

ARE DISCARDS A SUBSTANTIAL FOOD SOURCE FOR BENTHIC COMMUNITIES?

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SPATIO-TEMPORAL PATTERNS IN FOOD SUBSIDIES PROVIDED BY DISCARDS TO SCAVENGING SEABIRDS IN THE BAY OF BISCAY

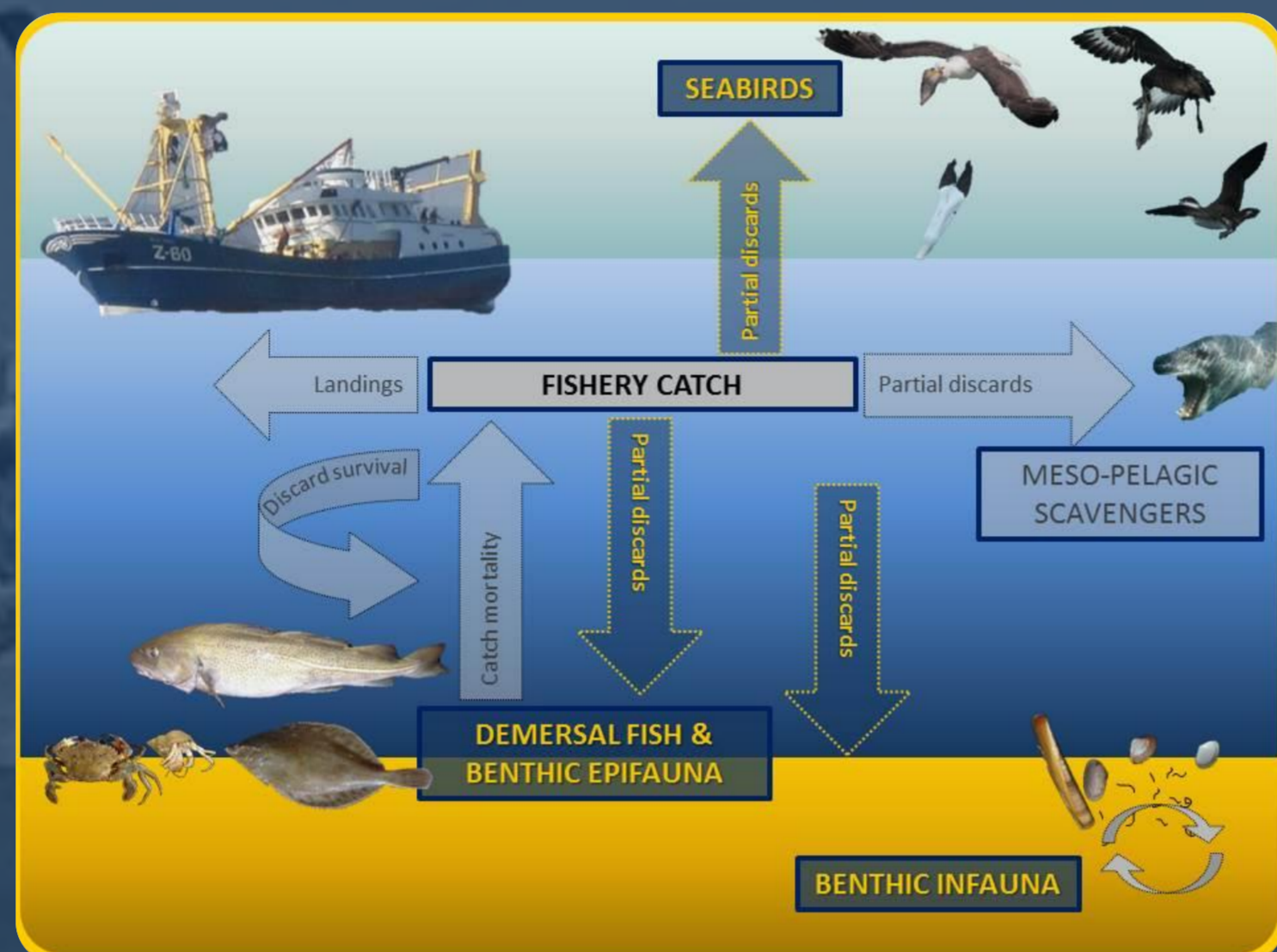


Introduction

- ✓ Fishery discards = food source for marine scavengers
- ✓ Availability for benthic communities depends on
 - Discard selection by scavenging seabirds
 - Variability of discards and seabirds in space and time

Objectives

- Defining the **finest spatial and temporal resolution** of discard and seabird distribution
- Spatio-temporal **quantification of discard consumption**
- Allow assessing whether discards are a **food subsidy and/or facultative food source?**



Discard consumption Success Index (DSI)

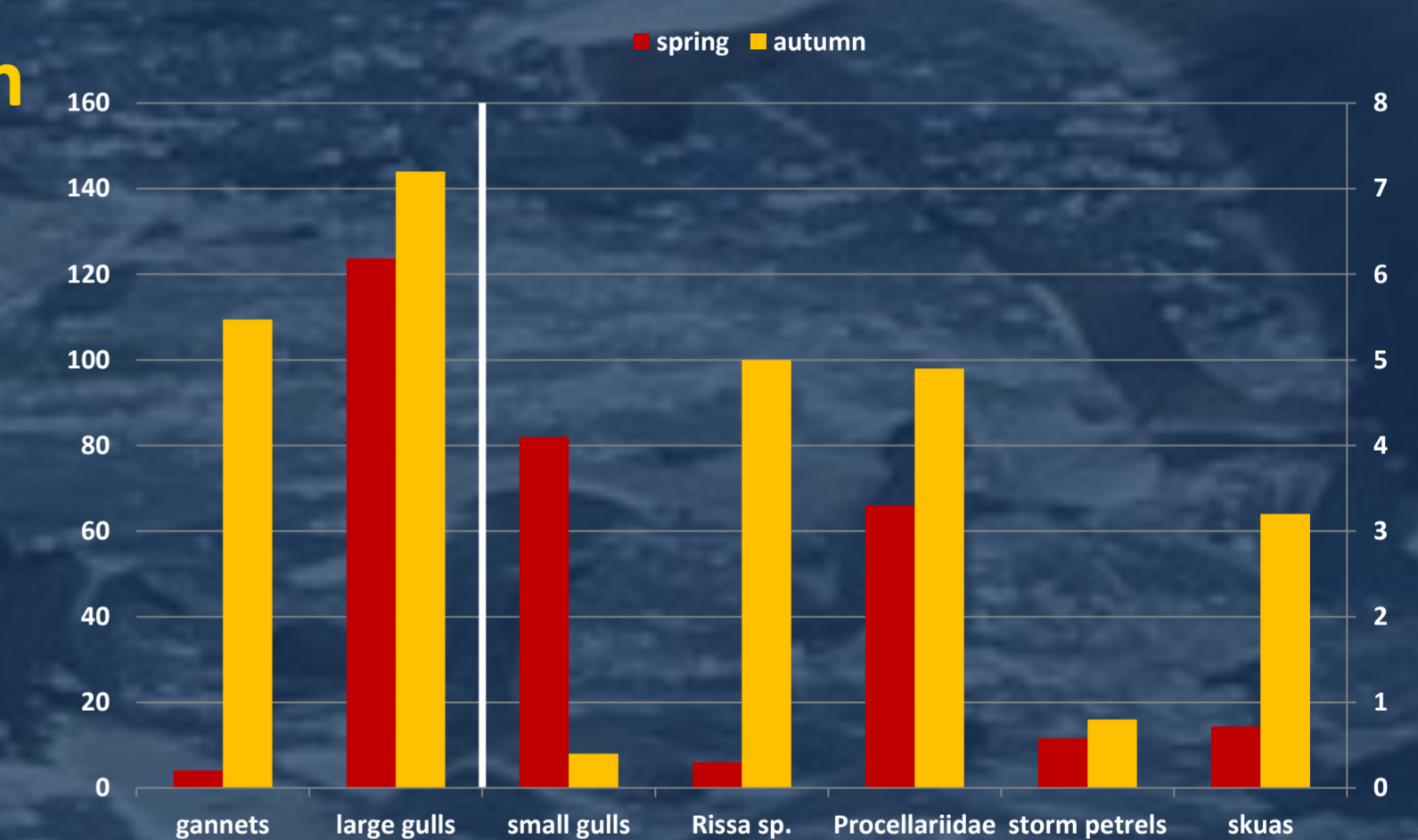
- ✓ Discard proportion swallowed during experimental discarding studies depends on
 - Discard morphology 'i'
 - Ship followers' community 'j' composed of foraging guilds



$$DSI_{(i,j)}$$

Ship following scavenging index (ScavI)

- ✓ Measuring the relative attraction of foraging guilds to fishing vessels rather than natural food



$$ScavI_{foraging\ guild} = \left[\frac{n_{ship\ followers}}{n_{density}} \right]_{foraging\ guild}$$

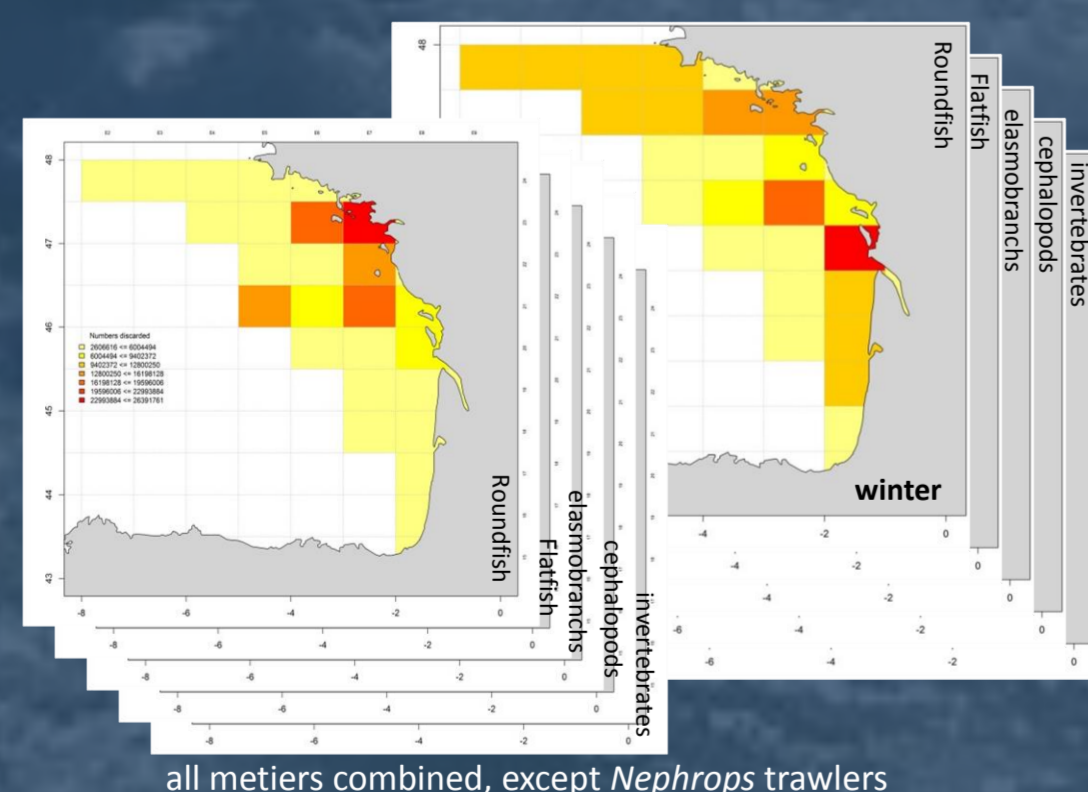
Spatio-temporal distribution of discards

- ✓ Distribution of discard types by spatio-temporal unit 'k'

$$Discards_{(i,k)}$$

- Six metiers: (1) Bottom trawls targeting demersal fish and cephalopods, (2) targeting crustaceans, (3) midwater trawls targeting small pelagic fish, (4) targeting demersal fish and cephalopods, (5) gill nets and (6) longlines

- Spatial units: ≥10 fishing operations, ≥3 fishing trips
- Temporal strata: Pooled to match seabird data



all metiers combined, except Nephrops trawlers

Nr of ship following birds in community 'j' in spatio-temporal unit 'k'

$$C_k = C_j = \sum_{foraging\ guild} (ScavI_{foraging\ guild} * n_{k,foraging\ guild})$$

Nr of discards consumed in spatio-temporal unit 'k'

$$DSI_{i,k} * Discards_{i,k}$$

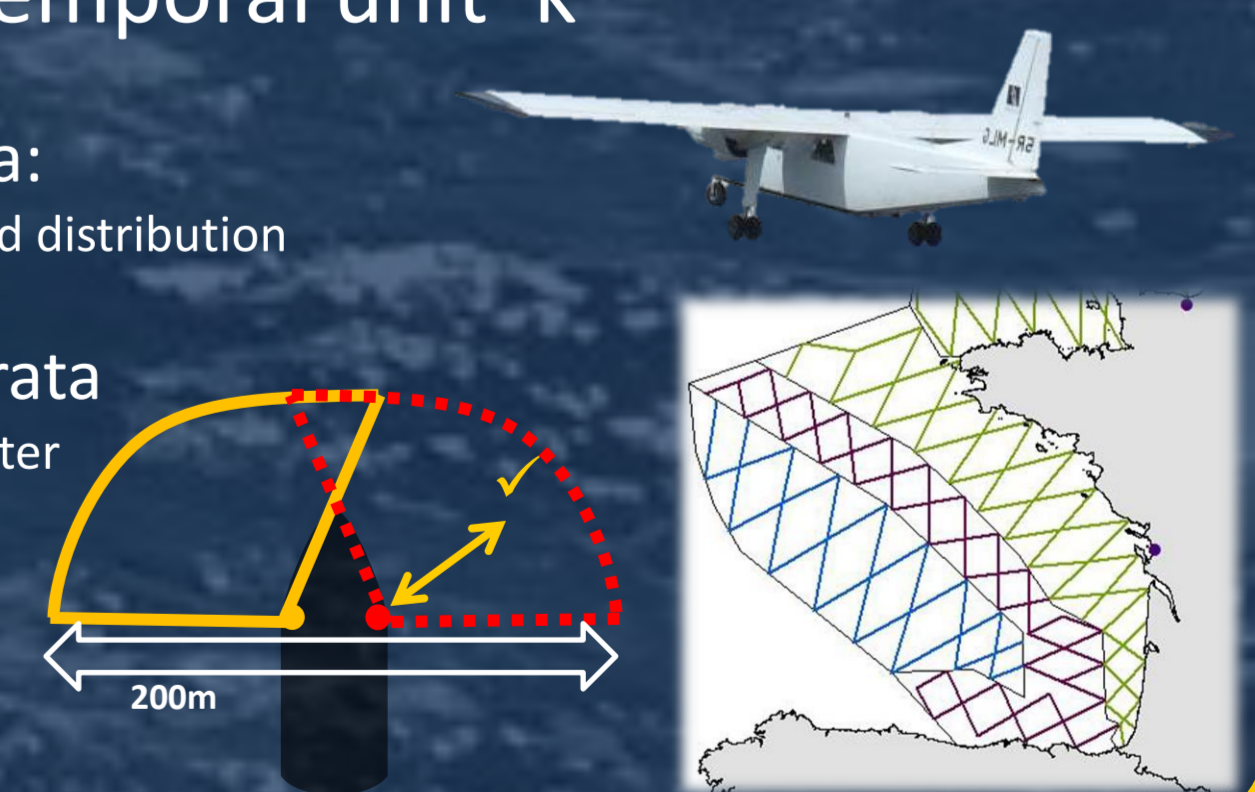
with $DSI_{i,k} = DSI_{i,j} = f(C_j)$

Spatio-temporal distribution of foraging guilds

$$n_{k,foraging\ guild}$$

- ✓ Distribution of foraging guilds by spatio-temporal unit 'k'

- Spatial strata: Limited by discard distribution
- Temporal strata: Summer and winter



Quantification of discards for benthic communities will become available on

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