Cancer pagurus

Data Sources for current assessments

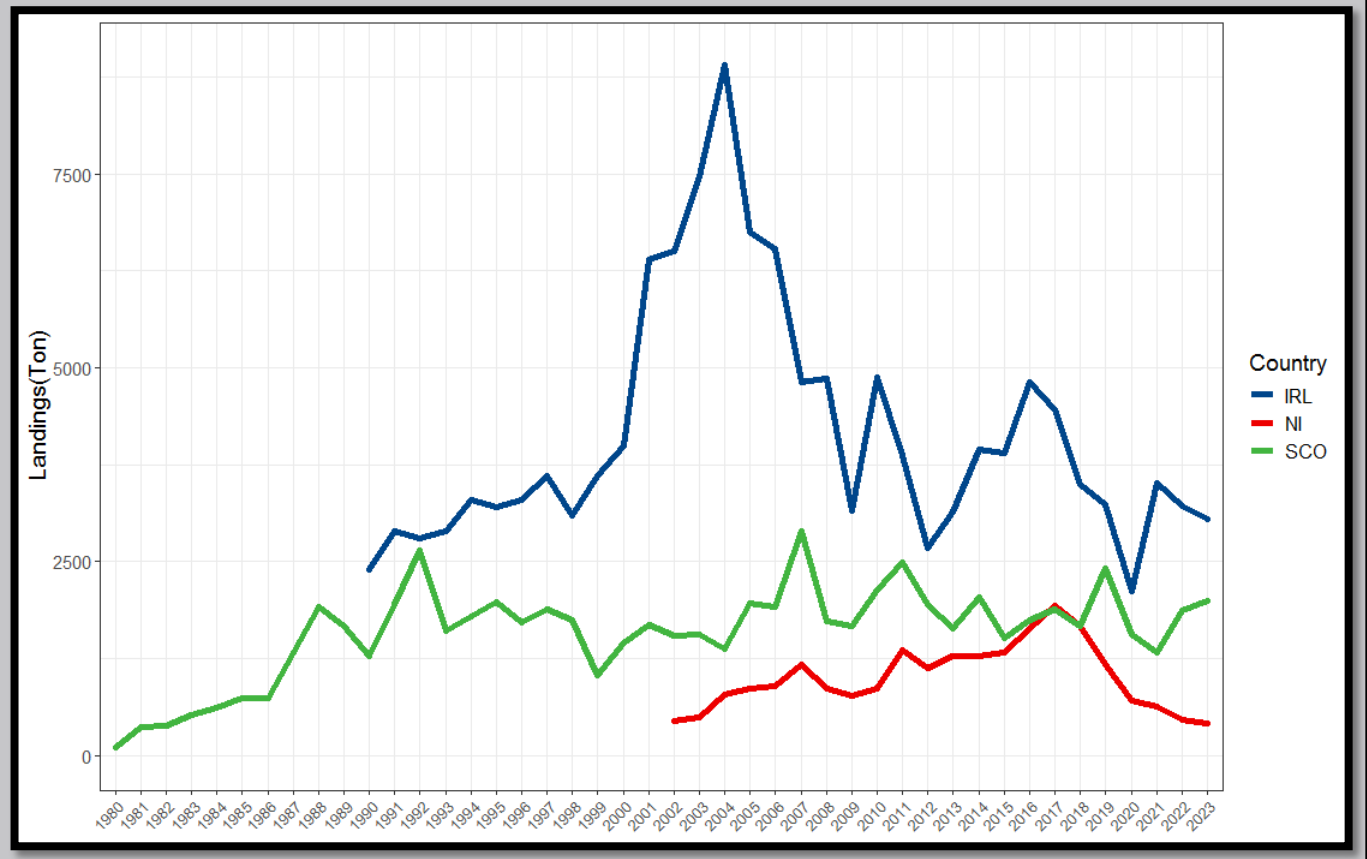
Guillermo Martin*, Oliver Tully*, Liese Carleton

guillermo.martin@marine.ie; oliver.tully@marine.ie; liese.carleton@marine.ie

Marine Institute
Foras na Mara

Logbook and sales data

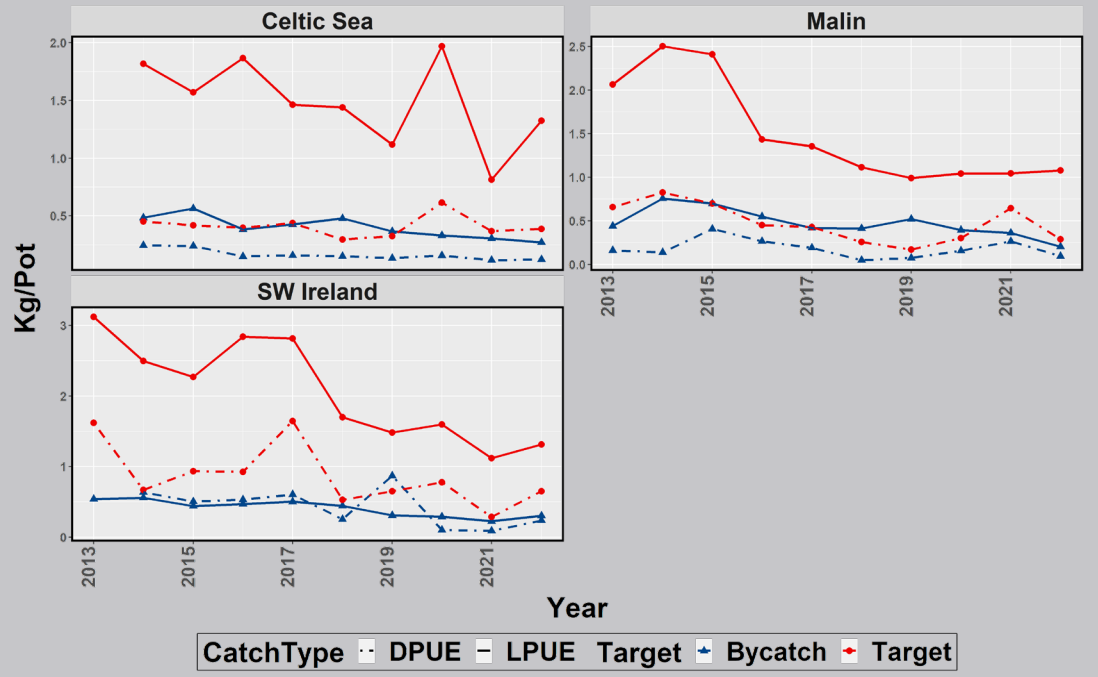
- Landings: logbooks (>10) and SalesNotes (<10m)
  - National and international
  - Landings by ICES rectangle

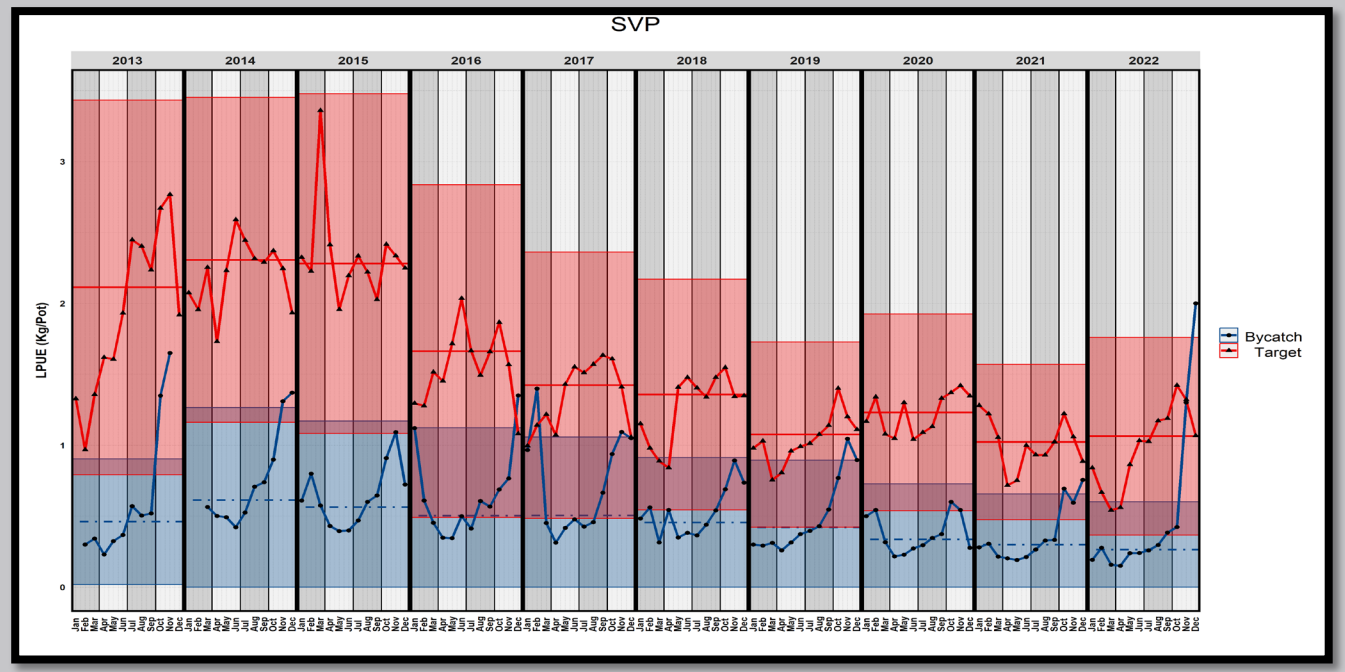


Brown crab landings in the Malin Head by Irish, Scottish and Northern Irish boats (1980-2023). Both >10m and <10m

Commercial data

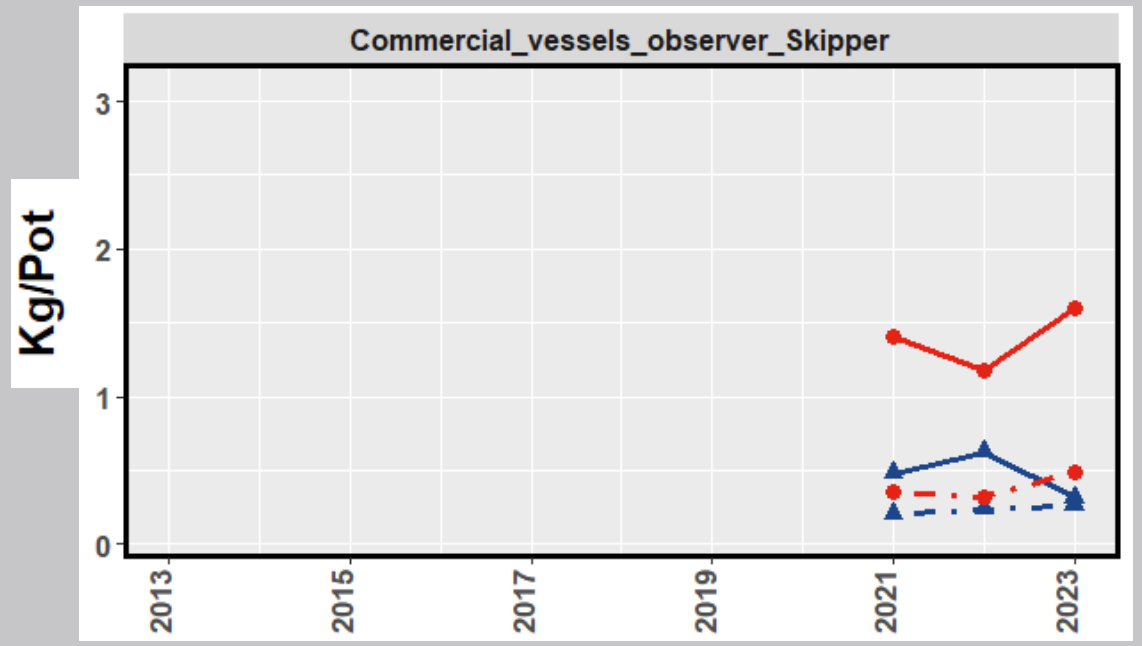
- Landings
- Sentinel Vessel Programme (SVP):
  - BIM based programme
  - 2013- (earlier versions available since ~2005)
  - daily catches and discards from a subset of the Irish fleet (about 7% of the active fleet under 12m)
  - data informing the Malin stock assessment
  - 8-14 boats per year in the Malin Head area
  - Data sub-sets
    - LPUE in gear targeting crab
    - DPUE in gear target crab
    - LPUE crab bycatch in lobster gear
    - DPUE crab bycatch in lobster gear

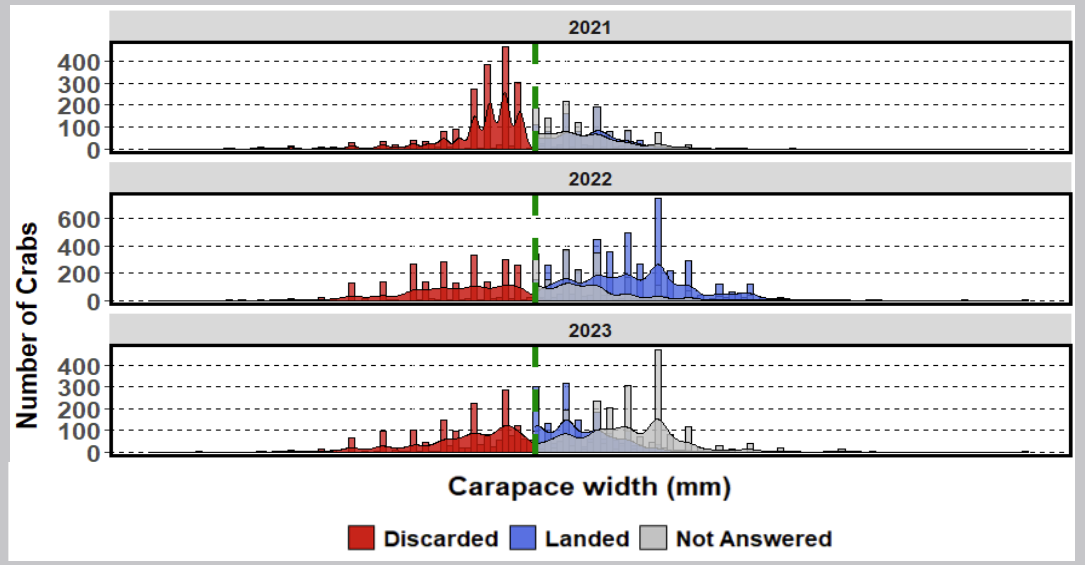




Commercial data

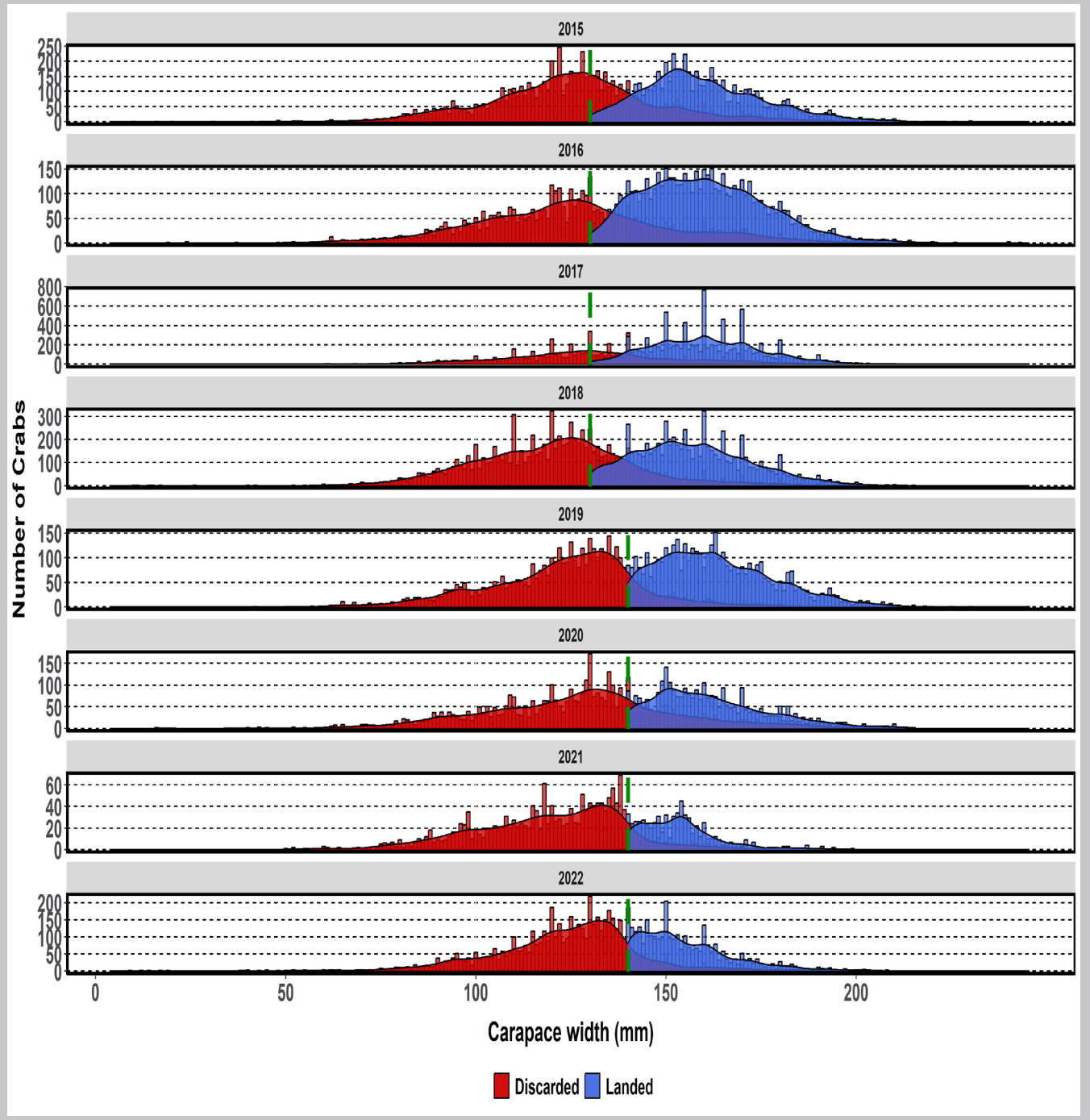
- Landings
- Sentinel Vessel Programme (SVP)
- Skipper-self sampling programme:
  - MI based programme
  - 2021-now
  - Haul by haul data on catches and discards by about 20 skippers nationally





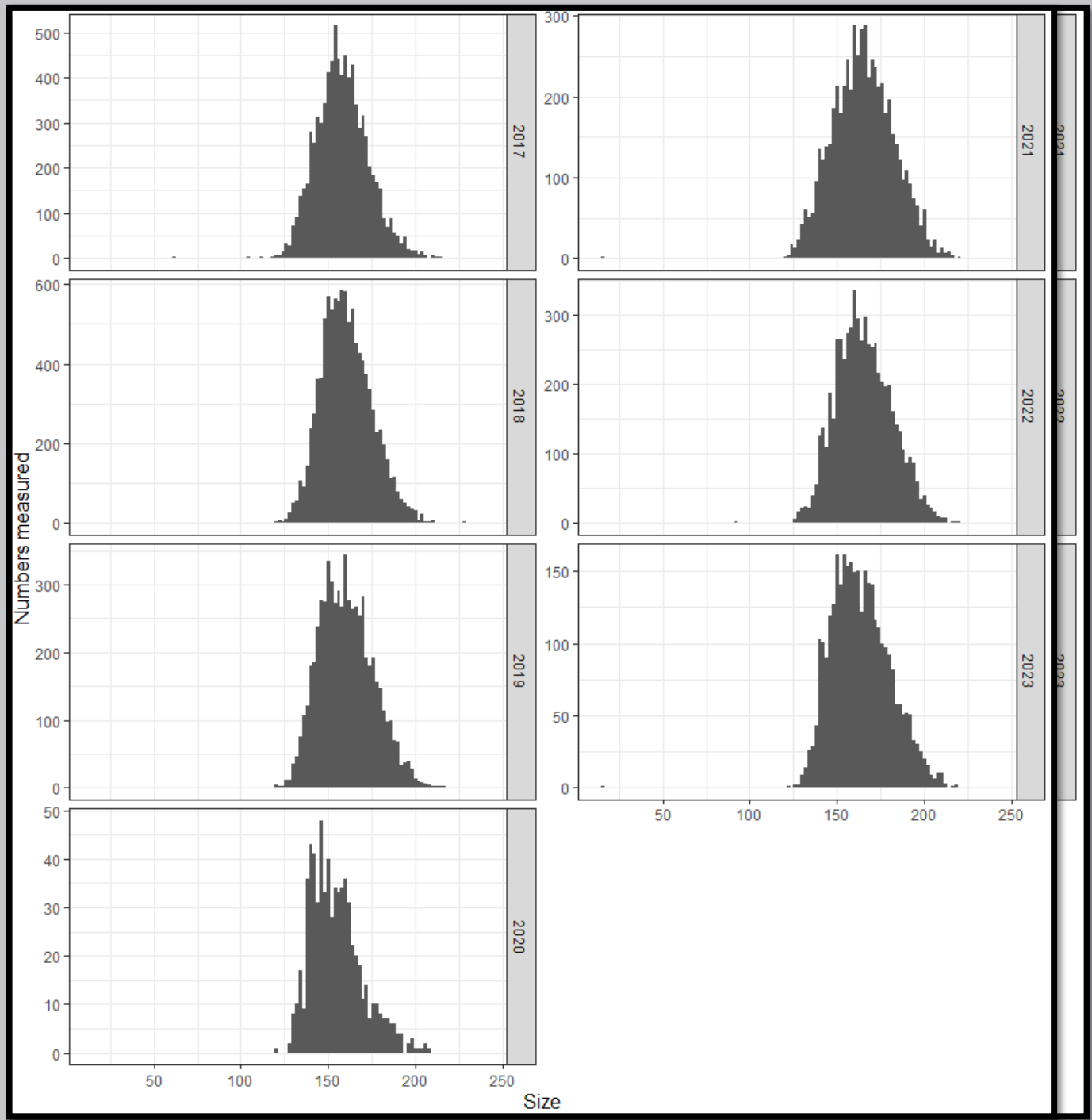
Commercial data

- Landings
- Sentinel Vessel Programme (SVP)
- Skipper-self sampling programme
- Observer at sea programme
  - MI based programme
  - 2015-now
  - Small number of trips per year
  - Haul by haul data on catches and discards and size composition



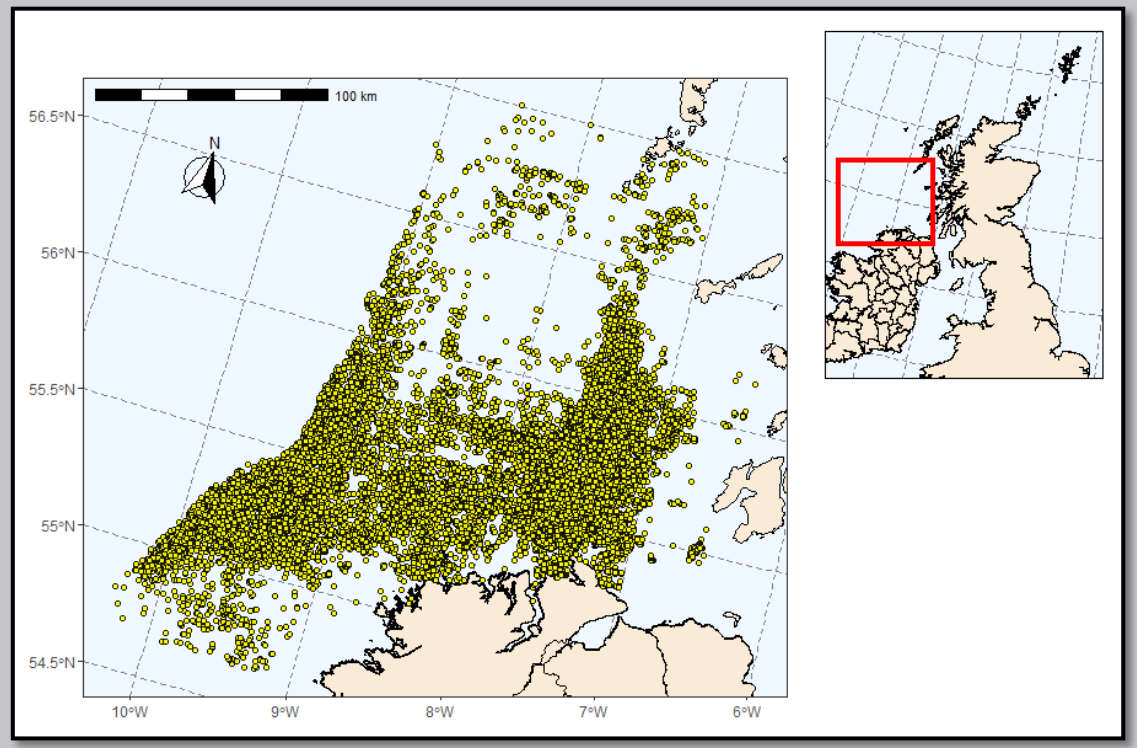
Commercial data

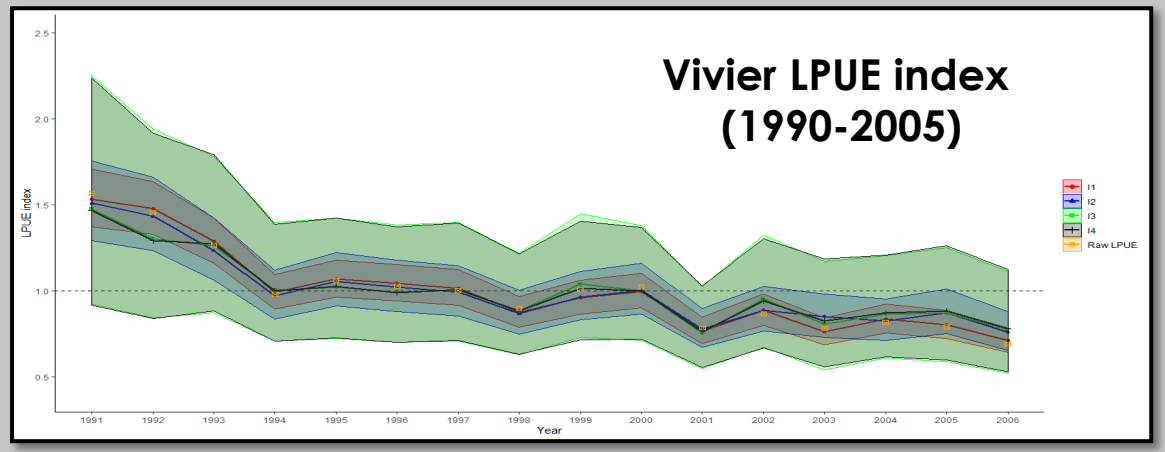
- Landings
- Sentinel Vessel Programme (SVP)
- Skipper-self sampling programme
- Observer at sea programme
- Port sampling size distribution of the landings
  - MI based programme
  - 2013-now although lag in data entry and processing



Commercial data

- Landings
- Sentinel Vessel Programme (SVP)
- Skipper-self sampling programme
- Observer at sea programme
- Port sampling size distribution of the landings
- Historical Vivier fleet LPUE time series
  - 1990-2005
  - Daily records of catches
  - Index informing the Malin Stock Assessment





Data	Type	Used in Assessment
Landings	Landings	Yes
Sentinel Vessel Programme (SVP)	Mostly LPUE	Yes
Skipper-self sampling programme	Mostly Length	No
Observer at sea programme	Mostly Length	No
Port sampling size distribution	Length	No
Historical Vivier-fleet LPUE time series	LPUE	Yes

ICES Recommended Assessments

(ICES Category 3*)

(*Stocks for which survey or other indices are available that provide reliable indications of trends in stock metrics, such as total mortality, recruitment, and biomass)

Surplus Production Models (SPiCT)

Basic formulation from the 1950's

"…to optimize harvest by fishing the excess (surplus) production without affecting the long term productivity of the stock…"

~~**Length-Based Assessments**~~

- Representativeness of the data
- Size distribution does not seem to respond to landings and effort
- Discarding and high-grading hides patterns in the data
- Requires estimation of Life-history parameters and assumptions of natural mortality

Accuracy and Precision in the data and implications for the assessment

Accuracy (bias)

- LPUE is used as the stock abundance index and we assume changes in LPUE reflect proportional changes in the abundance of crab in the stock area

- The LPUE index is standardized to the extent possible to remove effects on LPUE that may not be related to changes in abundance eg. Vessel effects, Soak time

- Remaining potential sources of bias
  - Changes in grading practice on vessels over time will bias the index (High grading will reduce LPUE)
  - Increase in pot density may introduce gear competition effects (more pots on the ground will reduce CPUE (and LPUE)

Precision

- LPUE is different on every vessel; different fishing grounds, variation in gears and set up, grading
- The more boats that provide data the higher the precision (or confidence we have in the LPUE index)

Data visualization

R-Shiny app

https://shiny.marine.ie/shellfish/

Landings

Sentinel Vessel Fleet

Observer programme

Annual bivalve assessments

Relevant links and information