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Numbers 1-456 in this series were issued as Technical Reports of the Fisheries Research Board of Canada. Numbers 457-714 were issued as Department of the Environment, Fisheries and Marine Service, Research and Development Directorate Technical Reports. Numbers 715-924 were issued as Department of Fisheries and Environment, Fisheries and Marine Service Technical Reports. The current series name was changed with report number 925.

Rapport technique canadien des sciences halieutiques et aquatiques

Les rapports techniques contiennent des renseignements scientifiques et techniques qui constituent une contribution aux connaissances actuelles, mais qui ne sont pas normalement appropriés pour la publication dans un journal scientifique. Les rapports techniques sont destinés essentiellement à un public international et ils sont distribués à cet échelon. Il n'y a aucune restriction quant au sujet; de fait, la série reflète la vaste gamme des intérêts et des politiques de Pêches et Océans Canada, c'est-à-dire les sciences halieutiques et aquatiques.

Les rapports techniques peuvent être cités comme des publications à part entière. Le titre exact figure au-dessus du résumé de chaque rapport. Les rapports techniques sont résumés dans la base de données *Résumés des sciences aquatiques et halieutiques*.

Les rapports techniques sont produits à l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre.

Les numéros 1 à 456 de cette série ont été publiés à titre de Rapports techniques de l'Office des recherches sur les pêcheries du Canada. Les numéros 457 à 714 sont parus à titre de Rapports techniques de la Direction générale de la recherche et du développement, Service des pêches et de la mer, ministère de l'Environnement. Les numéros 715 à 924 ont été publiés à titre de Rapports techniques du Service des pêches et de la mer, ministère des Pêches et de l'Environnement. Le nom actuel de la série a été établi lors de la parution du numéro 925.

**Canadian Technical Report of
Fisheries and Aquatic Sciences ###**

2023

Maritimes Region American Lobster: Fisheries Spatial Distribution
by

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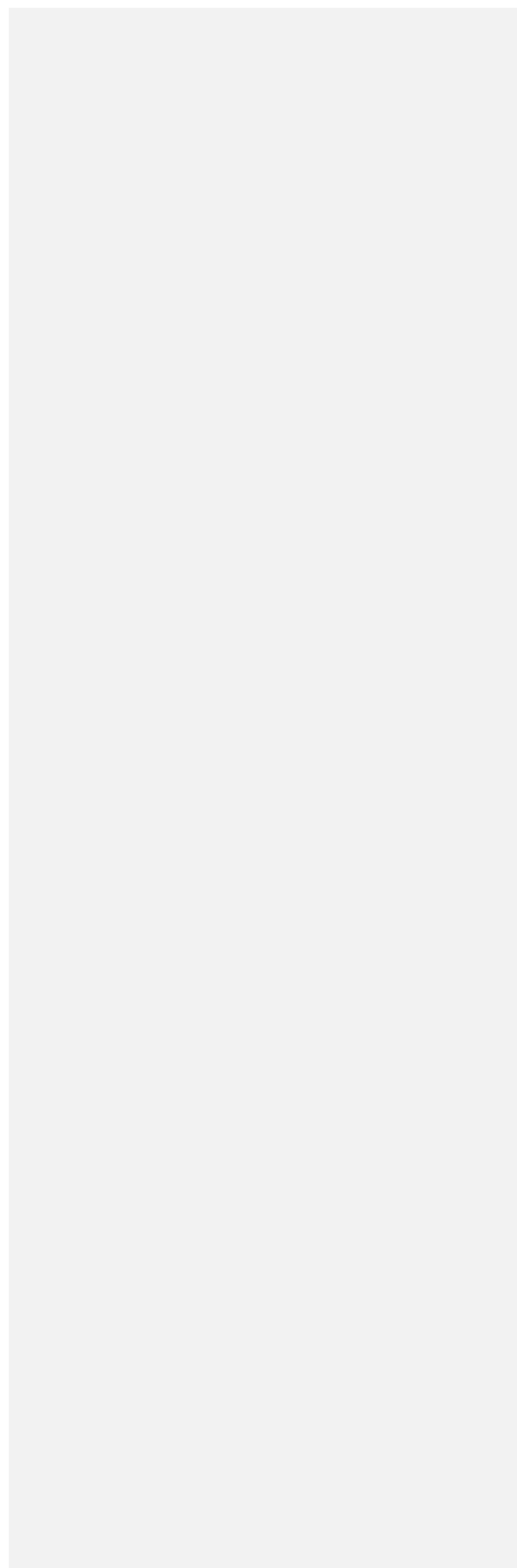
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ABSTRACT

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RÉSUMÉ

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INTRODUCTION

American lobster fisheries are among the most economically important fisheries in Canada. Within the Maritimes Region there are 13 (Figure 1) inshore lobster fishing areas (LFAs) that hold considerable cultural, social and economic importance. Fisheries stock assessments occur on an annual basis for each of these lobster fishing areas based on the methodologies outlined in Cook et. 2019 and Cook et al. 2023. These assessments make use of both fisheries independent surveys as well as fisheries dependent data from mandatory commercial logbooks. These assessments typically report high (across an entire LFA) level outputs of trends and temporal patterns. Specific changes within fisheries distribution typically are not part of stock assessments but are becoming of increasing interest / importance due to ecosystem changes (such as climate change) as well as the increased interest in marine spatial planning and increased use from ocean development planning. Other publications have attempted to better document distribution patterns of lobster fisheries (e.g. Serdynska et al. 2022), however they do not accurately reflect the true spatial extent of fishing for many LFAs (particularly LFA 27-32). The use of summary statistics in such approaches can introduce bias in fishery estimates.

Within this document, we provide a methodology for estimating measures of unbiased catch per unit effort, fishery effort (trap hauls) and landings; based directly on fisheries logbook data. Further, we discretize this information to a spatial resolution appropriate for the fisheries within each LFA by providing metrics of fisheries statistics on a density scale (variable / km²). We analyze and produce maps on each LFA separately as each maintains different environmental and fisheries management characteristics (Table 1), altering the interpretation of fisheries footprints.

Data Sources and Analyses

Logbook Data

Mandatory commercial fishing logbooks (herein logbooks) provide the most detailed accounting of the spatial and temporal effort and landings for commercial lobster fishing currently available. These logbooks are required to be filled out daily and are submitted on a monthly basis to Dockside Monitoring Companies for data entry and transmission to the Department of Fisheries and Oceans' (DFO) Commercial Data Division (CDD). Logbooks contain fishing information on *Date Fished*, *Vessel Registration Number*, *Fishing License Number* and *Reporting Grid Number(s)* (Gridded Location). For each day, *Grid Number*, *effort (Number of Traps Hauled)* and *Estimated Landings* are provided. The measured weight of lobsters landed is reported in the *Weigh-Out Slip* portion of the logbook, which is completed upon sale of the lobsters. The slip-weight cannot be readily linked directly to a fishing trip as harvesters sell only a portion of the catch from a trip and / or aggregate catch from multiple trips for a single sales event. As such, slips are the most accurate accounting of annual (or seasonal) landings available whereas daily logs are the most accurate information available on fishing effort and spatial distribution. Logbook data are stored in the Maritimes Fishery Information System (MARFIS) which is maintained by CDD.

As with most databases, errors or incomplete information exist for the lobster logbook data in MARFIS. The process of filtering logbooks with incomplete effort information will yield an underestimate of total number of traps hauls (effort). In order to provide an improved estimate of total trap hauls (H_{ly}) we used the catch per unit effort (CE_{ly}) estimated from the filtered logbooks meeting data quality standards and the reported slip landings (S_{ly}) for each LFA (l) and year (y). For fishing seasons that span 2 calendar years, year will refer to the end of season year.

$$H_{ly} = \frac{S_{ly}}{CE_{ly}} \quad \text{Eq. 1}$$

where

$$CE_{ly} = \frac{\sum_{i=1}^n c_{lyi}}{\sum_{i=1}^n e_{lyi}} \quad \text{Eq. 2}$$

for all filtered logbook entries ($i = 1:n$). As CE_{ly} is a ratio estimator, with both catch (c_{ly}) and effort (e_{ly}) being random variables, it is considered biased on the order of $1/n$ where n represents the sample size (Cochran 1977). Although n is large for these datasets an asymptotically correct estimator is (van Kempen and van Vliet 2000):

$$CE_{ly}' = CE_{ly} + \frac{\sigma_e^2 \mu_c}{\mu_e^2 \mu_e} - \frac{\sigma_{ec}}{\mu_e^2} \quad \text{Eq. 3}$$

with variance estimated as:

$$var(CE_{ly}') = \frac{1}{n} \left[\frac{\sigma_c^2}{\mu_e^2} + \frac{\mu_c^2 \sigma_e^2}{\mu_e^4} - \frac{2\mu_c \sigma_{ec}}{\mu_e^3} \right] \quad \text{Eq. 4}$$

Where μ_c , μ_e , σ_c^2 , σ_e^2 and σ_{ec} represent the mean of catch, mean of effort, variance of catch, variance of effort and the covariance of effort and catch respectively. Confidence intervals (4%; 96%) were approximated by Chebyshev's inequality. Throughout the document, the bias corrected CE_{ly}' statistics will be presented. Point estimates of H_{ly} , associated variances $var(H_{ly})$ and confidence intervals will be based on those calculated with CE_{ly}' .

CE_{ly} , H_{ly} and S_{ly} were discretized to the smallest spatial scales using the reported proportion of either total landings or total trap hauls within logbook grids assuming that the filtered logbooks

represent an unbiased sample of the spatial fishing patterns. In order to meet the Government of Canada privacy policy (Treasury Board Directive, 2010), data was screened to block out grid fisheries statistics with less than five vessel IDs and license IDs. The so-called “Rule of Five” was not met in all years and LFAs. Grids that did not meet this criteria were left blank for all maps in this document.

The fisheries statistics in LFA 28 did not meet the minimum threshold in any year and were therefore not included in this document, however fishing does occur in all grids on an annual basis. The non-public, underlying data is still available to the DFO for Marine spatial planning exercises.

Adjustment of Spatial Grids

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In LFAs 27-32, the LFA boundaries and the entire grids within them do not accurately represent the extent of fishing activity within the areas. Each LFA boundary in this area extends from the coast to ~50 nautical miles offshore whereas lobster fishing in these LFAs typically occurs closer to the coast. To provide a more realistic representation of the spatial extent of Lobster fishing within these LFAs, we used three sources of information:

1. georeferenced at-sea sampling of commercial fishing coupled with a high-resolution digital elevation map to determine the depth at each trap location
2. results from a harvester survey (Parlee et al, in prep).
3. Direct reports from harvesters.

Within each LFA, the greater of the upper 99th quantile break (removing outliers) or the deepest depth reported by harvesters were used to define the commercial fishing area and provide a more realistic determination of fisheries areas.

LFA 37

At the time of completion of this document LFA 37 is considered a shared resource between LFA 36 and 38. The grids of LFA 37 overlap those in LFA 36, therefore fisheries statistics for those grids in LFA 36 are for the entire grid area. LFA 38 harvesters fishery statistics in LFA 37 grids represent just the activity within the shared area.

Time series Trends

Temporal trends in catch per unit effort (CPUE) within each grid were displayed as the percent change from mean CE_{iy} between 2006 and 2010 commercial fishing seasons and the mean CE_{iy} for each of 2011:2013, 2014:2016, 2017:2019 and 2020:2022 .

Results

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The depth distribution of fishing from observations and harvester surveys ~~was~~ less than or equal to 80m for LFAs 27-32. The resulting fishery footprint estimations ~~for~~ these LFAs are substantially ~~smaller~~ than ~~those~~ available for fishing as outlined in regulations (Table 3); ~~estimations~~ ranging from 3% to 44% (excluding landlocked LFA 28) of the available (regulated) LFA area.

LFA 27

References

Treasury Board Directive on Privacy Impact Assessment. 2010. Available online: <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=18308§ion=text>

Table 1: Maritimes Region Lobster Fishing Areas restrictions and seasons.

LFA	Season	Trap limit ¹	Minimum Legal Size (mm)	Other measures	V-notch retention
27	May 15 - July 15	275	82.5		No restrictions
28	April 30 - June 30	250	84	Max. entrance hoop 153mm	Restricted
29	April 30 - June 30	250	84	Max. entrance hoop 153mm	Restricted
30	May 19 - July 20	250	82.5	Max. CL-135mm (female)	Restricted
31A	April 29 - June 30	250	82.5	Closed window (female), 114-124 mm	No restrictions
31B	April 19 - June 20	250	82.5	V-notching ²	Restricted if >=110 mm, must v-notch and release set quantity of females >= 110 mm each season (Class A = 50kg, Class B = 15kg, Partnerships, including stacked licenses = 75kg).
32	April 19 - June 20	250	82.5	V-notching ²	Restricted if >=110 mm, must v-notch and release set quantity of females >= 110 mm each season (Class A = 50kg, Class B = 15kg, Partnerships, including stacked licenses = 75kg).
33	Last Mon. Nov - May 31	250	82.5		Restricted, unless setal hair has grown all the way across the mutilation
34	Last Mon. Nov - May 31	375/400	82.5		Restricted, unless setal hair has grown all the way across the mutilation
35	Oct 14 - Dec 31 and Last day Feb - July 31	300	82.5		Restricted, unless setal hair has grown all the way across the mutilation
36	2 nd Tues Nov - Jan 14 and March 31 - June 29	300	82.5		Restricted, unless setal hair has grown all the way across the mutilation
37	2 nd Tues Nov - Jan 14 and March 31 - June 29	N/A	N/A		N/A
38	2 nd Tues Nov – Jun 29	375	82.5		Restricted, unless setal hair has grown all the way across the mutilation
38B	June 30 – Fri before 2 nd Tues Nov	375	82.5		Restricted, unless setal hair has grown all the way across the mutilation

¹The trap limit is for a Category A licence (full-time). A Category B licence (part-time) is allowed 30% of the limit of a Category A licence, and a licence fished under a partnership or stacking arrangement, 150%.

²V-notching means there is an active program to v-notch female lobsters. There is a possession restriction of v-notched lobsters in all other LFAs except in LFA 27 and LFA 31A.

Table 2: Number of Licences and type for Maritimes Inshore Lobster Fishery as of April 21st 2022.

LFA	Number of Licences			Length of Season (Days)	Number of Traps		
	Category A	Category B	Communal Commercial		Category A / Commercial Communal	Category B	Max Number of Trap Hauls
27	491	12	12	60	275	83	8,359,260
28	7	0	7	60	250	75	210,000
29	53	5	5	60	250	75	892,500
30	20	0	0	61	250	75	305,000
31A	68	3	0	61	250	75	1,050,725
31B	70	0	0	61	250	75	1,067,500
32	147	4	6	61	250	75	2,351,550
33	634	28	21	187	250	75	31,013,950
34	944	0	35	187	375/400*	113/120*	70,120,875
35	75	2	17	230	300	90	6,389,400
36	161	1	15	156	300	90	8,250,840
38	119	1	16	232	375	113	11,771,216

Table 3: Area of LFA after adjustment for observed depth distribution of commercial fishing activities.

LFA	Max Depth (m)	Original LFA Area (km ²)	Depth Pruned Area (km ²)	Proportion of Original Area
27	60	33297	3549	0.11
28	73	660	660	1.00
29	73	1203	655	0.44
30	46	4838	125	0.03
31A	80	5255	776	0.15
31B	67	7327	997	0.14
32	73	8681	1874	0.22

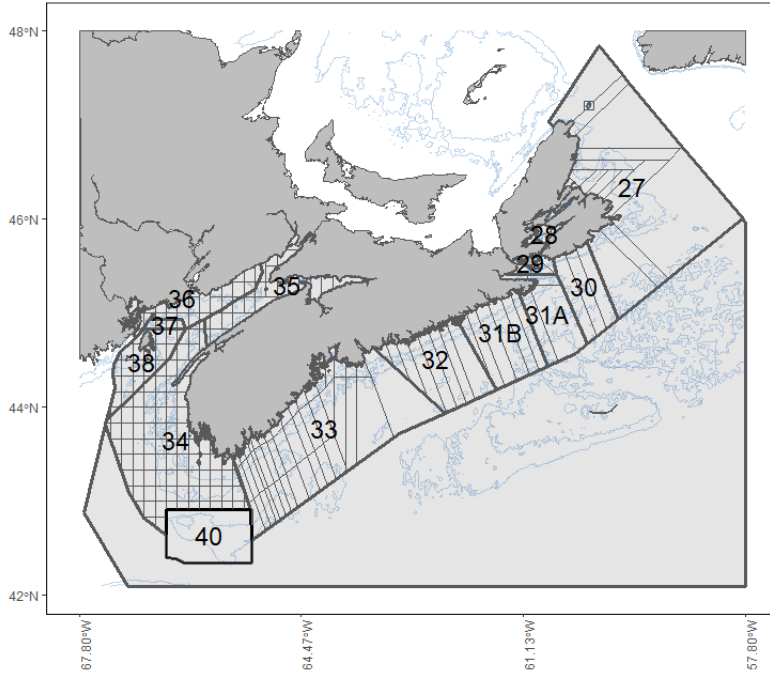


Figure 1: Inshore lobster fishing areas (LFA) managed within the Maritimes Region.

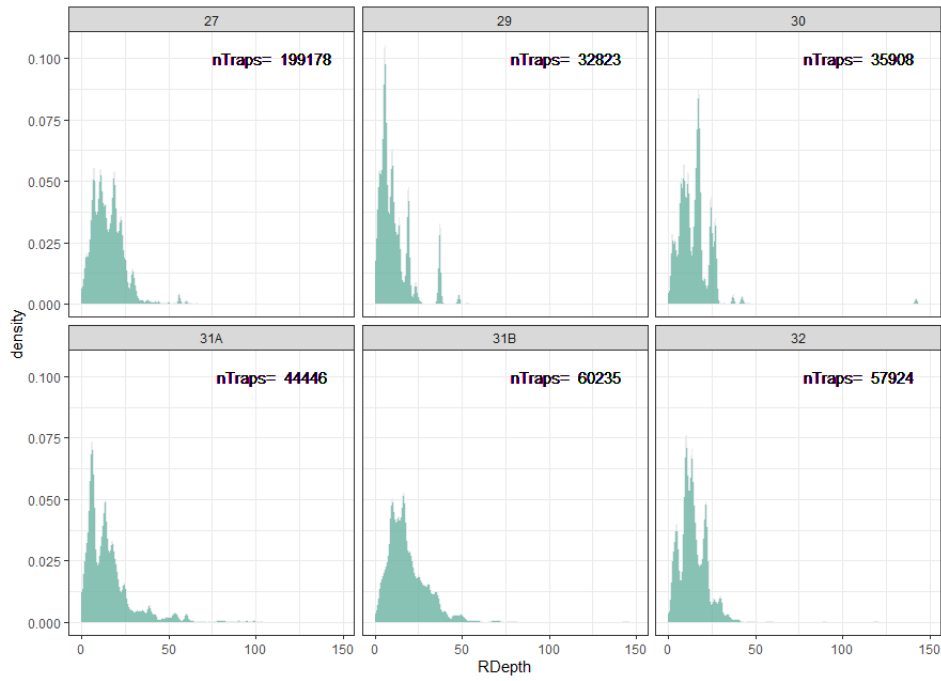


Figure : The distribution of depths of sampled traps during the commercial fisheries in LFAs 27 - 32.

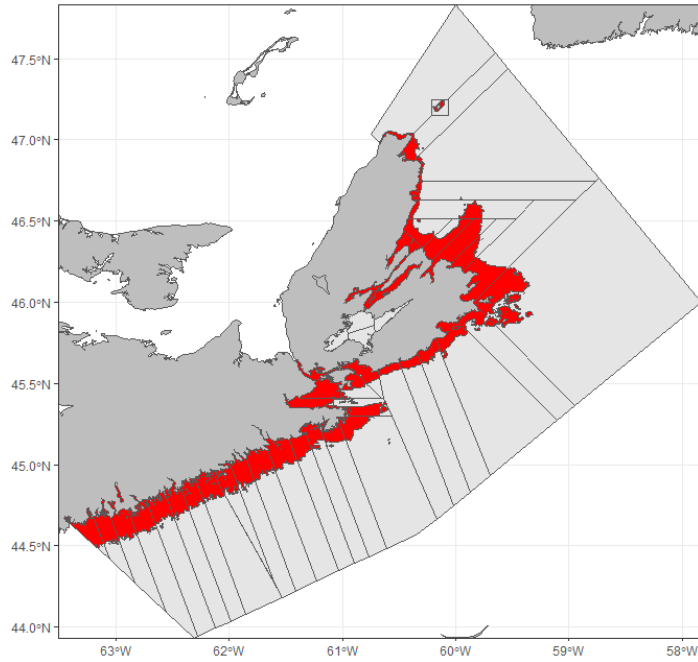
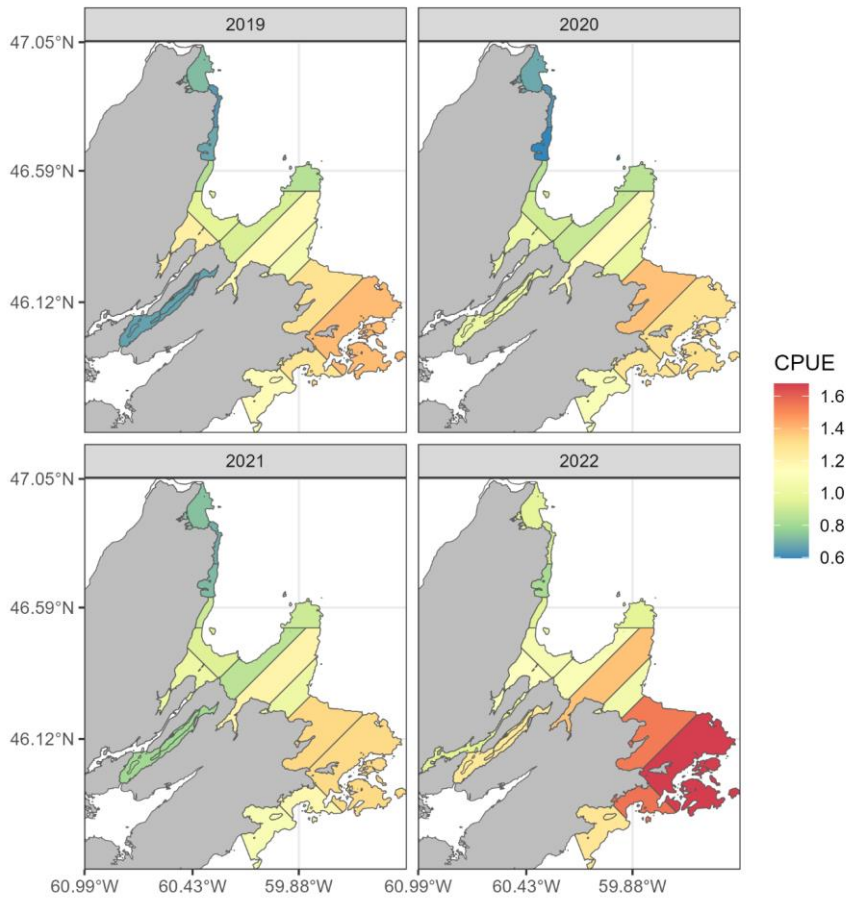
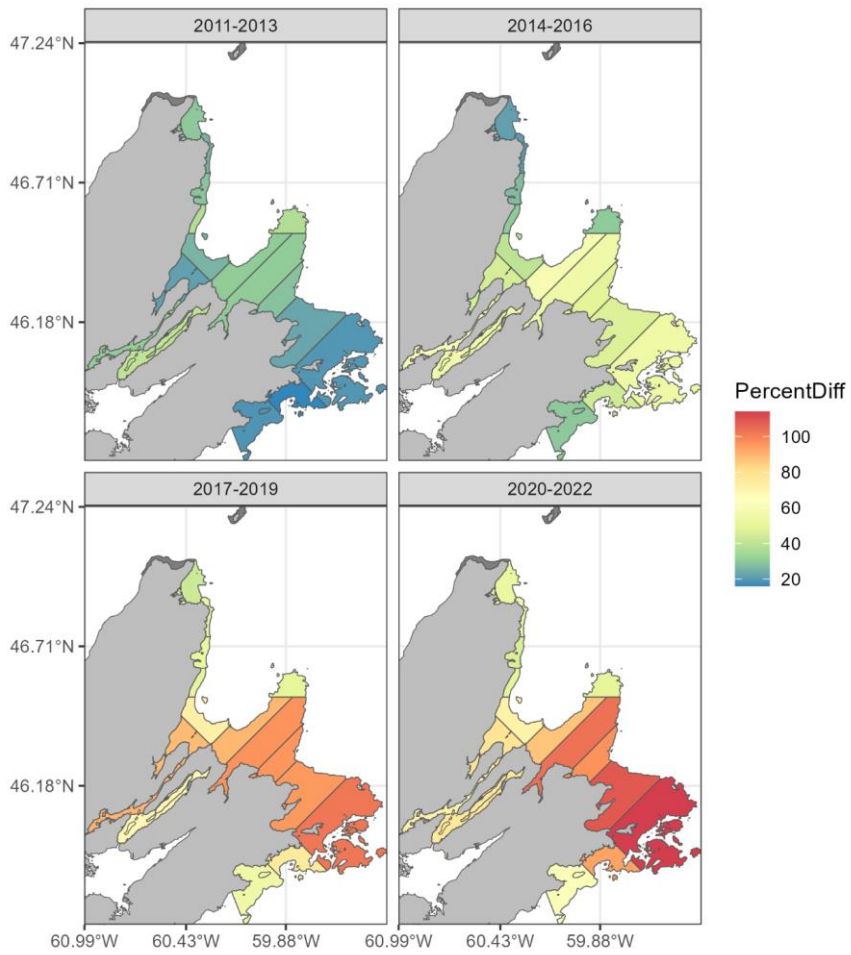


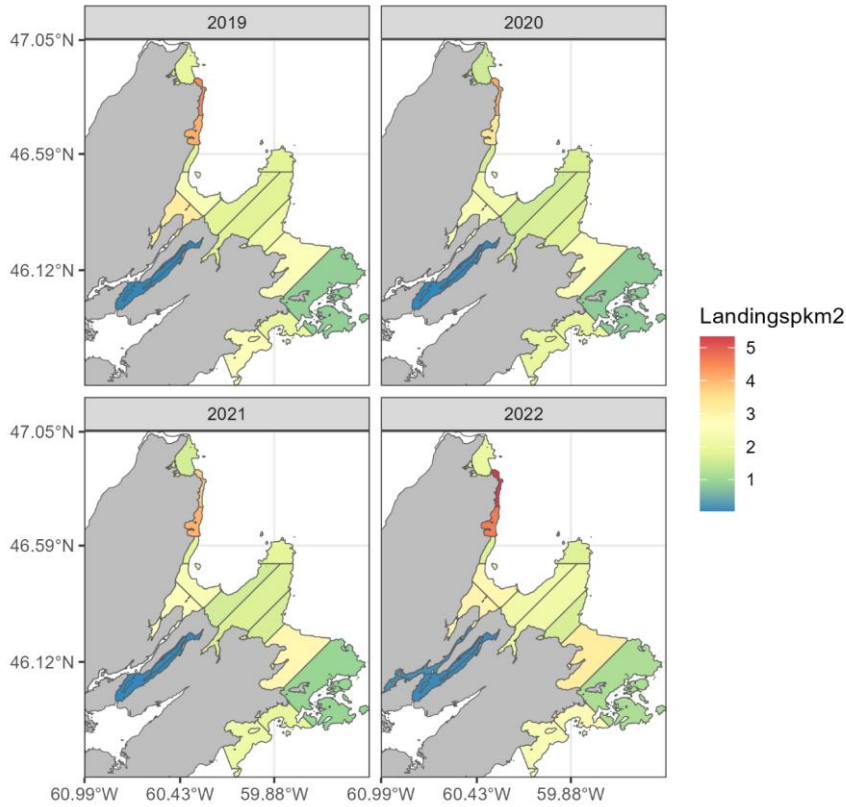
Figure : Depth truncated distribution of LFAs and grids after integrating depth contours with observed / reported commercial fishing Depth.



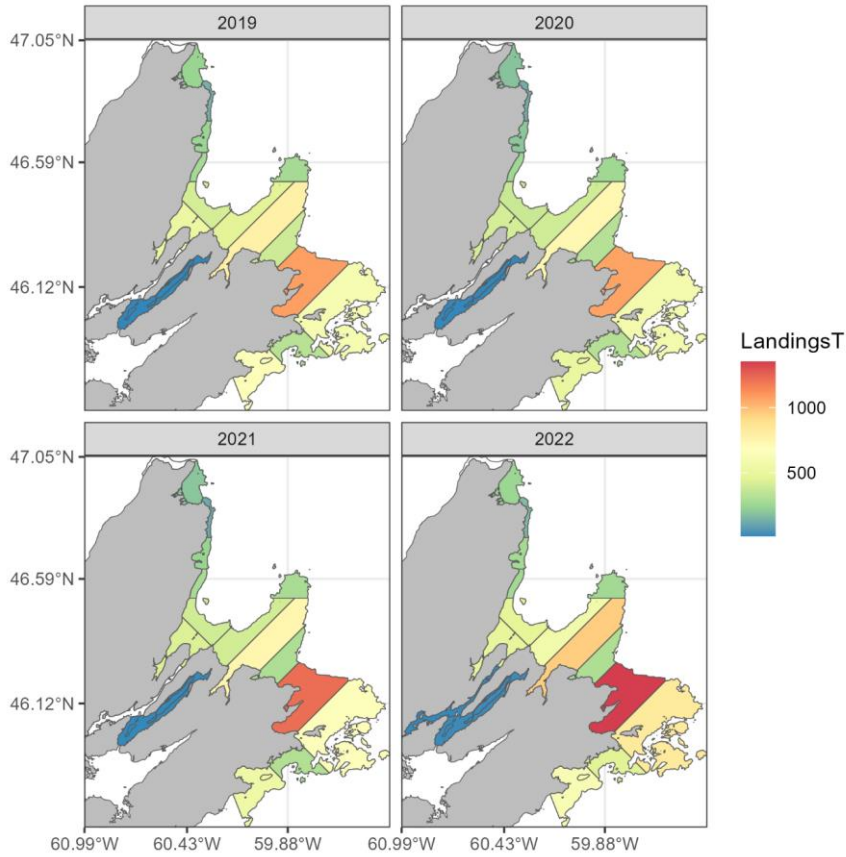
LFA27- Logbook reported catch (kg) per unit effort (trap haul) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



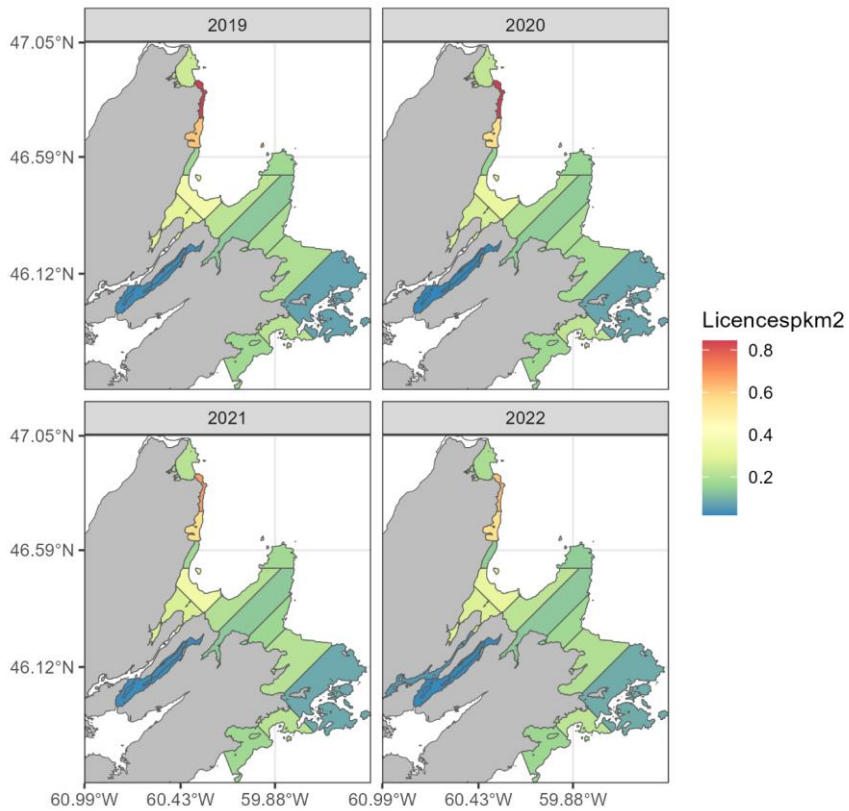
LFA27- Logbook reported grid estimates of percent difference in catch per unit effort (CPUE) relative to mean CPUE between 2006 and 2010. Grey grids indicate percent difference could not be estimated.



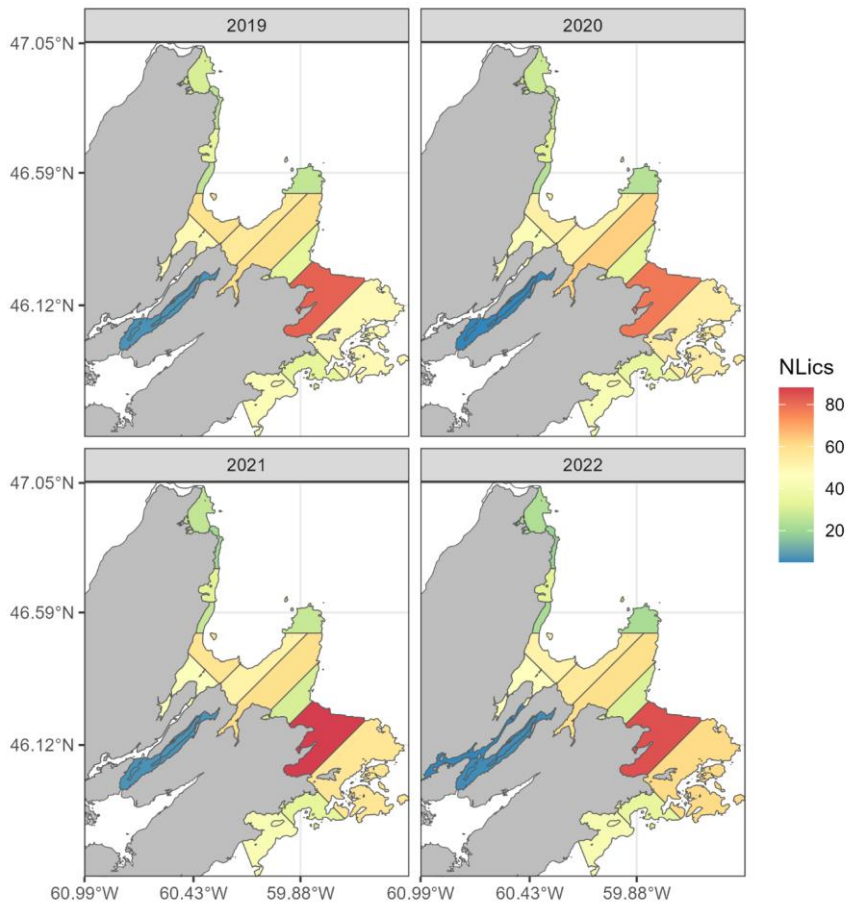
LFA27- Logbook reported Landings (t) by grid adjusted by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



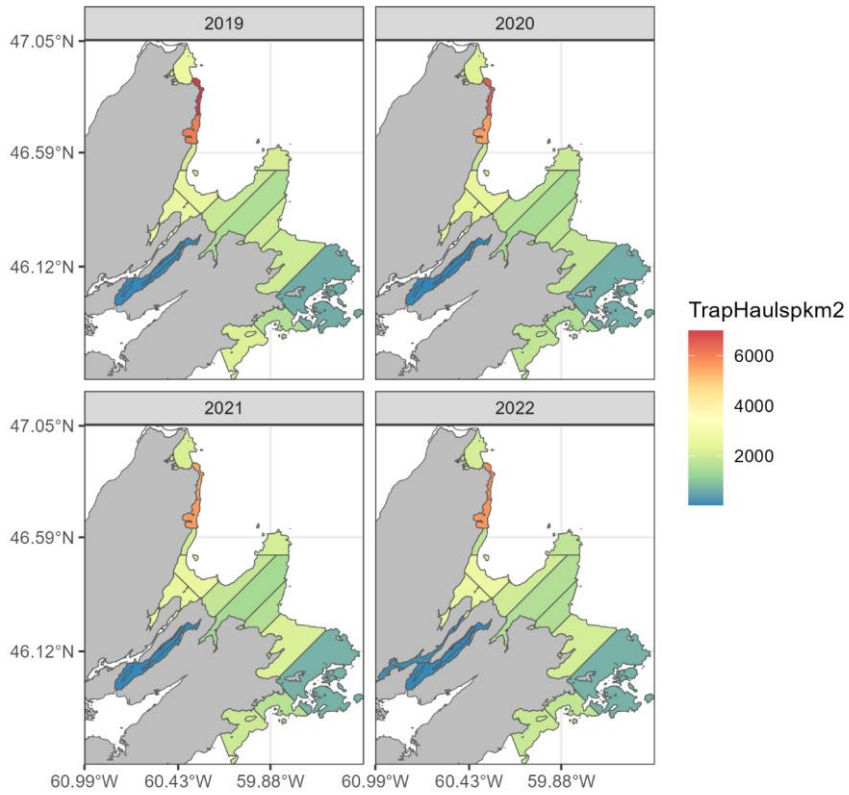
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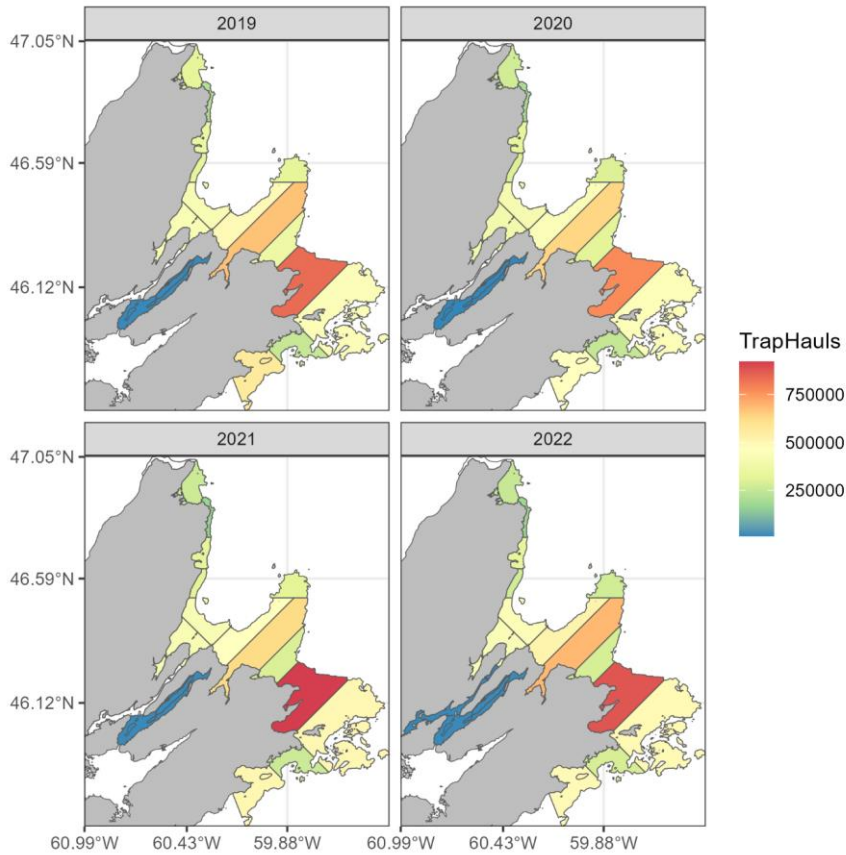
LFA27- Logbook reported number of licences fishing by grid corrected by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



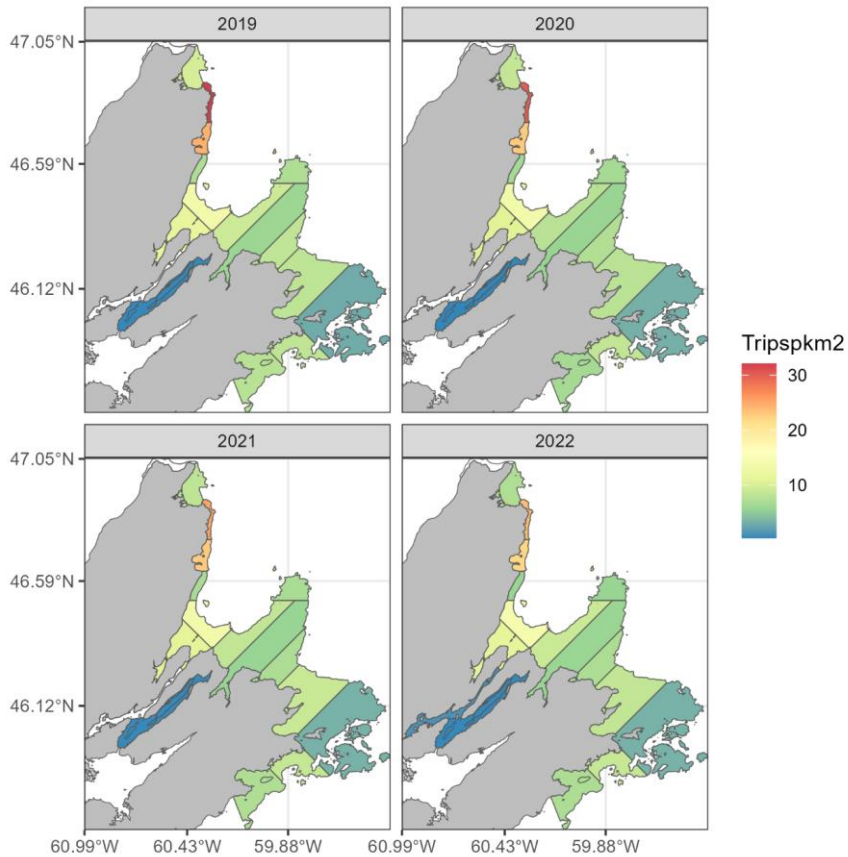
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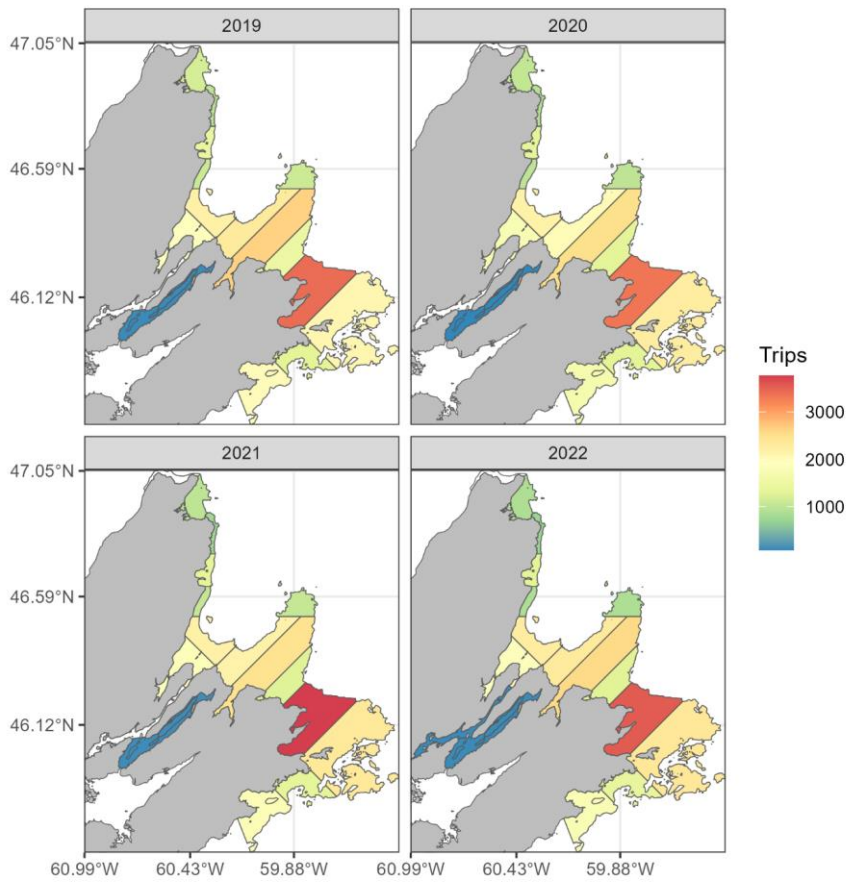
LFA27- Logbook reported number of trap hauls (TH) by grid corrected by the area of the grid (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



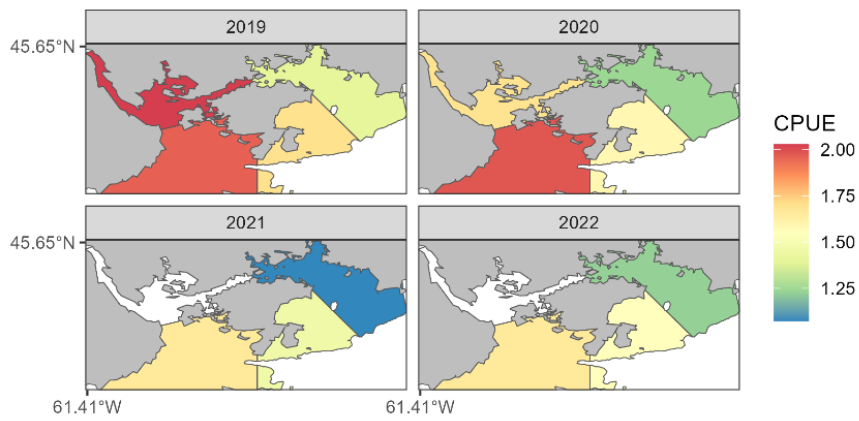
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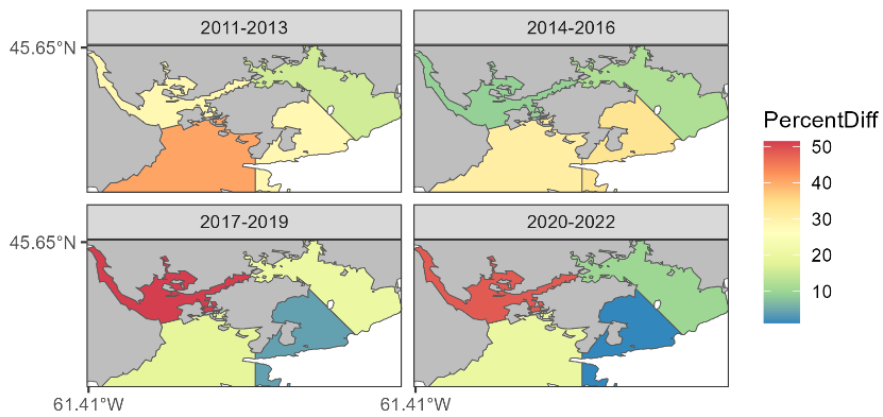
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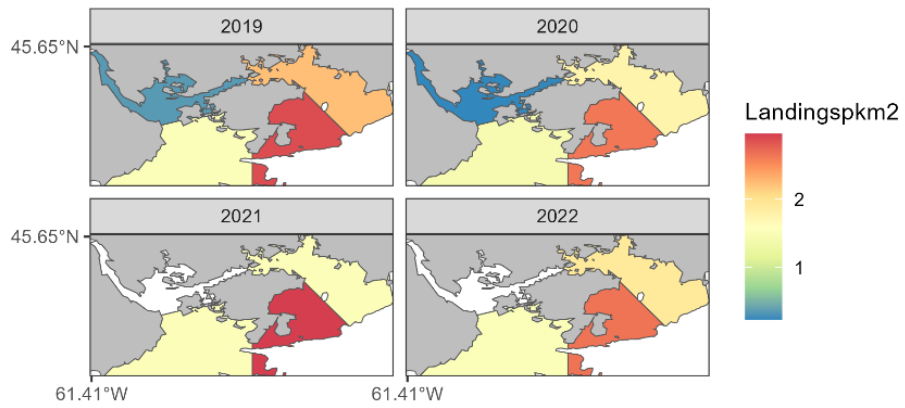
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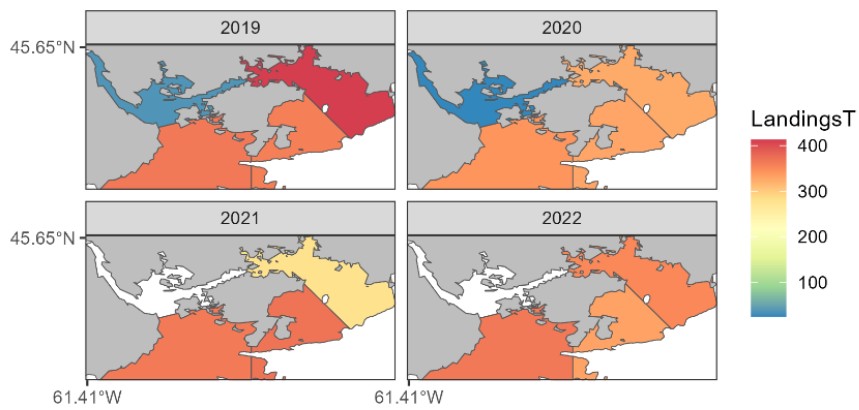
LFA29- Logbook reported catch (kg) per unit effort (trap haul) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



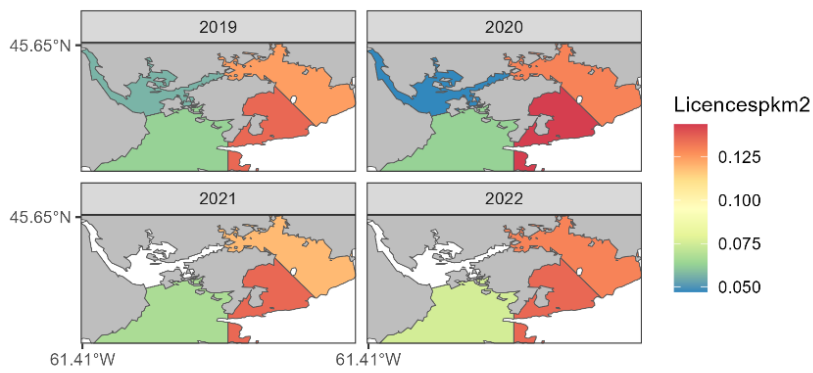
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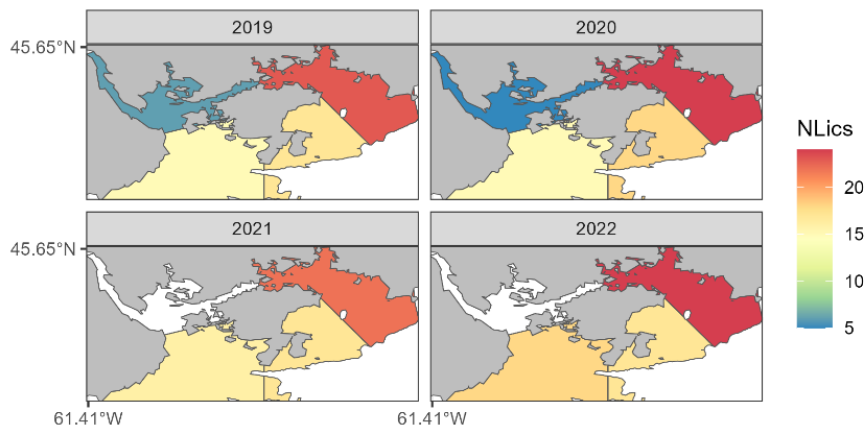
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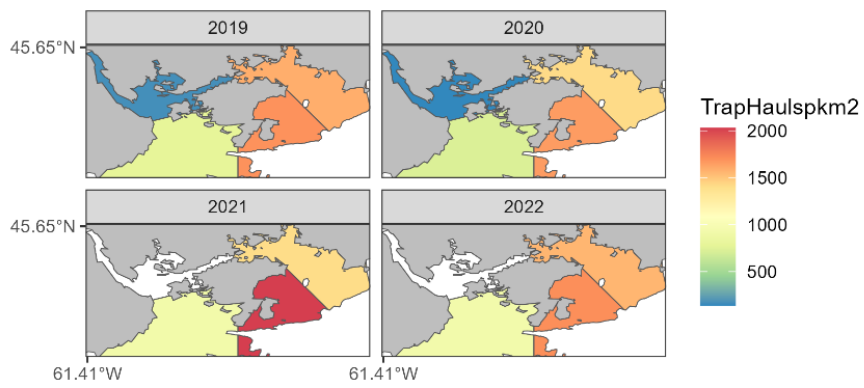
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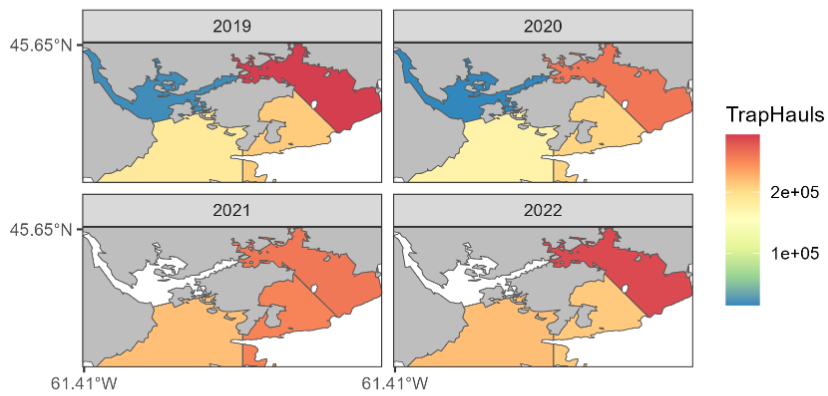
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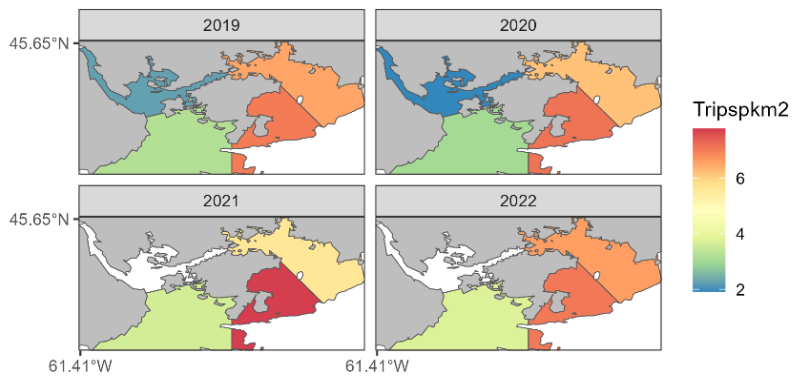
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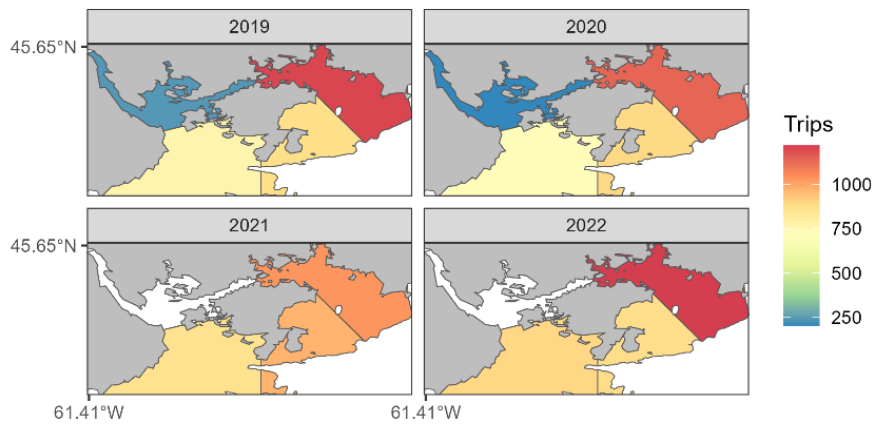
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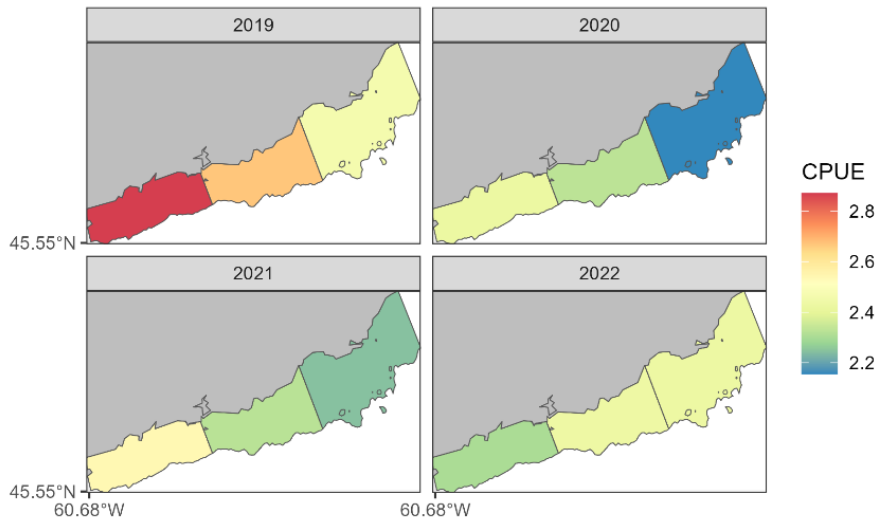
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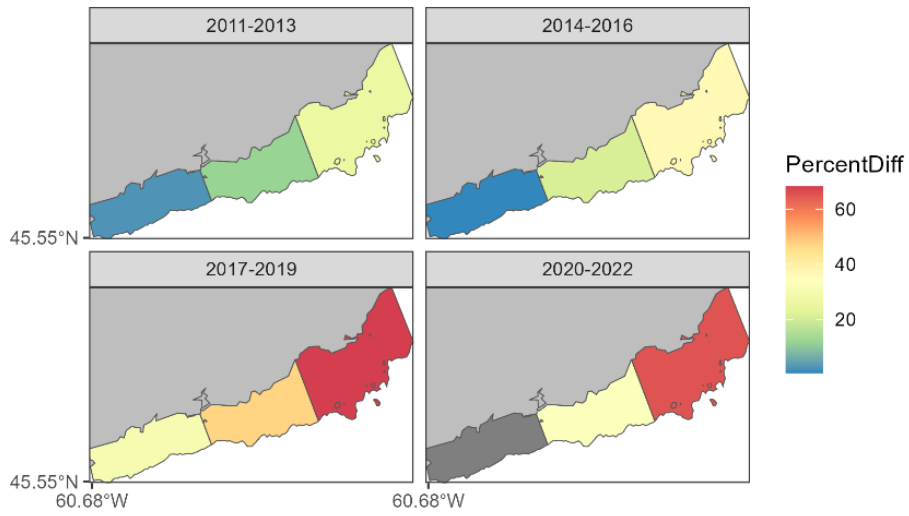
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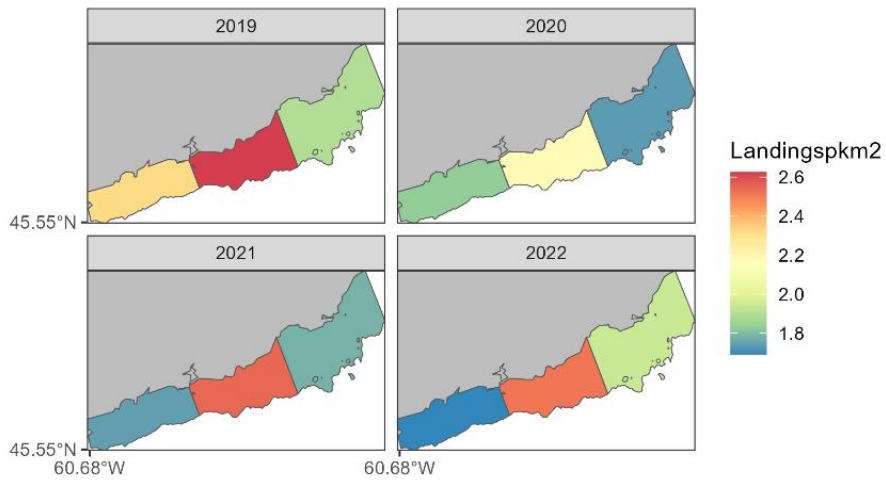
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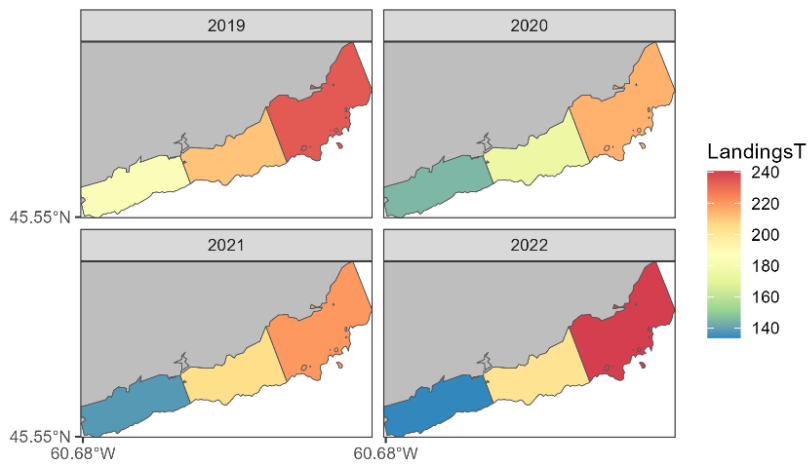
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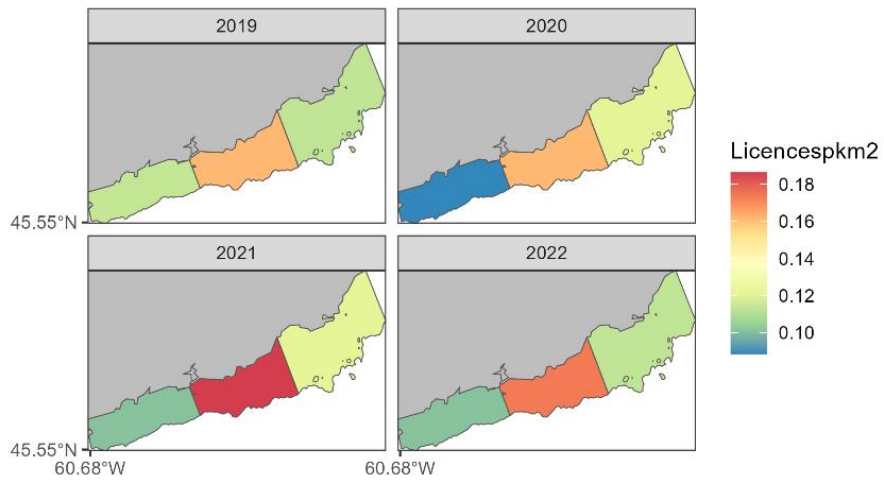
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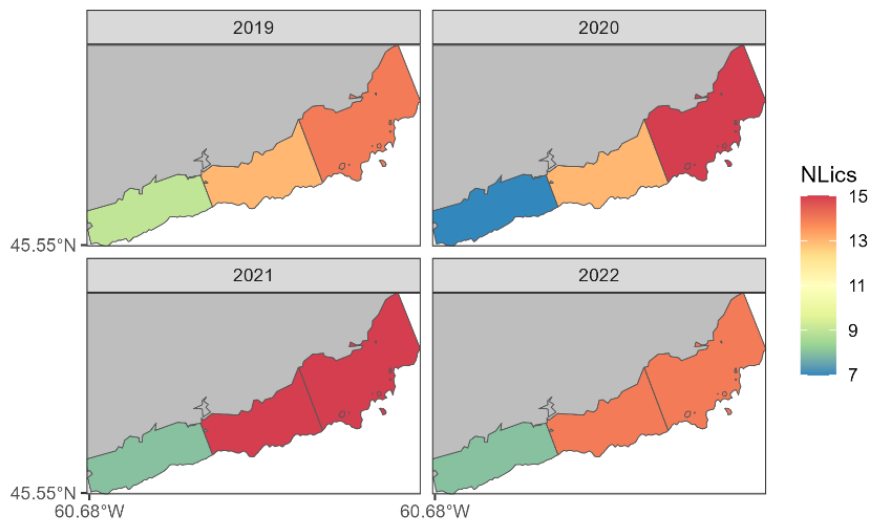
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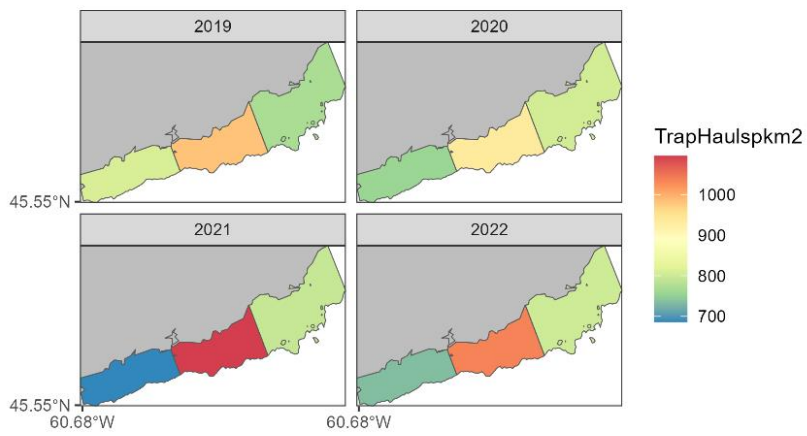
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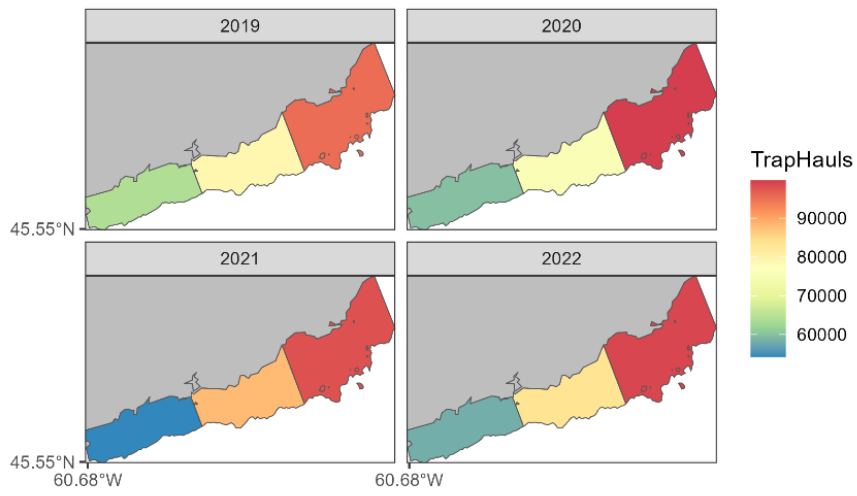
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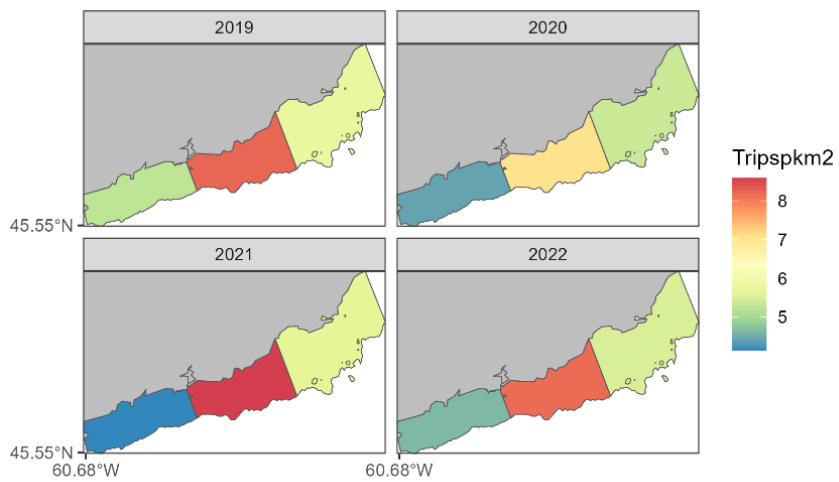
LFA30- Logbook reported number of licences fishing by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



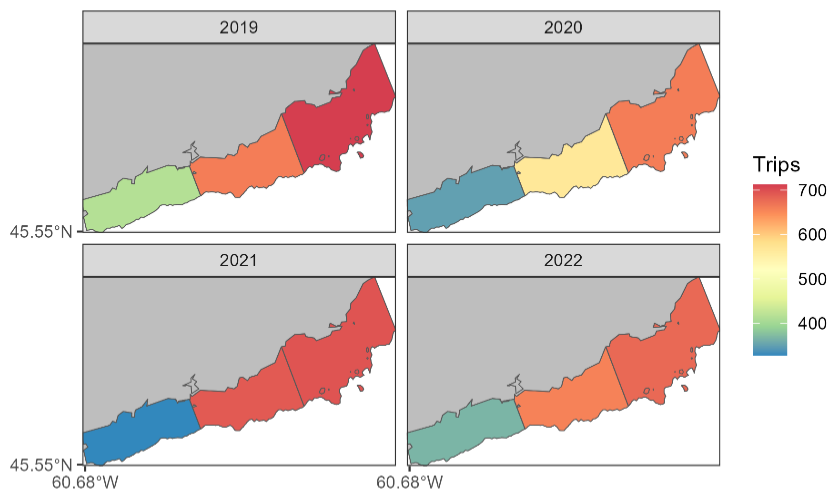
LFA30- Logbook reported number of trap hauls (TH) by grid corrected by the area of the grid (km²).
 White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



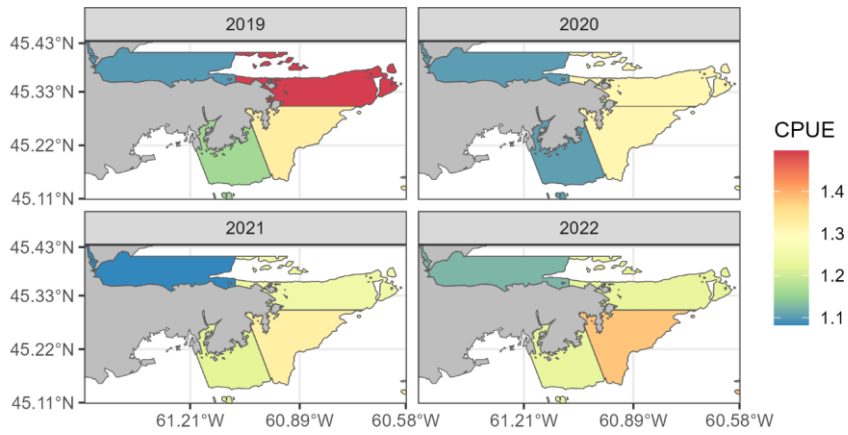
LFA30- Logbook reported number of trap hauls by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



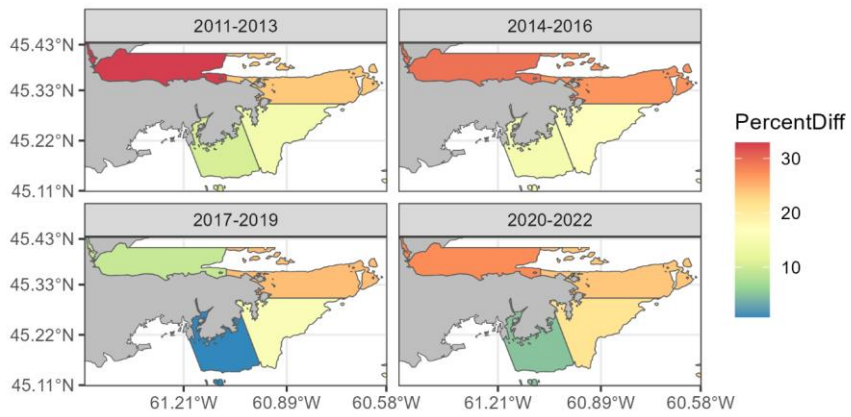
LFA30- Logbook reported number of trips by grid adjusted by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



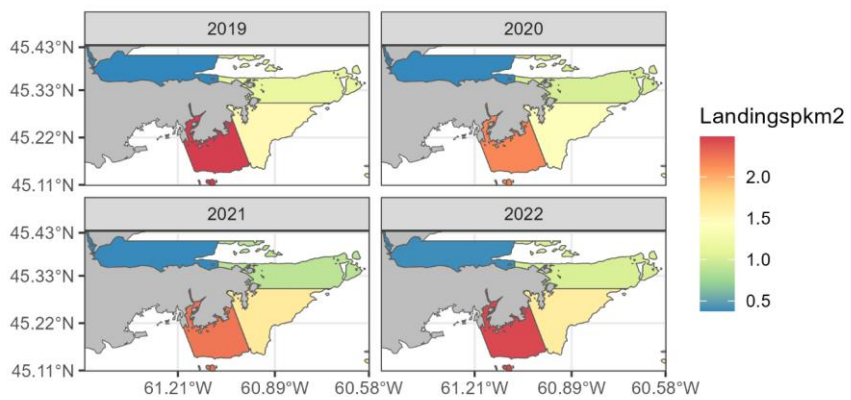
LFA30- Logbook reported number of trips by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



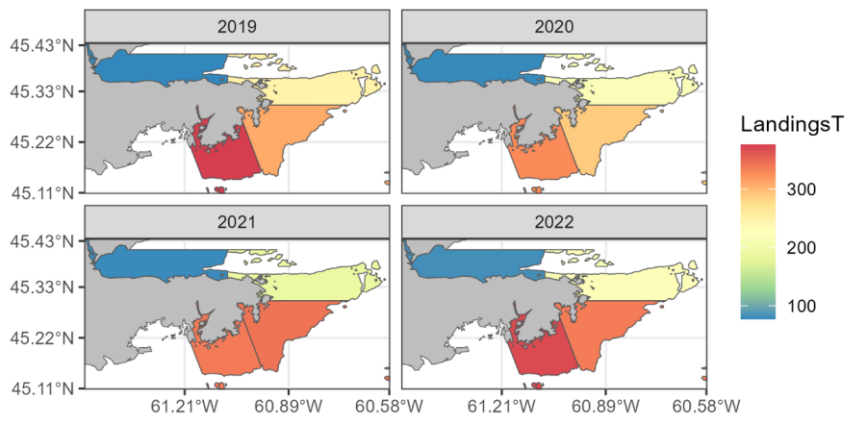
LFA31A- Logbook reported catch (kg) per unit effort (trap haul) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



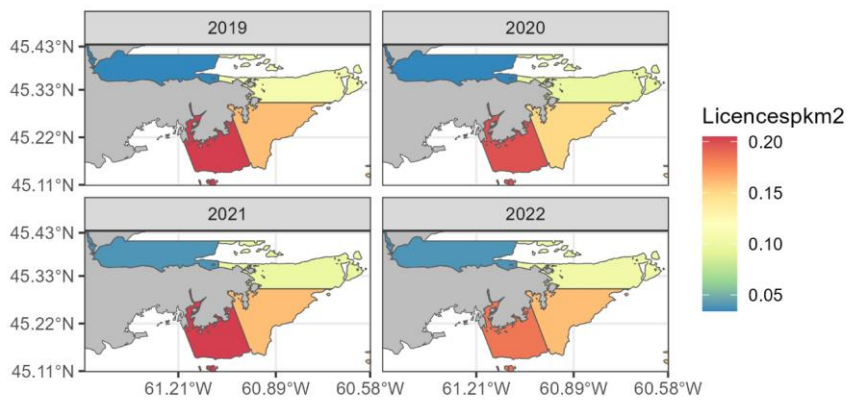
LFA31A- Logbook reported grid estimates of percent difference in catch per unit effort (CPUE) relative to mean CPUE between 2006 and 2010. Grey grids indicate percent difference could not be estimated.



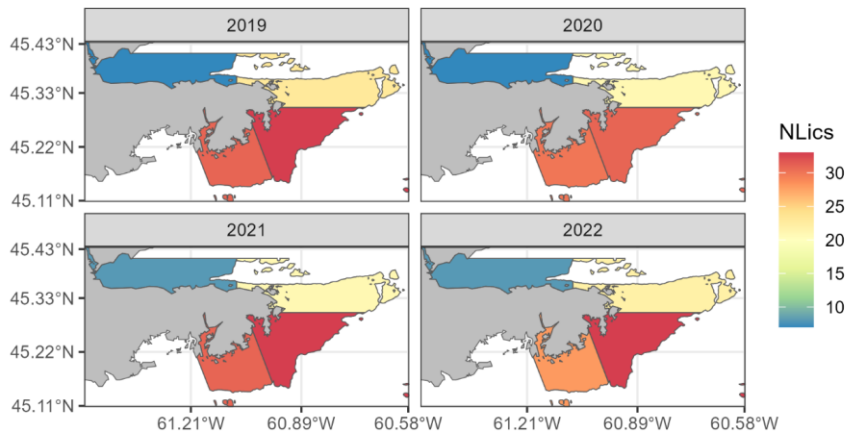
LFA31A- Logbook reported Landings (t) by grid adjusted by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



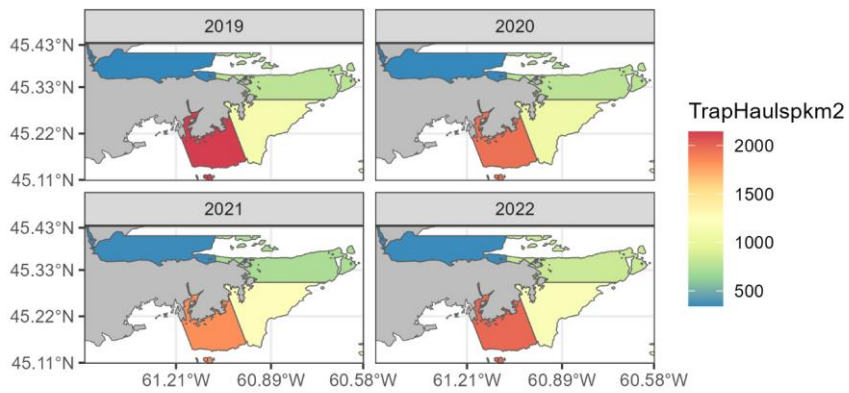
LFA31A- Logbook reported Landings (t) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



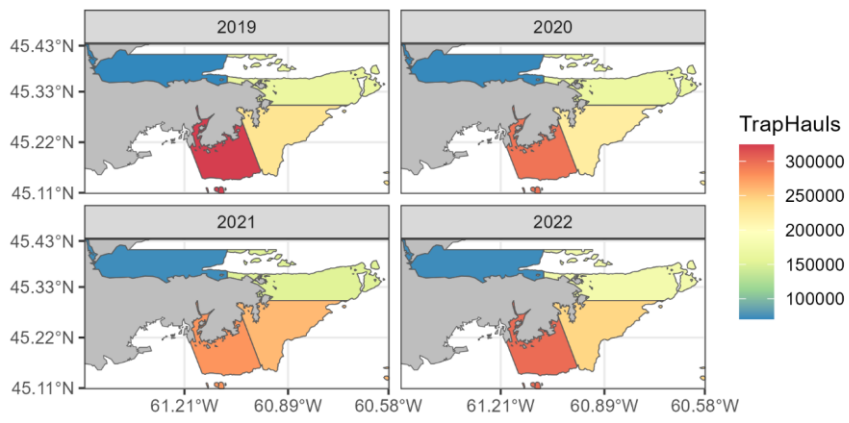
LFA31A- Logbook reported number of licences fishing by grid corrected by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



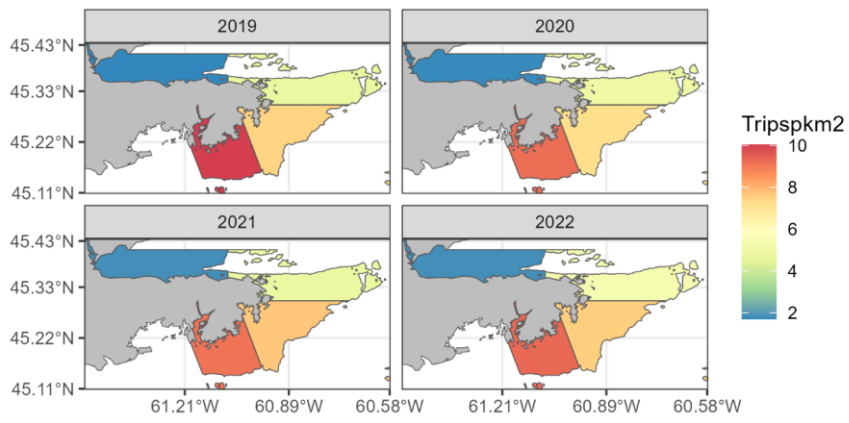
LFA31A- Logbook reported number of licences fishing by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



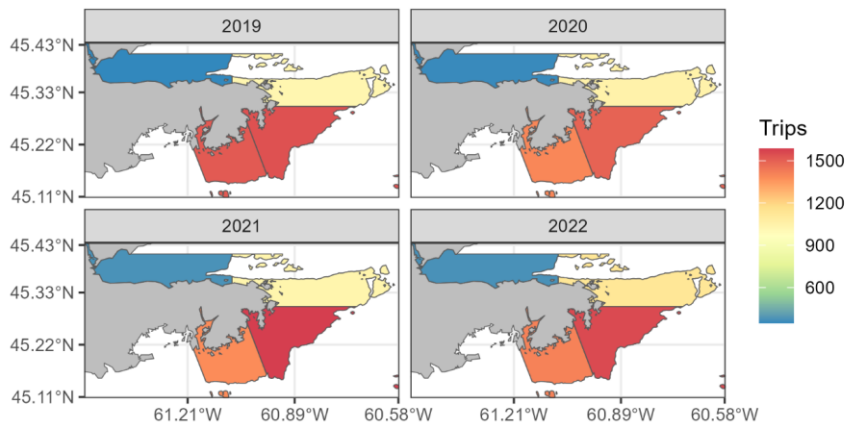
LFA31A- Logbook reported number of trap hauls (TH) by grid corrected by the area of the grid (km²).
 White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



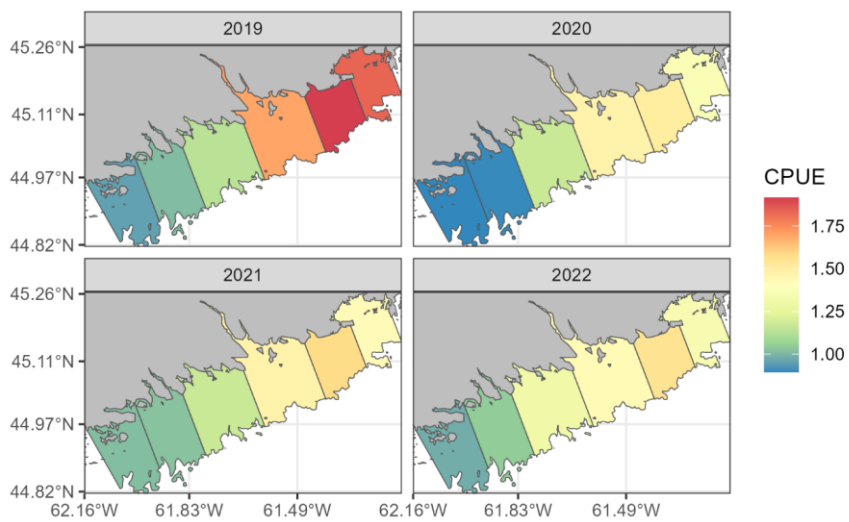
LFA31A- Logbook reported number of trap hauls by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



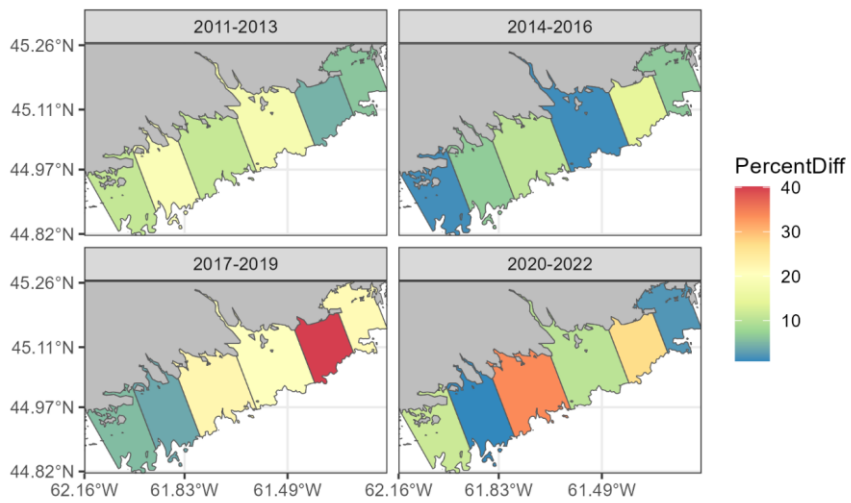
LFA31A- Logbook reported number of trips by grid adjusted by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



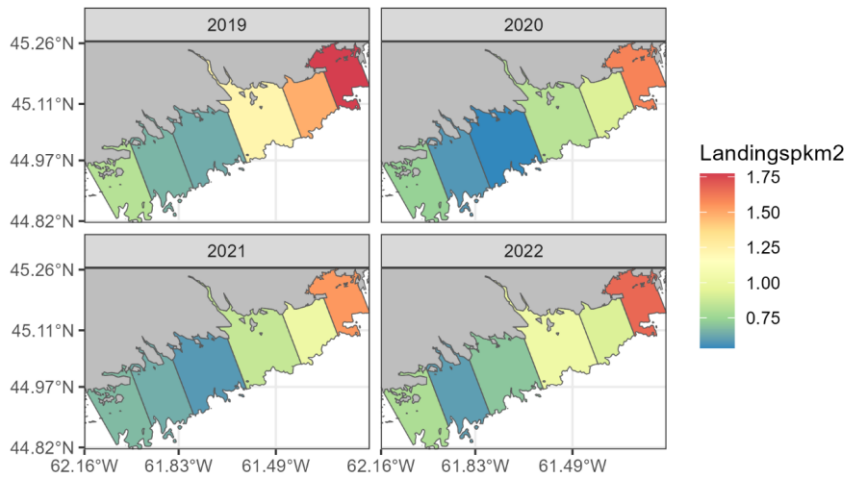
LFA31A- Logbook reported number of trips by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



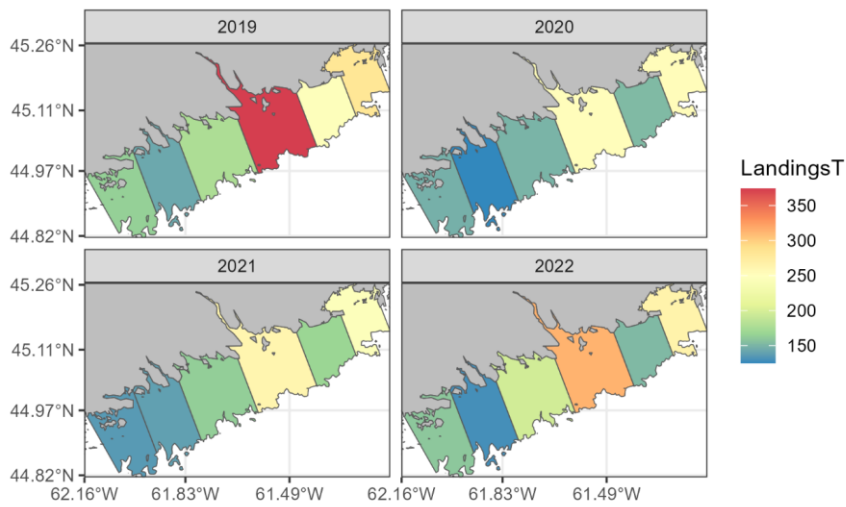
LFA31B- Logbook reported catch (kg) per unit effort (trap haul) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



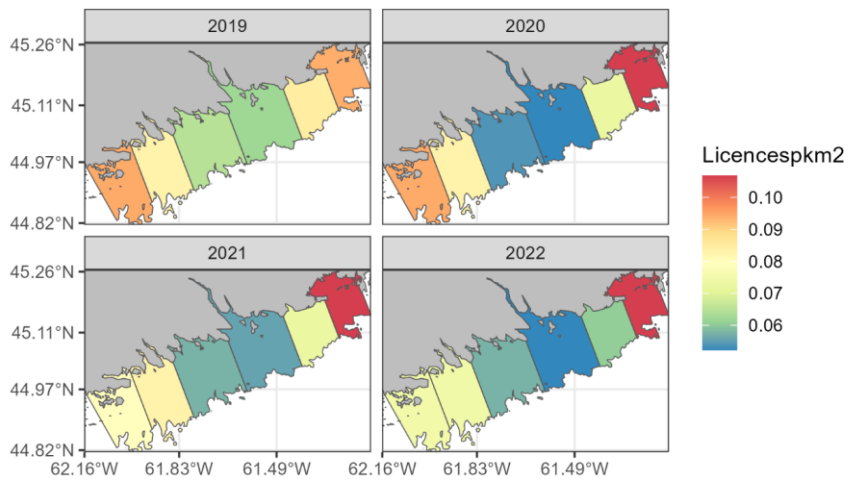
LFA31B- Logbook reported grid estimates of percent difference in catch per unit effort (CPUE) relative to mean CPUE between 2006 and 2010. Grey grids indicate percent difference could not be estimated.



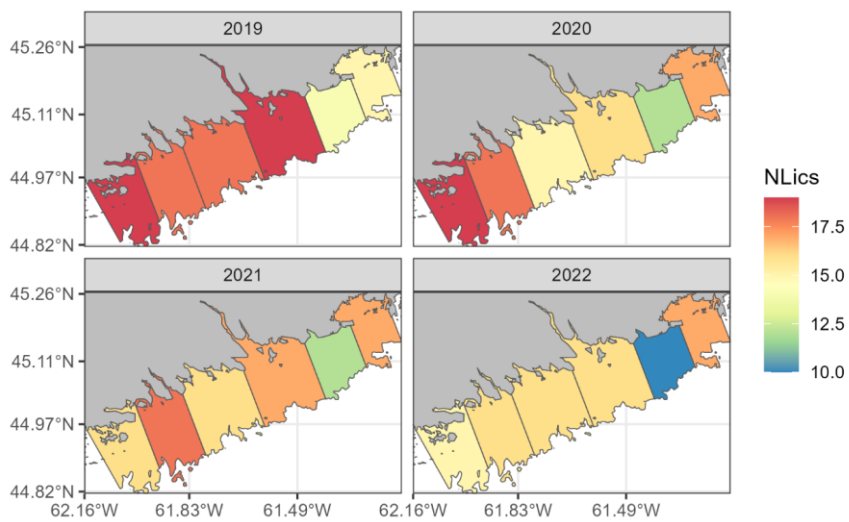
LFA31B- Logbook reported Landings (t) by grid adjusted by area (km2). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



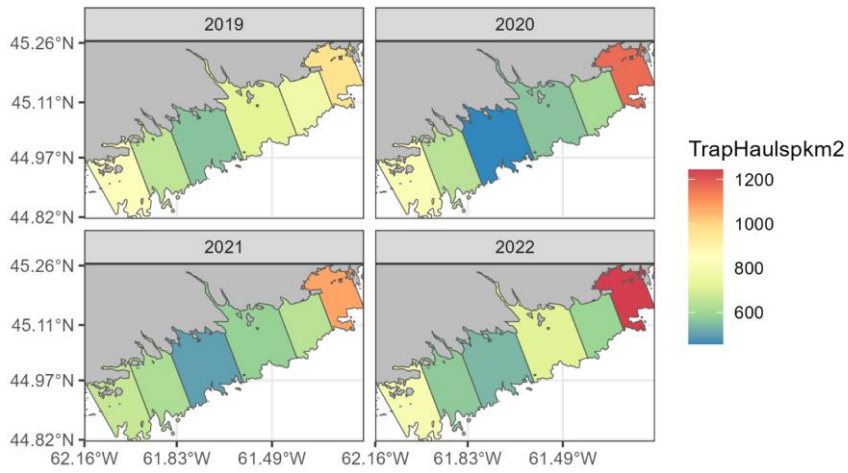
LFA31B- Logbook reported Landings (t) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



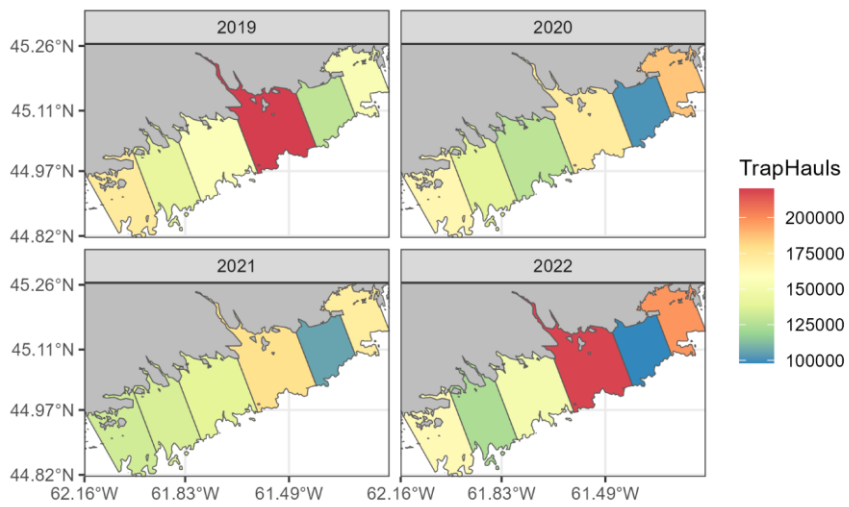
LFA31B- Logbook reported number of licences fishing by grid corrected by area (km2). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



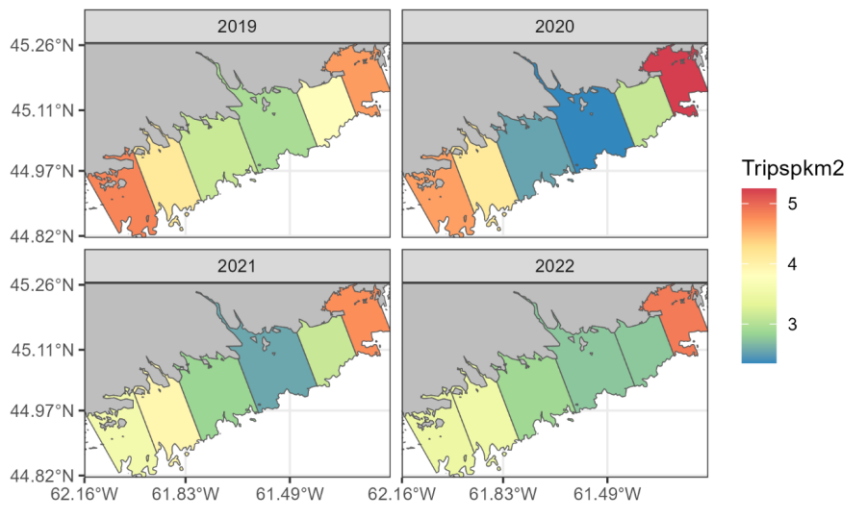
LFA31B- Logbook reported number of licences fishing by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



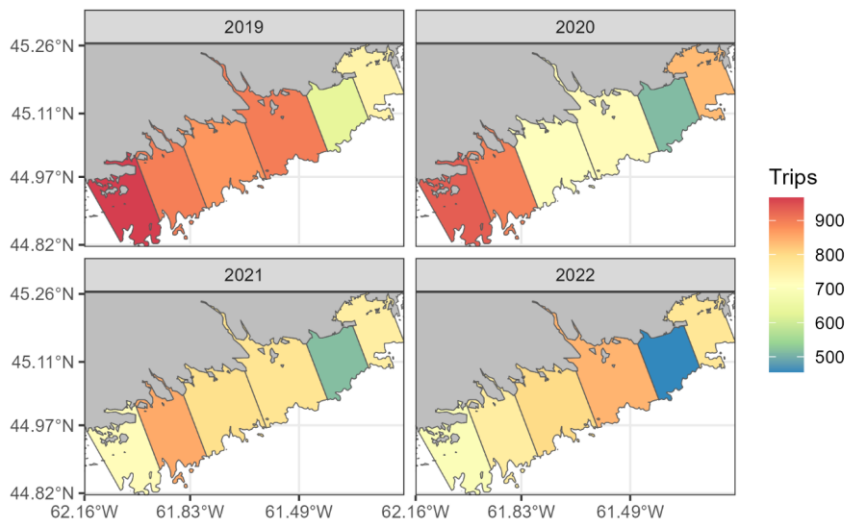
LFA31B- Logbook reported number of trap hauls (TH) by grid corrected by the area of the grid (km²).
 White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



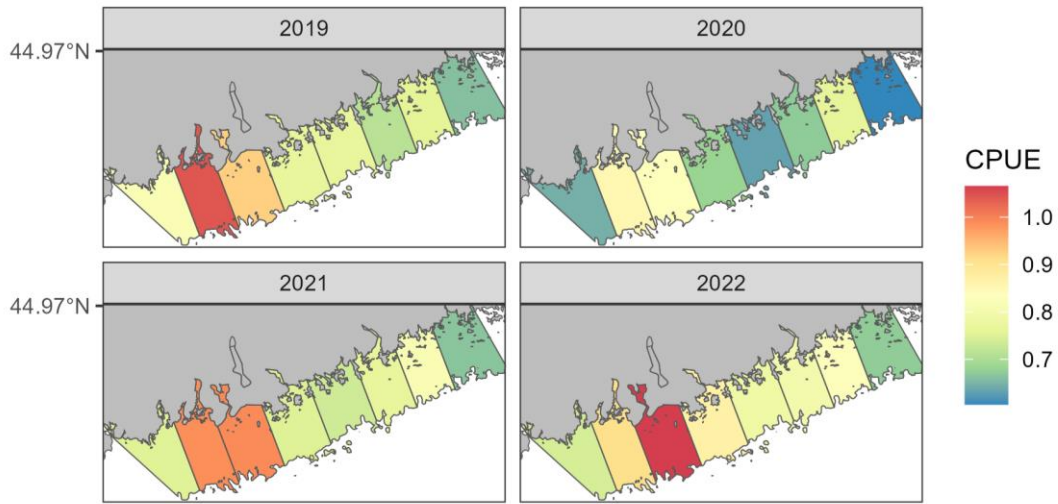
LFA31B- Logbook reported number of trap hauls by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



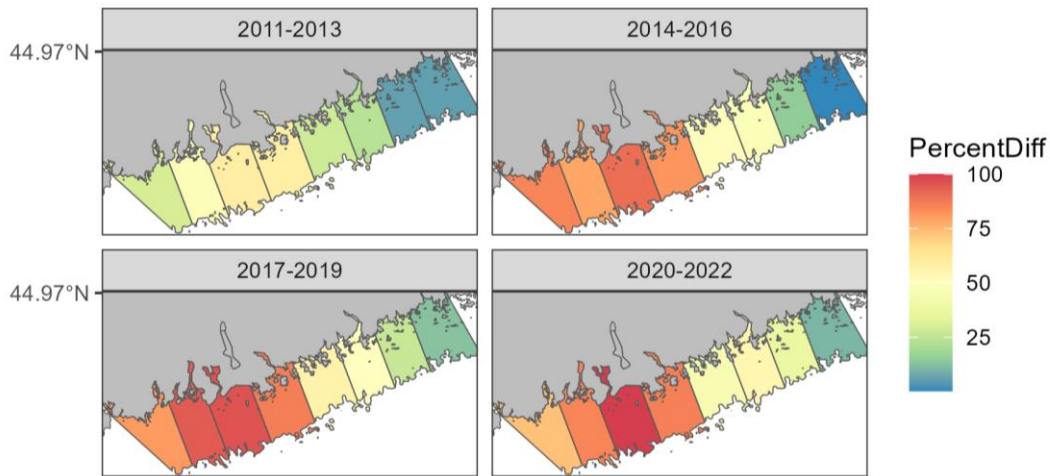
LFA31B- Logbook reported number of trips by grid adjusted by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



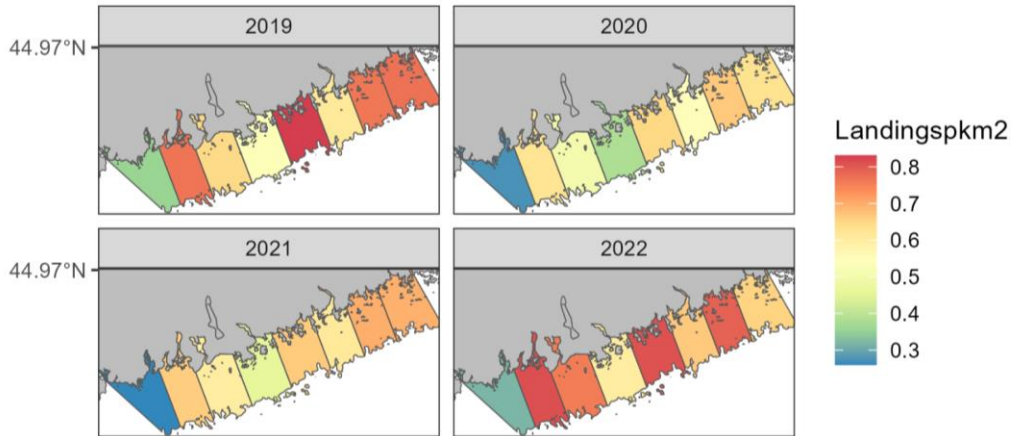
LFA31B- Logbook reported number of trips by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



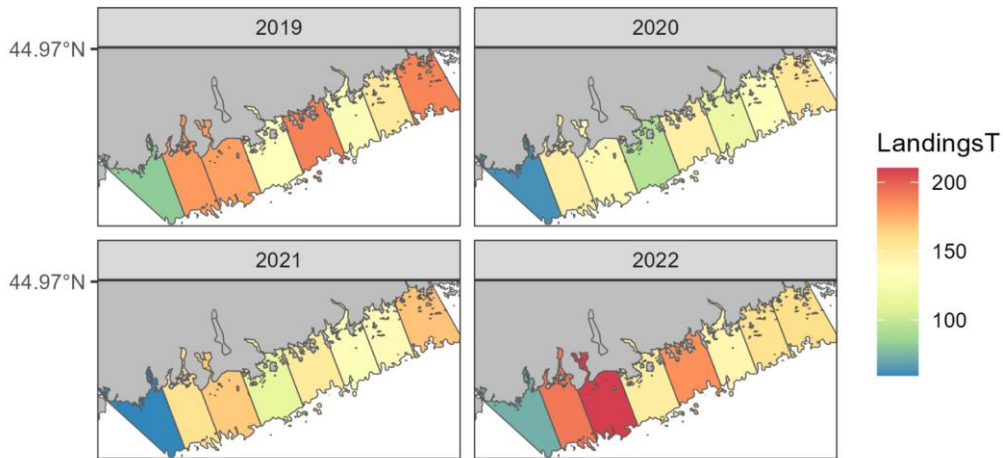
LFA32- Logbook reported catch (kg) per unit effort (trap haul) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



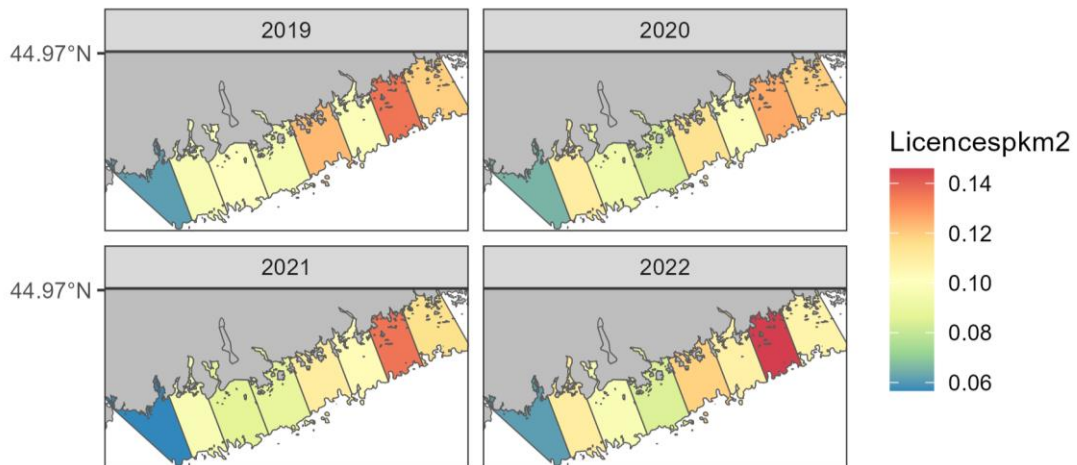
LFA32- Logbook reported grid estimates of percent difference in catch per unit effort (CPUE) relative to mean CPUE between 2006 and 2010. Grey grids indicate percent difference could not be estimated.



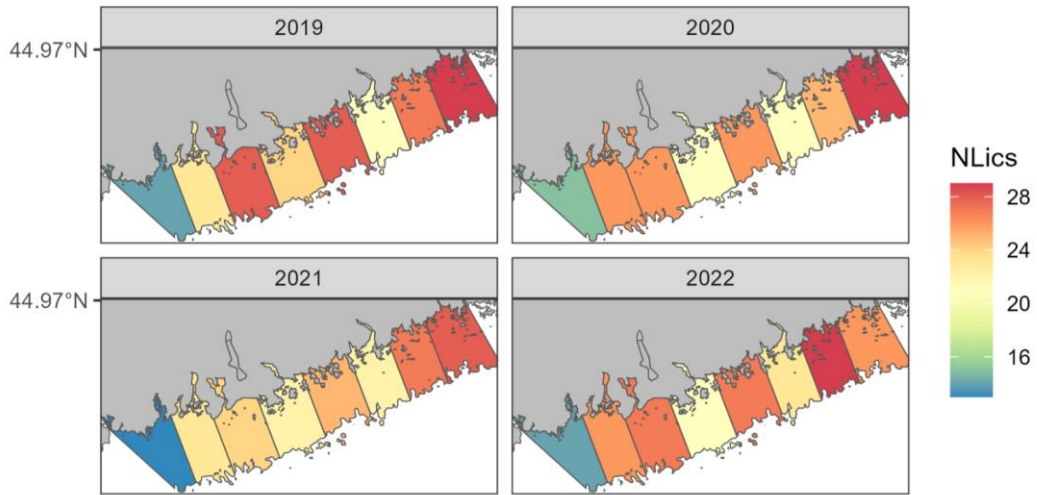
LFA32- Logbook reported Landings (t) by grid adjusted by area (km2). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



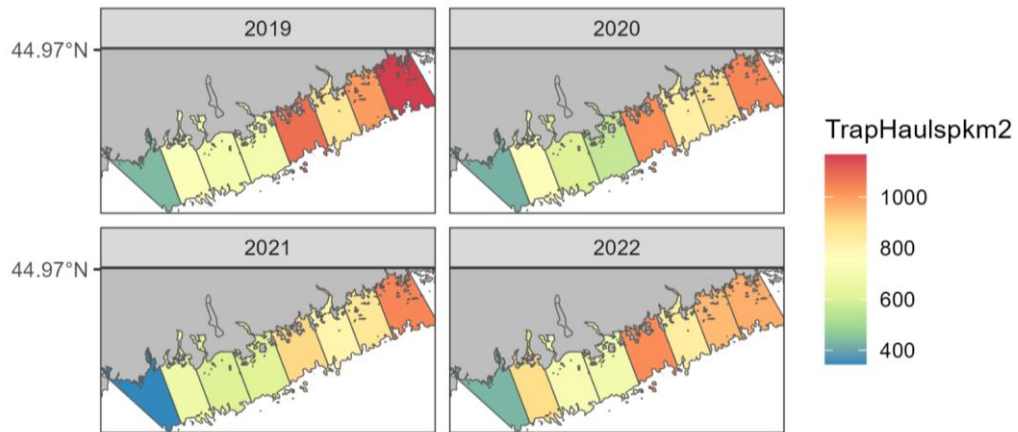
LFA32- Logbook reported Landings (t) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



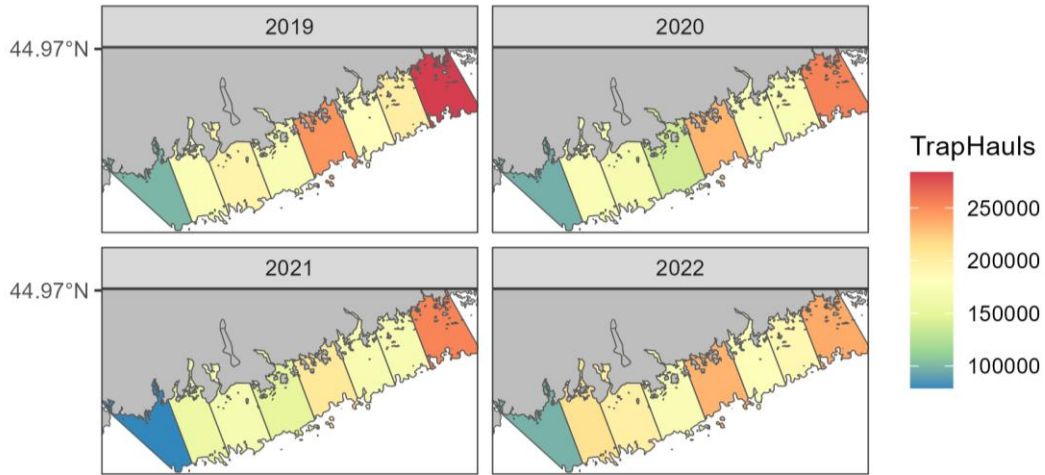
LFA32- Logbook reported number of licences fishing by grid corrected by area (km2). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



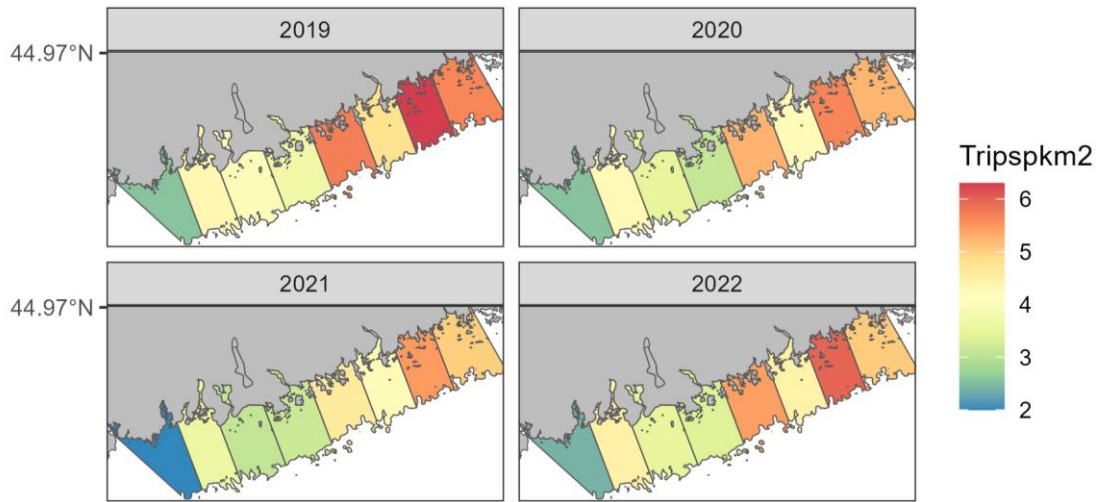
LFA32- Logbook reported number of licences fishing by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



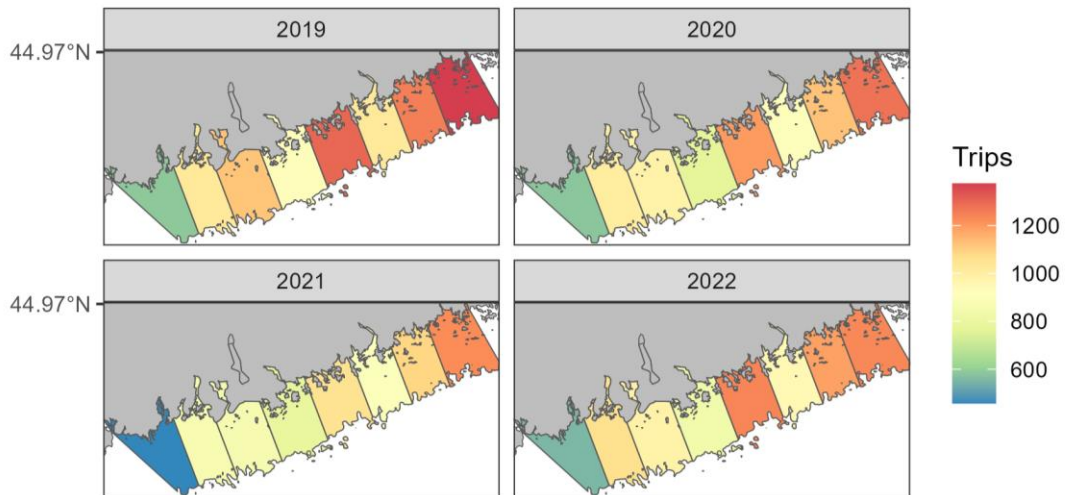
LFA32- Logbook reported number of trap hauls (TH) by grid corrected by the area of the grid (km²).
 White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



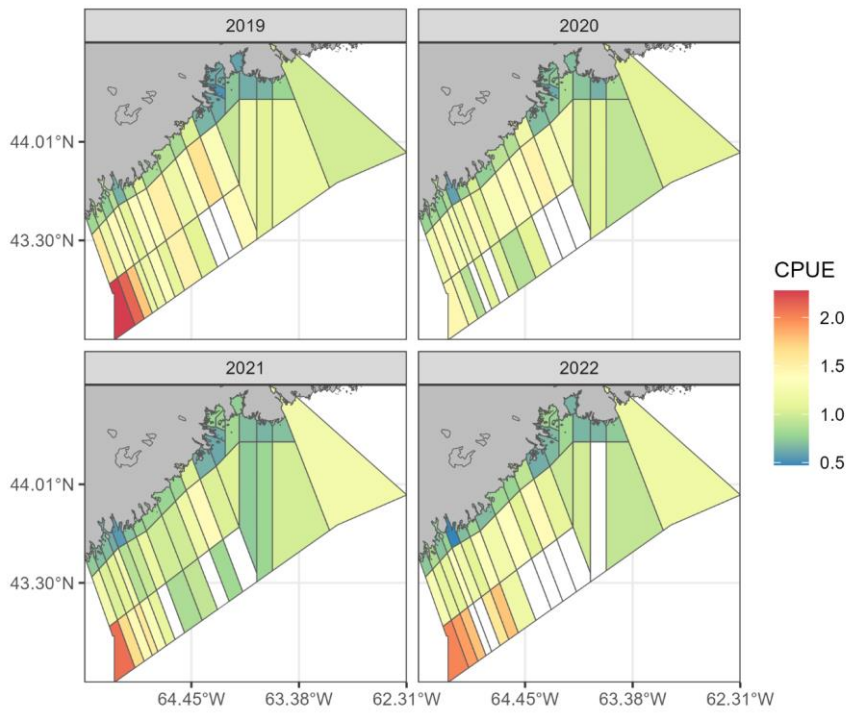
LFA32- Logbook reported number of trap hauls by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



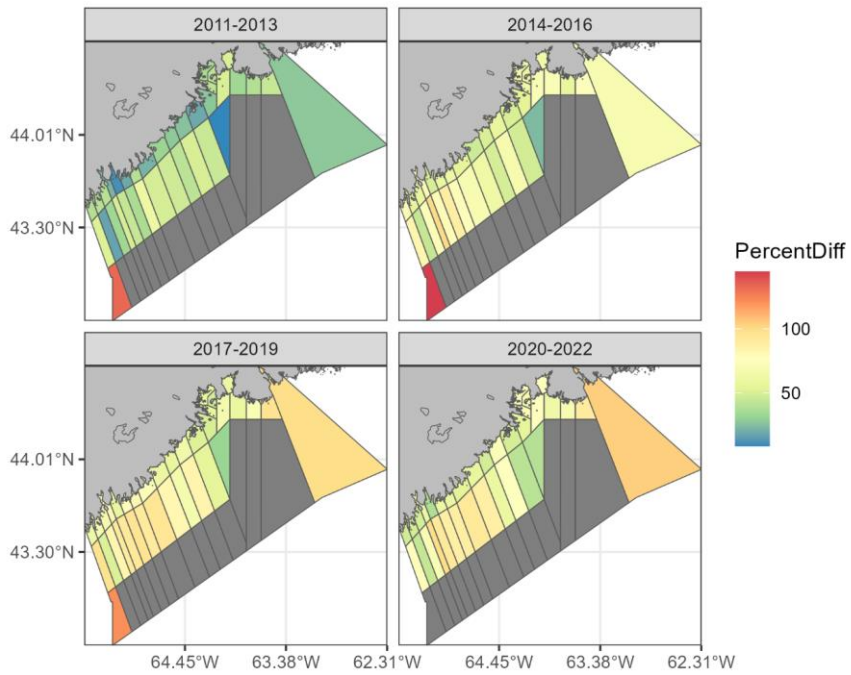
LFA32- Logbook reported number of trips by grid adjusted by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



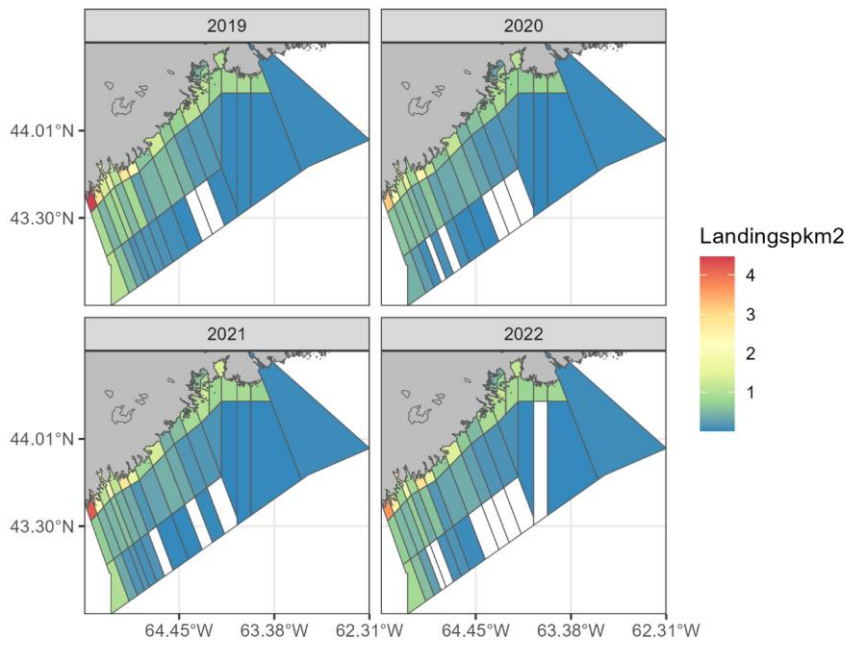
LFA32- Logbook reported number of trips by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



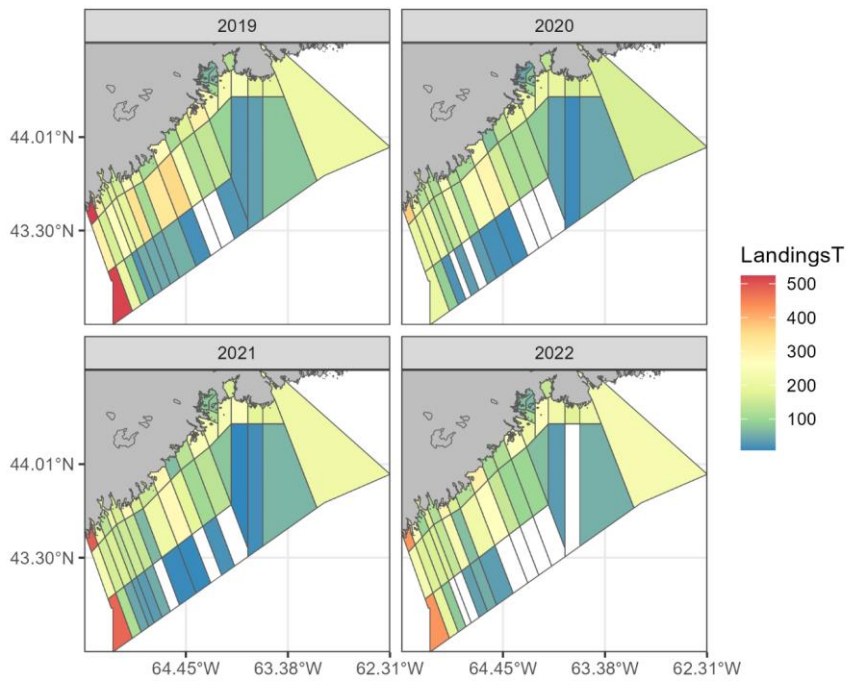
LFA33- Logbook reported catch (kg) per unit effort (trap haul) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



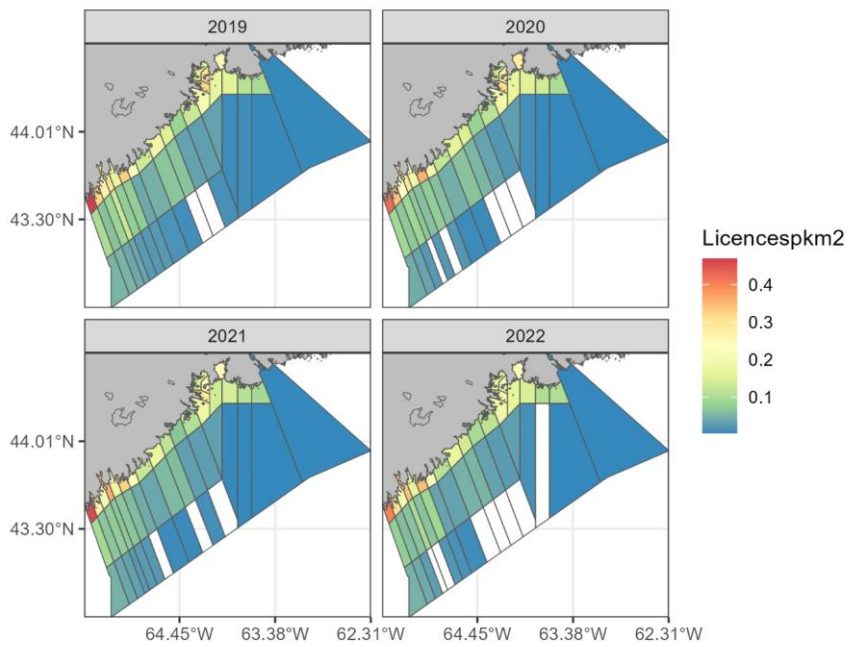
LFA33- Logbook reported grid estimates of percent difference in catch per unit effort (CPUE) relative to mean CPUE between 2006 and 2010. Grey grids indicate percent difference could not be estimated.



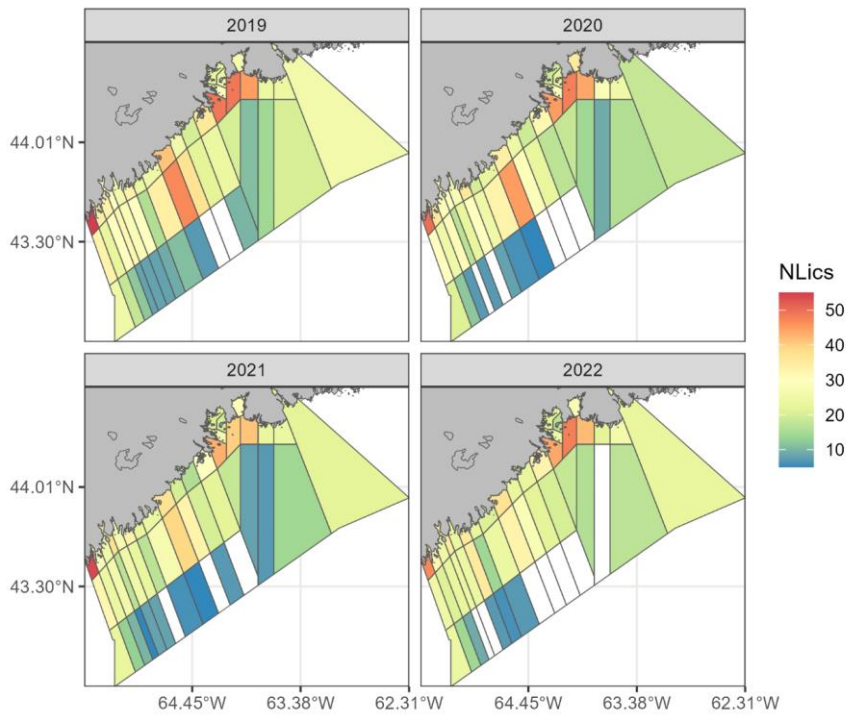
LFA33- Logbook reported Landings (t) by grid adjusted by area (km2). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



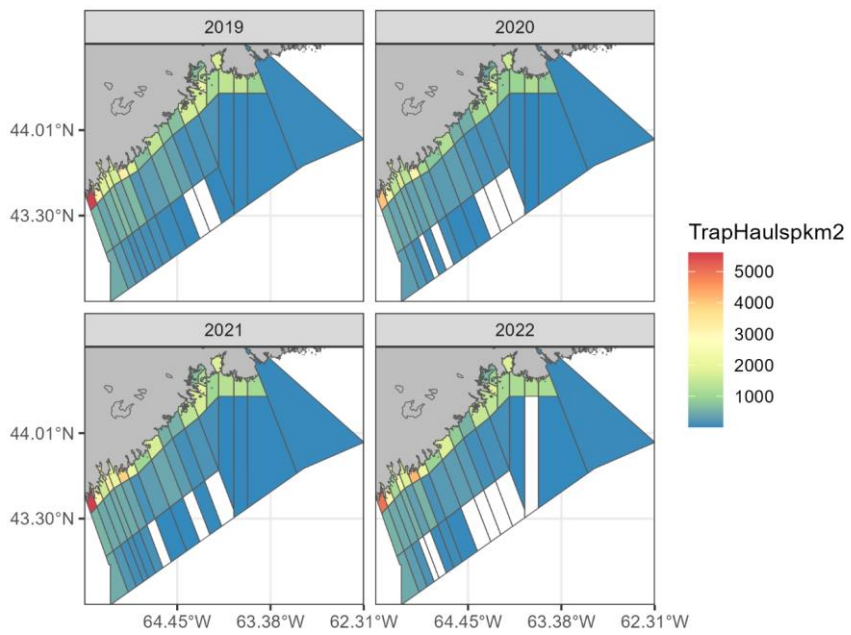
LFA33- Logbook reported Landings (t) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



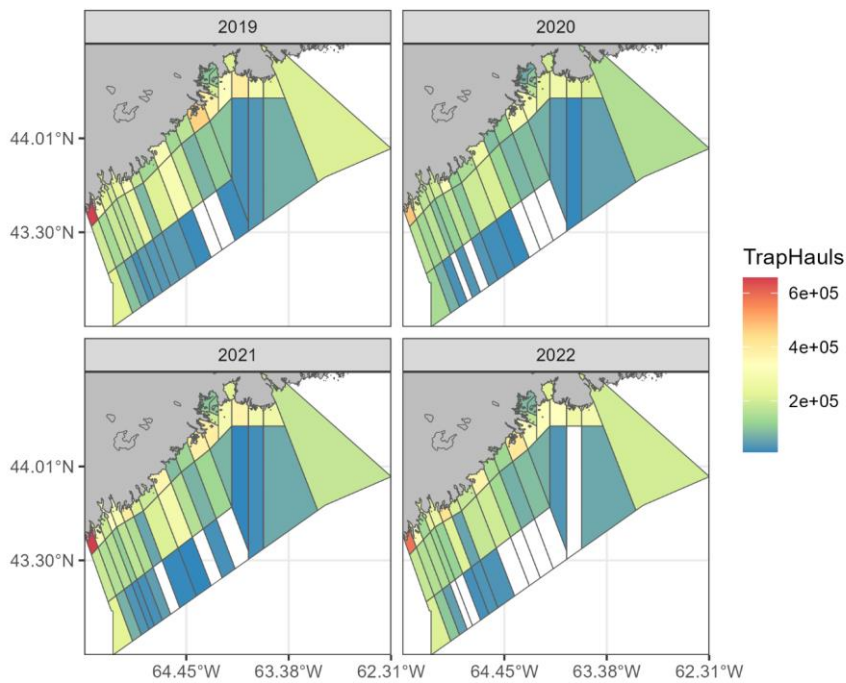
LFA33- Logbook reported number of licences fishing by grid corrected by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



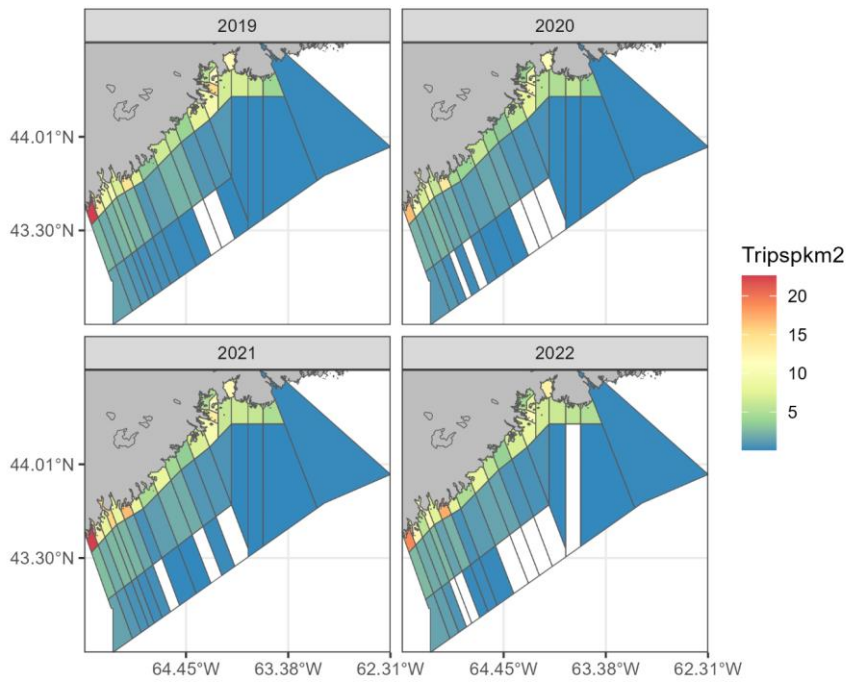
LFA33- Logbook reported number of licences fishing by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



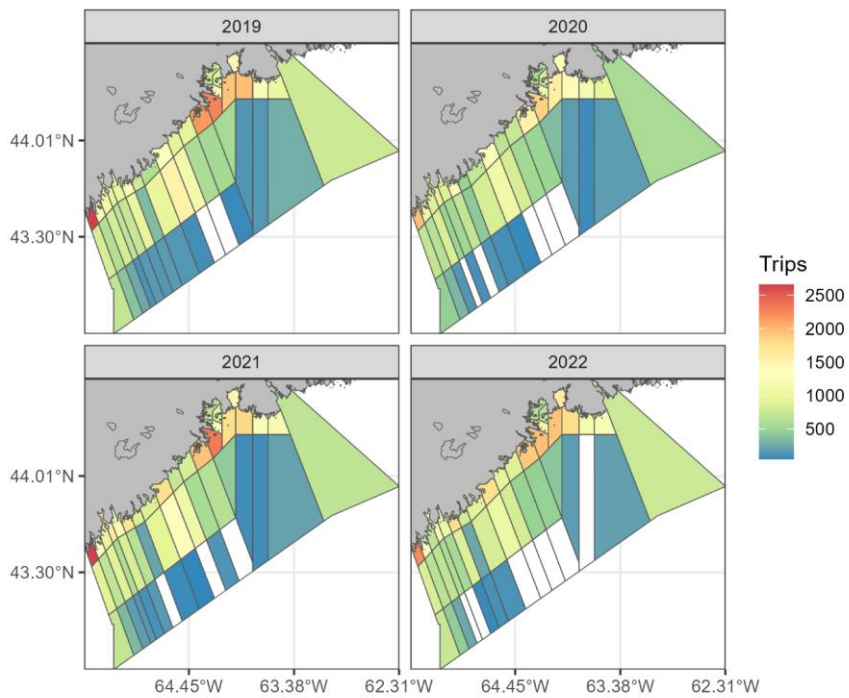
LFA33- Logbook reported number of trap hauls (TH) by grid corrected by the area of the grid (km²).
 White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



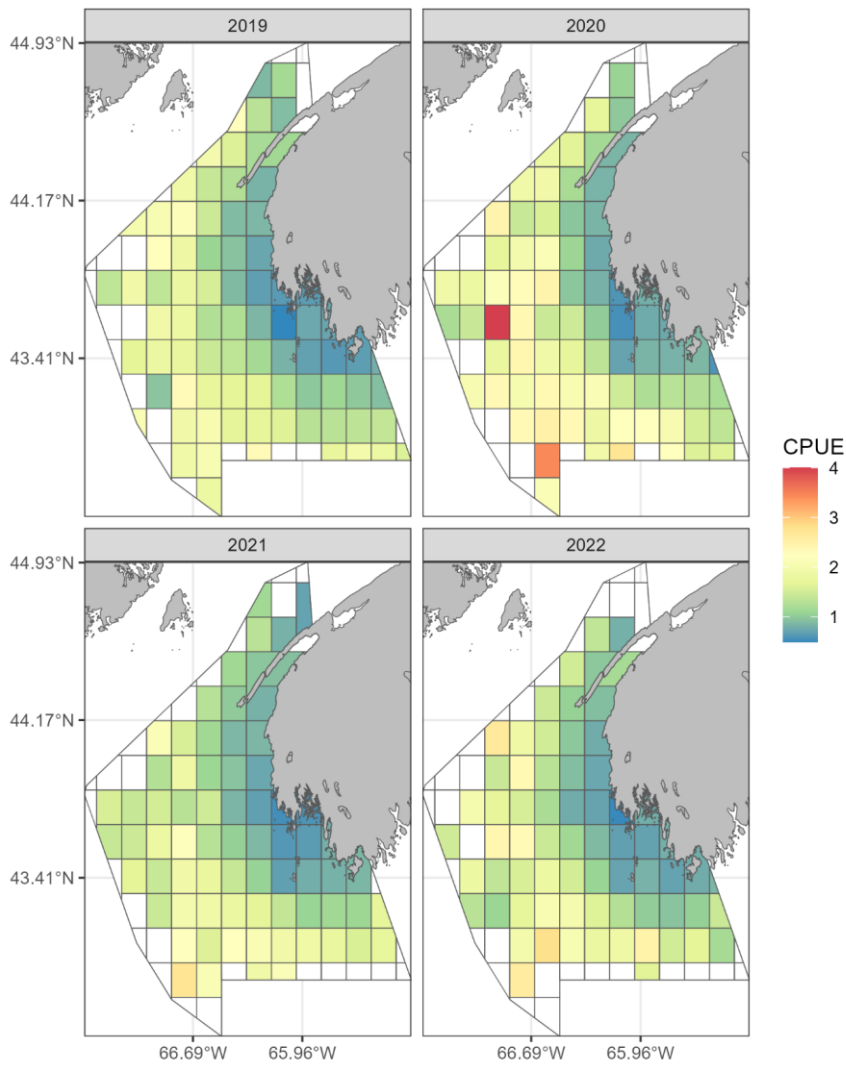
LFA33- Logbook reported number of trap hauls by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



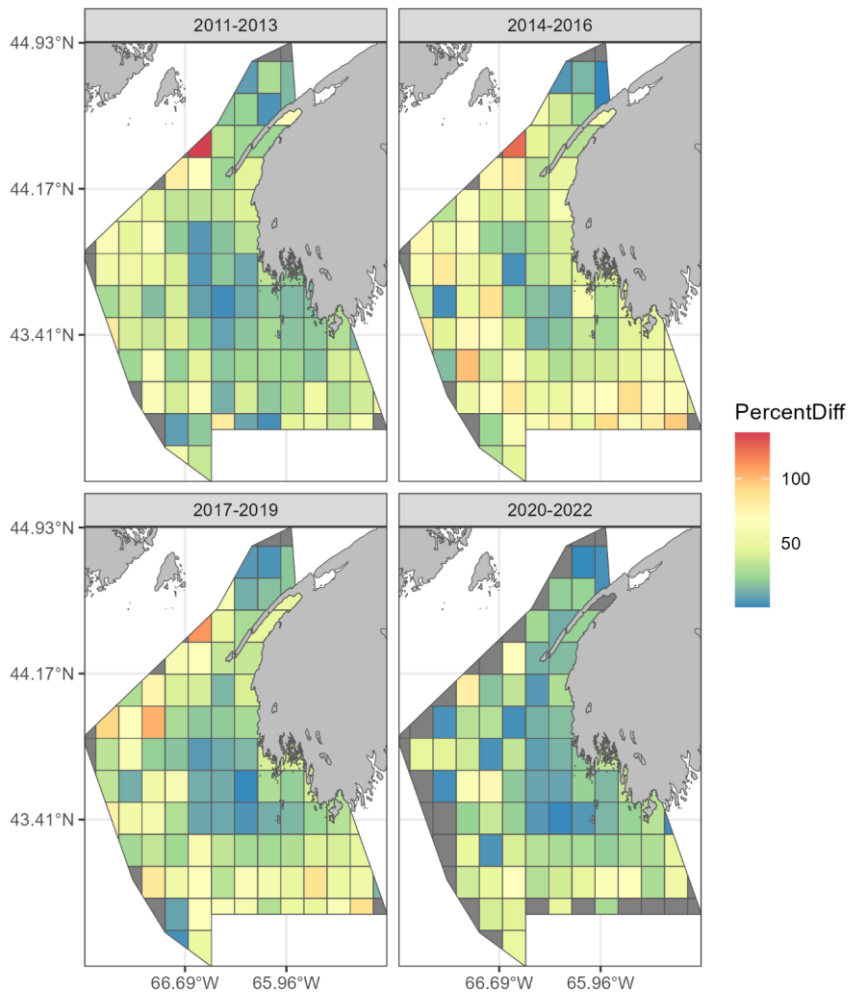
LFA33- Logbook reported number of trips by grid adjusted by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



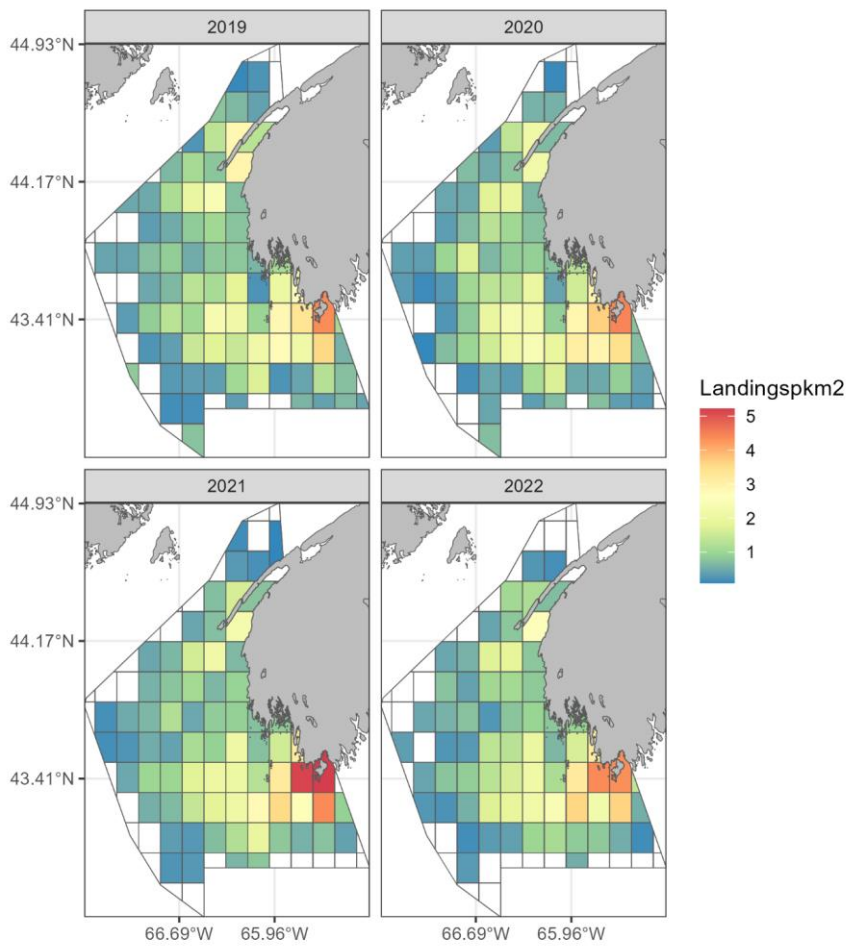
LFA33- Logbook reported number of trips by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



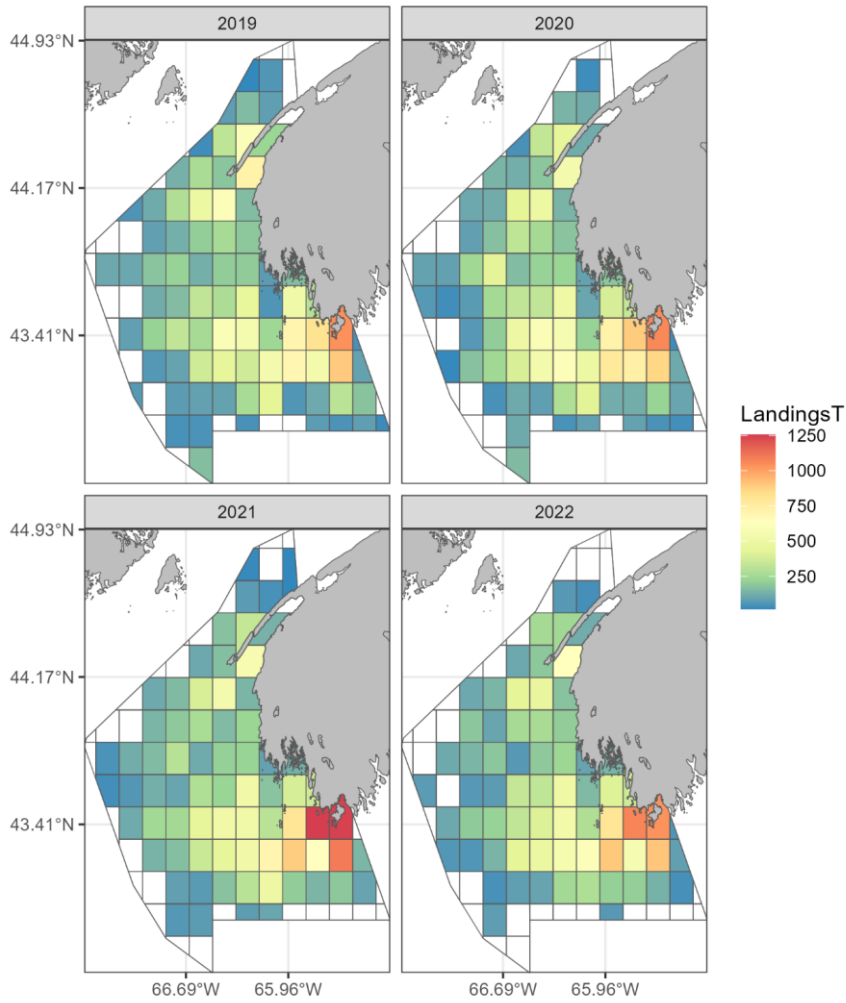
LFA34- Logbook reported catch (kg) per unit effort (trap haul) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



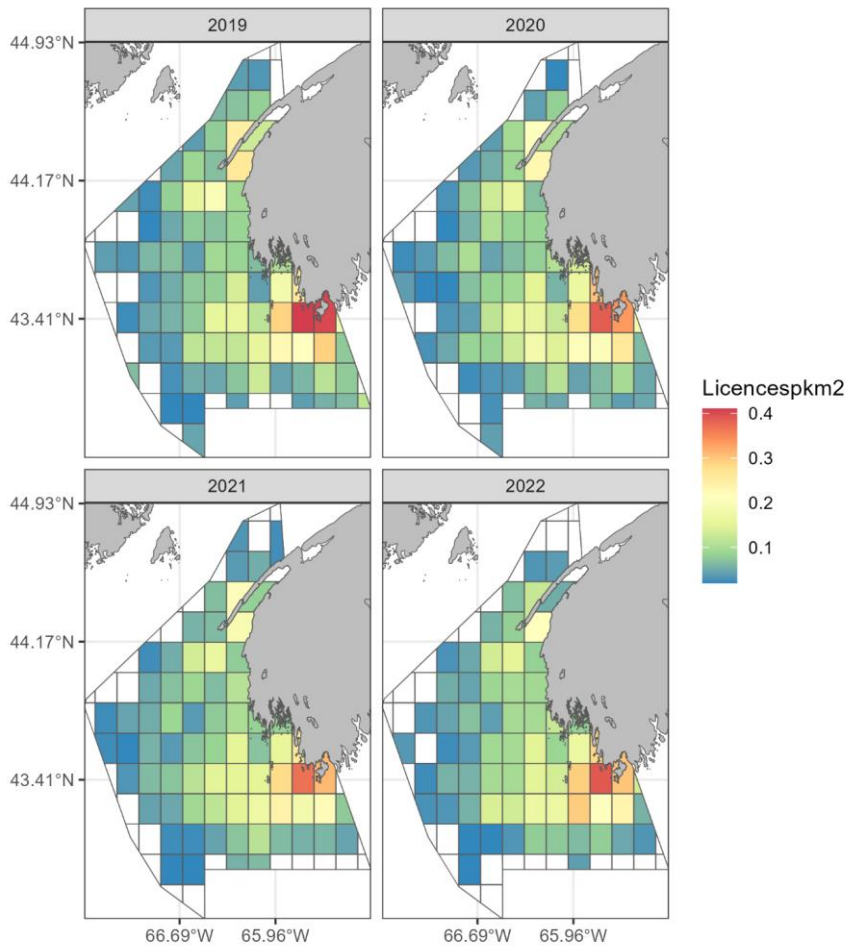
LFA34- Logbook reported grid estimates of percent difference in catch per unit effort (CPUE) relative to mean CPUE between 2006 and 2010. Grey grids indicate percent difference could not be estimated.



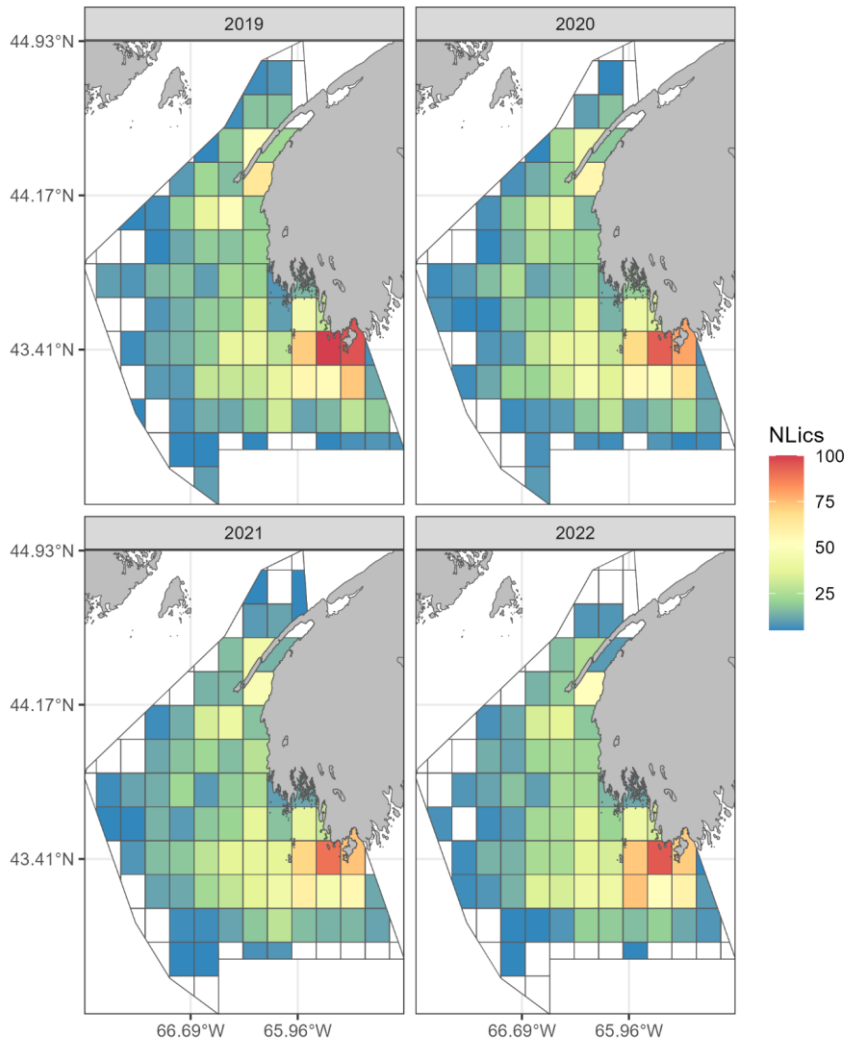
LFA34- Logbook reported Landings (t) by grid adjusted by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



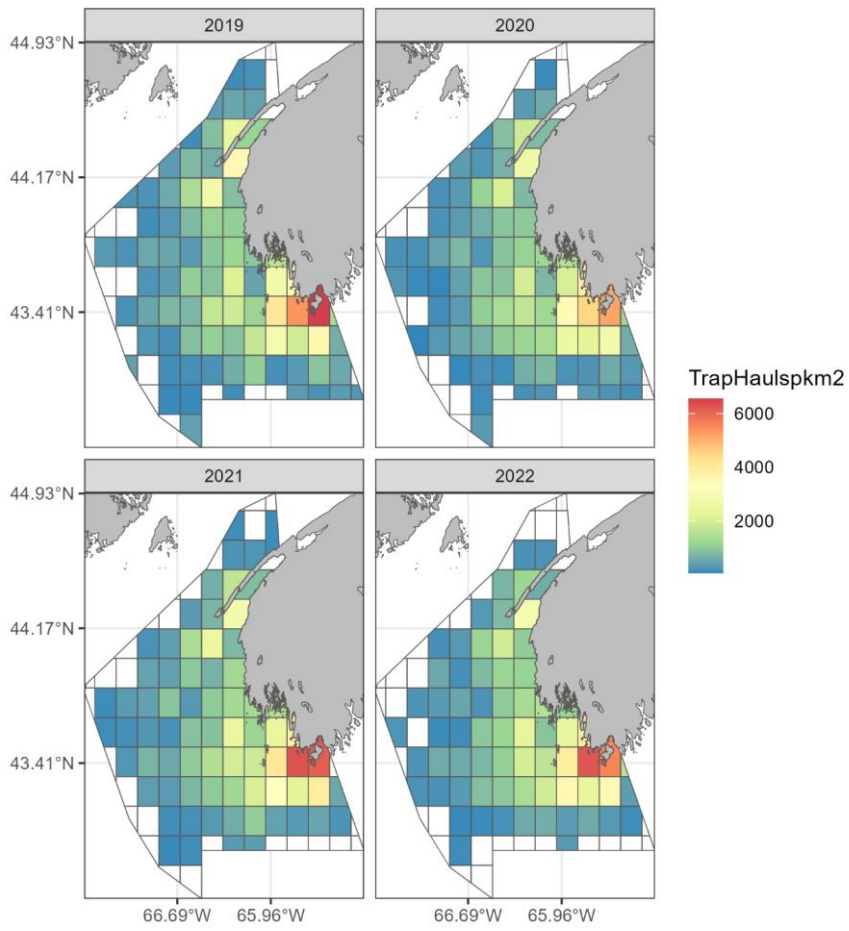
LFA34- Logbook reported Landings (t) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



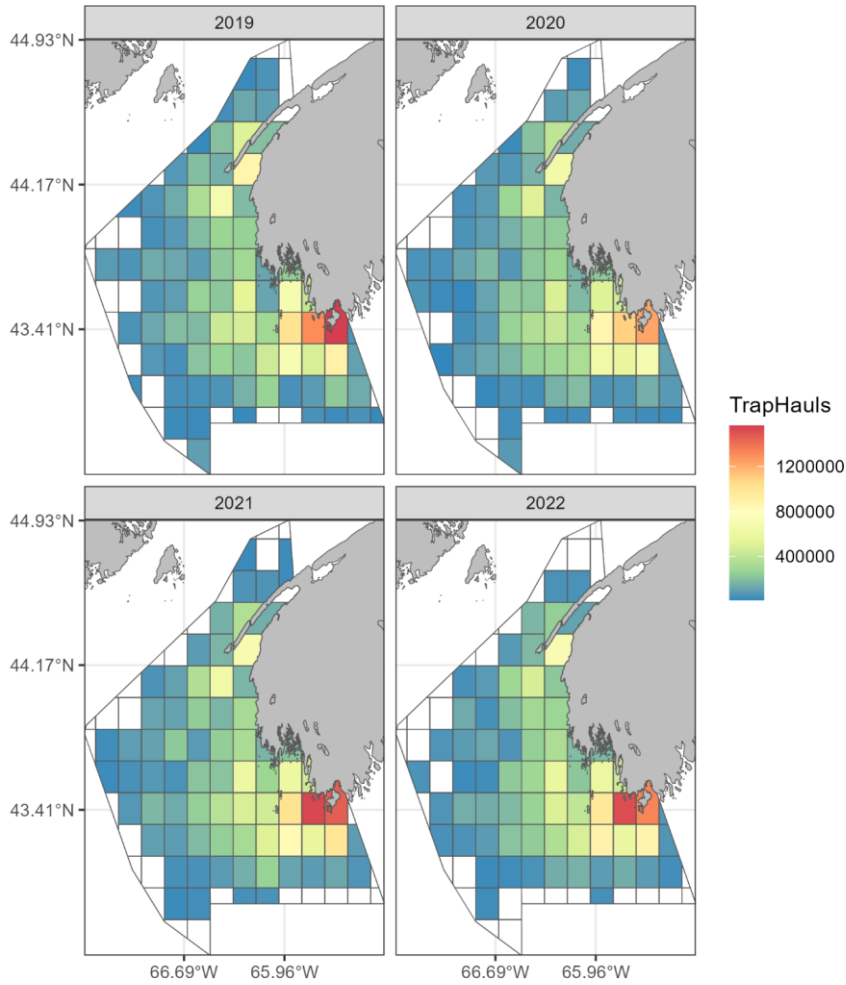
LFA34- Logbook reported number of licences fishing by grid corrected by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



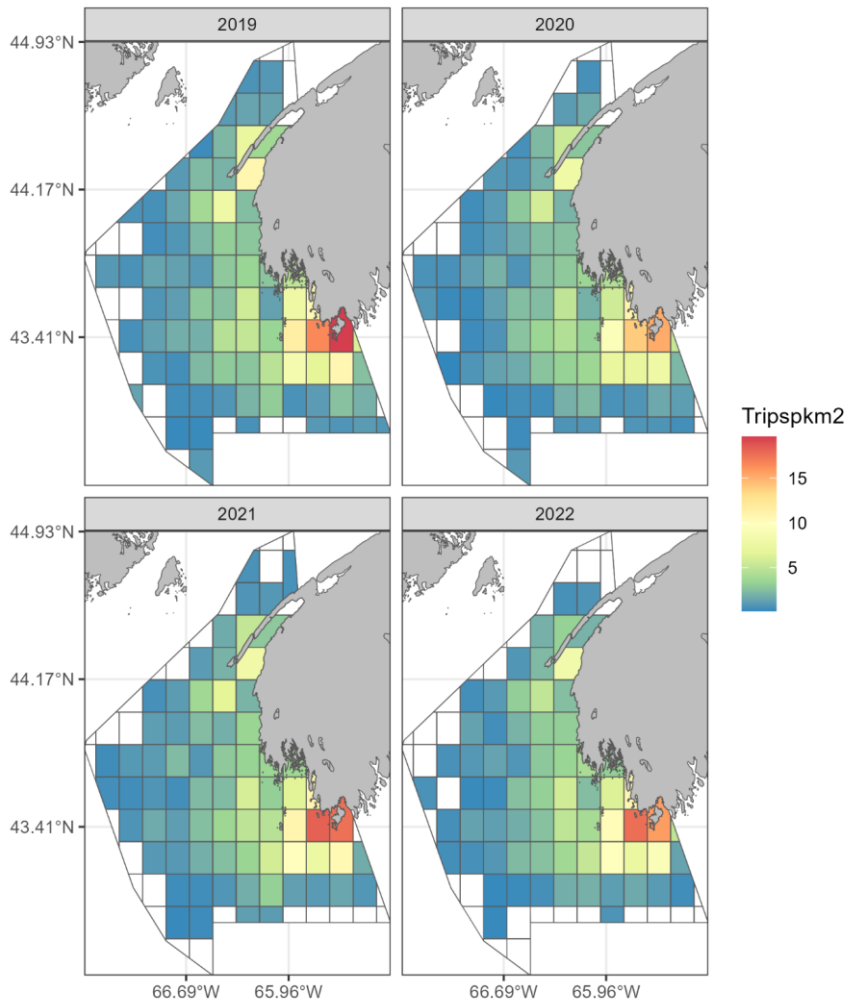
LFA34- Logbook reported number of licences fishing by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



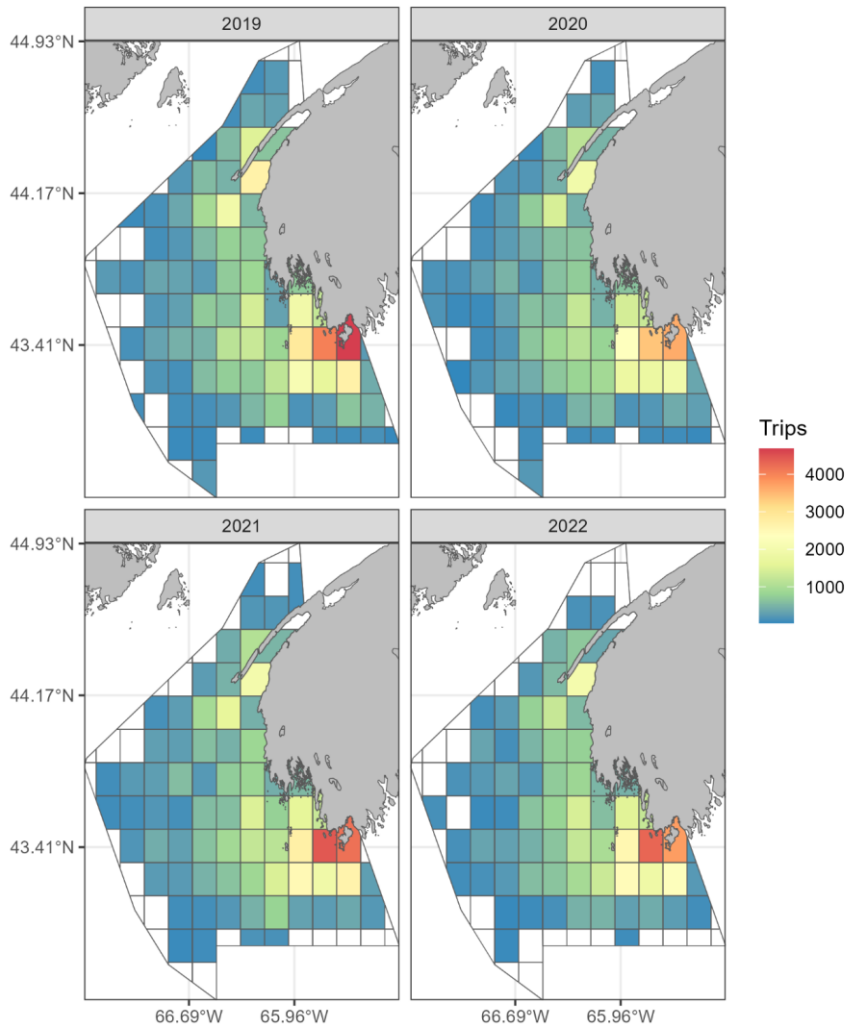
LFA34- Logbook reported number of trap hauls (TH) by grid corrected by the area of the grid (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



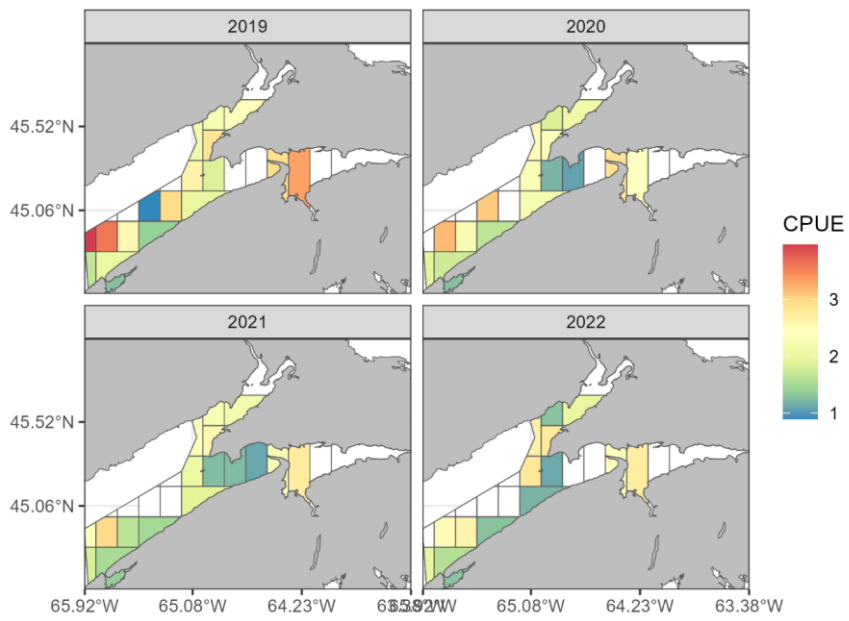
LFA34- Logbook reported number of trap hauls by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



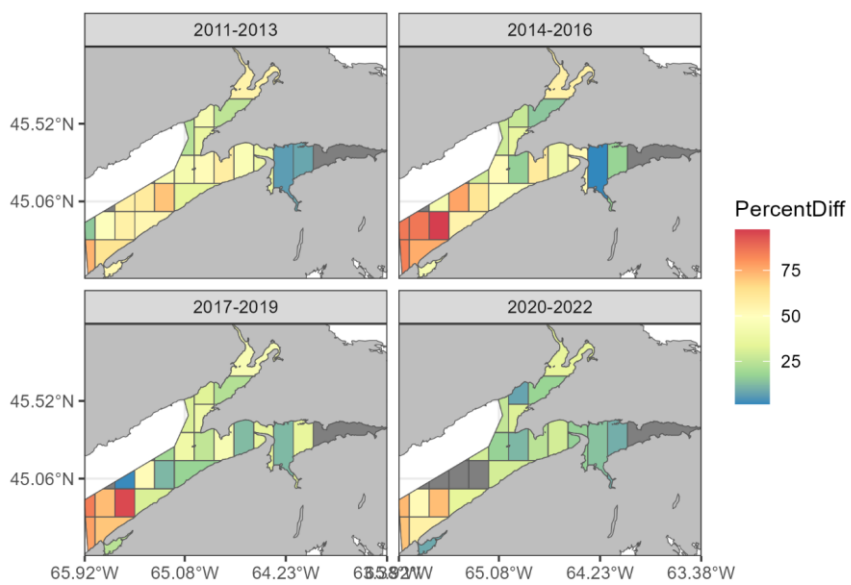
LFA34- Logbook reported number of trips by grid adjusted by area (km2). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



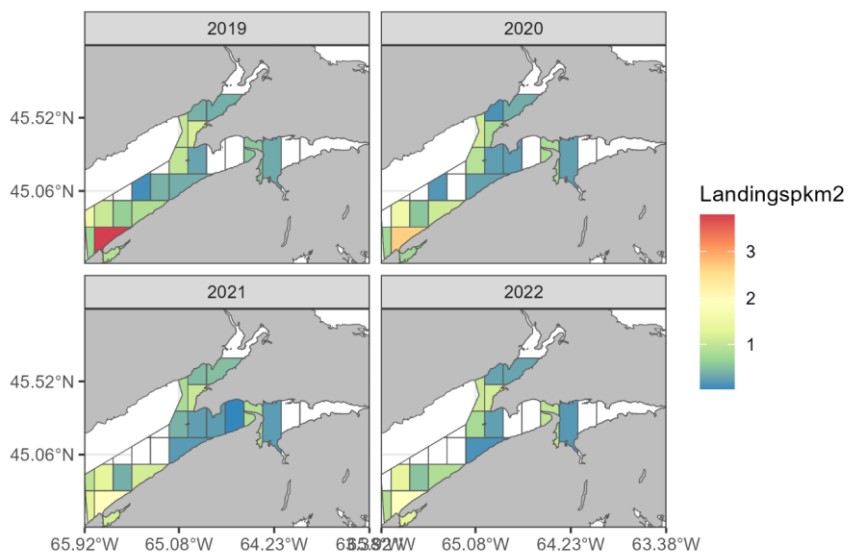
LFA34- Logbook reported number of trips by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



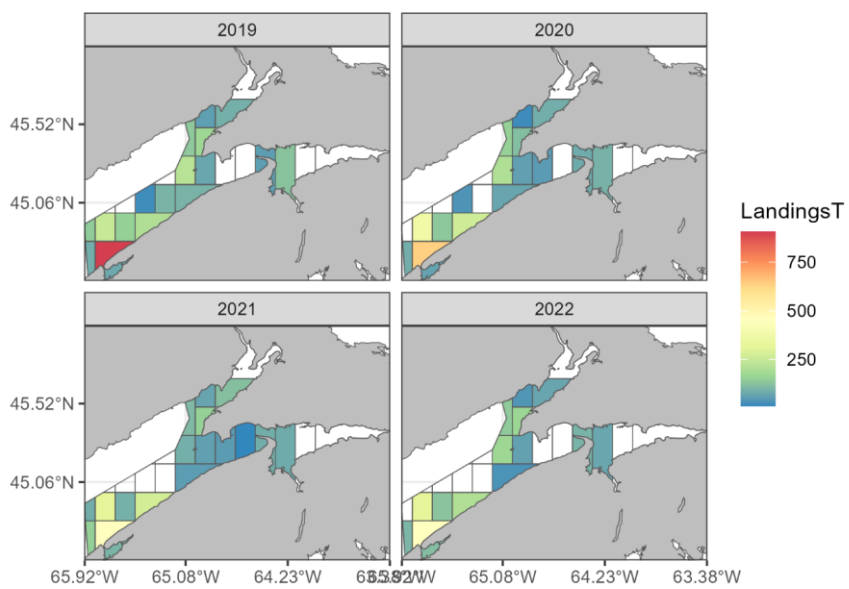
LFA35- Logbook reported catch (kg) per unit effort (trap haul) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



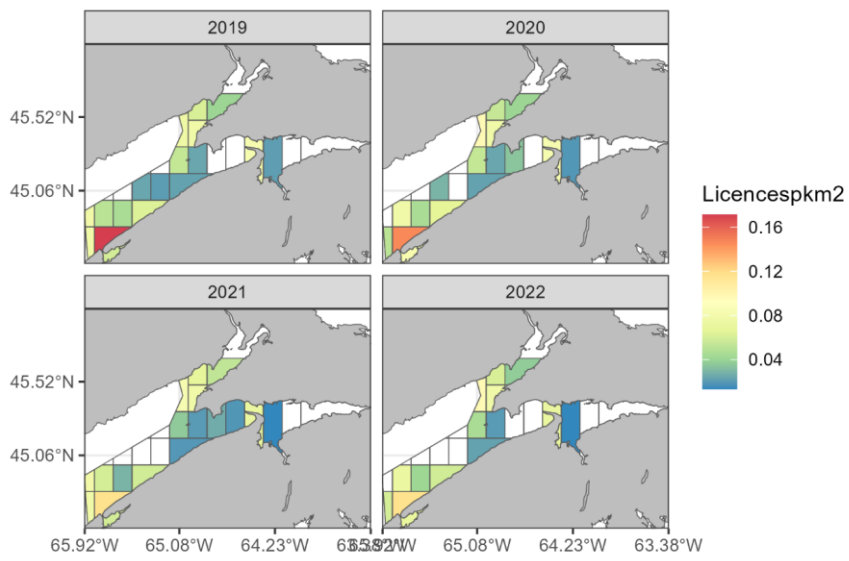
LFA35- Logbook reported grid estimates of percent difference in catch per unit effort (CPUE) relative to mean CPUE between 2006 and 2010. Grey grids indicate percent difference could not be estimated.



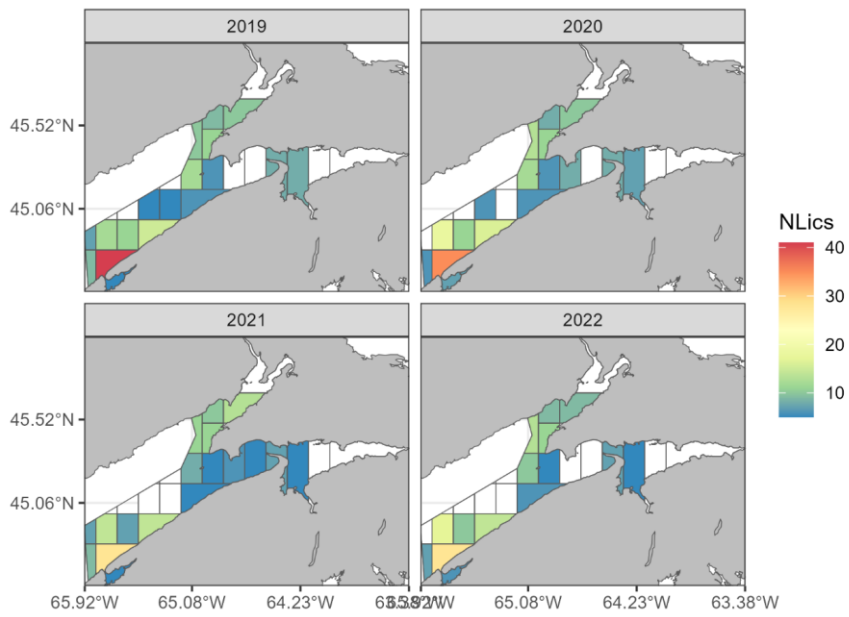
LFA35- Logbook reported Landings (t) by grid adjusted by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



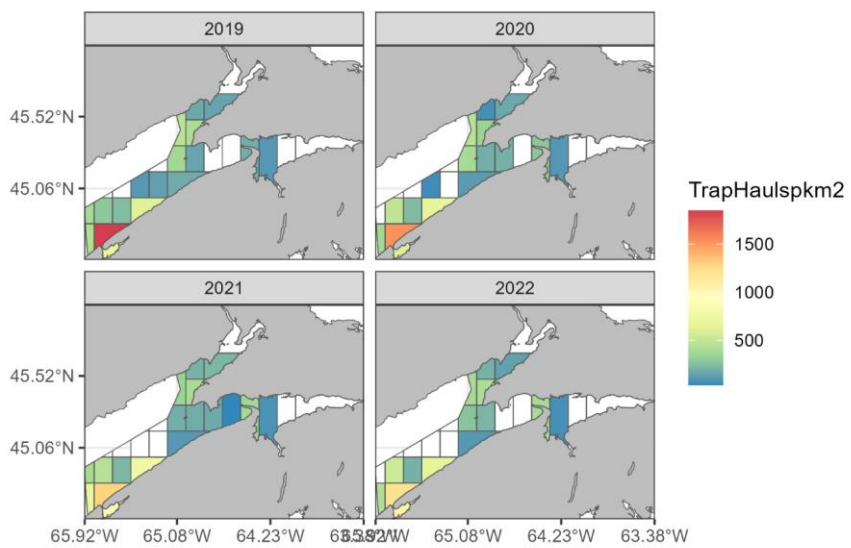
LFA35- Logbook reported Landings (t) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



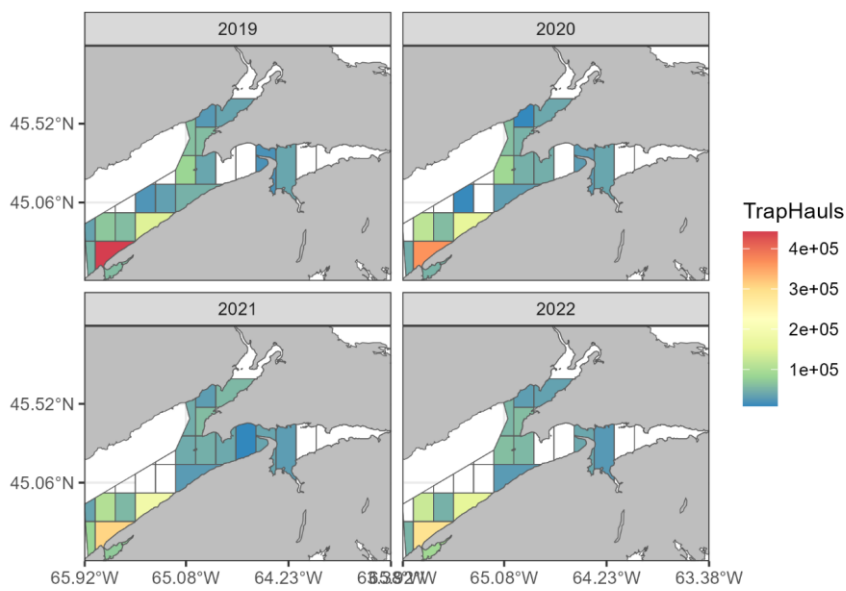
LFA35- Logbook reported number of licences fishing by grid corrected by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



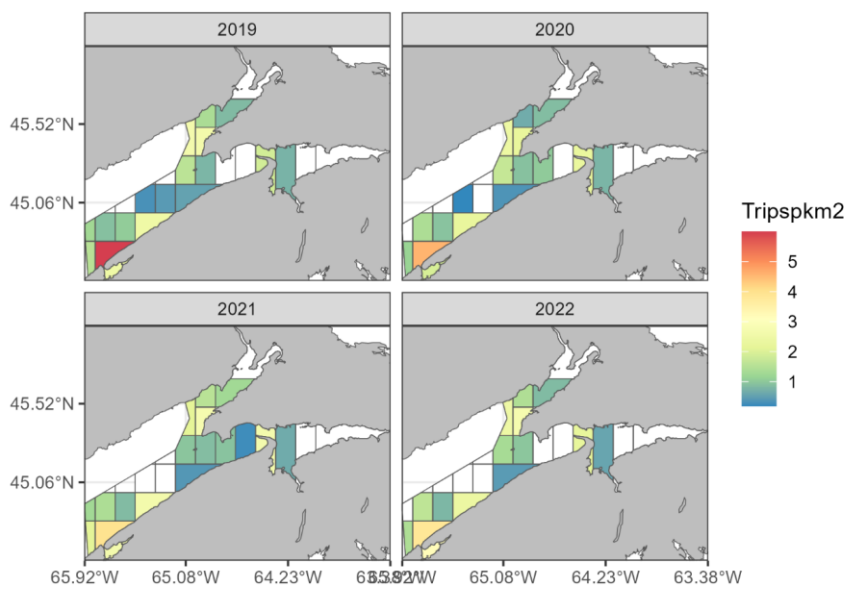
LFA35- Logbook reported number of licences fishing by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



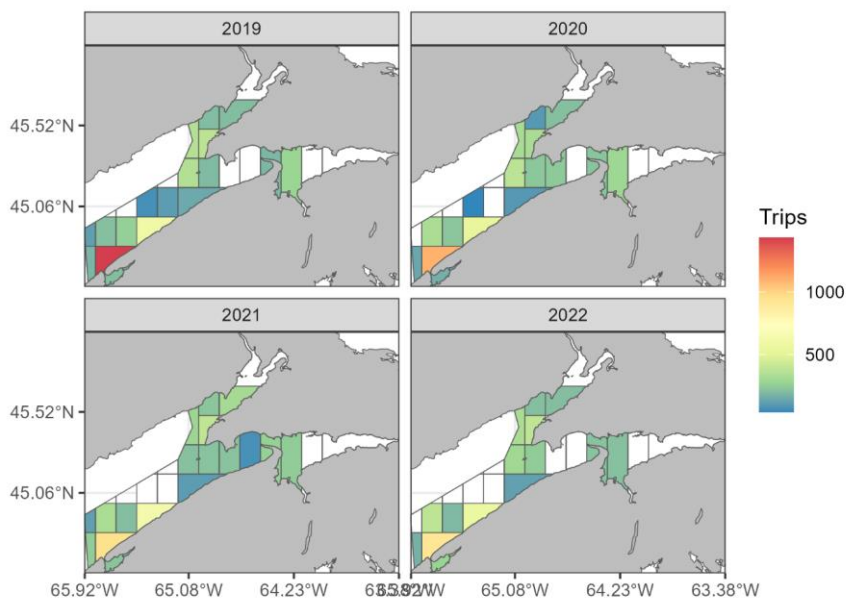
LFA35- Logbook reported number of trap hauls (TH) by grid corrected by the area of the grid (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



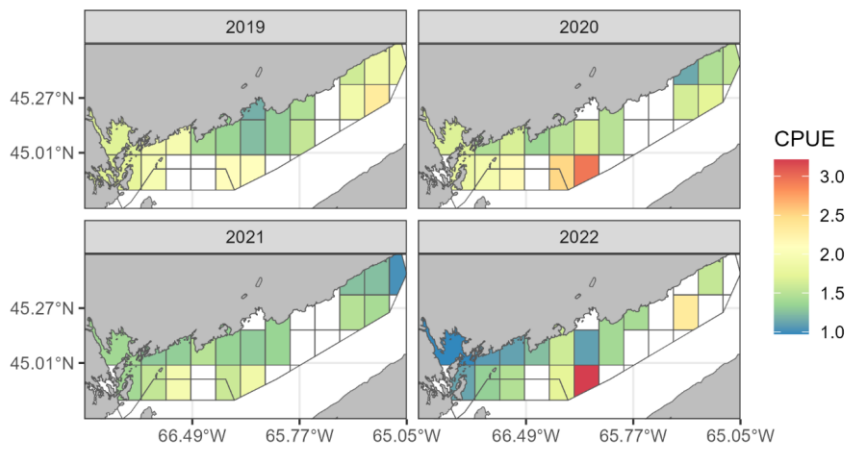
LFA35- Logbook reported number of trap hauls by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



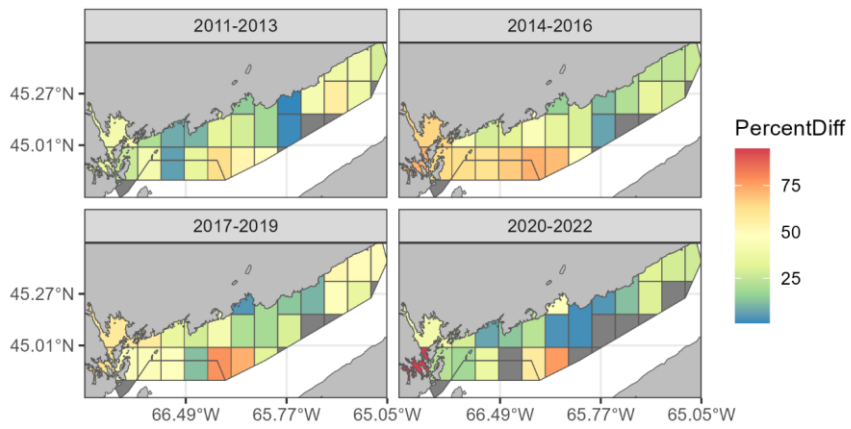
LFA35- Logbook reported number of trips by grid adjusted by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



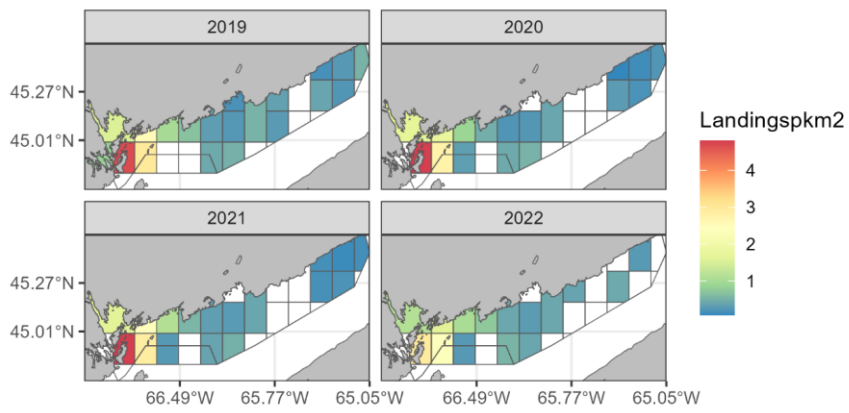
LFA35- Logbook reported number of trips by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



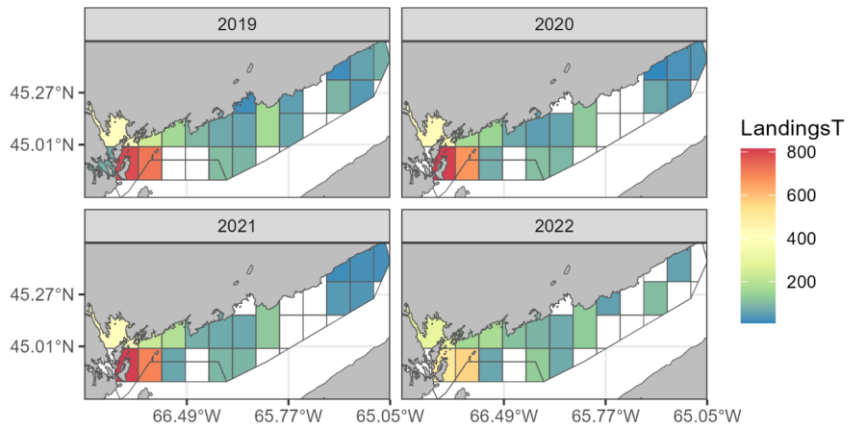
LFA36- Logbook reported catch (kg) per unit effort (trap haul) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



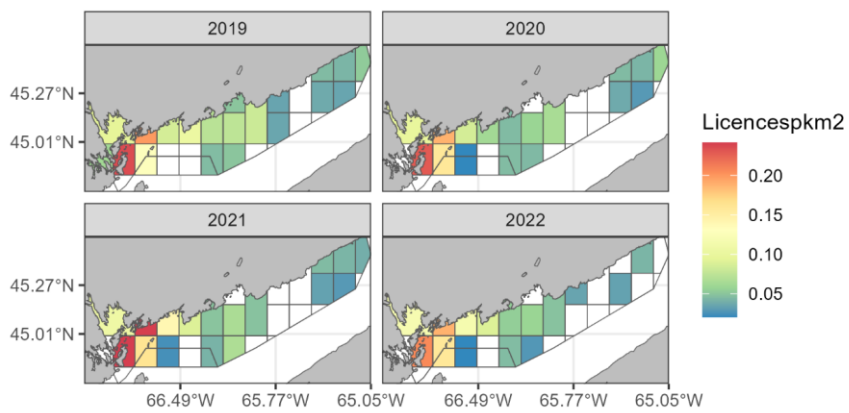
LFA36- Logbook reported grid estimates of percent difference in catch per unit effort (CPUE) relative to mean CPUE between 2006 and 2010. Grey grids indicate percent difference could not be estimated.



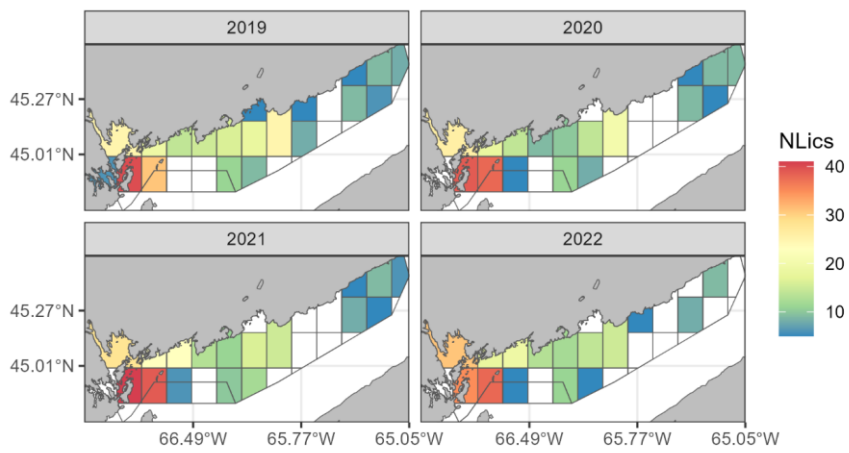
LFA36- Logbook reported Landings (t) by grid adjusted by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



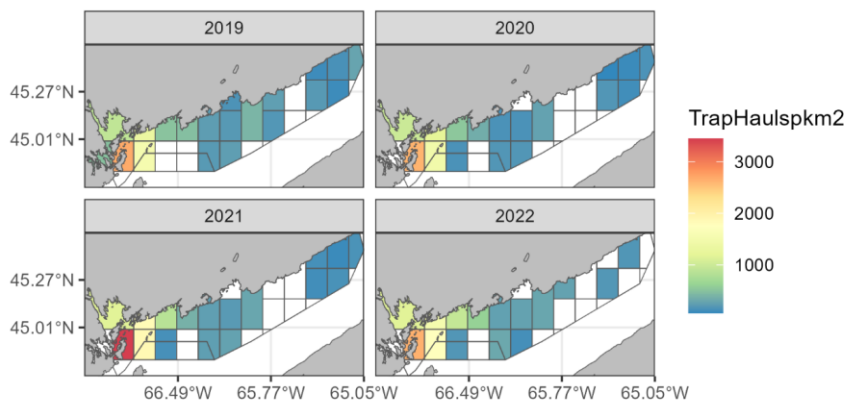
LFA36- Logbook reported Landings (t) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



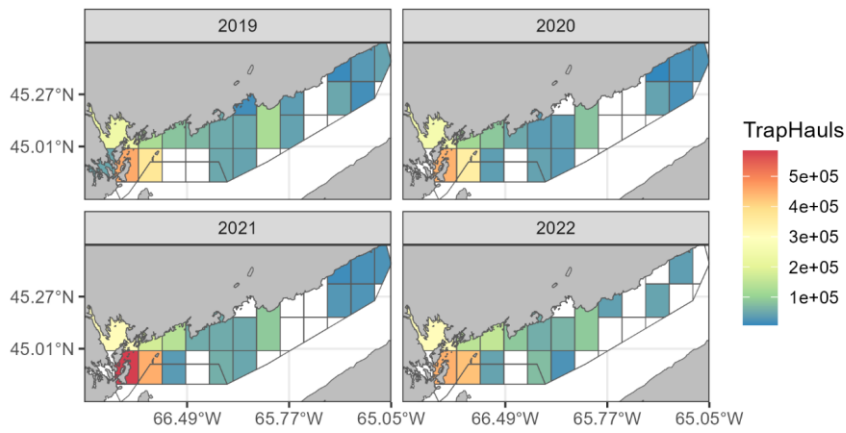
LFA36- Logbook reported number of licences fishing by grid corrected by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



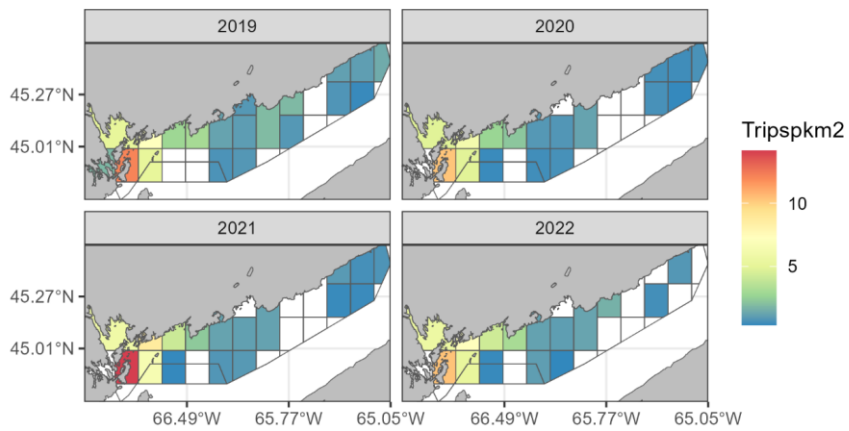
LFA36- Logbook reported number of licences fishing by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



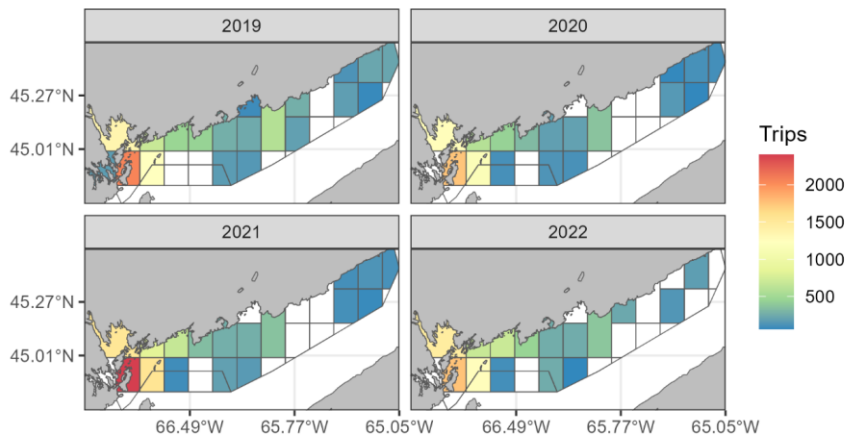
LFA36- Logbook reported number of trap hauls (TH) by grid corrected by the area of the grid (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



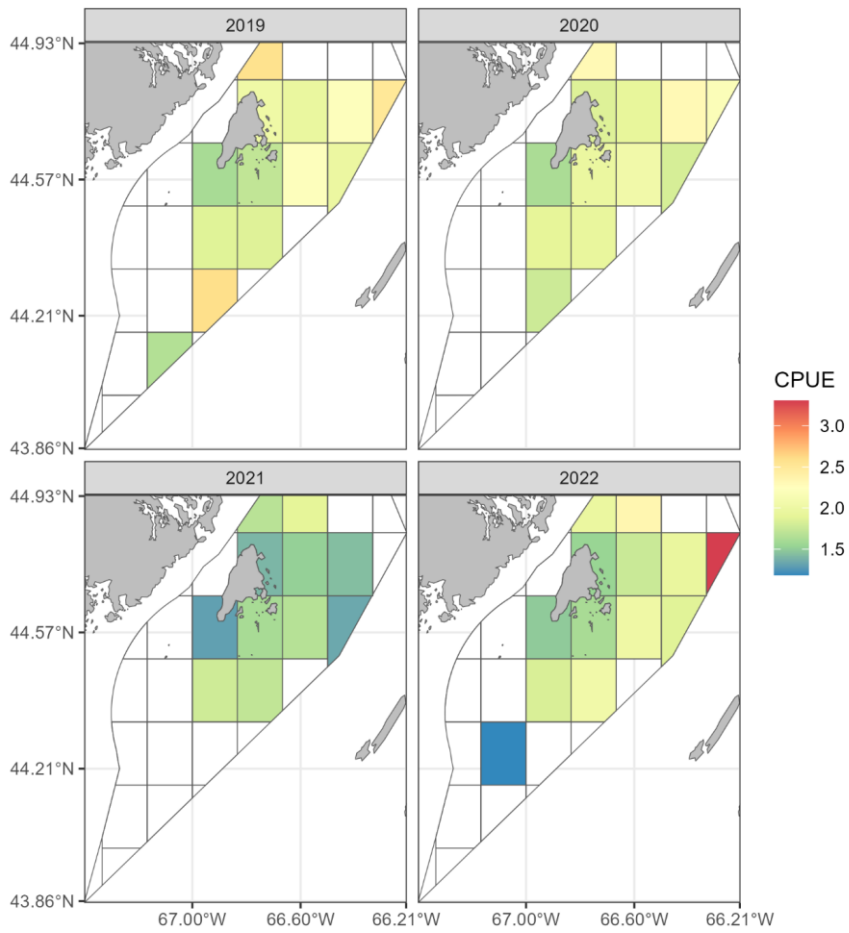
LFA36- Logbook reported number of trap hauls by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



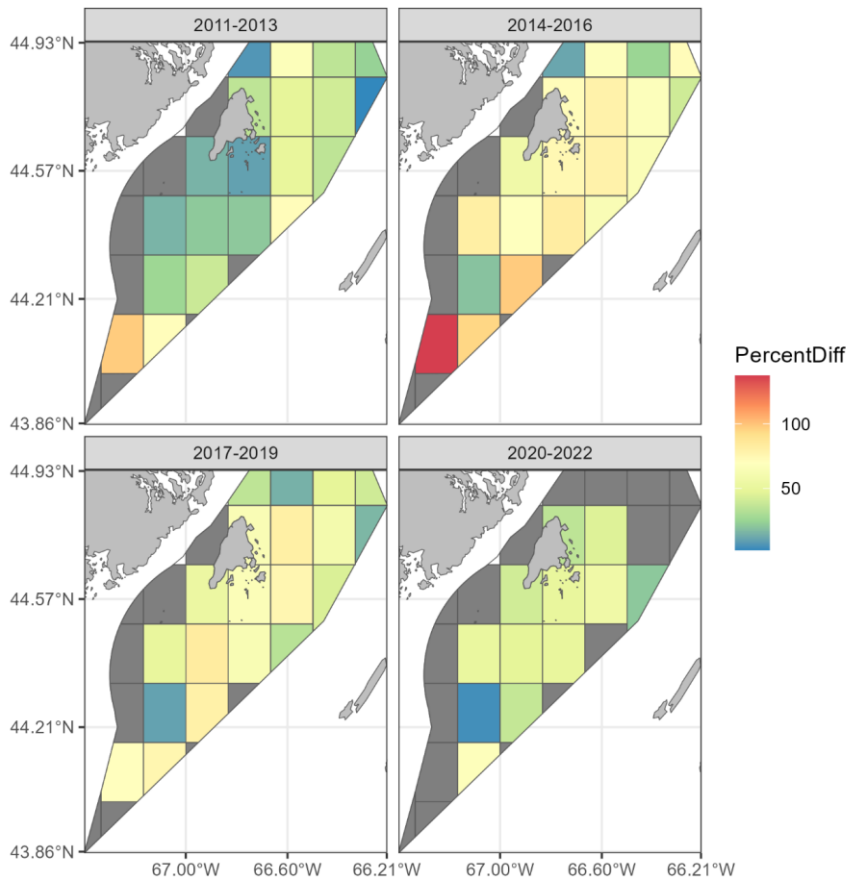
LFA36- Logbook reported number of trips by grid adjusted by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



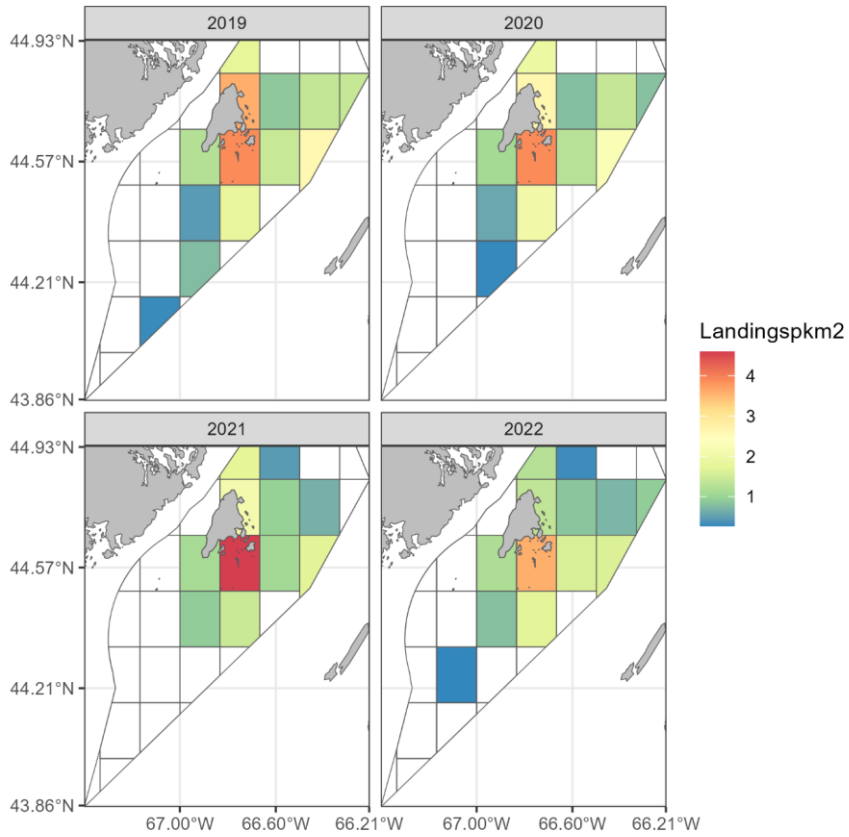
LFA36- Logbook reported number of trips by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



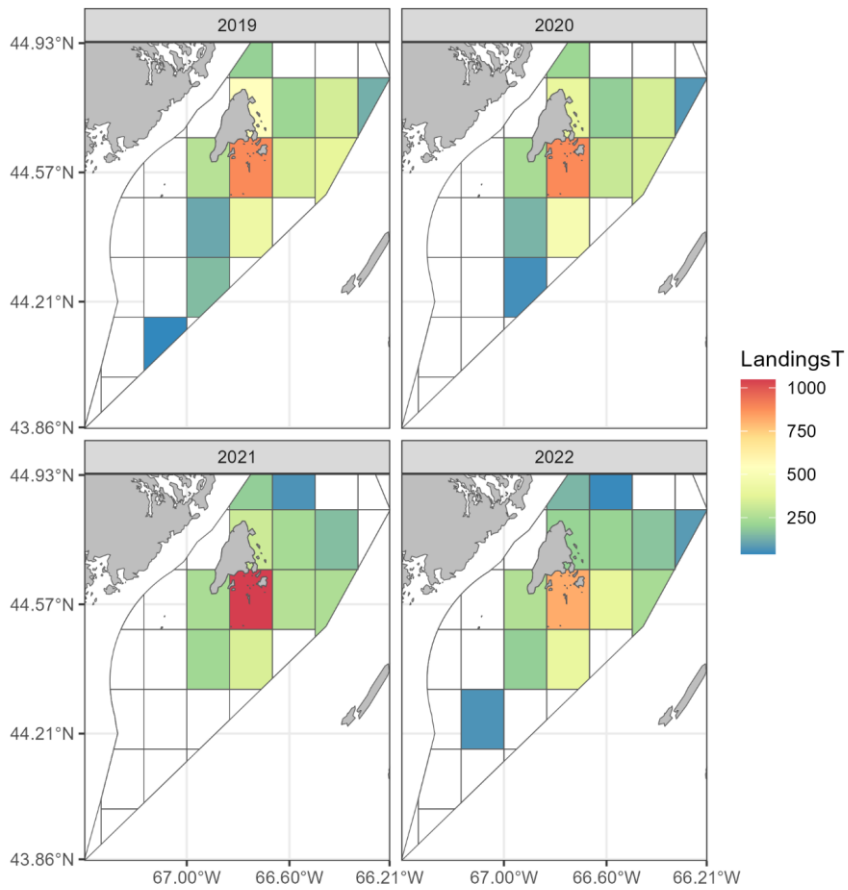
LFA38- Logbook reported catch (kg) per unit effort (trap haul) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



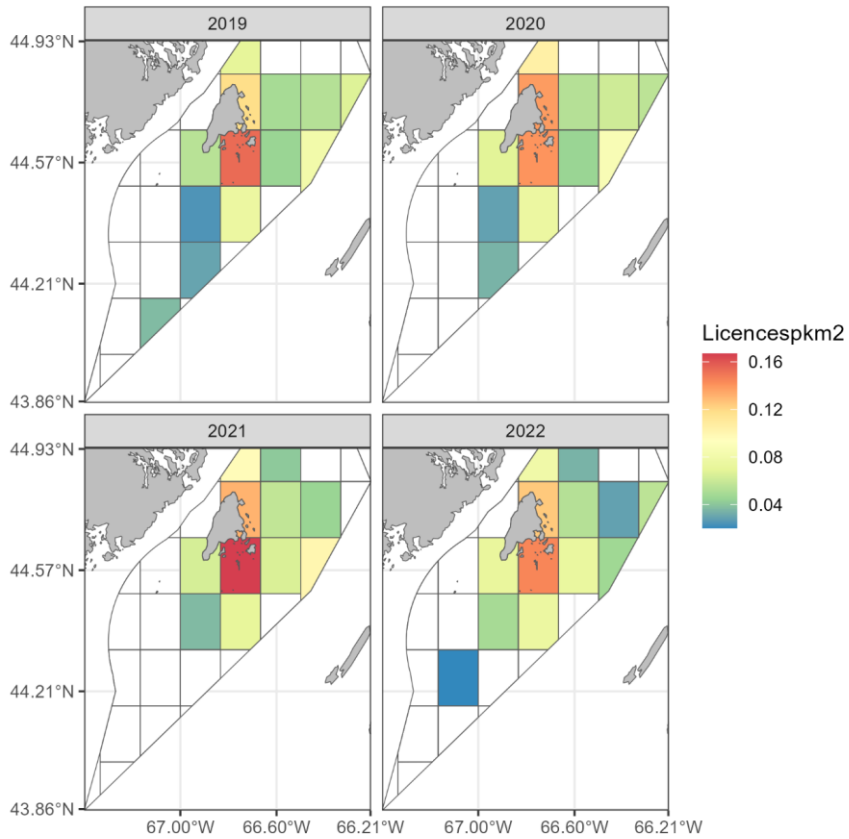
LFA38- Logbook reported grid estimates of percent difference in catch per unit effort (CPUE) relative to mean CPUE between 2006 and 2010. Grey grids indicate percent difference could not be estimated.



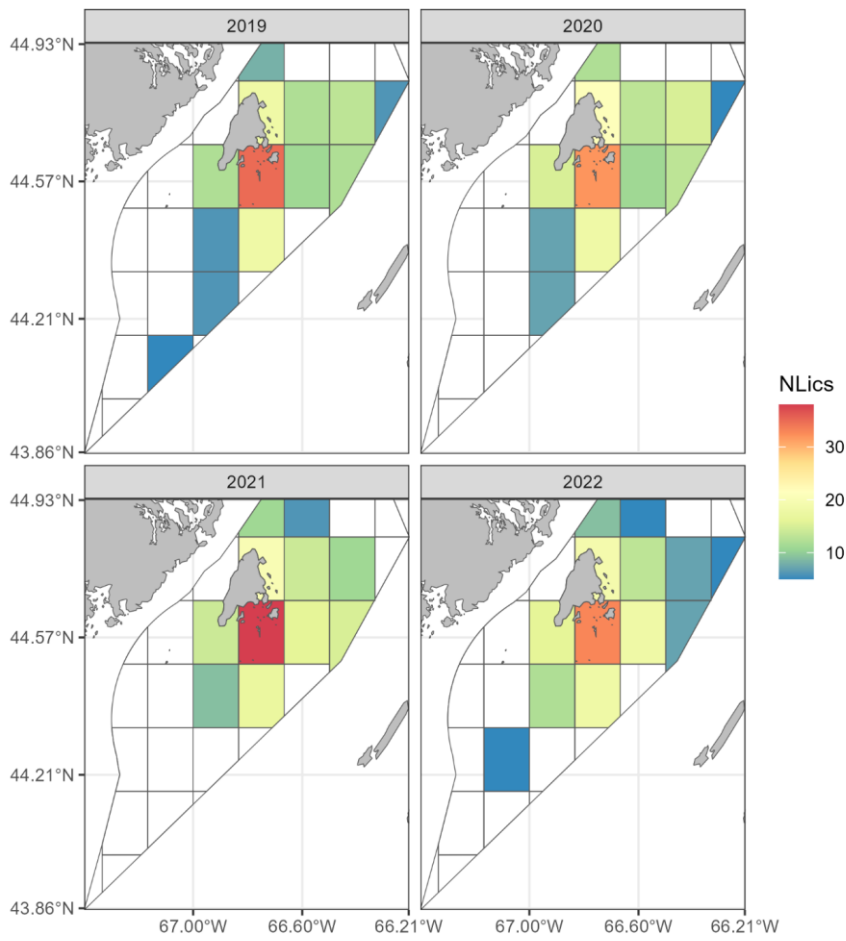
LFA38- Logbook reported Landings (t) by grid adjusted by area (km2). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



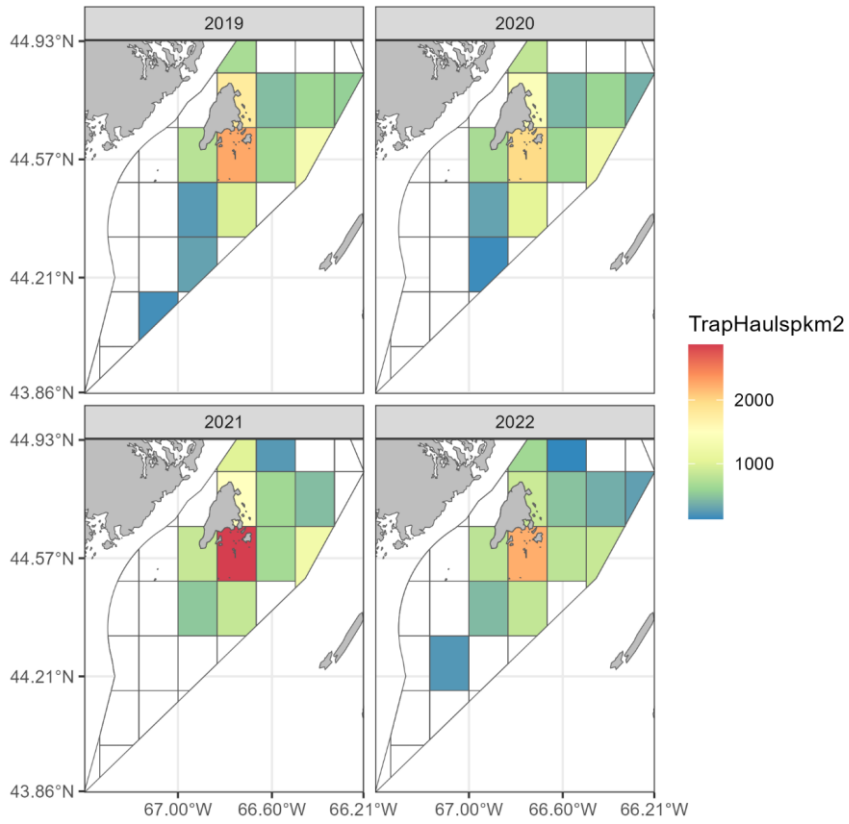
LFA38- Logbook reported Landings (t) by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



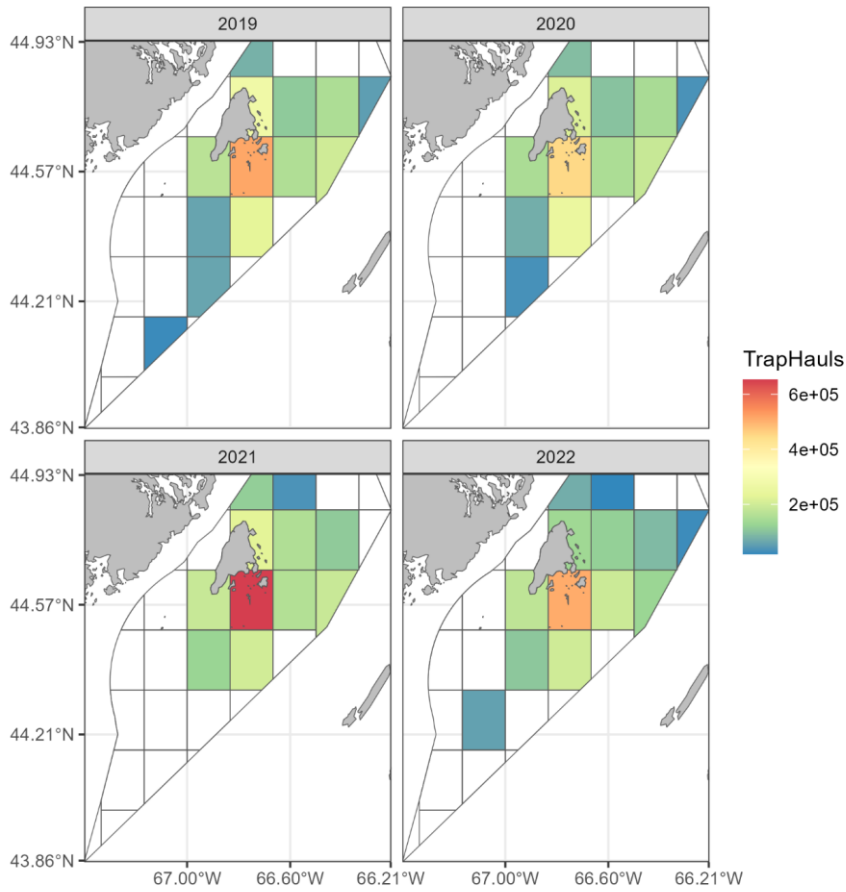
LFA38- Logbook reported number of licences fishing by grid corrected by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



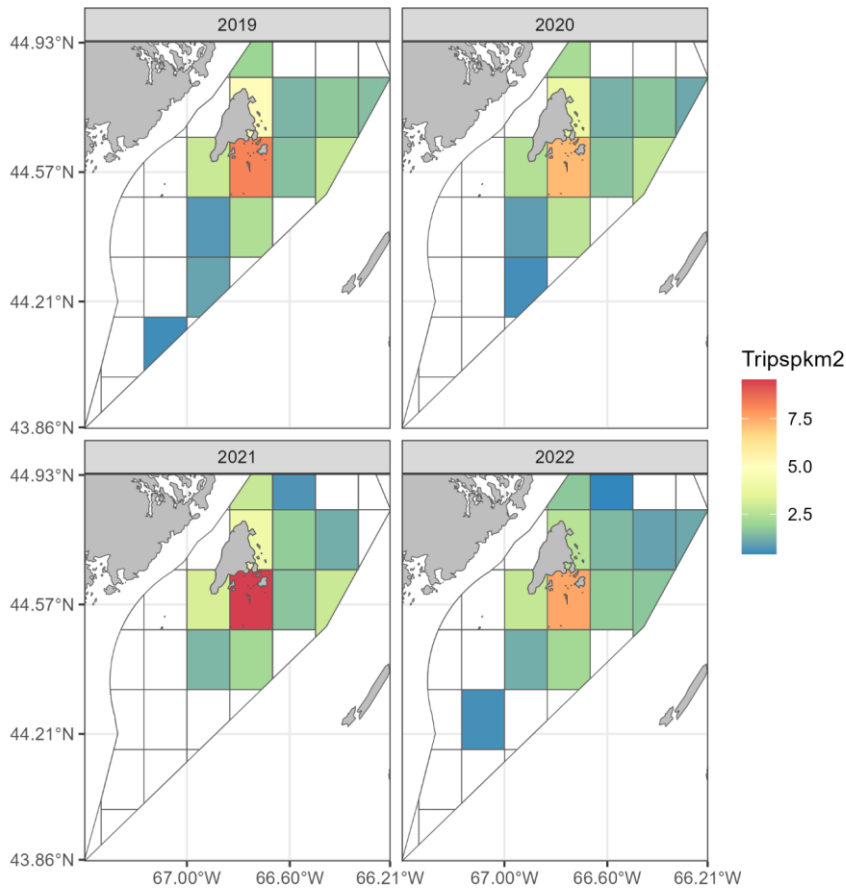
LFA38- Logbook reported number of licences fishing by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



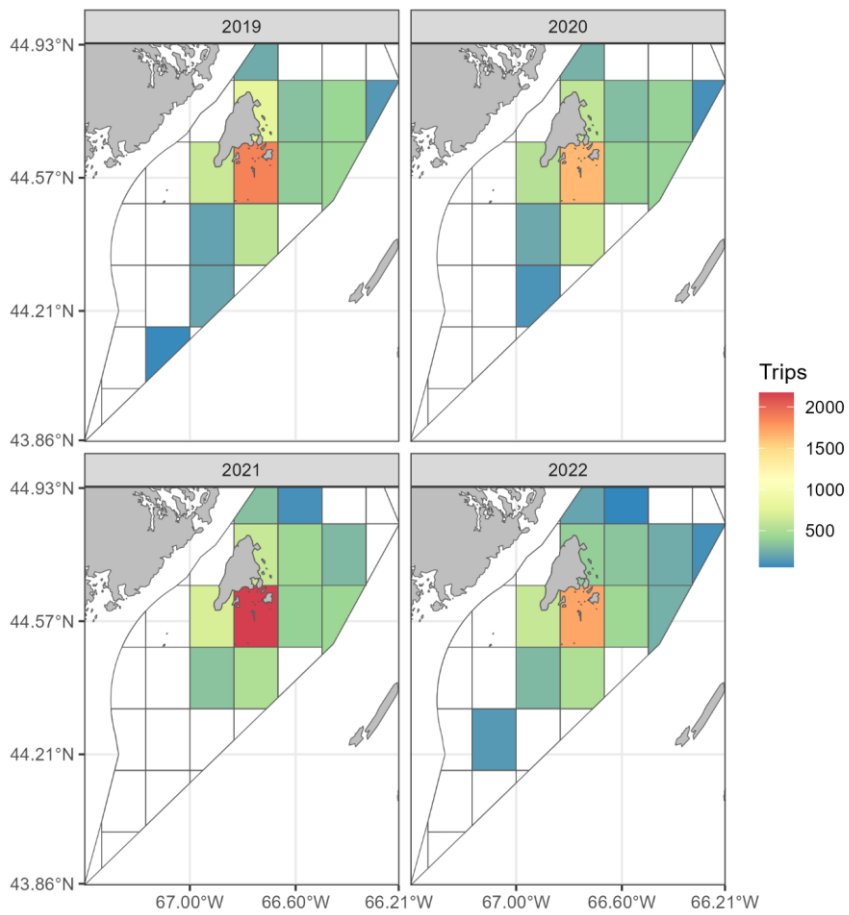
LFA38- Logbook reported number of trap hauls (TH) by grid corrected by the area of the grid (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



LFA38- Logbook reported number of trap hauls by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



LFA38- Logbook reported number of trips by grid adjusted by area (km²). White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).



LFA38- Logbook reported number of trips by grid. White grids indicate fishing information is privacy protected (i.e. <5 Licences reporting).