

Introduction

The main spawning grounds for Icelandic cod (*Gadus morhua*) are located along the southwest coast, however the small scale structure within this area is not well documented and recent research has identified other areas contributing to the pelagic juvenile population (Marteinsdottir *et al*, 2000).

By examining the distribution of fisheries targeting spawning cod and confirmed spawning cod samples collected by the Marine Research Institute, we address the following questions:

1. How do the spatial distributions of demersal trawl and gillnet differ during the spawning season?
2. Is there a small scale structure within the southwest spawning grounds?
3. What is the relative contribution of other areas to the spawning population?

Method

- Logbook entries and survey samples from 1991-2011 considered.
- Data restricted to the main spawning period (15th Mar-21st May).

Logbook entries:

- Catch must consist of $\geq 60\%$ Cod.
- Vessel gross tonnage > 9.9 and geartype = gillnet or trawl.
- Icelandic waters divided into minute by minute gridcells.
- Gridcells fished > 2 times in a season a potential spawning site.

Potential spawning sites

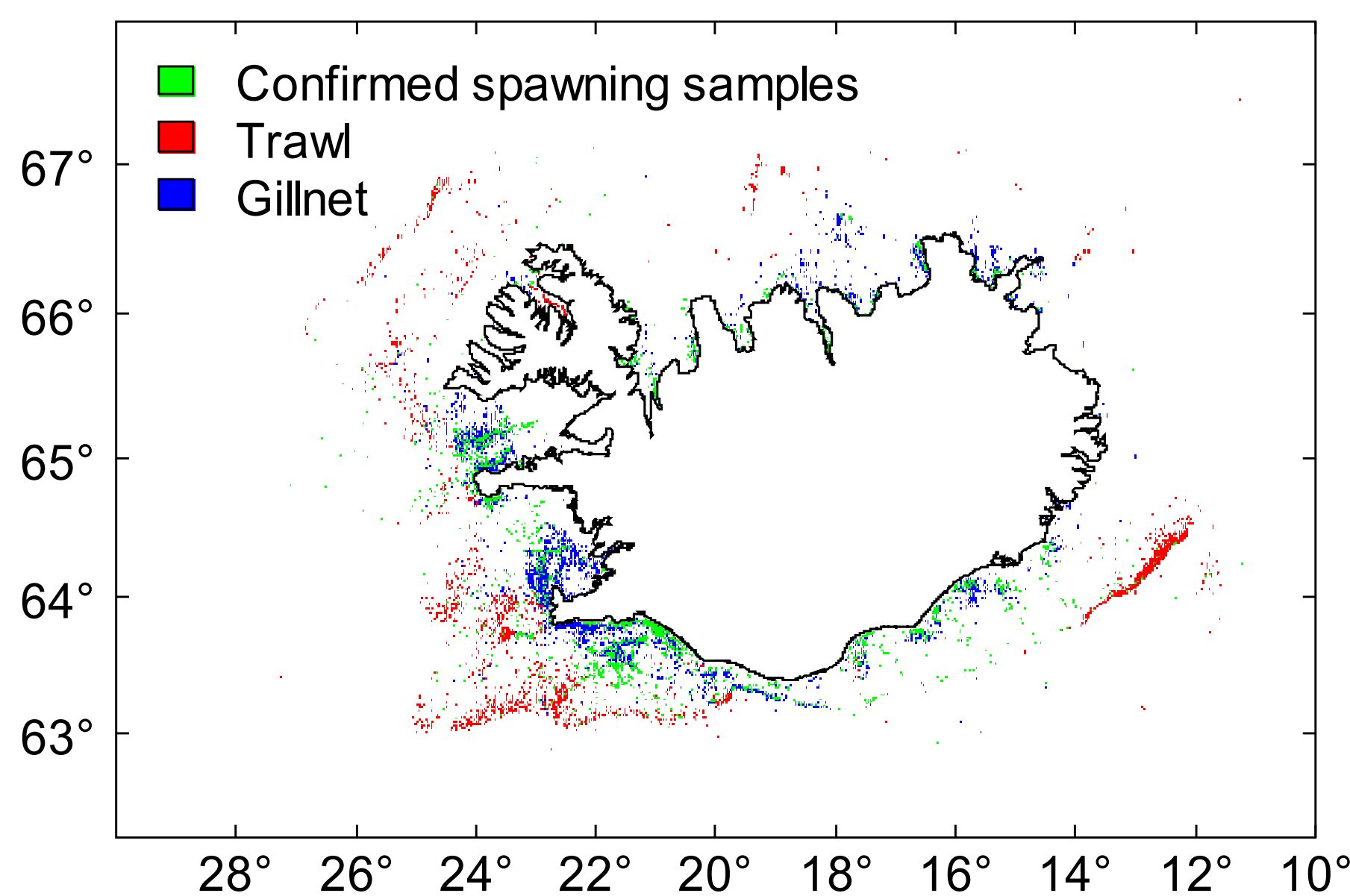


Figure 1. Potential spawning sites identified using the above criteria.

55 potential spawning regions defined:

- Aggregations of fisheries records.
- Confirmed spawning cod samples.
- Areas historically delineated by fishermen.

6 spawning areas defined:

- Regions grouped into areas according to proximity and hydrography.

Potential spawning regions and areas

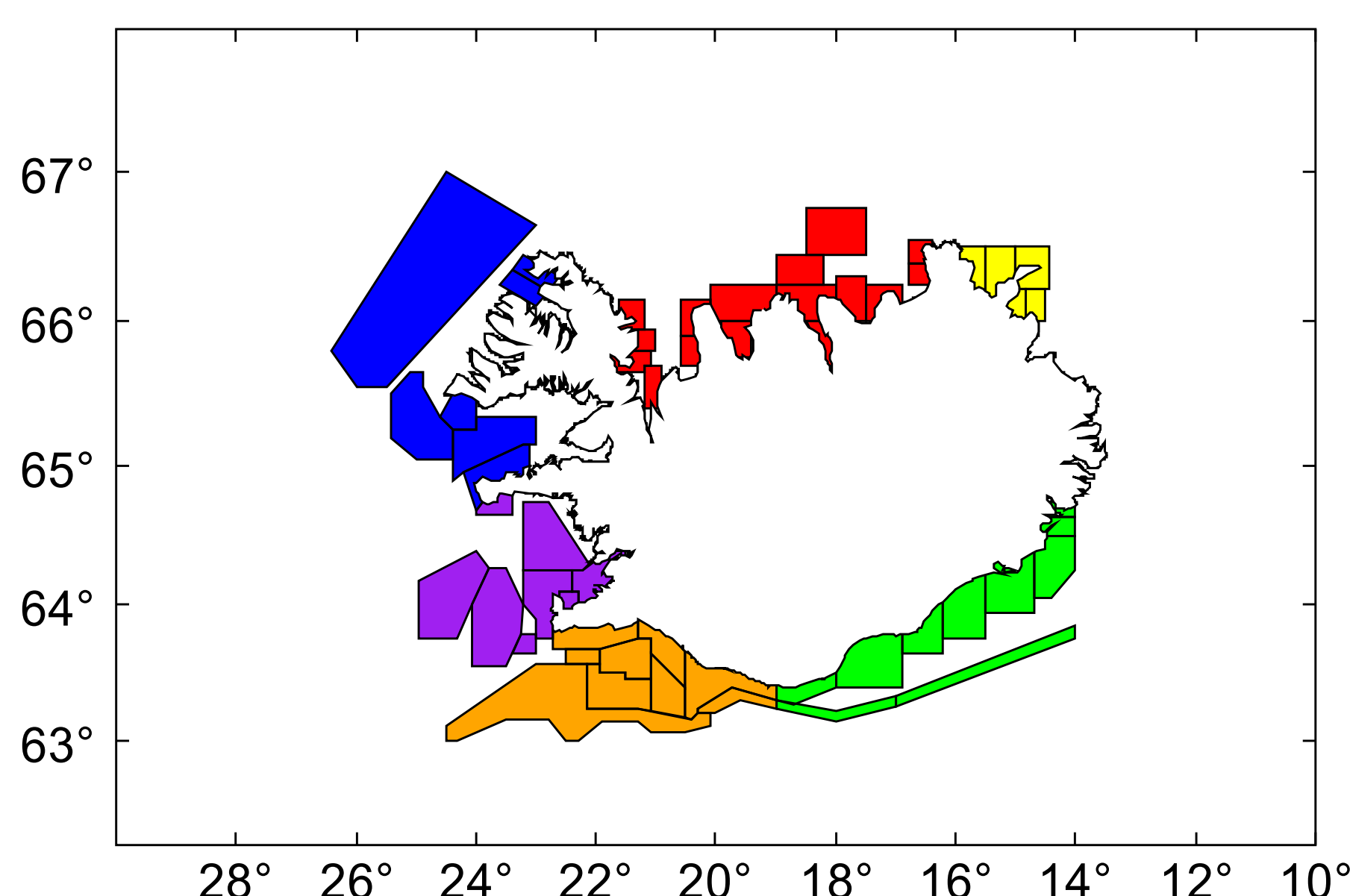


Figure 2. Fifty-five potential spawning regions grouped into 6 areas.

Spawning female abundance (from gillnet survey data):

- Maturity ogives and sex ratios used to calculate the length distribution and proportion of spawning females per area.
- These are used, together with gillnet survey CPUE, to calculate an abundance index for each spawning region.
- The index is used to calculate the relative distribution of spawning females per region.
- VPAs' split using the relative distributions to give the number of spawning females per year per region.

Results

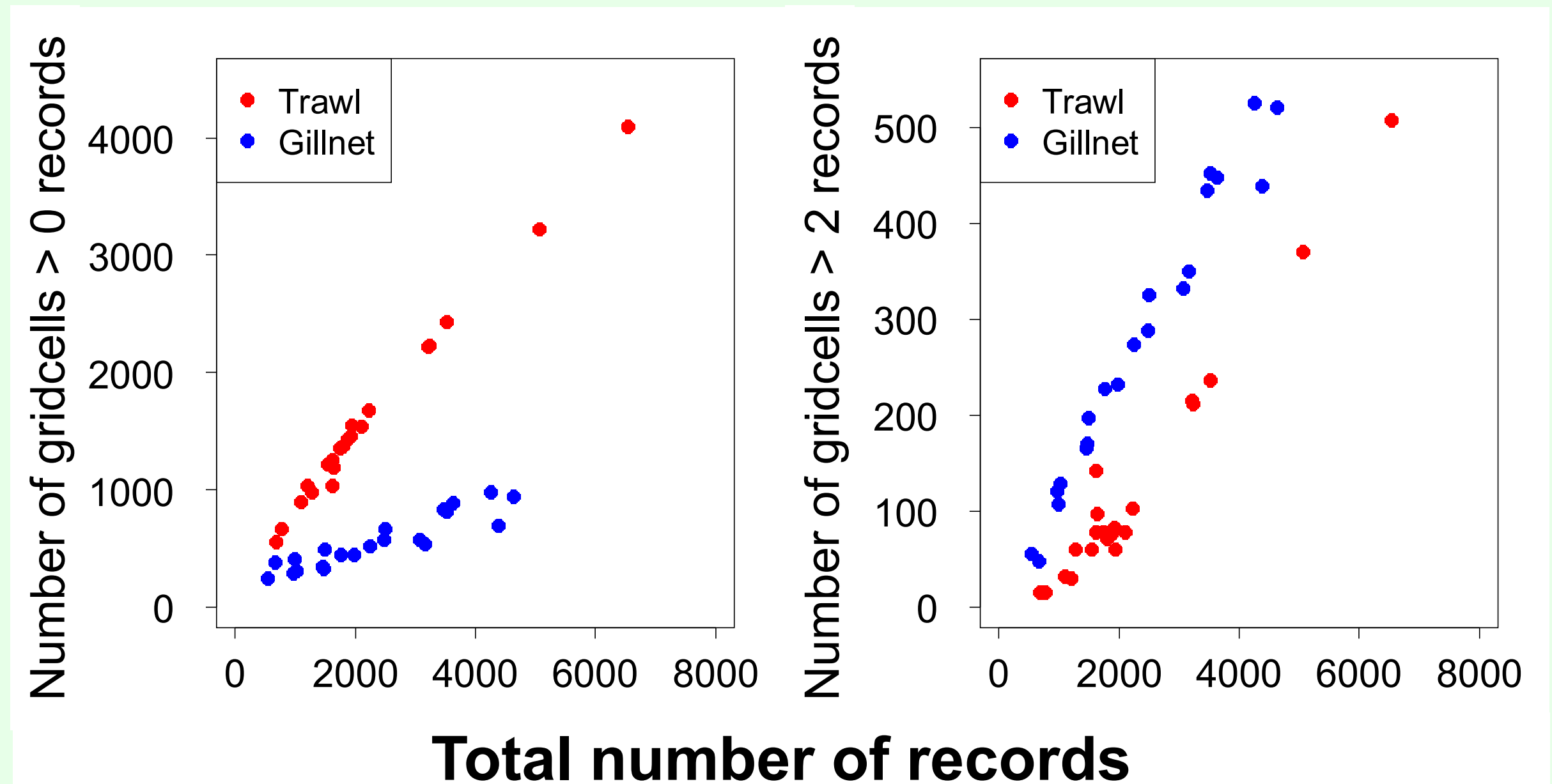


Figure 3. Relationships between fishing effort (number of logbook records) and spatial coverage of vessels (number of gridcells fished) per year.

- As fishing effort increases the geographical area covered by fishermen increases for both geartypes.
- The rate of increase is greater for demersal trawl.
- Gillnet vessels target the same gridcell multiple times in a single spawning season; trawls target the same gridcell less frequently.
- Gillnets used close to shore; trawls used further offshore (figure 1).

Abundance of spawning females

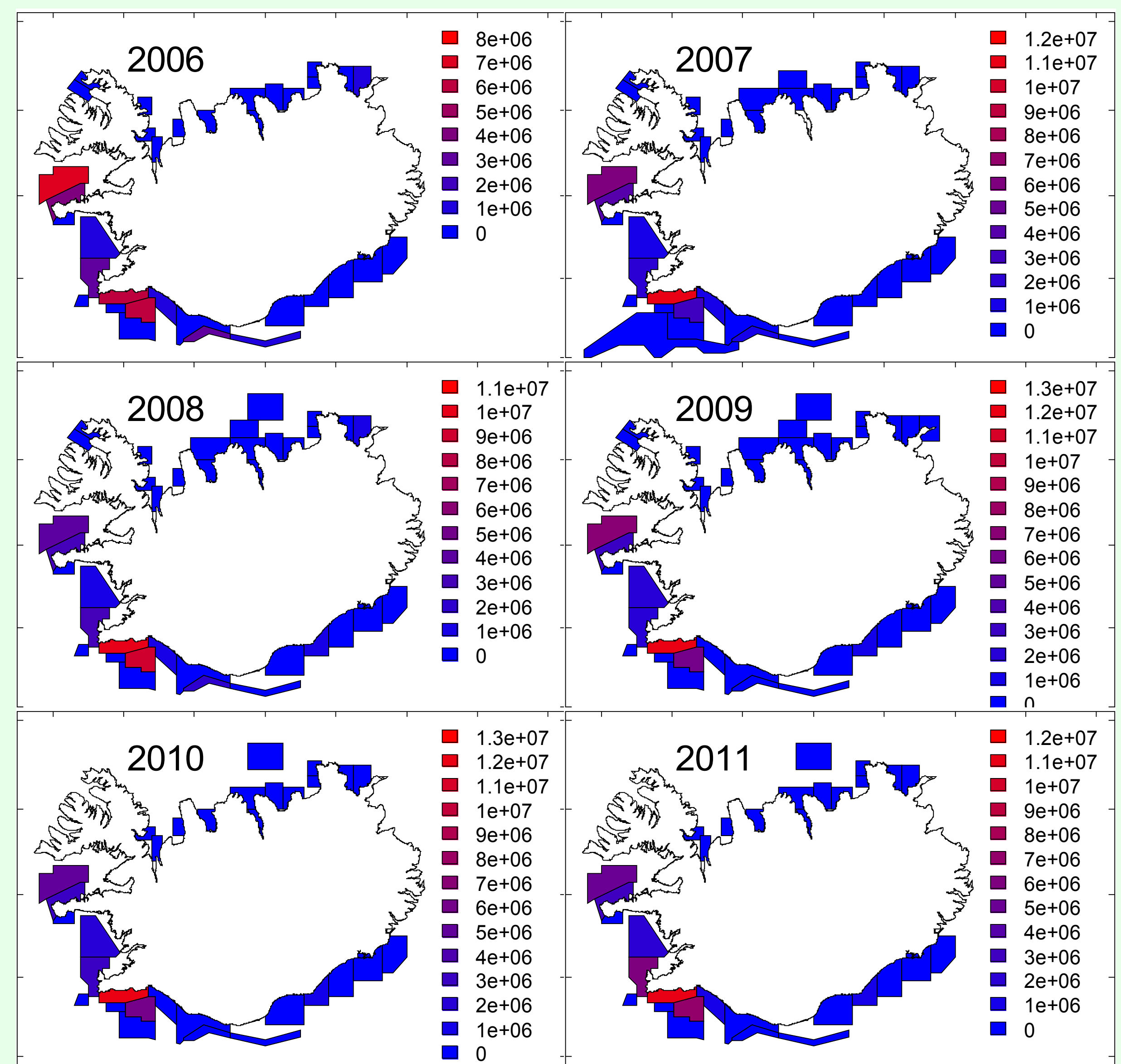


Figure 4. Abundance of spawning females per region. The legend displays the lower limit of the interval. The notation $e+05$ is equivalent to $\times 10^5$.

1. Abundance is consistently greatest in 2 Selvogsbanki (SW) regions, Breiðafjörður (upper W fjord) and Faxaflói (lower W fjord).
2. These contribute 43%, 25% and 13% respectively to the spawning female abundance (over 6 years).
3. In these areas, steep gradients between adjacent regions suggest spawning is a location-specific event.
4. Regions along the north and southeast coasts consistently have smaller abundance (13 % over 6 years).