

The MARMAP/SEAMAP-SA/SEFIS Reef Fish Monitoring Program

An update of 2012 sampling activities and trap CPUE.



April - 2013
Snapper Grouper AP



- MARMAP since 1972, with reef fish sampling since late 70's
Live bottom habitat sampling using fish traps since 1978
- SEAMAP-SA since 1986, with reef fish sampling since 2009
- SEFIS since 2010, introduction of video on traps



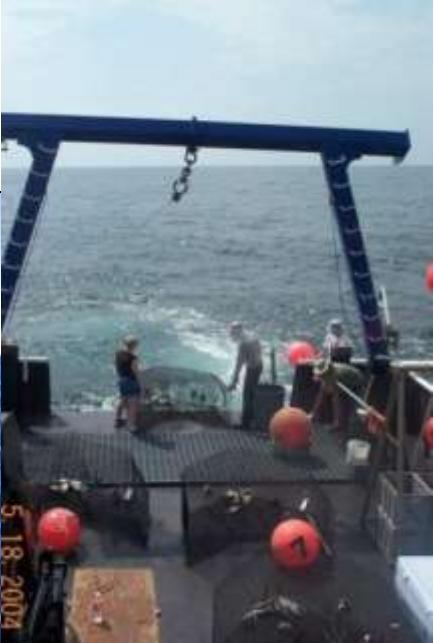
Primary tasks of monitoring programs:

- Monitor abundance of reef fishes (various gears incl. traps and video)
- Conduct life history studies
- Conduct research and provide data and analyses in support of stock assessments and fisheries management
- Investigate and map bottom habitat



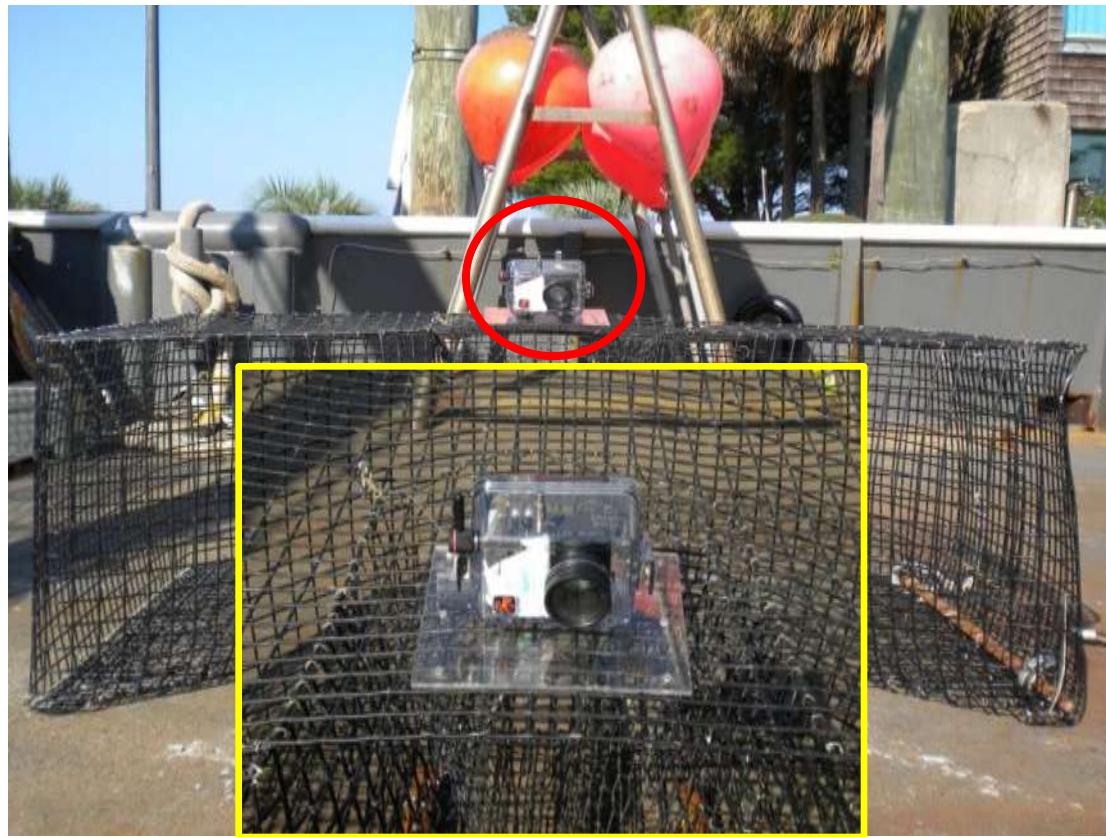
Chevron trap

- Used consistently since 1988
- Standardized since 1990
- Deployed in depths to \approx 120 m
- Soak time \approx 90 minutes
- Baited with clupeids
- Digital still camera since 2008
- Video cameras since 2010



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R/V Palmetto
MARMAP/SEAMAP
SC-DNR

R/V Savannah
SEFIS
SKIO



35 - 60 days at sea per vessel
5 -12 days per cruise

Sampling - design

2,685 of sampling stations with known live bottom habitat

Random selection of these stations at least >200m apart.



Sampling - geographical focus

MARMAP/SEAMAP: NC and SC

SEFIS: GA and FL

Sample - processing and data analysis

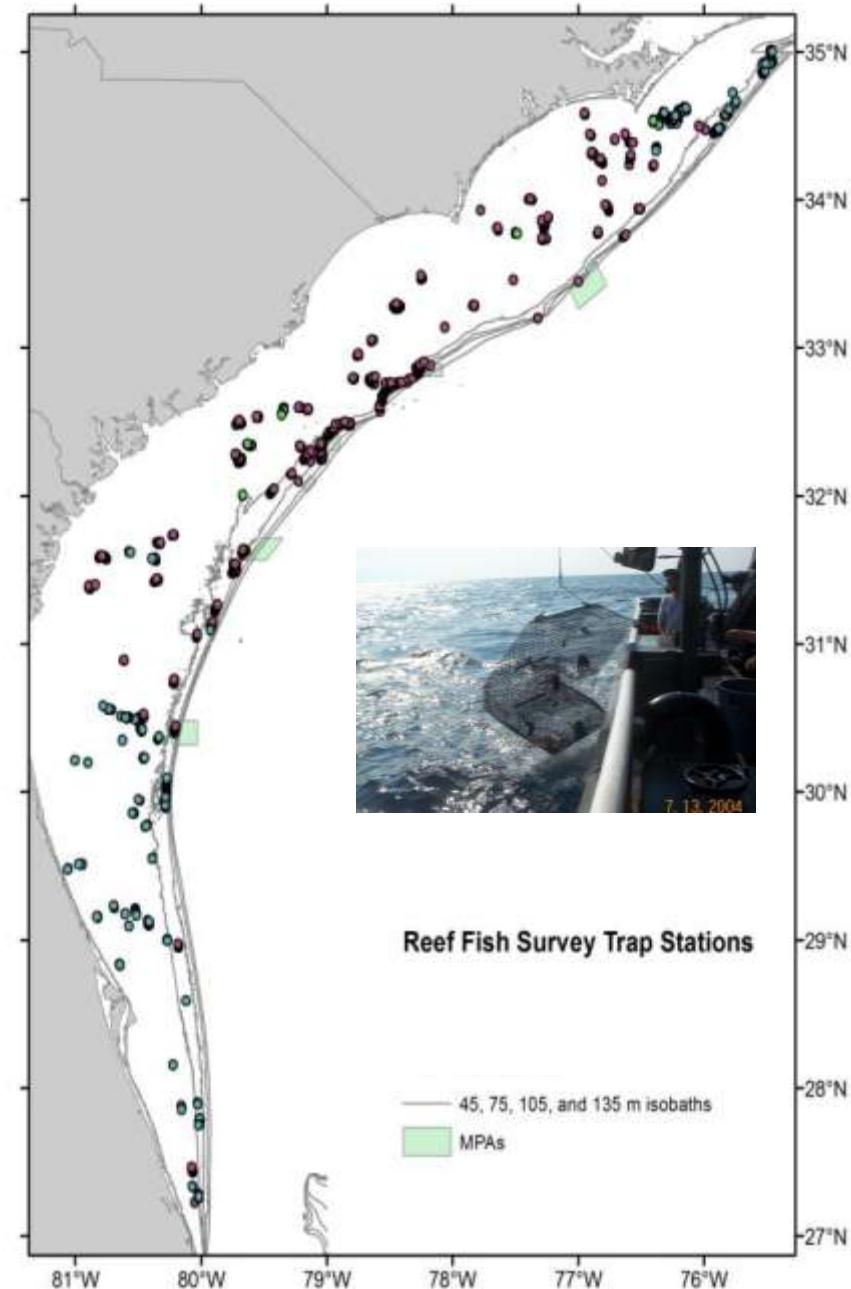
CPUE: Combined effort

Life history: MARMAP/SEAMAP-SA

Video : SEFIS

Data

One combined comprehensive data base
Managed in collaboration



MARMAP/SEAMAP-SA Reef Fish
2006 – 2009:
690 collections annually



MARMAP/SEAMAP-SA/SEFIS
2010 – 2012:
1,000 - 1,500 collections annually

MARMAP funding reduction affected sampling in 2012:

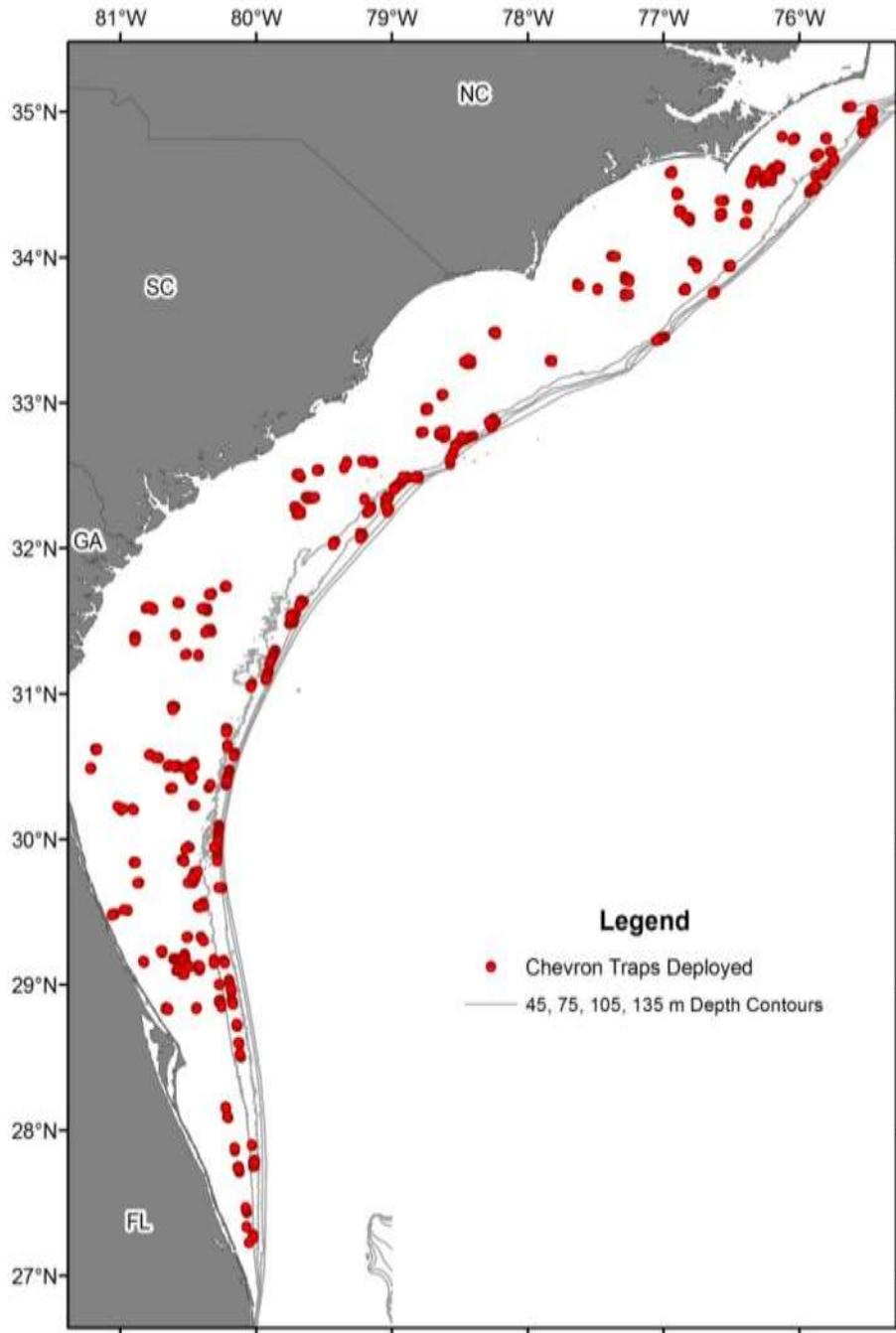
- Reduction in sea days and processing staff.
- Halting of short and long bottom long line surveys
(affecting data for species such as snowy grouper, tilefish, and amberjack)

2012 Summary

- 1,393 traps deployed
(all with video cameras)
- 458 other gears deployments
(CTD, H&L, etc.)
- Collected, identified, weighed and measured 74 species - 40,400 fish
- 9,359 fish - 40 species kept for life history studies
(age, growth, reproduction)

Diet studies:

- Completed sampling: red porgy, vermillion snapper, gray triggerfish
- Ongoing: groupers, red snapper, squirrelfish



2012 Reef Fish Survey catches - Most common species

Common_Name	Scientific_Name	Other gear	Chevron trap	total
Black sea bass	<i>Centropristes striata</i>		20,361	20,361
Tomtate	<i>Haemulon aurolineatum</i>	2	7,526	7,528
Scup and longspine porgy	<i>Stenotomus sp.</i>		4,139	4,139
Red porgy	<i>Pagrus pagrus</i>	8	2,331	2,339
Gray triggerfish	<i>Balistes capriscus</i>		1,148	1,148
Vermilion snapper	<i>Rhomboplites aurorubens</i>	78	1,095	1,173
Bank sea bass	<i>Centropristes ocyurus</i>		1,053	1,053
Sand perch	<i>Diplectrum formosum</i>		433	433
Red snapper	<i>Lutjanus campechanus</i>	38	430	467
White grunt	<i>Haemulon plumieri</i>	6	351	357
Spottail pinfish	<i>Diplodus holbrookii</i>		300	300
Pinfish	<i>Lagodon rhomboides</i>		177	177
Planehead filefish	<i>Stephanolepis hispidus</i>		105	105
Knobbed porgy	<i>Calamus nodosus</i>		66	66
Scamp	<i>Mycteroperca phenax</i>	17	63	80
Cubbyu	<i>Pareques umbrosus</i>		55	55
Jackknife fish	<i>Equetus lanceolatus</i>		54	54
Gag	<i>Mycteroperca microlepis</i>	25	47	72
Snowy grouper	<i>Epinephelus niveatus</i>	76	44	120
Red grouper	<i>Epinephelus morio</i>	3	41	42
Blueline tilefish	<i>Caulolatilus microps</i>	11	32	43

21 most abundant species in trap catches in 2012

2012 life history samples

common name	Scientific name	Other gear *	Chevron trap	Total
Black sea bass	<i>Centropristes striata</i>		4,829	4,829
Red porgy	<i>Pagrus pagrus</i>	60	1,700	1,760
Vermillion snapper	<i>Rhomboplites aurorubens</i>	113	514	627
Gray triggerfish	<i>Balistes capriscus</i>		505	505
Red snapper	<i>Lutjanus campechanus</i>	96	430	526
White grunt	<i>Haemulon plumieri</i>	3	331	334
scamp	<i>Mycteroperca phenax</i>	93	62	155
Gag	<i>Mycteroperca microlepis</i>	79	47	126
Snowy grouper	<i>Epinephelus niveatus</i>	123	44	167
Red grouper	<i>Epinephelus morio</i>	28	41	69
Blueline tilefish	<i>Caulolatilus microps</i>	11	32	43
Squirrelfish	<i>Holocentrus adscensionis</i>	12	22	34
Silk snapper	<i>Lutjanus vivanus</i>		16	16
Rock hind	<i>Epinephelus adscensionis</i>	4	5	9
Lane snapper	<i>Lutjanus synagris</i>		5	5
Graysby	<i>Cephalopholis cruentata</i>		4	4
Almaco jack	<i>Seriola rivoliana</i>		3	3
Speckled hind	<i>Epinephelus drummondhayi</i>		2	2
Warsaw grouper	<i>Epinephelus nigritus</i>		2	2
Greater amberjack	<i>Seriola dumerili</i>	25	2	27
Banded rudderfish	<i>Seriola zonata</i>		2	2

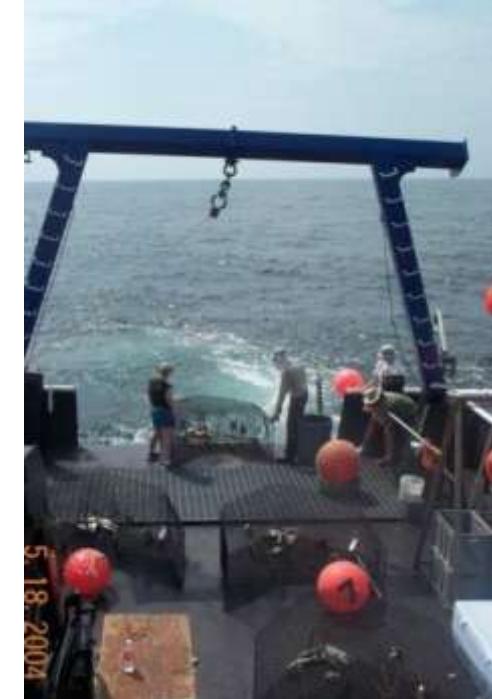
* Note that “other gear” includes fishery dependent samples to prepare for SEDAR stock assessments

CPUE summary

- Includes **chevron trap monitoring station** data from MARMAP, SEAMAP-SA and SEFIS
- Time series: **1990 – 2012**
- **Specific depth ranges** for each species included
- Data presented in **normalized** CPUE (to long term average)
- CPUE in **fish per trap per hour**
- **Nominal CPUE** and **Delta GLM standardized CPUE**

Nominal:

- Geometric mean of all traps
- No correction for variability in sampling (depth, location, temp., etc.)
- All chevron trap data can be used



Delta GLM:

- Technique commonly used in fisheries research to model CPUE
- Adjusts CPUE for variability in sampling, such as location (lat-long), depth, date, and bottom temp.
- If any variable data (e.g. temp., depth) for a trap is missing, trap catches are excluded from analysis





Caveats

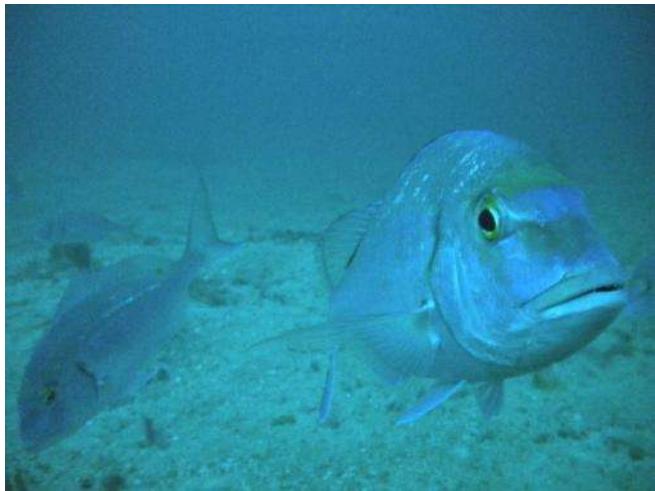


- This is a summary overview.
- General trends more relevant than absolute CPUE levels.
- Increase in sampling efforts since 2009.
- Many species have not been assessed through a SEDAR assessment and trends (analyses) have not been discussed in SEDAR framework (e.g. Data Workshops).
- Constraints, stratification, and models used in our CPUE analysis may be different from those used in SEDAR assessments.
- Not an update of stock status

Such update would need to include

- update of all indices,
 - update of age compositions for all data streams, and
 - assumption that all other parameters remained the same as in the last assessment.
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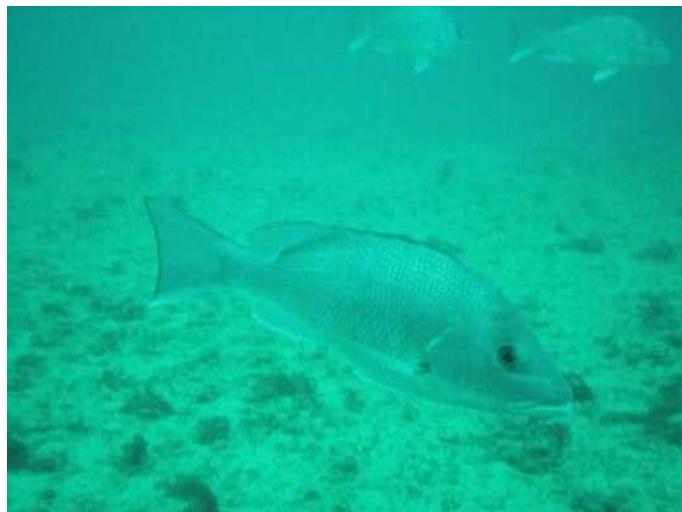
OVERVIEW SELECTED SPECIES



Graphs:

Nominal: blue line

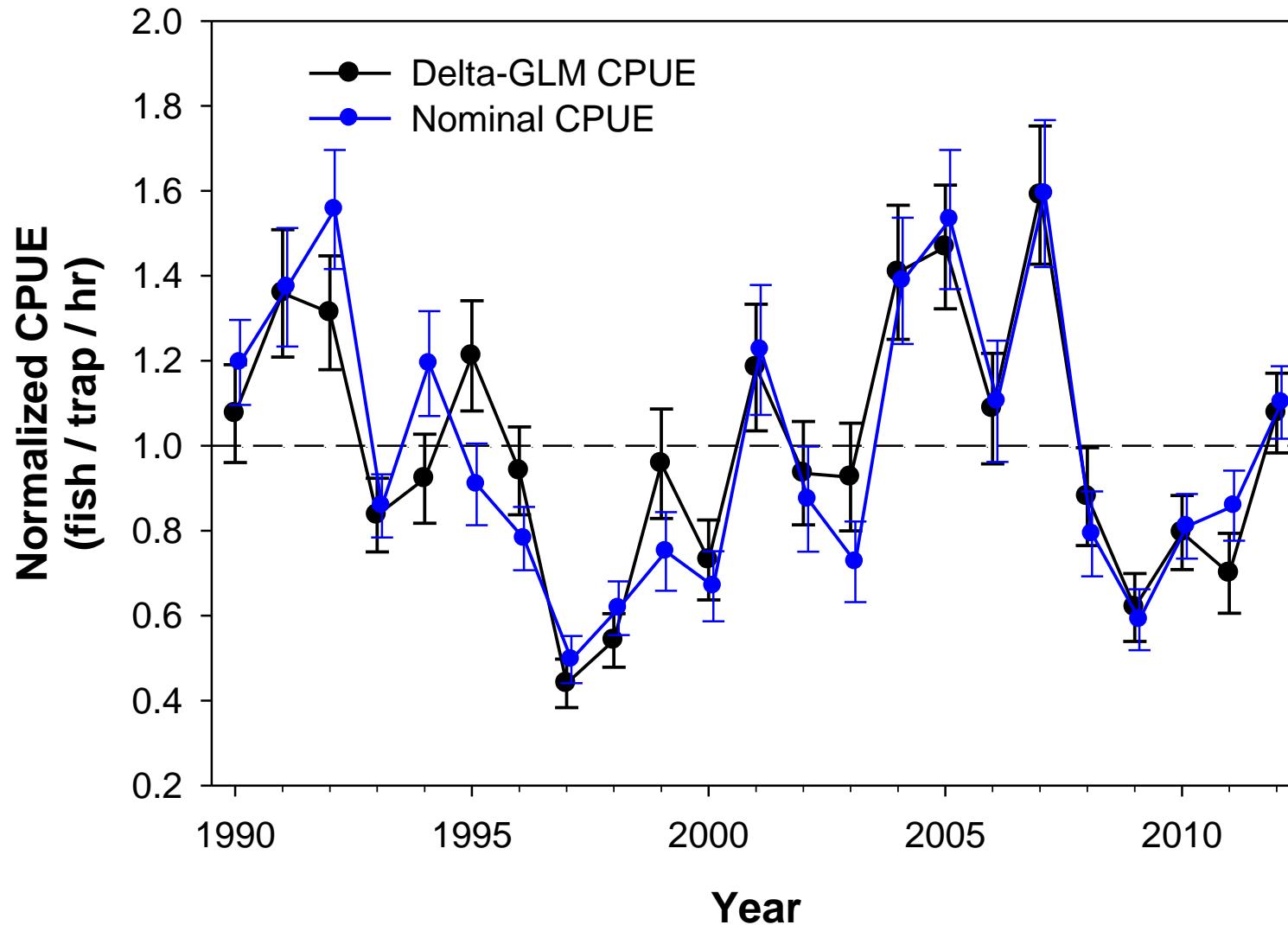
Delta GLM: black lines





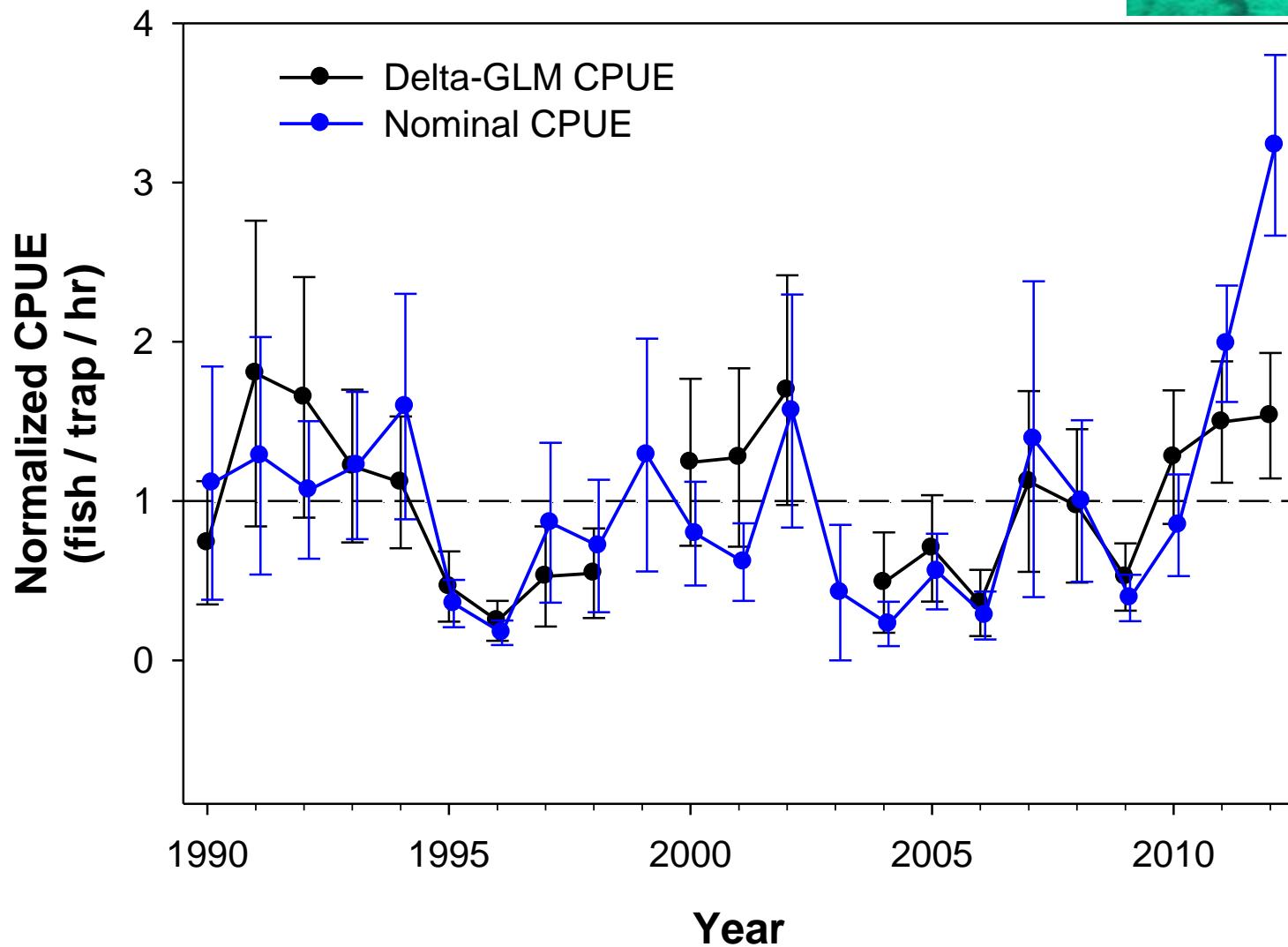
Chevron trap CPUE

Red porgy



Chevron trap CPUE

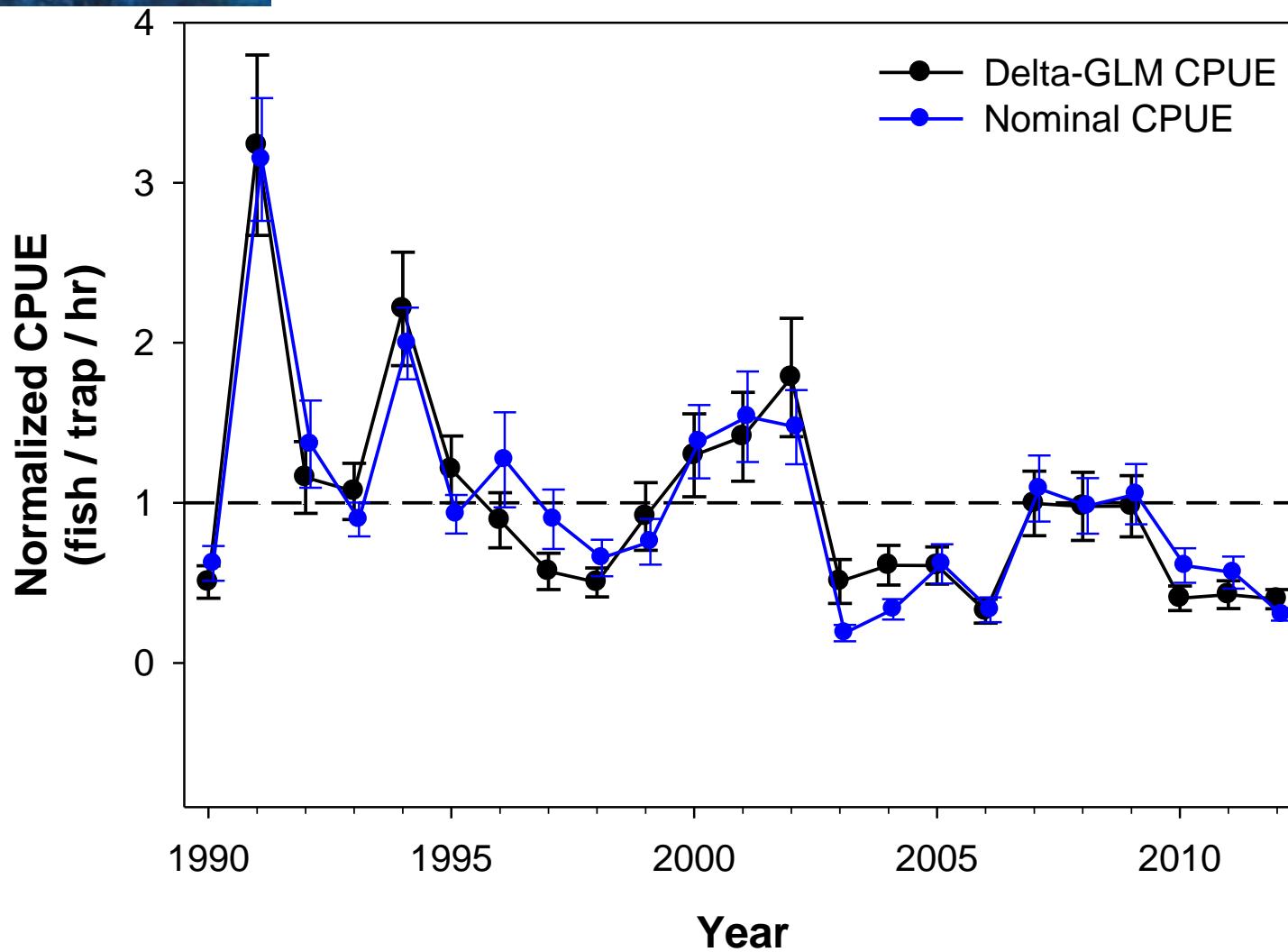
Red snapper





Chevron trap CPUE

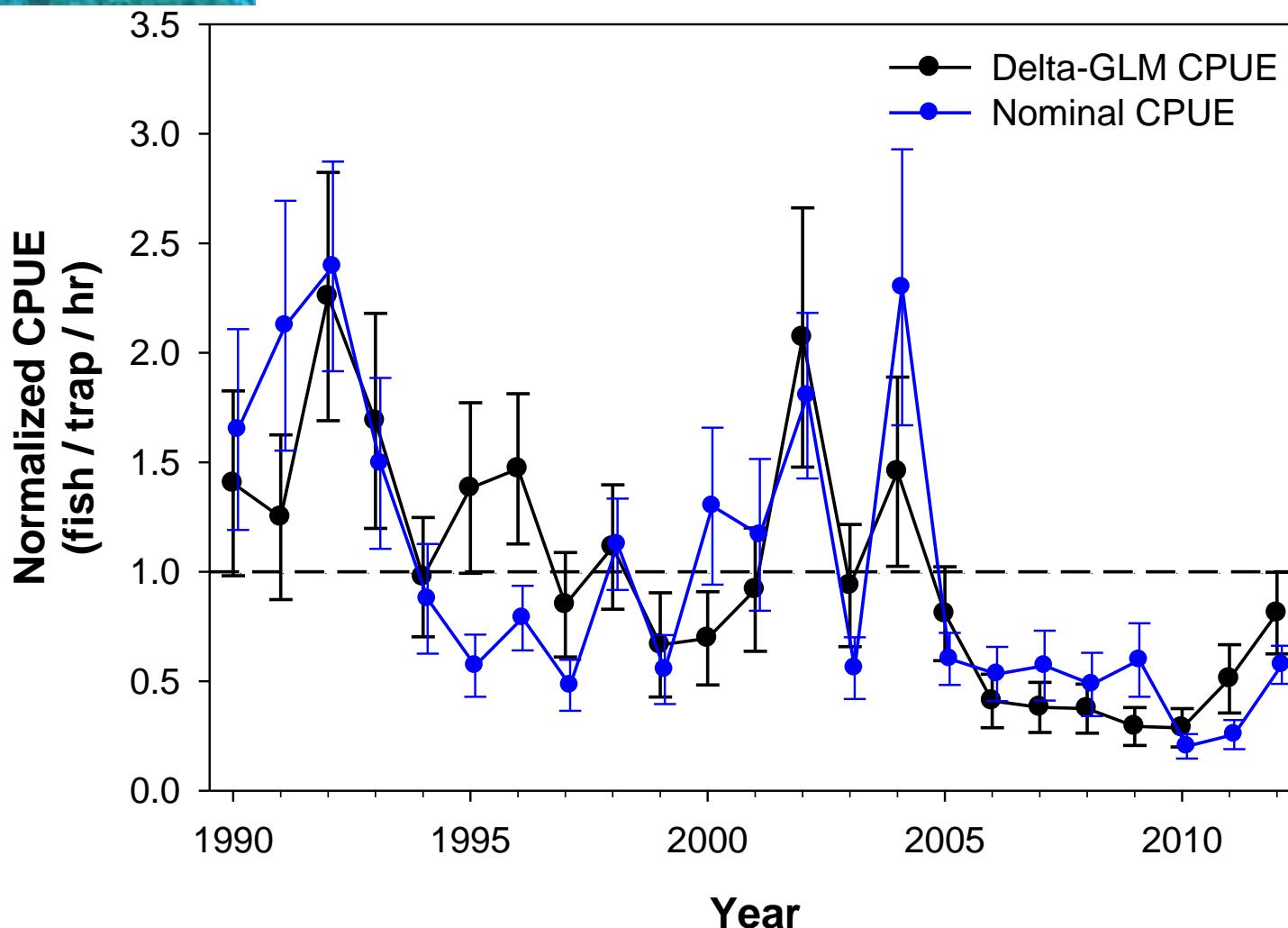
Vermilion snapper





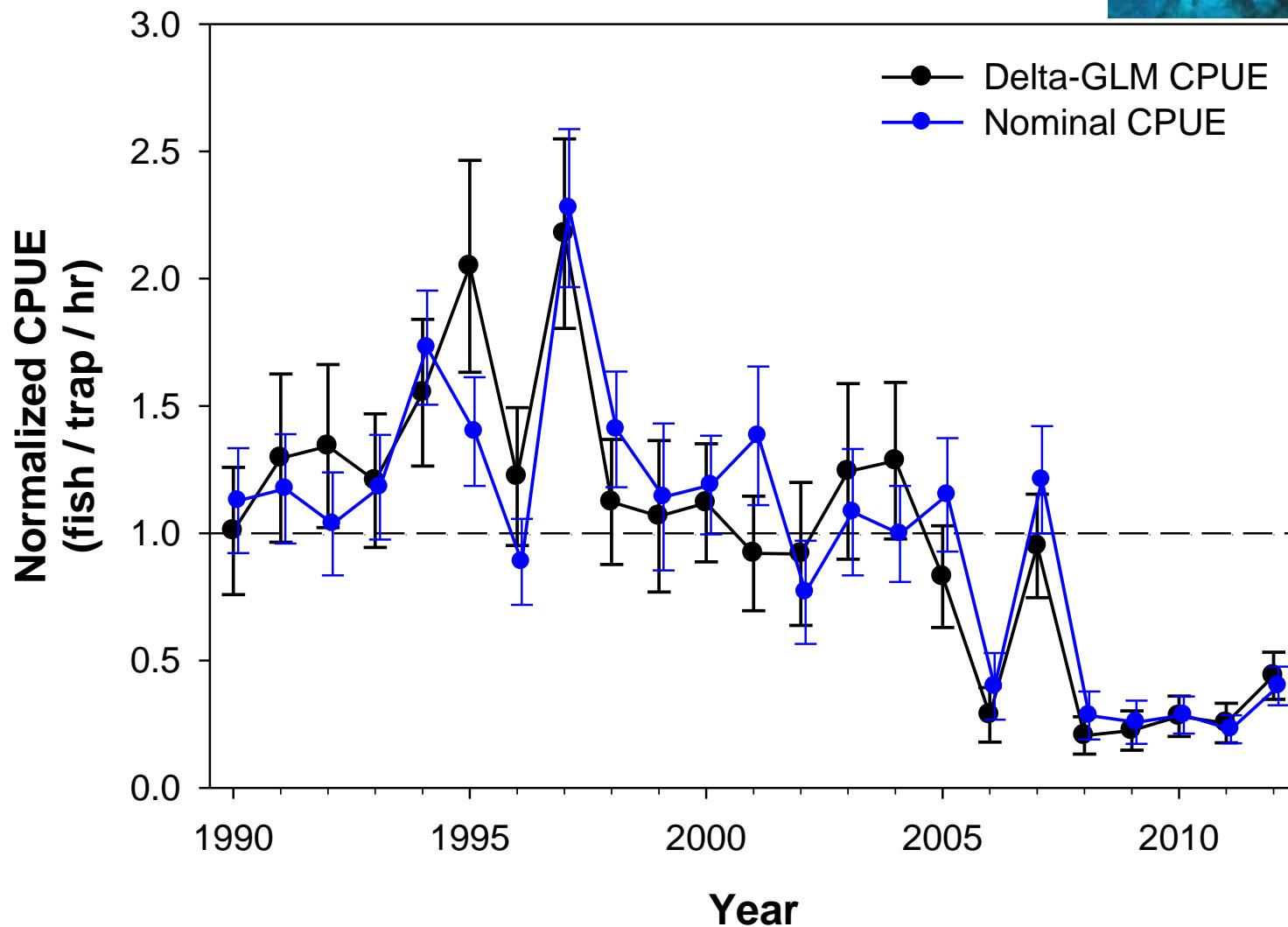
Chevron trap CPUE

White grunt



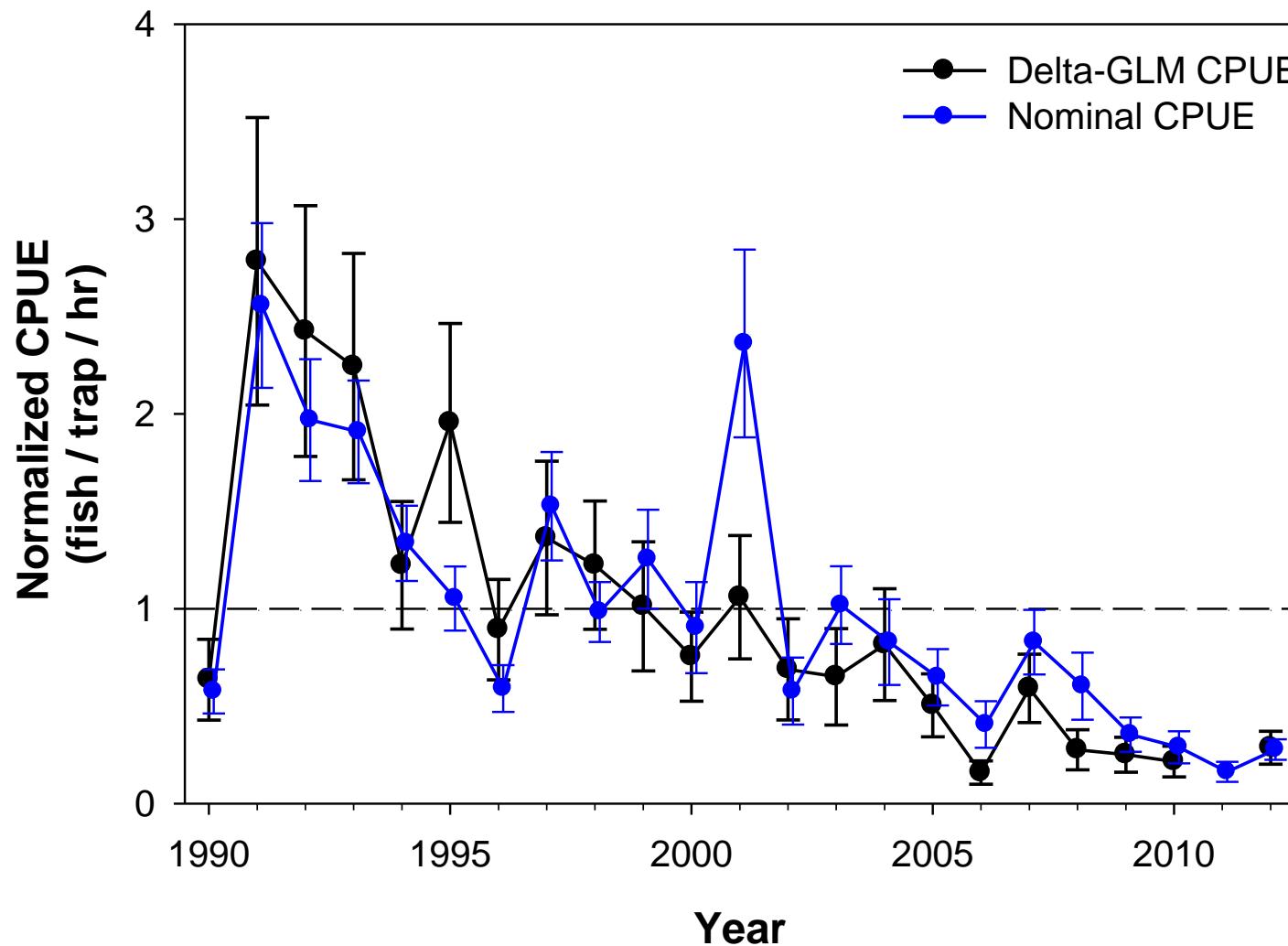
Chevron trap CPUE

Scamp



Chevron trap CPUE

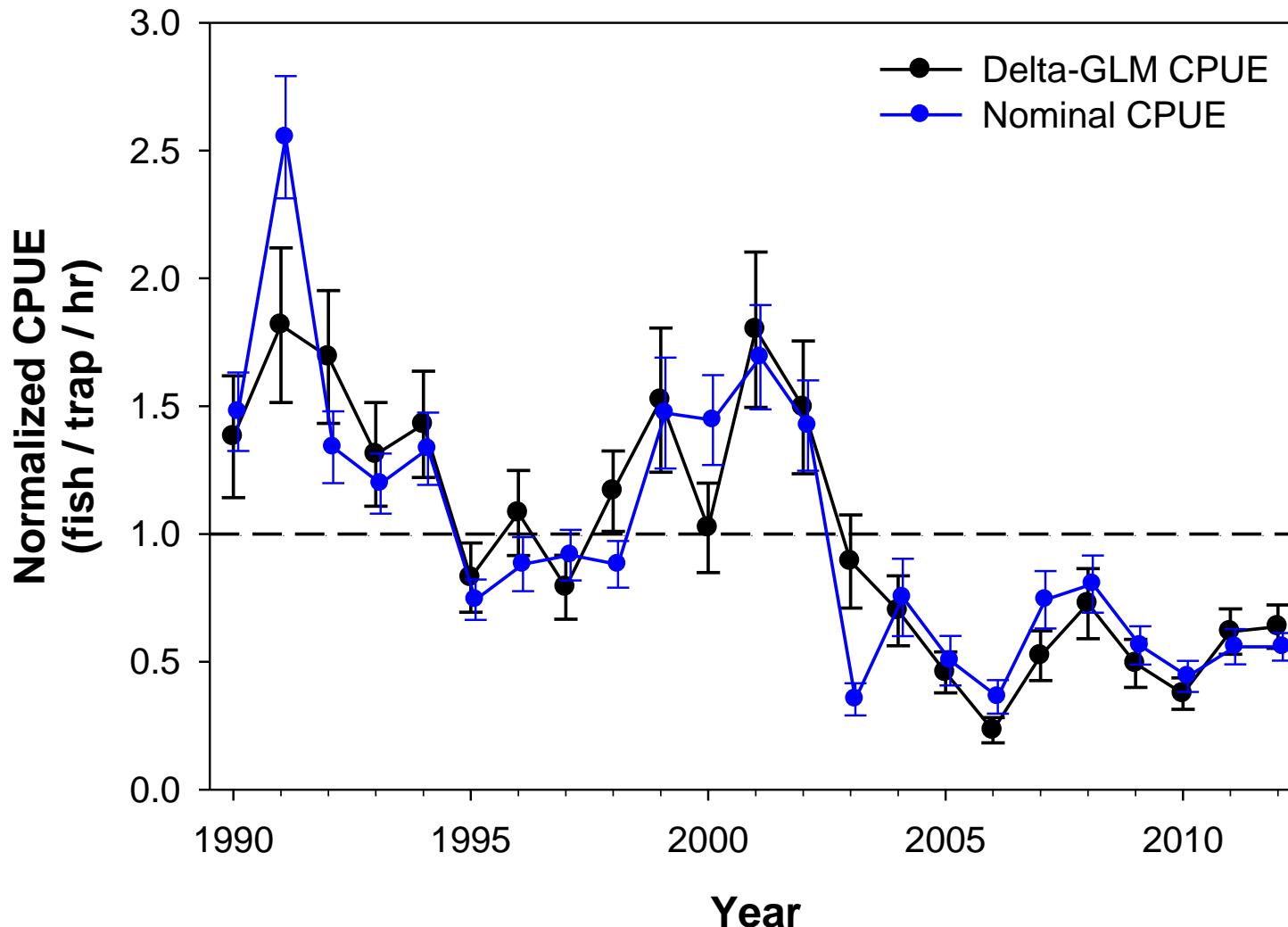
Knobbed porgy





Chevron trap CPUE

Tomate



2013 Reef Fish Monitoring

- **Sampling season :**
Scheduled fieldwork April 22 – October 18
- **Gears:**
Chevron traps with 2 video cameras
CTD & hook & line (e.g. SEAMAP-SA diet studies)

Depending on funding:
Long bottom long-line (e.g. tilefish)
Short bottom long-line (e.g. snowy grouper, amberjack)
- Expected 2013 update to be available in April 2014.



Acknowledgements:

MARMAP/SEAMAP-SA/SEFIS
Reef Fish Survey
staff and students

Research Vessel Crews

