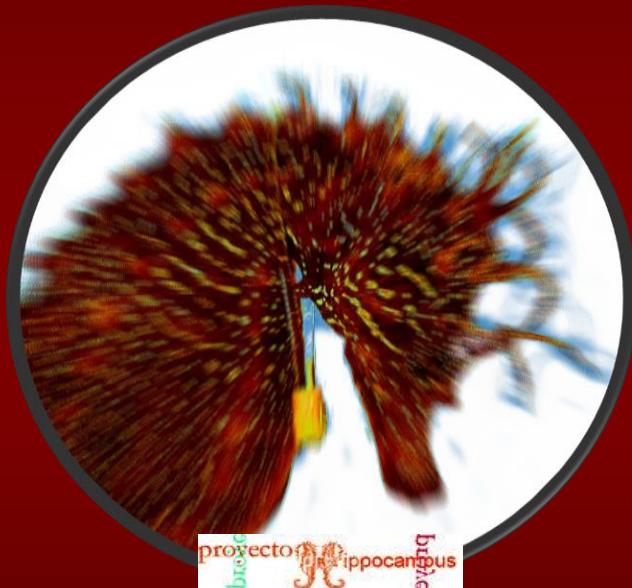


A TEMPORAL-SPATIAL STUDY ON SYNGNATHID FISHES FROM CÍES ARCHIPELAGO (ATLANTIC ISLANDS NATIONAL PARK, NW SPAIN)

M. Planas^{*1}, A. Chamorro¹, M.E. García Blanco¹, J. Hernández-Urcera², R. Chamorro¹

¹Department of Ecology and Marine Resources, Instituto de Investigaciones Marinas (CSIC), Vigo, SPAIN

²Instituto Español de Oceanografía (IEO), Centro Oceanográfico de Vigo, Vigo, SPAIN



**ISMS 2018 - Workshop Patrimonio Cíes
Vigo (Spain), 20-22th June 2018**



Gobierno de España
ORGANISMO AUTÓNOMO PARQUES NACIONALES
MINISTERIO
DE AGRICULTURA Y PESCA,
ALIMENTACIÓN Y MEDIO AMBIENTE

What are Syngnathids?

They are bony fishes of the Family Syngnathidae, integrated by:



Pipefishes



Sea Dragons



Seahorses



- Elongate, narrow, bodies surrounded by a series of bony rings, and small tubular mouths.
- Parental care

What are Syngnathids?

THREATS TO SYNGNATHIDS POPULATIONS

Despite formal protection, many **threats** to Syngnathids remain.

Multiple aspects of their life history makes them **highly sensitive to disturbances** from human activities:

- Long period of parental care,
- Small broods,
- Juveniles with limited dispersal (especially in fragmented habitats),
- Reduced home ranges and mobility, and
- The faithful pair bonds maintained in many species.



What are Syngnathids?

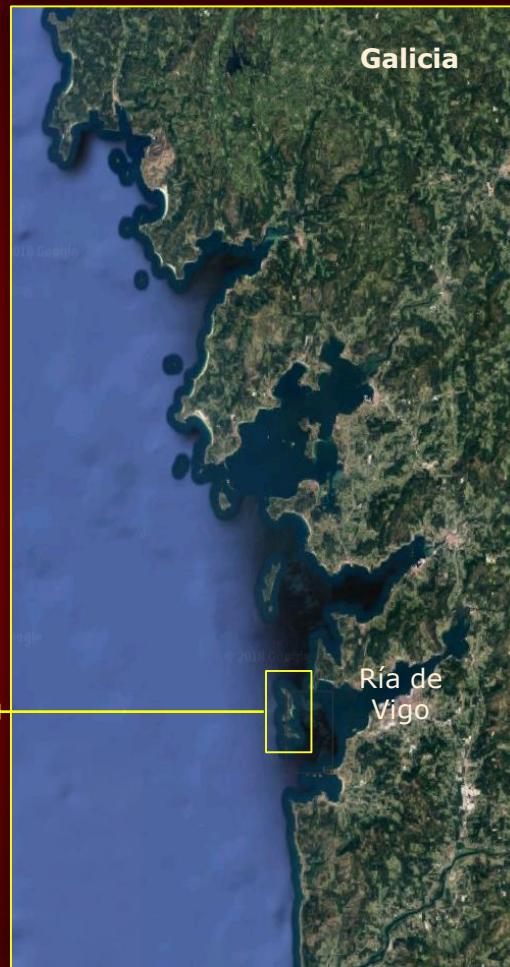
Main threats to Syngnathids population

The two main threats, especially in seahorses, are:

- 1- **Exploitation** by targeted fisheries and as by-catch.
- 2- **Sensitivity to habitat loss and degradation**



Sampling site: Cíes Archipelago (NW Spain)



Previous surveys (2016)



Underwater visual transects
From 2-3 to 18-20 m depth
100 – 400 m length
Duration: 1 hour
4-5 persons

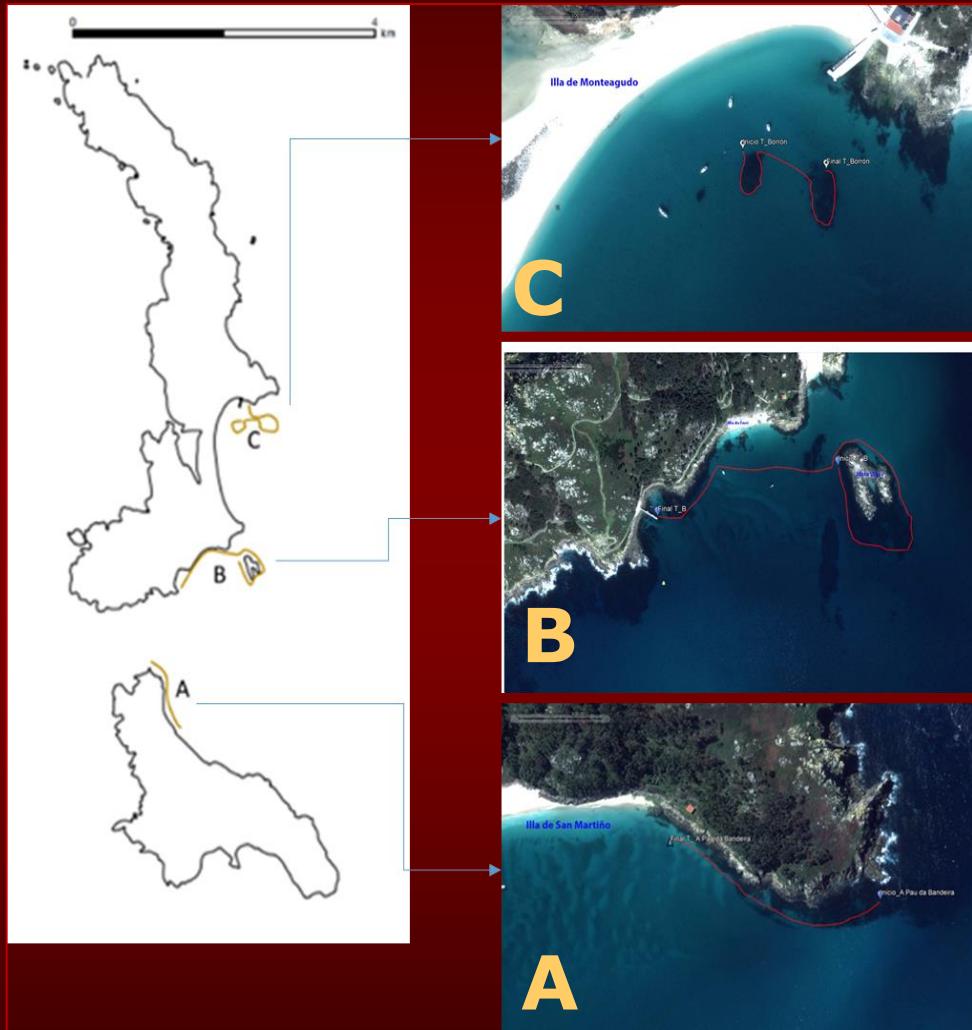
Sampling

- Sediment
- Vegetal communities
- Syngnathid fishes

Length / Weight
Sexual maturation
Fin-clipping (SIA, Genetics)
Sampling of embryos/juveniles
Labelling (VIE)
Return to original site



Sites selected for this study



Substrate

Rocky-sandy bottoms

Gravel

Maërl

Habitat

**Macroalgae communities
generating habitat and
protection to Syngnathids**

Cystoseira baccata

C. usneoides

Dictyota dichotoma

Padina pavonica

Saccorhiza polyschides

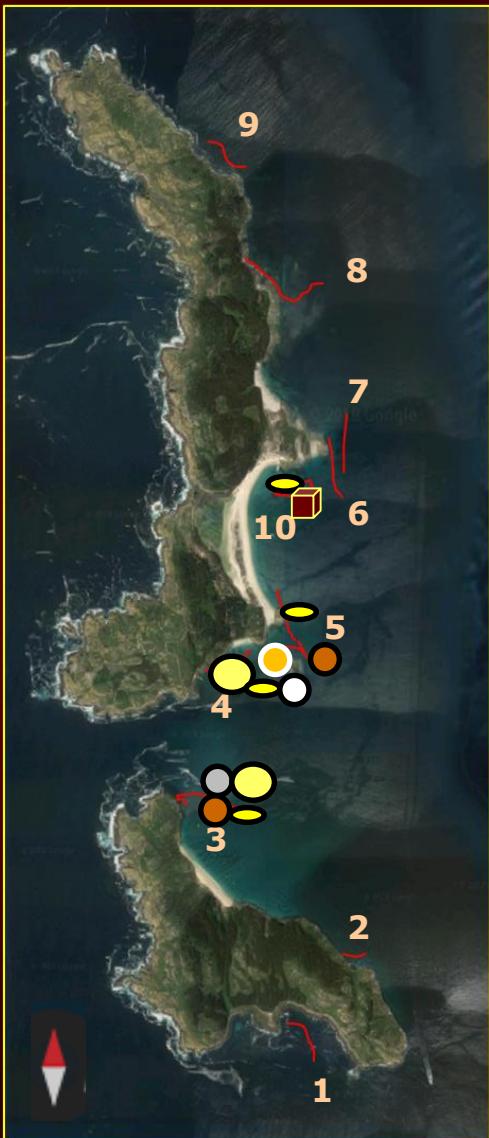
Asparagopsis armata

Gracilaria spp.

Codium tomentosum

Ulva spp.

Substrate characterization (data from 2016)



Sampling (52 samples; spring 2016)

Gravel (10%)

Coarse (medium) sand (89%)

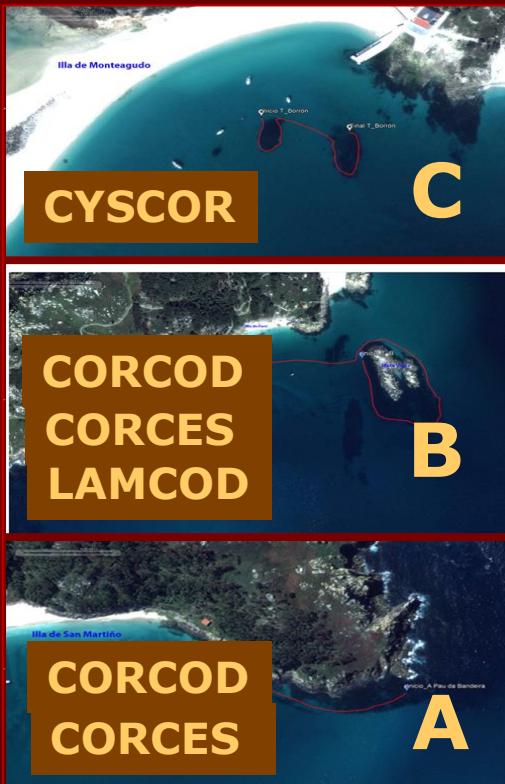
Silt (<1%)

Average particle size: 620 µm (coarse sand)

- C: Cobbles
- G: Gravel
- CS: Coarse sand
- MS: Medium/Fine sand
- S: Silt
- M: Maërl
- R: Rocks

Surveys 2017: Vegetal communities

Z
O
N
E



	COMMUNITY TYPE			
	CORCOD	CORCES	LAMCOD	CYSCOR
C	 <i>Corallina officinalis</i>	 <i>Corallina officinalis</i>	 <i>Lithophyllum incrustans</i>	 <i>Corallina officinalis</i>
B	 <i>Lithophyllum incrustans</i>	 <i>Lithophyllum incrustans</i>	 <i>Codium tomentosum</i>	 <i>Lithophyllum incrustans</i>
A	 <i>Codium tomentosum</i>	 <i>Chondracanthus acicularis</i>	 <i>Laminaria ochroleuca</i>	 <i>Cystoseira bacata</i>

Syngnathids in Cíes Archipelago



Syngnathus acus



Hippocampus guttulatus



Entelurus aequoreus

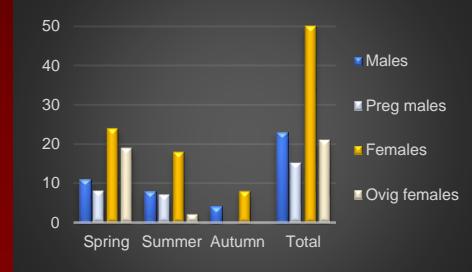
Surveys 2017: Monitoring of syngnathids



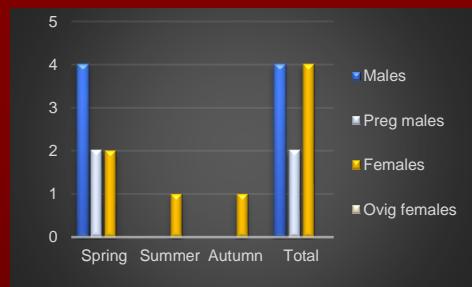
Individuals encountered
Zone A - 15%
Zone B - 33%
Zone C - 52%

Species (5-12 m depth)

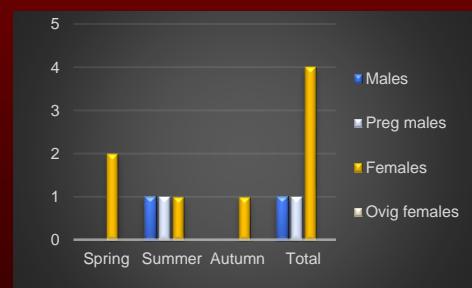
Syngnathus acus ($n=73$)



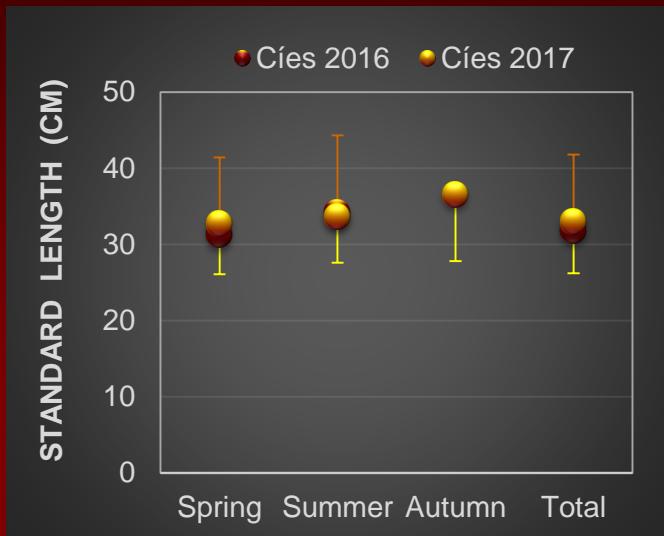
Hippocampus guttulatus ($n=7$)



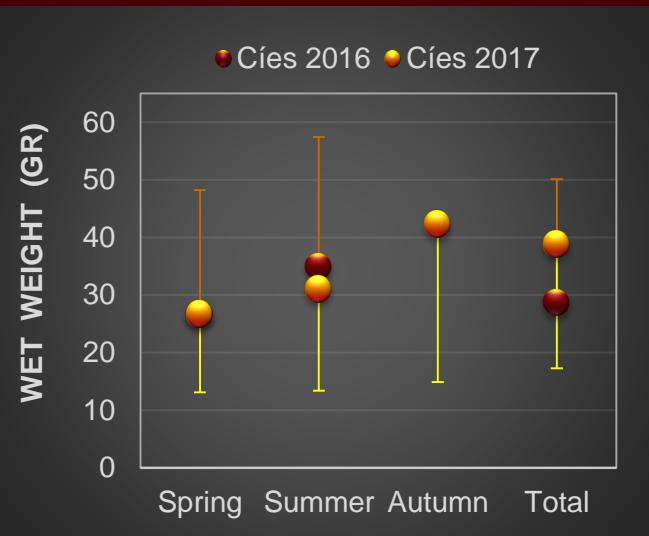
Entelurus aequoreus ($n=5$)



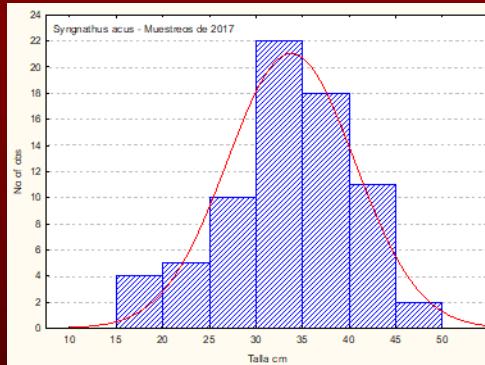
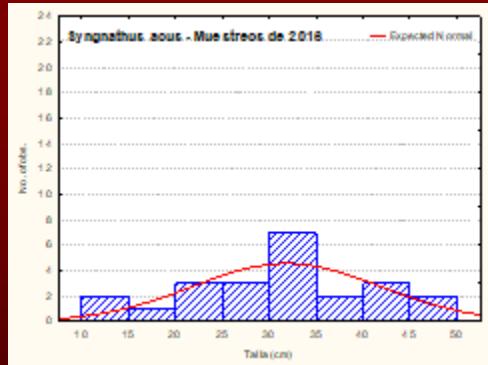
Surveys 2017: *Syngnathus acus*



Length: 2016 vs 2017



Weight: 2016 vs 2017



**Similar population structure
Very large individuals**

2017: **72% females**
47% recorded in spring; 32% in summer; 21% in autumn.

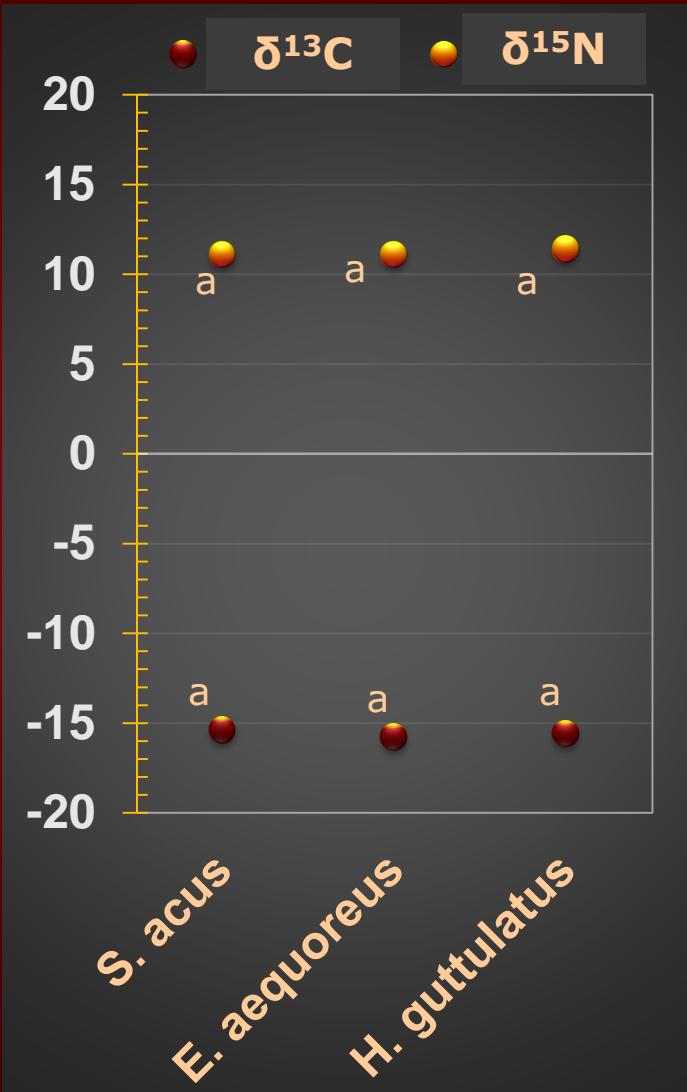
Stable isotopes: Syngnathid species



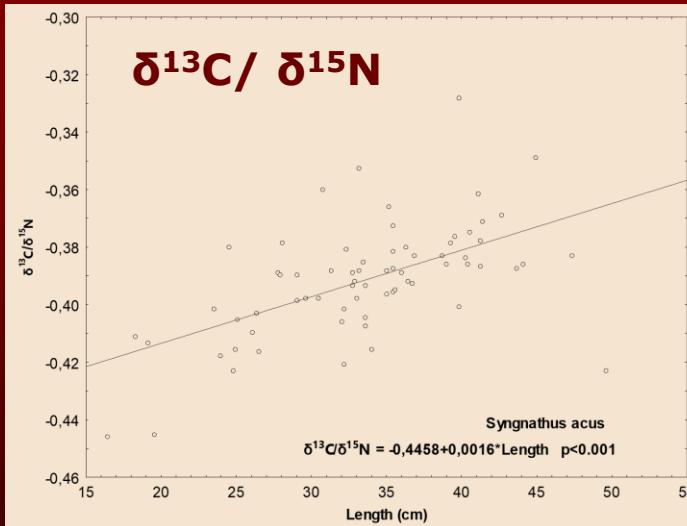
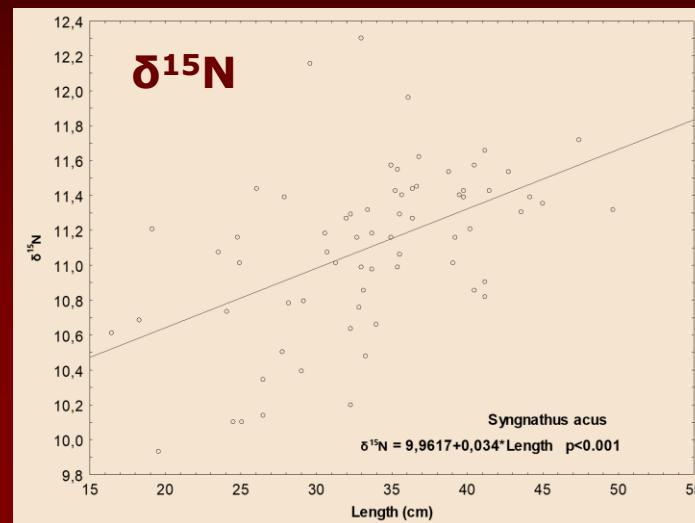
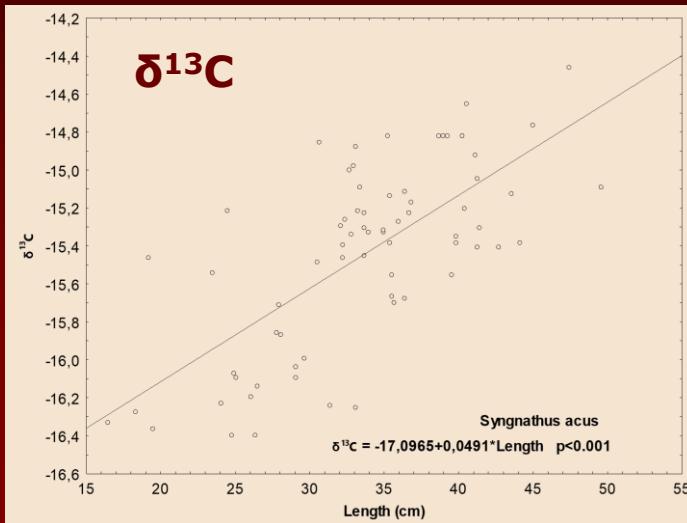
Isotopic signatures did not differ significantly among species, indicating that all them feed on similar resources.

$\delta^{13}\text{C}\text{\%oo}$ Range: -15.8 to -15.5

$\delta^{15}\text{N}\text{\%oo}$ Range: 11.1 to 11.4

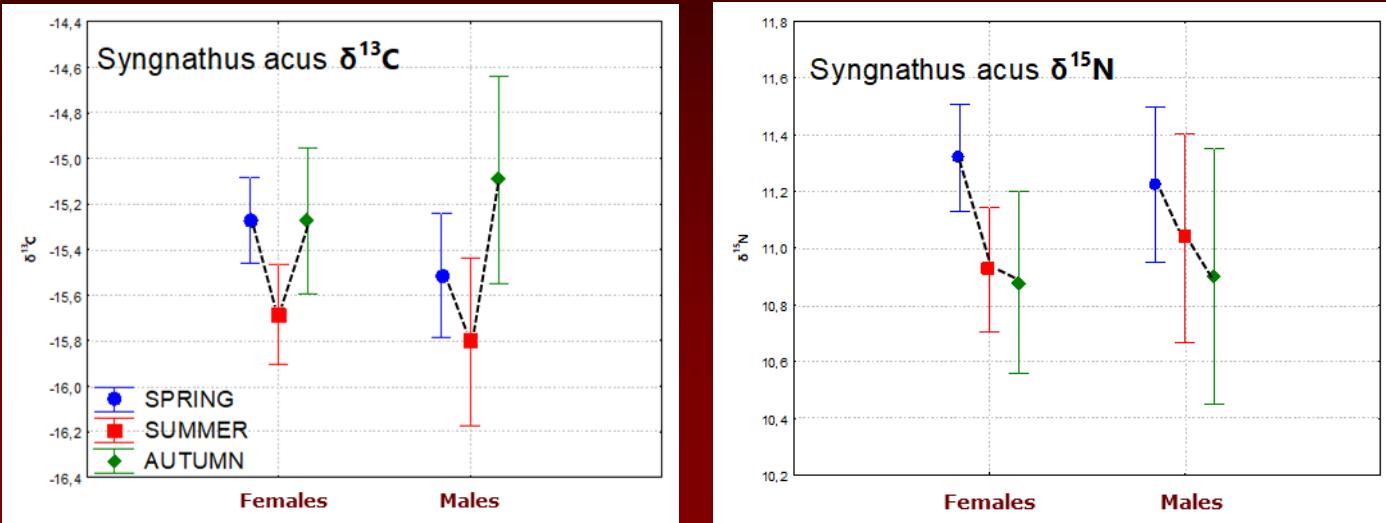


Stable isotopes: Syngnathus acus

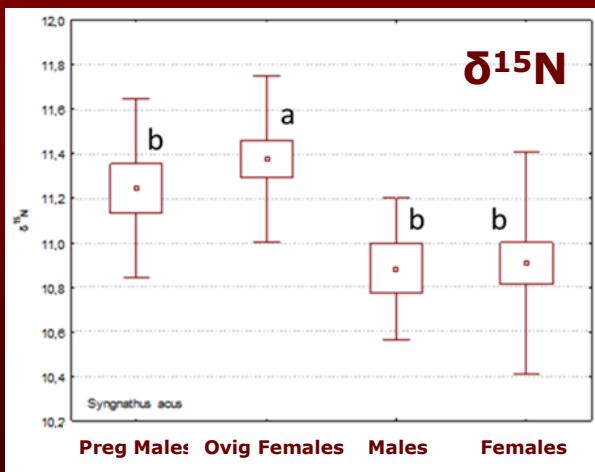


**Isotopic signatures
were related with
size**
**Change in diet
composition with
growth?**

Stable isotopes: *Syngnathus acus*



Isotopic signatures changed with season and sex



$\delta^{15}\text{N}$ signatures in mature females differed from those in males and nonovigerous females
Different dietary resources?

Relationship: Vegetal communities - Syngnathids

nMMS: Non-metric multidimensional scaling

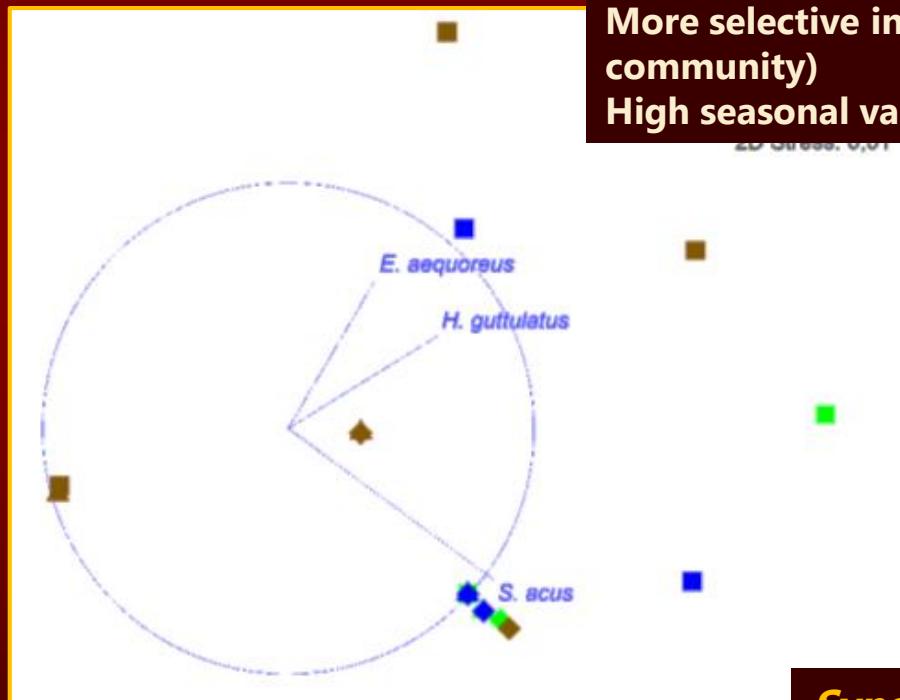
(Groups data points into classes of similar points based on a series of variables)

Variables: Surveyed sites, season and Syngnathids abundance.

Entelurus aequoreus , Hippocampus guttulatus

More selective in habitat preference zone (C only; CYSCOR community)

High seasonal variation in abundance (not present in autumn)



nMDS results (2017 data)

Seasons

Green: Spring

Blue: Summer

Brown: Autumn

Zones

Triangle: A

Rhombus: B

Circle: C

Syngnathus acus

Wider distribution

Abundance increases in spring and summer.

General conclusions



Four species identified:

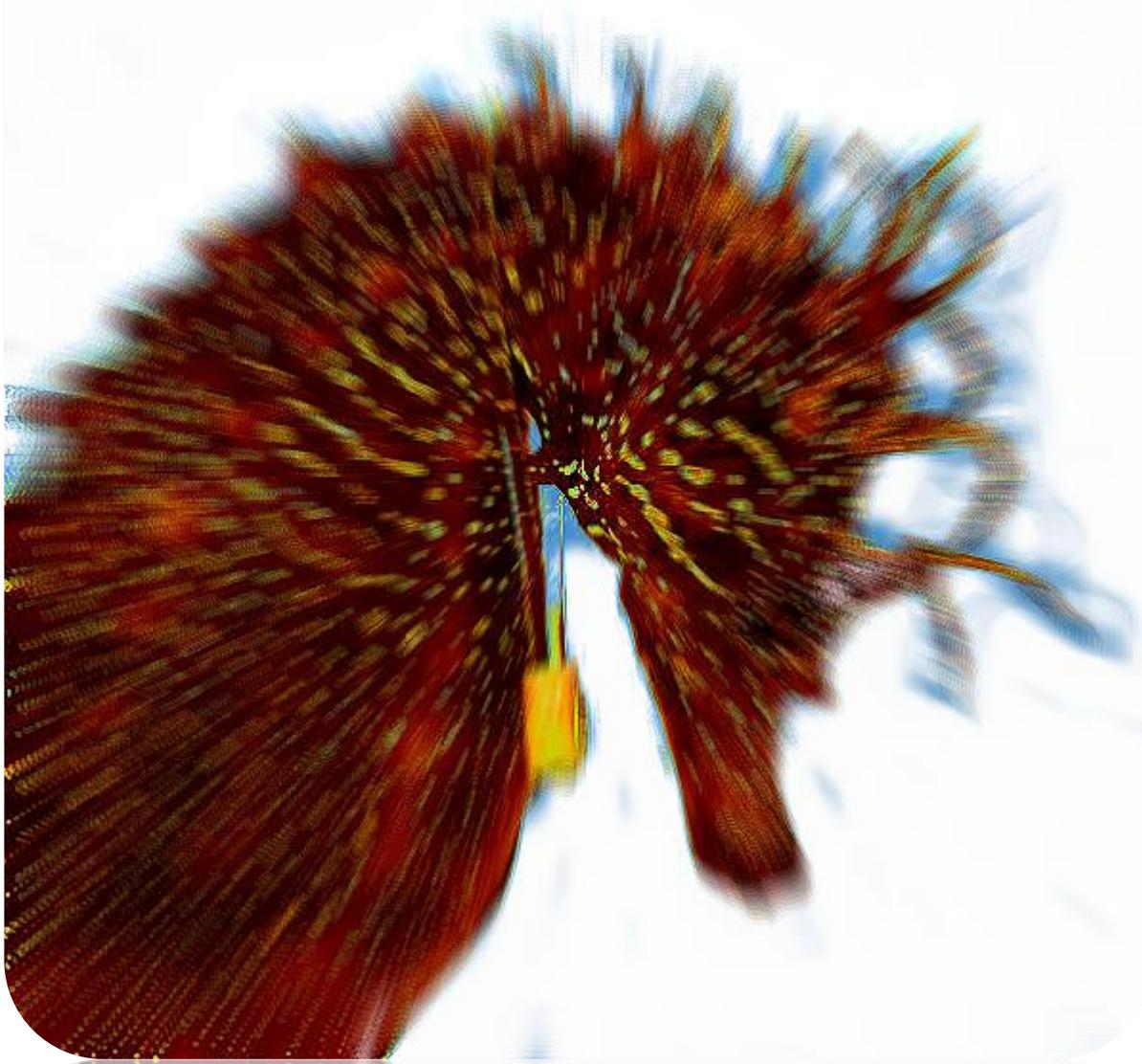
- S. acus (dominant)*
- E. aequoreus (low density, restricted area)*
- H. guttulatus (low density, highly restricted area)*
- H. hippocampus (2016 surveys)*

Interest:

- *Reduced sanctuary for threatened seahorses that need conservation*
- *Potential breeding area for some Syngnathids, particularly for S. acus (large average size)*
- *Temporary stable genetic diversity (gene flow with populations from annex area)*

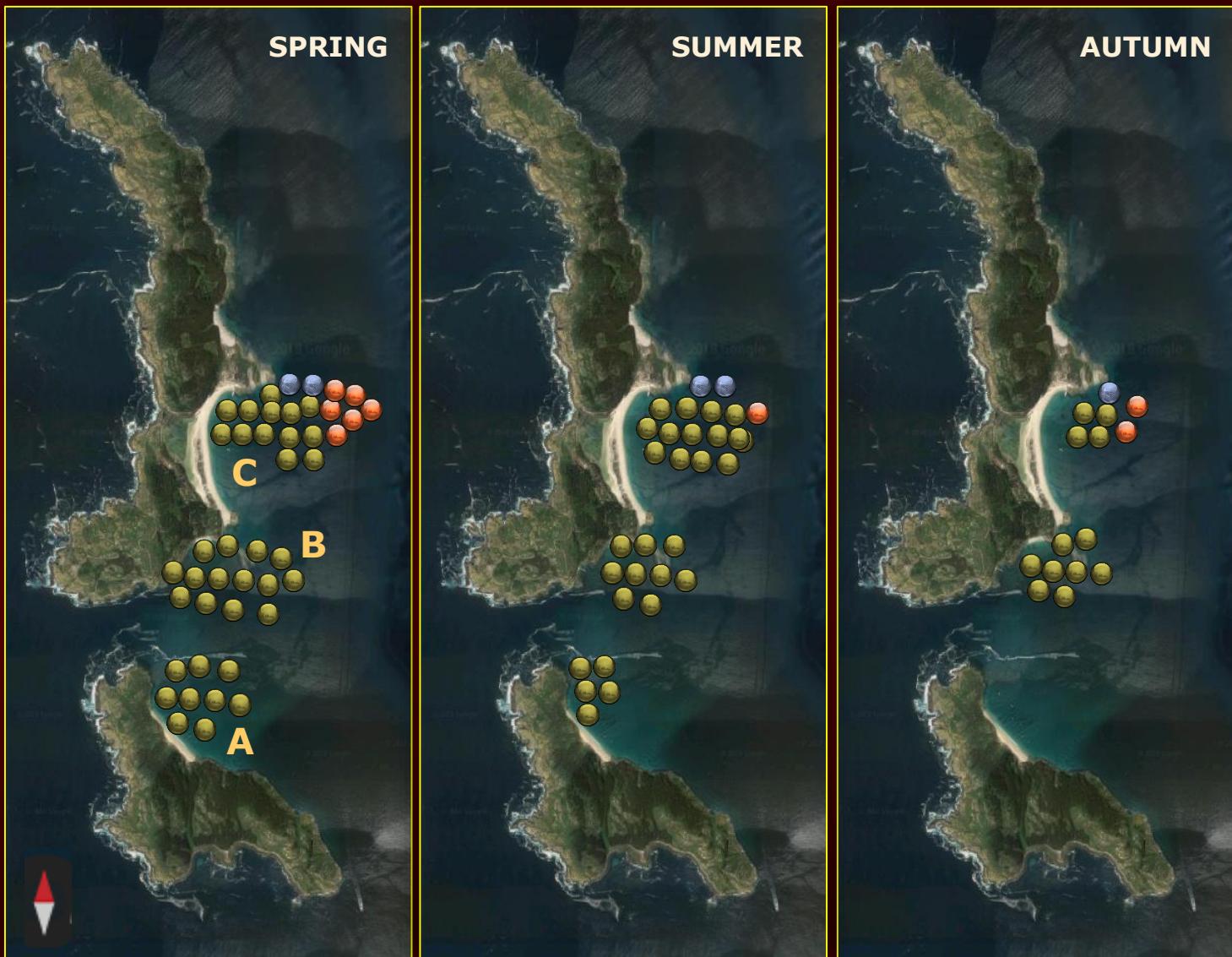
Need of special protection and management strategy:

- *Borrón (Priority) (zone C)*
- *Viños-Carracido (zone B)*



Thank you !!!!

Surveys 2017: Monitoring of syngnathids



Species (

● *Syngnathus*



● *Hippocamp*



● *Entelurus a*



Surveys 2016: 10 transects along East coast



SPRING

West

East

West

SUMMER

