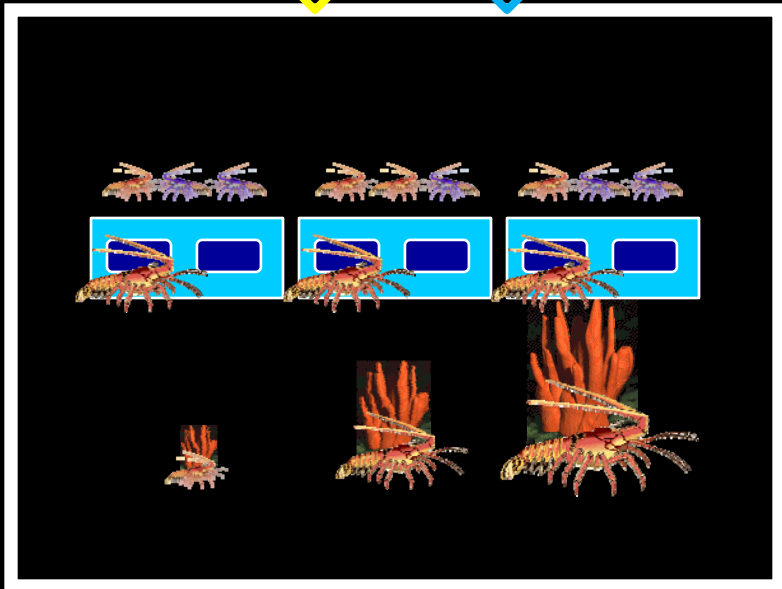
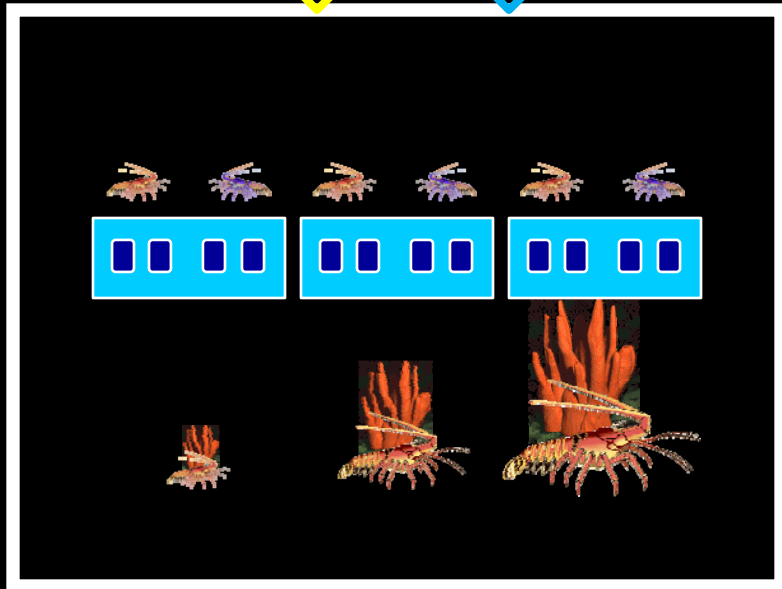
Larval
Supply

? untagged

tagged

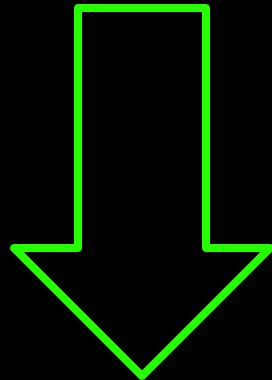
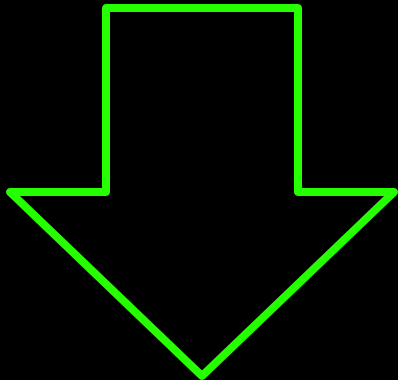
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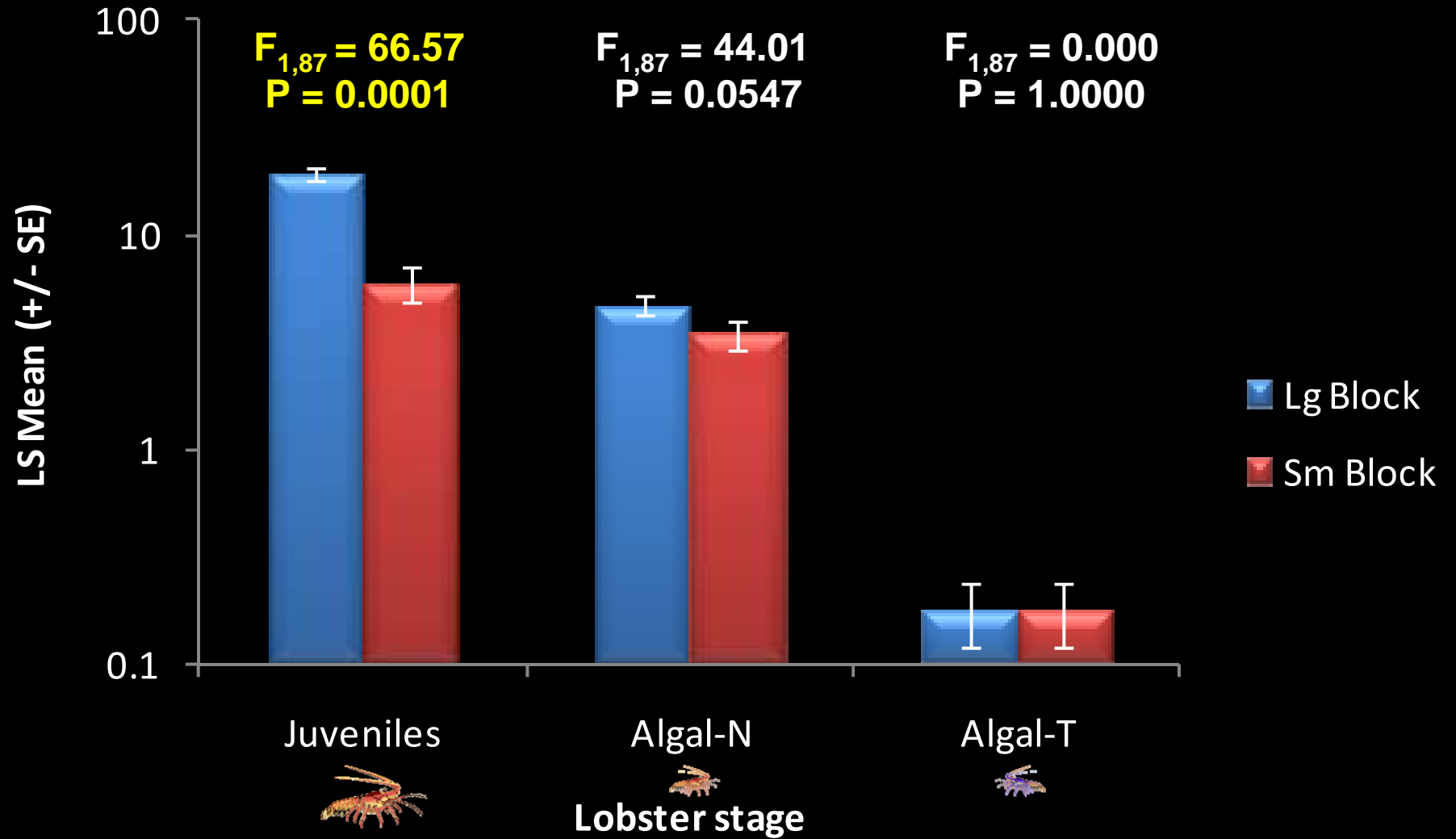
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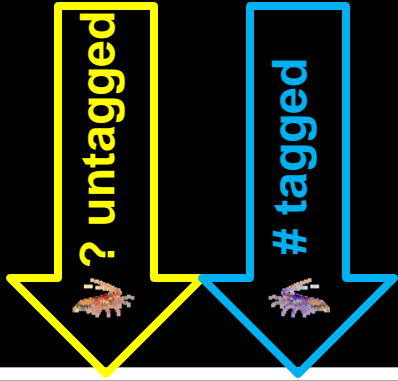


Group Defense
Hypothesis

Mortality

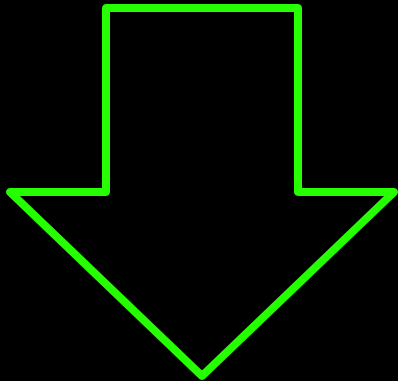
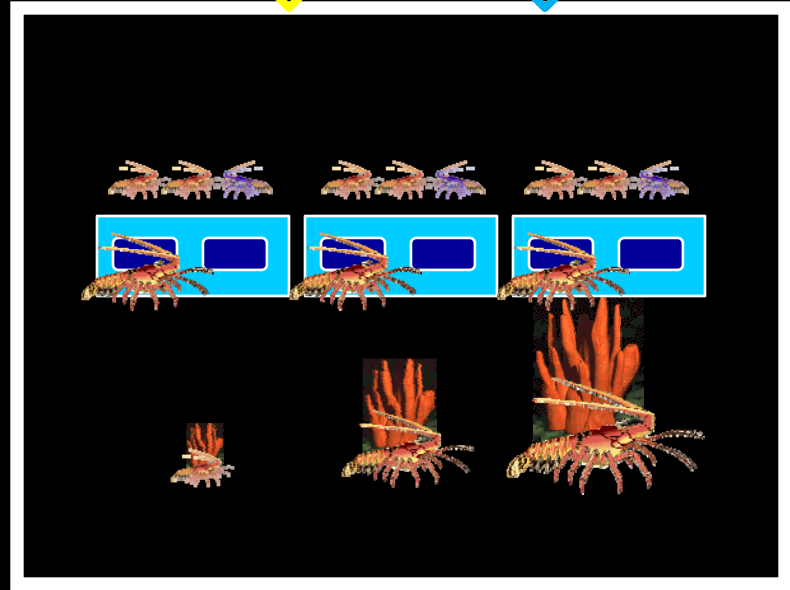
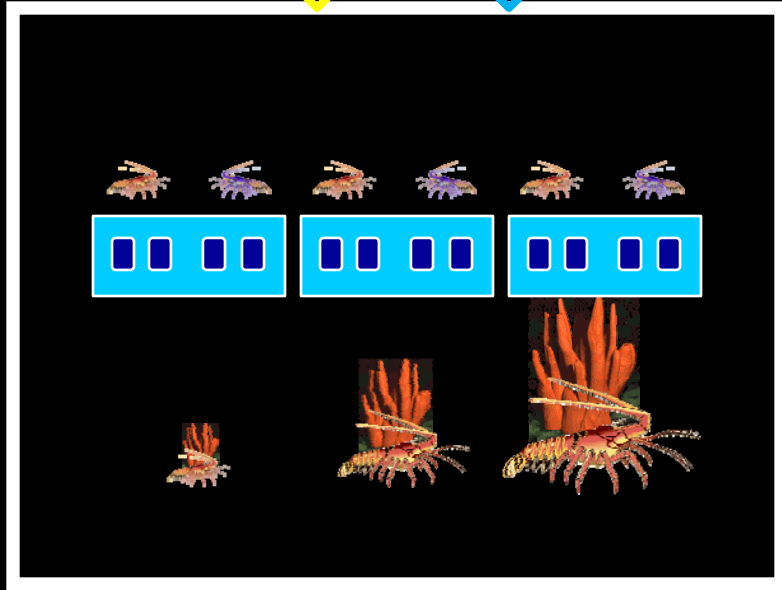
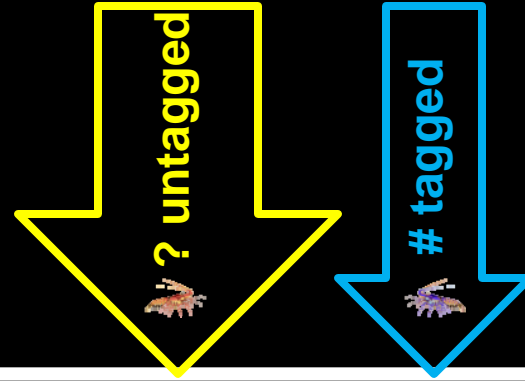




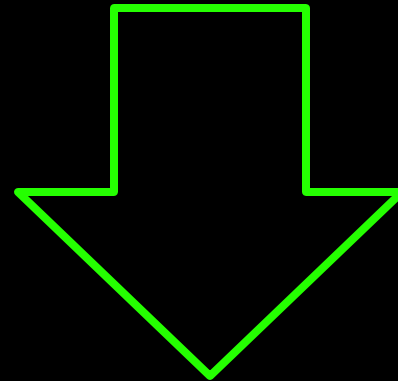


Larval Supply

Settlement Hypothesis



Mortality



Speciospongia vesparum before



Speciospongia vesparum after

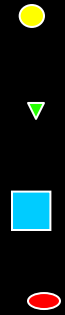
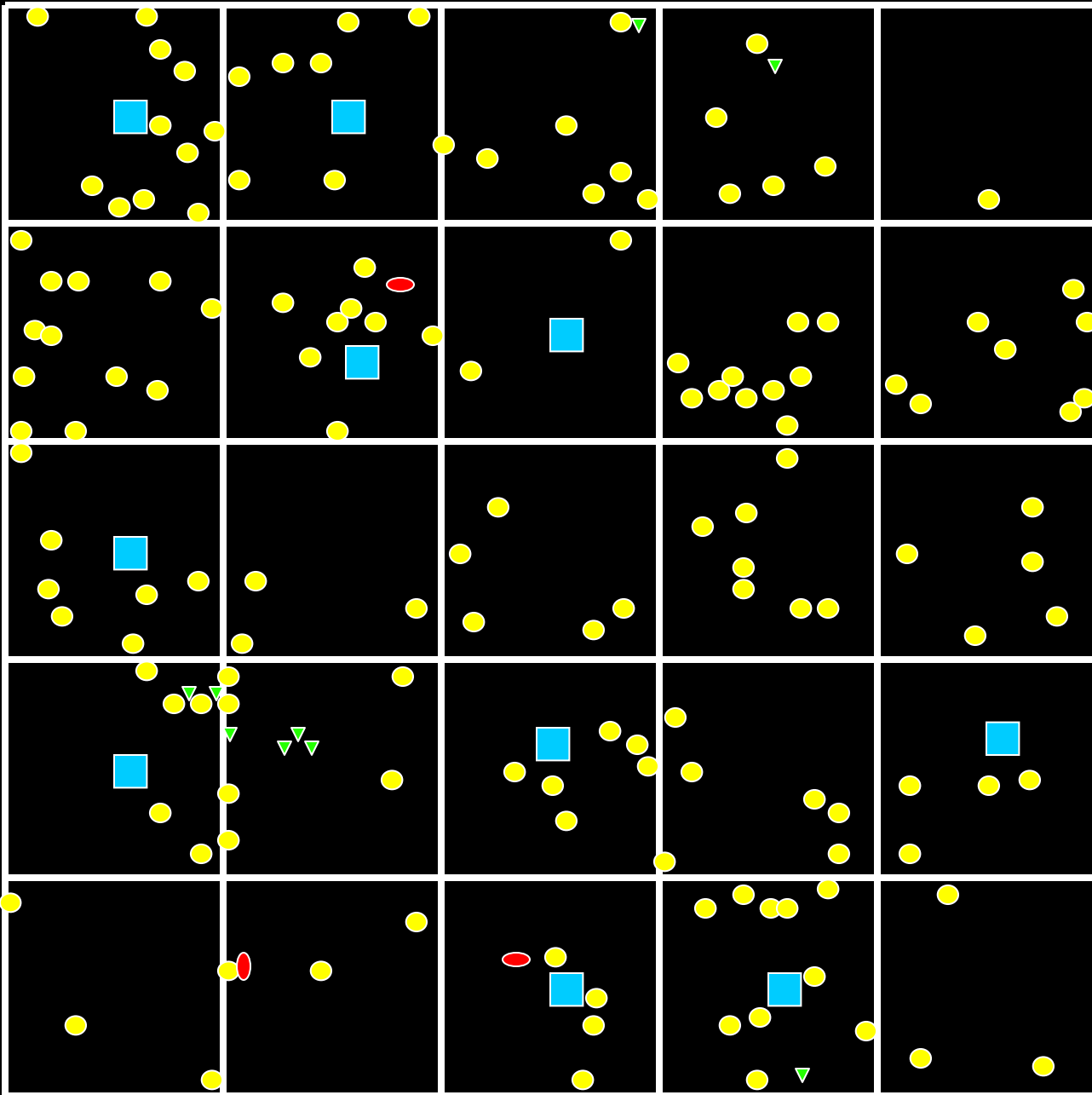


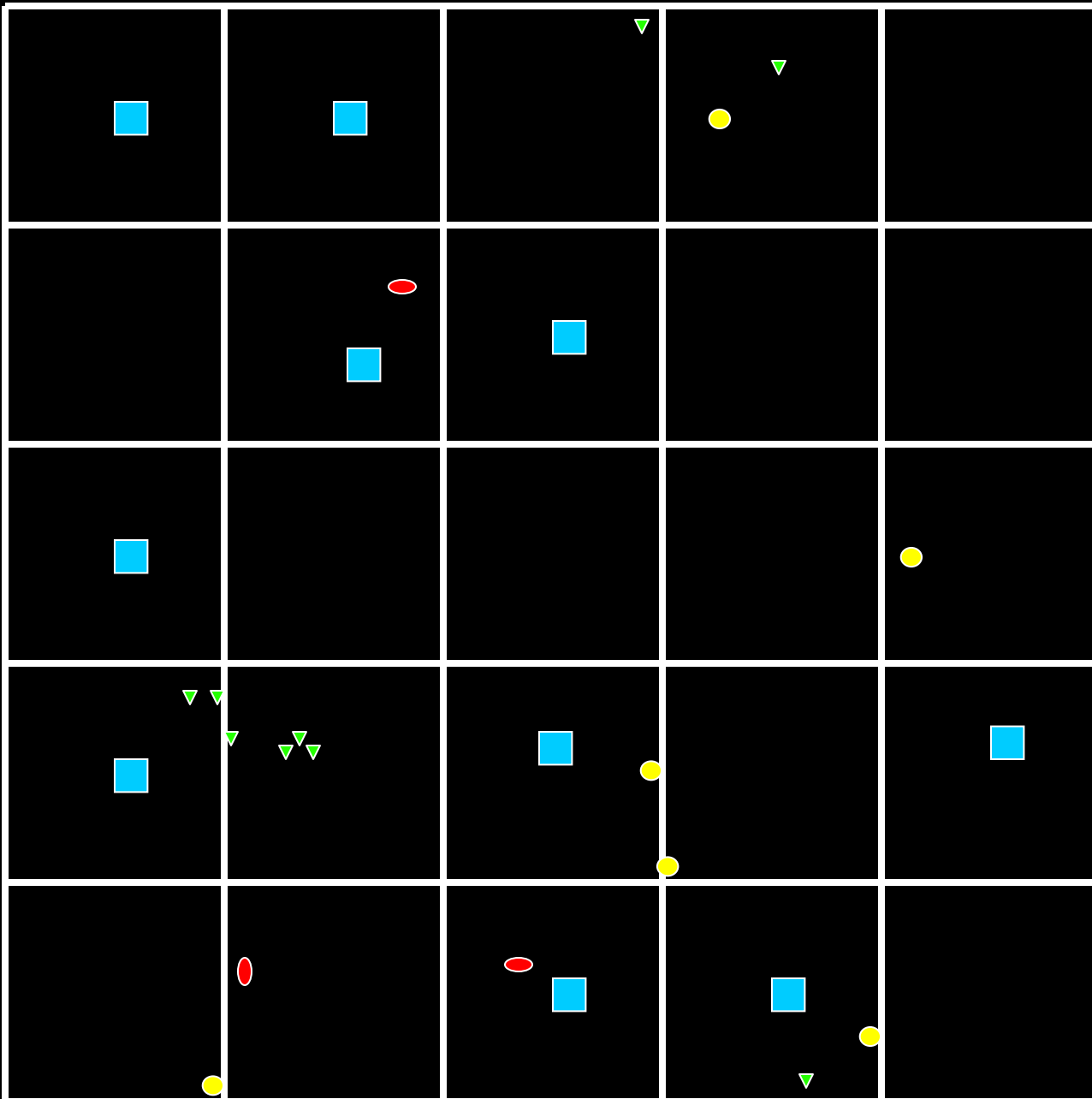
Ircinia campana before

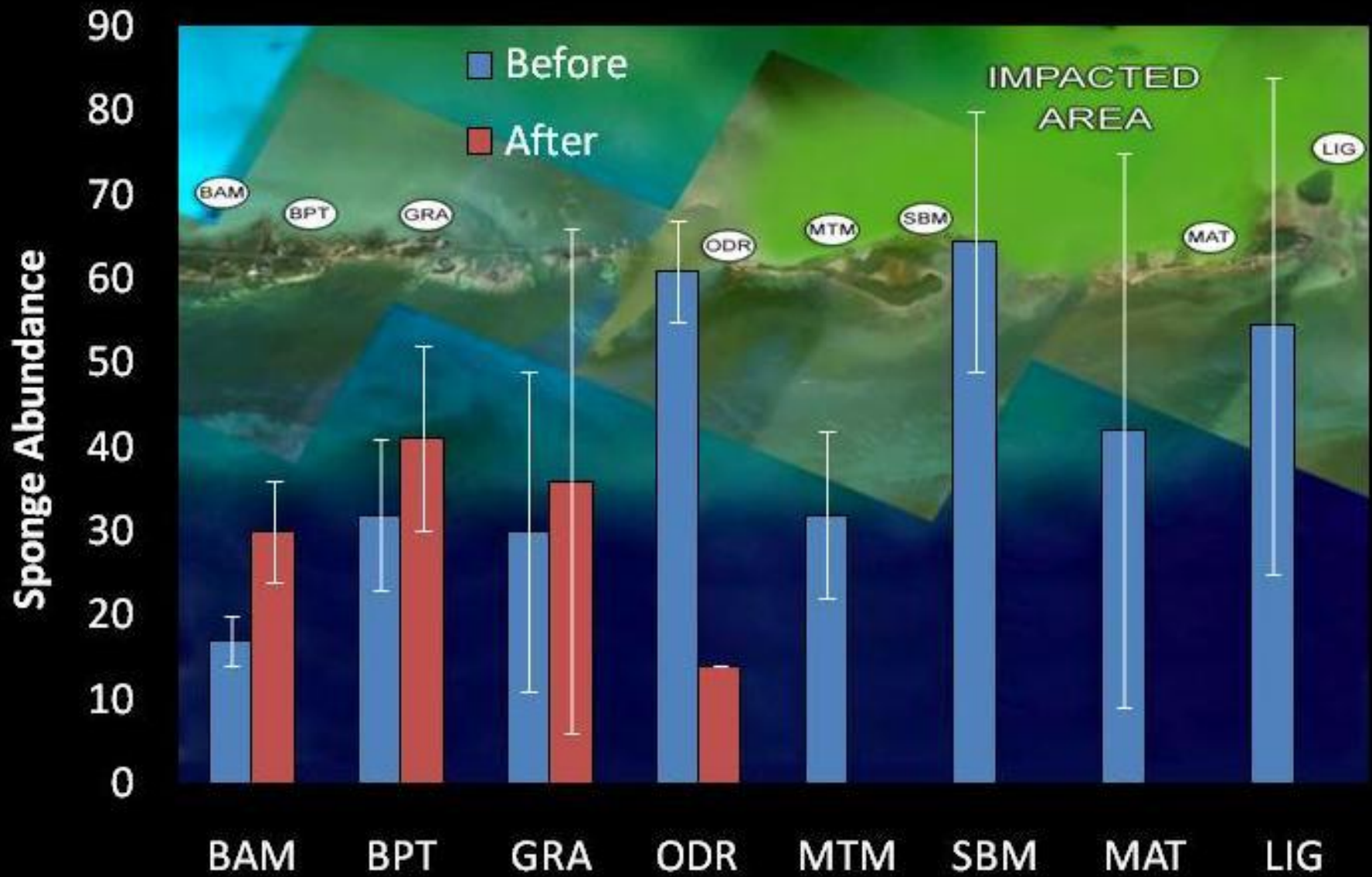


Ircinia campana after





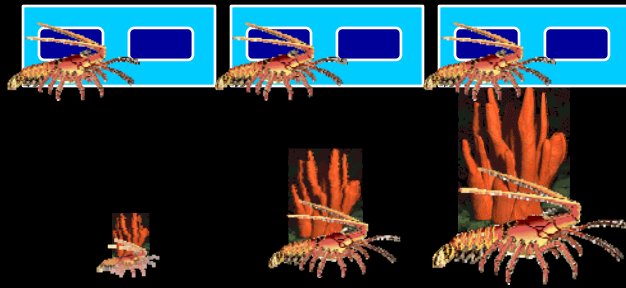




Before - 2006

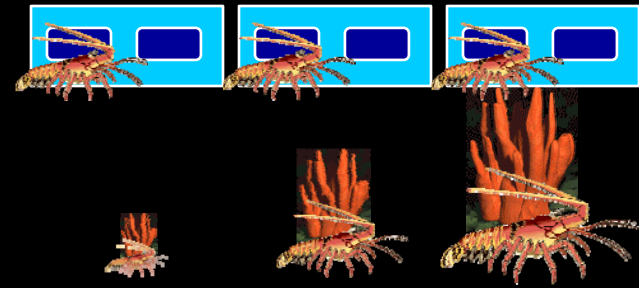
No Impact

Large Shelters



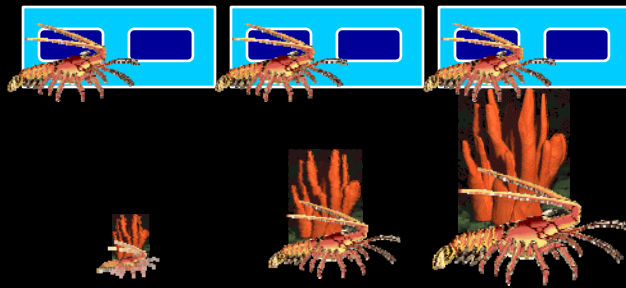
Impact

Large Shelters

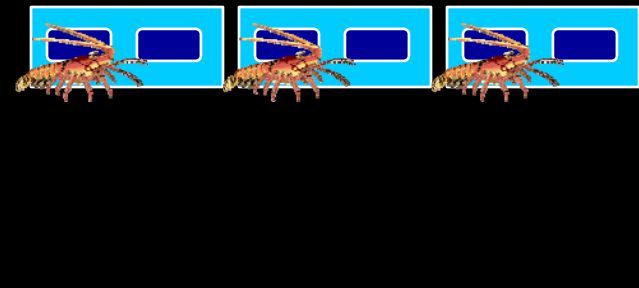


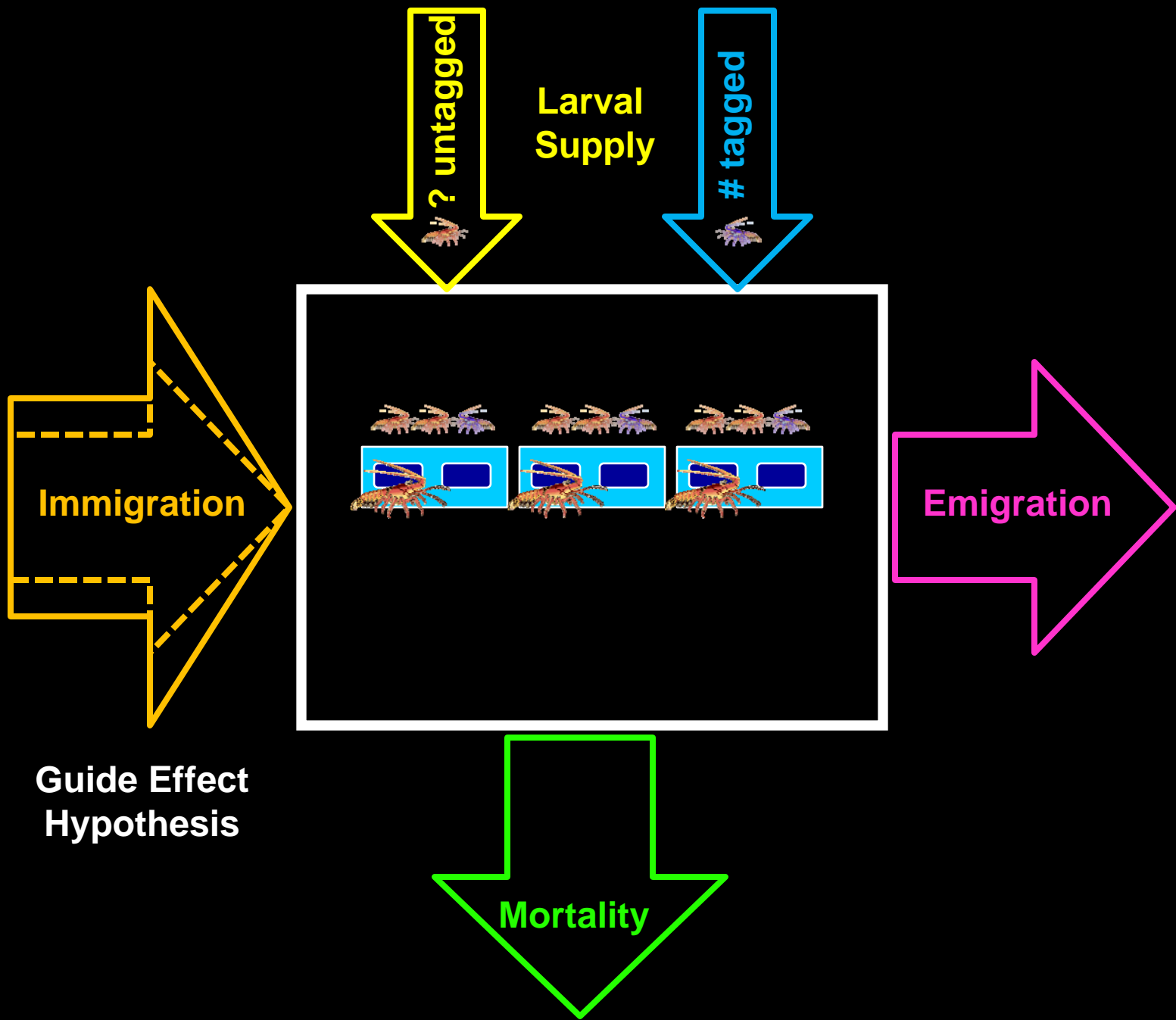
After - 2008

Large Shelters

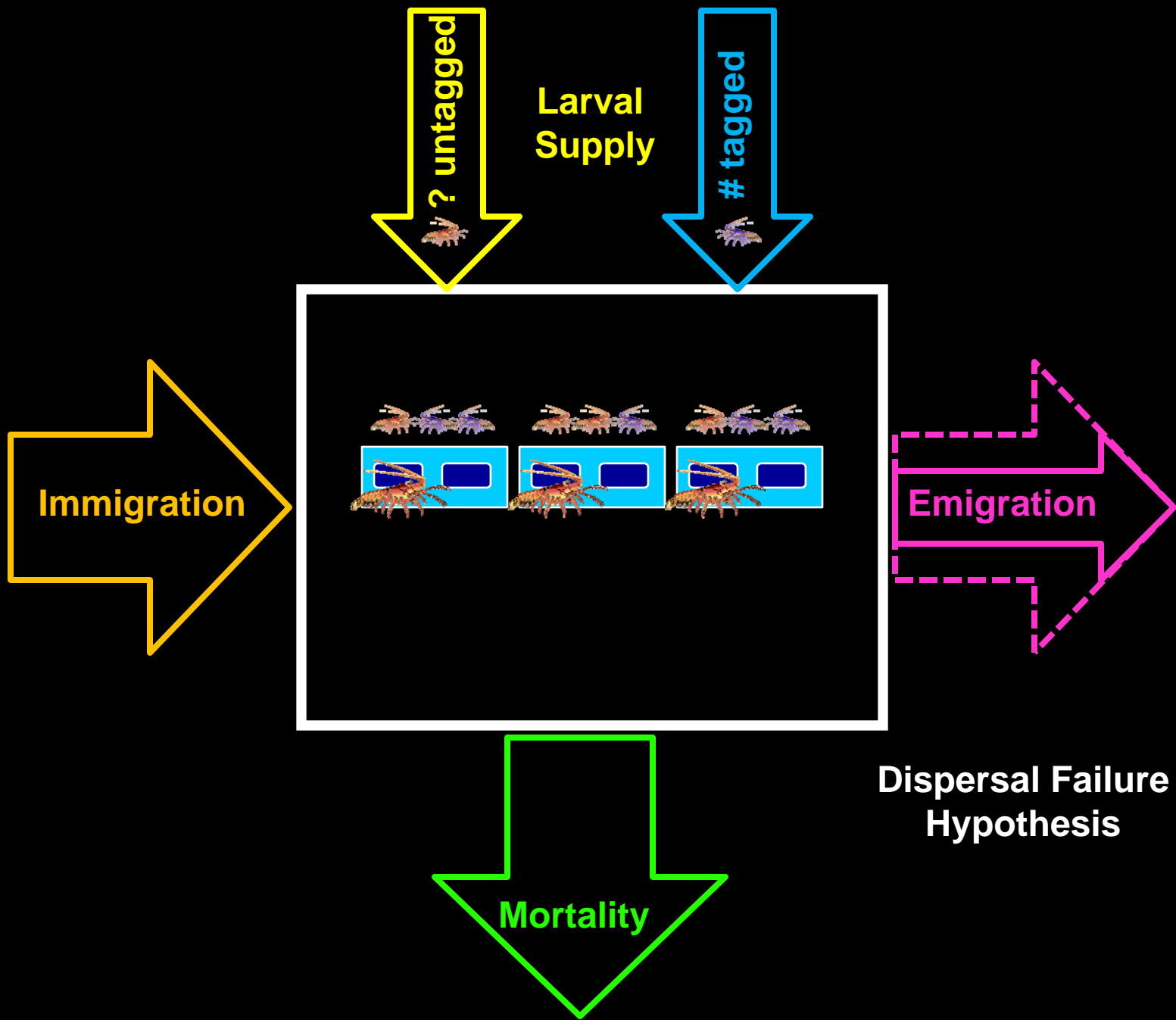


Large Shelters

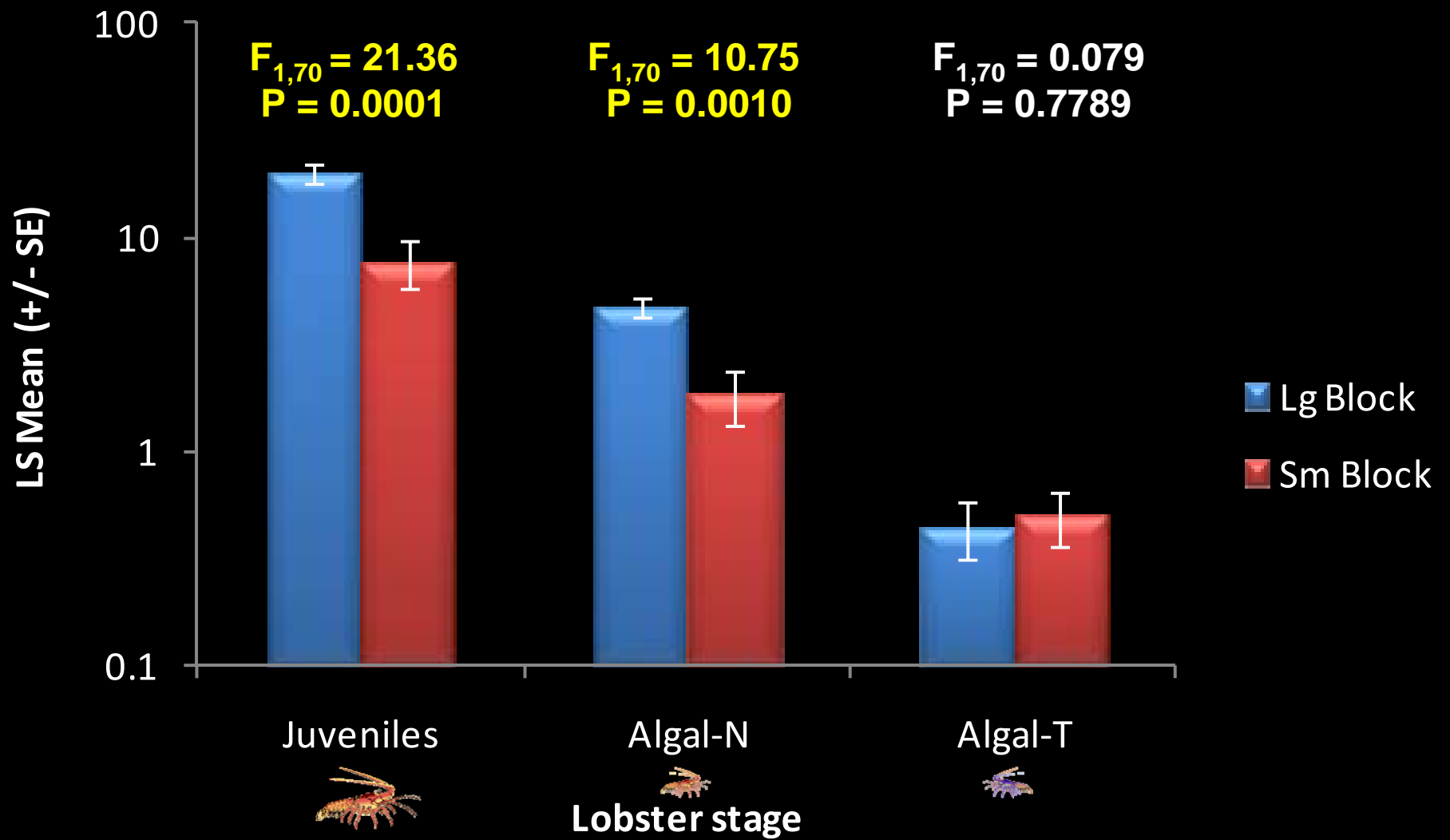




Guide Effect Hypothesis



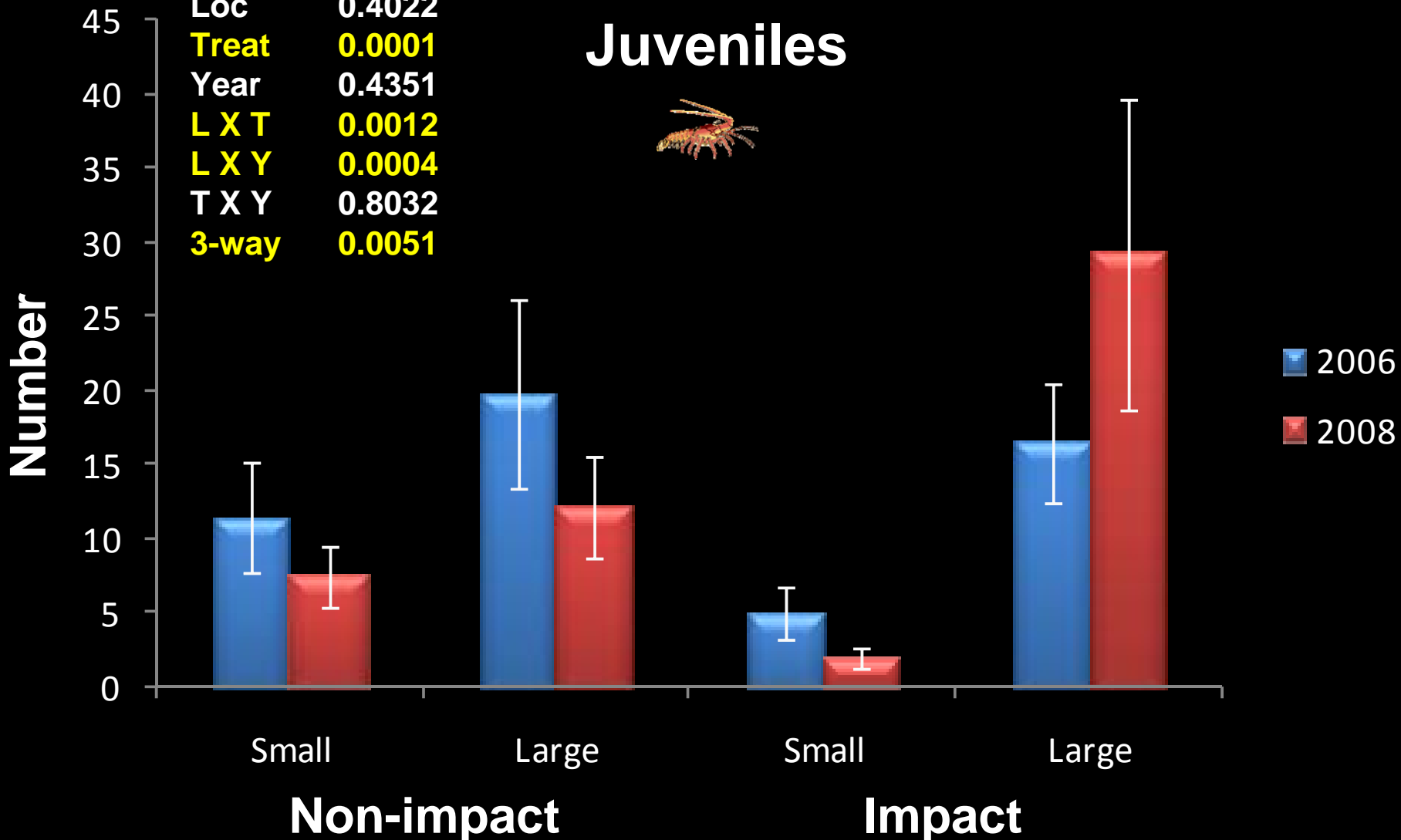
Dispersal Failure Hypothesis



Juveniles



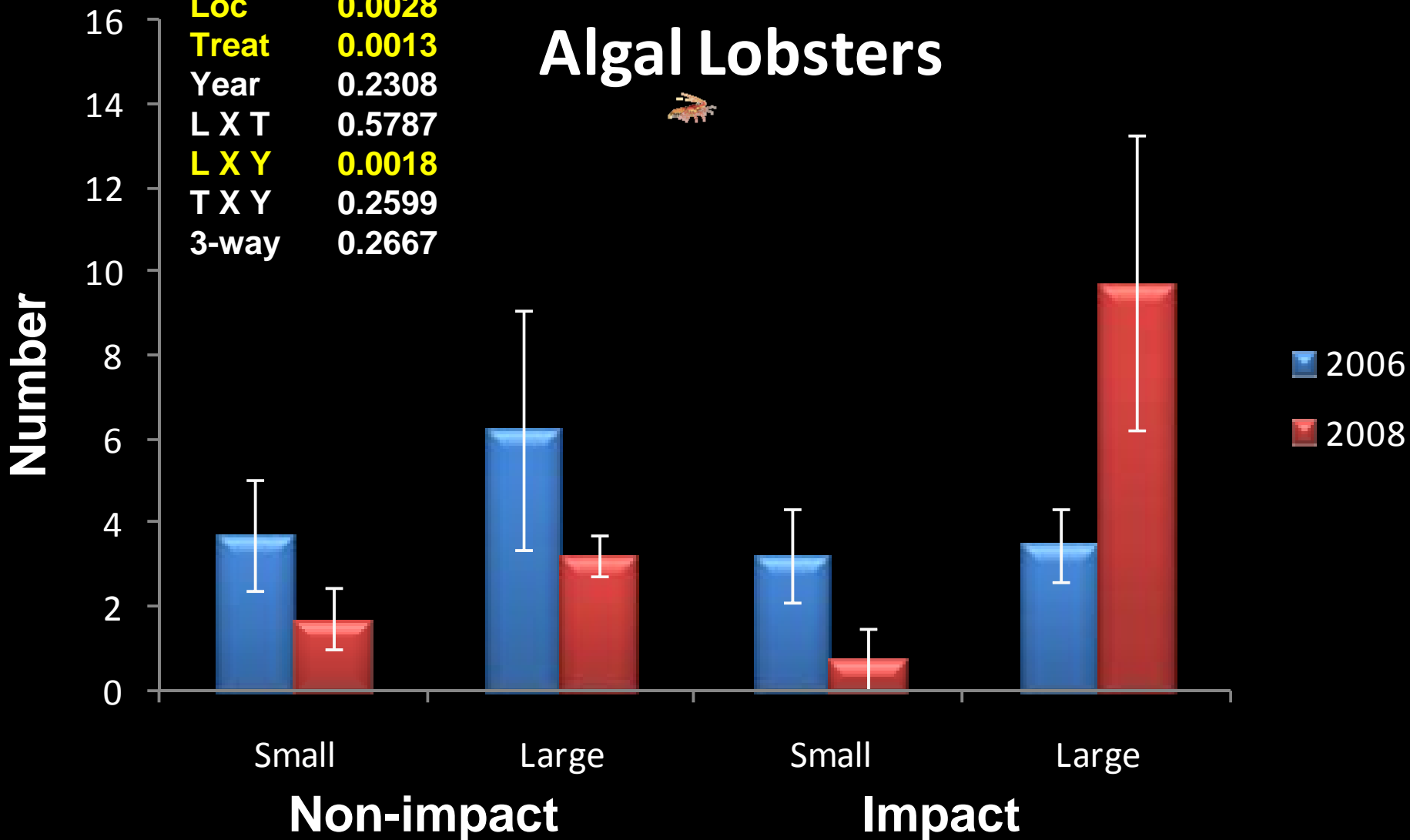
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Loc	0.4022
Treat	0.0001
Year	0.4351
L X T	0.0012
L X Y	0.0004
T X Y	0.8032
3-way	0.0051



Algal Lobsters



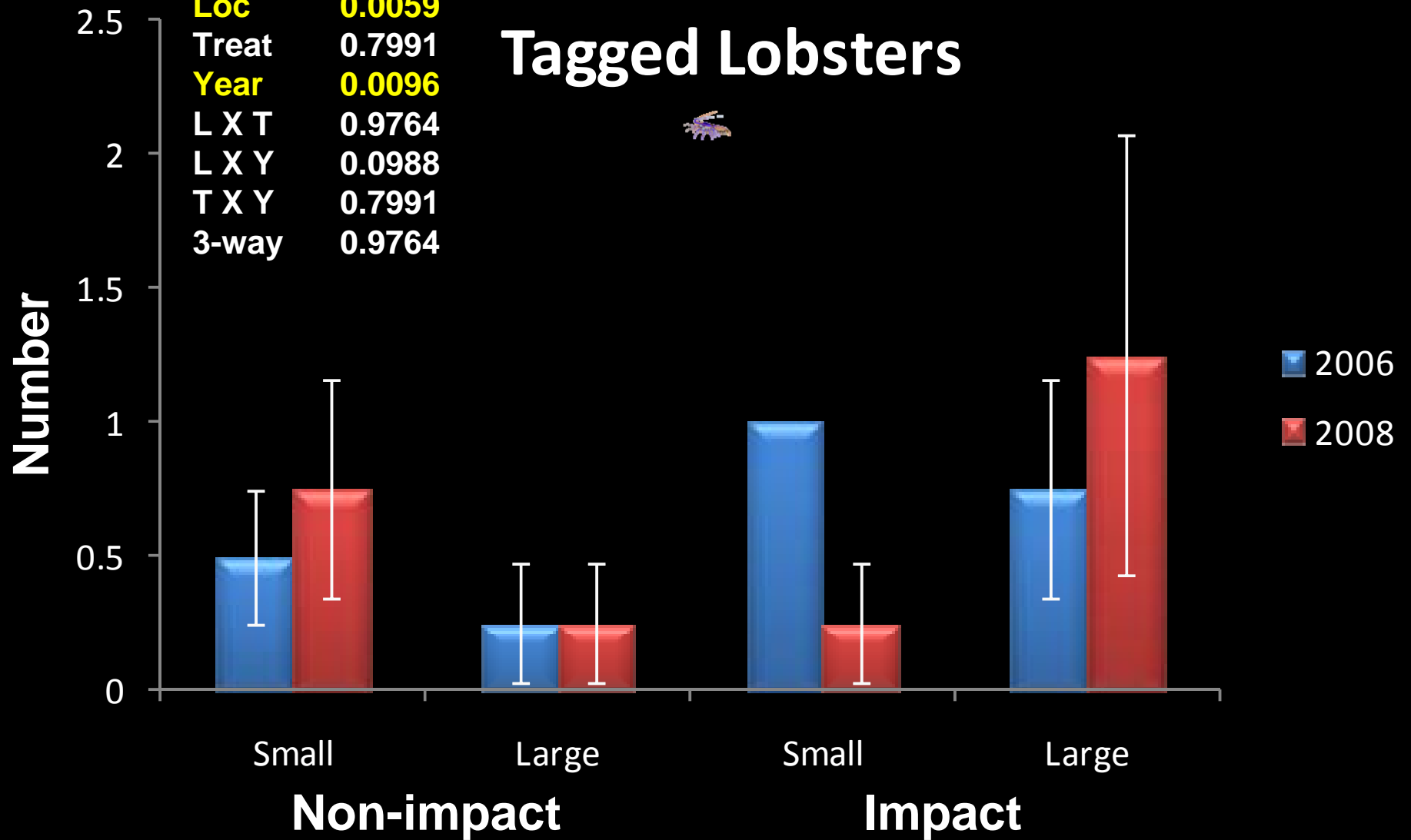
<u>Source</u>	<u>P-value</u>
Loc	0.0028
Treat	0.0013
Year	0.2308
L X T	0.5787
L X Y	0.0018
T X Y	0.2599
3-way	0.2667

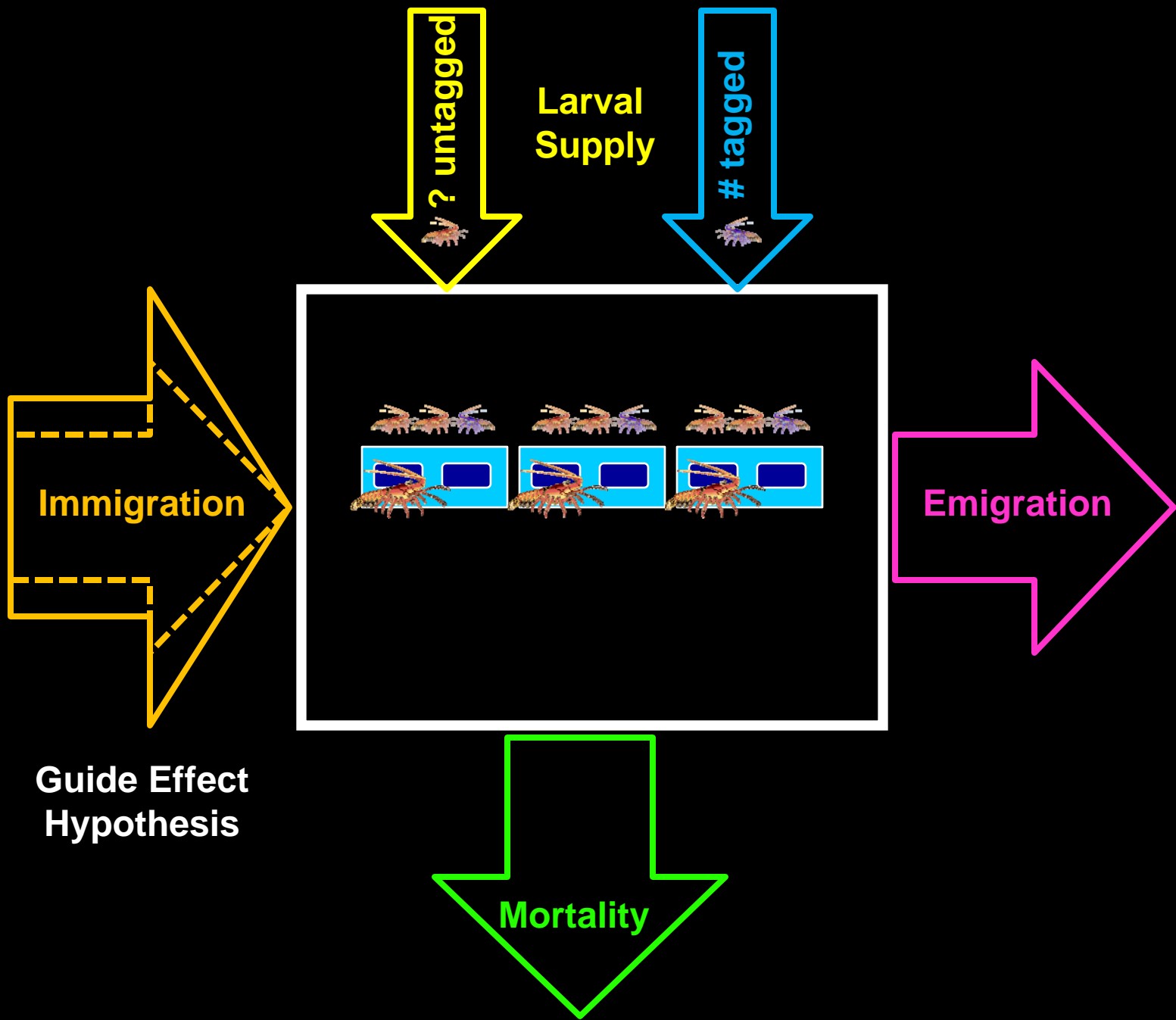


Tagged Lobsters



<u>Source</u>	<u>P-value</u>
Loc	0.0059
Treat	0.7991
Year	0.0096
L X T	0.9764
L X Y	0.0988
T X Y	0.7991
3-way	0.9764





Guide Effect Hypothesis

Conclusions

- ◆ **Conspecific density may increase postlarval settlement by conspecific attraction**
- ◆ **Conspecific density may increase immigration when shelter availability is limited**

Management Recommendations

- ◆ **Protect natural crevice shelters by reducing cyanobacteria blooms**
- ◆ **Maintain corridors of shelter-rich habitats from nursery to reproductive habitats**
- ◆ **Eliminate the use of juvenile lobsters as attractants in the trap fishery**

Acknowledgements

◆ Funding

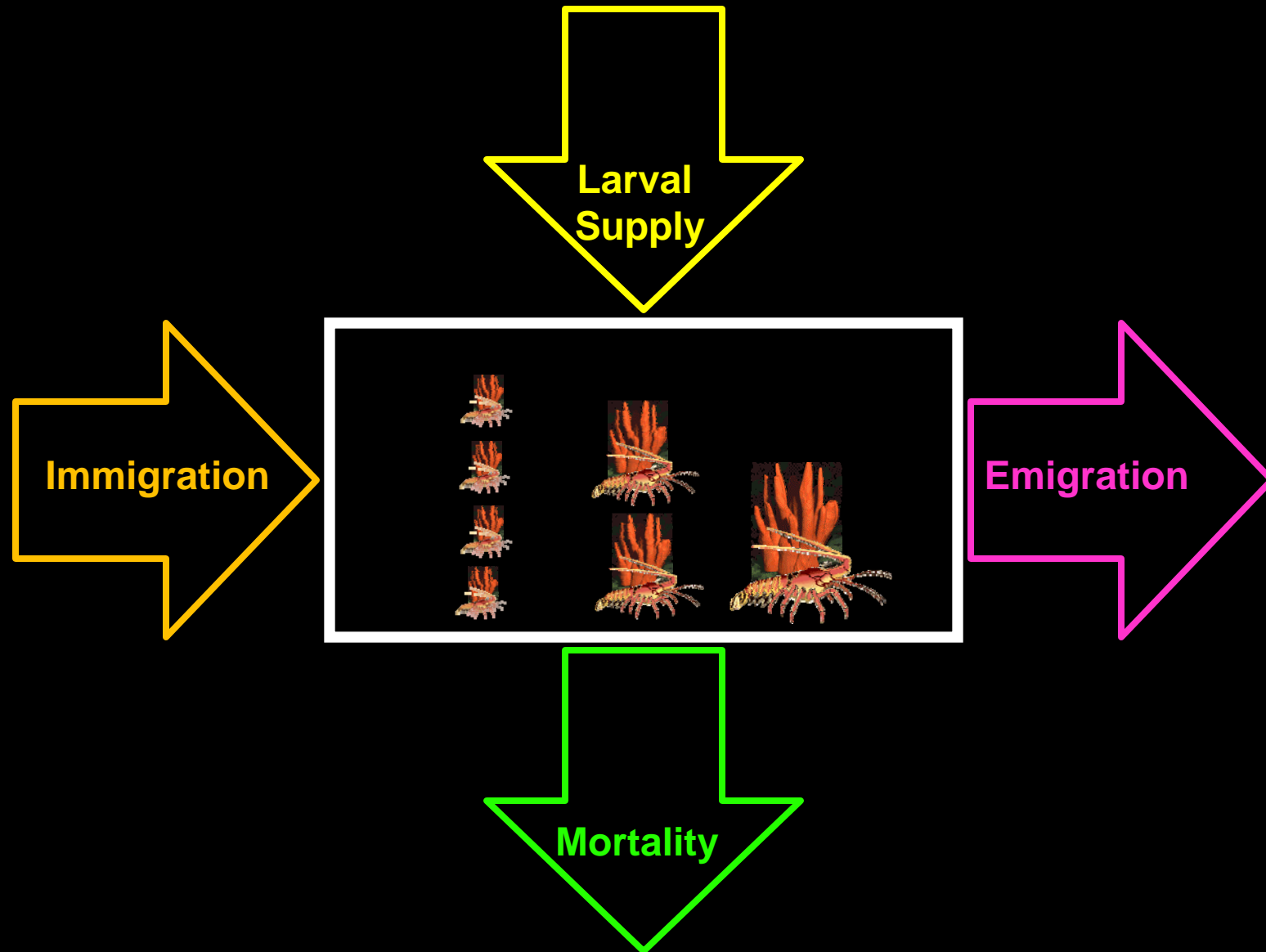
- Florida FWC
- PADI Foundation
- Clemson University

◆ Field assistants

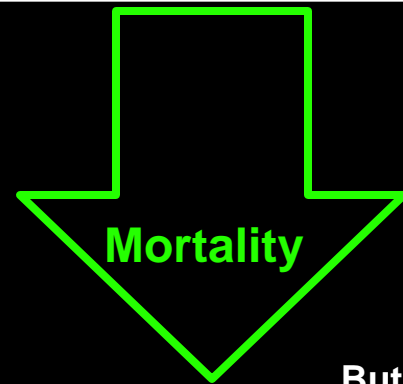
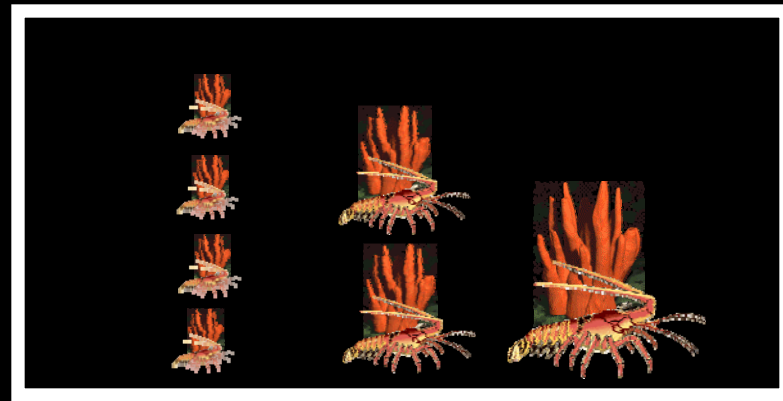
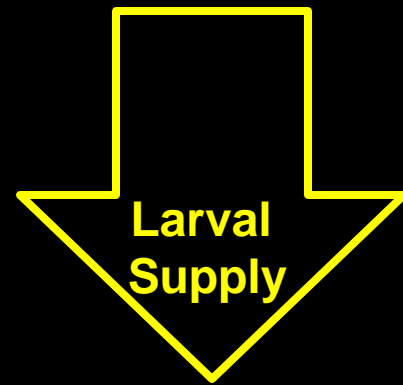
- Adrianna Zito-Livingston
- Sarah Rider
- Nyssa Silbiger
- Tami Mayer
- Peter Bouwma
- Tim Jordan



What limits density?



What limits density?



Florida Bay

- JEP 1991-92 27 sites
- JEP2 1992-93 24 sites
- Allee 2006-08 16 sites



Lignumvitae Basin

Indian Key

