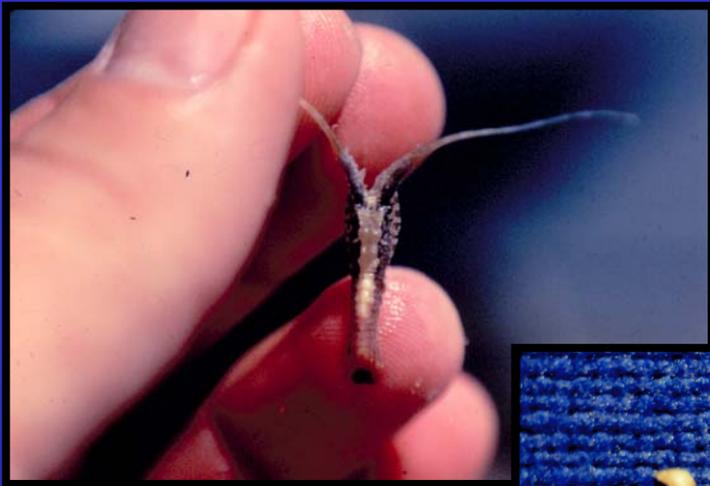




Long-term *Panulirus argus* Puerulus Influx Monitoring in the Florida Keys

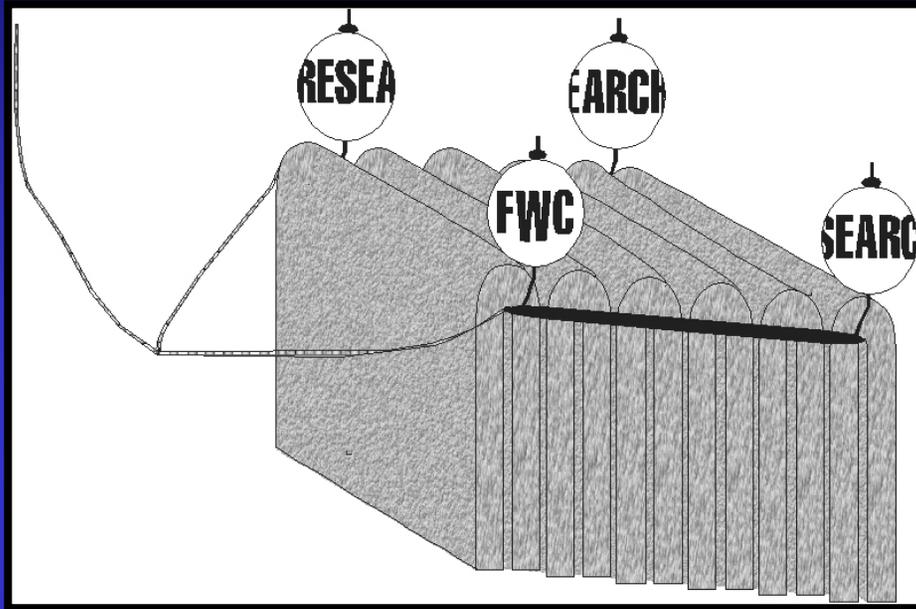


- Postlarval spiny lobster settlement monitoring in the Florida Keys since 1987

Initial Objective

- Establish a long-term record of recruitment to the Florida Keys for use in predicting future spiny lobster landings and abundance.

Methods & Gears



Modified Witham Collector

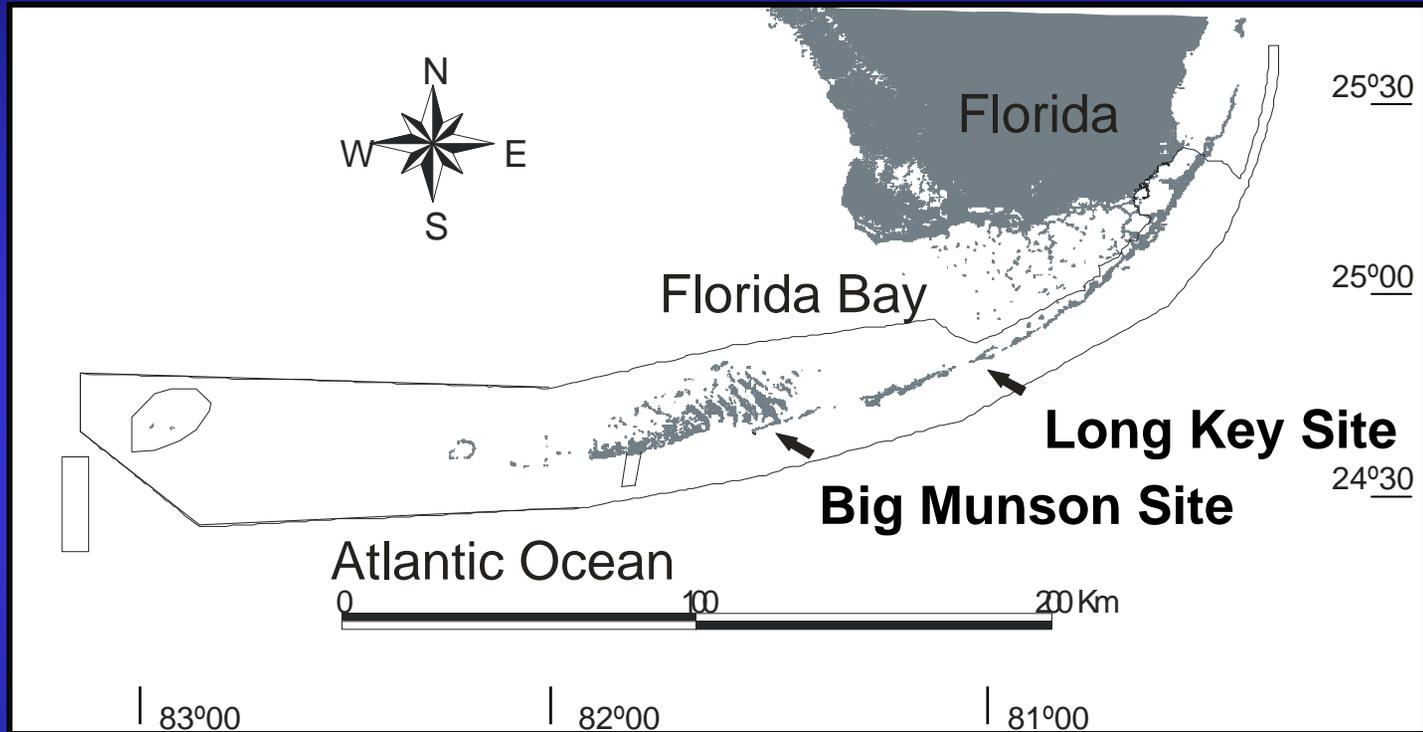
- Hog's hair air conditioner filter material
- PVC frame
- Buoyed at the surface <2m water depth
- 12 week max collector age

Sampling Methods

- Collectors brought aboard in a mesh bag
- Postlarvae counted & grouped by metamorphosis stage:
 - Transparent
 - Semi pigmented
 - Pigmented
 - Juvenile



Sample Locations



- 5 Collectors parallel to shore
- Near inter-island channels

GULF OF MEXICO

Panulirus argus

 RECRUITMENT TO NURSERY AREAS



Sampling Intensity

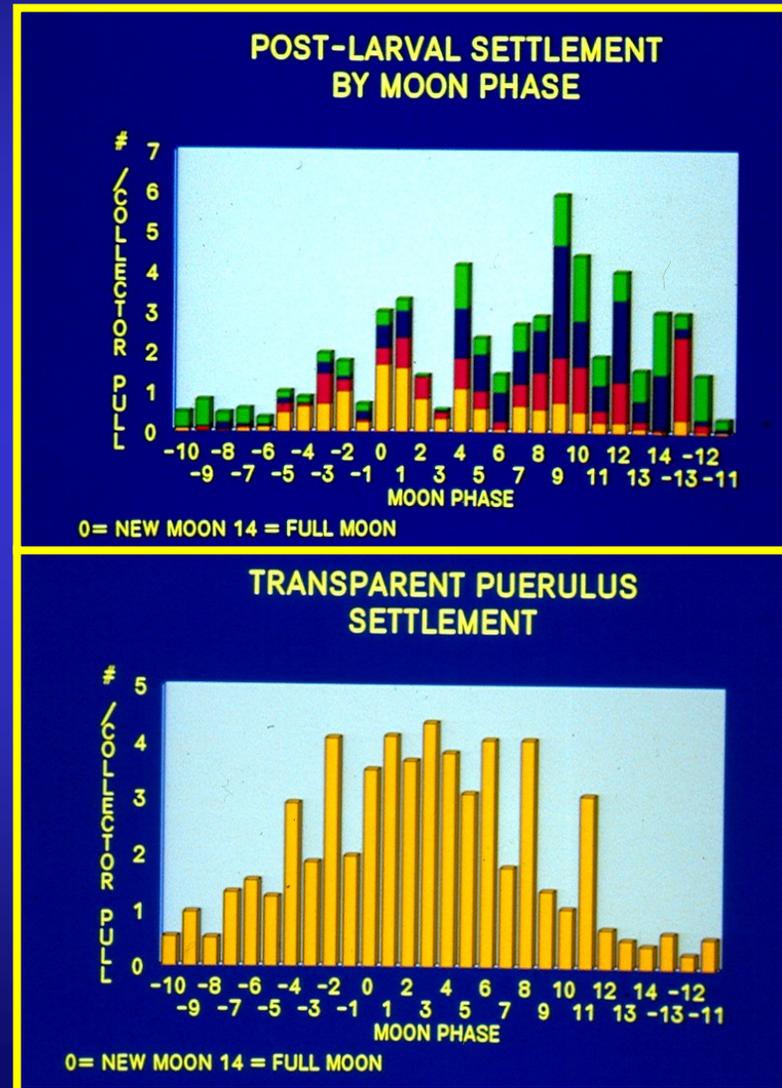
Preliminary Testing

- Early phase of project at Big Munson (1987)
 - Weekly sampling until 1991
 - too labor intensive
- Several preliminary studies to determine if sampling intensity could be reduced
- How often?
- When in the lunar cycle?

Sampling Intensity

Puerulus Settlement

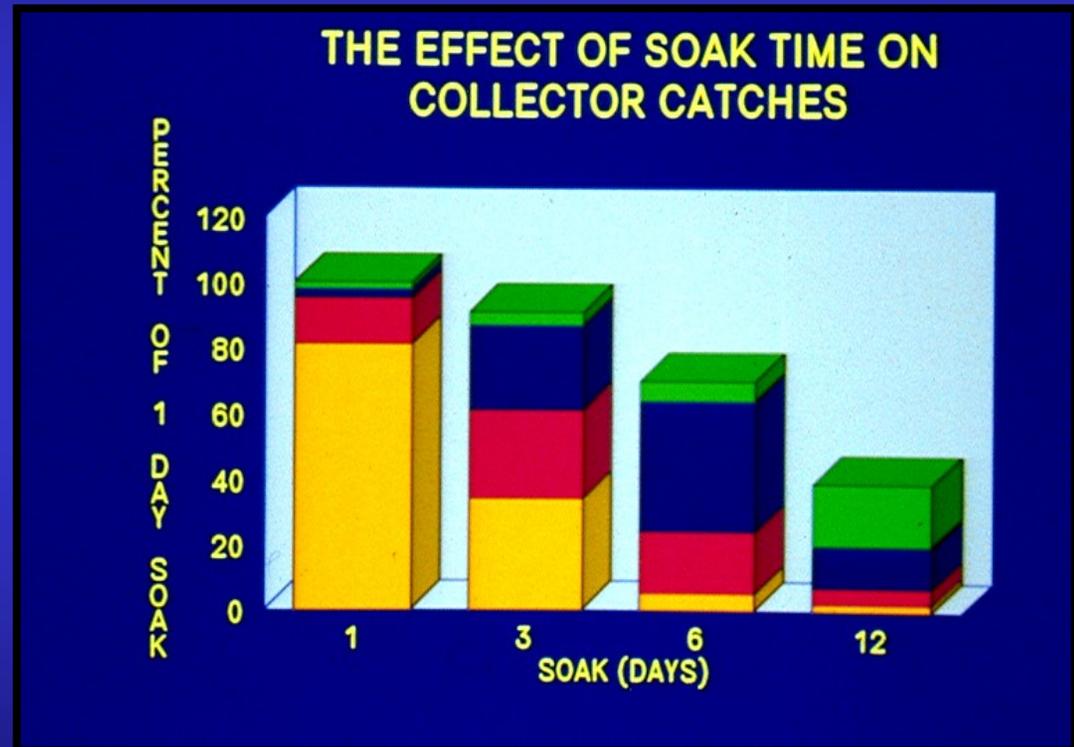
- Lunar cycle settlement patterns
- All metamorphic stages adjusted to transparent settlement time
 - Lab studies of metamorphosis time
- Bulk of puerulus settlement about day +2
 - Settle under cover of darkness following the new moon



Sampling Intensity

Soak Time/PL time on collector

- How long do the PLs stay on the collector?
 - 1st stage juveniles leave collector in search of food
- Examined soak time of postlarvae and catch
- Soak time of <6 days maintains >70 % of 1 day soak catch



Sampling Intensity

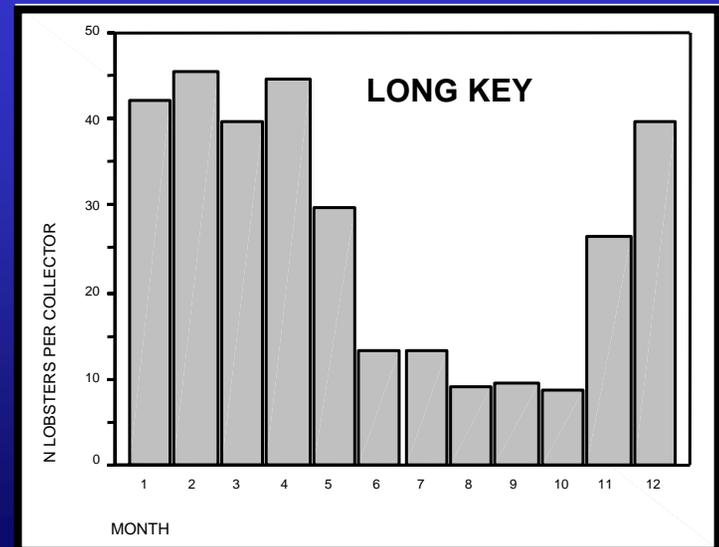
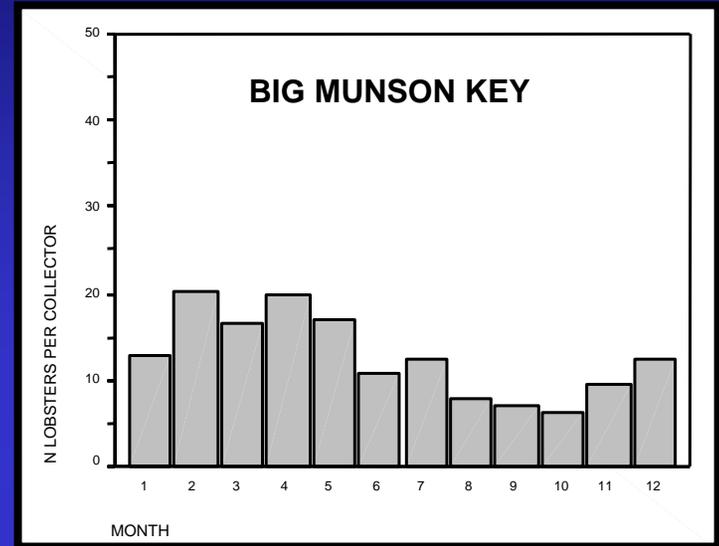
Monthly

- Sampling in the first quarter of lunar cycle (+7) maintains 70-90% of a daily catch rate by:
 - Maximizing catch from bulk of puerulus settling (day +2)
 - Minimizing losses by sampling at <6 soak days (+7)
- Still reflects seasonal trends apparent in more intense sampling regime
- Monthly sampling on +7 since 1991

Seasonal Trends in *Panulirus argus* Postlarval Settlement

Mean # lobsters per collector per month

- Big Munson
 - March 1987-Sept 2004
- Long Key
 - June 1993-Sept 2004



Time Series Analysis

Mean number of PL per collector per year over time
Adjusted October-September year

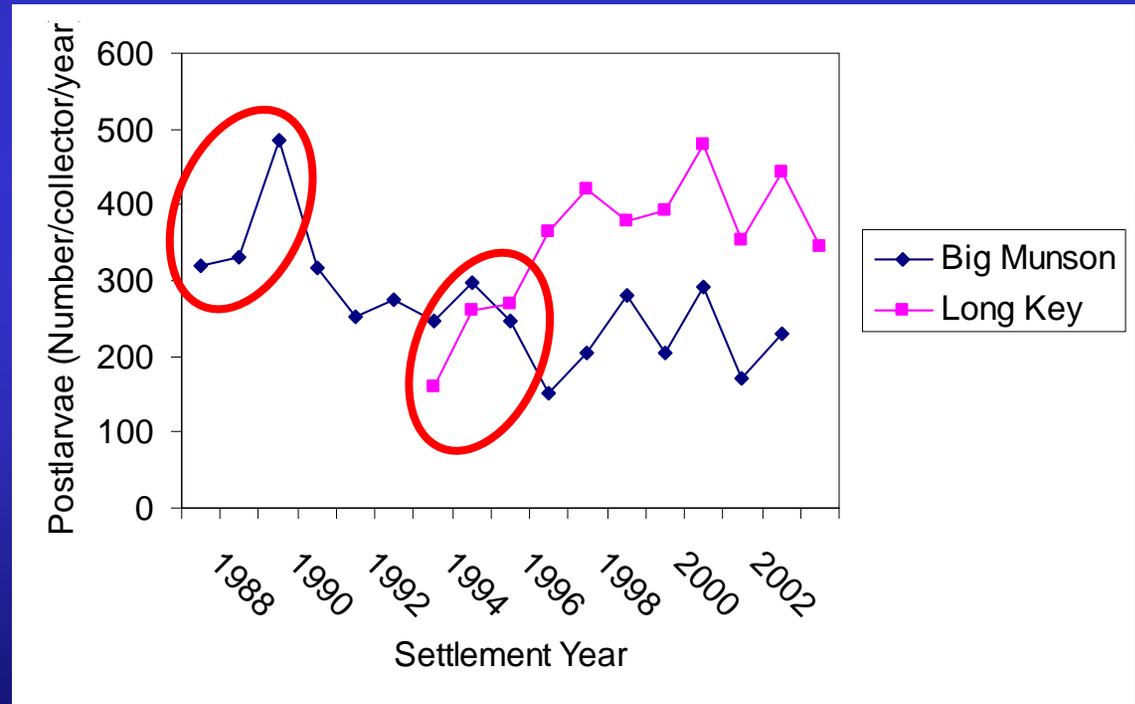
• ~~Early mean number of years is so small that both sites trend~~

• **Big Munson**

• **Big Munson** 3-4 changes
in methodology

• **Long Key**

• **Long Key** years known



Database Components

- Site
- Date
- Lunar Date
- Individual Collector ID
- Collector Position (among 5 at site)
- Soak Time/Collector Age
- Numbers of lobster PL/collector/month
 - Grouped by 4 stages of metamorphosis



Additional PL Influx Data

Project Site	FWCBIGM		FWCLK		JEP		MISC		RCRT	
	Minimum	Maximum								
BEARPL
BIGMPL	MAR 1987	SEP 2004	.	.	JUN 1991	JAN 1992	JUN 1985	AUG 1985	JUL 1998	MAR 2000
BOCAPL	JUN 1998	MAR 2000
CCPL	JUL 1998	DEC 1998
CH2PL	JUL 1989	JUL 1989	.	.
CH5PL	AUG 1989	JUL 1990	.	.
CONKPL	JUN 1991	OCT 1993	SEP 1984	JUL 1990	.	.
CUDJPL	JUN 1998	MAR 2000
GRASSPL	JUN 1985	JUL 1986	.	.
LDCKPL	JUN 1998	MAR 2000
LKEPL	NOV 1992	FEB 1993	SEP 1984	JUN 1989	.	.
LKWPL	.	.	JUN 1993	SEP 2004	MAY 1991	OCT 1993	.	.	JUN 1998	JUL 2009
LSNDPL	JUN 1998	MAR 2000
TAVPL	JUN 1998	MAR 2000
TOMHPL	JUN 1989	JUL 1990	JUL 1998	MAR 2000
TORTPL	OCT 1992	MAR 1993

SEDAR

- Usefulness of long-term database
 - Index of stock recruitment
 - Tuning index for abundance estimates, not a predictor
 - Disconnect between landings and recruitment patterns limits landings and abundance prediction as stated in initial objectives
- Additional PL recruitment data
 - Robust enough for use with SEDAR?