

# Distribution and biomass of shrimp species caught in the annual September research vessel trawl survey in the southern Gulf of St. Lawrence (2003 to 2020)

Daniel Ricard, Jenni McDermid, Nicolas Rolland, Katherine Landry and Pablo Vergara

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2021

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



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**ABSTRACT**

57 Ricard, D., McDermid, J., Rolland, N., Landry, K. and Vergara, P. 2021. Distribution and biomass  
58 of shrimp species caught n in the annual September research vessel trawl survey in the  
59 southern Gulf of St. Lawrence (2003 to 2020). Can. Tech. Rep. Fish. Aquat. Sci. nnn:  
60 vi + 79 p.

61 Here is the abstract text. Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do  
62 eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis  
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64 dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint  
65 occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

## RÉSUMÉ

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69 southern Gulf of St. Lawrence (2003 to 2020). Can. Tech. Rep. Fish. Aquat. Sci. nnn:  
70 vi + 79 p.

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74 in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat  
75 non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

## 1 Introduction

77 Document to examine the shrimp data from the RV survey.

## 2 Methods

79 The survey protocol has used a single species code for “Decapod unidentified.” Since 2003,  
80 all shrimp species are sorted from the catch and weighted as a group during the survey. The  
81 protocol is to then collect a ~1 kg sample and to freeze it for subsequent processing in the lab.

82 Frozen samples are thawed to determine the species composition of shrimp, where individual  
83 specimens are identified to the most precise taxonomic classification possible. All the decapod  
84 species captured in the survey belong to the [Superorder Eucarida](#). This taxonomic group  
85 includes Decapods (order Decapoda) as well as Euphasids (order Euphasiacea). At the  
86 level of detail possible during sorting of specimens during the survey, krill specimens are  
87 indistinguishable from other shrimp species and will be part of the “Decapod unidentified” code  
88 used, even though they are not a decapod.

89 The utmost care is taken to identify individuals at the species level in the lab, but it is often not  
90 possible to do so. Samples are sometimes broken and only parts are available for identification.  
91 The procedure for processing samples in the laboratory uses a list of species that are likely to be  
92 observed in the southern Gulf of St. Lawrence.

93 **2.1 Species considered**

94 We refer the reader to the identification guides of shrimp species for an overview of the  
95 morphological difference between species and an appreciation of the level of details necessary  
96 for identification at the species level (Squires 1990). The species that were observed in the  
97 survey appear in Table 1.

Table 1. List of species included in this document. The World Registry of Marine Species Aphia ID is the unique taxonomic identifier for each of the group of organisms captured in the survey. The number of records represents the number of trawl sets where each group was identified.

Genus	Scientific name	English name	French name	Species code	AphiaID	Number of records
<b>Order: Decapoda</b>						
<i>Family: Pandalidae</i>						
<i>Pandalus</i>	<i>Pandalus borealis</i>	Northern shrimp	Crevette nordique	2211	<a href="#">107649</a>	1166
	<i>Pandalus montagui</i>	Aesop shrimp	Crevette ésope	2212	<a href="#">107651</a>	2231
<i>Atlantopandalus</i>	<i>Atlantopandalus propinquus</i>	Similar shrimp	Crevette similaire	2213	<a href="#">158351</a>	7
<i>Family: Thoridae</i>						
<i>Lebbeus</i>	<i>Lebbeus polaris</i>	Polar shrimp	Bouc	2312	<a href="#">107521</a>	875
<i>Spirontocaris</i>	<i>Spirontocaris liljeborgii</i>	Spirontocaris liljeborgii	Bouc épineux	2313	<a href="#">107531</a>	410
	<i>Spirontocaris phippsii</i>	Punctate bladed shrimp	Bouc	2315	<a href="#">107532</a>	335
	<i>Spirontocaris spinus</i>	Parrot bladed shrimp	Bouc perroquet	2316	<a href="#">107533</a>	918
<i>Lebbeus</i>	<i>Lebbeus groenlandicus</i>	Spiny lebbeid	Bouc	2319	<a href="#">107520</a>	113
<i>Eualus</i>	<i>Eualus</i>	Eualus unidentified	Eualus non-spécifié	2330	<a href="#">106986</a>	42
	<i>Eualus macilentus</i>	Greenland shrimp	Bouc du Groenland	2331	<a href="#">158359</a>	1215
	<i>Eualus fabricii</i>	Arctic eualid	Bouc Arctique	2332	<a href="#">158357</a>	363
	<i>Eualus gaimardii</i>	Circumpolar shrimp	Bouc	2333	<a href="#">107504</a>	1130
<i>Family: Crangonidae</i>						
<i>Argis</i>	<i>Argis dentata</i>	Arctic argid	Crevette verte	2411	<a href="#">107550</a>	1866
<i>Sclerocrangon</i>	<i>Sclerocrangon boreas</i>	Sculptured shrimp	Crevette de roche (ciselée)	2414	<a href="#">107568</a>	289
<i>Pontophilus</i>	<i>Pontophilus norvegicus</i>	Norwegian shrimp	Crevette	2415	<a href="#">107563</a>	55

Order	Family	Genus	Scientific name	English name	French name	Species code	AphiaID	Number of records	
		<i>Crangon</i>	<i>Crangon septemspinosa</i>	Sevenspine bay shrimp	Crevette grise	2417	<a href="#">158355</a>	226	
		<i>Sabinea</i>	<i>Sabinea septemcarinata</i>	Sevenline shrimp	Crevette	2421	<a href="#">107567</a>	1506	
<i>Family: Pasiphaeidae</i>									
		<i>Pasiphaea</i>	<i>Pasiphaea tarda</i>	Crimson pasiphaeid	Sivade	2220	<a href="#">107678</a>	6	
			<i>Pasiphaea multidentata</i>	Pink glass shrimp	Sivade rose (Crevette blanche)	2221	<a href="#">107676</a>	229	
		<i>Parapasiphae</i>	<i>Parapasiphae sulcatifrons</i>	Parapasiphae sulcatifrons	Parapasiphae sulcatifrons	2222	<a href="#">107673</a>	7	
<i>Family: Sergestidae</i>									
		<i>Robustosergia</i>	<i>Robustosergia robusta</i>	Robustosergia robusta	Robustosergia robusta	1283	<a href="#">1056517</a>	3	
		NA	<i>Decapoda</i>	Decapod unidentified	Décapode non-spécifié	2100	<a href="#">1130</a>	2468	
<b>Order: Euphausiacea</b>									
<i>Family: Euphausiidae</i>									
		<i>Meganyctiphanes</i>	<i>Meganyctiphanes norvegica</i>	Norwegian krill	Norwegian krill	2611	<a href="#">110690</a>	558	
		<i>Euphausia</i>	<i>Euphausia</i>	Euphausia unidentified	Euphausia non-spécifié	2612	<a href="#">110673</a>	121	

98 **2.2 DR notes after chatting with Katherine on 2021-04-16**

99 Pandalus montagui vs. "new species" from Claude Nozeres, Dichelopandalus leptocerus. This  
100 species was flagged in 2016 as a species that was previously identified as Pandalus montagui,  
101 but now got its own recognition. THERE ARE NO RECORDS OF THIS "NEW" SPECIES IN THE  
102 DATABASE, IS THAT CORRECT, WE'VE NEVER SEEN IT?

103 Pasiphaea multidentata and Pasiphaea tarda are very hard to distinguish from each other. There  
104 are only 6 records of Pasiphaea tarda, but 229 records of Pasiphaea multidentata.

105 What happened in 2016? Robustosergia robusta and Parapasiphae sulcatifrons are only  
106 observed in 2016.

107 Eualus unidentified vs. 2 other species that are hard to tell apart especially if rostrum is broken.  
108 Here are the 3 Eualus species:

109 Eualus macilentus

110 Eualus fabricii

111 Eualus gaimardii

112 Species Pasiphaea multidentata has a few records in the shallower Magdalen shallows, instead  
113 of along the Laurentian Channel, this seems suspicious.

114 for 2020, Pablo identified some species that were not in the species table

115 Sabinea sarsii and Sabinea septemcarinata: check with Katherine and Eliane, the former is only in  
116 2020, the later every year except 2019.

117 The 2020 numbers are down for many species, is this an artefact of the sampling being done by  
118 someone else?

119 **2.3 Answers Claude Nozeres**

120 How many potential species of euphasids in the Gulf? Most likely to be Norwegian krill, so  
121 perhaps we could change the species code of 2612 to 2611.

122 **2.4 Yearly stratified random estimates of biomass**

123 In this document, if a temporal index is presented, it (will) means that it was calculated at a  
124 taxonomic level that represents a valid aggregation for allowing the comparison from year to  
125 year.

### 3 Acknowledgements

## 4 Appendix

<sup>128</sup> **4.1 Northern shrimp (Crevette nordique) - species code 2211**

<sup>129</sup> Scientific name: [Pandalus borealis](#)

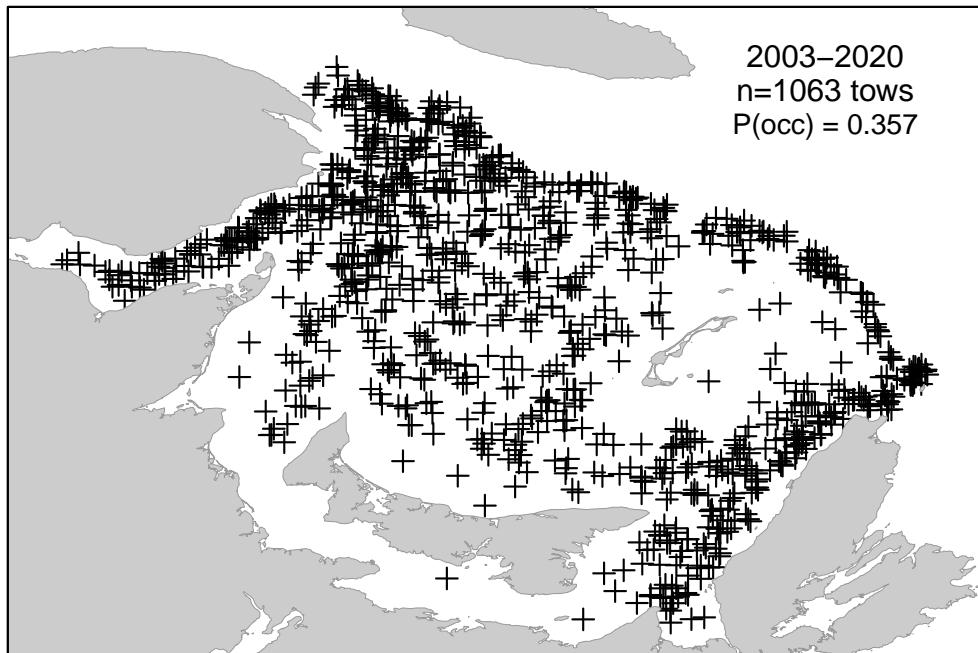


Figure 4.1A. Presence map for Northern shrimp.

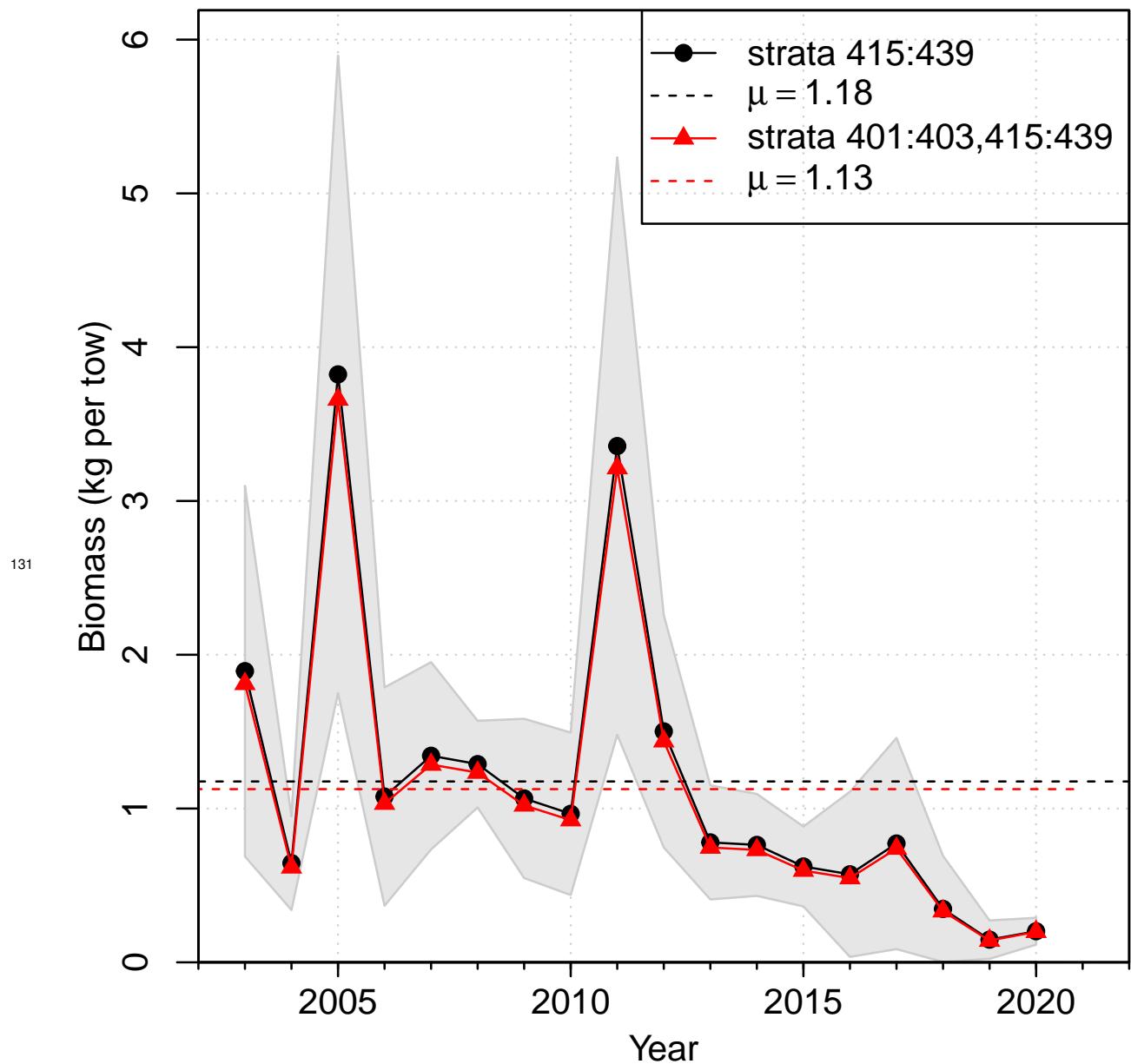


Figure 4.1B. RV index for Northern shrimp.

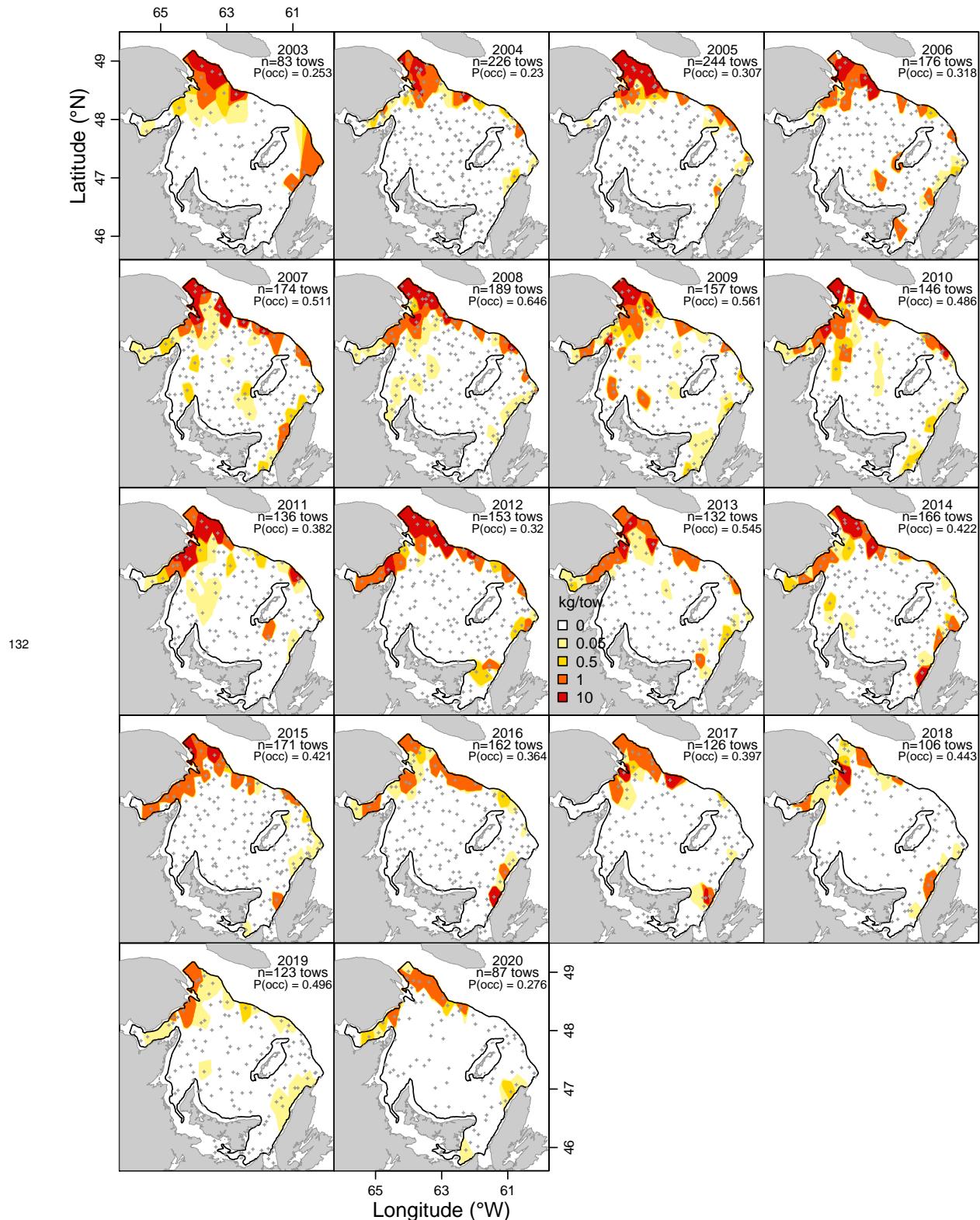


Figure 4.1C. IDW map for Northern shrimp.

<sup>133</sup> **4.2 Aesop shrimp (Crevette ésope) - species code 2212**

<sup>134</sup> Scientific name: [Pandalus montagui](#)

<sup>135</sup>

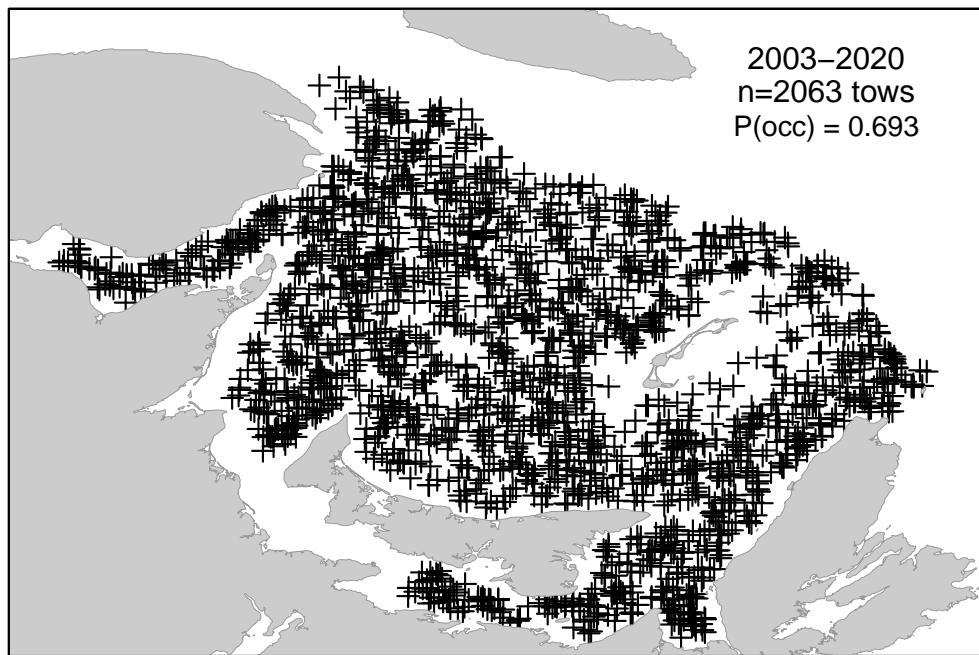


Figure 4.2A. Presence map for Aesop shrimp.

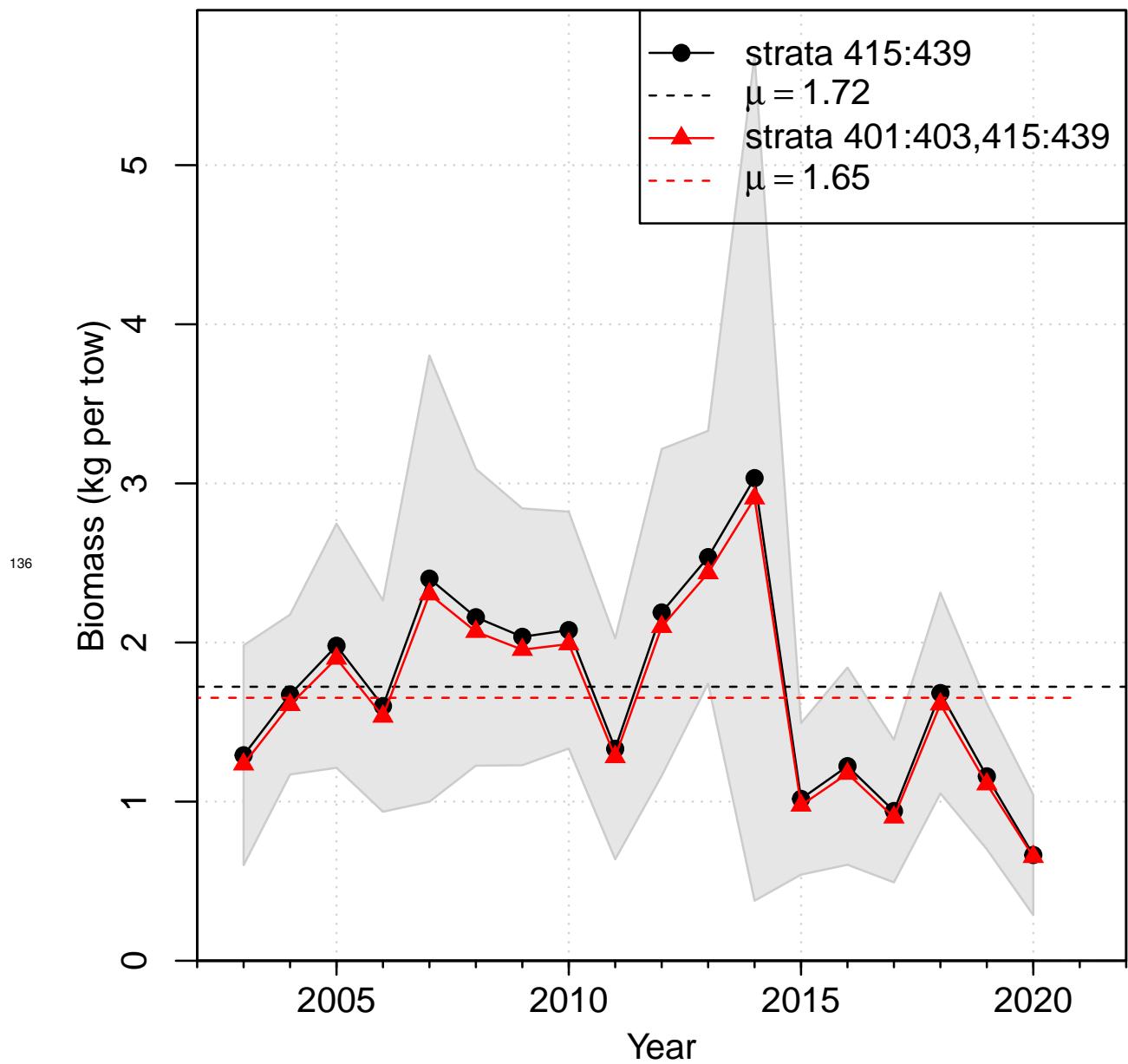


Figure 4.2B. RV index for Aesop shrimp.

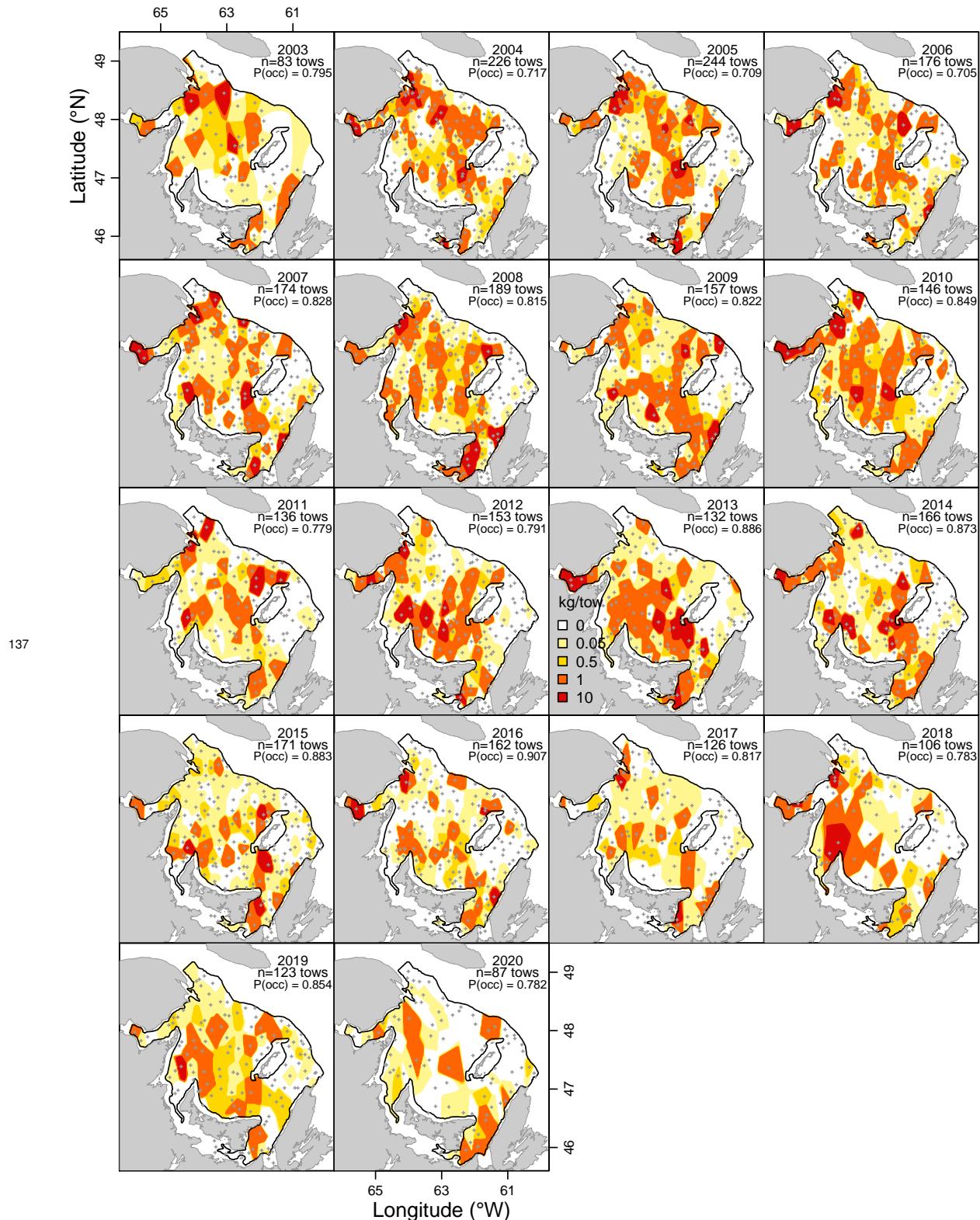


Figure 4.2C. IDW map for Aesop shrimp.

138 4.3 Similar shrimp (Crevette similaire) - species code 2213

139 Scientific name: [Atlantopandalus propinquus](#)

140

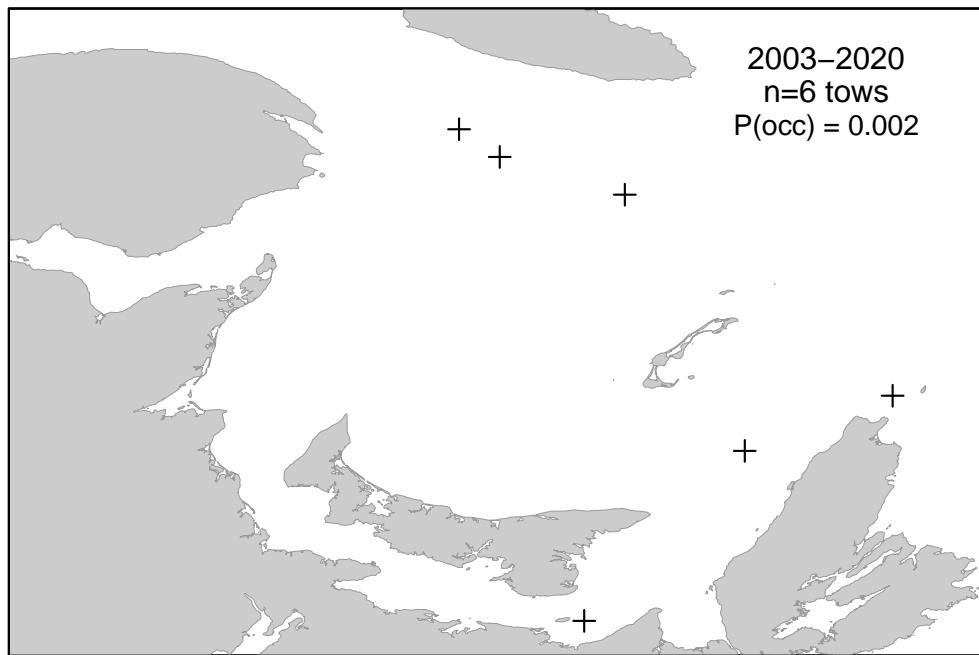


Figure 4.3A. Presence map for Similar shrimp.

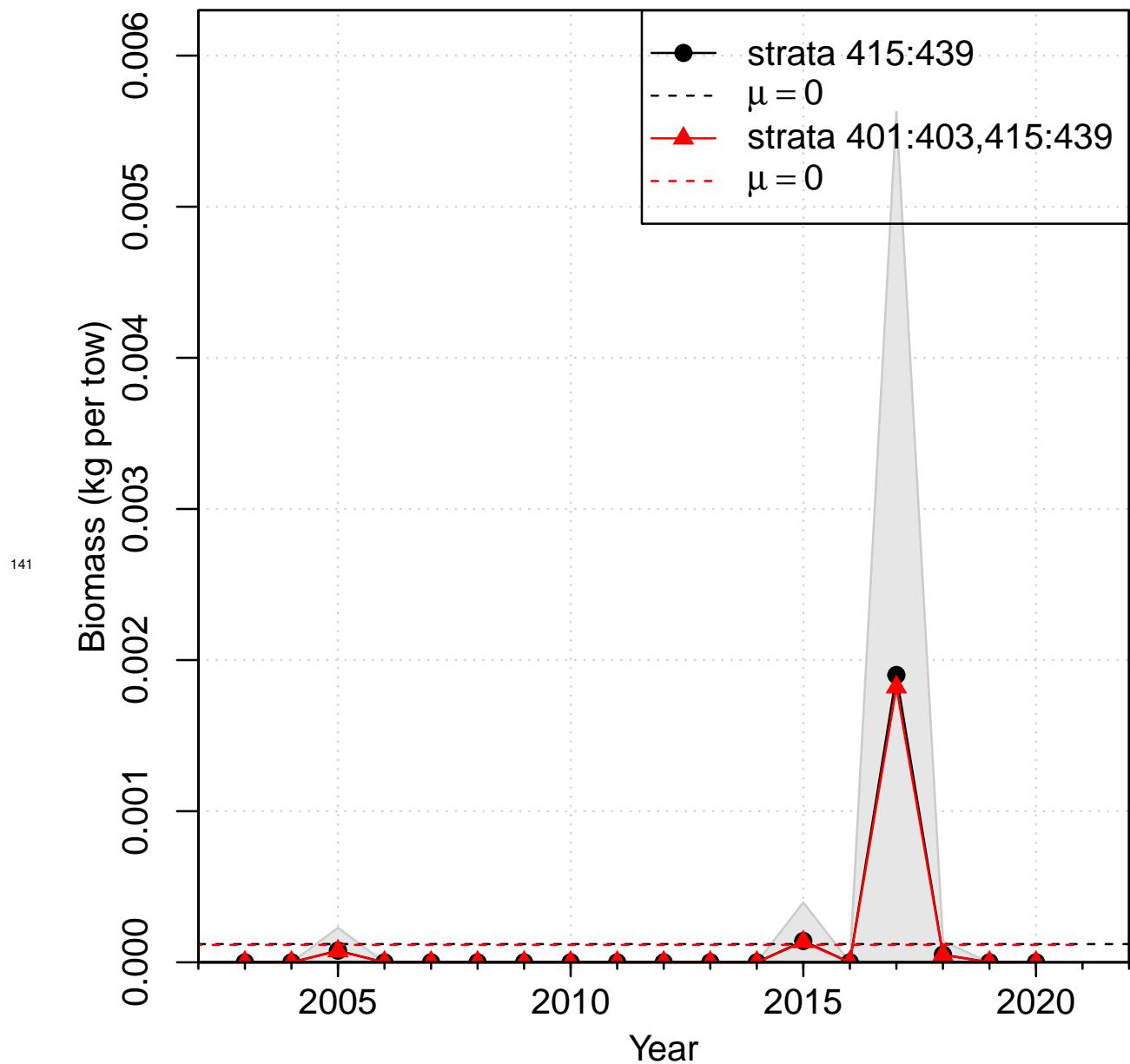


Figure 4.3B. RV index for Similar shrimp.

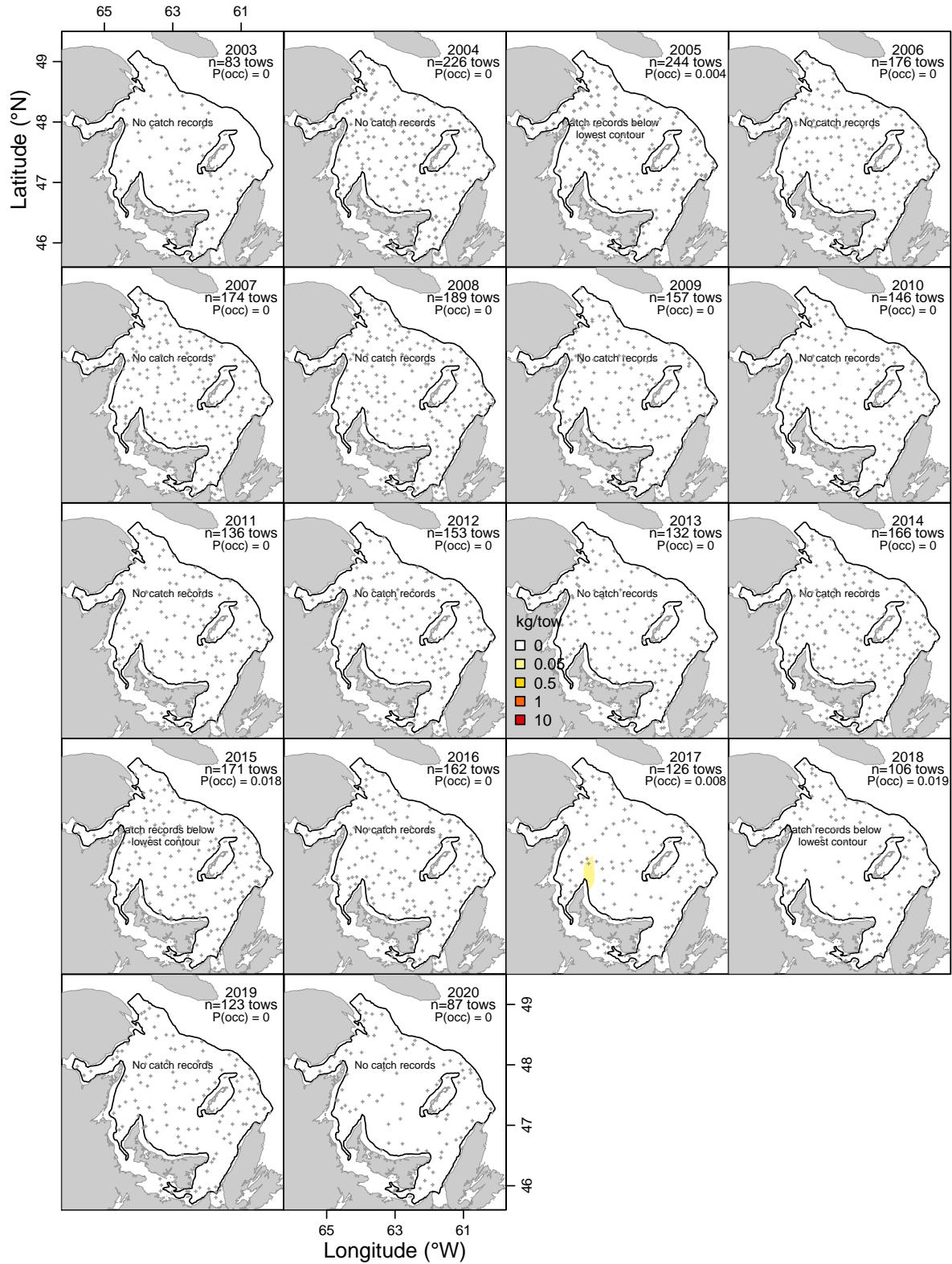


Figure 4.3C. IDW map for Similar shrimp.

<sup>143</sup> **4.4 Polar shrimp (Bouc) - species code 2312**

<sup>144</sup> Scientific name: [Lebbeus polaris](#)

<sup>145</sup>

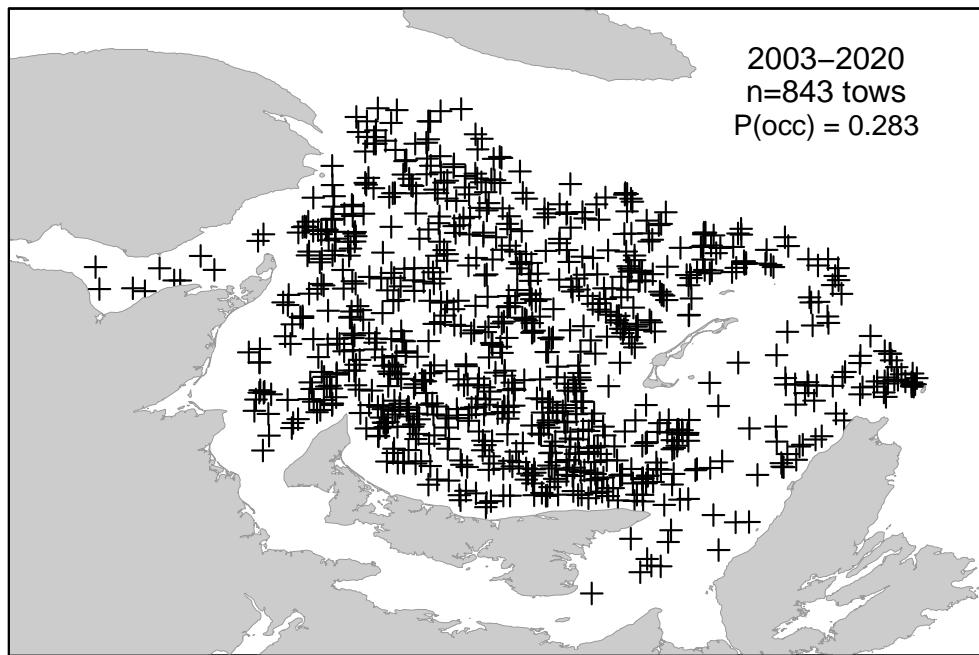


Figure 4.4A. Presence map for Polar shrimp.

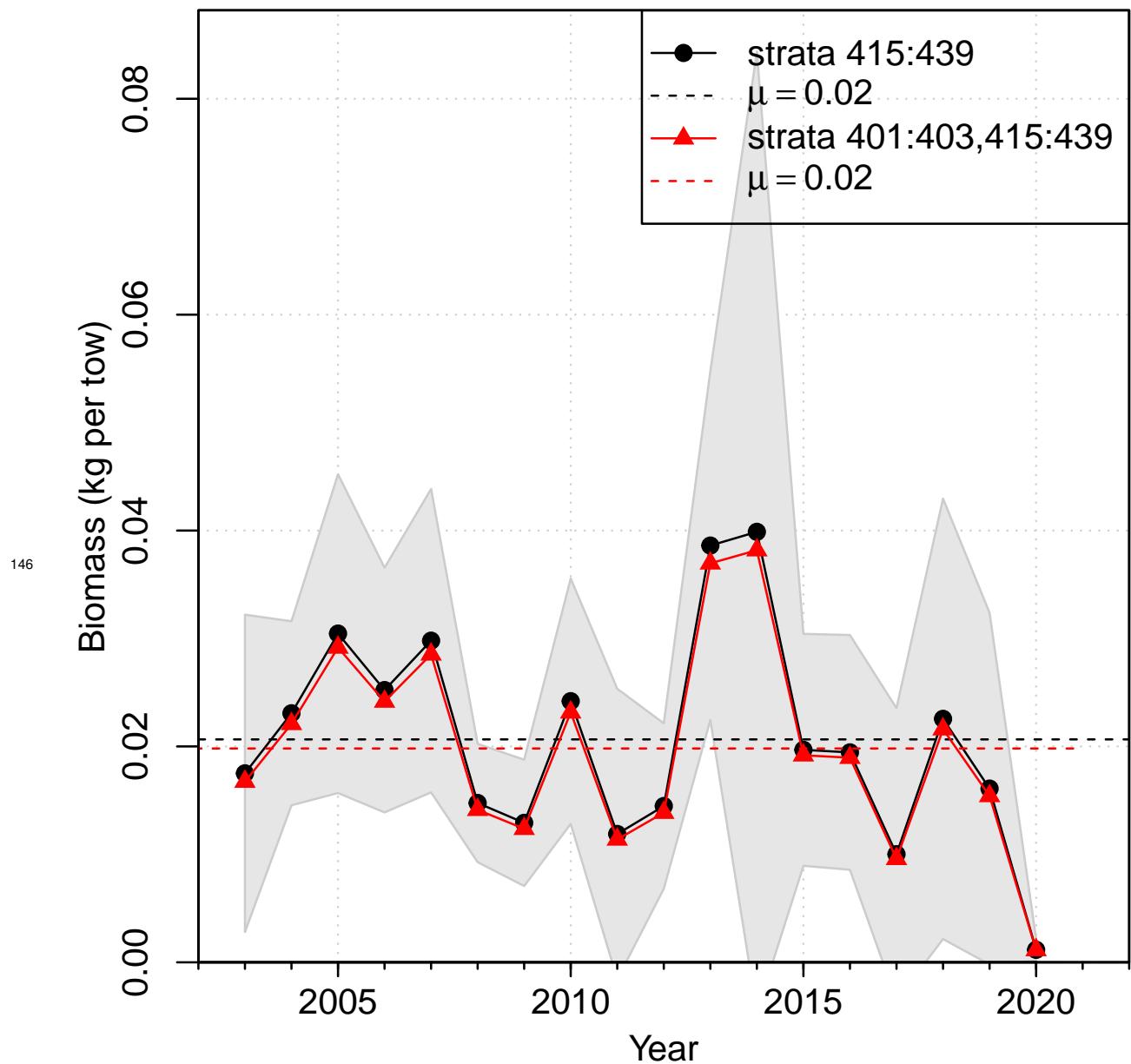


Figure 4.4B. RV index for Polar shrimp.

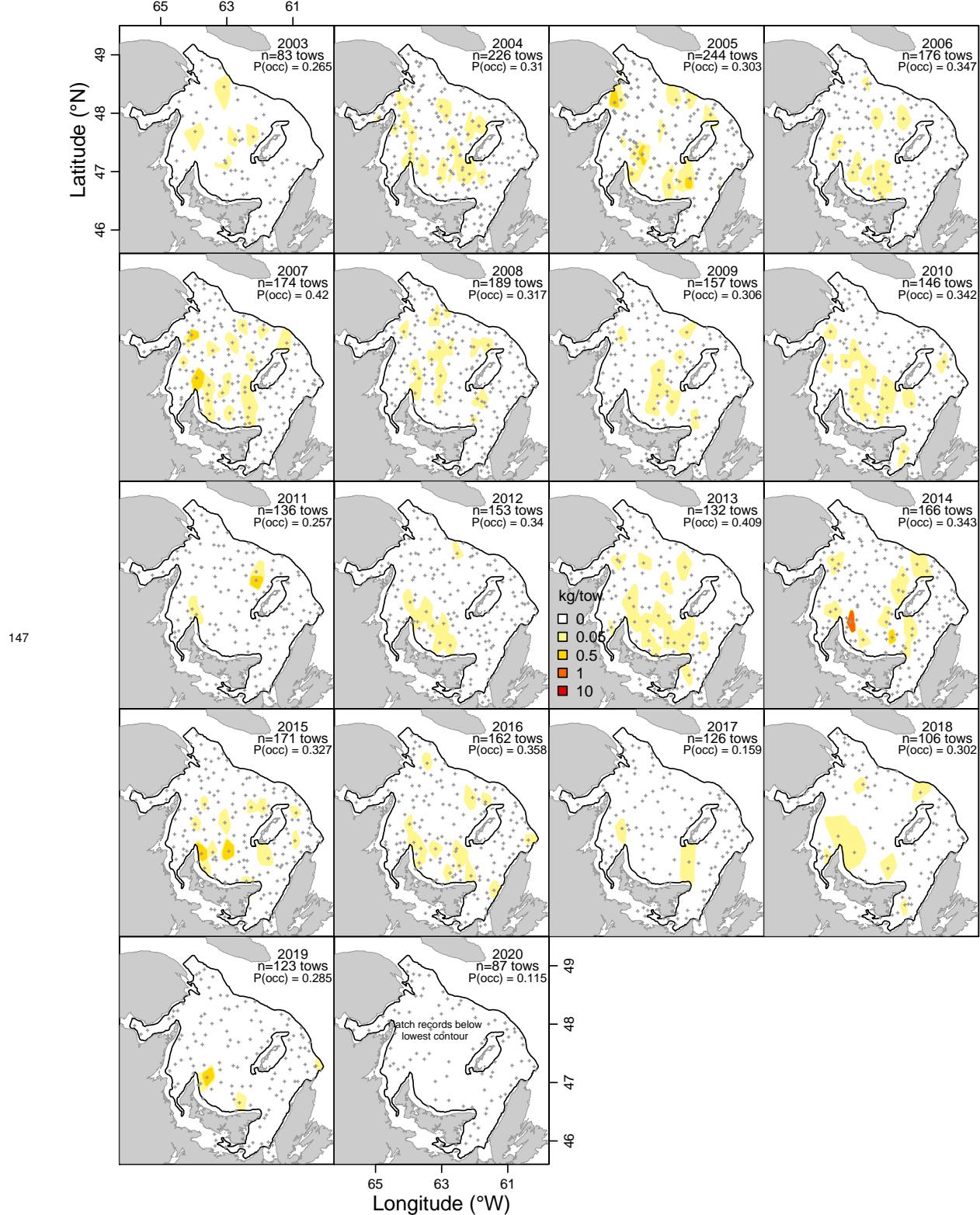


Figure 4.4C. IDW map for Polar shrimp.

148 **4.5 *Spirontocaris liljeborgii* (Bouc épineux) - species code 2313**

149 Scientific name: [Spirontocaris liljeborgii](#)

150

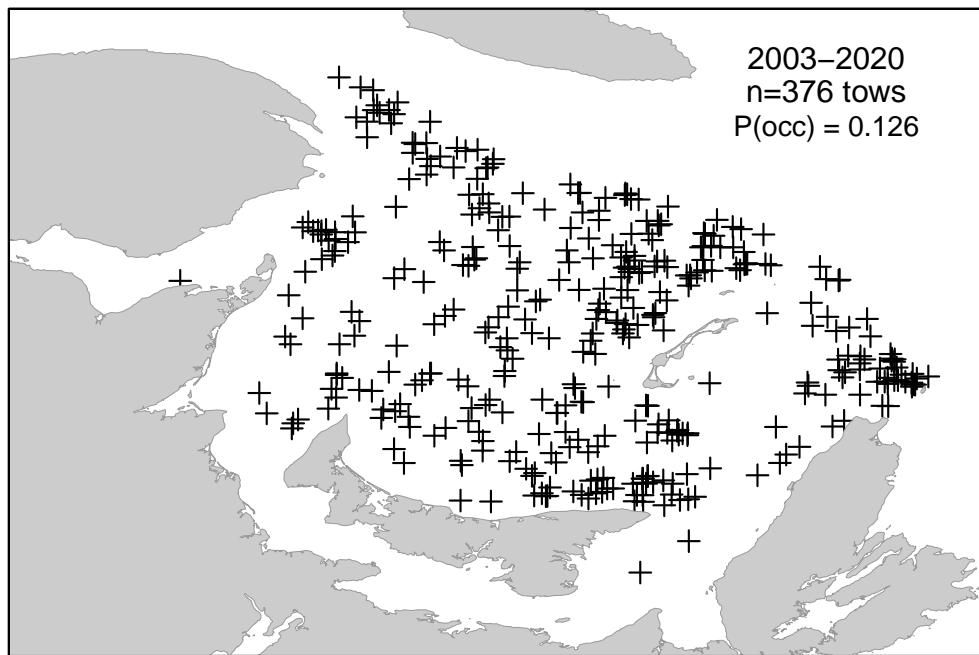


Figure 4.5A. Presence map for *Spirontocaris liljeborgii*.

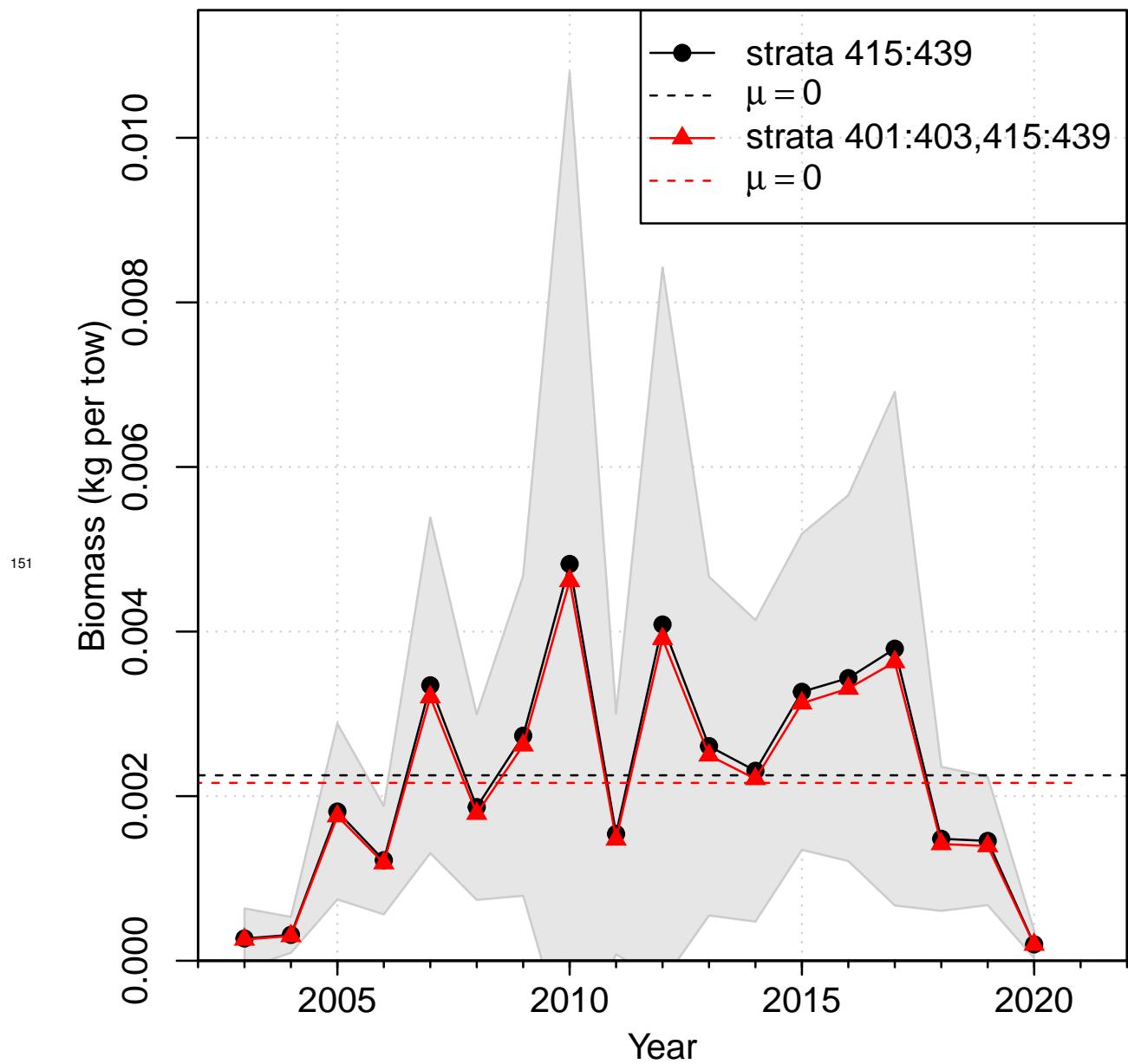


Figure 4.5B. RV index for *Spirontocaris liljeborgii*.

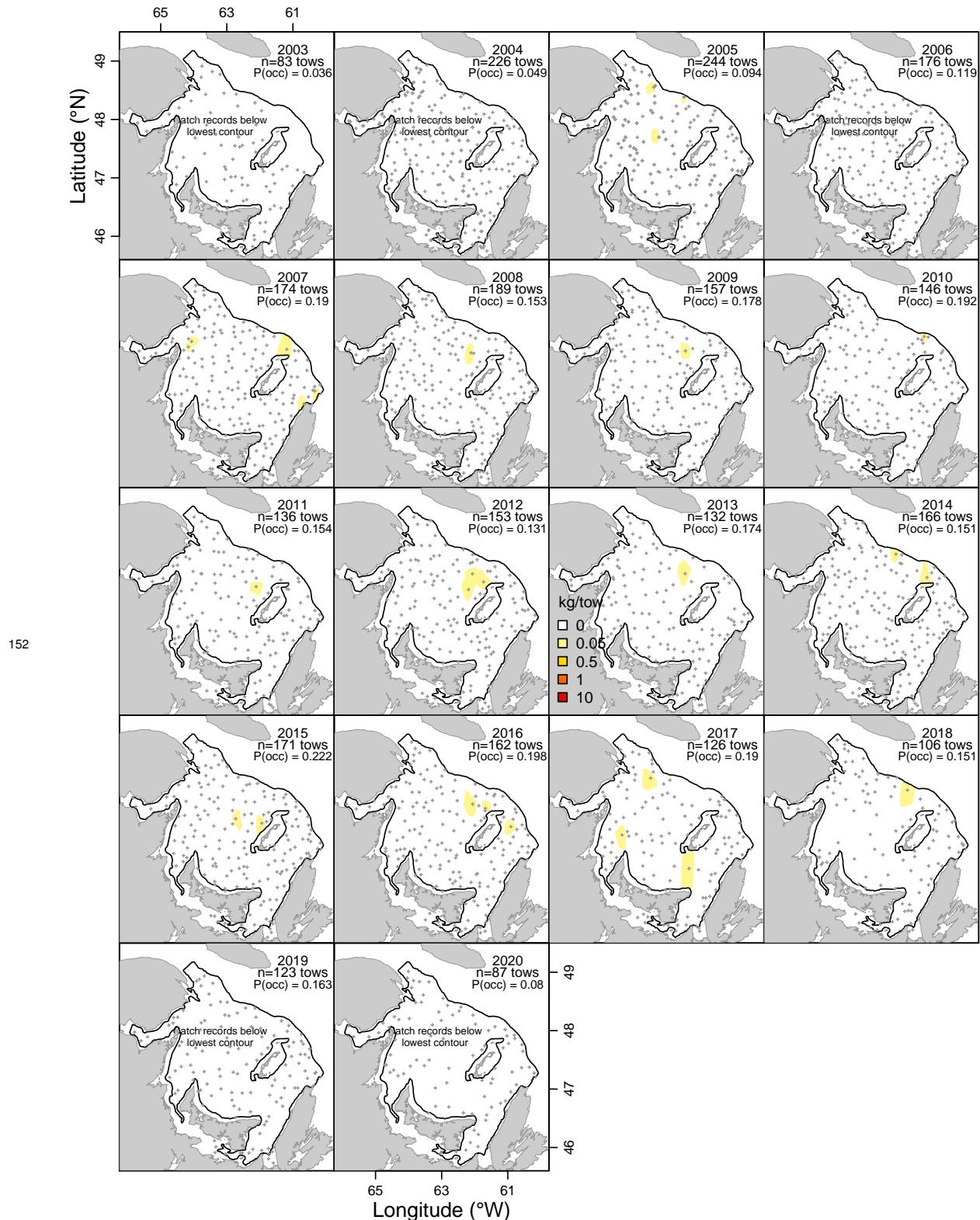


Figure 4.5C. IDW map for *Spirontocaris liljeborgii*.

153 4.6 Punctate bladed shrimp (Bouc) - species code 2315

154 Scientific name: [Spirontocaris phippsii](#)

155

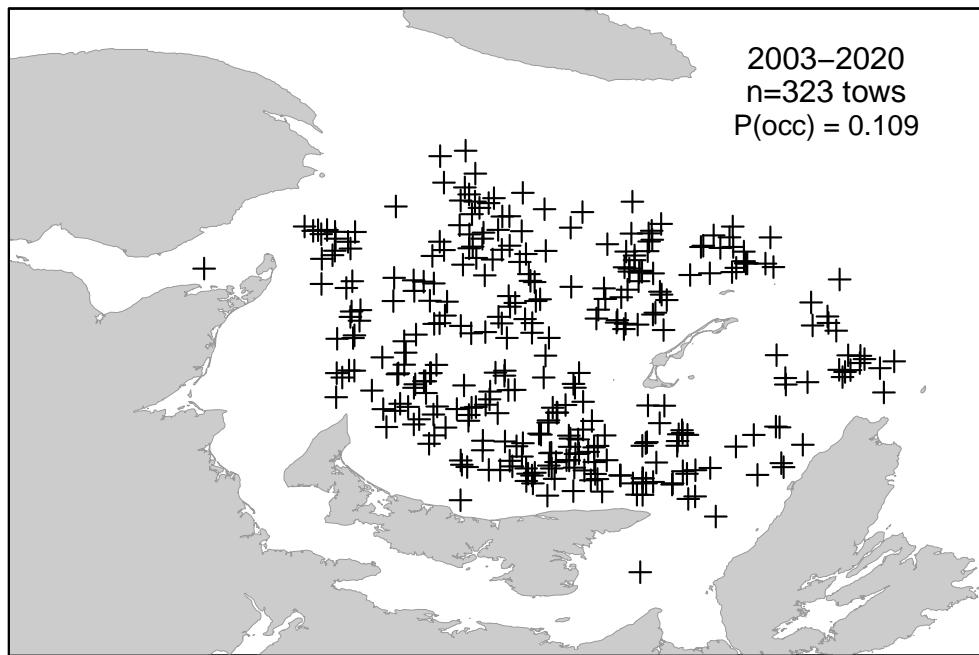


Figure 4.6A. Presence map for Punctate bladed shrimp.

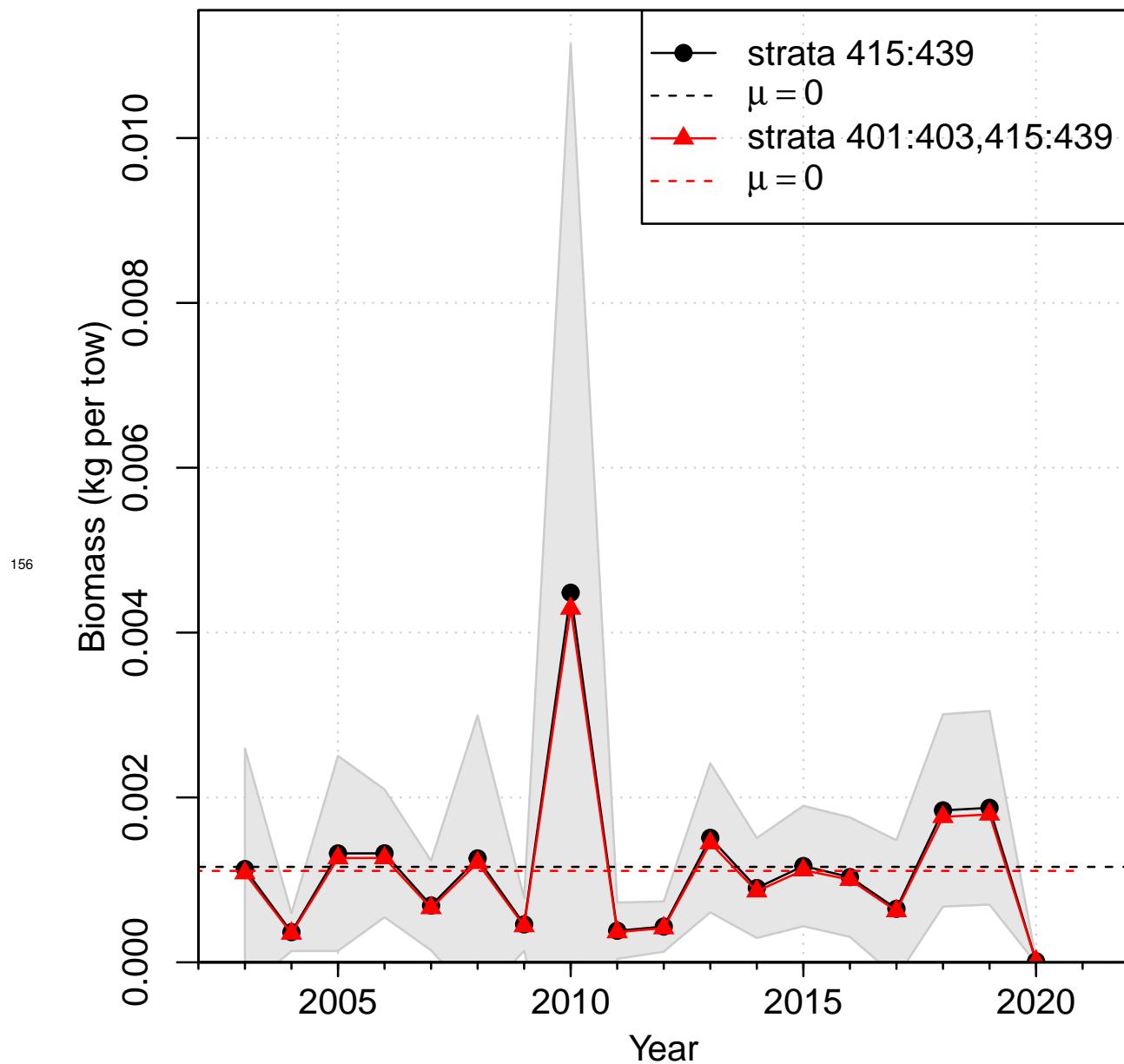


Figure 4.6B. RV index for Punctate bladed shrimp.

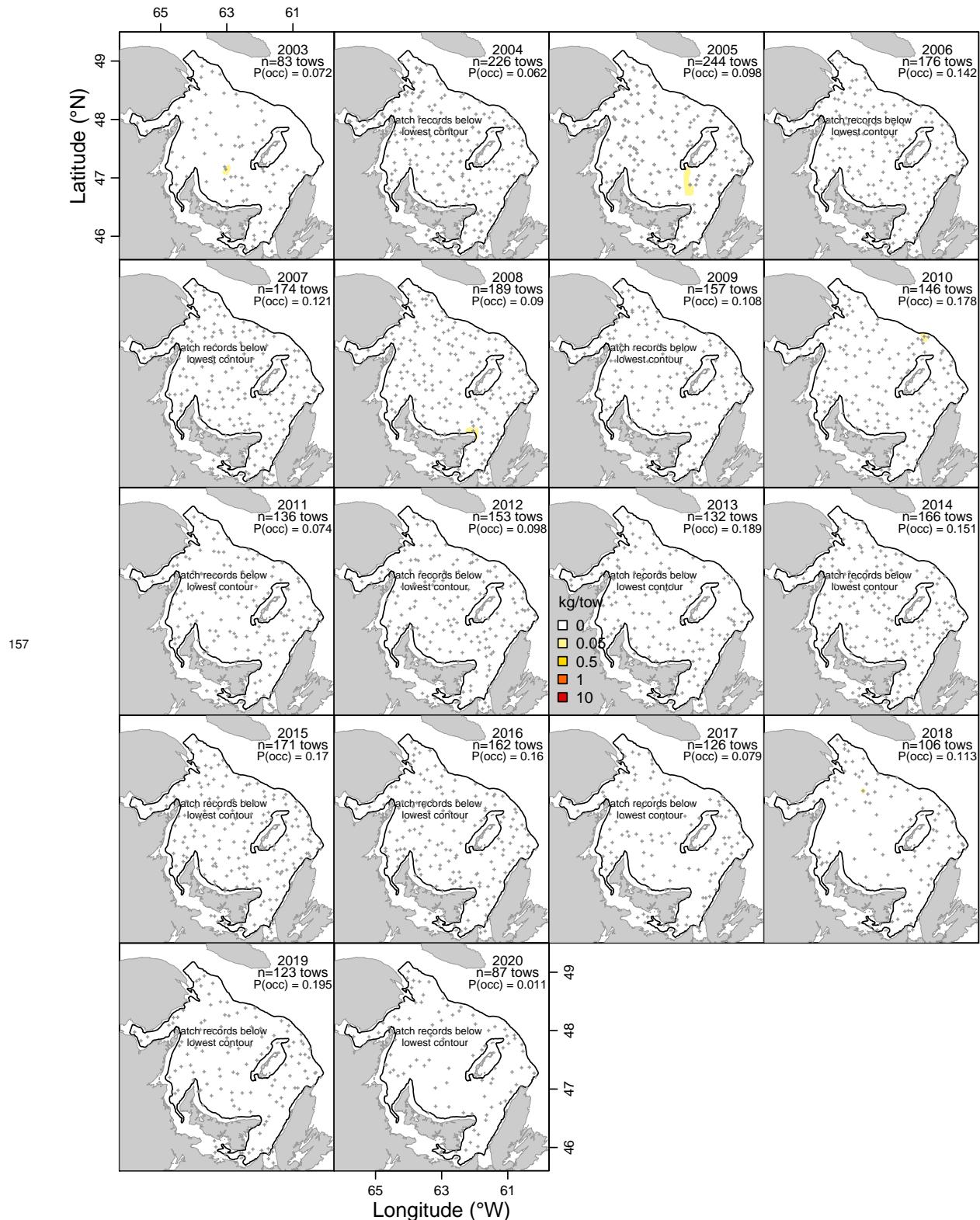


Figure 4.6C. IDW map for Punctate bladed shrimp.

158 **4.7 Parrot bladed shrimp (Bouc perroquet) - species code 2316**

159 Scientific name: [Spirontocaris spinus](#)

160

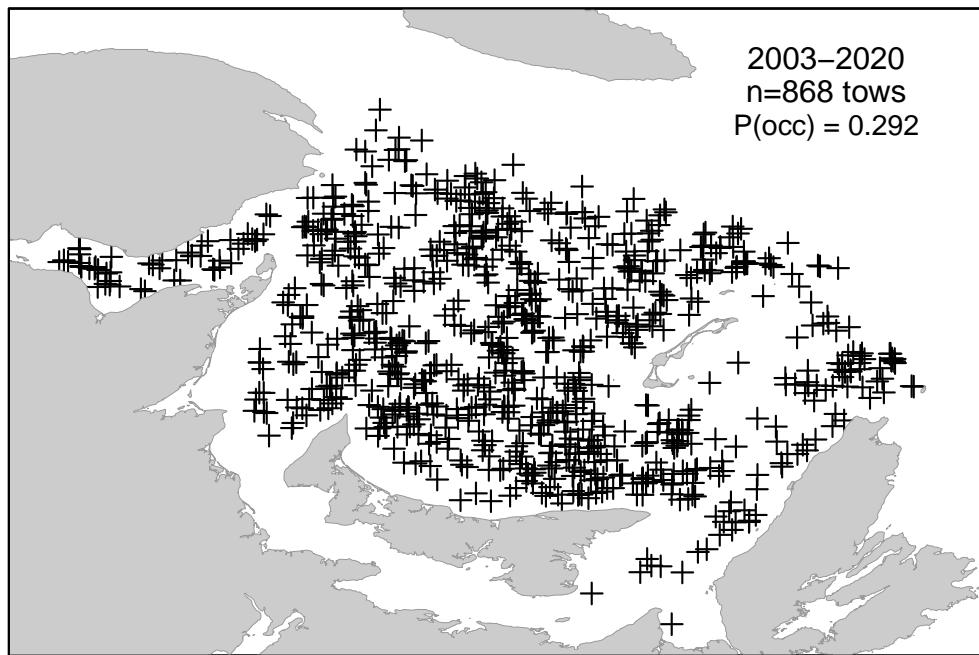


Figure 4.7A. Presence map for Parrot bladed shrimp.

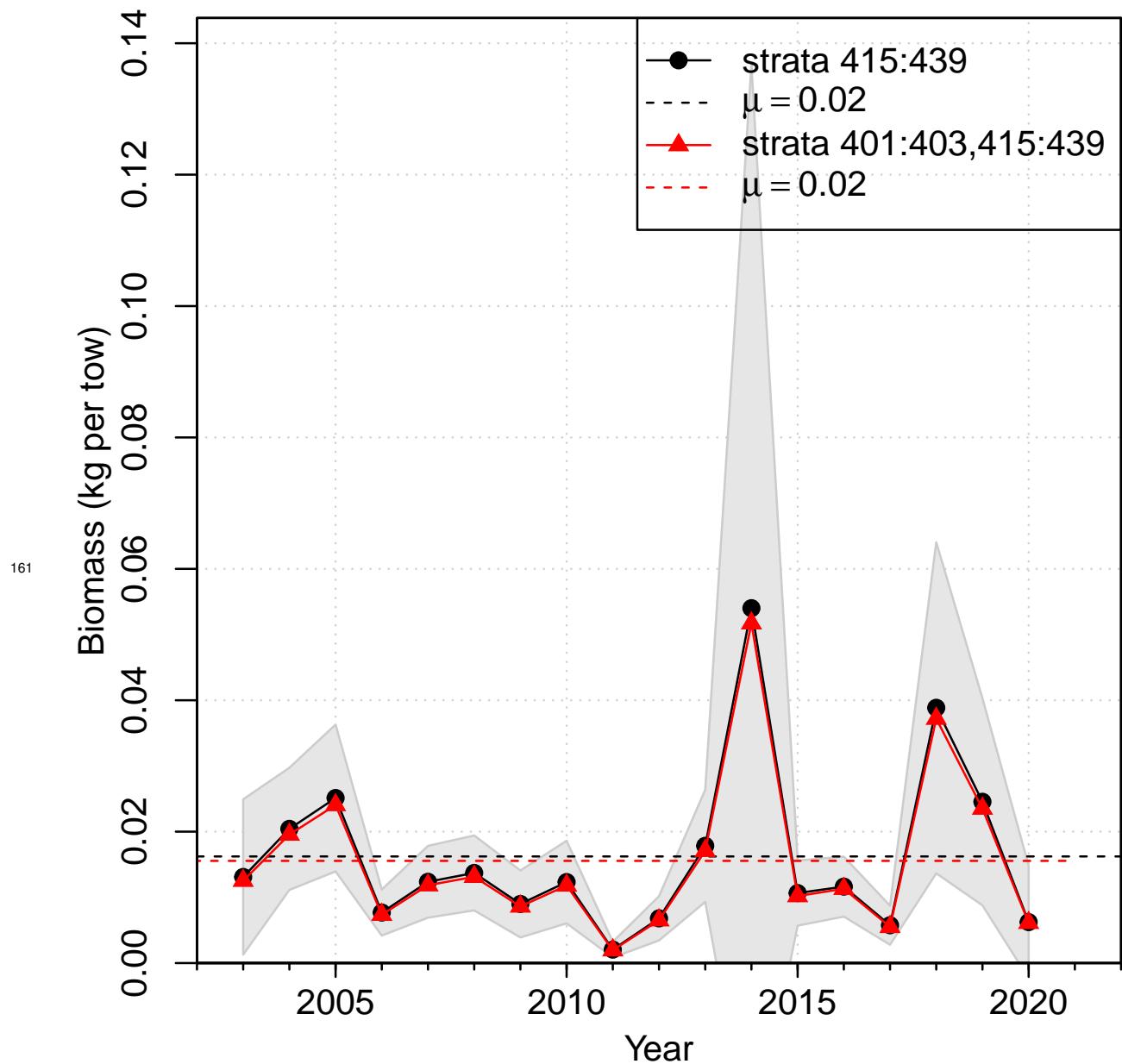


Figure 4.7B. RV index for Parrot bladed shrimp.

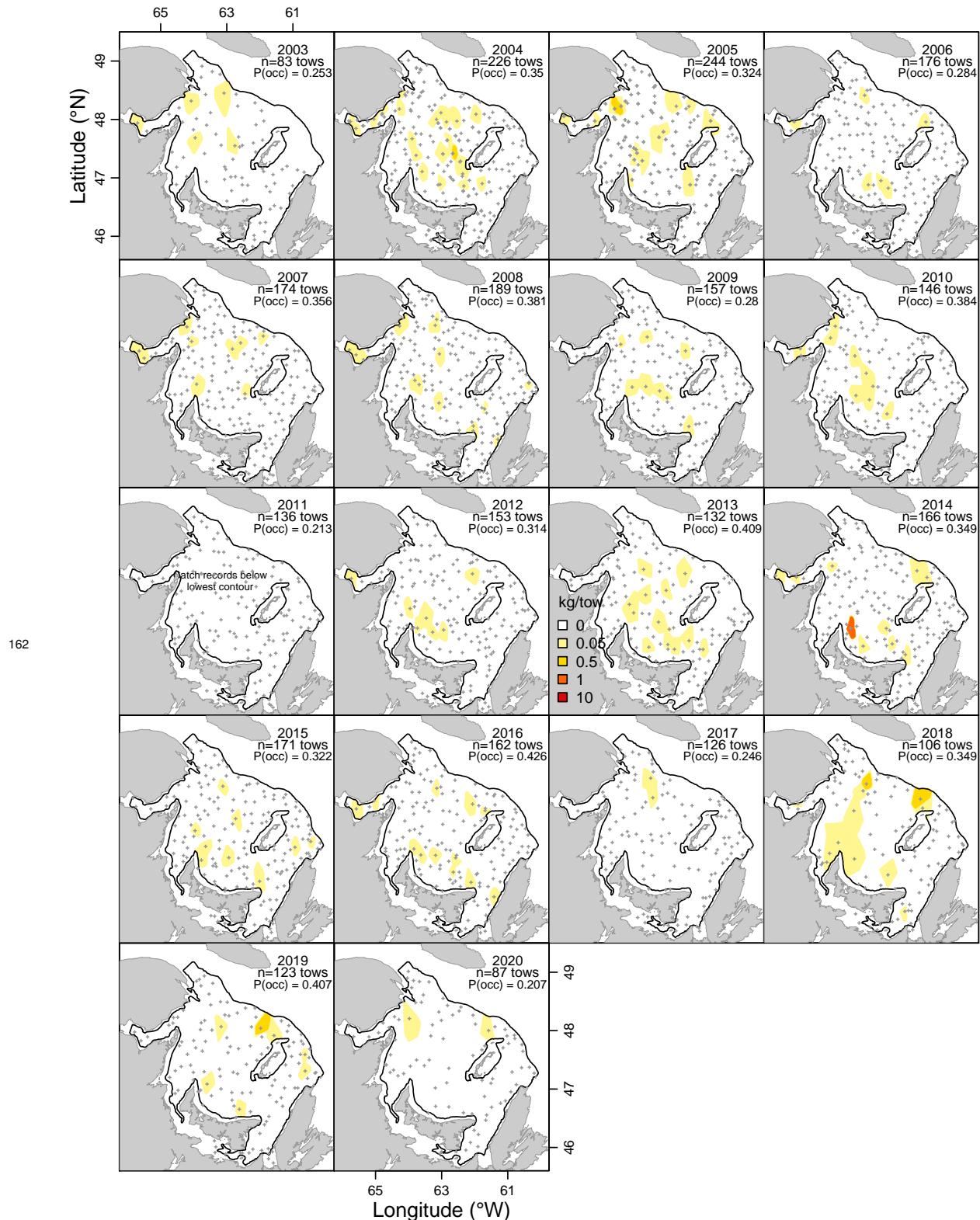


Figure 4.7C. IDW map for Parrot bladed shrimp.

<sup>163</sup> 4.8 Spiny lebbeid (Bouc) - species code 2319

<sup>164</sup> Scientific name: [Lebbeus groenlandicus](#)

<sup>165</sup>

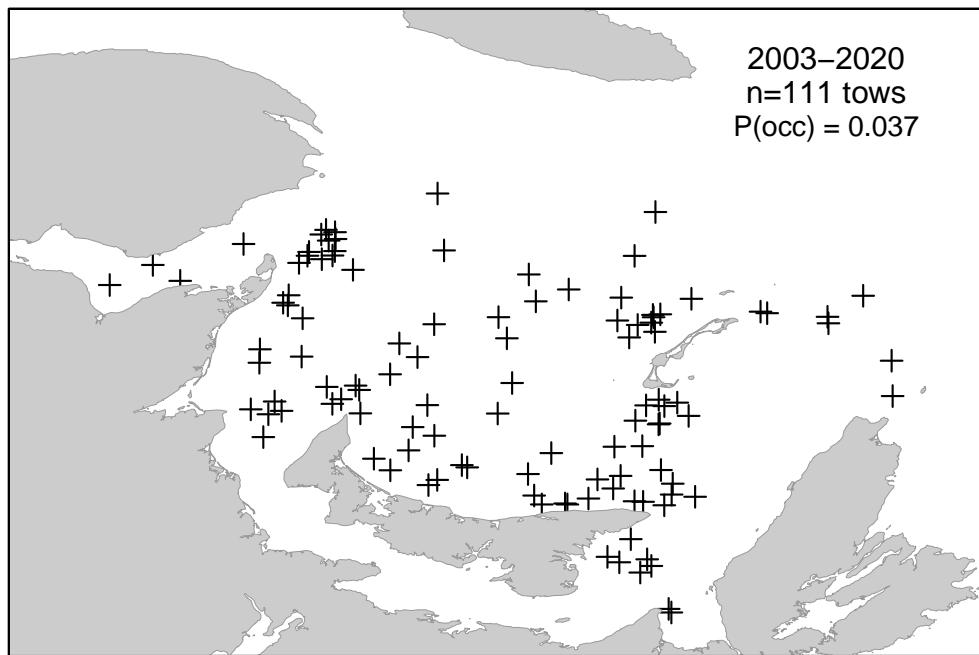


Figure 4.8A. Presence map for Spiny lebbeid.

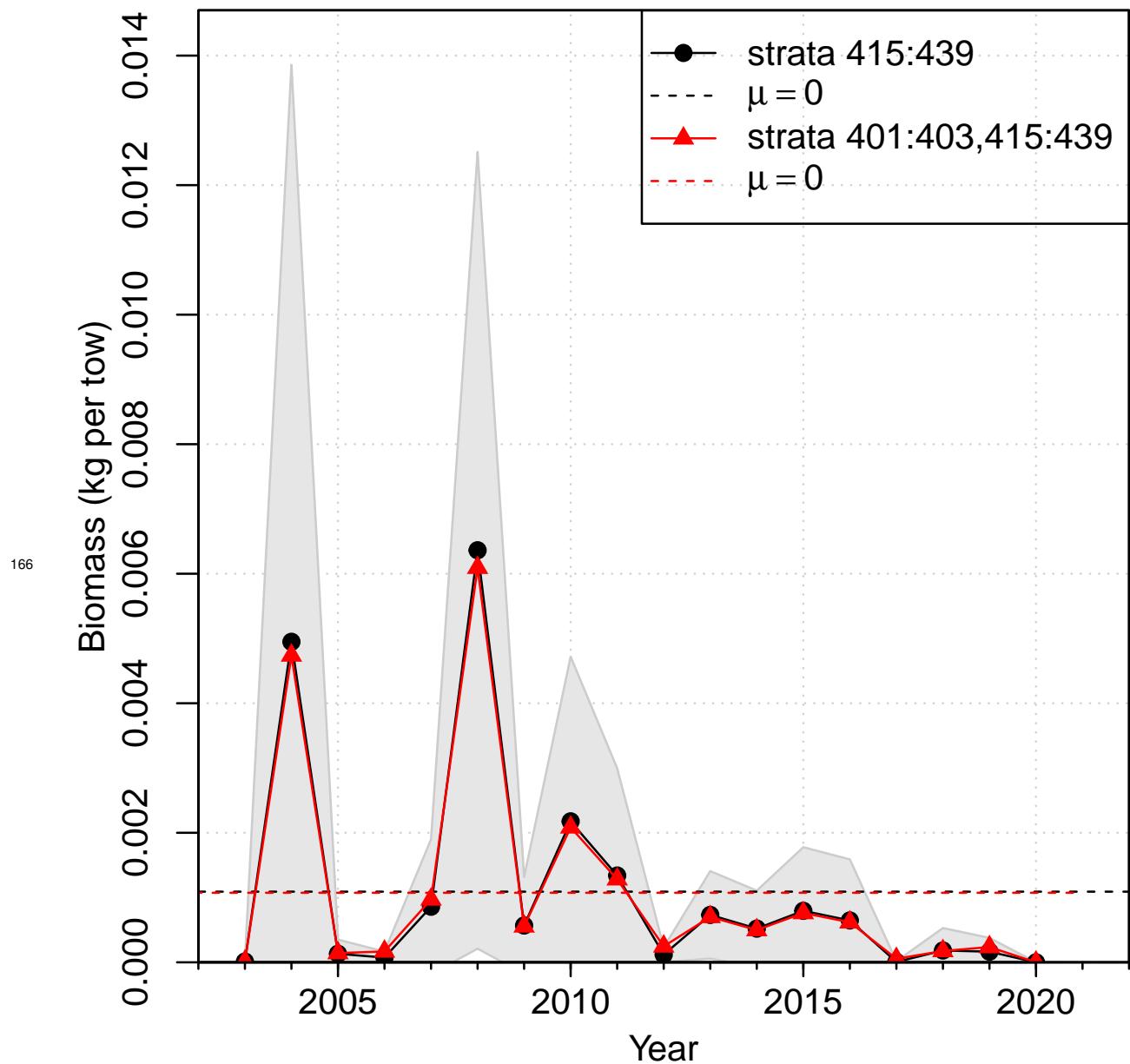


Figure 4.8B. RV index for Spiny lebbeid.

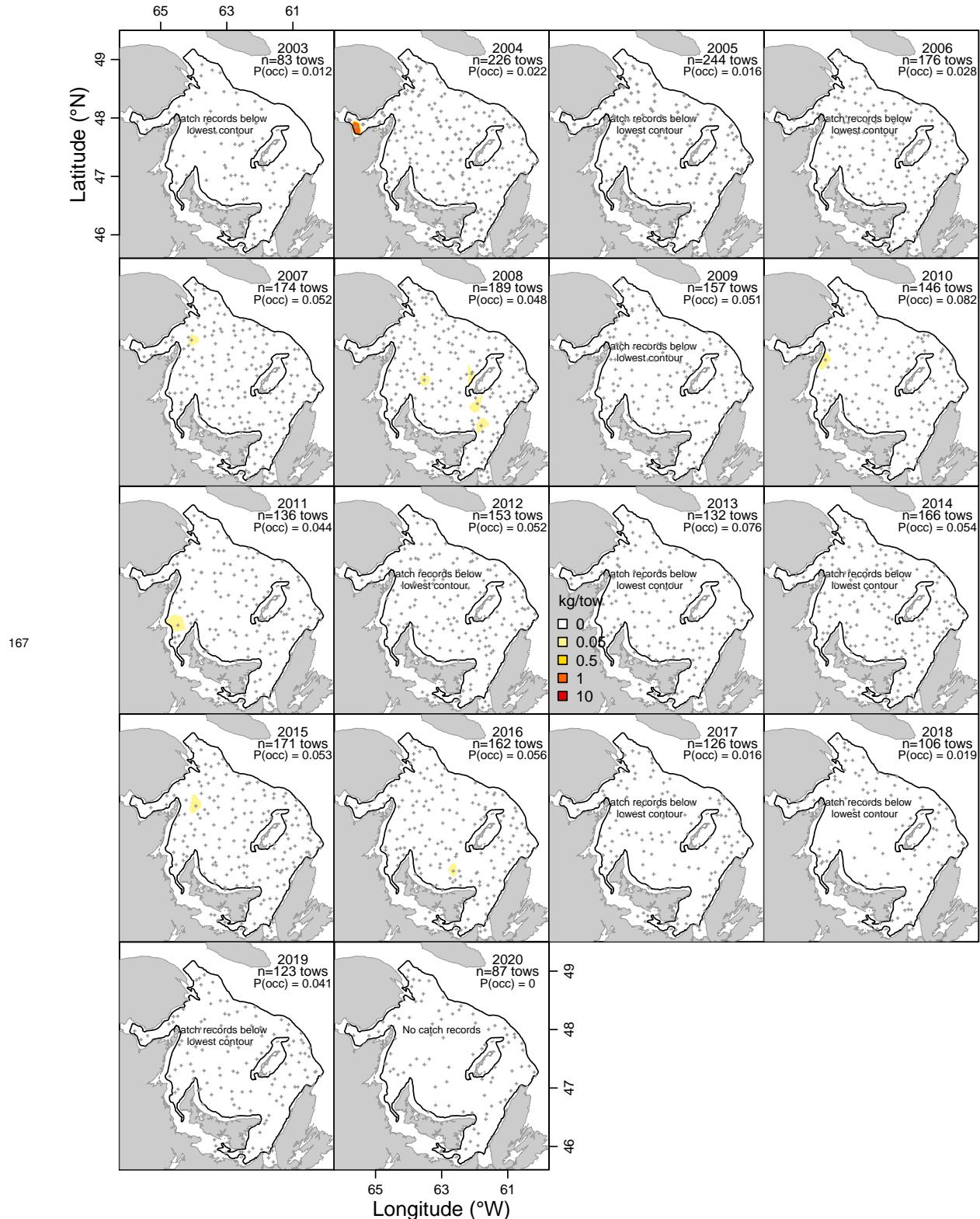


Figure 4.8C. IDW map for Spiny lebtheid.

168 **4.9 Eualus unidentified (Eualus non-spécifié) - species code 2330**

169 Scientific name: [Eualus](#)

170

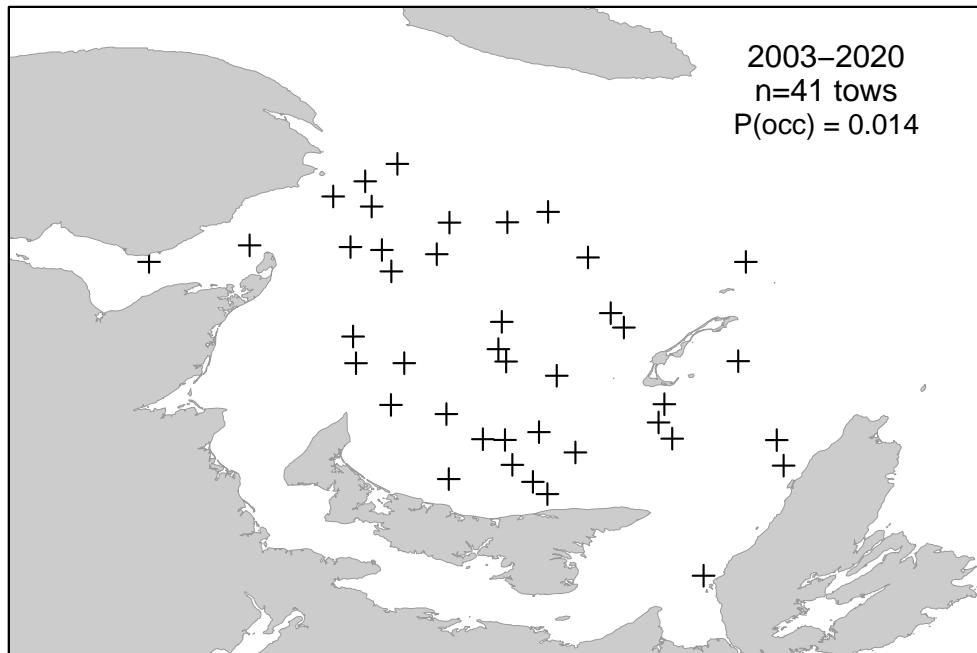


Figure 4.9A. Presence map for Eualus unidentified.

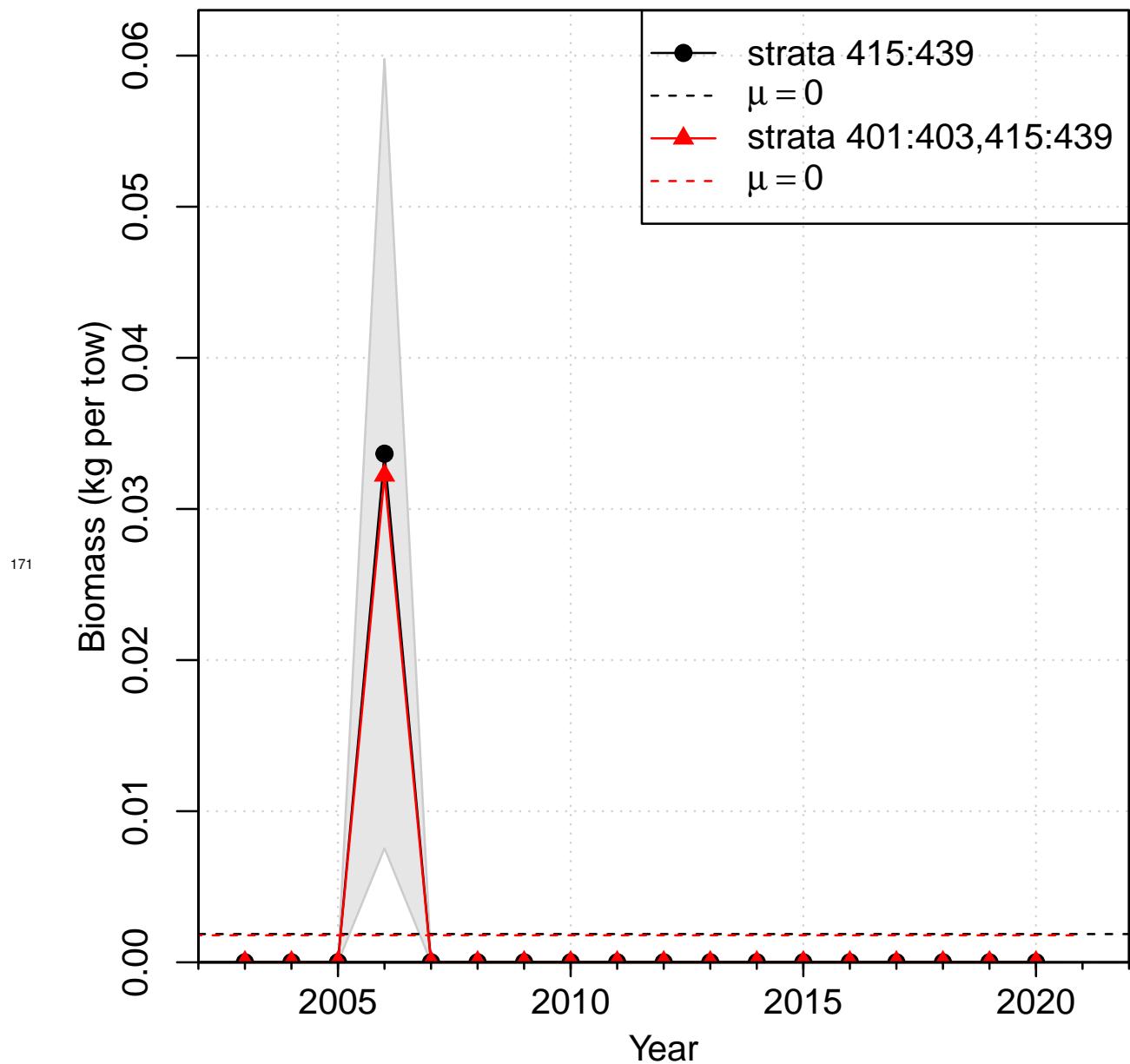
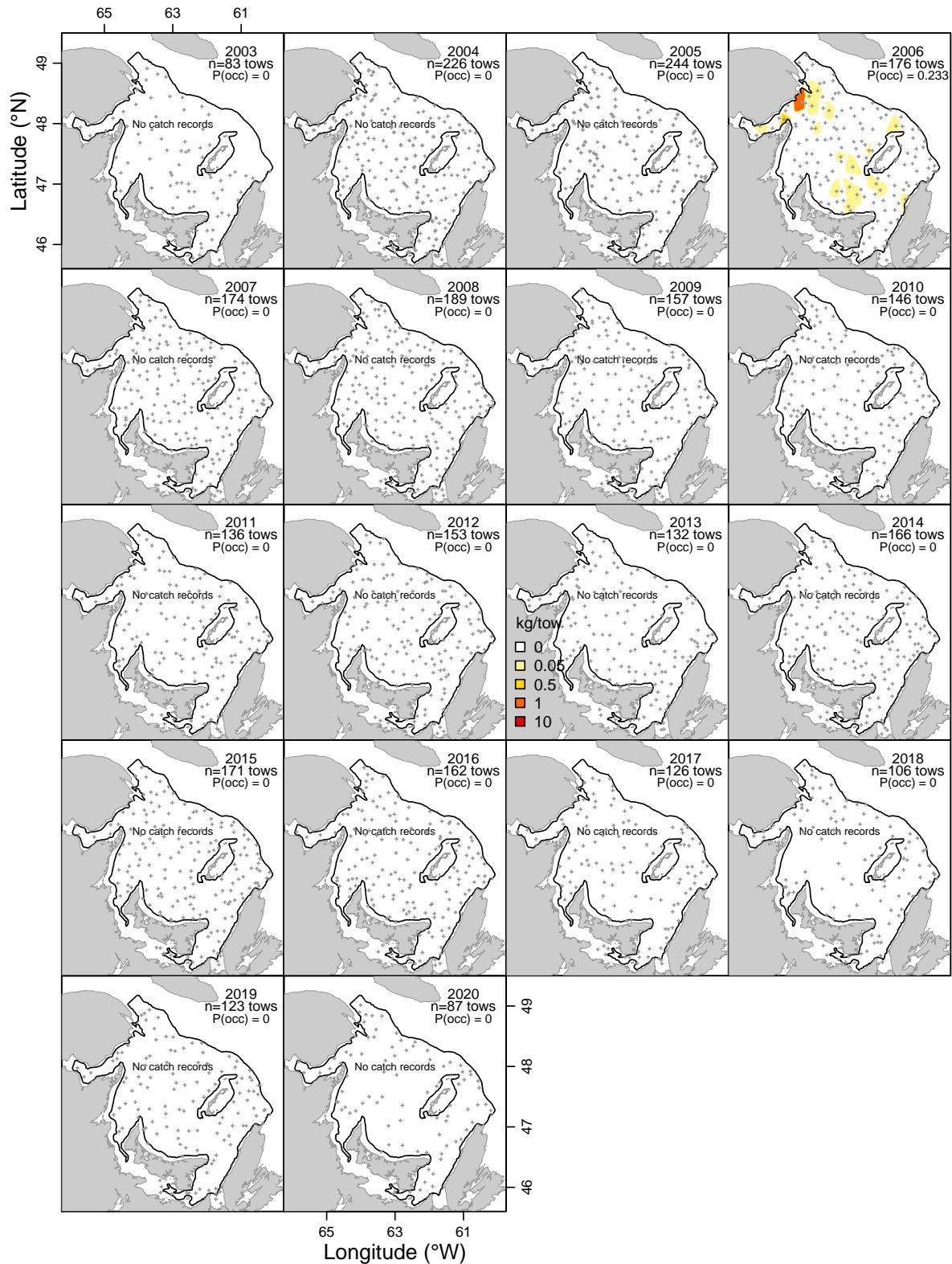


Figure 4.9B. RV index for *Eualus* unidentified.

172

Figure 4.9C. IDW map for *Eualus* unidentified.

<sup>173</sup> **4.10 Greenland shrimp (Bouc du Groenland) - species code 2331**

<sup>174</sup> Scientific name: [Eualus macilentus](#)

<sup>175</sup>

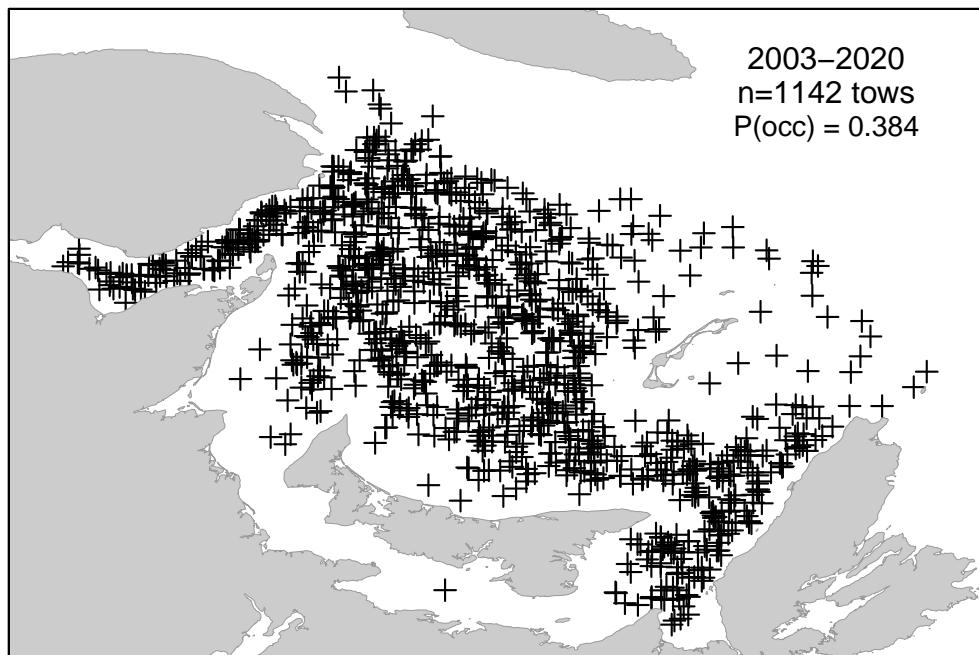


Figure 4.10A. Presence map for Greenland shrimp.

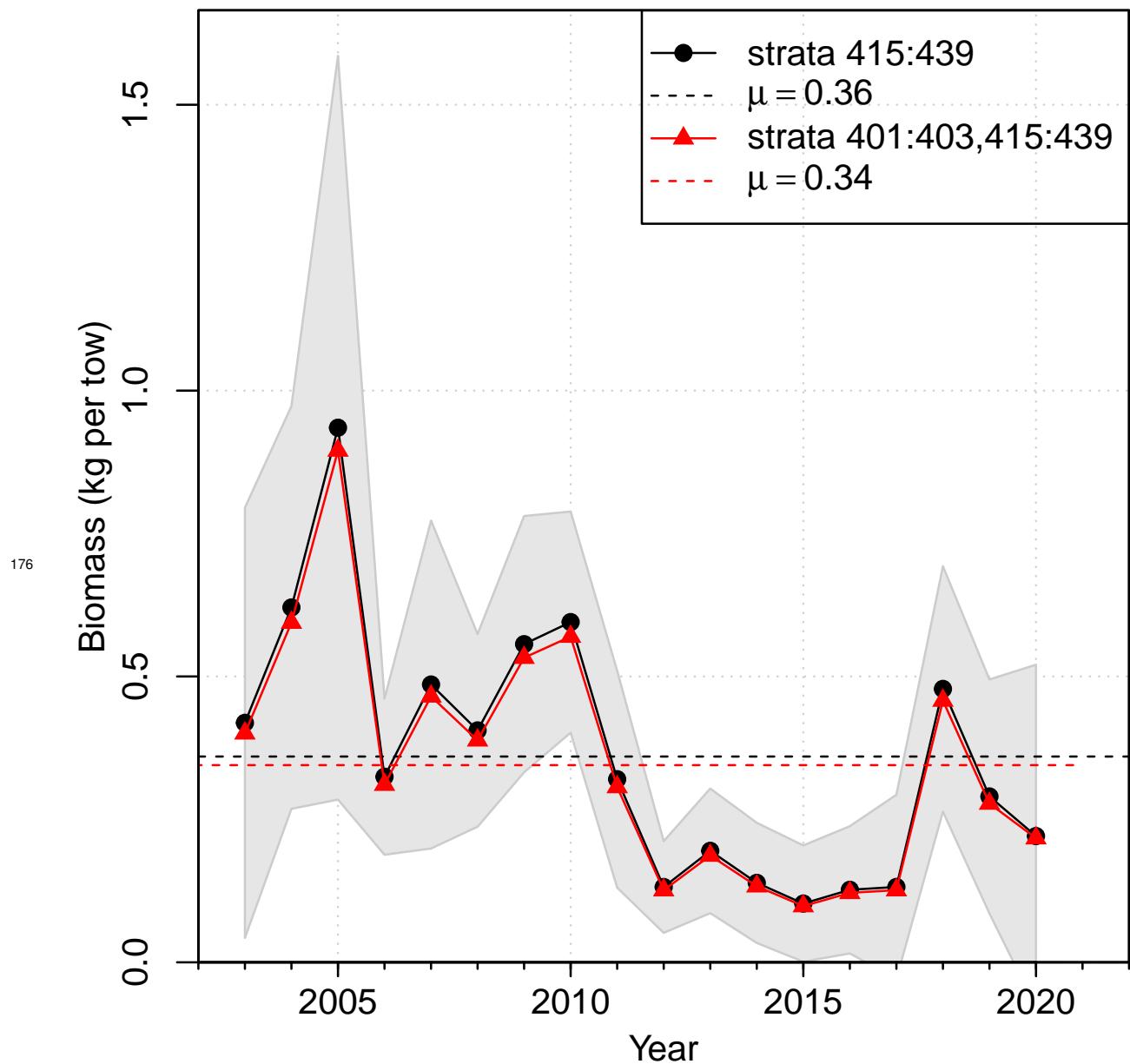


Figure 4.10B. RV index for Greenland shrimp.

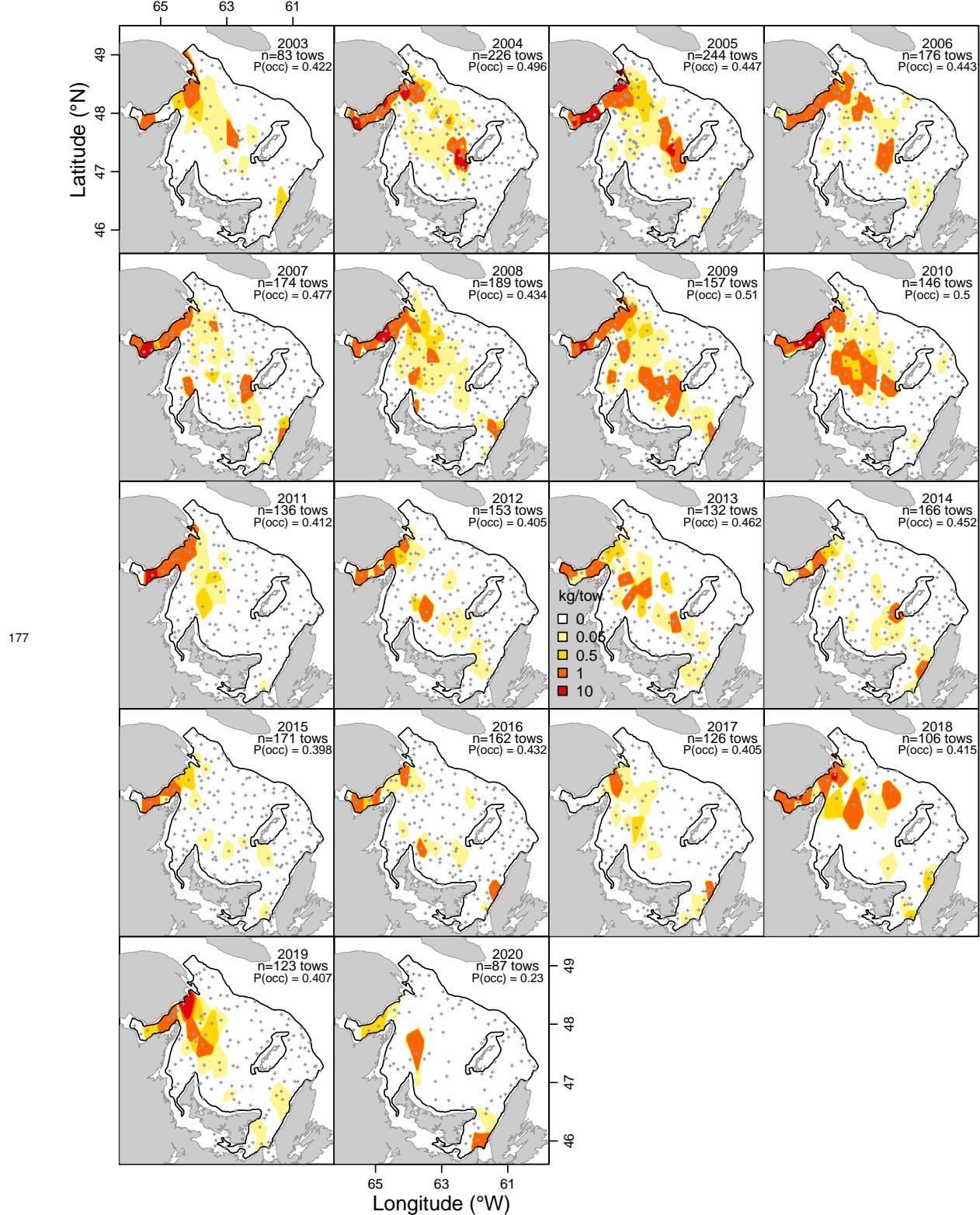


Figure 4.10C. IDW map for Greenland shrimp.

<sup>178</sup> **4.11 Arctic eualid (Bouc Arctique) - species code 2332**

<sup>179</sup> Scientific name: [Eualus fabricii](#)

<sup>180</sup>

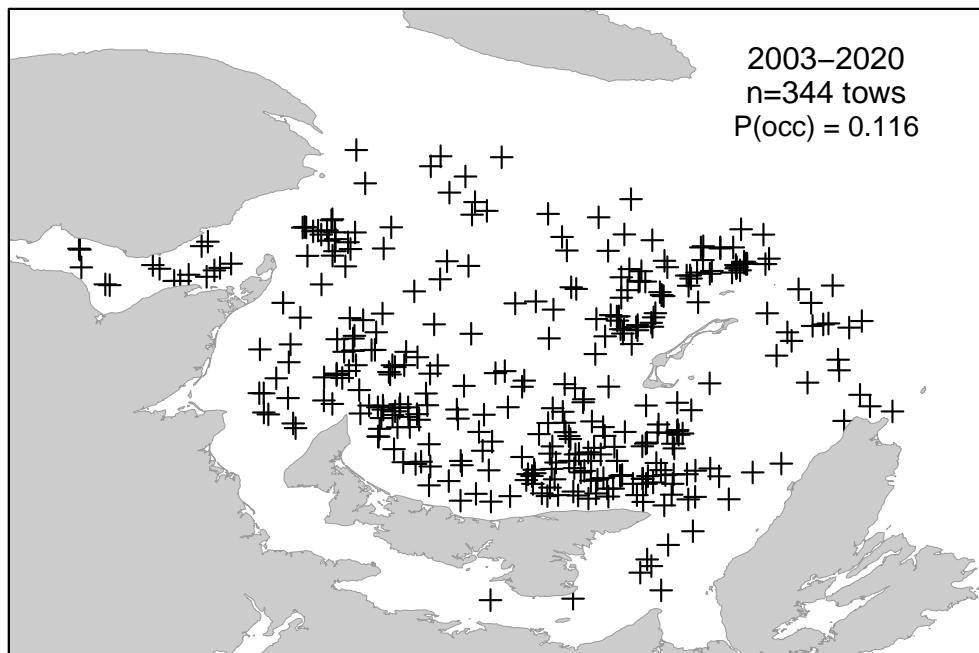


Figure 4.11A. Presence map for Arctic eualid.

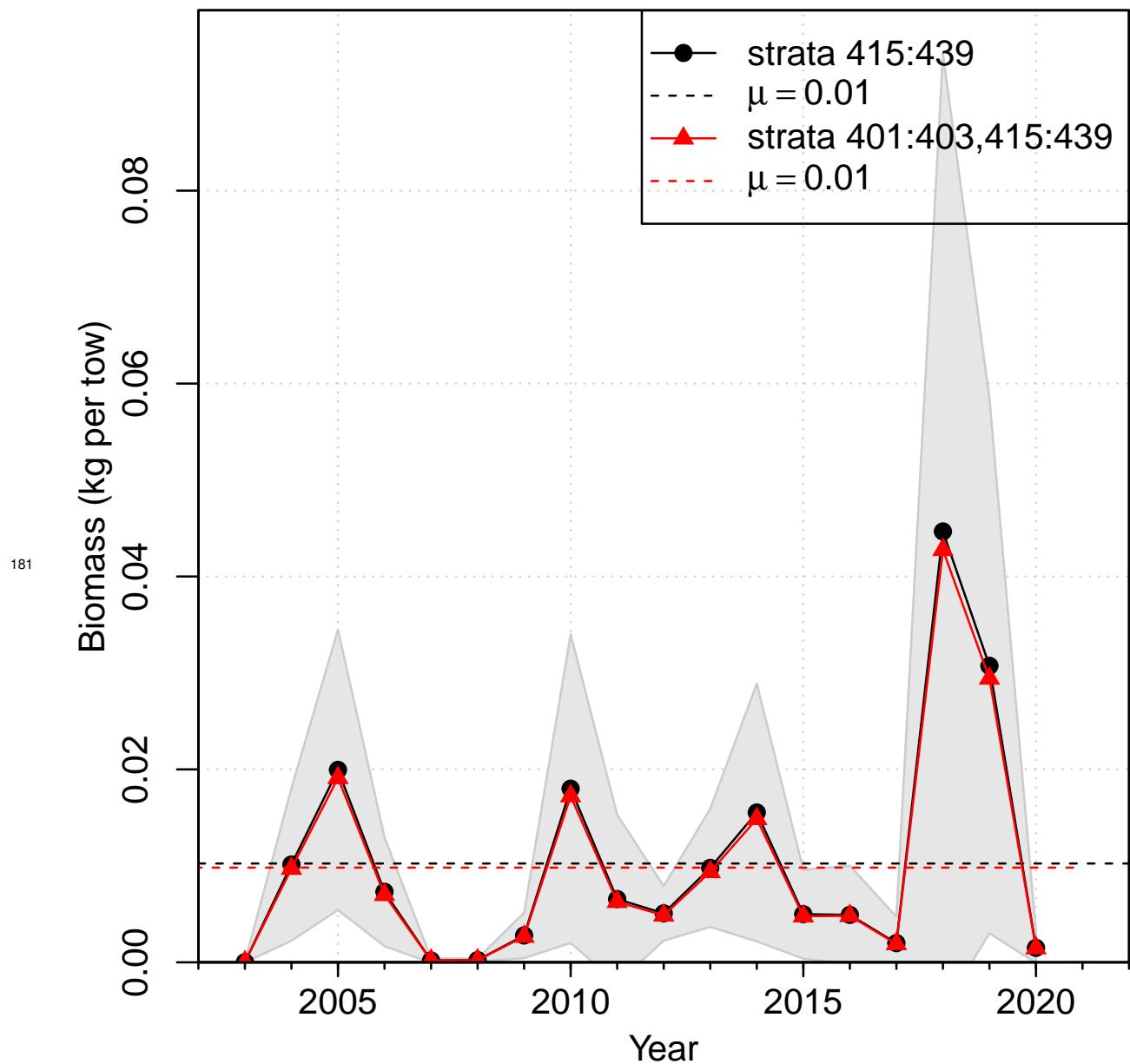


Figure 4.11B. RV index for Arctic eulaid.

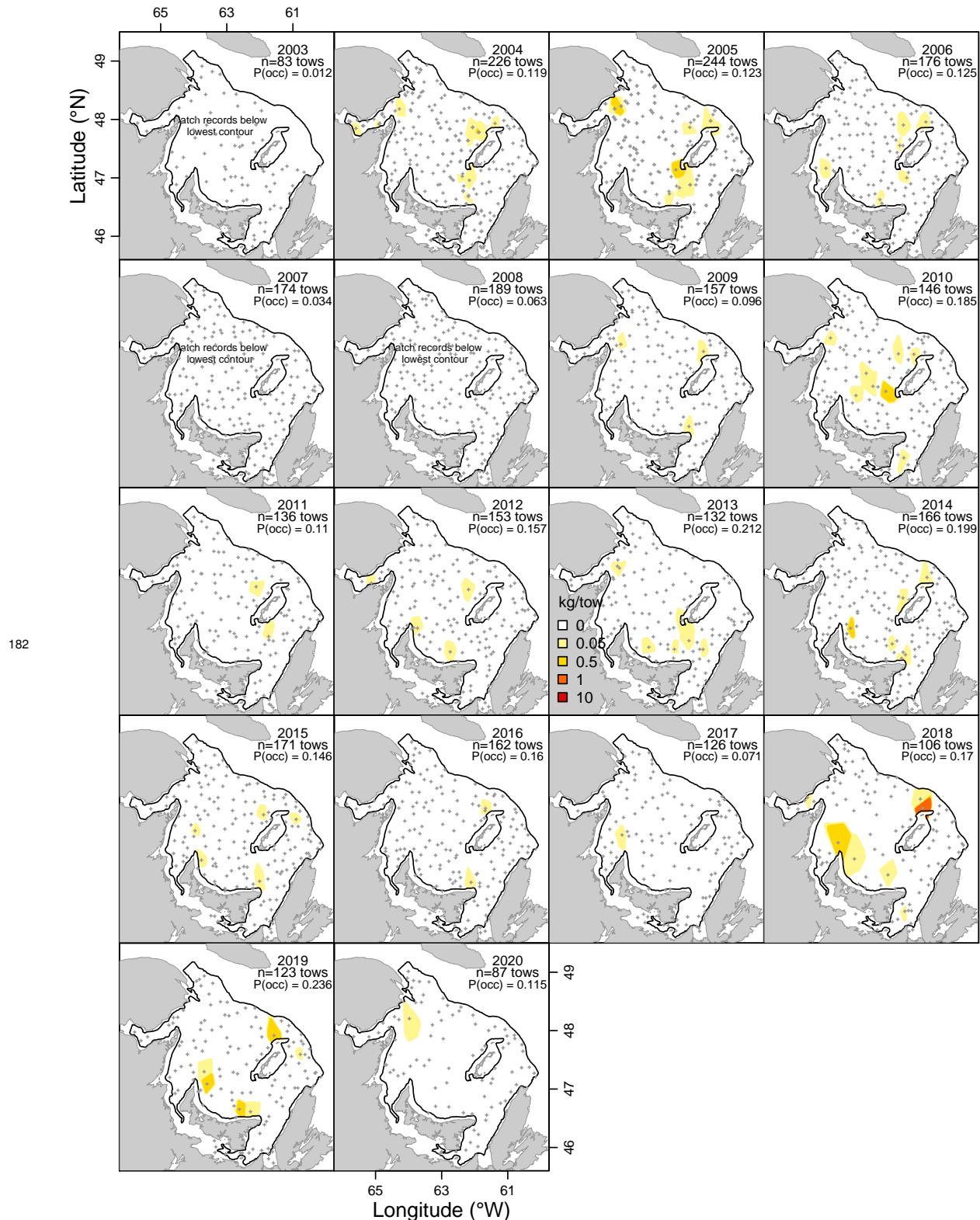


Figure 4.11C. IDW map for Arctic eulaid.

183 4.12 Circumpolar shrimp (Bouc) - species code 2333

184 Scientific name: [Eualus gaimardii](#)

185

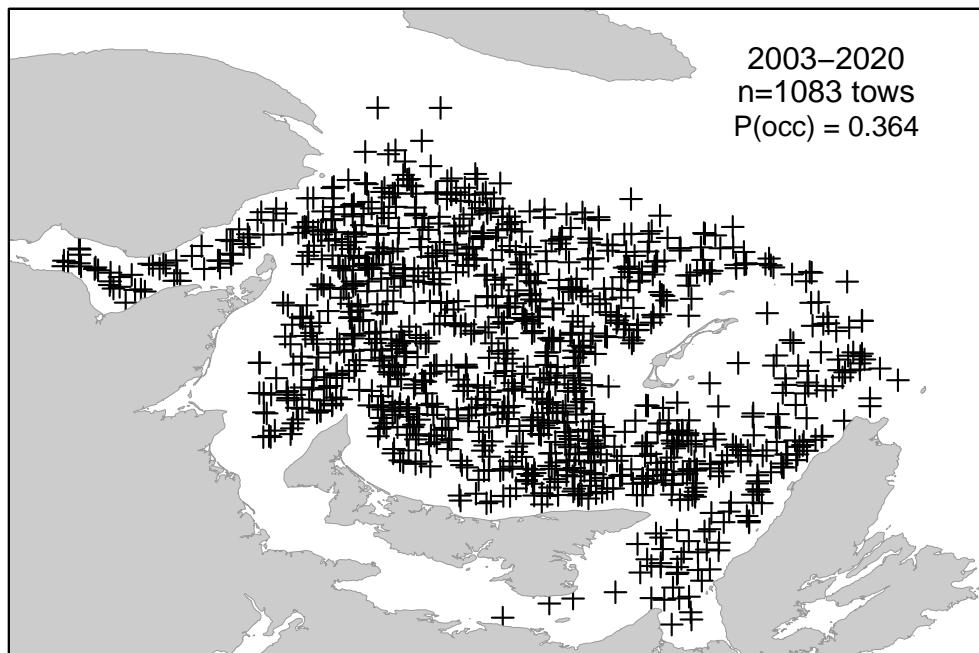


Figure 4.12A. Presence map for Circumpolar shrimp.

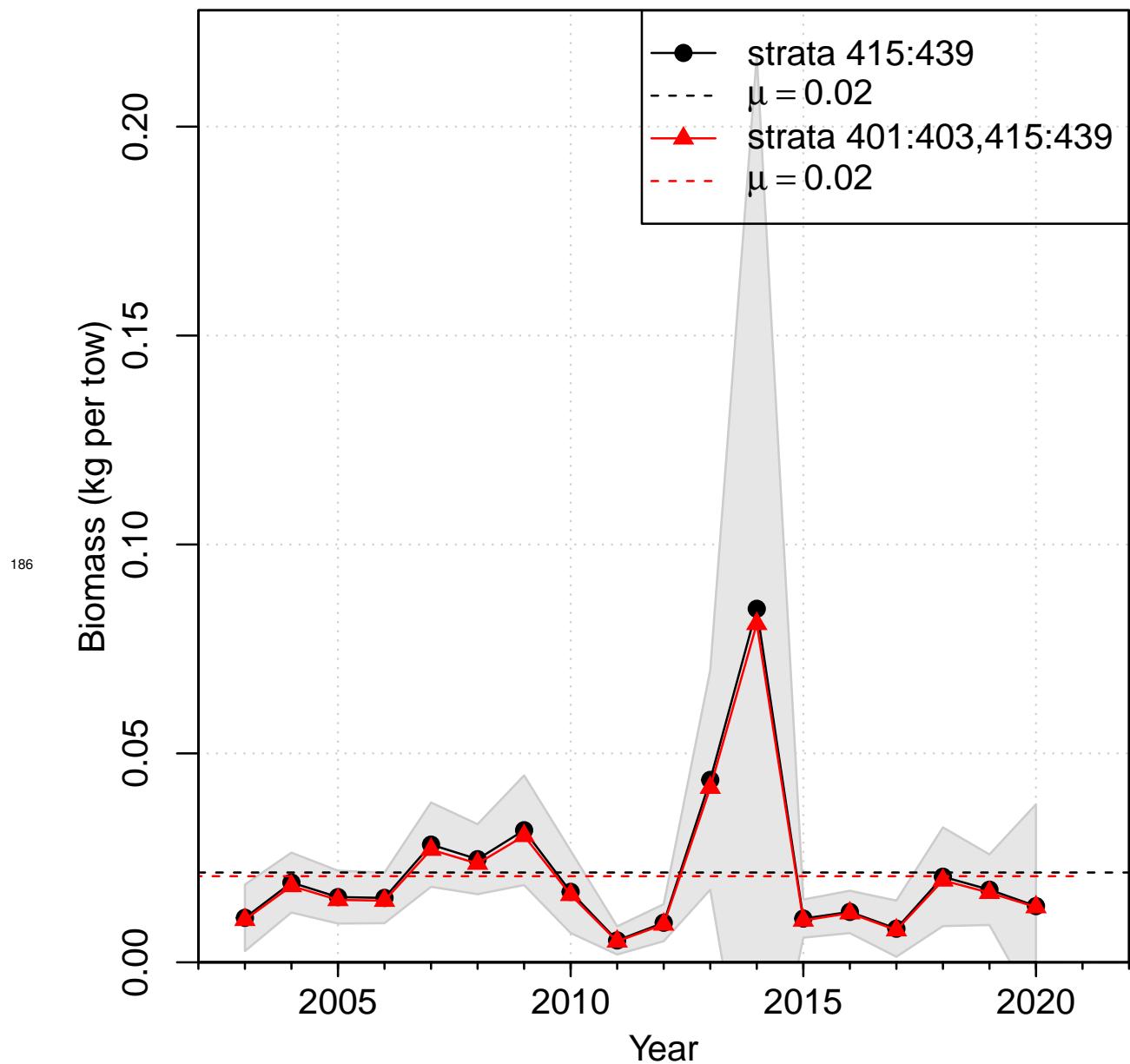


Figure 4.12B. RV index for Circumpolar shrimp.

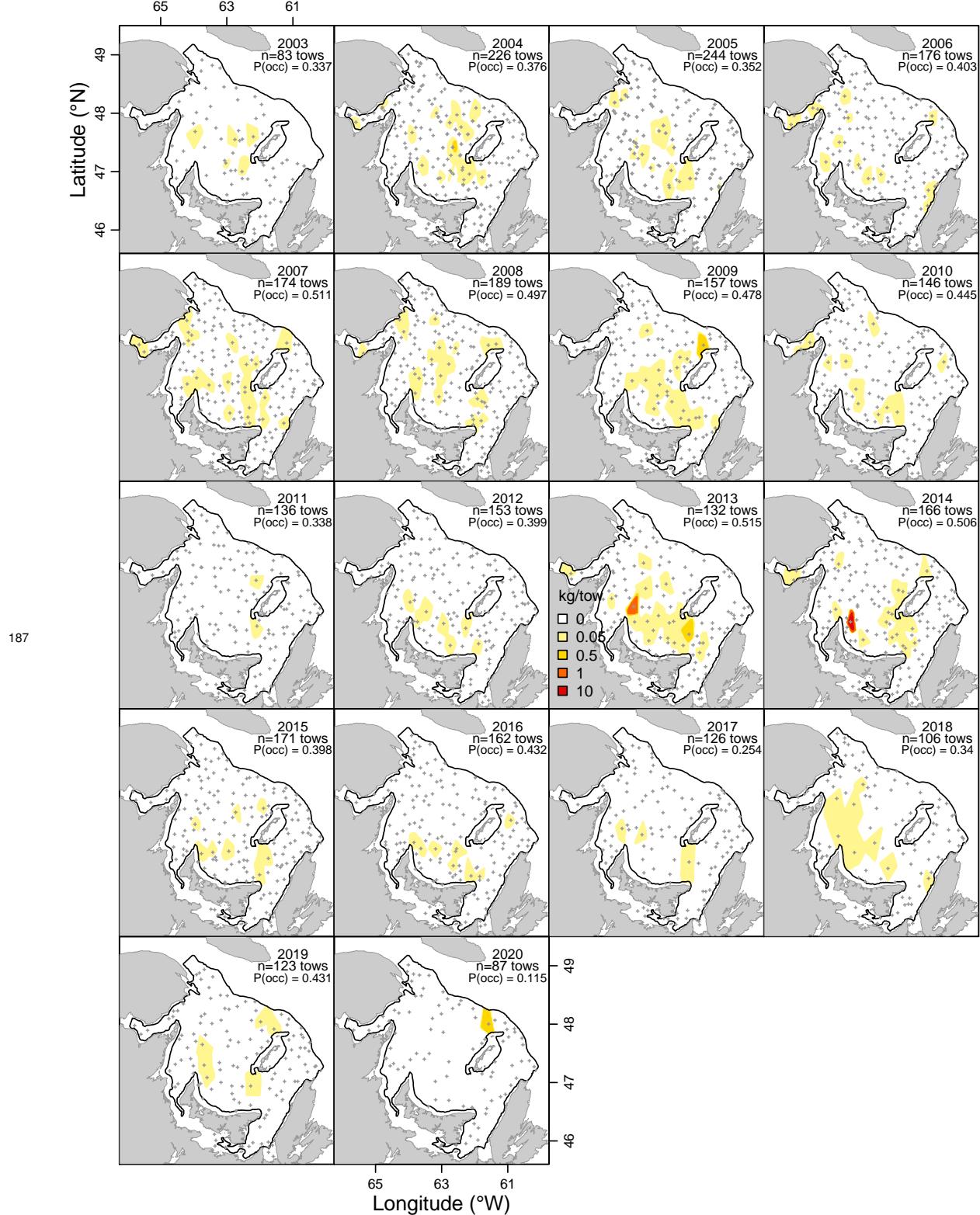


Figure 4.12C. IDW map for Circumpolar shrimp.

188 4.13 Arctic argid (Crevette verte) - species code 2411

189 Scientific name: [Argis dentata](#)

190

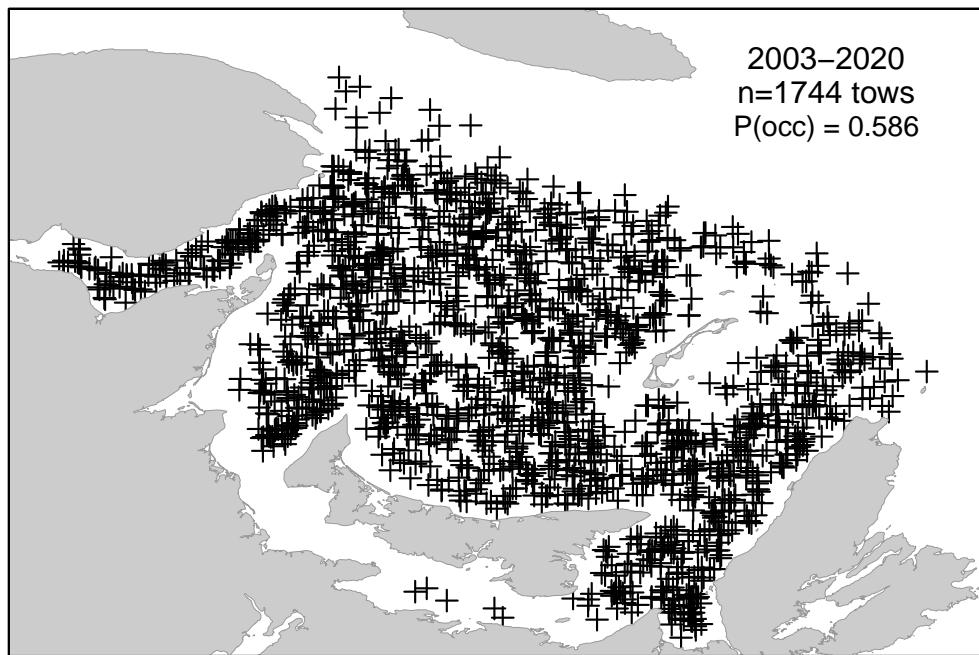


Figure 4.13A. Presence map for Arctic argid.

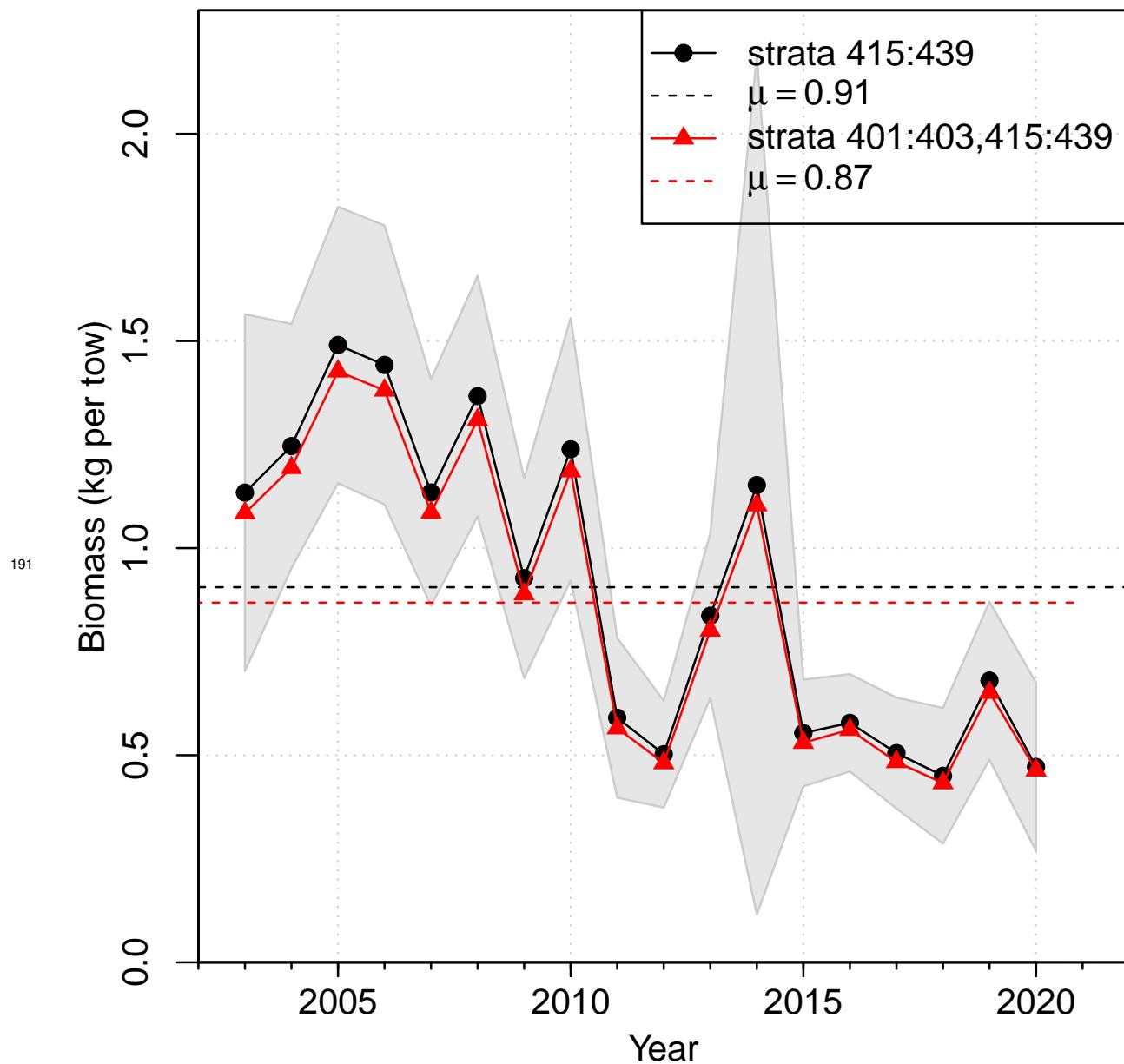


Figure 4.13B. RV index for Arctic argid.

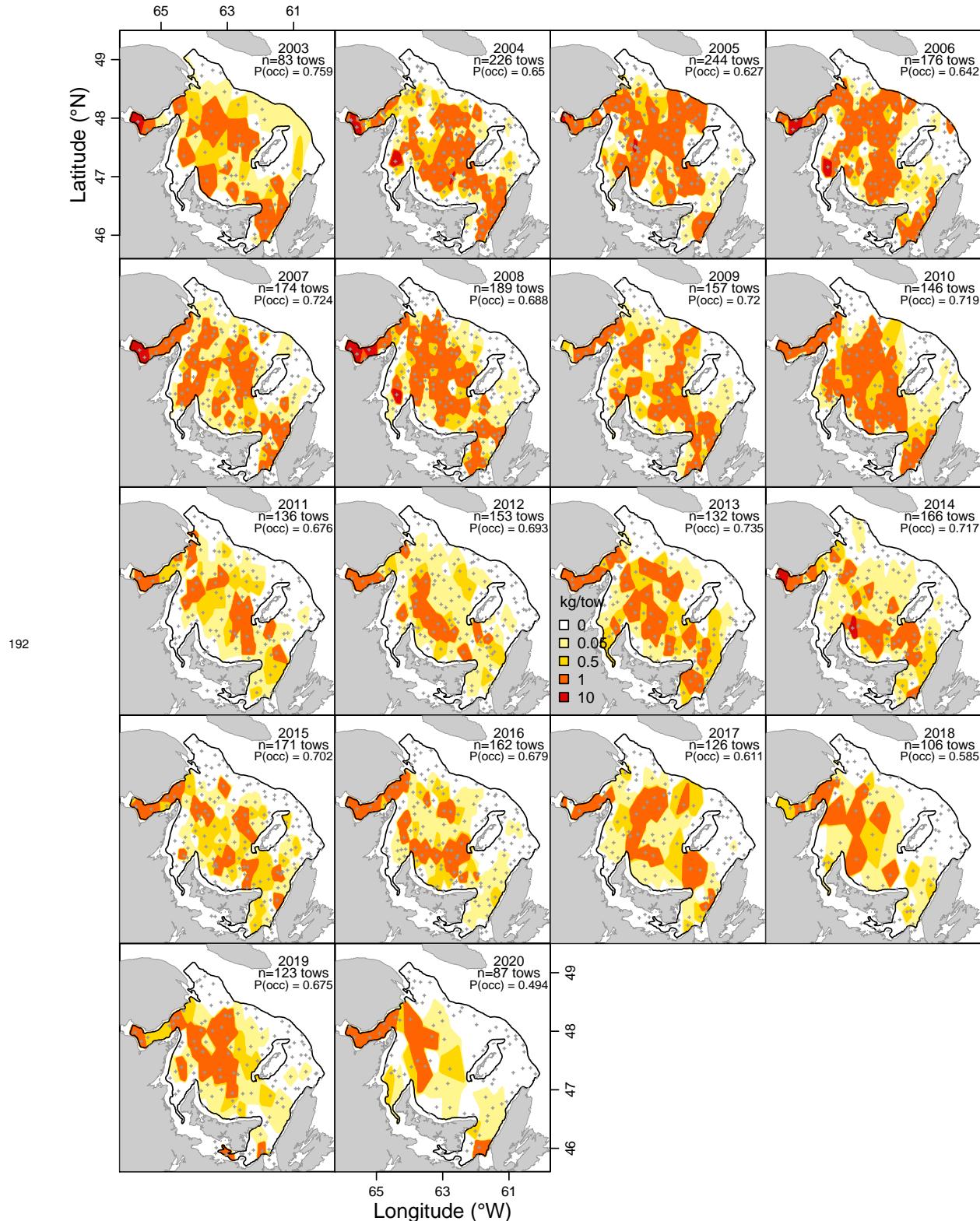


Figure 4.13C. IDW map for Arctic argid.

193 4.14 Sculptured shrimp (Crevette de roche (ciselée)) - species code 2414

194 Scientific name: [Sclerocrangon boreas](#)

195

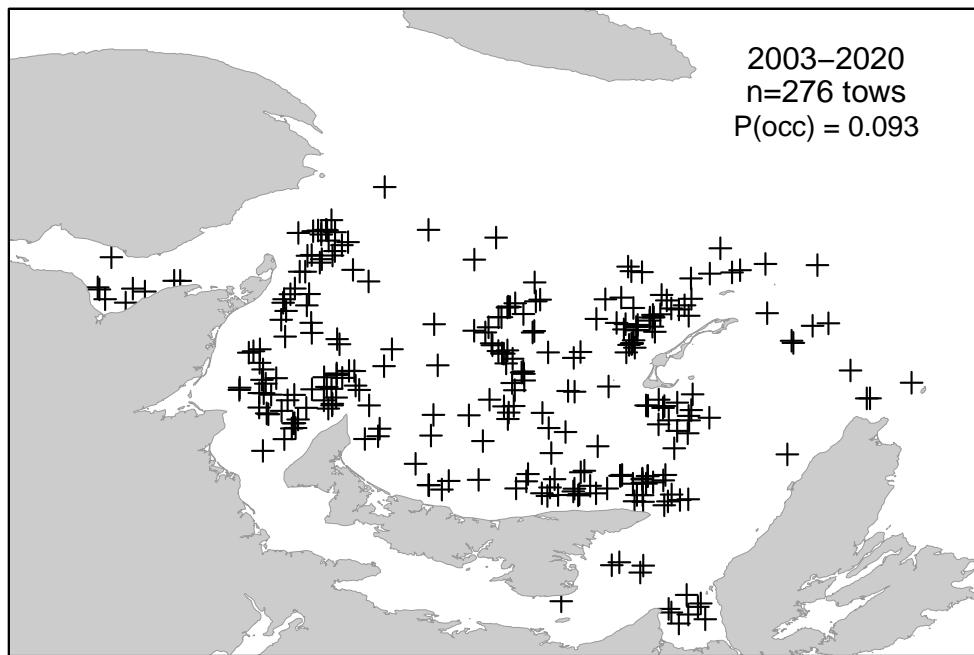


Figure 4.14A. Presence map for Sculptured shrimp.

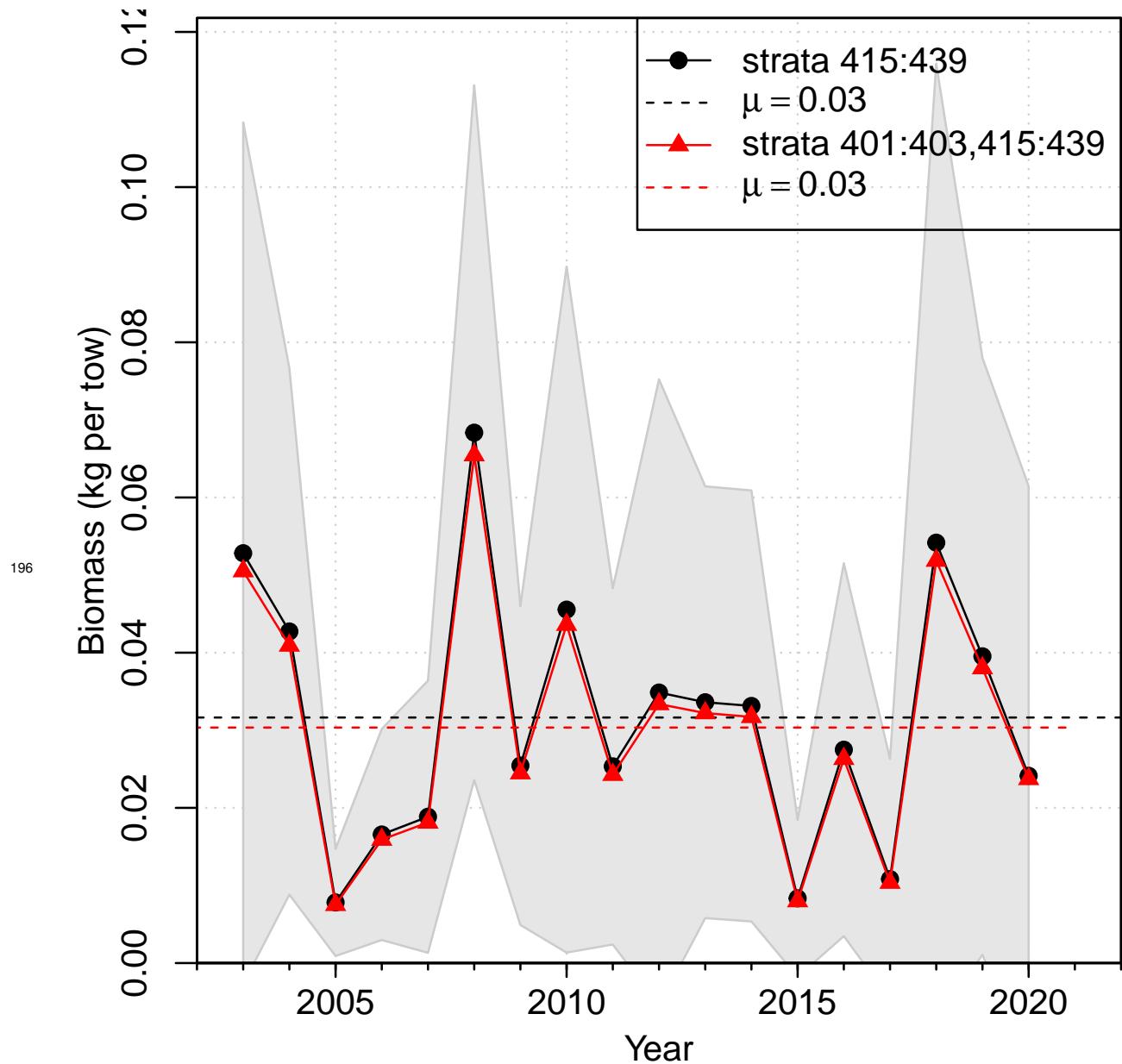


Figure 4.14B. RV index for Sculptured shrimp.

197

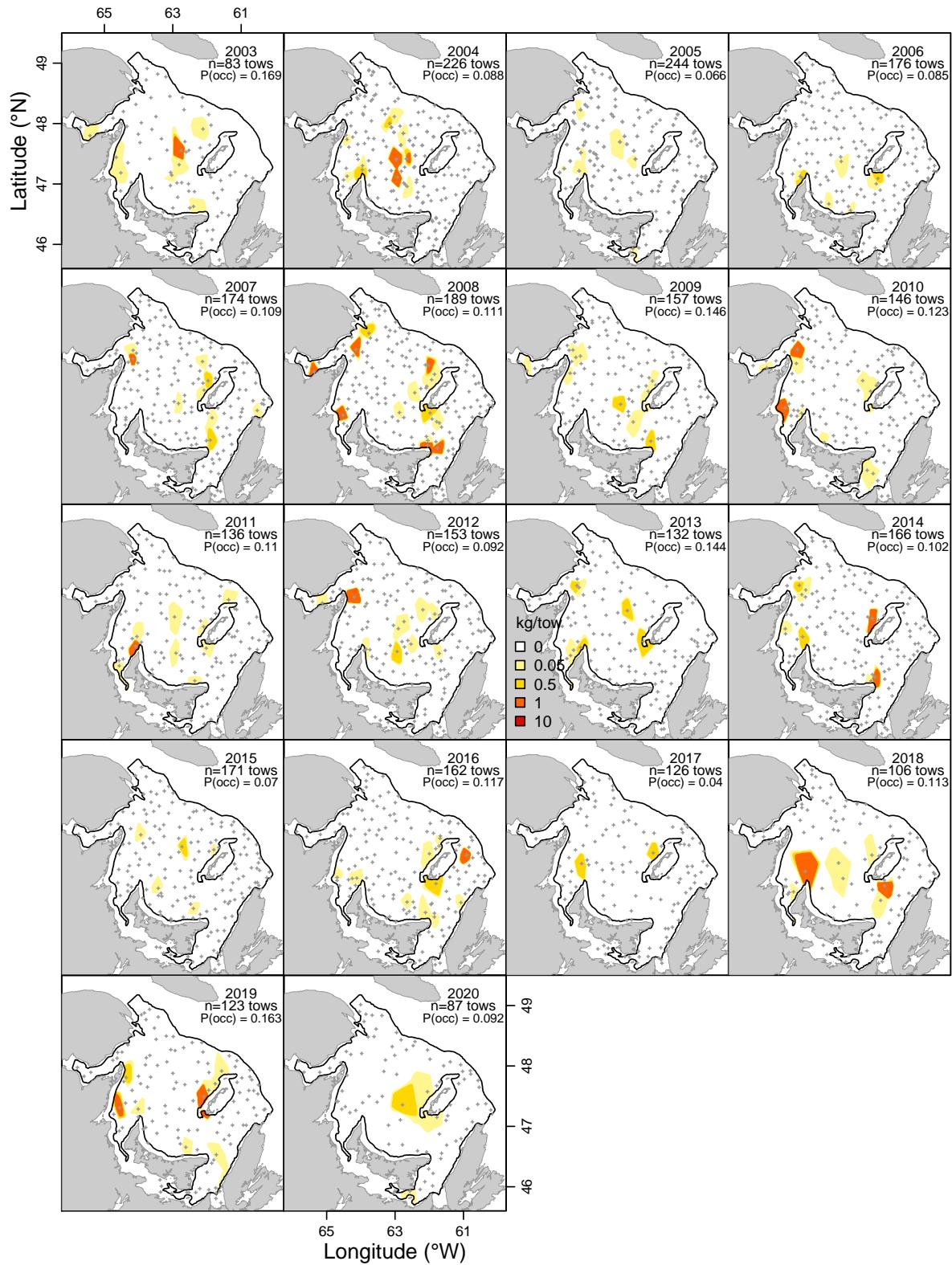


Figure 4.14C. IDW map for Sculptured shrimp.

198 4.15 Norwegian shrimp (Crevette) - species code 2415

199 Scientific name: [Pontophilus norvegicus](#)

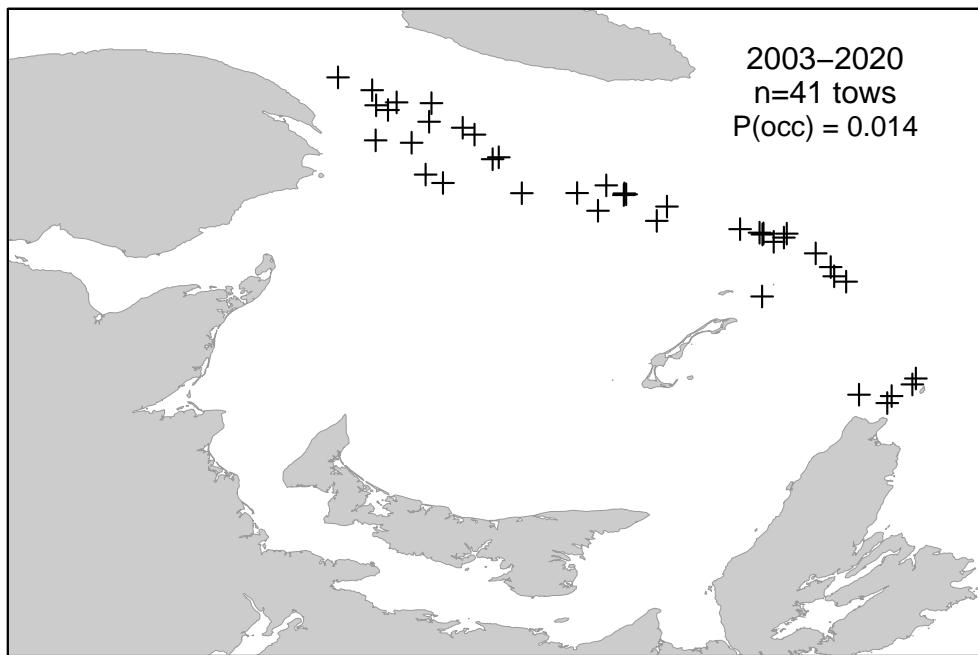


Figure 4.15A. Presence map for Norwegian shrimp.

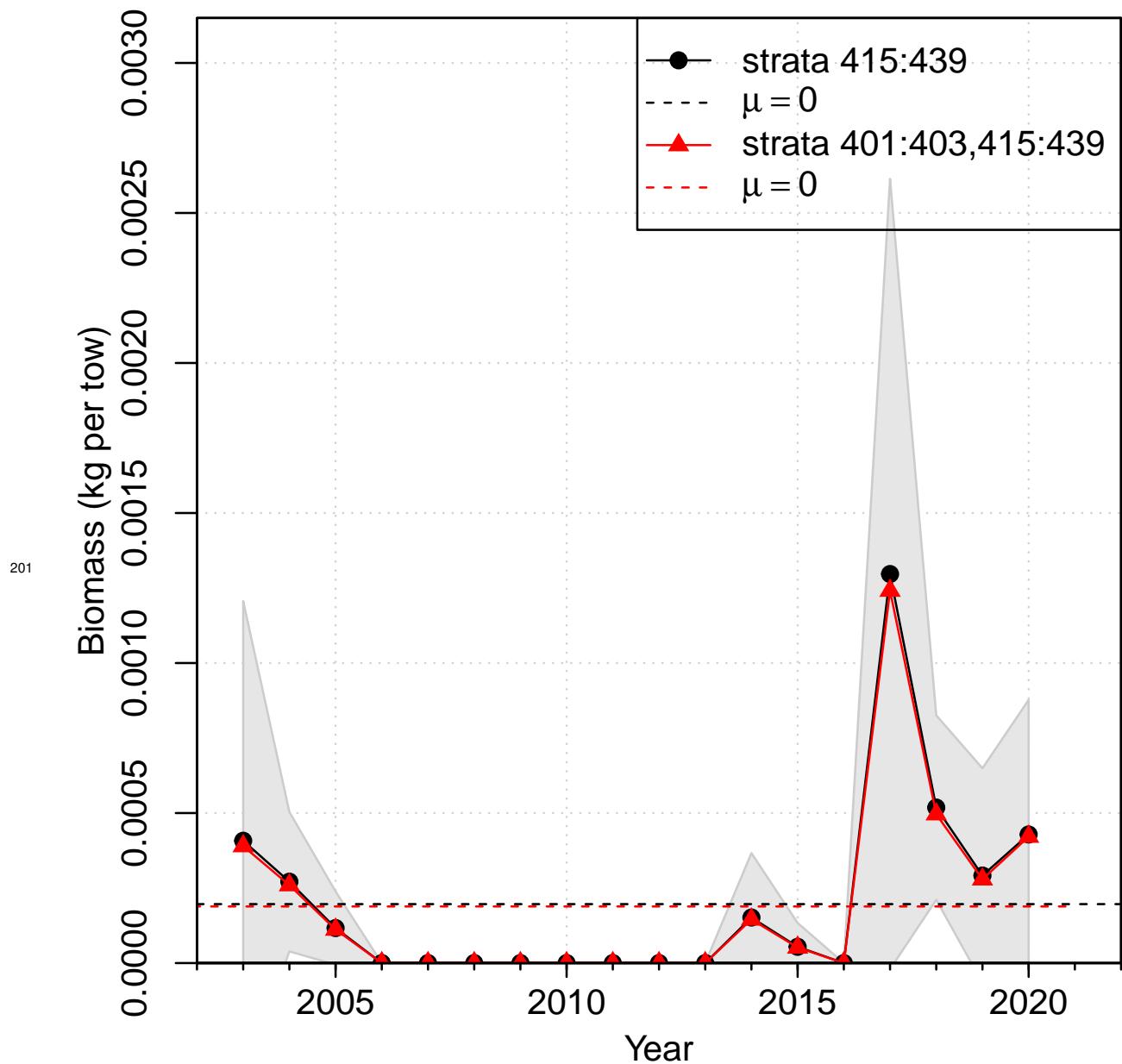


Figure 4.15B. RV index for Norwegian shrimp.

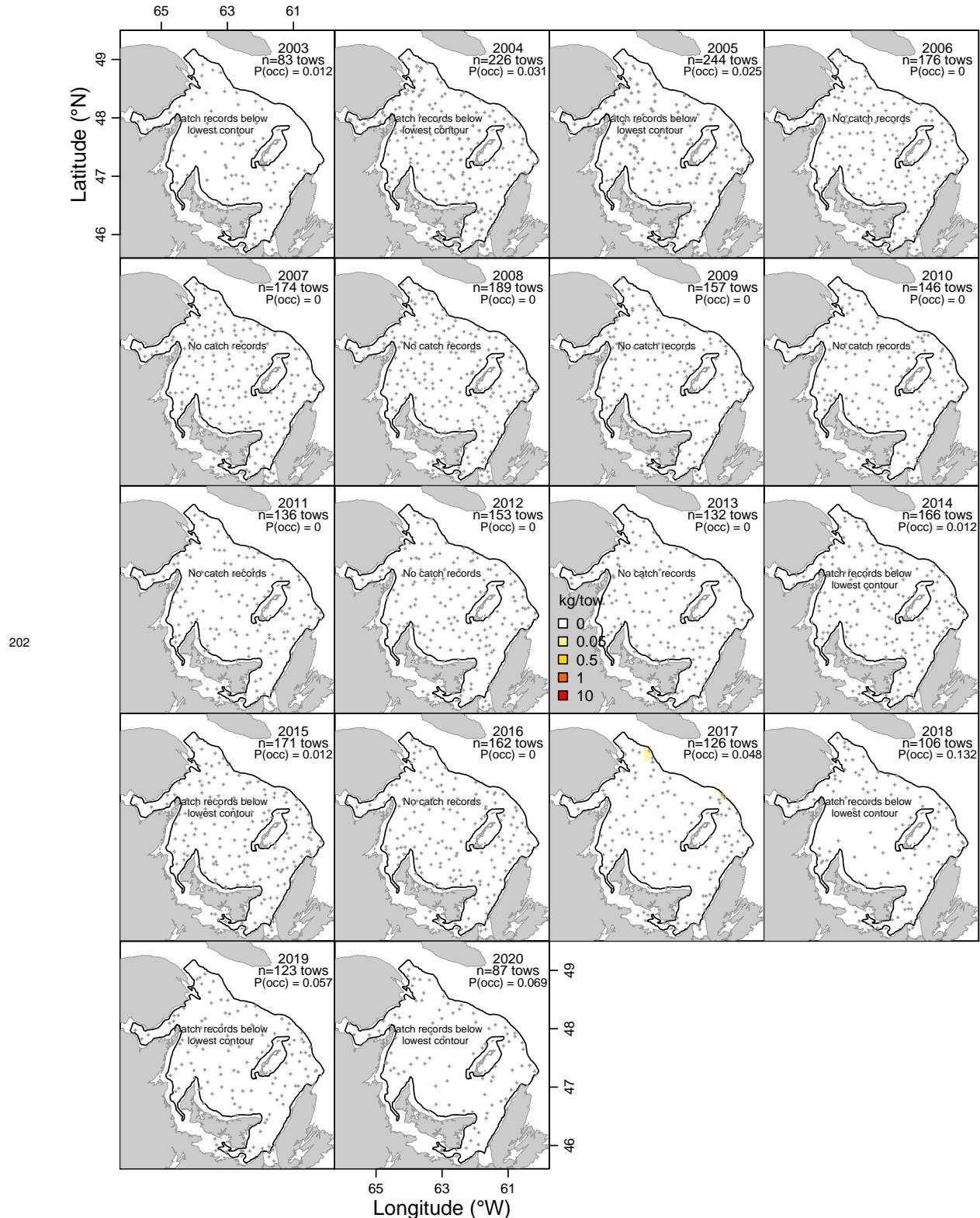


Figure 4.15C. IDW map for Norwegian shrimp.

203 4.16 Sevenspine bay shrimp (Crevette grise) - species code 2417

204 Scientific name: *Crangon septemspinosa*

205

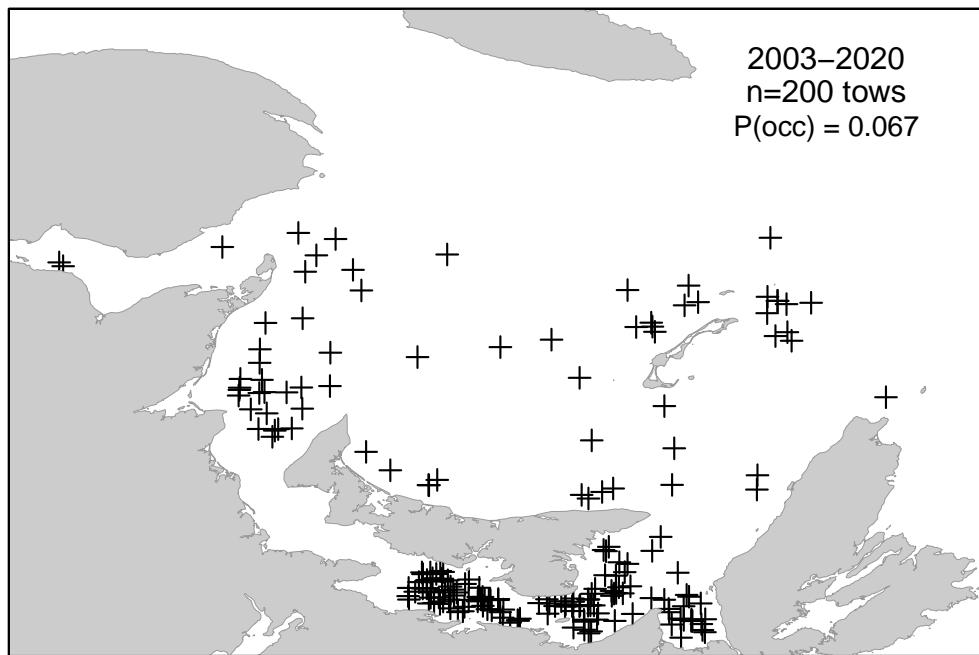


Figure 4.16A. Presence map for Sevenspine bay shrimp.

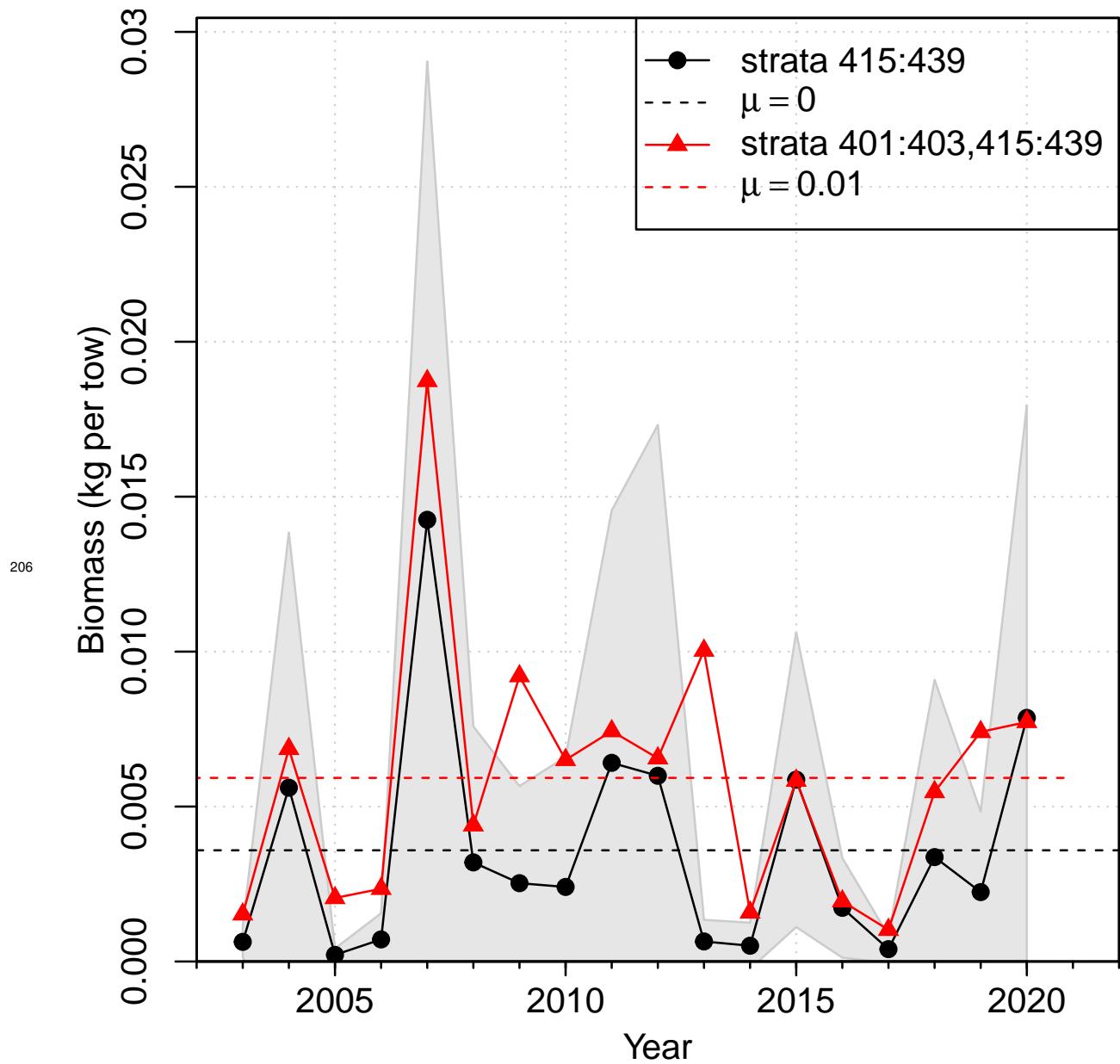


Figure 4.16B. RV index for Sevenspine bay shrimp.

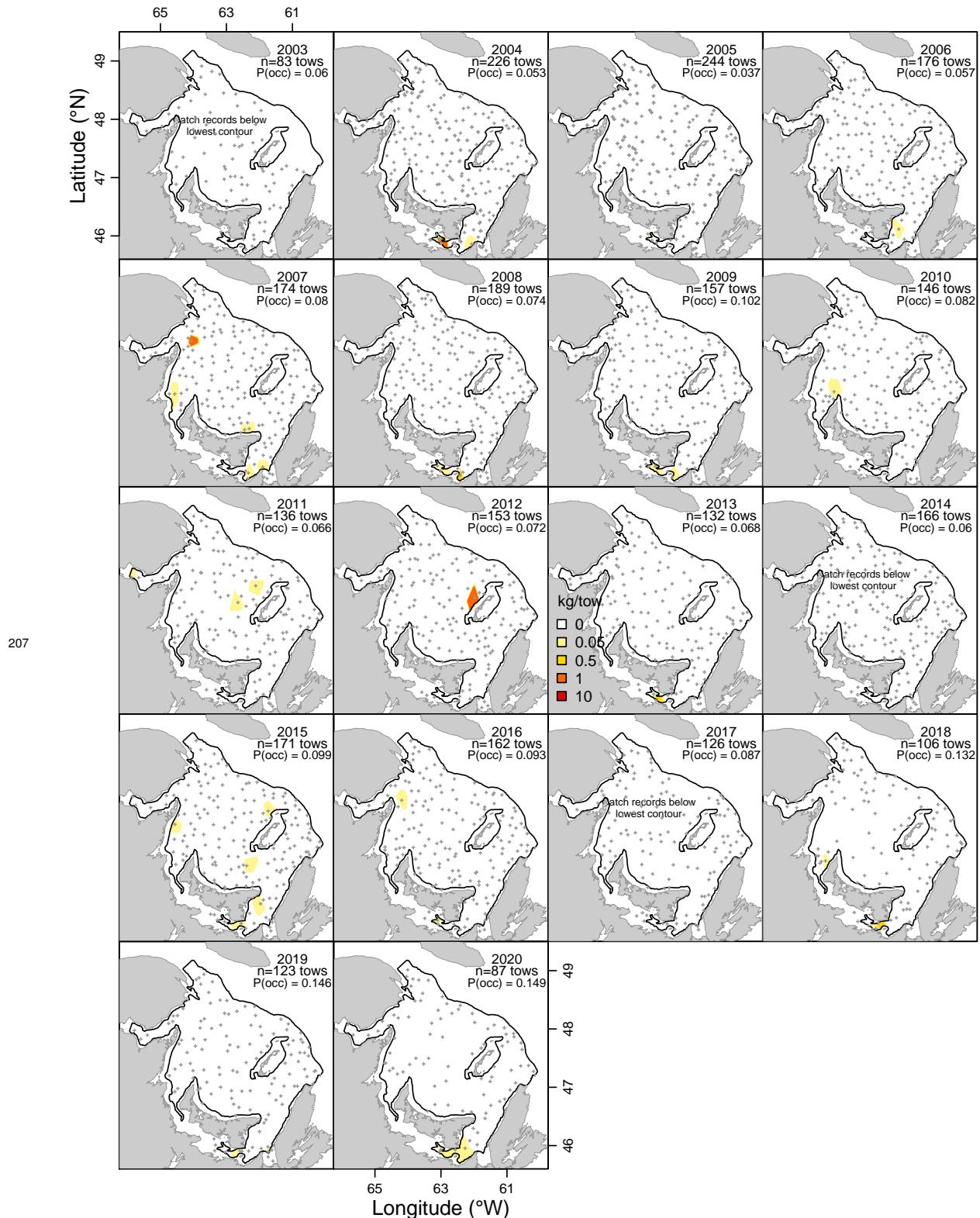


Figure 4.16C. IDW map for Sevenspine bay shrimp.

208 4.17 Sevenline shrimp (Crevette) - species code 2421

209 Scientific name: [Sabinea septemcarinata](#)

210

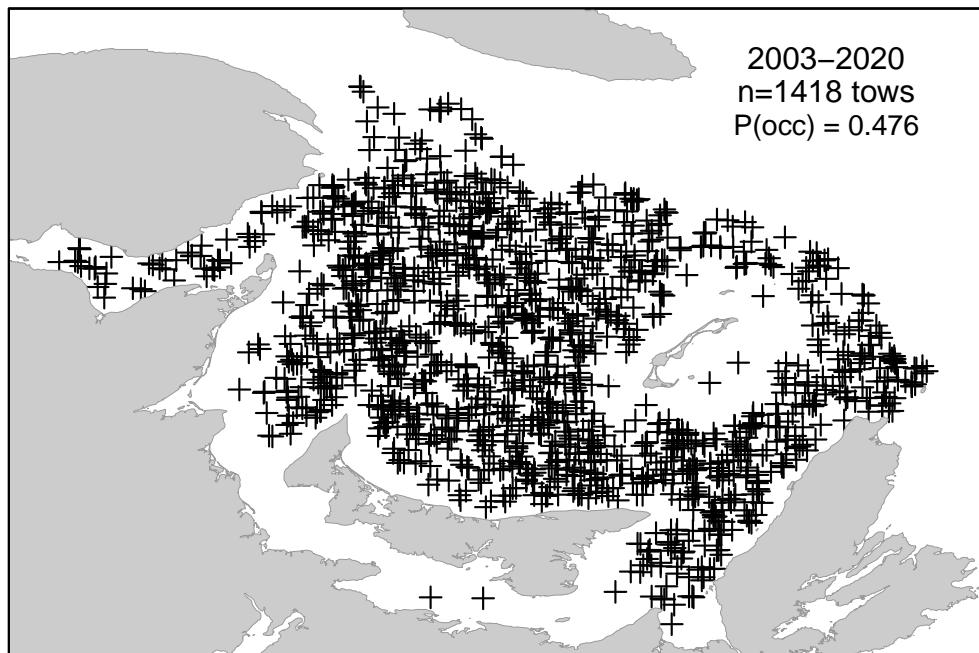


Figure 4.17A. Presence map for Sevenline shrimp.

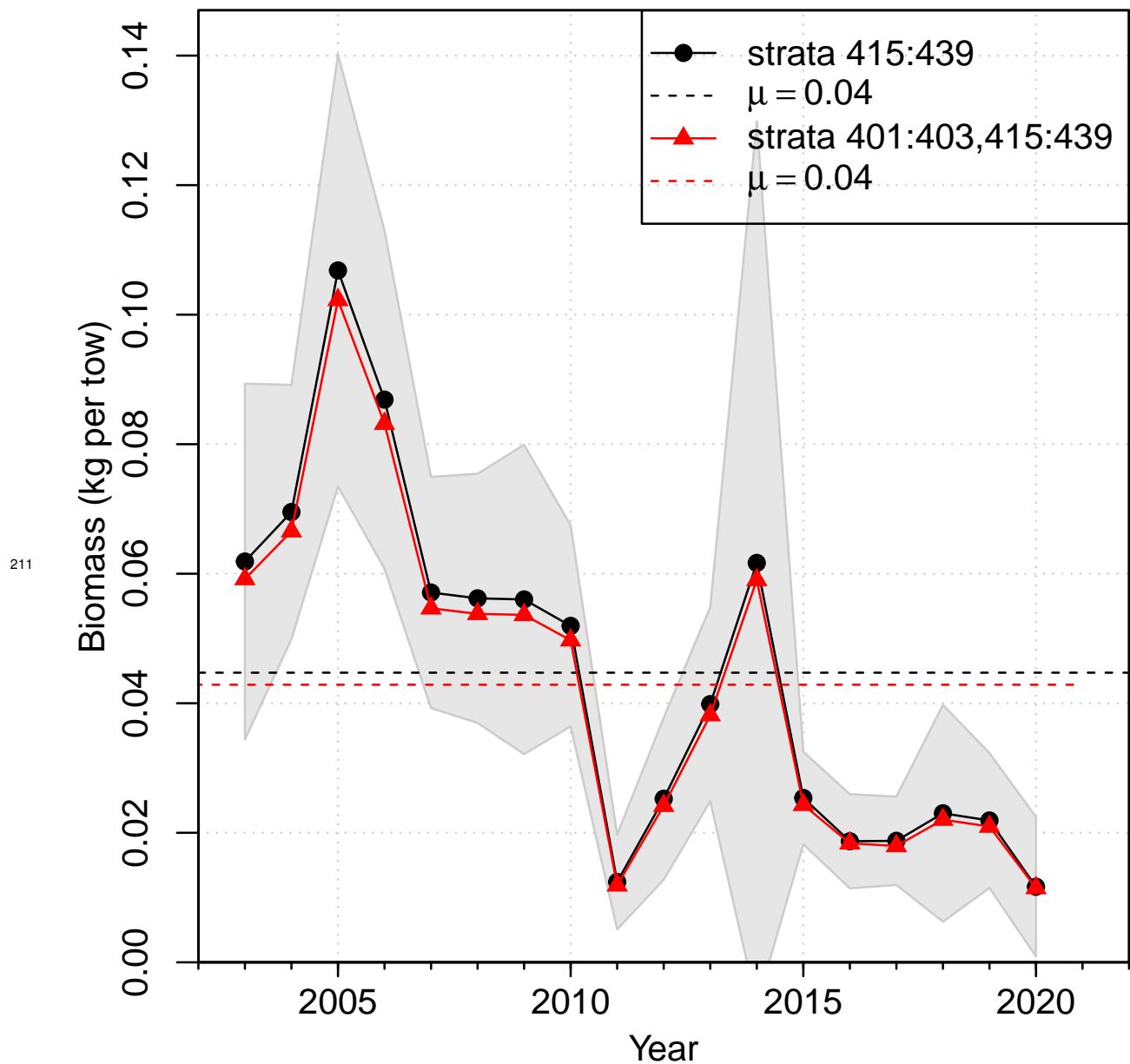


Figure 4.17B. RV index for Sevenline shrimp.

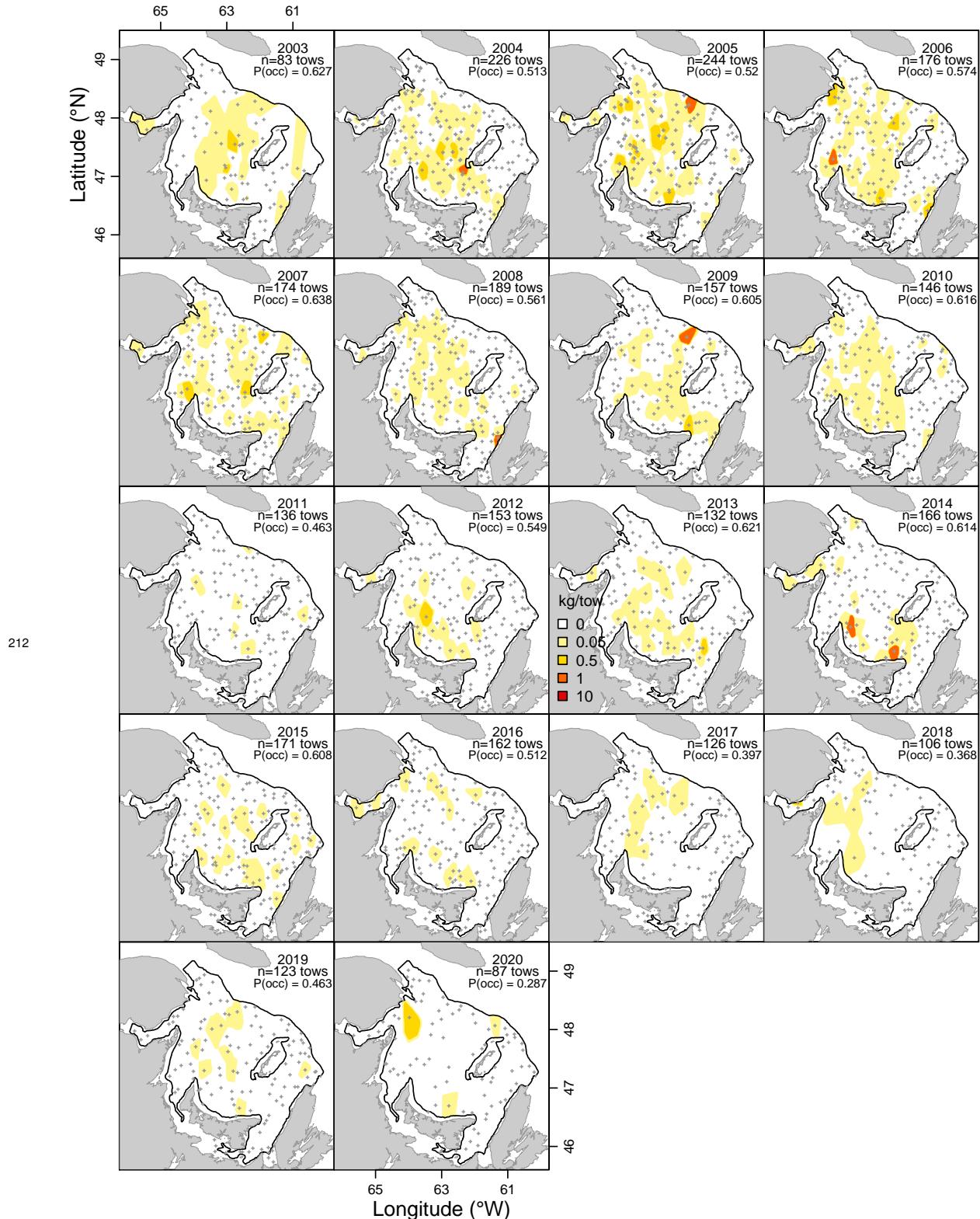


Figure 4.17C. IDW map for Sevenline shrimp.

<sup>213</sup> 4.18 Crimson pasiphaeid (Sivade) - species code 2220

<sup>214</sup> Scientific name: [Pasiphaea tarda](#)

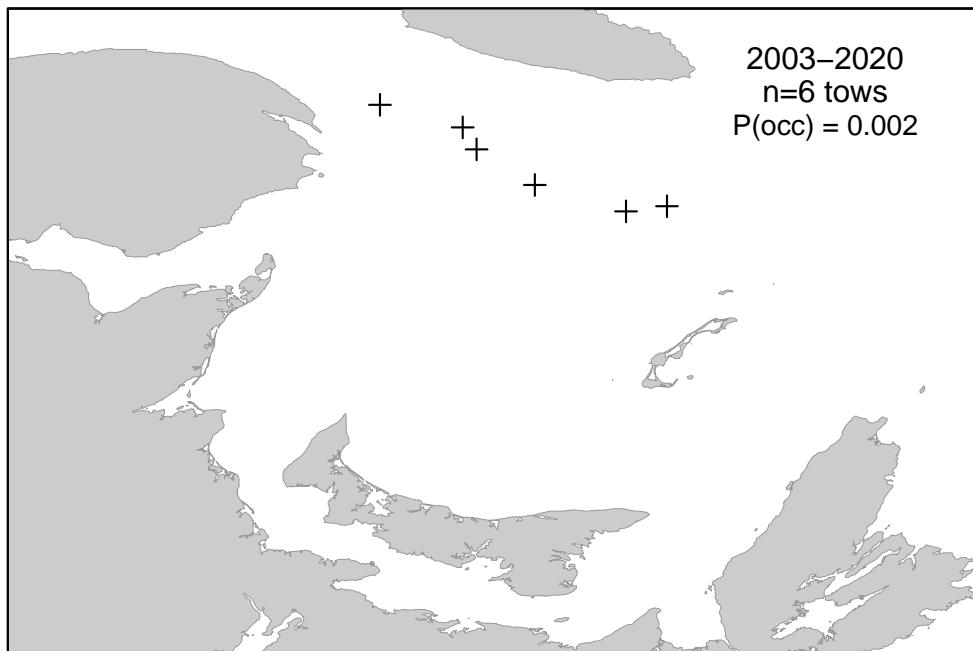


Figure 4.18A. Presence map for Crimson pasiphaeid.

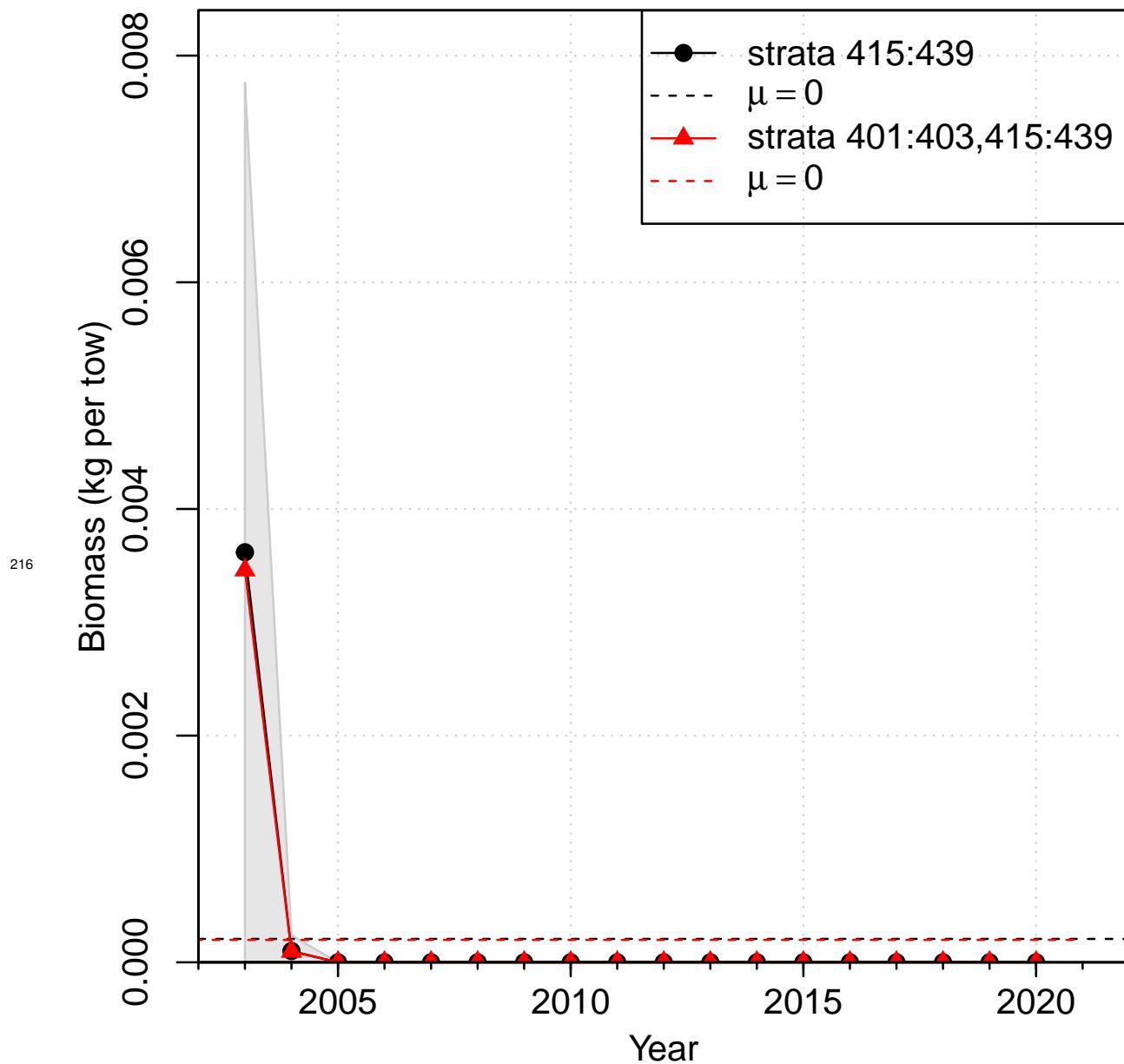


Figure 4.18B. RV index for Crimson pasiphaeid.

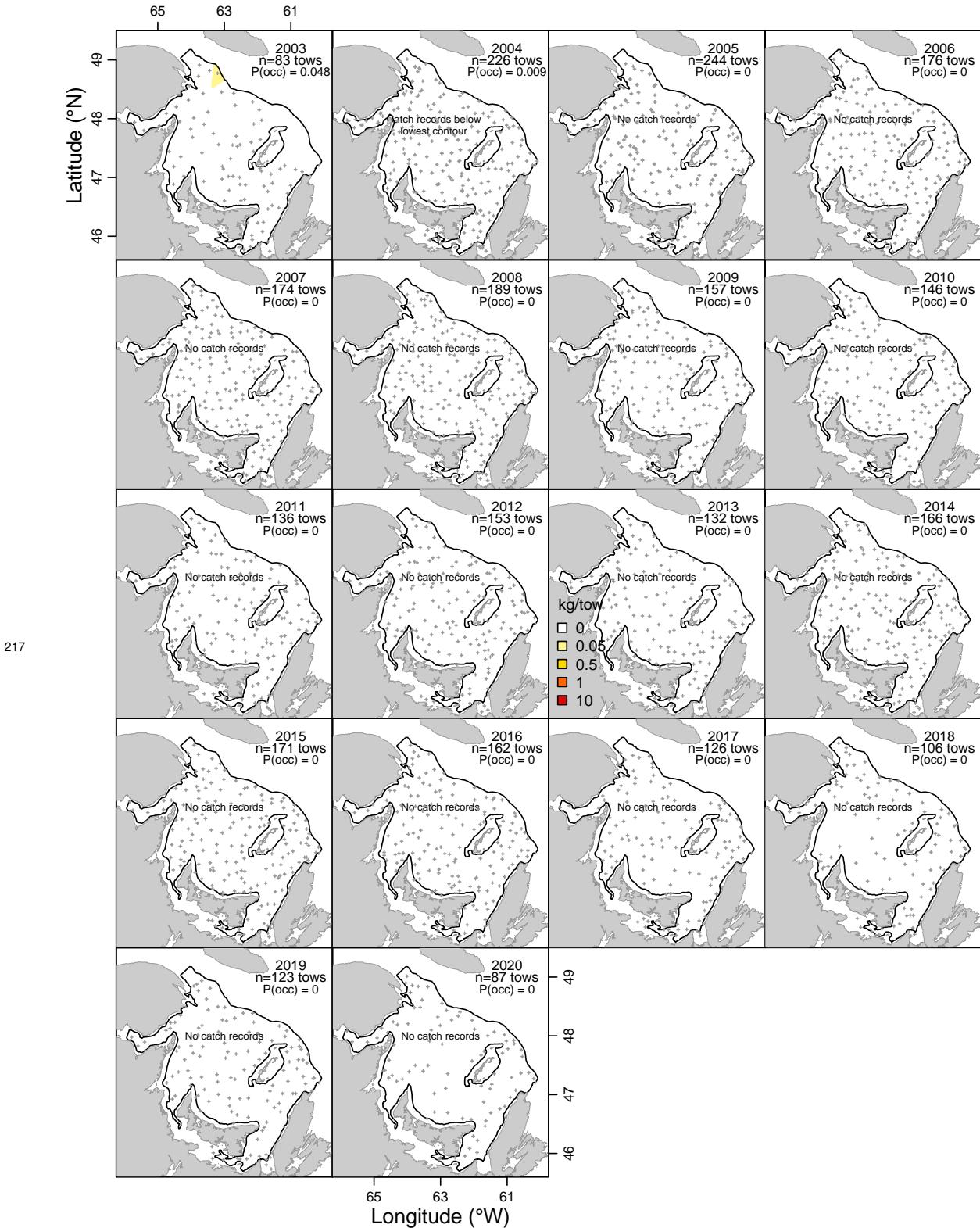


Figure 4.18C. IDW map for Crimson pasiphaeid.

<sup>218</sup> 4.19 Pink glass shrimp (Sivade rose (Crevette blanche)) - species code 2221

<sup>219</sup> Scientific name: [Pasiphaea multidentata](#)

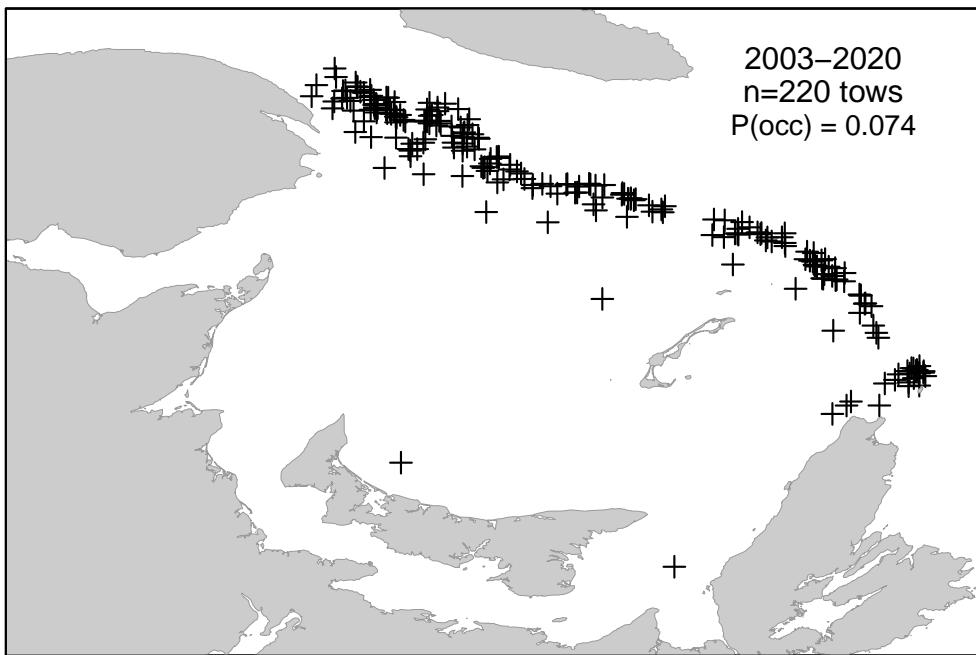


Figure 4.19A. Presence map for Pink glass shrimp.

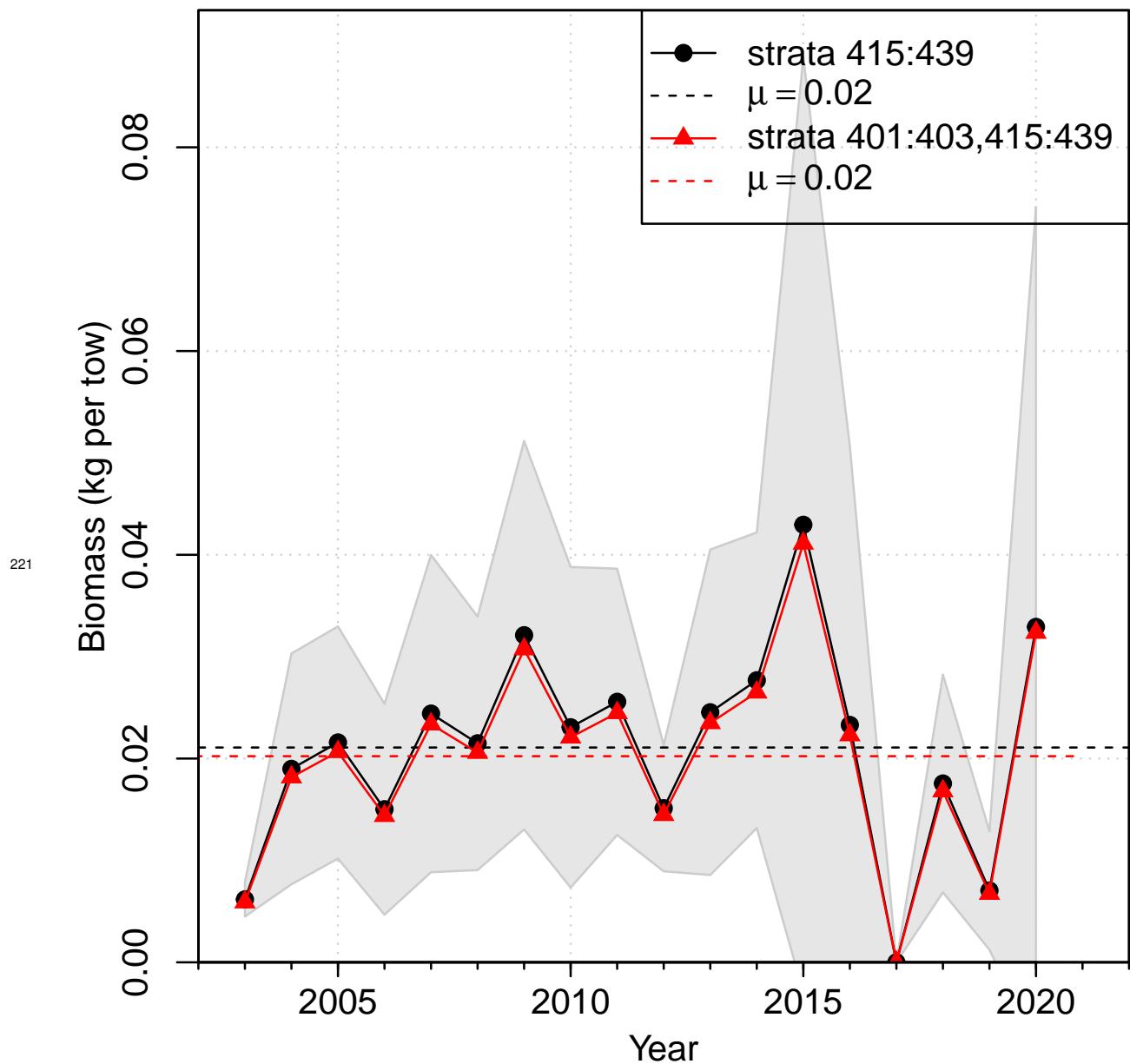


Figure 4.19B. RV index for Pink glass shrimp.

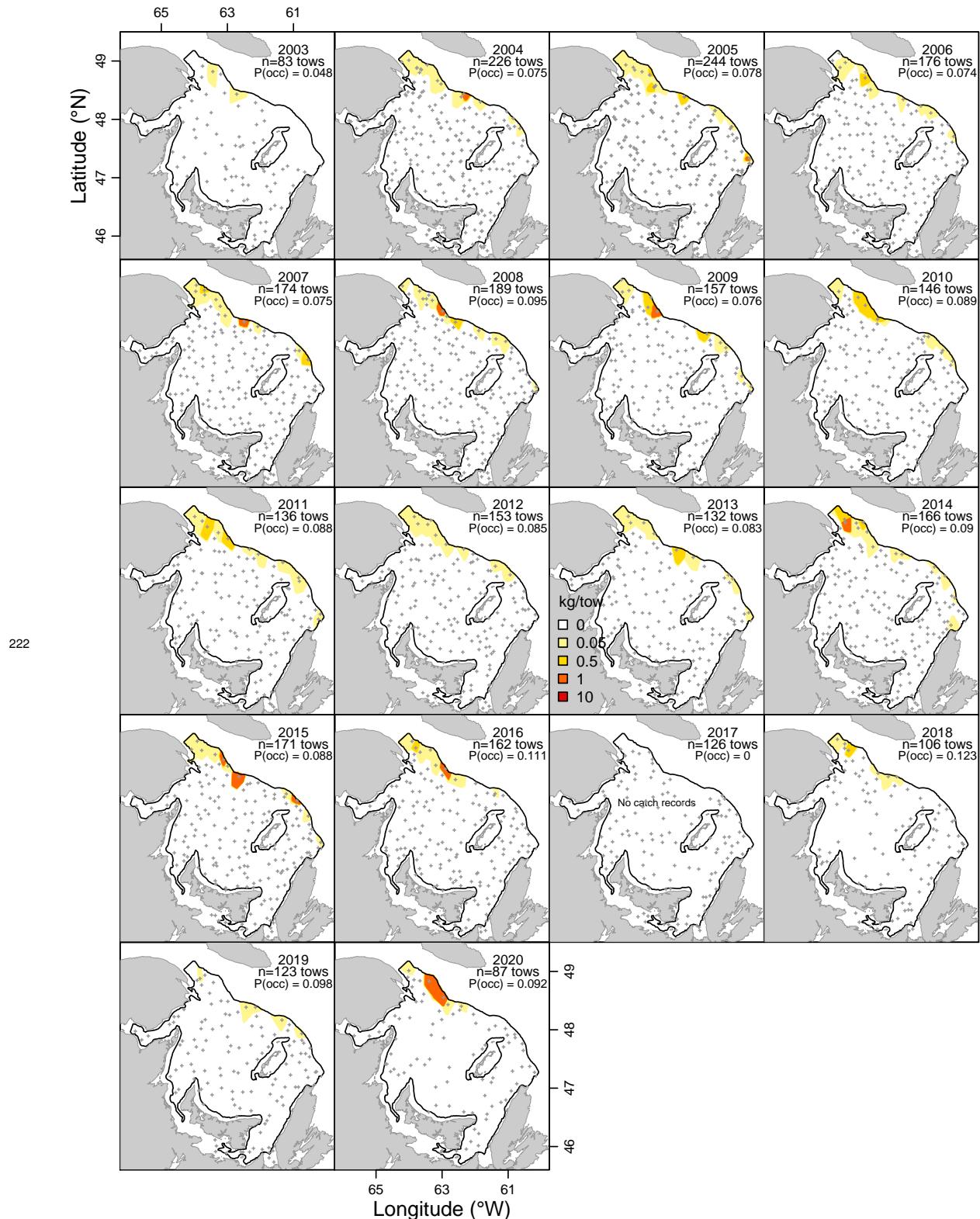


Figure 4.19C. IDW map for Pink glass shrimp.

<sup>223</sup> **4.20 Parapasiphae sulcatifrons (Parapasiphae sulcatifrons) - species code 2222**

<sup>224</sup> Scientific name: [Parapasiphae sulcatifrons](#)

<sup>225</sup>

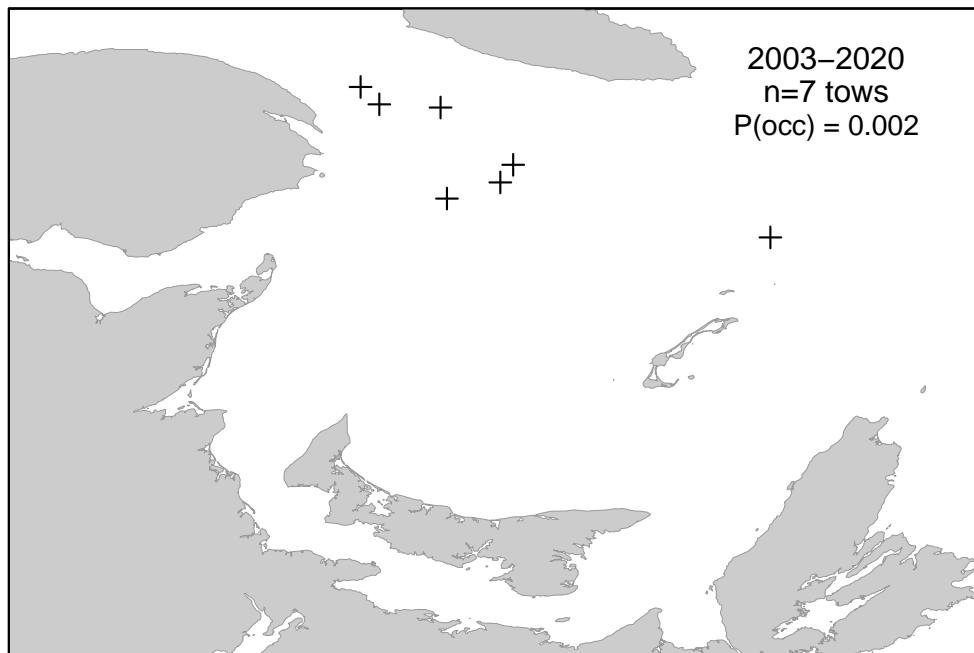


Figure 4.20A. Presence map for *Parapasiphae sulcatifrons*.

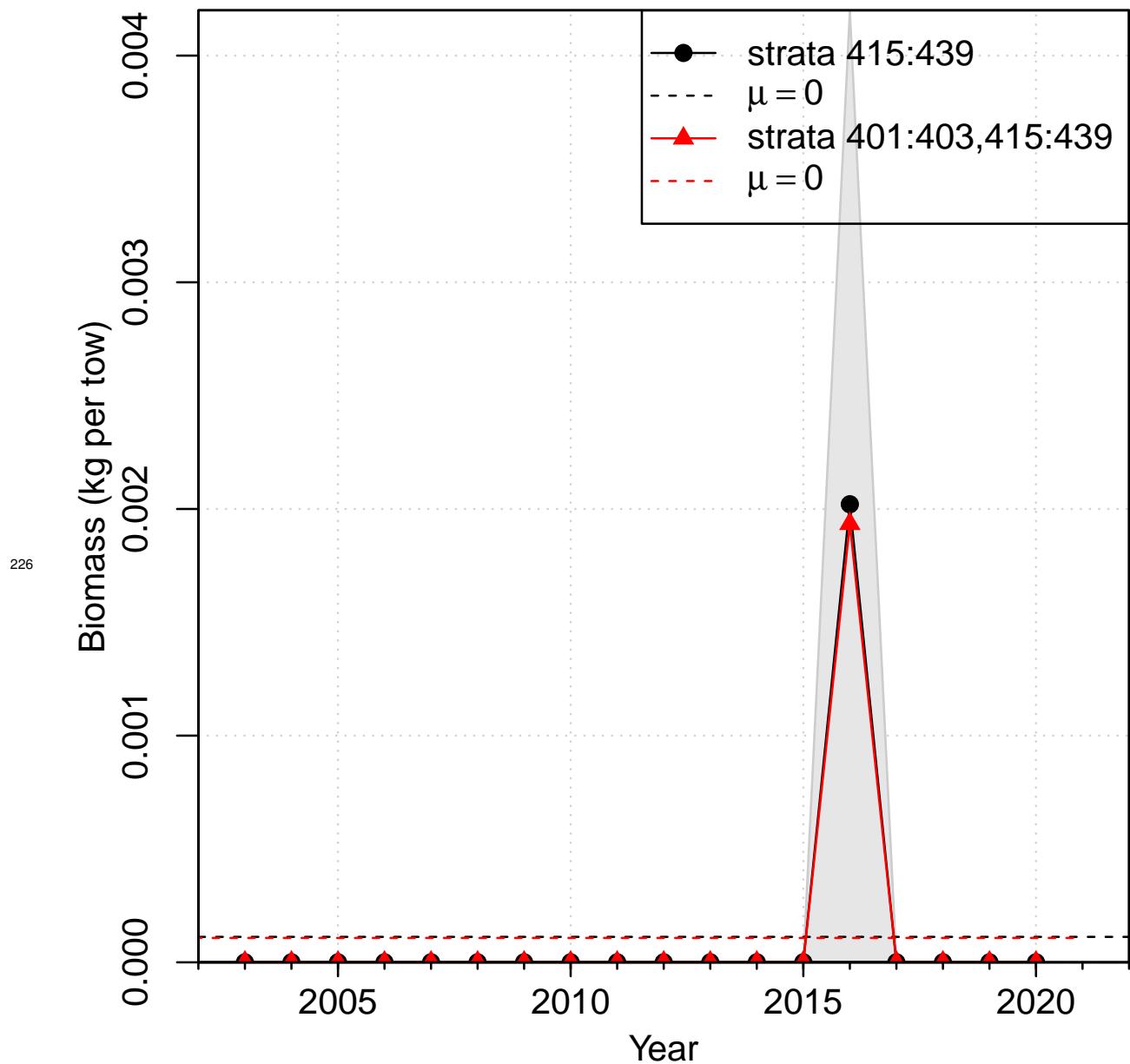
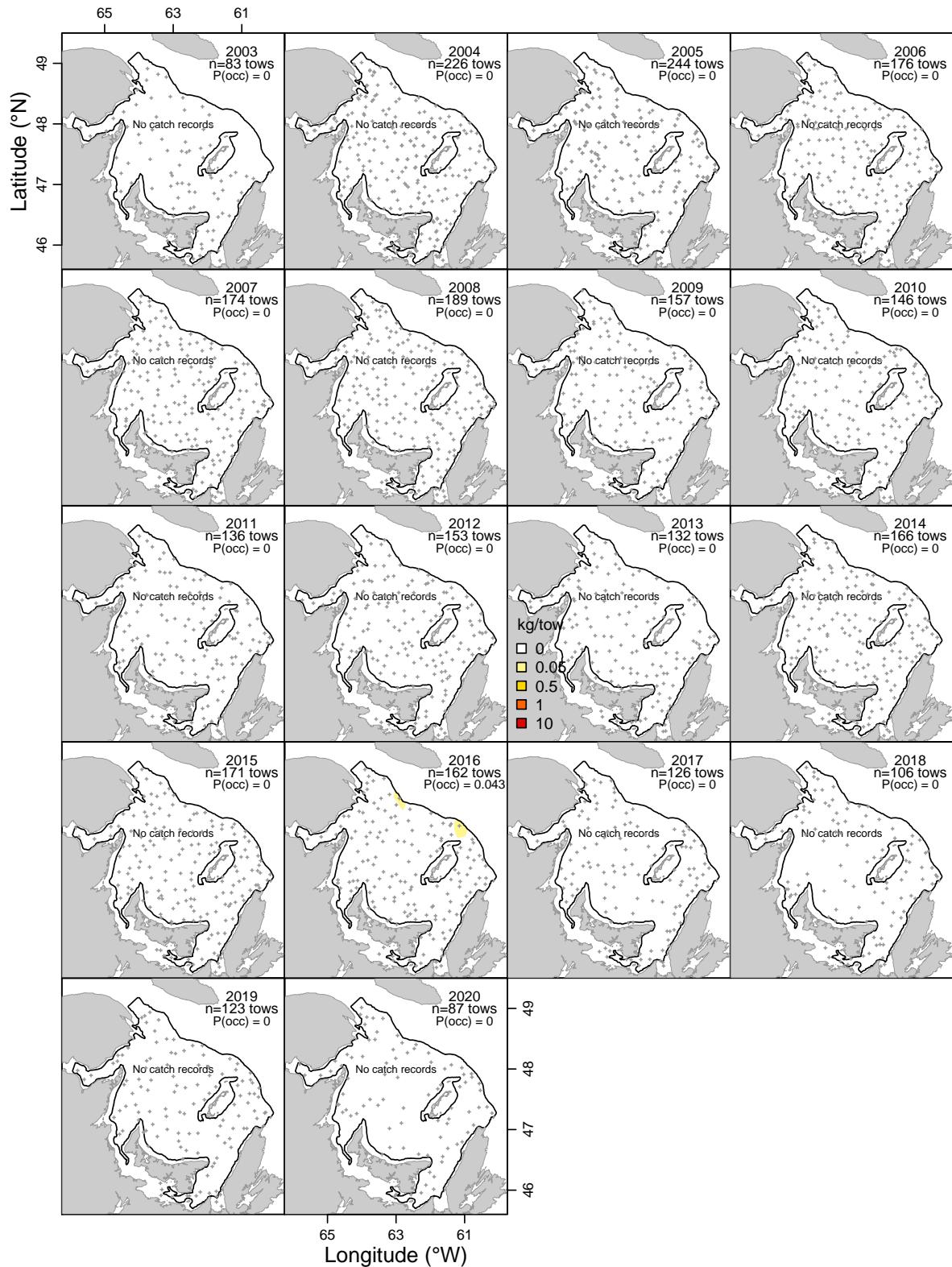


Figure 4.20B. RV index for *Parapaspisphae sulcatifrons*.

227

Figure 4.20C. IDW map for *Parapaspheae sulcatifrons*.

228 **4.21 Robustosergia robusta (Robustosergia robusta) - species code 1283**

229 Scientific name: [Robustosergia robusta](#)

230

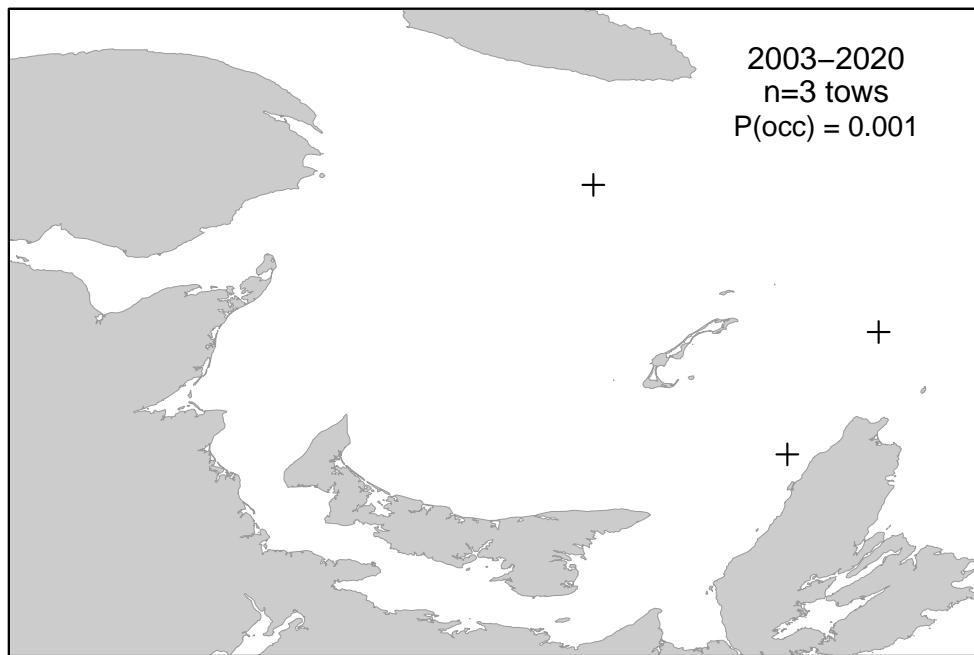


Figure 4.21A. Presence map for Robustosergia robusta.

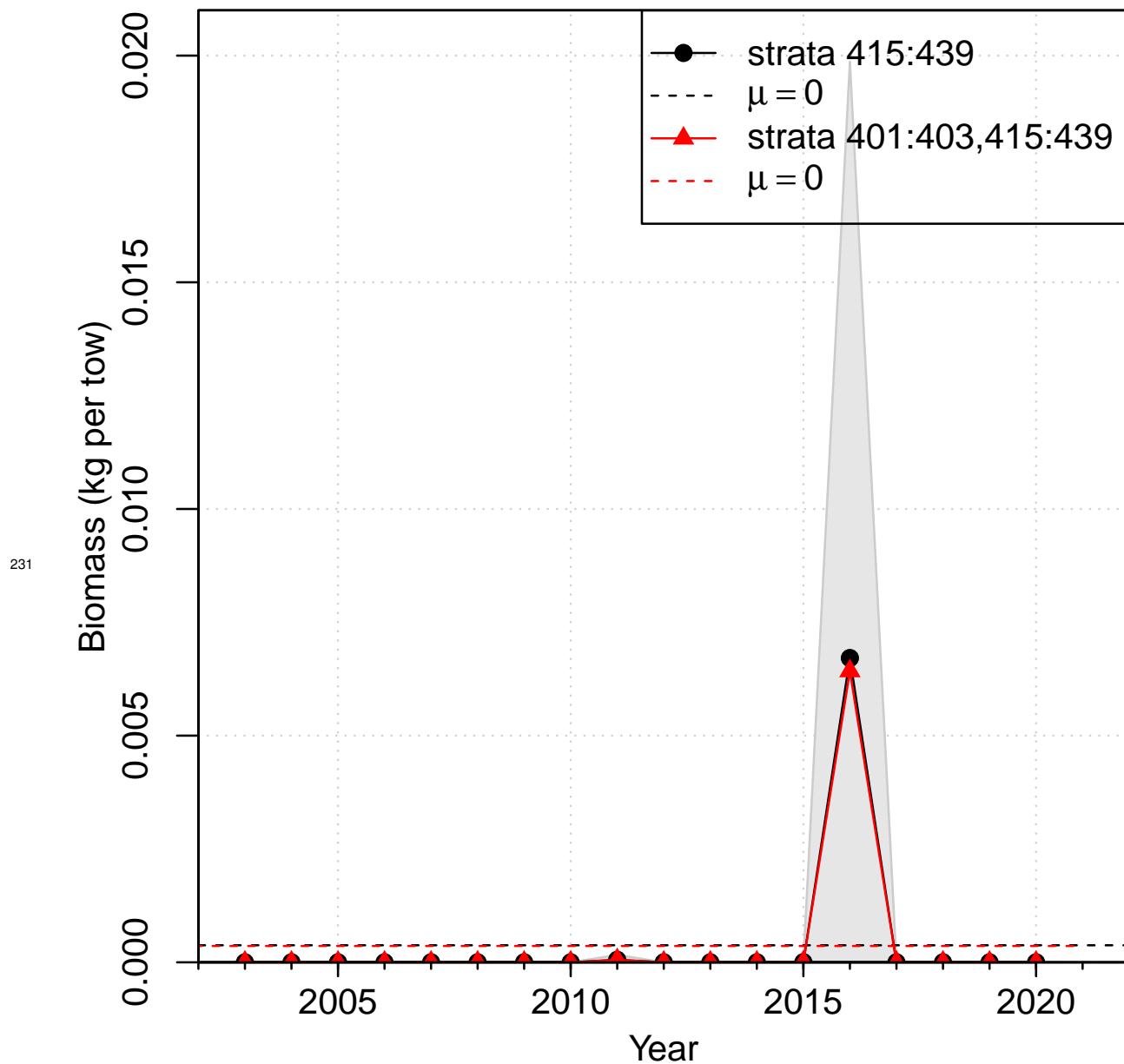
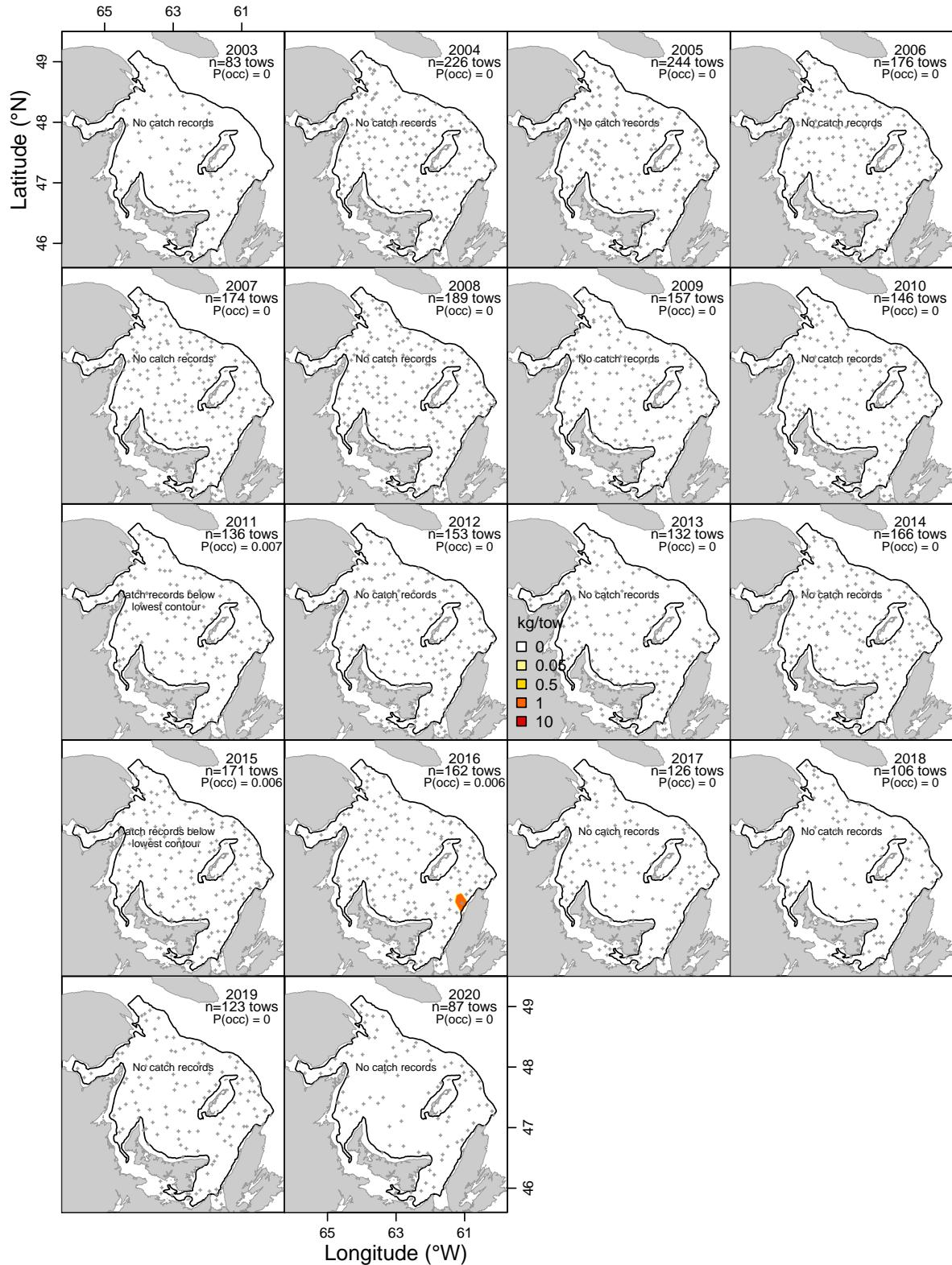


Figure 4.21B. RV index for *Robustosergia robusta*.

Figure 4.21C. IDW map for *Robustosergia robusta*.

<sup>233</sup> **4.22 Decapod unidentified (Décapode non-spécifié) - species code 2100**

<sup>234</sup> Scientific name: [Decapoda](#)

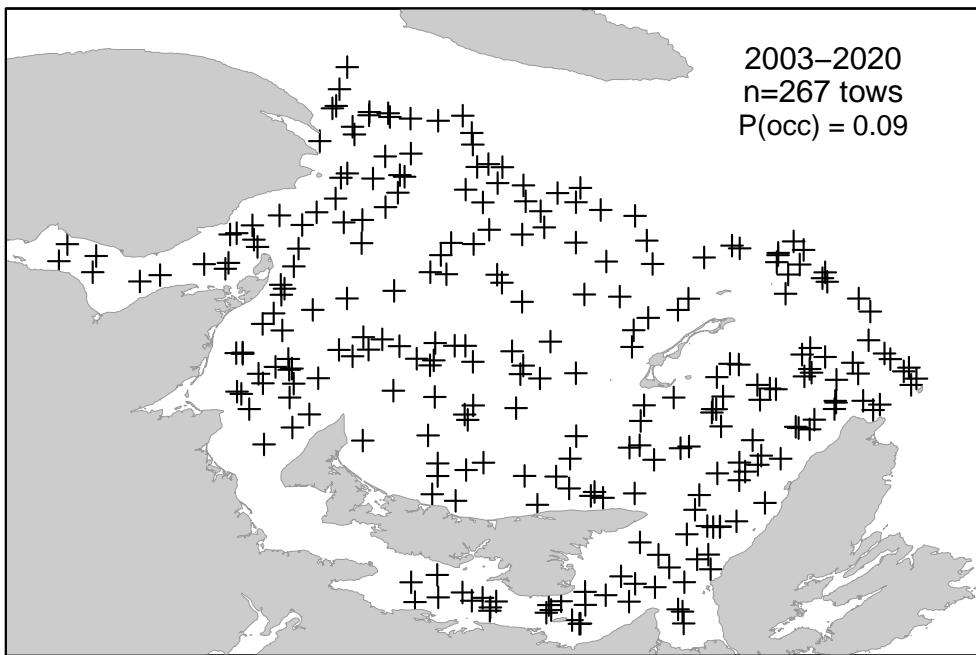


Figure 4.22A. Presence map for Decapod unidentified.

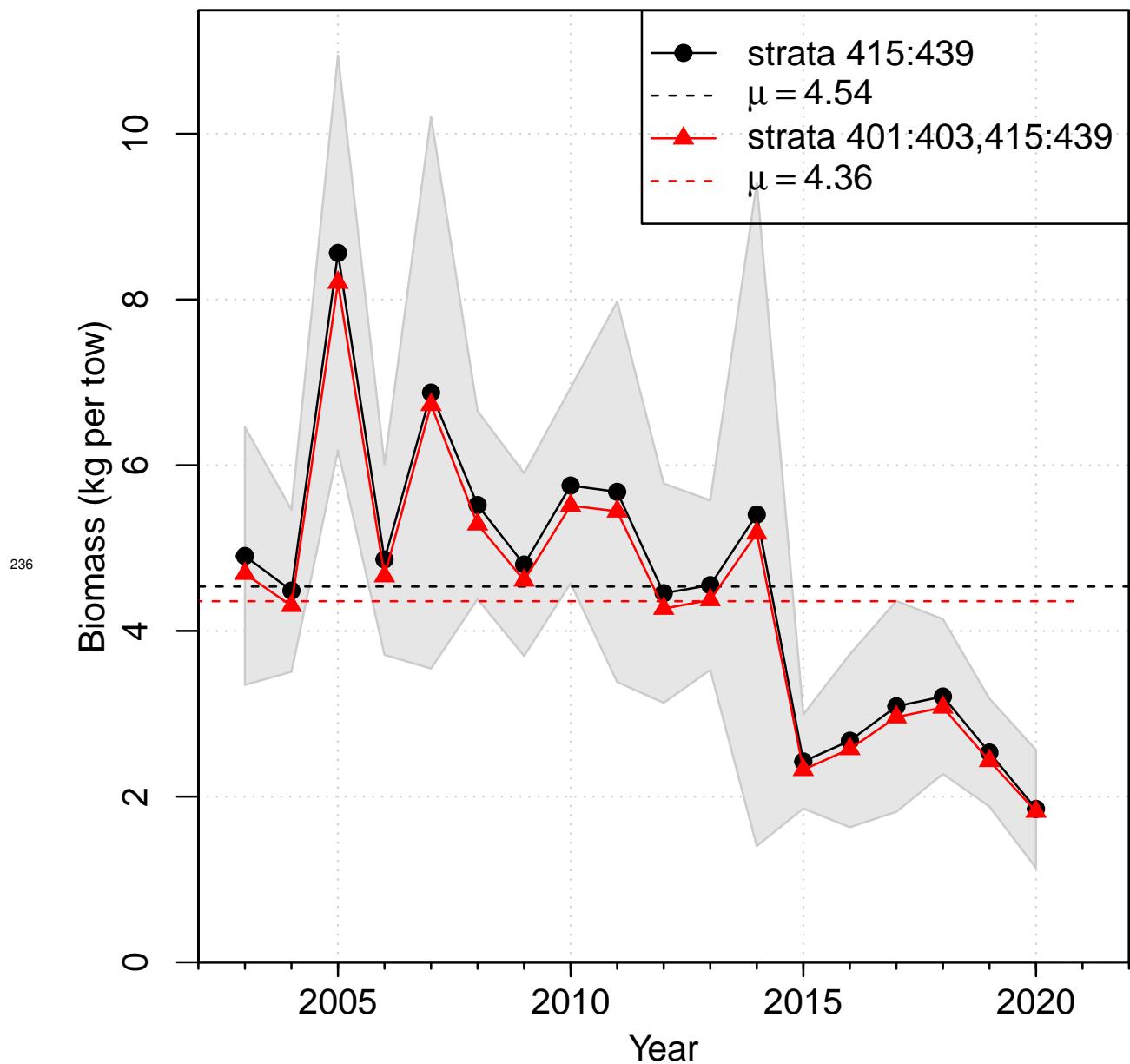


Figure 4.22B. RV index for Decapod unidentified.

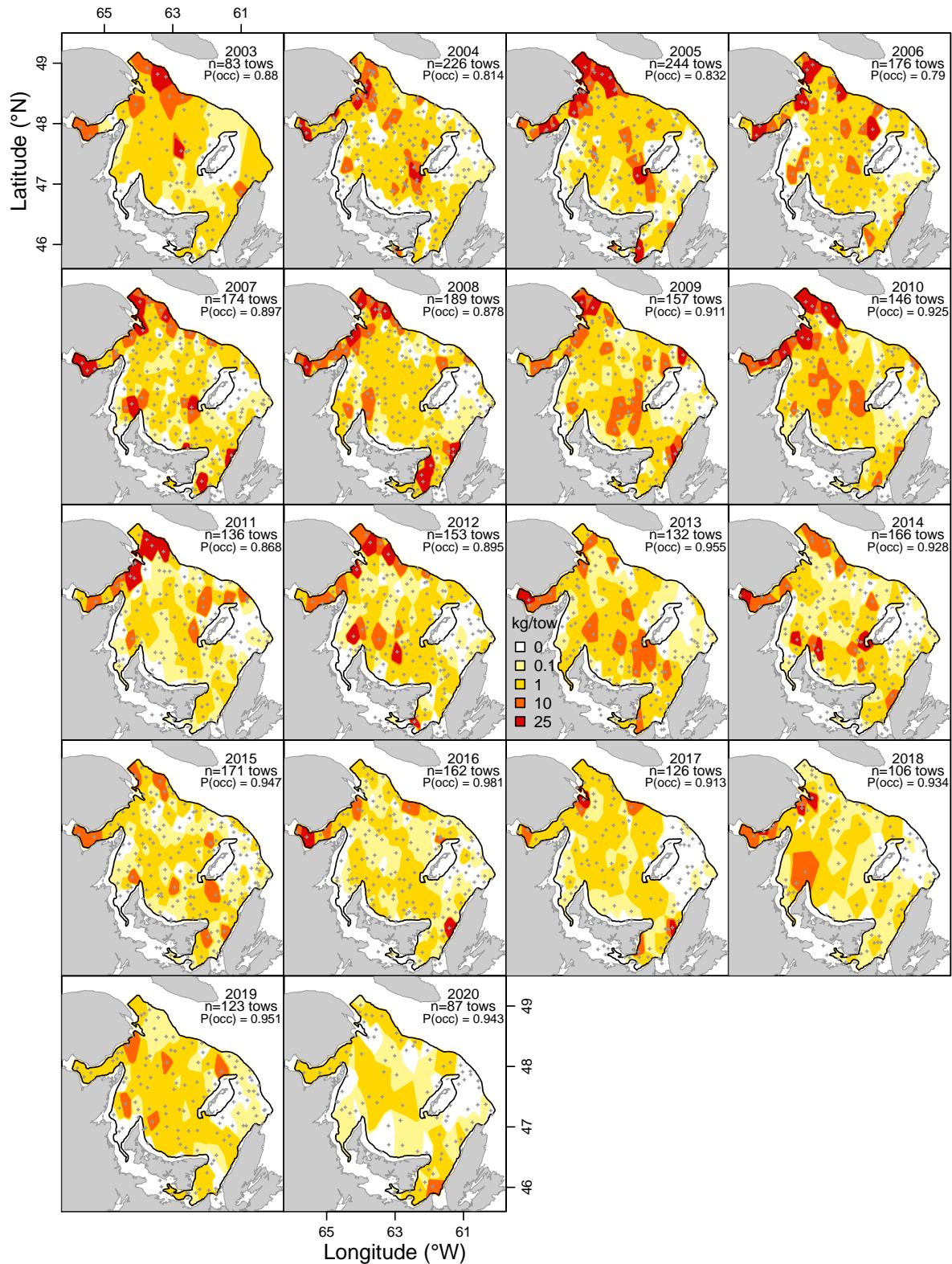


Figure 4.22C. IDW map for Decapod unidentified.

238 **4.23 Norwegian krill (Norwegian krill) - species code 2611**

239 Scientific name: [Meganyctiphanes norvegica](#)

240

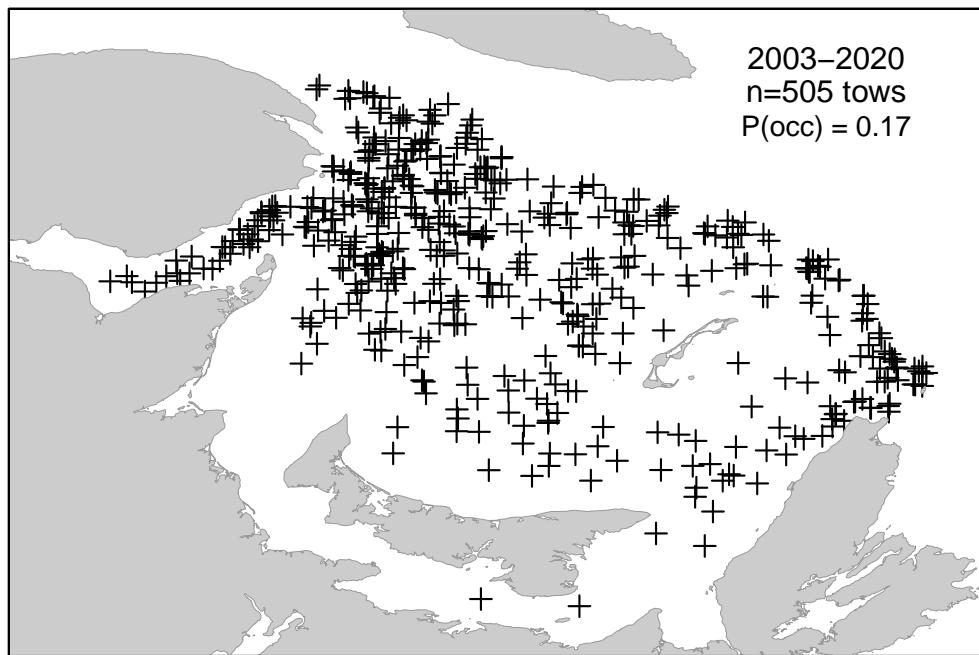


Figure 4.23A. Presence map for Norwegian krill.

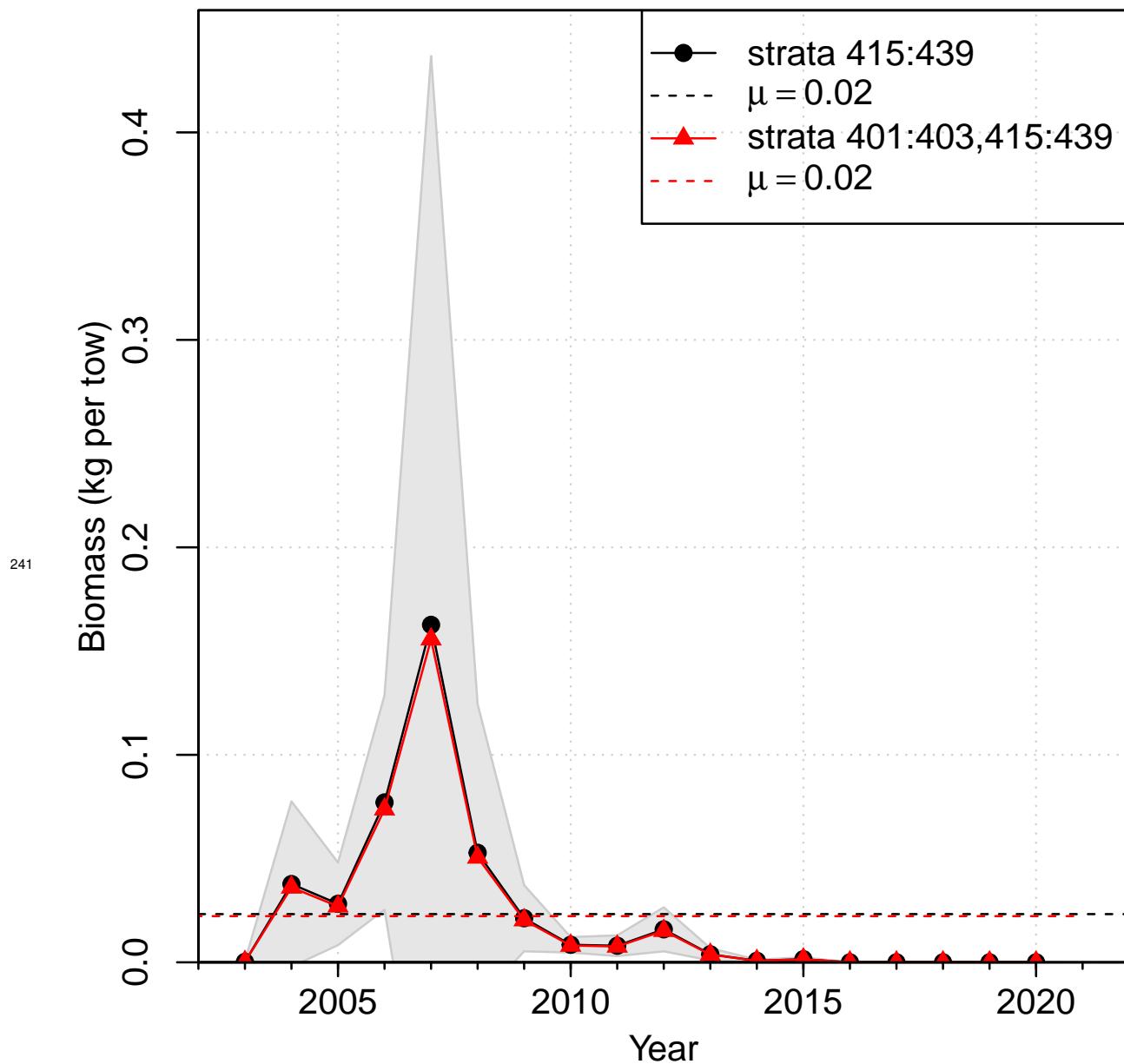


Figure 4.23B. RV index for Norwegian krill.

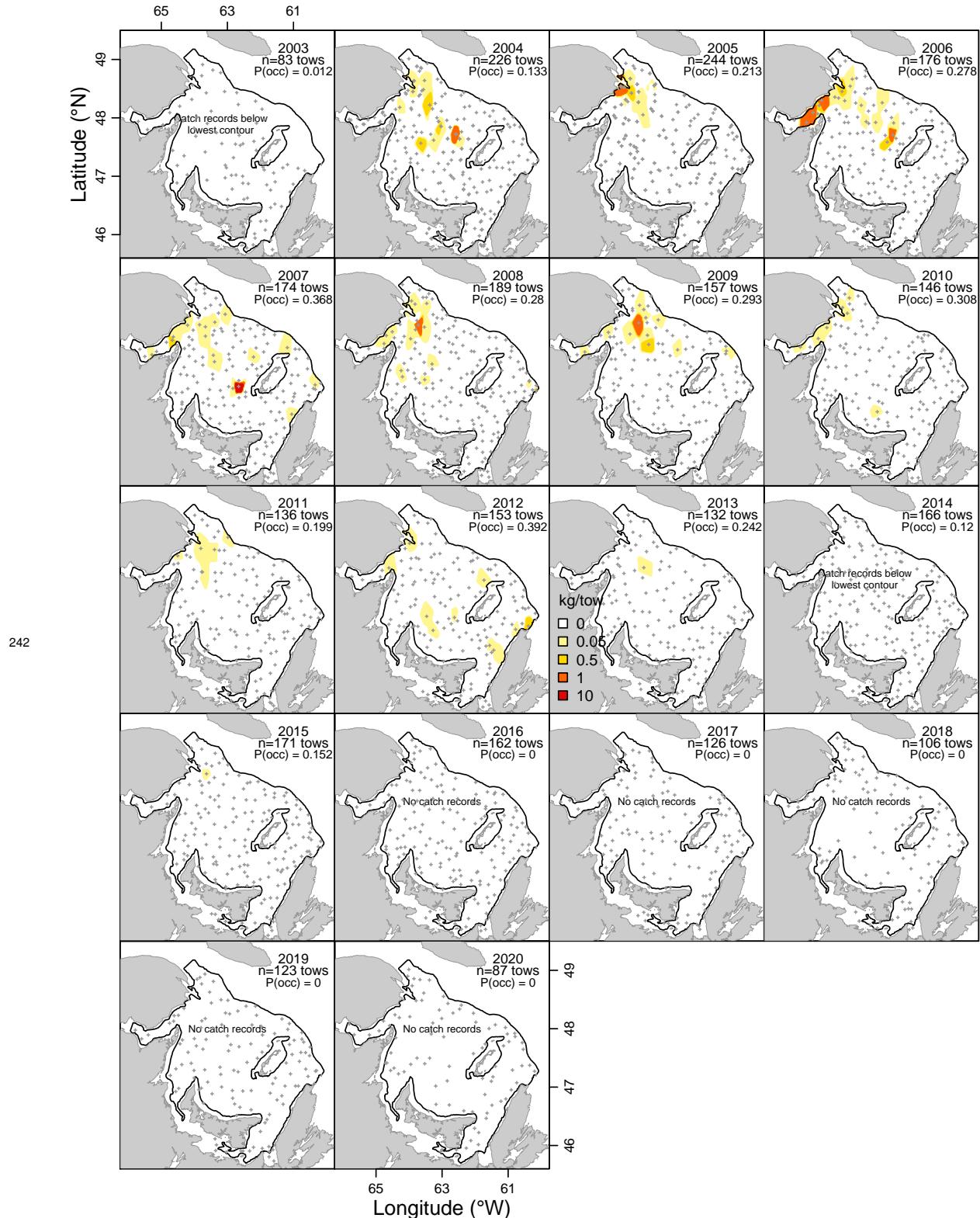


Figure 4.23C. IDW map for Norwegian krill.

<sup>243</sup> **4.24 Euphausia unidentified (Euphausia non-spécifié) - species code 2612**

<sup>244</sup> Scientific name: [Euphausia](#)

<sup>245</sup>

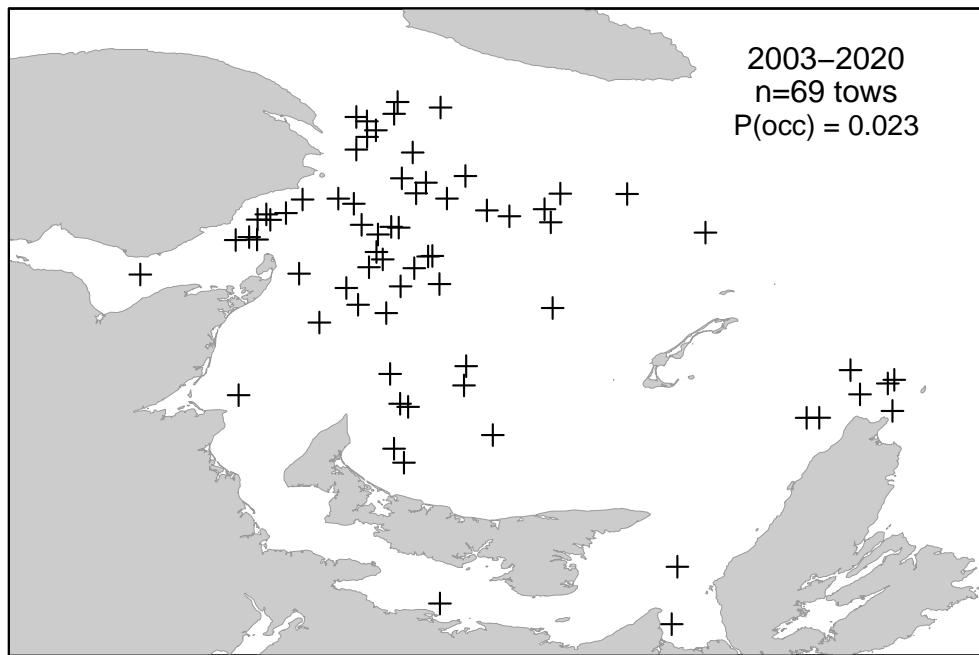


Figure 4.24A. Presence map for Euphausia unidentified.

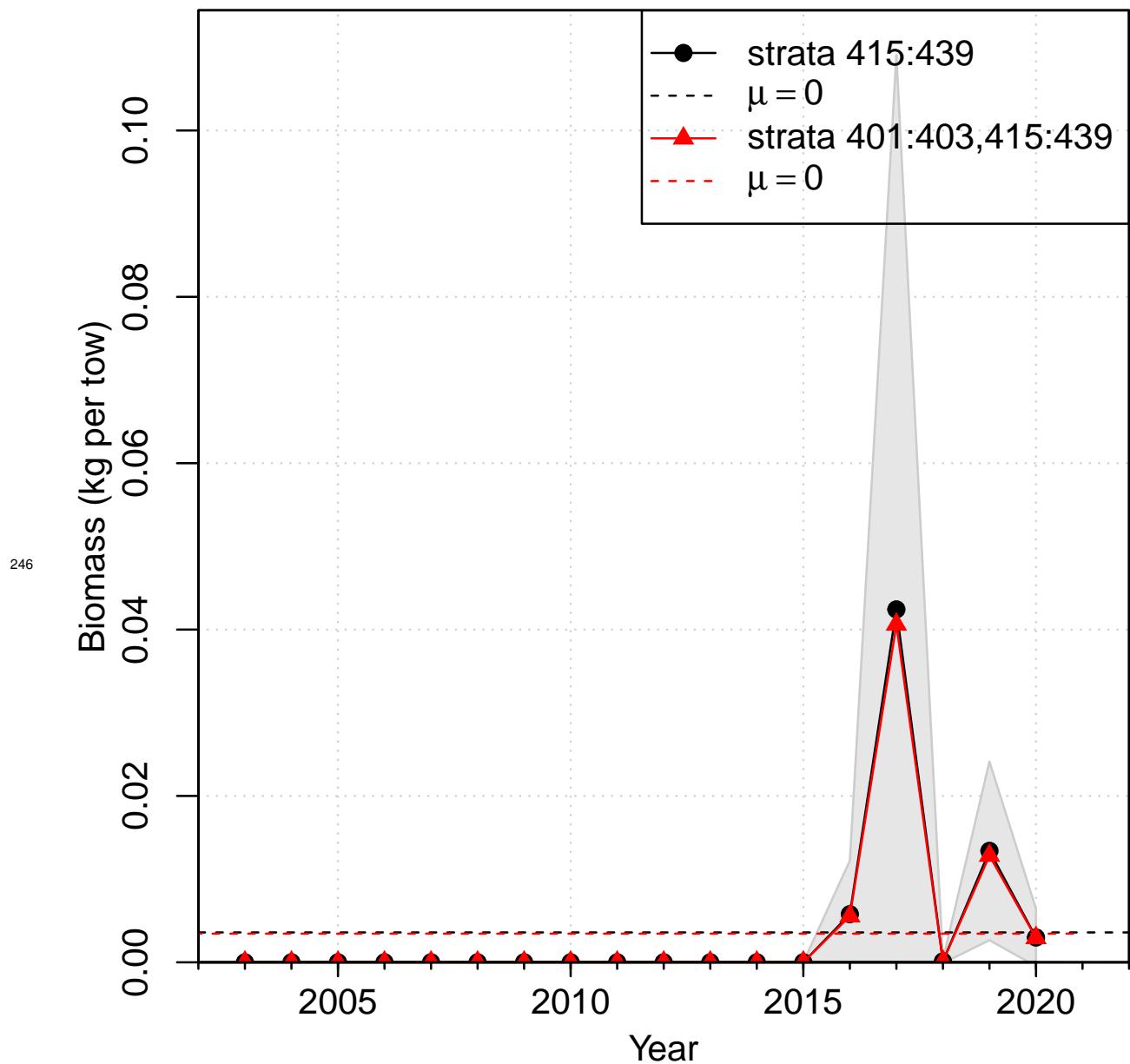


Figure 4.24B. RV index for Euphausia unidentified.

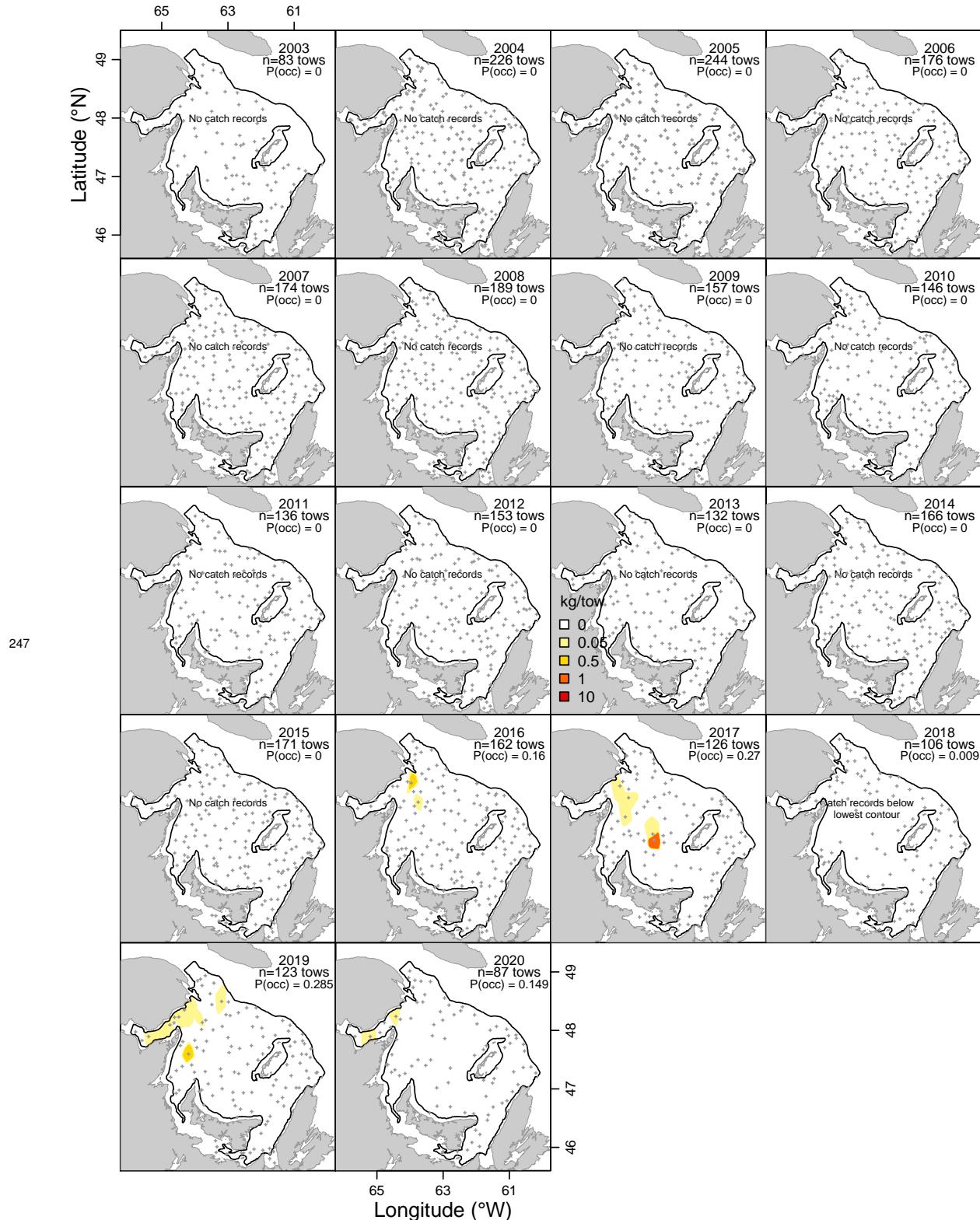


Figure 4.24C. IDW map for *Euphausia unidentified*.

<sup>248</sup> Squires, H.J. 1990. Decapod Crustacea of the Atlantic Coast of Canada. Can. Bull. Fish. Aquat.  
<sup>249</sup> Sci. 221: 532 p.