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Groundfish Surveys in the Northern Gulf of Mexico

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# Brown, White and Pink Shrimp Abundance Indices from SEAMAP Groundfish Surveys in the Northern Gulf of Mexico

Adam G. Pollack and David S. Hanisko

NOAA Fisheries, Southeast Fisheries Science Center,  
Population and Ecosystem Monitoring Division,  
Trawl and Plankton Branch, Pascagoula, MS

## Abstract

*Since 1972 the Southeast Fisheries Science Center Population and Ecosystem Monitoring Division and state partners have conducted groundfish surveys in the northern Gulf of Mexico (GOM) during the summer and fall under several sampling programs. In 1987, the summer and fall groundfish surveys were brought under the Southeast Area Monitoring and Assessment Program (SEAMAP). Data from this fisheries independent program were used to develop abundance indices for brown shrimp (*Farfantepenaeus aztecus*), white shrimp (*Litopenaeus setiferus*) and pink shrimp (*F. duorarum*). Trawl catches were evaluated for three areas: shrimp statistical zones 21-18, 17-11, and 10-2 to determine where sufficient catches of the three species were present for model development. Indices of abundance were produced for three size classes of each species in areas where sufficient data was available.*

## Introduction

The Southeast Fisheries Science Center (SEFSC) Population and Ecosystem Monitoring Division (PEMD) and state partners have conducted standardized groundfish surveys under the Southeast Area Monitoring and Assessment Program (SEAMAP) in the Gulf of Mexico (GOM) since 1987. SEAMAP surveys are a collaborative effort among federal, state and university programs, designed to collect, manage and distribute fishery independent data throughout the region. The primary objective of the trawl surveys is to collect data on the abundance and distribution of demersal organisms in the northern GOM. Surveys are conducted during summer and fall seasons. Prior to 1987, the summer survey was conducted under SEAMAP protocols; however, the fall survey operated independently of SEAMAP and dates back to 1972. The surveys, provides an important source of fisheries independent information on many commercially and recreationally important species throughout the GOM. The purpose of this document is to provide abundance indices for brown shrimp (*Farfantepenaeus aztecus*), white shrimp (*Litopenaeus setiferus*) and pink shrimp (*F. duorarum*).

## Methodology

### *Survey Design*

The survey methods and descriptions of the datasets used herein have been presented in detail by Nichols (2004) and Pollack and Ingram (2010). A change to the survey design was implemented between the summer and fall surveys of 2008. Prior to the fall of 2008, the survey design (i.e. 1987- summer of 2008) followed a stratified random station allocation with strata derived from

depth zones (5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-22, 22-25, 25-30, 30-35, 35-40, 40-45, 45-50 and 50-60 fathoms (fm)), shrimp statistical zones (SSZ) (between 88° and 97° W longitude, paired SSZ from west to east: 21-20, 19-18, 17-16, 15-13 and 12-10), and time of day (i.e. day or night). Survey methods prior to 1987 are presented in detail by Nichols (2004).

Starting in the fall of 2008 and continuing through present, station allocations are randomized within each SSZ with a weighting by spatial area of each SSZ. Other notable changes included a standardized 30 min tow and dropping the day/night stratification. The main purpose of these changes was to increase the sample effort of each survey and expand the survey into the waters off Florida. In 2014, randomized station allocation was modified to include a depth stratification of 5 - 20 fm and 20 – 60 fm within each SSZ (SEAMAP Trawl Work Group 2023).

### ***Data***

A total of 17,897 stations were sampled from 1987- 2022, with 9,170 and 8,727 stations sampled during the summer and fall surveys, respectively (Tables 1 and 2). Trawl data from PEMD were obtained from the PEMD database and combined with data from the Gulf States Marine Fisheries Commission (GSMFC) database, which contains data collected by state partners from Alabama, Florida, Louisiana, Mississippi and Texas.

### ***Data Caveats***

From 1987 – 2008 (summer), the area sampled was from Brownsville, TX to Mobile Bay, AL. Sampling rarely extended past Mobile Bay due to an increase in the number of hangs. During this time, tow time was dependent on how long it took to cover a full depth stratum (defined above). However, single tows never exceeded 55 min. Full details about this survey can be found in Nichols (2004).

Beginning in 2008, sampling was expanded into the eastern GOM, from Mobile Bay, AL to the Florida Keys. Other changes to the survey are outlined in the above survey design section, and in Pollack and Ingram (2010).

### ***Data Inclusions***

Data used in the abundance indices had to meet the following criteria:

- (1) No problems with tow (i.e. net torn, doors crossed, etc.)
- (2) Depths between 5 and 60 fm
- (3) Sampled with a 40 ft. shrimp trawl (Texas uses a 20 ft. shrimp trawl and data are not used)
- (4) Sampled between 1987 and 2022 (2008 – 2022 for pink shrimp)

### ***Generation of Catch by Length Category Datasets***

Species-specific datasets were generated to examine the catch of brown, white and pink shrimp in three size categories utilizing length data collected associated with catch data at SEAMAP trawl stations. Size categories of shrimp were designated as small, medium and large. The classifications were based on market categories of greater than 67 (small), 67 to 30 (medium) and less than 30 (large) shrimp tails per pound. Species specific length to weight conversions were used to convert the total length to weights in order to determine the total lengths belonging to each count per pound category (Stevens, 2023). Table 3 shows the breakdown for each species by size category.

To determine the number of catch by category for each station, the number of sub-sampled shrimp lengths associated with individual catch records were summed by size category, and the proportion of each category determined by dividing by the total number of length measurement. The proportions by size category were then used to extrapolate the total count of shrimp for the unmeasured fraction of shrimp catch at each stations.

Sub-sampled lengths were not recorded for a small fraction of catch records. The proportion of catch by size category for these records were estimated by pooling extrapolated counts from stations with catch to determine overall proportion by size category. To account for relationships of total length with season, region and depth, extrapolated counts of each size category were summed by these factors, and then divided by the total extrapolated counts for all size categories by the same factors. The proportions by each category were then used to determine the total fraction of each size category at each station without sub-sampled lengths.

The brown shrimp data set is specific to SSZ 21-8 and includes data from 1987 to 2022 for both the summer and fall seasons. It is based on 15,247 stations and 13,236 catch records. There were 136 catch records without recorded lengths. Extrapolated counts were summarized by season, region and depth zone to determine pooled proportions of small, medium and large shrimp:

Season: Summer or Fall

Region: SSZ 21-18, 17-13 and 11 - 8

Depth Zone: 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-22, 22-25, 25-30, 30-35, 35-40, 40-45, 45-50 and 50-60 fm

The white shrimp data set is specific to SSZ 21-11 and includes data from 1987 to 2022 for both the summer and fall seasons. It is based on 10,475 stations and 4,029 catch records. There were 61 catch records without recorded lengths. Extrapolated counts were summarized by season, region and depth zone to determine pooled proportions of small, medium and large shrimp:

Season: Summer or Fall

Region: SSZ 21-11

Depth Zone: 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-22 and 22-25 fm

The pink shrimp data set is specific to SSZ 11-2 and includes data from 2010 to 2022 for both the summer and fall seasons. It is based on 3,480 stations and 998 catch records. There were

zero catch records without recorded lengths. Therefore, extrapolated counts were not needed to estimate size categories for catch records without lengths.

### ***Index Construction***

Delta-lognormal modeling methods were used to estimate relative abundance indices for brown, pink and white shrimp (Pennington, 1983; Bradu and Mundlak, 1970). The main advantage of using this method is allowance for the probability of zero catch (Ortiz *et al.* 2000). The index computed by this method is a mathematical combination of yearly abundance estimates from two distinct generalized linear models: a binomial (logistic) model which describes proportion of positive abundance values (i.e. presence/absence) and a lognormal model which describes variability in only the nonzero abundance data (*cf.* Lo *et al.* 1992).

The delta-lognormal index of relative abundance ( $I_y$ ) was estimated as:

$$(1) \quad I_y = c_y p_y,$$

where  $c_y$  is the estimate of mean CPUE for positive catches only for year  $y$ , and  $p_y$  is the estimate of mean probability of occurrence during year  $y$ . Both  $c_y$  and  $p_y$  were estimated using generalized linear models. Data used to estimate abundance for positive catches ( $c$ ) and probability of occurrence ( $p$ ) were assumed to have a lognormal distribution and a binomial distribution, respectively, and modeled using the following equations:

$$(2) \quad \ln(c) = X\beta + \varepsilon$$

and

$$(3) \quad p = \frac{e^{X\beta + \varepsilon}}{1 + e^{X\beta + \varepsilon}},$$

respectively, where  $c$  is a vector of the positive catch data,  $p$  is a vector of the presence/absence data,  $X$  is the design matrix for main effects,  $\beta$  is the parameter vector for main effects, and  $\varepsilon$  is a vector of independent normally distributed errors with expectation zero and variance  $\sigma^2$ . Therefore,  $c_y$  and  $p_y$  were estimated as least-squares means for each year along with their corresponding standard errors,  $SE(c_y)$  and  $SE(p_y)$ , respectively. From these estimates,  $I_y$  was calculated, as in equation (1), and its variance calculated using the delta method approximation

$$(4) \quad V(I_y) \approx V(c_y)p_y^2 + c_y^2V(p_y).$$

A covariance term is not included in the variance estimator since there is no correlation between the estimator of the proportion positive and the mean CPUE given presence. The two estimators are derived independently and have been shown not to covary for a given year (Mary Christman, MCC Statistical Consulting LLC, unpublished).

The submodels of the delta-lognormal model were built using a backward selection procedure based on type 3 analyses with an inclusion level of significance of  $\alpha = 0.05$ . Binomial submodel

performance was evaluated using AIC, while the performance of the lognormal submodel was evaluated based on analyses of residual scatter and QQ plots in addition to AIC. Variables that could be included in the submodels were year, SSZ, time of day (day or night), and depth (continuous 5-60 fm). Individual values for year and SSZ varied according to the survey timeframe and geographical area being modeled (see Figure 1 for area breakdown).

Models were built for each year range, geographical area, and size class combination when enough data was available for analysis. Pre and post design change time series were modeled separately following the recommendations of the SEAMAP Trawl Work Group (2023) to account for any potential changes in catchability.

For brown shrimp, all three geographical areas were attempted, however for the 10-2 SSZ area; only data from SSZ 10-8 were used in the analysis due to the lack of positive catches in the other SSZs.

For white shrimp, only the 21-18 and 17-11 areas were modeled because of the lack of positive catches in the other SSZs. In addition, only stations occurring at less than 25 fm were considered for use in the model due to the lack of positive catches in the outer depth ranges of the SEAMAP Survey (SEAMAP Trawl Work Group 2023).

For pink shrimp, only the 10-2 area was considered for analysis because of the location of the primary pink shrimp fishing grounds in the eastern gulf. Even though pink shrimp are caught in the western gulf, information from commercial fishers seem to point to them being lumped with the overwhelming catches of brown shrimp. Following the recommendations of the SEAMAP Trawl Work Group (2023), the summer time series was started in 2010 due to the spatial coverage of the survey during the early years of the survey expansion. The fall time series was started in 2014 also because of the gaps in spatial coverage of the survey.

## **Results and Discussion**

### ***Brown Shrimp***

The nominal CPUE for brown shrimp is presented in Table 4 for the summer survey and Table 5 for the fall survey. The overall catches of brown shrimp from 1987-2022 are presented in Figure 2. Yearly distribution of brown shrimp in the summer and fall surveys can be found in Appendix Figures 1 and 2, respectively. Length distribution of brown shrimp caught during the summer and fall surveys area presented in Figure 3. A summary of the abundance indices for the summer survey and fall surveys for sampling iterations is presented in Table 6, which the individual abundance indices presented in Tables 7 – 32 and Figures 4 - 8.

### ***White Shrimp***

The nominal CPUE for white shrimp is presented in Table 33 for the summer survey and Table 34 for the fall survey. The overall catches of white shrimp from 1987-2022 are presented in Figure 9. Yearly distribution of white shrimp in the summer and fall surveys can be found in Appendix Figures 3 and 4, respectively. Length distribution of white shrimp caught during the summer and fall surveys area presented in Figure 10. A summary of the abundance indices for

the summer survey and fall surveys for sampling iterations is presented in Table 35, which the individual abundance indices presented in Tables 36 – 54 and Figures 11 - 14.

### **Pink Shrimp**

The nominal CPUE for pink shrimp is presented in Table 55 for the summer survey and Table 56 for the fall survey. The overall catches of pink shrimp from 1987-2022 are presented in Figure 15. Yearly distribution of pink shrimp in the summer and fall surveys can be found in Appendix Figures 5 and 6, respectively. Length distribution of pink shrimp caught during the summer and fall surveys area presented in Figure 16. A summary of the abundance indices for the summer survey and fall surveys for sampling iterations is presented in Table 57, which the individual abundance indices presented in Tables 58 – 63 and Figures 17 and 18.

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Table 1. Number of stations sampled by shrimp statistical zone for the SEAMAP Summer Groundfish Survey.

Year	Shrimp Statistical Zone															Total				
	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	
1987								28	61	6	20	19	25	20	16	25	28	19	267	
1988								18	48	5	4	3	19	24	14	25	28	23	211	
1989								23	30		3	18	25	7	15	20	29	24	194	
1990								68	11	20	15	23	16	20	23	24	20	240		
1991								46	12	24	13	23	22	24	18	23	26	231		
1992								1	45	2	20	24	20	25	12	31	26	20	226	
1993								46	10	19	17	24	19	14	29	24	22	22	224	
1994								61	6	17	22	25	17	20	22	26	22	22	238	
1995								44	10	16	18	22	23	13	27	26	21	21	220	
1996								46	14	12	19	22	18	17	21	26	25	25	220	
1997								44		12	16	22	23	10	28	26	26	26	207	
1998								36	2	14	21	25	18	14	22	36	17	20	205	
1999								44	7	20	19	20	23	13	25	32	20	20	223	
2000								45	2	19	15	19	27	8	29	31	21	21	216	
2001								36	7	18	18	13	3	10	9	17	21	21	152	
2002								44	11	14	21	27	19	15	25	29	22	22	227	
2003								44	9	10	8	2	17	20	22	26	23	23	181	
2004								39	11	18	17	20	25	21	19	25	21	21	216	
2005								32	10	9	11	16	21	5	28	22	27	27	181	
2006								45	11	21	12	20	23	17	23	31	18	221		
2007								41		7	15	22	23	7	29	32	21	197		
2008		1	8	11	6	11	8	11	44	24	19	26	23	21	16	24	21	28	302	
2009		36	23	29	15	16	18	24	67	25	20	36	39	46	50	33	29	23	529	
2010	31	26	21	26	10	12	14	13	22	5	19	16	21	33	34	27	27	19	376	
2011	11	24	22	20	29	2	15	11	8	16	7	14	17	23	29	29	18	21	13	329
2012	12	39	33	29	30	19	16	16	13	16	7	14	18	25	30	27	20	20	15	399
2013	9	27	28	23	19	8	11	9	7	14	5	12	14	22	21	22	16	17	12	296
2014	15	31	23	24	30	17	15	9	7	17	6	15	18	22	28	23	18	18	14	350
2015	9	32	29	22	27	22	18	10	8	16	7	15	18	21	28	27	19	20	13	361
2016	9	25	29	26	22	15	15	10	8	16	6	16	16	21	30	23	19	17	14	337
2017	10	28	19	28	14	15	14	6	10	17	7	14	13	23	26	24	19	21	14	322
2018	8	30	28	24	23	16	12	5	7	14	7	12	14	21	26	19	11	11	14	302

2019	11	31	23	21	15	5	15	8	9	14	3	12	13	20	27	22	16	20	12	297
2021	9	24	21	19	3		9	7	6	6	4	9	8	17	22	20	14	14	11	223
2022	6	23	21	20	24	2	11	9	6	11	5	9	8	15	20	21	15	15	9	250
Total	109	345	339	308	302	152	190	140	207	1235	264	517	576	747	800	662	769	838	670	9170

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Table 2. Number of stations sampled by shrimp statistical zone for the SEAMAP Fall Groundfish Survey.

Year	Shrimp Statistical Zone																					
	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	Total		
1987									13	23	15	14	16	17	15	15	15	18	3	164		
1988									8	28	7	22	17	18	26	19	21	31	20	217		
1989										44	12	19	17	22	20	17	22	25	26	224		
1990										52	14	12	23	22	19	18	22	19	27	228		
1991										46	6	24	14	20	25	24	19	25	22	225		
1992										34	7	23	14	25	18	17	27	30	18	213		
1993										72	10	19	17	26	18	16	25	28	18	249		
1994										50	9	16	21	25	20	21	23	24	20	229		
1995										40	10	17	18	24	19	14	26	30	19	217		
1996										45	9	18	19	17	28	13	25	29	24	227		
1997										44	10	17	20	26	19	18	23	22	24	223		
1998										44	10	22	14	34	11	15	24	29	22	225		
1999										43	10	17	18	29	18	12	28	29	22	226		
2000										43	10	14	22	20	26	12	30	25	21	223		
2001										44	10	17	19	26	20	14	27	28	23	228		
2002										1	51	10	13	22	22	23	14	26	30	21	233	
2003										1	76	9	16	21	24	22	20	23	25	23	260	
2004											43		11	18	17	27	14	24	30	21	205	
2005											45	11	20	16	33	18	14	23	24	27	231	
2006											1	46	7	22	14	18	28	13	23	32	19	223
2007											33	9	20	17	18	28	17	20	18	26	206	
2008			15	14	4	4	3	4	35	17	28	34	42	46	44	19	36	20	365			
2009		20	21	25	11	21	13	12	50	12	23	23	30	49	47	31	36	22	446			
2010		9	25	27	17	16	11	14	15	7	15	18	26	30	29	18	19	14	310			
2011							9	11	7	15	6	15	16	27	31	28	21	18	15	219		
2012	2	3	6	6	17	10	7	5	12	5	11	13	19	23	22	13	15	11	200			
2013	4	14	10	10	11	10	10	6	5	10	5	11	9	3	12	16	12	14	9	181		
2014	8	31	25	22	23	13	12	7	7	16	5	13	14	21	27	22	15	17	12	310		
2015	10	28	25	25	21	14	12	9	11	16	6	13	13	19	27	21	16	17	12	315		
2016	5	4	8	11	9	6	13	5	4	8	4	12	11	18	22	17	13	13	8	191		
2017	9	19	27	19	18	8	12	7	7	15	6	9	12	22	25	22	15	18	14	284		
2018	9	29	21	14	10	7	13	8	7	13	5	12	15	21	25	22	13	15	14	273		
2019	11	17	17	19	24	9	11	9	10	12	4	9	13	20	25	22	16	16	12	276		

2020	9	15	17	20	8	4	8	7	9	12	4	9	10	18	22	18	15	14	11	230
2021	6	23	17	17	14	2	12	5	6	12	4	11	12	19	25	22	16	16	12	251
2022	6	22	20	14	16	9	10	7	6	10	2	10		2	11	11	16	16	12	200
Total	77	204	219	238	226	131	173	115	138	1197	287	574	590	790	848	700	745	831	644	8727

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Table 3. Size categories of brown, white and pink shrimp based shrimp total lengths.

Species	Length Limits	Size Category	Market Category (tails/lb)
Brown	Total Length < 115.6	Small	> 67
	115.6 >= Total Length <= 151.8	Medium	30 to 67
	151.8 > Total Length	Large	< 30
Pink	Total Length < 109.8	Small	> 67
	109.8 >= Total Length <= 144.2	Medium	30 to 67
	144.2 > Total Length	Large	< 30
White	Total Length < 108.1	Small	> 67
	108.1 >= Total Length <= 144.3	Medium	30 to 67
	144.3 > Total Length	Large	< 30

Table 4. Brown shrimp nominal CPUE (number per trawl-hour) by shrimp statistical zone for the SEAMAP Summer Groundfish Survey.

Year	Shrimp Statistical Zone														Total					
	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	
1987									1.59	47.97	137.73	62.62	32.63	70.03	49.51	55.04	353.60	178.17	1360.36	183.40
1988									0.29	13.26	54.55	27.69	73.82	42.86	24.51	44.04	174.86	181.83	364.86	100.10
1989									0.54	95.47		4.61	30.71	76.96	46.54	294.64	495.64	575.60	692.65	274.95
1990									41.78	87.82	51.85	80.75	51.78	23.25	98.27	820.82	584.53	1229.20	279.48	
1991									55.62	176.25	167.48	178.00	67.79	69.79	97.05	563.95	993.08	1473.84	379.84	
1992									0.00	14.82	39.23	30.68	21.52	43.84	13.66	15.52	186.89	652.01	101.62	124.15
1993									21.95	107.55	82.04	95.96	13.09	55.61	79.45	108.11	180.06	371.26	104.39	
1994									37.48	26.62	29.78	66.30	36.83	29.46	182.77	270.15	506.82	1224.43	233.39	
1995									59.62	121.31	105.82	136.89	59.30	90.65	145.67	702.17	682.08	788.98	302.45	
1996									24.19	164.49	151.74	46.49	73.00	28.55	173.32	565.51	68.48	231.16	139.19	
1997									42.25		18.20	55.94	20.77	17.79	68.78	249.45	156.71	432.31	129.59	
1998									72.68	6.52	86.89	41.11	84.18	27.18	278.23	600.10	559.31	593.61	266.47	
1999									155.62	36.76	135.41	97.25	57.94	60.03	185.45	689.81	566.35	576.79	284.82	
2000									122.22	21.11	441.68	183.08	126.96	61.76	471.94	364.57	729.54	911.78	355.88	
2001									153.33	99.80	88.43	63.81	57.83	53.04	157.97	476.96	157.04	708.18	218.97	
2002									90.79	35.00	51.08	94.00	35.66	80.36	690.41	714.92	219.70	631.53	255.74	
2003									316.49	375.59	337.87	276.74	0.86	70.87	109.72	1084.91	670.69	384.94	422.43	
2004									81.50	128.33	193.70	109.24	77.64	110.54	366.75	669.81	322.69	926.31	287.95	
2005									43.73	283.49	119.35	162.29	206.32	253.89	629.59	226.81	191.74	196.85	192.03	
2006									551.27	844.62	373.33	545.33	380.95	333.06	635.79	1030.29	781.04	585.20	601.86	
2007									176.69		241.44	61.11	117.67	202.22	339.52	485.37	428.65	654.86	309.71	
2008	0.00	0.00	0.00	0.00	0.18	1.46	0.97	121.73	96.58	80.11	311.62	102.67	384.96	1024.11	791.68	408.80	545.77	288.15		

2009	0.00	0.00	0.00	0.00	0.00	13.88	4.56	0.08	78.21	382.44	195.52	293.64	329.74	627.60	695.19	791.48	231.40	552.59	286.61	
2010	0.00	0.00	0.00	0.00	0.00	0.00	4.57	0.00	149.75	364.00	1051.80	415.40	397.01	258.41	201.51	553.50	534.85	1195.56	286.24	
2011	0.00	0.00	0.00	0.00	0.00	24.13	0.00	0.25	105.18	326.10	438.17	158.89	204.88	677.27	415.94	1479.97	870.53	624.84	311.93	
2012	0.00	0.00	0.06	0.00	0.19	0.10	0.00	0.00	1.83	230.38	708.29	717.32	370.00	412.00	192.12	469.82	258.09	908.10	410.63	209.55
2013	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.29	330.46	589.89	213.72	130.95	114.06	99.13	342.06	1045.60	214.94	62.28	152.84	
2014	0.00	0.00	0.00	0.00	0.00	0.00	31.78	0.00	141.06	525.87	68.06	169.79	238.42	130.51	187.68	266.05	360.58	37.16	99.81	
2015	0.00	0.06	0.00	0.00	0.00	0.00	0.44	0.00	0.00	150.50	321.73	560.17	425.40	236.00	590.57	371.29	544.07	469.91	327.87	211.20
2016	0.00	0.00	0.00	0.00	0.00	0.53	2.66	0.80	0.50	86.13	198.66	214.88	288.20	311.31	222.38	213.31	541.35	447.00	121.95	143.58
2017	0.00	0.00	0.00	0.00	1.06	0.00	1.99	10.17	229.92	155.94	395.60	242.10	208.84	264.79	232.40	214.59	468.30	595.64	165.63	
2018	0.00	0.00	0.00	0.00	0.00	2.82	95.02	2.29	133.74	472.71	312.29	259.71	134.67	174.13	356.66	681.06	491.12	83.72	136.71	
2019	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	91.00	244.42	62.67	105.61	297.53	82.47	260.36	1076.74	553.90	92.06	159.79	
2021	0.00	0.00	0.00	0.00	0.00	0.22	2.00	0.00	10.98	77.60	836.89	178.09	265.85	406.70	312.32	441.15	1699.77	2816.62	403.67	
2022	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	853.97	483.65	288.83	528.34	196.71	485.49	882.57	390.67	465.90	407.65	265.41	
Total	0.00	0.05	0.01	0.00	0.02	0.17	3.58	6.82	1.08	115.79	248.77	236.22	174.15	152.67	209.60	334.32	550.83	488.87	640.94	239.78

Table 5. Brown shrimp nominal CPUE (number per trawl-hour) shrimp statistical zone for the SEAMAP Fall Groundfish Survey.

Year	Shrimp Statistical Zone														Total						
	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21		
1987									1.04	20.35	67.68	121.94	68.13	64.97	29.25	32.86	41.55	28.49	0.00	45.53	
1988									0.00	15.00	67.60	58.33	77.07	21.42	9.98	25.23	35.05	52.76	32.21	35.15	
1989									98.80	92.49	49.99	89.94	64.63	71.32	31.46	66.76	70.41	47.11	70.41		
1990									43.22	138.35	42.37	96.69	130.98	38.74	69.73	90.51	90.90	63.76	75.57		
1991									61.87	51.34	121.45	83.75	91.41	72.21	88.00	144.80	170.12	44.23	93.17		
1992									59.68	83.60	72.64	105.90	105.35	44.54	39.89	53.91	78.35	54.47	68.86		
1993									67.75	136.10	18.88	203.66	57.21	40.45	21.61	81.65	121.61	28.80	74.64		
1994									30.89	70.87	43.65	94.62	87.12	79.17	48.37	134.13	95.98	58.51	70.76		
1995									41.14	70.25	73.89	234.14	187.28	36.07	48.98	106.65	70.32	150.56	98.74		
1996									32.53	108.20	127.95	105.89	90.49	33.81	16.54	32.97	65.83	101.94	64.46		
1997									64.40	68.92	21.62	123.75	85.81	22.22	51.75	97.36	113.98	102.78	76.97		
1998									42.72	155.40	35.82	48.01	59.31	46.53	64.98	89.65	93.11	66.22	65.36		
1999									82.75	178.61	314.46	60.73	102.64	55.02	41.00	67.63	50.48	54.22	92.00		
2000									33.93	98.00	150.41	79.04	90.20	27.75	30.71	107.95	137.40	246.40	94.28		
2001									50.07	89.93	150.14	47.55	78.16	56.50	87.04	76.25	103.05	121.91	81.96		
2002									559.25	103.06	140.98	123.82	101.69	40.66	101.75	44.26	82.31	75.12	65.76	88.85	
2003									5.73	56.81	63.11	71.14	80.26	83.64	32.02	60.90	70.63	125.11	106.07	72.45	
2004									23.60		220.89	107.16	41.54	72.01	76.48	64.97	86.68	186.09	83.72		
2005									65.48	301.13	245.75	89.01	77.90	59.71	98.68	108.44	149.07	111.21	115.58		
2006									30.77	85.08	465.30	221.42	62.44	71.97	96.30	114.23	105.34	183.64	245.05	140.71	
2007									112.03	72.67	142.12	69.66	36.22	84.74	47.95	71.03	151.27	136.89	96.70		
2008		0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.75	500.10	479.19	207.04	142.74	154.31	90.86	146.01	124.84	225.03	162.89		
2009	0.00	0.00	0.00	0.00	0.00	39.23	0.65	195.60	103.86	150.83	129.53	115.54	152.77	133.88	186.91	233.54	374.45	129.32			

2010	0.00	0.24	0.07	0.00	0.00	3.27	0.29	224.13	103.70	83.63	122.95	250.37	196.25	101.25	205.60	227.76	416.09	118.68		
2011						0.00	9.06	0.00	80.40	301.09	148.28	188.82	198.87	65.69	167.40	159.53	164.02	141.52	131.85	
2012	0.00	0.00	0.00	0.00	0.00	2.99	0.00	5.60	184.23	42.80	44.00	136.53	173.99	158.12	181.07	113.91	235.96	291.91	119.49	
2013	0.00	0.00	0.00	0.00	0.00	0.00	38.27	0.40	155.04	162.40	65.52	89.32	76.95	77.93	68.32	147.04	126.81	287.89	69.11	
2014	0.00	0.00	0.00	0.09	0.00	0.00	6.64	17.43	0.86	99.13	244.37	200.60	160.38	191.57	186.67	155.47	121.56	163.81	257.48	90.49
2015	0.00	0.00	0.00	0.00	0.09	0.00	4.83	3.54	0.00	88.91	675.61	245.83	170.37	105.93	130.33	158.13	229.76	126.34	324.10	93.79
2016	0.00	0.00	0.00	0.00	0.00	0.00	6.28	8.78	0.00	21.00	142.81	230.46	168.86	111.61	109.17	104.17	58.24	109.84	116.87	77.43
2017	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00	120.93	128.00	120.95	409.43	152.96	65.16	179.86	66.70	182.73	295.05	91.43
2018	0.00	0.00	0.00	0.00	0.00	0.00	7.98	3.75	8.84	151.88	585.98	203.87	113.63	124.96	65.29	76.30	188.72	133.89	204.83	82.47
2019	0.00	0.00	0.00	0.00	0.00	0.00	8.36	4.89	0.80	110.49	140.00	104.22	136.45	104.59	93.16	83.43	98.01	182.23	247.51	66.86
2020	0.00	0.00	0.00	0.00	0.00	0.00	7.25	7.14	0.00	151.50	64.18	46.40	123.39	217.22	169.39	157.41	301.10	188.46	435.24	114.12
2021	0.00	0.00	0.00	0.00	0.00	0.00	1.50	1.60	1.00	126.27	306.95	133.80	352.29	92.22	108.82	136.40	212.39	297.25	246.82	107.82
2022	0.00	0.00	0.00	0.00	0.00	0.00	1.14	0.00	107.29	31.00	110.60		139.99	170.07	33.64	172.05	316.34	236.74	77.12	
Total	0.00	0.00	0.00	0.03	0.02	0.00	3.07	10.55	5.31	73.03	171.33	139.76	126.61	108.97	89.94	90.81	109.80	129.53	154.57	92.69

Table 6. Summary of brown shrimp abundance indices calculated from the SEAMAP Summer and Fall Groundfish Surveys. Indices are provided for each season, year range, and area as defined by the shrimp statistical zones that it encompasses.

Species	Season	Year	Area	Size Class	Final Model		Tables	Figures
					Binomial Submodel	Lognormal Submodel		
Brown shrimp	Summer	1987-2008	SZ1711	Large	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	7	4A
Brown shrimp	Summer	1987-2008	SZ1711	Medium	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	8	4B
Brown shrimp	Summer	1987-2008	SZ1711	Small	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	9	4C
Brown shrimp	Summer	1987-2008	SZ2118	Large	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	10	5A
Brown shrimp	Summer	1987-2008	SZ2118	Medium	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	11	5B
Brown shrimp	Summer	1987-2008	SZ2118	Small	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	12	5C
Brown shrimp	Summer	2009-2022	SZ1008	Large	No model ran – low encounters / catch		-	-
Brown shrimp	Summer	2009-2022	SZ1008	Medium	No model ran – low encounters / catch		-	-
Brown shrimp	Summer	2009-2022	SZ1008	Small	No model ran – low encounters / catch		-	-
Brown shrimp	Summer	2009-2022	SZ1711	Large	Year + TOD + Depth	Year + SZ + Depth	13	4A
Brown shrimp	Summer	2009-2022	SZ1711	Medium	Year + TOD + Depth	Year + TOD + Depth	14	4B
Brown shrimp	Summer	2009-2022	SZ1711	Small	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	15	4C
Brown shrimp	Summer	2009-2022	SZ2118	Large	Year + TOD + Depth	Year + TOD + Depth	16	5A
Brown shrimp	Summer	2009-2022	SZ2118	Medium	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	17	5B
Brown shrimp	Summer	2009-2022	SZ2118	Small	Year + SZ + Depth	Year + TOD + SZ + Depth	18	5C
Brown shrimp	Fall	1987-2007	SZ1711	Large	Year + TOD + SZ + Depth	Year + TOD + Depth	19	6A
Brown shrimp	Fall	1987-2007	SZ1711	Medium	Year + TOD + SZ + Depth	Year + TOD + SZ	20	6B
Brown shrimp	Fall	1987-2007	SZ1711	Small	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	21	6C
Brown shrimp	Fall	1987-2007	SZ2118	Large	Year + TOD + Depth	Year + TOD + SZ + Depth	22	7A
Brown shrimp	Fall	1987-2007	SZ2118	Medium	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	23	7B
Brown shrimp	Fall	1987-2007	SZ2118	Small	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	24	7C
Brown shrimp	Fall	2008-2022	SZ1008	Large	Year + TOD + SZ + Depth	Year + TOD + Depth	25	8A
Brown shrimp	Fall	2008-2022	SZ1008	Medium	Year + TOD + SZ	Year	26	8B
Brown shrimp	Fall	2008-2022	SZ1008	Small	No model ran – low encounters / catch		-	-
Brown shrimp	Fall	2008-2022	SZ1711	Large	Year + Depth	Year + TOD + SZ + Depth	27	6A
Brown shrimp	Fall	2008-2022	SZ1711	Medium	Year + TOD + Depth	Year + TOD + Depth	28	6B
Brown shrimp	Fall	2008-2022	SZ1711	Small	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	29	6C
Brown shrimp	Fall	2008-2022	SZ2118	Large	year	Year + TOD + SZ + Depth	30	7A
Brown shrimp	Fall	2008-2022	SZ2118	Medium	Year + SZ + Depth	Year + TOD + SZ	31	7B
Brown shrimp	Fall	2008-2022	SZ2118	Small	Year + TOD + SZ + Depth	Year + TOD + SZ	32	7C

Table 7. Large (<= 30 count) brown shrimp abundance index for statistical zones 17-11 from the SEAMAP Summer Groundfish Survey, 1987-2008 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.43046	151	8.6716	0.66503	0.20267	0.44521	0.99337
1988	0.43689	103	6.5390	0.50148	0.24526	0.30927	0.81317
1989	0.34940	83	10.4132	0.79860	0.30650	0.43859	1.45412
1990	0.43137	153	11.1047	0.85163	0.19181	0.58230	1.24553
1991	0.46429	140	11.4019	0.87442	0.20168	0.58653	1.30364
1992	0.45588	136	6.8912	0.52849	0.21553	0.34510	0.80933
1993	0.37037	135	7.6510	0.58676	0.25480	0.35532	0.96895
1994	0.49324	148	10.1295	0.77684	0.18964	0.53341	1.13136
1995	0.49624	133	12.0808	0.92648	0.19592	0.62844	1.36587
1996	0.44275	131	8.1840	0.62764	0.21827	0.40768	0.96627
1997	0.40171	117	5.8905	0.45175	0.26462	0.26849	0.76009
1998	0.36207	116	4.2205	0.32367	0.27906	0.18717	0.55971
1999	0.37594	133	7.0595	0.54140	0.25557	0.32737	0.89535
2000	0.48819	127	11.2143	0.86003	0.20754	0.57036	1.29684
2001	0.52632	95	4.3166	0.33104	0.20774	0.21945	0.49937
2002	0.48529	136	8.6931	0.66668	0.20305	0.44599	0.99657
2003	0.54444	90	20.1418	1.54469	0.20369	1.03209	2.31188
2004	0.52308	130	20.8724	1.60072	0.19054	1.09721	2.33529
2005	0.37374	99	18.1513	1.39204	0.25274	0.84628	2.28975
2006	0.58333	132	42.2274	3.23845	0.16364	2.33960	4.48263
2007	0.60185	108	34.2841	2.62927	0.17799	1.84689	3.74308
2008	0.36306	157	16.7279	1.28288	0.23573	0.80573	2.04258

Table 8. Medium (31-67 count) brown shrimp abundance index for statistical zones 17-11 from the SEAMAP Summer Groundfish Survey, 1987-2008 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.58278	151	35.922	0.60144	0.18448	0.41715	0.86715
1988	0.47573	103	25.556	0.42787	0.24808	0.26245	0.69756
1989	0.62651	83	57.156	0.95694	0.23560	0.60118	1.52324
1990	0.55556	153	31.028	0.51950	0.18857	0.35746	0.75501
1991	0.56429	140	44.396	0.74331	0.19464	0.50545	1.09310
1992	0.43382	136	17.840	0.29869	0.23099	0.18931	0.47124
1993	0.39259	135	22.501	0.37673	0.24384	0.23296	0.60923
1994	0.50676	148	26.513	0.44389	0.20227	0.29740	0.66254
1995	0.57143	133	63.227	1.05860	0.19805	0.71508	1.56713
1996	0.46565	131	24.429	0.40900	0.22463	0.26243	0.63745
1997	0.49573	117	20.465	0.34263	0.22878	0.21810	0.53829
1998	0.62069	116	34.954	0.58523	0.20122	0.39290	0.87172
1999	0.61654	133	37.600	0.62954	0.18931	0.43254	0.91624
2000	0.69291	127	74.226	1.24275	0.18041	0.86884	1.77760
2001	0.66316	95	55.775	0.93383	0.21300	0.61278	1.42308
2002	0.66176	136	49.915	0.83571	0.17984	0.58491	1.19404
2003	0.76667	90	128.541	2.15213	0.19970	1.44911	3.19621
2004	0.59231	130	58.977	0.98743	0.19588	0.66984	1.45561
2005	0.62626	99	70.755	1.18464	0.21654	0.77207	1.81768
2006	0.75758	132	287.535	4.81413	0.16810	3.44763	6.72224
2007	0.64815	108	86.426	1.44701	0.20317	0.96779	2.16352
2008	0.48408	157	60.265	1.00900	0.20303	0.67502	1.50821

Table 9. Small (> 67 count) brown shrimp abundance index for statistical zones 17-11 from the SEAMAP Summer Groundfish Survey, 1987-2008 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.38411	151	12.150	0.32399	0.23721	0.20291	0.51732
1988	0.24272	103	4.008	0.10688	0.35917	0.05325	0.21452
1989	0.37349	83	19.099	0.50929	0.32243	0.27152	0.95527
1990	0.30719	153	9.264	0.24702	0.26690	0.14618	0.41742
1991	0.37857	140	20.804	0.55475	0.24711	0.34091	0.90274
1992	0.20588	136	2.729	0.07277	0.34550	0.03718	0.14243
1993	0.29630	135	19.625	0.52330	0.28759	0.29778	0.91960
1994	0.30405	148	9.106	0.24281	0.27102	0.14257	0.41354
1995	0.44361	133	26.905	0.71743	0.23150	0.45428	1.13301
1996	0.34351	131	19.795	0.52785	0.26965	0.31073	0.89666
1997	0.39316	117	15.956	0.42547	0.26189	0.25419	0.71216
1998	0.51724	116	35.497	0.94653	0.22510	0.60678	1.47653
1999	0.48120	133	45.589	1.21563	0.22069	0.78593	1.88025
2000	0.53543	127	54.135	1.44352	0.21061	0.95164	2.18965
2001	0.57895	95	22.325	0.59529	0.23480	0.37456	0.94611
2002	0.43382	136	19.710	0.52557	0.23139	0.33286	0.82984
2003	0.58889	90	82.096	2.18912	0.23703	1.37149	3.49419
2004	0.39231	130	32.203	0.85869	0.25039	0.52438	1.40613
2005	0.64646	99	70.022	1.86714	0.21624	1.21758	2.86324
2006	0.73485	132	182.006	4.85323	0.17309	3.44185	6.84336
2007	0.60185	108	63.722	1.69916	0.21256	1.11596	2.58716
2008	0.53503	157	58.300	1.55457	0.19537	1.05560	2.28940

Table 10. Large (<= 30 count) brown shrimp abundance index for statistical zones 21-18 from the SEAMAP Summer Groundfish Survey, 1987-2008 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.35227	88	5.3946	0.26772	0.39183	0.12573	0.57009
1988	0.41111	90	3.0566	0.15169	0.32939	0.07984	0.28823
1989	0.54545	88	14.4263	0.71595	0.24524	0.44154	1.16090
1990	0.56322	87	20.7069	1.02764	0.22469	0.65930	1.60179
1991	0.69231	91	47.5238	2.35852	0.16955	1.68426	3.30269
1992	0.53933	89	12.9759	0.64397	0.24266	0.39912	1.03904
1993	0.41573	89	5.0507	0.25066	0.33077	0.13158	0.47748
1994	0.45556	90	12.6941	0.62999	0.31045	0.34345	1.15559
1995	0.56322	87	18.8139	0.93370	0.22770	0.59556	1.46383
1996	0.44944	89	6.0658	0.30104	0.29669	0.16840	0.53815
1997	0.45556	90	5.9116	0.29338	0.29563	0.16444	0.52342
1998	0.61798	89	13.5003	0.66999	0.20269	0.44852	1.00083
1999	0.63333	90	20.9659	1.04050	0.19877	0.70189	1.54248
2000	0.53933	89	25.4409	1.26258	0.23977	0.78687	2.02589
2001	0.70175	57	35.2794	1.75085	0.20379	1.16961	2.62094
2002	0.63736	91	21.2240	1.05331	0.19250	0.71923	1.54256
2003	0.58242	91	16.0998	0.79900	0.21900	0.51826	1.23182
2004	0.67442	86	39.5297	1.96179	0.17547	1.38481	2.77915
2005	0.50000	82	14.0864	0.69908	0.25319	0.42464	1.15089
2006	0.67416	89	53.8614	2.67304	0.17922	1.87312	3.81456
2007	0.57303	89	20.2759	1.00625	0.22879	0.64049	1.58090
2008	0.50562	89	30.4130	1.50934	0.25940	0.90600	2.51446

Table 11. Medium (31-67 count) brown shrimp abundance index for statistical zones 21-18 from the SEAMAP Summer Groundfish Survey, 1987-2008 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.63636	88	41.278	0.29418	0.23480	0.18510	0.46755
1988	0.57778	90	33.496	0.23871	0.24626	0.14693	0.38782
1989	0.76136	88	151.985	1.08315	0.20945	0.71567	1.63932
1990	0.82759	87	211.012	1.50382	0.19967	1.01265	2.23324
1991	0.76923	91	258.210	1.84019	0.20394	1.22892	2.75551
1992	0.59551	89	28.375	0.20222	0.24358	0.12511	0.32686
1993	0.70787	89	60.057	0.42801	0.21843	0.27793	0.65913
1994	0.80000	90	86.370	0.61554	0.20065	0.41371	0.91583
1995	0.80460	87	201.954	1.43927	0.20414	0.96081	2.15598
1996	0.68539	89	34.891	0.24866	0.22172	0.16045	0.38537
1997	0.77778	90	42.924	0.30591	0.20545	0.20369	0.45942
1998	0.79775	89	101.681	0.72465	0.20306	0.48476	1.08325
1999	0.85556	90	209.733	1.49470	0.19328	1.01908	2.19231
2000	0.87640	89	231.830	1.65218	0.19197	1.12932	2.41712
2001	0.85965	57	208.725	1.48752	0.23765	0.93083	2.37715
2002	0.79121	91	163.976	1.16861	0.20164	0.78391	1.74210
2003	0.67033	91	71.751	0.51135	0.22258	0.32940	0.79380
2004	0.83721	86	214.781	1.53068	0.19961	1.03085	2.27287
2005	0.69512	82	72.864	0.51928	0.23055	0.32941	0.81859
2006	0.84270	89	344.847	2.45762	0.19577	1.66750	3.62214
2007	0.78652	89	155.455	1.10788	0.20565	0.73743	1.66444
2008	0.76404	89	160.785	1.14587	0.20810	0.75909	1.72972

Table 12. Small (> 67 count) brown shrimp abundance index for statistical zones 21-18 from the SEAMAP Summer Groundfish Survey, 1987-2008 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.60227	88	153.669	0.64208	0.27464	0.37443	1.10108
1988	0.51111	90	80.390	0.33590	0.30110	0.18635	0.60547
1989	0.61364	88	157.539	0.65825	0.26870	0.38820	1.11617
1990	0.71264	87	169.936	0.71005	0.24629	0.43702	1.15366
1991	0.60440	91	230.909	0.96482	0.26575	0.57219	1.62686
1992	0.49438	89	30.804	0.12871	0.31221	0.06994	0.23687
1993	0.66292	89	140.131	0.58552	0.25805	0.35237	0.97293
1994	0.56667	90	103.792	0.43368	0.28043	0.25014	0.75189
1995	0.72414	87	355.589	1.48578	0.24602	0.91495	2.41274
1996	0.60674	89	82.249	0.34367	0.26999	0.20218	0.58416
1997	0.74444	90	215.692	0.90124	0.23645	0.56526	1.43692
1998	0.74157	89	321.880	1.34493	0.23674	0.84307	2.14554
1999	0.75556	90	494.698	2.06703	0.23332	1.30427	3.27586
2000	0.79775	89	362.223	1.51350	0.22768	0.96542	2.37274
2001	0.61404	57	163.677	0.68390	0.32950	0.35986	1.29973
2002	0.74725	91	331.567	1.38541	0.23339	0.87406	2.19589
2003	0.65934	91	239.858	1.00222	0.25241	0.60967	1.64750
2004	0.79070	86	403.523	1.68607	0.23173	1.06715	2.66393
2005	0.60976	82	110.660	0.46238	0.28587	0.26397	0.80992
2006	0.78652	89	511.106	2.13559	0.22806	1.36124	3.35041
2007	0.73034	89	358.485	1.49788	0.24148	0.93046	2.41133
2008	0.76404	89	246.841	1.03139	0.23245	0.65189	1.63184

Table 13. Large (<= 30 count) brown shrimp abundance index for statistical zones 17-11 from the SEAMAP Summer Groundfish Survey, 2009-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2009	0.56652	233	64.5303	1.32671	0.14820	0.98799	1.78157
2010	0.46552	116	62.7045	1.28918	0.24219	0.79972	2.07820
2011	0.55660	106	47.6644	0.97996	0.21608	0.63923	1.50231
2012	0.70000	110	62.7342	1.28979	0.17421	0.91271	1.82265
2013	0.61364	88	62.1463	1.27770	0.23213	0.80805	2.02030
2014	0.56604	106	35.1552	0.72277	0.21894	0.46887	1.11417
2015	0.65714	105	55.6207	1.14354	0.18395	0.79396	1.64703
2016	0.59048	105	44.5565	0.91606	0.22729	0.58477	1.43503
2017	0.65000	100	29.9418	0.61559	0.18614	0.42559	0.89041
2018	0.58511	94	37.4886	0.77075	0.23762	0.48234	1.23162
2019	0.50562	89	46.4882	0.95578	0.30748	0.52395	1.74351
2021	0.50000	66	24.3769	0.50118	0.33570	0.26071	0.96345
2022	0.51471	68	58.9017	1.21099	0.30365	0.66863	2.19330

Table 14. Medium (31-67 count) brown shrimp abundance index for statistical zones 17-11 from the SEAMAP Summer Groundfish Survey, 2009-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2009	0.75966	233	196.777	1.10590	0.15501	0.81259	1.50508
2010	0.62931	116	270.744	1.52160	0.22681	0.97222	2.38143
2011	0.66038	106	174.354	0.97989	0.23094	0.62113	1.54585
2012	0.86364	110	235.792	1.32517	0.19677	0.89739	1.95685
2013	0.69318	88	97.131	0.54588	0.24514	0.33672	0.88496
2014	0.71698	106	111.519	0.62675	0.22182	0.40432	0.97153
2015	0.88571	105	219.287	1.23241	0.19781	0.83289	1.82358
2016	0.65714	105	136.308	0.76606	0.23345	0.48326	1.21438
2017	0.79000	100	210.082	1.18068	0.21487	0.77197	1.80576
2018	0.79787	94	191.168	1.07438	0.21964	0.69602	1.65842
2019	0.65169	89	90.417	0.50815	0.25140	0.30972	0.83372
2021	0.77273	66	121.008	0.68007	0.26231	0.40597	1.13923
2022	0.72059	68	258.546	1.45305	0.26901	0.85642	2.46532

Table 15. Small (> 67 count) brown shrimp abundance index for statistical zones 17-11 from the SEAMAP Summer Groundfish Survey, 2009-2022. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2009	0.63090	233	149.530	1.29221	0.16379	0.93327	1.78921
2010	0.50000	116	83.459	0.72124	0.25655	0.43530	1.19501
2011	0.50943	106	75.659	0.65383	0.26085	0.39140	1.09223
2012	0.64545	110	178.269	1.54057	0.21780	1.00159	2.36958
2013	0.47727	88	48.453	0.41872	0.29227	0.23618	0.74234
2014	0.48113	106	93.831	0.81087	0.27050	0.47658	1.37964
2015	0.67619	105	155.821	1.34658	0.21724	0.87643	2.06895
2016	0.51429	105	68.471	0.59171	0.25614	0.35740	0.97964
2017	0.75000	100	138.883	1.20021	0.20933	0.79319	1.81608
2018	0.59574	94	82.119	0.70965	0.24725	0.43598	1.15513
2019	0.40449	89	49.658	0.42914	0.32031	0.22969	0.80178
2021	0.74242	66	194.848	1.68384	0.25542	1.01846	2.78394
2022	0.66176	68	185.310	1.60142	0.27226	0.93808	2.73380

Table 16. Large (<= 30 count) brown shrimp abundance index for statistical zones 21-18 from the SEAMAP Summer Groundfish Survey, 2009-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2009	0.66667	135	56.715	0.84771	0.17880	0.59451	1.20873
2010	0.77570	107	75.702	1.13149	0.18095	0.79022	1.62016
2011	0.88889	81	127.799	1.91017	0.17745	1.34319	2.71648
2012	0.79268	82	99.419	1.48599	0.19636	1.00709	2.19263
2013	0.64179	67	39.438	0.58946	0.27455	0.34380	1.01066
2014	0.61644	73	25.173	0.37626	0.26093	0.22520	0.62864
2015	0.69620	79	34.177	0.51083	0.22792	0.32569	0.80121
2016	0.65753	73	53.201	0.79518	0.24764	0.48816	1.29532
2017	0.73077	78	43.335	0.64772	0.21644	0.42222	0.99366
2018	0.76364	55	62.015	0.92692	0.24078	0.57656	1.49020
2019	0.48571	70	22.610	0.33795	0.39253	0.15851	0.72053
2021	0.57627	59	110.421	1.65044	0.31398	0.89386	3.04740
2022	0.61667	60	119.750	1.78987	0.27606	1.04096	3.07760

Table 17. Medium (31-67 count) brown shrimp abundance index for statistical zones 21-18 from the SEAMAP Summer Groundfish Survey, 2009-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2009	0.82222	135	267.301	0.89402	0.18768	0.61623	1.29704
2010	0.85047	107	300.570	1.00529	0.20221	0.67362	1.50027
2011	0.91358	81	578.035	1.93331	0.21908	1.25383	2.98101
2012	0.87805	82	330.068	1.10395	0.22272	0.71094	1.71423
2013	0.80597	67	124.800	0.41741	0.25440	0.25296	0.68877
2014	0.73973	73	49.209	0.16458	0.25881	0.09891	0.27388
2015	0.83544	79	239.863	0.80225	0.23226	0.50724	1.26884
2016	0.73973	73	162.530	0.54360	0.25781	0.32730	0.90285
2017	0.83333	78	242.585	0.81135	0.23415	0.51114	1.28791
2018	0.90909	55	261.489	0.87458	0.26009	0.52430	1.45889
2019	0.75714	70	105.133	0.35163	0.25863	0.21138	0.58493
2021	0.79661	59	846.844	2.83237	0.27207	1.65974	4.83349
2022	0.80000	60	378.415	1.26565	0.26991	0.74470	2.15103

Table 18. Small (> 67 count) brown shrimp abundance index for statistical zones 21-18 from the SEAMAP Summer Groundfish Survey, 2009-2022. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2009	0.73333	135	275.246	0.94857	0.21768	0.61685	1.45870
2010	0.68224	107	234.381	0.80774	0.24063	0.50257	1.29821
2011	0.69136	81	285.868	0.98518	0.27741	0.57149	1.69832
2012	0.70732	82	314.017	1.08219	0.26051	0.64823	1.80667
2013	0.49254	67	297.346	1.02474	0.40526	0.46979	2.23522
2014	0.54795	73	129.813	0.44737	0.37941	0.21485	0.93155
2015	0.67089	79	470.131	1.62020	0.28095	0.93359	2.81179
2016	0.58904	73	106.716	0.36777	0.34861	0.18682	0.72400
2017	0.75641	78	283.172	0.97589	0.25479	0.59097	1.61151
2018	0.50909	55	127.483	0.43934	0.42842	0.19331	0.99852
2019	0.64286	70	246.521	0.84958	0.31746	0.45715	1.57890
2021	0.81356	59	838.202	2.88868	0.27690	1.67731	4.97490
2022	0.80000	60	163.292	0.56275	0.28572	0.32136	0.98546

Table 19. Large ( $\leq 30$  count) brown shrimp abundance index for statistical zones 17-11 from the SEAMAP Fall Groundfish Survey, 1987-2007. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.45000	100	9.5448	0.67549	0.28346	0.38739	1.17786
1988	0.46610	118	7.8468	0.55532	0.26018	0.33285	0.92650
1989	0.57463	134	11.3008	0.79976	0.17577	0.56422	1.13364
1990	0.44366	142	15.6875	1.11022	0.23708	0.69549	1.77224
1991	0.51852	135	19.0189	1.34598	0.21156	0.88570	2.04545
1992	0.47934	121	13.9628	0.98816	0.24884	0.60524	1.61334
1993	0.44444	162	14.0864	0.99690	0.20727	0.66148	1.50242
1994	0.43972	141	11.0149	0.77953	0.24730	0.47886	1.26898
1995	0.38281	128	14.9710	1.05951	0.30727	0.58104	1.93197
1996	0.41176	136	9.3246	0.65991	0.28066	0.38047	1.14460
1997	0.41912	136	8.8280	0.62477	0.27149	0.36651	1.06501
1998	0.41481	135	13.6429	0.96552	0.26530	0.57310	1.62662
1999	0.34815	135	8.0359	0.56871	0.32862	0.29974	1.07904
2000	0.45185	135	15.4830	1.09574	0.24454	0.67667	1.77435
2001	0.32353	136	7.2181	0.51083	0.34461	0.26140	0.99825
2002	0.39007	141	12.4992	0.88457	0.28153	0.50915	1.53681
2003	0.46429	168	16.4149	1.16169	0.19997	0.78181	1.72617
2004	0.46552	116	18.1228	1.28256	0.27333	0.74977	2.19396
2005	0.39860	143	11.2547	0.79650	0.27584	0.46342	1.36899
2006	0.47407	135	31.3827	2.22098	0.22685	1.41896	3.47631
2007	0.41600	125	27.0925	1.91735	0.25909	1.15161	3.19227

Table 20. Medium (31-67 count) brown shrimp abundance index for statistical zones 17-11 from the SEAMAP Fall Groundfish Survey, 1987-2007 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.70000	100	29.1276	0.77592	0.18813	0.53435	1.12668
1988	0.41525	118	11.4703	0.30555	0.24117	0.18991	0.49160
1989	0.70896	134	43.6002	1.16145	0.15977	0.84546	1.59552
1990	0.64085	142	43.3644	1.15517	0.16644	0.82998	1.60777
1991	0.71111	135	41.8176	1.11396	0.15916	0.81188	1.52844
1992	0.71074	121	48.4309	1.29013	0.16781	0.92445	1.80045
1993	0.64815	162	34.0626	0.90738	0.15353	0.66867	1.23131
1994	0.65248	141	36.9299	0.98376	0.16485	0.70902	1.36496
1995	0.71094	128	53.4346	1.42342	0.16326	1.02910	1.96883
1996	0.67647	136	40.8989	1.08949	0.16431	0.78606	1.51004
1997	0.63235	136	35.7375	0.95199	0.17154	0.67720	1.33830
1998	0.65185	135	32.5025	0.86582	0.16824	0.61989	1.20931
1999	0.65926	135	40.7376	1.08519	0.16752	0.77804	1.51359
2000	0.57037	135	30.9695	0.82498	0.18454	0.57214	1.18957
2001	0.55882	136	39.1858	1.04385	0.18606	0.72178	1.50964
2002	0.64539	141	44.9566	1.19758	0.16631	0.86067	1.66637
2003	0.64286	168	34.5088	0.91926	0.15253	0.67876	1.24498
2004	0.62069	116	27.7078	0.73810	0.18827	0.50816	1.07207
2005	0.58042	143	29.6353	0.78944	0.17701	0.55559	1.12171
2006	0.65185	135	44.4612	1.18438	0.16819	0.84804	1.65411
2007	0.67200	125	44.7915	1.19318	0.17121	0.84932	1.67626

Table 21. Small (> 67 count) brown shrimp abundance index for statistical zones 17-11 from the SEAMAP Fall Groundfish Survey, 1987-2007. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.40000	100	11.1966	0.39327	0.27922	0.22735	0.68027
1988	0.24576	118	6.3553	0.22322	0.33018	0.11731	0.42476
1989	0.46269	134	21.0290	0.73862	0.21008	0.48743	1.11926
1990	0.39437	142	21.3144	0.74864	0.22920	0.47614	1.17711
1991	0.48148	135	27.6510	0.97121	0.19969	0.65398	1.44233
1992	0.59504	121	32.3474	1.13617	0.18425	0.78839	1.63737
1993	0.37654	162	22.4962	0.79016	0.21650	0.51501	1.21231
1994	0.40426	141	21.3965	0.75153	0.22207	0.48459	1.16551
1995	0.48438	128	25.1505	0.88338	0.20951	0.58361	1.33713
1996	0.38971	136	18.1574	0.63776	0.23088	0.40431	1.00600
1997	0.47059	136	17.2977	0.60756	0.20694	0.40339	0.91506
1998	0.55556	135	22.0737	0.77531	0.18633	0.53581	1.12188
1999	0.51111	135	40.1797	1.41127	0.19596	0.95719	2.08075
2000	0.53333	135	28.2698	0.99294	0.18786	0.68417	1.44108
2001	0.56618	136	28.7022	1.00813	0.18082	0.70424	1.44315
2002	0.67376	141	57.9244	2.03453	0.15685	1.48954	2.77891
2003	0.46429	168	19.8752	0.69810	0.18402	0.48462	1.00561
2004	0.54310	116	40.5562	1.42449	0.19425	0.96939	2.09324
2005	0.74126	143	39.2100	1.37721	0.14781	1.02638	1.84795
2006	0.57778	135	61.7740	2.16974	0.17692	1.52730	3.08243
2007	0.63200	125	34.9266	1.22676	0.17515	0.86651	1.73678

Table 22. Large (<= 30 count) brown shrimp abundance index for statistical zones 21-18 from the SEAMAP Fall Groundfish Survey, 1987-2007 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.41176	51	5.8494	0.22761	0.51213	0.08669	0.59756
1988	0.57143	91	10.1848	0.39630	0.27410	0.23134	0.67890
1989	0.51111	90	13.8131	0.53748	0.34171	0.27651	1.04476
1990	0.51163	86	15.8480	0.61667	0.31960	0.33050	1.15061
1991	0.62222	90	20.9211	0.81407	0.23111	0.51585	1.28468
1992	0.57609	92	19.2261	0.74811	0.27402	0.43677	1.28140
1993	0.48276	87	10.8647	0.42276	0.35214	0.21336	0.83765
1994	0.60227	88	23.8504	0.92805	0.24241	0.57546	1.49667
1995	0.58427	89	22.1244	0.86089	0.25726	0.51888	1.42833
1996	0.53846	91	12.7120	0.49464	0.31743	0.26617	0.91920
1997	0.49425	87	17.9493	0.69843	0.34637	0.35625	1.36930
1998	0.52222	90	26.2612	1.02186	0.31631	0.55103	1.89500
1999	0.60440	91	21.3700	0.83153	0.24927	0.50889	1.35874
2000	0.60227	88	26.8731	1.04567	0.24951	0.63964	1.70942
2001	0.54348	92	19.9587	0.77662	0.30796	0.42535	1.41797
2002	0.53846	91	17.4658	0.67962	0.31384	0.36817	1.25453
2003	0.74725	91	40.9132	1.59199	0.17114	1.13334	2.23623
2004	0.65169	89	36.3278	1.41356	0.21361	0.92648	2.15671
2005	0.59091	88	42.0813	1.63744	0.26277	0.97663	2.74537
2006	0.80460	87	94.4123	3.67371	0.15410	2.70419	4.99082
2007	0.70370	81	40.6821	1.58299	0.18858	1.08921	2.30064

Table 23. Medium (31-67 count) brown shrimp abundance index for statistical zones 21-18 from the SEAMAP Fall Groundfish Survey, 1987-2007 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.54902	51	13.2664	0.34330	0.28535	0.19618	0.60074
1988	0.59341	91	10.8421	0.28056	0.20611	0.18658	0.42189
1989	0.66667	90	16.8629	0.43636	0.18966	0.29961	0.63552
1990	0.68605	86	28.2509	0.73105	0.18798	0.50359	1.06123
1991	0.67778	90	32.5075	0.84120	0.18726	0.58029	1.21941
1992	0.76087	92	26.6348	0.68923	0.17192	0.48992	0.96962
1993	0.67816	87	26.3327	0.68141	0.19030	0.46728	0.99365
1994	0.73864	88	37.0152	0.95784	0.17740	0.67359	1.36205
1995	0.76404	89	48.6608	1.25919	0.17326	0.89272	1.77611
1996	0.78022	91	25.7845	0.66723	0.16898	0.47702	0.93328
1997	0.72414	87	39.3206	1.01750	0.18111	0.71038	1.45739
1998	0.72222	90	46.8542	1.21245	0.17963	0.84893	1.73162
1999	0.71429	91	27.6105	0.71448	0.18101	0.49892	1.02316
2000	0.81818	88	72.6897	1.88099	0.16586	1.35299	2.61503
2001	0.70652	92	53.2237	1.37727	0.18123	0.96134	1.97315
2002	0.68132	91	31.2385	0.80836	0.18755	0.55732	1.17248
2003	0.69231	91	35.3694	0.91525	0.18396	0.63545	1.31825
2004	0.75281	89	35.7570	0.92528	0.17559	0.65300	1.31109
2005	0.71591	88	66.7849	1.72819	0.18237	1.20359	2.48145
2006	0.83908	87	88.1775	2.28177	0.16344	1.64910	3.15716
2007	0.74074	81	48.3487	1.25112	0.18308	0.87013	1.79892

Table 24. Small (> 67 count) brown shrimp abundance index for statistical zones 21-18 from the SEAMAP Fall Groundfish Survey, 1987-2007. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.39216	51	6.0441	0.29223	0.39493	0.13647	0.62576
1988	0.32967	91	4.1810	0.20215	0.32584	0.10710	0.38159
1989	0.26667	90	2.6001	0.12572	0.36541	0.06193	0.25520
1990	0.32558	86	10.6598	0.51541	0.33859	0.26669	0.99609
1991	0.26667	90	15.1636	0.73316	0.36738	0.35987	1.49369
1992	0.46739	92	10.8320	0.52373	0.26850	0.30899	0.88772
1993	0.41379	87	16.9729	0.82065	0.29580	0.45983	1.46459
1994	0.39773	88	19.2346	0.93000	0.29916	0.51782	1.67025
1995	0.47191	89	18.3658	0.88799	0.27125	0.52117	1.51301
1996	0.51648	91	19.1462	0.92573	0.25188	0.56371	1.52023
1997	0.56322	87	36.0444	1.74276	0.24316	1.07908	2.81462
1998	0.63333	90	41.6982	2.01612	0.22119	1.30221	3.12141
1999	0.48352	91	17.4260	0.84255	0.26471	0.50068	1.41788
2000	0.60227	88	49.3184	2.38456	0.23288	1.50592	3.77587
2001	0.50000	92	30.2936	1.46471	0.25545	0.88586	2.42178
2002	0.49451	91	32.8162	1.58667	0.25951	0.95224	2.64381
2003	0.41758	91	15.0669	0.72849	0.28412	0.41727	1.27185
2004	0.47191	89	26.4620	1.27945	0.27026	0.75232	2.17592
2005	0.53409	88	29.2906	1.41621	0.25143	0.86314	2.32368
2006	0.56322	87	25.2242	1.21960	0.24558	0.75167	1.97883
2007	0.40741	81	7.4893	0.36211	0.30867	0.19807	0.66203

Table 25. Large (<= 30 count) brown shrimp abundance index for statistical zones 10-08 from the SEAMAP Fall Groundfish Survey, 2008-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2009	0.08696	46	1.69461	1.18977	0.76919	0.30431	4.65174
2010	0.07317	41	0.18930	0.13291	0.89125	0.02880	0.61331
2011	0.11111	27	1.80567	1.26774	0.85846	0.28683	5.60323
2012	0.09091	22	0.21178	0.14868	1.03285	0.02705	0.81724
2013	0.09524	21	0.59365	0.41680	1.03024	0.07606	2.28388
2014	0.15385	26	2.46449	1.73029	0.74982	0.45496	6.58058
2015	0.12500	32	1.12762	0.79169	0.74194	0.21054	2.97693
2016	0.13636	22	1.37134	0.96280	0.90750	0.20431	4.53716
2018	0.21429	28	2.25398	1.58249	0.63722	0.49237	5.08621
2019	0.23333	30	4.70849	3.30578	0.56645	1.15098	9.49467
2020	0.08333	24	1.28081	0.89924	1.08959	0.15327	5.27575
2021	0.17391	23	0.70293	0.49352	0.74445	0.13077	1.86248
2022	0.04348	23	0.11151	0.07829	1.35645	0.01015	0.60408

Table 26. Medium (31-67 count) brown shrimp abundance index for statistical zones 10-08 from the SEAMAP Fall Groundfish Survey, 2008-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2009	0.06522	46	1.01010	0.61880	0.82484	0.14649	2.6140
2011	0.03704	27	0.06482	0.03971	1.28953	0.00549	0.2874
2012	0.13636	22	1.59801	0.97896	0.82447	0.23186	4.1333
2013	0.04762	21	4.89869	3.00098	1.28796	0.41527	21.6869
2014	0.11538	26	3.25071	1.99141	0.82812	0.46933	8.4498
2015	0.12500	32	1.26564	0.77534	0.72507	0.21132	2.8448
2016	0.13636	22	1.27057	0.77836	0.82256	0.18483	3.2778
2017	0.11538	26	0.31073	0.19036	0.83161	0.04465	0.8116
2018	0.25000	28	2.19730	1.34609	0.55566	0.47699	3.7987
2019	0.16667	30	1.57386	0.96416	0.64706	0.29545	3.1464
2020	0.16667	24	1.59449	0.97680	0.70862	0.27274	3.4983
2021	0.13043	23	0.55344	0.33904	0.81647	0.08118	1.4159

Table 27. Large (<= 30 count) brown shrimp abundance index for statistical zones 17-11 from the SEAMAP Fall Groundfish Survey, 2008-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2008	0.55446	202	36.596	0.56033	0.34701	0.28547	1.09984
2009	0.54011	187	107.497	1.64592	0.19194	1.12511	2.40781
2010	0.57658	111	109.908	1.68283	0.30877	0.92031	3.07715
2011	0.65455	110	95.483	1.46196	0.24219	0.90690	2.35673
2012	0.67470	83	67.554	1.03434	0.22503	0.66315	1.61328
2013	0.54000	50	32.576	0.49878	0.76640	0.12808	1.94243
2014	0.61458	96	85.937	1.31580	0.23423	0.82880	2.08896
2015	0.51064	94	71.641	1.09692	0.34932	0.55647	2.16223
2016	0.57333	75	68.213	1.04442	0.30394	0.57635	1.89264
2017	0.50562	89	47.604	0.72888	0.41812	0.32659	1.62669
2018	0.58242	91	60.996	0.93392	0.26550	0.55414	1.57399
2019	0.54217	83	37.542	0.57482	0.38543	0.27307	1.21001
2020	0.53333	75	63.244	0.96834	0.38730	0.45846	2.04526
2021	0.54217	83	56.281	0.86173	0.31693	0.46414	1.59990
2022	0.57143	35	38.600	0.59102	0.46296	0.24481	1.42682

Table 28. Medium (31-67 count) brown shrimp abundance index for statistical zones 17-11 from the SEAMAP Fall Groundfish Survey, 2008-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2008	0.74752	202	65.074	0.93256	0.13295	0.71565	1.21521
2009	0.65775	187	74.350	1.06549	0.14399	0.80005	1.41899
2010	0.70270	111	78.977	1.13180	0.17849	0.79423	1.61284
2011	0.72727	110	48.254	0.69152	0.17554	0.48807	0.97977
2012	0.80723	83	90.340	1.29464	0.18149	0.90321	1.85572
2013	0.60000	50	28.274	0.40519	0.31659	0.21838	0.75181
2014	0.71875	96	85.968	1.23198	0.18527	0.85316	1.77900
2015	0.69149	94	84.677	1.21348	0.19211	0.82923	1.77579
2016	0.69333	75	69.544	0.99662	0.21410	0.65259	1.52202
2017	0.69663	89	77.458	1.11003	0.19690	0.75151	1.63960
2018	0.70330	91	56.828	0.81439	0.19341	0.55512	1.19478
2019	0.71084	83	59.328	0.85021	0.20067	0.57140	1.26506
2020	0.60000	75	60.450	0.86630	0.24227	0.53731	1.39671
2021	0.75904	83	113.200	1.62225	0.18889	1.11554	2.35912
2022	0.68571	35	53.977	0.77353	0.30953	0.42242	1.41647

Table 29. Small (> 67 count) brown shrimp abundance index for statistical zones 17-11 from the SEAMAP Fall Groundfish Survey, 2008-2022. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2008	0.71287	202	59.3594	2.04271	0.12001	1.60819	2.59462
2009	0.50267	187	20.6839	0.71179	0.16591	0.51194	0.98964
2010	0.36937	111	15.8997	0.54715	0.24979	0.33452	0.89494
2011	0.43636	110	17.2311	0.59297	0.22085	0.38325	0.91745
2012	0.42169	83	12.1687	0.41876	0.26410	0.24913	0.70389
2013	0.38000	50	13.0587	0.44938	0.35776	0.22448	0.89962
2014	0.44792	96	24.9078	0.85714	0.23754	0.53648	1.36946
2015	0.61702	94	38.0983	1.31106	0.19268	0.89493	1.92069
2016	0.42667	75	24.0129	0.82635	0.28066	0.47642	1.43328
2017	0.73034	89	41.9610	1.44398	0.17108	1.02810	2.02809
2018	0.57143	91	30.1428	1.03729	0.20596	0.69002	1.55934
2019	0.55422	83	36.1409	1.24370	0.21151	0.81848	1.88983
2020	0.60000	75	40.5815	1.39651	0.21079	0.92032	2.11908
2021	0.65060	83	53.4578	1.83962	0.19215	1.25701	2.69225
2022	0.42857	35	8.1832	0.28160	0.39270	0.13204	0.60059

Table 30. Large (<= 30 count) brown shrimp abundance index for statistical zones 21-18 from the SEAMAP Fall Groundfish Survey, 2008-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2008	0.67227	119	53.326	0.79442	0.16011	0.57790	1.09205
2009	0.75735	136	98.399	1.46589	0.13910	1.11137	1.93349
2010	0.80000	80	114.162	1.70071	0.17124	1.21051	2.38941
2011	0.78049	82	74.047	1.10310	0.17272	0.78288	1.55429
2012	0.77049	61	66.281	0.98741	0.19994	0.66456	1.46712
2013	0.76471	51	50.252	0.74862	0.21848	0.48607	1.15297
2014	0.81818	66	72.088	1.07392	0.18483	0.74436	1.54940
2015	0.84848	66	92.873	1.38356	0.18015	0.96777	1.97800
2016	0.70588	51	38.604	0.57511	0.23084	0.36462	0.90710
2017	0.66667	69	44.443	0.66209	0.20743	0.43918	0.99815
2018	0.71875	64	66.579	0.99185	0.20457	0.66157	1.48702
2019	0.69697	66	49.649	0.73964	0.20597	0.49201	1.11190
2020	0.67241	58	60.783	0.90550	0.22421	0.58147	1.41012
2021	0.75758	66	69.818	1.04011	0.19494	0.70686	1.53046
2022	0.76364	55	55.586	0.82808	0.21167	0.54479	1.25869

Table 31. Medium (31-67 count) brown shrimp abundance index for statistical zones 21-18 from the SEAMAP Fall Groundfish Survey, 2008-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2008	0.72269	119	78.856	0.83597	0.16193	0.60597	1.15327
2009	0.79412	136	123.081	1.30481	0.14182	0.98395	1.73030
2010	0.77500	80	76.786	0.81403	0.18404	0.56508	1.17265
2011	0.78049	82	57.488	0.60944	0.18306	0.42387	0.87626
2012	0.88525	61	115.333	1.22267	0.18939	0.83995	1.77977
2013	0.90196	51	68.224	0.72325	0.20485	0.48215	1.08492
2014	0.87879	66	79.742	0.84536	0.18337	0.58761	1.21617
2015	0.90909	66	110.275	1.16905	0.17920	0.81923	1.66823
2016	0.74510	51	53.117	0.56311	0.23401	0.35484	0.89361
2017	0.81159	69	80.529	0.85371	0.19118	0.58445	1.24703
2018	0.70313	64	57.087	0.60519	0.22419	0.38864	0.94241
2019	0.77273	66	64.140	0.67996	0.20376	0.45425	1.01782
2020	0.81034	58	146.410	1.55213	0.20827	1.02789	2.34373
2021	0.86364	66	168.635	1.78774	0.18680	1.23437	2.58919
2022	0.83636	55	135.226	1.43357	0.20948	0.94715	2.16979

Table 32. Small (> 67 count) brown shrimp abundance index for statistical zones 21-18 from the SEAMAP Fall Groundfish Survey, 2008-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2008	0.57143	119	14.1234	0.74198	0.19911	0.50018	1.10067
2009	0.42647	136	25.0182	1.31435	0.22035	0.85032	2.03160
2010	0.26250	80	3.8636	0.20298	0.36987	0.09918	0.41540
2011	0.37805	82	8.1552	0.42844	0.29928	0.23850	0.76965
2012	0.50820	61	18.8667	0.99117	0.28919	0.56233	1.74707
2013	0.43137	51	20.3988	1.07166	0.33451	0.55870	2.05560
2014	0.42424	66	17.2264	0.90500	0.31701	0.48738	1.68048
2015	0.34848	66	13.8554	0.72790	0.35120	0.36800	1.43979
2016	0.33333	51	8.0439	0.42259	0.41508	0.19038	0.93805
2017	0.55072	69	23.3203	1.22515	0.25387	0.74321	2.01958
2018	0.34375	64	7.6319	0.40095	0.36999	0.19587	0.82073
2019	0.43939	66	12.7153	0.66801	0.29969	0.37158	1.20092
2020	0.75862	58	67.6403	3.55353	0.20267	2.37898	5.30798
2021	0.42424	66	19.5880	1.02907	0.29644	0.57592	1.83876
2022	0.56364	55	25.0728	1.31722	0.28561	0.75236	2.30614

Table 33. White shrimp nominal CPUE (number per trawl-hour) by shrimp statistical zone for the SEAMAP Summer Groundfish Survey.

Year	Shrimp Statistical Zone															Total				
	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	
1987									0.43	3.92	0.91	4.41	0.79	3.36	6.16	15.33	5.12	0.13	0.58	3.58
1988									0.00	1.05	0.00	0.00	0.00	2.84	5.95	2.31	5.26	0.19	0.00	1.97
1989									0.00	4.47		0.00	4.95	2.86	1.96	13.41	5.09	8.69	0.52	4.51
1990									1.15	5.00	0.00	2.11	0.48	1.81	2.97	27.74	4.91	0.60	4.30	
1991									1.83	5.50	0.30	3.46	2.17	11.25	20.58	34.90	23.64	3.50	9.77	
1992									0.00	0.62	18.46	2.54	0.07	0.39	0.31	0.89	32.87	2.66	42.00	9.17
1993									0.16	1.10	1.32	4.35	0.00	5.60	3.54	13.68	18.68	1.96	5.19	
1994									0.57	2.11	0.54	2.85	2.70	11.16	5.74	8.45	1.04	0.00	2.96	
1995									1.09	0.46	2.23	14.99	1.26	1.62	28.80	8.87	17.73	10.13	7.78	
1996									0.45	6.80	1.43	0.48	0.35	0.00	8.85	5.12	3.24	0.24	2.26	
1997									0.18		0.54	0.15	0.60	0.04	0.12	20.31	8.04	3.23	4.32	
1998									1.11	2.61	4.28	0.71	1.34	5.00	26.62	32.50	3.45	2.80	7.33	
1999									1.93	0.95	0.84	6.21	4.30	0.11	41.45	52.13	12.88	8.87	12.32	
2000									3.14	0.00	3.48	0.00	2.26	0.69	148.77	1.95	1.91	0.67	7.36	
2001									1.09	0.86	0.51	4.45	1.30	5.45	0.56	1.88	7.28	0.35	2.11	
2002									2.77	1.16	1.69	2.78	0.74	0.07	26.42	30.97	39.33	10.13	12.21	
2003									6.80	7.47	29.36	1.64	0.00	0.00	9.30	34.89	22.20	0.00	12.18	
2004									0.51	7.64	0.36	2.85	2.36	0.31	76.60	18.69	8.54	4.22	11.48	
2005									9.64	29.72	22.21	22.85	6.38	4.05	1.59	90.68	2.55	4.76	21.97	
2006									16.55	36.72	8.74	10.89	21.24	5.71	86.11	26.12	5.31	1.61	19.35	
2007									8.96		13.31	13.85	6.87	31.97	91.62	26.65	5.15	0.00	15.91	

2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.57	13.85	1.86	11.22	5.42	1.29	0.33	121.97	3.44	1.39	13.87	
2009	0.00	0.00	0.00	0.00	4.50	0.00	0.00	0.00	27.43	51.42	39.61	12.72	10.87	29.29	53.90	27.89	3.07	0.09	18.76	
2010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.41	188.00	22.00	27.57	20.10	21.86	104.62	90.46	13.31	13.72	25.92	
2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.25	30.00	18.76	18.65	22.22	22.52	39.72	50.20	99.64	2.90	18.82	
2012	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	1.75	25.71	7.29	1.78	33.64	22.43	50.64	82.86	16.35	0.00	13.06	
2013	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.00	0.00	3.71	28.60	11.59	1.13	2.54	18.10	55.87	3.36	0.12	0.17	7.03
2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41	4.66	0.53	5.66	3.36	24.69	30.11	2.11	12.51	0.00	5.38	
2015	0.00	0.00	0.00	0.00	0.00	14.67	0.00	0.00	1.88	10.86	18.13	20.08	13.38	41.97	73.98	16.13	2.40	0.00	13.33	
2016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.75	0.67	11.07	5.33	7.57	4.04	18.68	7.82	2.10	0.42	4.02	
2017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.47	26.00	51.00	5.54	73.89	38.48	36.82	17.12	7.77	0.57	17.60	
2018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.86	2.57	3.00	6.43	2.55	13.91	15.47	51.58	5.61	0.14	5.00	
2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.80	25.08	0.33	1.07	3.09	12.92	109.07	4.45	2.18	0.17	10.91	
2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	3.00	7.50	4.89	14.25	12.89	29.60	52.71	5.40	14.77	23.86	12.01	
2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31.27	5.19	70.29	12.34	34.27	20.57	29.19	57.61	3.60	9.99	14.59	
Total	0.00	0.00	0.00	0.00	0.00	1.81	0.00	0.08	5.55	17.80	9.34	6.97	9.05	13.19	40.05	30.36	10.78	4.09	10.87	

Table 34. White shrimp nominal CPUE (number per trawl-hour) by shrimp statistical zone for the SEAMAP Fall Groundfish Survey.

Year	Shrimp Statistical Zone																								
	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	Total						
1987									0.12	10.39	29.27	5.56	31.94	3.17	0.59	0.84	52.61	52.95	12.57	19.05					
1988									0.00	2.97	55.77	24.43	12.44	30.74	11.66	224.78	26.26	4.59	4.44	32.87					
1989										13.41	43.23	124.60	0.56	20.00	39.68	56.85	56.73	10.84	0.26	32.19					
1990										4.51	57.50	68.14	1.00	19.85	3.19	21.90	10.73	12.08	0.44	14.25					
1991										21.72	95.00	48.04	33.22	33.97	8.85	28.11	7.26	5.15	0.25	22.38					
1992										28.00	97.61	17.95	15.26	14.19	3.50	1.41	30.88	12.68	2.89	18.64					
1993										12.12	134.51	41.67	60.89	16.56	1.33	17.15	46.77	55.99	4.28	30.47					
1994										5.16	82.92	10.16	9.50	23.46	17.87	29.47	20.29	16.12	7.06	17.14					
1995										4.41	172.74	35.84	31.56	89.18	0.00	0.00	45.83	86.96	12.55	42.68					
1996										1.17	64.21	7.73	29.18	12.54	5.00	57.63	90.34	18.21	5.55	23.55					
1997										11.18	41.59	7.23	12.95	17.08	0.63	14.29	60.21	57.91	5.95	21.55					
1998										61.08	140.58	60.19	28.61	35.03	0.00	41.40	108.30	49.76	2.59	52.13					
1999										2.03	56.55	8.02	8.13	9.85	1.01	22.14	20.04	18.92	3.94	11.95					
2000										90.12	109.58	17.60	35.29	22.42	34.74	0.00	20.95	7.49	14.75	37.99					
2001										4.99	35.78	5.57	29.41	43.63	6.88	70.12	30.15	27.02	1.74	22.35					
2002										0.00	18.93	46.23	36.97	59.00	40.84	5.85	61.49	58.05	13.57	7.07	30.75				
2003										0.00	4.76	50.45	39.52	7.18	45.32	0.44	5.67	75.77	21.94	4.06	19.98				
2004											3.06		4.74	27.08	32.59	22.87	72.01	36.14	11.24	0.10	19.79				
2005											41.46	121.09	36.45	15.79	21.63	33.29	110.14	39.64	4.04	0.99	34.93				
2006											0.00	7.58	300.22	49.56	22.06	56.34	29.67	19.15	91.34	14.70	0.73	38.24			
2007											10.76	114.41	9.12	17.53	17.33	6.18	75.87	102.57	2.40	0.86	27.95				
2008											0.00	0.00	0.00	0.00	0.00	12.11	39.04	17.97	7.70	10.81	22.56	60.48	11.02	1.77	15.56

2009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.60	53.38	19.04	15.22	27.79	52.47	48.78	29.35	3.84	0.00	20.75	
2010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	36.50	43.93	17.88	29.95	49.31	28.33	10.74	2.52	0.29	14.73	
2011					0.00	0.00	0.00	5.20	9.33	26.40	2.75	7.65	22.29	14.95	21.39	4.48	0.53	11.09	
2012	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.31	57.20	20.73	0.15	14.58	4.63	23.33	8.13	3.42	0.00	7.99	
2013	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.00	68.00	8.00	9.31	35.32	77.78	39.90	7.76	2.84	0.00	15.26	
2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25	22.40	7.23	11.13	5.24	13.33	2.36	5.33	0.94	0.00	3.28	
2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.76	60.18	0.76	9.38	46.14	50.07	28.36	15.20	7.40	0.00	13.67	
2016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.50	58.83	0.36	9.07	7.43	20.07	25.66	1.22	0.00	9.22	
2017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.47	76.00	101.11	22.03	8.23	12.65	11.32	46.92	3.42	0.00	11.35	
2018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.59	80.94	13.95	35.34	31.14	318.46	166.68	134.77	4.25	0.00	56.18	
2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.22	5.50	8.22	25.76	16.79	23.30	46.83	42.84	28.29	0.00	13.54	
2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.33	26.94	3.56	30.20	103.41	101.85	110.37	72.98	1.42	0.54	33.44	
2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.67	37.50	292.32	61.27	19.97	49.44	76.04	51.35	34.21	0.37	2.16	28.45
2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.80	14.00	5.20		0.00	11.38	52.00	93.24	1.00	0.00	12.27	
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	16.42	76.52	29.95	19.90	27.53	31.83	43.53	45.48	17.86	2.82	22.96

Table 35. Summary of white shrimp abundance indices calculated from the SEAMAP Summer and Fall Groundfish Surveys. Indices are provided for each season, year range, and area as defined by the shrimp statistical zones that it encompasses.

Species	Season	Year	Area	Size Class	Final Model		Tables	Figures
					Binomial Submodel	Lognormal Submodel		
White shrimp	Summer	1987-2008	SZ1711	Large	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	36	11A
White shrimp	Summer	1987-2008	SZ1711	Medium	Year + SZ + Depth	Year + SZ	37	11B
White shrimp	Summer	1987-2008	SZ1711	Small	No model ran – low encounters / catch	-	-	-
White shrimp	Summer	1987-2008	SZ2118	Large	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	38	12A
White shrimp	Summer	1987-2008	SZ2118	Medium	Year + SZ + Depth	Year + Depth	39	12B
White shrimp	Summer	1987-2008	SZ2118	Small	No model ran – low encounters / catch	-	-	-
White shrimp	Summer	2009-2022	SZ1008	Large	No model ran – low encounters / catch	-	-	-
White shrimp	Summer	2009-2022	SZ1008	Medium	No model ran – low encounters / catch	-	-	-
White shrimp	Summer	2009-2022	SZ1008	Small	No model ran – low encounters / catch	-	-	-
White shrimp	Summer	2009-2022	SZ1711	Large	Year + TOD + SZ + Depth	Year + TOD + SZ + Depth	40	11A
White shrimp	Summer	2009-2022	SZ1711	Medium	Year + Depth	Year + Depth	41	11B
White shrimp	Summer	2009-2022	SZ1711	Small	No model ran – low encounters / catch	-	-	-
White shrimp	Summer	2009-2022	SZ2118	Large	Year + Depth	Year + Depth	42	12A
White shrimp	Summer	2009-2022	SZ2118	Medium	Year + Depth	Year	43	12B
White shrimp	Summer	2009-2022	SZ2118	Small	No model ran – low encounters / catch	-	-	-
White shrimp	Fall	1987-2007	SZ1711	Large	Year + TOD + SZ + Depth	Year + SZ + Depth	44	13A
White shrimp	Fall	1987-2007	SZ1711	Medium	Year + SZ + Depth	Year + SZ + Depth	45	13B
White shrimp	Fall	1987-2007	SZ1711	Small	Year + SZ + Depth	Year + SZ + Depth	46	13C
White shrimp	Fall	1987-2007	SZ2118	Large	Year + TOD + SZ + Depth	Year + SZ + Depth	47	14A
White shrimp	Fall	1987-2007	SZ2118	Medium	Year + TOD + SZ + Depth	Year + SZ + Depth	48	14B
White shrimp	Fall	1987-2007	SZ2118	Small	Year + SZ + Depth	Year + Depth	49	14C
White shrimp	Fall	2008-2022	SZ1008	Large	No model ran – low encounters / catch	-	-	-
White shrimp	Fall	2008-2022	SZ1008	Medium	No model ran – low encounters / catch	-	-	-
White shrimp	Fall	2008-2022	SZ1008	Small	No model ran – low encounters / catch	-	-	-
White shrimp	Fall	2008-2022	SZ1711	Large	Year + SZ + Depth	Year + TOD + SZ + Depth	50	13A
White shrimp	Fall	2008-2022	SZ1711	Medium	Year + SZ + Depth	Year + SZ + Depth	51	13B
White shrimp	Fall	2008-2022	SZ1711	Small	No model ran – low encounters / catch	-	-	-
White shrimp	Fall	2008-2022	SZ2118	Large	Year + SZ + Depth	Year + SZ + Depth	52	14A
White shrimp	Fall	2008-2022	SZ2118	Medium	Year + Depth	Year + SZ + Depth	53	14B
White shrimp	Fall	2008-2022	SZ2118	Small	No model ran – low encounters / catch	54	14C	-

Table 36. Large (<= 30 count) white shrimp abundance index for statistical zones 17-11 from the SEAMAP Summer Groundfish Survey, 1987-2008 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.22689	119	5.2969	1.07453	0.29154	0.60692	1.90242
1988	0.15190	79	2.7531	0.55850	0.43412	0.24328	1.28214
1989	0.25714	70	3.4923	0.70846	0.35481	0.35581	1.41063
1990	0.11290	124	1.5584	0.31613	0.40640	0.14463	0.69097
1991	0.29245	106	4.4252	0.89770	0.26604	0.53210	1.51451
1992	0.12871	101	1.5327	0.31093	0.42253	0.13823	0.69937
1993	0.12621	103	1.7992	0.36498	0.42275	0.16221	0.82126
1994	0.19091	110	2.8079	0.56962	0.32892	0.30005	1.08136
1995	0.17822	101	3.8936	0.78986	0.35641	0.39553	1.57732
1996	0.11000	100	1.8031	0.36578	0.45711	0.15306	0.87415
1997	0.10465	86	0.6122	0.12419	0.50298	0.04804	0.32107
1998	0.25000	88	3.3865	0.68698	0.31627	0.37047	1.27389
1999	0.27723	101	3.3507	0.67972	0.28262	0.39043	1.18335
2000	0.18947	95	2.3652	0.47980	0.35479	0.24098	0.95531
2001	0.22078	77	2.4770	0.50249	0.36126	0.24941	1.01238
2002	0.24752	101	3.6885	0.74825	0.29988	0.41607	1.34564
2003	0.27027	74	4.8221	0.97820	0.33265	0.51173	1.86990
2004	0.20408	98	1.8925	0.38391	0.33621	0.19952	0.73872
2005	0.36364	88	9.5599	1.93933	0.26012	1.16253	3.23518
2006	0.42308	104	17.1446	3.47797	0.21746	2.26268	5.34599
2007	0.45349	86	19.8127	4.01922	0.22923	2.55611	6.31983
2008	0.34146	123	9.9745	2.02343	0.23316	1.27714	3.20582

Table 37. Medium (31-67 count) white shrimp abundance index for statistical zones 17-11 from the SEAMAP Summer Groundfish Survey, 1987-2008 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.07563	119	0.86431	4.29719	0.58632	1.44889	12.7448
1988	0.01266	79	0.06515	0.32391	1.39647	0.04046	2.5933
1989	0.04286	70	0.34789	1.72962	0.95013	0.34777	8.6022
1990	0.02419	124	0.06183	0.30741	0.94334	0.06234	1.5160
1991	0.01887	106	0.02578	0.12817	1.08901	0.02186	0.7515
1992	0.01980	101	0.08757	0.43538	1.09555	0.07371	2.5715
1994	0.02727	110	0.16898	0.84011	0.95621	0.16765	4.2100
1995	0.03960	101	0.10208	0.50754	0.82594	0.11997	2.1472
1998	0.02273	88	0.08838	0.43941	1.09881	0.07413	2.6048
1999	0.01980	101	0.01446	0.07187	1.09269	0.01221	0.4231
2000	0.05263	95	0.32474	1.61452	0.75571	0.42095	6.1924
2001	0.09091	77	0.00946	0.04702	0.67661	0.01377	0.1605
2002	0.02970	101	0.01942	0.09655	0.93892	0.01969	0.4735
2003	0.13514	74	0.36790	1.82910	0.58183	0.62119	5.3858
2004	0.05102	98	0.21164	1.05222	0.77029	0.26871	4.1204
2005	0.11364	88	0.42625	2.11920	0.57708	0.72525	6.1924
2006	0.09615	104	0.49668	2.46936	0.56006	0.86876	7.0189
2007	0.10465	86	0.12939	0.64328	0.61801	0.20624	2.0064
2008	0.01626	123	0.00968	0.04815	1.11929	0.00794	0.2920

Table 38. Large (<= 30 count) white shrimp abundance index for statistical zones 21-18 from the SEAMAP Summer Groundfish Survey, 1987-2008 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.11940	67	2.1909	0.21862	0.69801	0.06201	0.77074
1988	0.13433	67	0.6289	0.06276	0.66947	0.01858	0.21195
1989	0.21538	65	8.2156	0.81981	0.54578	0.29525	2.27631
1990	0.17910	67	2.3763	0.23713	0.59286	0.07912	0.71069
1991	0.32353	68	18.8393	1.87992	0.43713	0.81456	4.33863
1992	0.16176	68	6.4903	0.64765	0.60432	0.21219	1.97681
1993	0.26471	68	10.9479	1.09246	0.48073	0.43889	2.71932
1994	0.12121	66	1.1205	0.11181	0.69505	0.03185	0.39243
1995	0.23881	67	8.5736	0.85554	0.51356	0.32509	2.25152
1996	0.25758	66	3.3028	0.32958	0.50046	0.12803	0.84841
1997	0.26471	68	6.9453	0.69305	0.48926	0.27440	1.75045
1998	0.31818	66	9.9604	0.99393	0.44510	0.42470	2.32610
1999	0.40299	67	34.0347	3.39623	0.38478	1.61528	7.14079
2000	0.19403	67	2.7112	0.27054	0.56588	0.09428	0.77632
2001	0.22727	44	1.7793	0.17755	0.65248	0.05396	0.58427
2002	0.27941	68	19.0059	1.89654	0.47756	0.76608	4.69517
2003	0.22059	68	6.2784	0.62650	0.52797	0.23239	1.68898
2004	0.29412	68	22.2702	2.22228	0.45878	0.92721	5.32627
2005	0.23881	67	17.7334	1.76957	0.51527	0.67048	4.67036
2006	0.34328	67	10.2921	1.02702	0.42074	0.45805	2.30272
2007	0.28358	67	16.1228	1.60885	0.47682	0.65070	3.97790
2008	0.23529	68	10.6493	1.06266	0.50598	0.40898	2.76115

Table 39. Medium (31-67 count) white shrimp abundance index for statistical zones 21-18 from the SEAMAP Summer Groundfish Survey, 1987-2008 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.02985	67	0.04680	0.35605	1.37064	0.04554	2.7839
1988	0.01493	67	0.01225	0.09320	1.81347	0.00834	1.0411
1989	0.03077	65	0.08166	0.62128	1.38892	0.07813	4.9401
1991	0.04412	68	0.04717	0.35886	1.14934	0.05727	2.2487
1992	0.05882	68	0.05050	0.38423	1.02725	0.07037	2.0981
1993	0.08824	68	0.15042	1.14442	0.87352	0.25382	5.1600
1994	0.01515	66	0.00556	0.04233	1.81090	0.00380	0.4720
1995	0.08955	67	0.23914	1.81941	0.87769	0.40132	8.2485
1996	0.07576	66	0.16425	1.24964	0.94435	0.25308	6.1704
1997	0.04412	68	0.02267	0.17249	1.13258	0.02803	1.0614
1998	0.13636	66	0.17183	1.30731	0.74170	0.34779	4.9141
1999	0.11940	67	0.38923	2.96123	0.79144	0.73405	11.9458
2000	0.05970	67	0.04978	0.37874	1.05526	0.06713	2.1367
2002	0.11765	68	0.30239	2.30060	0.76213	0.59436	8.9051
2003	0.04412	68	0.07579	0.57661	1.13131	0.09384	3.5432
2004	0.14706	68	0.62662	4.76730	0.73920	1.27286	17.8551
2005	0.01493	67	0.03132	0.23826	1.79586	0.02160	2.6286
2006	0.04478	67	0.07001	0.53264	1.16610	0.08348	3.3983
2007	0.07463	67	0.07004	0.53290	0.94809	0.10742	2.6436
2008	0.01471	68	0.02136	0.16250	1.80073	0.01468	1.7991

Table 40. Large ( $\leq 30$  count) white shrimp abundance index for statistical zones 17-11 from the SEAMAP Summer Groundfish Survey, 2009-2022. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2009	0.57831	166	44.3743	1.66359	0.17251	1.18114	2.34311
2010	0.44186	86	27.8867	1.04547	0.27058	0.61437	1.77907
2011	0.43038	79	26.3984	0.98967	0.27535	0.57635	1.69942
2012	0.41935	62	19.8528	0.74428	0.32249	0.39676	1.39621
2013	0.44643	56	19.3341	0.72484	0.31900	0.38890	1.35094
2014	0.40278	72	11.9612	0.44842	0.30761	0.24576	0.81820
2015	0.56522	69	36.6007	1.37216	0.24630	0.84453	2.22944
2016	0.49231	65	13.7398	0.51510	0.28188	0.29629	0.89551
2017	0.60938	64	65.9446	2.47226	0.24613	1.52209	4.01558
2018	0.32308	65	11.7482	0.44044	0.35311	0.22189	0.87423
2019	0.35000	60	12.2299	0.45850	0.35835	0.22879	0.91885
2021	0.40816	49	22.7671	0.85354	0.35265	0.43038	1.69277
2022	0.44898	49	33.9216	1.27172	0.34221	0.65365	2.47422

Table 41. Medium (31-67 count) white shrimp abundance index for statistical zones 17-11 from the SEAMAP Summer Groundfish Survey, 2009-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2009	0.13253	166	1.07058	1.71236	0.38447	0.81487	3.5984
2010	0.04651	86	0.22513	0.36009	0.82930	0.08473	1.5304
2011	0.01266	79	0.08129	0.13001	1.51258	0.01467	1.1524
2012	0.08065	62	0.73158	1.17014	0.74989	0.30764	4.4507
2013	0.08929	56	0.44120	0.70568	0.74462	0.18694	2.6638
2014	0.01389	72	0.01123	0.01796	1.51536	0.00202	0.1596
2015	0.15942	69	1.20846	1.93290	0.51415	0.73373	5.0919
2016	0.07692	65	0.50279	0.80420	0.74616	0.21257	3.0425
2017	0.18750	64	3.01824	4.82759	0.49398	1.89612	12.2912
2018	0.01538	65	0.04192	0.06704	1.51541	0.00755	0.5957
2019	0.03333	60	0.14269	0.22822	1.12912	0.03723	1.3990
2021	0.04082	49	0.14484	0.23167	1.12340	0.03803	1.4113
2022	0.12245	49	0.50774	0.81212	0.68708	0.23415	2.8167

Table 42. Large (<= 30 count) white shrimp abundance index for statistical zones 21-18 from the SEAMAP Summer Groundfish Survey, 2009-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2009	0.30693	101	7.666	0.17680	0.38086	0.08468	0.3691
2010	0.60294	68	289.301	6.67205	0.27626	3.87881	11.4768
2011	0.45455	55	52.813	1.21802	0.38791	0.57605	2.5754
2012	0.35185	54	28.899	0.66649	0.46965	0.27290	1.6277
2013	0.30435	46	6.231	0.14370	0.51885	0.05412	0.3815
2014	0.24490	49	4.005	0.09237	0.58114	0.03141	0.2717
2015	0.44231	52	95.715	2.20745	0.38607	1.04745	4.6521
2016	0.32609	46	5.173	0.11930	0.51677	0.04509	0.3157
2017	0.30769	52	14.056	0.32416	0.49169	0.12782	0.8221
2018	0.25714	35	8.694	0.20051	0.63287	0.06281	0.6401
2019	0.32609	46	7.327	0.16898	0.52483	0.06301	0.4532
2021	0.40000	40	28.643	0.66058	0.49737	0.25796	1.6916
2022	0.39130	46	15.158	0.34960	0.49293	0.13755	0.8885

Table 43. Medium (31-67 count) white shrimp abundance index for statistical zones 21-18 from the SEAMAP Summer Groundfish Survey, 2009-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2009	0.02970	101	0.05773	0.40981	1.24183	0.05937	2.8286
2010	0.04412	68	0.05482	0.38917	1.18826	0.05958	2.5418
2012	0.05556	54	0.04793	0.34024	1.21370	0.05073	2.2819
2013	0.02174	46	0.01304	0.09254	1.77486	0.00851	1.0058
2014	0.04082	49	0.02943	0.20891	1.42303	0.02548	1.7132
2015	0.07692	52	0.17934	1.27308	1.00005	0.24081	6.7302
2017	0.05769	52	0.11622	0.82498	1.19419	0.12553	5.4219
2018	0.02857	35	0.01533	0.10882	1.79363	0.00988	1.1987
2019	0.04348	46	0.52441	3.72259	1.39697	0.46474	29.8181
2021	0.02500	40	0.01273	0.09034	1.79983	0.00817	0.9995
2022	0.17391	46	0.49862	3.53952	0.96318	0.70026	17.8908

Table 44. Large (<= 30 count) white shrimp abundance index for statistical zones 17-11 from the SEAMAP Fall Groundfish Survey, 2008-2022. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2008	0.59649	114	40.7453	1.04464	0.17585	0.73686	1.48099
2009	0.63571	140	59.8395	1.53419	0.15923	1.11800	2.10531
2010	0.52113	71	62.0773	1.59156	0.24252	0.98667	2.56729
2011	0.56338	71	29.8370	0.76497	0.22352	0.49188	1.18968
2012	0.33929	56	16.6363	0.42653	0.38998	0.20097	0.90524
2013	0.53571	28	60.7670	1.55797	0.38605	0.73930	3.28322
2014	0.35714	70	10.1598	0.26048	0.34424	0.13338	0.50868
2015	0.53226	62	43.5360	1.11619	0.28202	0.64188	1.94100
2016	0.45098	51	9.8839	0.25341	0.34663	0.12919	0.49705
2017	0.44828	58	34.5843	0.88669	0.32111	0.47388	1.65908
2018	0.68333	60	49.8346	1.27768	0.22840	0.81387	2.00581
2019	0.45283	53	25.9137	0.66439	0.31718	0.35769	1.23407
2020	0.63462	52	56.8345	1.45715	0.24027	0.90725	2.34035
2021	0.63158	57	68.5257	1.75689	0.24062	1.09314	2.82366
2022	0.40000	25	15.8851	0.40727	0.48665	0.16197	1.02406

Table 45. Medium (31-67 count) white shrimp abundance index for statistical zones 17-11 from the SEAMAP Fall Groundfish Survey, 2008-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2008	0.07895	114	1.1406	0.20262	0.79934	0.04968	0.82642
2009	0.15714	140	2.6338	0.46785	0.51054	0.17868	1.22501
2010	0.11268	71	3.6644	0.65093	0.82931	0.15316	2.76649
2011	0.05634	71	0.4653	0.08264	1.03234	0.01504	0.45398
2012	0.12500	56	1.5114	0.26848	0.87116	0.05973	1.20676
2013	0.25000	28	10.6441	1.89076	0.86873	0.42200	8.47148
2014	0.14286	70	1.0025	0.17808	0.75684	0.04636	0.68412
2015	0.25806	62	6.2284	1.10637	0.62341	0.35173	3.48013
2016	0.23529	51	1.7199	0.30552	0.69420	0.08715	1.07098
2017	0.32759	58	8.9092	1.58258	0.54529	0.57043	4.39065
2018	0.26667	60	12.1532	2.15883	0.60145	0.71052	6.55936
2019	0.15094	53	3.1447	0.55860	0.78882	0.13898	2.24520
2020	0.28846	52	17.8191	3.16528	0.61024	1.02734	9.75239
2021	0.26316	57	13.1963	2.34412	0.61221	0.75845	7.24486
2022	0.08000	25	0.2102	0.03734	1.58422	0.00397	0.35112

Table 46. Large (<= 30 count) white shrimp abundance index for statistical zones 21-18 from the SEAMAP Fall Groundfish Survey, 2008-2022. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2008	0.47872	94	21.9439	2.38664	0.31669	1.28604	4.4291
2009	0.42708	96	15.0501	1.63686	0.38687	0.77558	3.4546
2010	0.45098	51	5.9972	0.65226	0.58658	0.21983	1.9353
2011	0.29091	55	3.4086	0.37072	0.63093	0.11648	1.1799
2012	0.34884	43	2.2622	0.24604	0.70469	0.06910	0.8760
2013	0.38710	31	15.1341	1.64600	0.63045	0.51755	5.2349
2014	0.19608	51	0.4748	0.05163	0.75280	0.01352	0.1972
2015	0.29787	47	2.8963	0.31501	0.69088	0.09031	1.0988
2016	0.42857	35	3.4750	0.37795	0.64779	0.11569	1.2348
2017	0.32653	49	2.7718	0.30147	0.64556	0.09259	0.9815
2018	0.36585	41	13.4490	1.46273	0.67814	0.42746	5.0054
2019	0.31818	44	7.7378	0.84157	0.66955	0.24916	2.8426
2020	0.43902	41	32.3712	3.52072	0.56922	1.22031	10.1576
2021	0.26667	45	6.5002	0.70696	0.65538	0.21388	2.3368
2022	0.40000	35	4.4451	0.48345	0.77983	0.12181	1.9188

Table 47. Medium (31-67 count) white shrimp abundance index for statistical zones 21-18 from the SEAMAP Fall Groundfish Survey, 2008-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2008	0.17021	94	0.4846	0.34001	0.60461	0.11134	1.0383
2009	0.10417	96	0.1725	0.12104	0.69118	0.03468	0.4224
2010	0.13725	51	0.0551	0.03867	0.81123	0.00933	0.1603
2011	0.10909	55	0.1237	0.08682	0.81719	0.02077	0.3629
2012	0.06977	43	0.0757	0.05312	1.04833	0.00949	0.2973
2013	0.16129	31	0.9495	0.66623	0.87238	0.14798	2.9994
2014	0.03922	51	0.0067	0.00467	1.14726	0.00075	0.0292
2015	0.14894	47	0.1986	0.13935	0.80928	0.03370	0.5762
2016	0.20000	35	0.2319	0.16273	0.77853	0.04107	0.6447
2017	0.18367	49	0.1340	0.09402	0.75875	0.02441	0.3622
2018	0.29268	41	3.7754	2.64911	0.68599	0.76506	9.1728
2019	0.18182	44	1.1297	0.79267	0.79563	0.19535	3.2164
2020	0.34146	41	12.1852	8.54999	0.60390	2.80304	26.0796
2021	0.22222	45	1.6781	1.17750	0.73369	0.31691	4.3751
2022	0.22857	35	0.1768	0.12406	0.85361	0.02825	0.5448

Table 48. Small (> 67 count) white shrimp abundance index for statistical zones 21-18 from the SEAMAP Fall Groundfish Survey, 2008-2022. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2008	0.04255	94	0.03077	0.14845	1.76834	0.01372	1.6059
2009	0.01042	96	0.00988	0.04766	2.43256	0.00295	0.7692
2010	0.01961	51	0.00095	0.00460	2.46383	0.00028	0.0754
2013	0.06452	31	0.10128	0.48865	1.93748	0.04022	5.9361
2014	0.01961	51	0.00114	0.00550	2.41516	0.00034	0.0880
2015	0.04255	47	0.00650	0.03134	2.08615	0.00235	0.4179
2016	0.05714	35	0.04912	0.23701	1.96348	0.01918	2.9281
2017	0.12245	49	0.04974	0.23997	1.67967	0.02369	2.4314
2018	0.12195	41	0.25098	1.21095	1.63358	0.12384	11.8412
2019	0.11364	44	0.56969	2.74869	1.71472	0.26424	28.5921
2020	0.17073	41	1.38836	6.69871	1.38999	0.84163	53.3161
2021	0.08889	45	0.21423	1.03364	1.68650	0.10149	10.5269
2022	0.14286	35	0.02173	0.10483	1.86709	0.00904	1.2152

Table 49. Large (<= 30 count) white shrimp abundance index for statistical zones 17-11 from the SEAMAP Fall Groundfish Survey, 1987-2007. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.33784	74	7.5674	0.42681	0.31740	0.22969	0.79313
1988	0.25000	88	5.9359	0.33479	0.34016	0.17273	0.64891
1989	0.31000	100	10.0900	0.56909	0.27841	0.32950	0.98289
1990	0.29630	108	6.1480	0.34676	0.28231	0.19930	0.60332
1991	0.31000	100	12.9283	0.72917	0.26567	0.43251	1.22933
1992	0.43820	89	14.6631	0.82702	0.23157	0.52360	1.30628
1993	0.47656	128	16.2969	0.91917	0.17461	0.64993	1.29994
1994	0.36190	105	9.0129	0.50834	0.24558	0.31330	0.82479
1995	0.38542	96	22.2857	1.25695	0.24985	0.76838	2.05616
1996	0.32673	101	8.4531	0.47677	0.26287	0.28430	0.79953
1997	0.30693	101	10.8413	0.61146	0.28259	0.35125	1.06444
1998	0.49000	100	39.7386	2.24131	0.20300	1.49953	3.35004
1999	0.40777	103	6.5738	0.37077	0.22965	0.23561	0.58347
2000	0.41346	104	18.5242	1.04479	0.21867	0.67813	1.60971
2001	0.50980	102	15.0581	0.84930	0.18924	0.58362	1.23593
2002	0.47222	108	22.1438	1.24894	0.19282	0.85229	1.83020
2003	0.36090	133	9.3676	0.52834	0.21114	0.34795	0.80226
2004	0.44186	86	20.7401	1.16977	0.21648	0.76247	1.79466
2005	0.51402	107	46.1728	2.60421	0.18385	1.80849	3.75005
2006	0.47619	105	50.1068	2.82610	0.18990	1.93954	4.11789
2007	0.47000	100	19.6825	1.11012	0.20375	0.74163	1.66169

Table 50. Medium (31-67 count) white shrimp abundance index for statistical zones 17-11 from the SEAMAP Fall Groundfish Survey, 1987-2007 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.31081	74	5.9167	0.32617	0.48609	0.12984	0.81936
1988	0.29545	88	18.5060	1.02019	0.40370	0.46901	2.21911
1989	0.28000	100	24.9427	1.37502	0.40905	0.62612	3.01967
1990	0.23148	108	8.1483	0.44919	0.48141	0.18025	1.11942
1991	0.25000	100	32.9896	1.81863	0.40533	0.83364	3.96745
1992	0.28090	89	11.5215	0.63515	0.44352	0.27214	1.48236
1993	0.28125	128	25.7633	1.42026	0.33814	0.73549	2.74259
1994	0.31429	105	18.0417	0.99459	0.36069	0.49418	2.00174
1995	0.29167	96	25.6427	1.41361	0.43175	0.61833	3.23176
1996	0.18812	101	11.1083	0.61237	0.51274	0.23301	1.60936
1997	0.27723	101	10.3337	0.56967	0.41678	0.25586	1.26836
1998	0.41000	100	34.2231	1.88663	0.30236	1.04419	3.40873
1999	0.25243	103	7.9536	0.43846	0.44767	0.18651	1.03076
2000	0.30769	104	36.0994	1.99006	0.35927	0.99136	3.99489
2001	0.33333	102	21.0215	1.15886	0.34056	0.59744	2.24782
2002	0.31481	108	35.9837	1.98369	0.33322	1.03663	3.79598
2003	0.13534	133	13.0499	0.71940	0.54096	0.26116	1.98170
2004	0.16279	86	11.5654	0.63757	0.52267	0.23860	1.70369
2005	0.21495	107	9.6270	0.53071	0.49086	0.20955	1.34407
2006	0.27619	105	15.4719	0.85292	0.37752	0.41102	1.76994
2007	0.18000	100	3.0264	0.16684	0.55390	0.05929	0.46947

Table 51. Small (> 67 count) white shrimp abundance index for statistical zones 17-11 from the SEAMAP Fall Groundfish Survey, 1987-2007. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.12162	74	0.18615	0.11434	0.77547	0.02899	0.4510
1988	0.15909	88	3.46694	2.12949	0.62213	0.67834	6.6850
1989	0.13000	100	1.63953	1.00704	0.62771	0.31800	3.1891
1990	0.12037	108	1.30634	0.80239	0.67855	0.23434	2.7474
1991	0.13000	100	5.63328	3.46012	0.61623	1.11248	10.7619
1992	0.11236	89	1.16993	0.71860	0.75158	0.18847	2.7399
1993	0.09375	128	2.78711	1.71192	0.68003	0.49885	5.8748
1994	0.07619	105	0.61502	0.37776	0.80762	0.09156	1.5585
1995	0.08333	96	2.50130	1.53637	0.81015	0.37109	6.3607
1996	0.04950	101	0.14427	0.08861	1.11294	0.01472	0.5336
1997	0.06931	101	0.94603	0.58108	0.83899	0.13494	2.5022
1998	0.12000	100	2.31841	1.42403	0.68414	0.41240	4.9172
1999	0.07767	103	0.38447	0.23615	0.88032	0.05191	1.0743
2000	0.11538	104	2.02885	1.24617	0.72979	0.33731	4.6040
2001	0.09804	102	1.44845	0.88968	0.71593	0.24575	3.2209
2002	0.09259	108	2.58461	1.58754	0.70594	0.44503	5.6632
2003	0.08271	133	2.72115	1.67141	0.67638	0.48974	5.7043
2004	0.05814	86	1.61212	0.99021	0.90656	0.21038	4.6607
2005	0.02804	107	0.04377	0.02688	1.33067	0.00357	0.2025
2006	0.04762	105	0.64719	0.39752	0.93884	0.08106	1.9493
2007	0.01000	100	0.00436	0.00268	1.93860	0.00022	0.0325

Table 52. Large (<= 30 count) white shrimp abundance index for statistical zones 21-18 from the SEAMAP Fall Groundfish Survey, 1987-2007. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.31818	44	2.5114	0.24356	0.43882	0.10522	0.56378
1988	0.52941	68	10.8766	1.05483	0.24019	0.65686	1.69391
1989	0.37313	67	9.9717	0.96707	0.30798	0.52965	1.76577
1990	0.26866	67	5.6872	0.55155	0.37254	0.26820	1.13426
1991	0.38235	68	2.9324	0.28439	0.31822	0.15281	0.52927
1992	0.44118	68	9.2466	0.89675	0.28916	0.50878	1.58054
1993	0.42647	68	10.5558	1.02371	0.28461	0.58582	1.78893
1994	0.40299	67	6.2524	0.60637	0.30405	0.33455	1.09904
1995	0.42647	68	11.4629	1.11169	0.29358	0.62552	1.97574
1996	0.40299	67	13.4091	1.30044	0.29986	0.72313	2.33862
1997	0.34328	67	5.2760	0.51168	0.32978	0.26910	0.97293
1998	0.54412	68	34.6703	3.36238	0.23437	2.11736	5.33949
1999	0.32836	67	6.9686	0.67582	0.34837	0.34345	1.32984
2000	0.50746	67	10.3649	1.00520	0.25978	0.60295	1.67581
2001	0.45588	68	15.1398	1.46828	0.27443	0.85656	2.51687
2002	0.54412	68	17.3644	1.68402	0.23829	1.05251	2.69445
2003	0.26866	67	6.8152	0.66095	0.37607	0.31934	1.36795
2004	0.35821	67	8.1284	0.78830	0.33144	0.41331	1.50351
2005	0.36364	66	6.5107	0.63142	0.31857	0.33906	1.17587
2006	0.41176	68	10.1672	0.98603	0.30025	0.54791	1.77450
2007	0.39394	66	12.2246	1.18556	0.29142	0.66979	2.09848

Table 53. Medium (31-67 count) white shrimp abundance index for statistical zones 21-18 from the SEAMAP Fall Groundfish Survey, 1987-2007 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.45455	44	14.2702	1.76507	0.40480	0.80985	3.84697
1988	0.29412	68	3.9337	0.48656	0.42513	0.21533	1.09946
1989	0.26866	67	4.5555	0.56347	0.44741	0.23980	1.32403
1990	0.17910	67	2.3302	0.28822	0.54661	0.10366	0.80137
1991	0.14706	68	0.8002	0.09898	0.59942	0.03268	0.29976
1992	0.29412	68	3.4875	0.43137	0.43765	0.18674	0.99645
1993	0.39706	68	15.3120	1.89393	0.35313	0.95413	3.75943
1994	0.37313	67	4.6949	0.58071	0.38324	0.27696	1.21759
1995	0.29412	68	13.7875	1.70537	0.43640	0.73987	3.93077
1996	0.32836	67	12.7456	1.57651	0.41144	0.71483	3.47687
1997	0.34328	67	11.9241	1.47489	0.39059	0.69416	3.13369
1998	0.44118	68	33.3349	4.12318	0.32760	2.17723	7.80839
1999	0.37313	67	6.3310	0.78308	0.38374	0.37314	1.64338
2000	0.22388	67	2.5070	0.31009	0.50790	0.11896	0.80835
2001	0.33824	68	7.6215	0.94270	0.39722	0.43844	2.02694
2002	0.39706	68	14.8063	1.83139	0.36199	0.90779	3.69467
2003	0.28358	67	6.6587	0.82361	0.42984	0.36148	1.87658
2004	0.20896	67	1.8802	0.23256	0.51810	0.08770	0.61672
2005	0.21212	66	2.0088	0.24847	0.51717	0.09384	0.65788
2006	0.23529	68	2.9895	0.36978	0.48858	0.14657	0.93287
2007	0.24242	66	3.8003	0.47006	0.46752	0.19318	1.14377

Table 54. Small (> 67 count) white shrimp abundance index for statistical zones 21-18 from the SEAMAP Fall Groundfish Survey, 1987-2007. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
1987	0.25000	44	2.97252	2.01286	0.71008	0.56082	7.22449
1988	0.11765	68	0.07470	0.05059	0.78749	0.01261	0.20295
1989	0.19403	67	1.07009	0.72462	0.64058	0.22428	2.34112
1990	0.02985	67	0.04301	0.02912	1.35558	0.00378	0.22453
1991	0.08824	68	0.12479	0.08450	0.87455	0.01872	0.38152
1992	0.08824	68	0.24412	0.16530	0.88222	0.03625	0.75389
1993	0.14706	68	1.04104	0.70495	0.70739	0.19719	2.52012
1994	0.17910	67	0.74856	0.50689	0.64624	0.15552	1.65210
1995	0.14706	68	1.75801	1.19045	0.71921	0.32725	4.33056
1996	0.19403	67	1.76870	1.19768	0.64698	0.36705	3.90801
1997	0.19403	67	3.97148	2.68931	0.63934	0.83398	8.67211
1998	0.27941	68	5.06540	3.43006	0.53382	1.26002	9.33744
1999	0.10448	67	0.93921	0.63599	0.83165	0.14917	2.71157
2000	0.11940	67	0.25046	0.16960	0.79222	0.04200	0.68493
2001	0.10294	68	0.98493	0.66695	0.81638	0.15972	2.78498
2002	0.19118	68	2.26937	1.53671	0.63815	0.47743	4.94622
2003	0.16418	67	3.15505	2.13646	0.67458	0.62771	7.27159
2004	0.08955	67	0.57354	0.38838	0.87242	0.08626	1.74859
2005	0.10606	66	0.83716	0.56689	0.84149	0.13120	2.44931
2006	0.16176	68	1.16202	0.78687	0.68837	0.22644	2.73437
2007	0.09091	66	1.95793	1.32582	0.86636	0.29684	5.92173

Table 55. Pink shrimp nominal CPUE (number per trawl-hour) by shrimp statistical zone for the SEAMAP Summer Groundfish Survey.

Year	Shrimp Statistical Zone															Total				
	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	
1987									10.30	6.87	1.82	4.10	0.79	0.54	1.09	3.52	0.62	0.00	120.32	12.02
1988									4.94	29.01	0.00	0.00	0.00	6.43	2.80	2.92	10.78	0.38	5.78	10.07
1989									23.85	0.58		0.00	0.09	1.32	1.00	57.20	0.32	8.59	131.39	25.13
1990										19.68	0.00	2.78	0.40	1.17	0.26	9.52	9.43	2.08	6.19	8.38
1991										30.39	0.00	0.11	0.26	1.02	9.04	48.09	19.36	7.01	155.46	31.74
1992									4.44	33.88	4.62	1.21	0.08	0.26	1.47	5.85	19.81	0.82	40.29	13.80
1993										8.82	0.00	5.05	0.42	0.92	1.67	0.25	37.19	18.82	112.56	20.41
1994										27.92	0.53	0.00	0.26	1.50	3.61	6.99	32.50	114.08	109.64	33.80
1995										58.63	0.80	0.88	0.43	0.14	15.43	1.04	3.52	65.27	71.67	28.54
1996										32.00	0.84	4.54	0.21	2.61	1.40	5.99	0.32	11.28	82.67	18.61
1997										13.04		2.61	0.44	1.42	3.13	6.73	6.04	83.87	105.81	28.42
1998										32.61	0.00	0.45	0.54	0.76	13.00	5.16	1.81	4.43	103.79	16.98
1999										10.78	0.00	0.13	0.00	0.12	1.33	7.07	2.93	14.80	47.73	9.43
2000										38.95	0.00	7.64	0.00	2.36	0.23	57.01	0.08	1.69	77.86	18.96
2001										24.85	0.00	0.52	0.43	0.18	0.61	36.41	0.00	22.65	46.06	17.32
2002										21.18	0.00	1.16	0.47	0.44	2.49	57.59	3.75	9.94	32.28	13.10
2003										19.49	0.28	0.44	0.14	0.00	0.93	0.15	1.05	2.21	651.22	88.08
2004										5.82	1.39	10.66	0.00	0.32	9.33	20.12	2.96	0.00	53.10	10.50
2005										12.47	1.01	3.12	0.00	0.07	1.34	120.36	1.21	0.91	44.20	12.79
2006										17.52	0.00	0.51	0.53	3.43	0.74	0.77	0.93	20.84	159.59	20.11
2007										22.19		2.40	0.75	0.35	2.51	39.68	4.85	1.27	204.01	29.17
2008		0.00	0.00	0.73	1.67	23.64	0.25	34.70	61.07	0.00	1.85	0.43	0.74	0.54	46.64	1.35	9.68	171.05	30.45	

2009		26.39	1.48	19.72	25.73	70.38	12.86	2.66	9.68	0.26	0.20	0.65	0.67	2.37	0.49	2.89	24.15	51.67	11.70	
2010		23.61	6.07	77.58	42.69	237.80	3.79	0.71	1.95	5.53	0.40	0.00	0.87	0.47	11.41	8.23	1.69	13.62	50.34	21.97
2011	428.55	15.16	3.27	28.50	20.36	0.00	0.00	16.00	0.50	2.22	0.00	0.43	0.58	0.34	3.49	0.75	0.22	0.38	47.74	22.20
2012	8.33	18.63	4.54	5.83	46.68	28.52	31.71	0.88	14.91	15.88	0.00	0.14	0.11	1.98	2.44	0.73	0.10	0.10	0.26	10.56
2013	0.22	25.26	7.79	2.70	24.42	42.75	58.73	0.67	2.00	0.43	0.79	0.00	0.00	0.36	0.10	2.45	2.00	0.35	8.12	8.94
2014	234.52	6.82	26.09	8.17	24.75	51.87	0.93	1.11	0.00	15.18	0.33	7.44	0.33	1.27	5.92	10.76	2.32	6.43	3.14	20.55
2015	196.00	26.75	2.90	7.18	30.46	7.78	13.11	0.00	0.25	1.50	0.00	0.00	0.00	1.90	11.35	13.16	3.15	0.50	2.00	13.65
2016	401.78	5.68	4.62	10.31	16.27	28.17	40.86	1.40	2.49	12.38	0.00	0.12	0.00	0.29	1.30	0.17	1.88	0.82	229.44	27.00
2017	173.60	4.57	8.21	21.07	29.29	57.65	12.20	1.32	0.60	6.35	0.29	1.00	0.46	0.09	1.07	2.85	0.73	0.47	91.79	17.41
2018	156.75	26.93	4.14	10.58	68.96	20.50	48.13	0.40	0.00	2.71	0.00	4.67	0.00	0.28	0.00	4.41	0.90	12.49	0.28	17.42
2019	8.00	21.68	3.57	26.57	33.12	11.17	3.06	1.25	0.44	21.98	0.00	0.33	0.15	0.30	0.15	0.09	3.34	0.30	197.75	16.06
2021	33.78	7.75	2.10	13.68	60.67		3.11	1.43	0.33	3.67	0.00	2.67	0.00	2.11	0.63	0.20	0.00	10.51	12.48	6.28
2022	470.00	30.61	5.24	27.90	25.41	15.99	0.36	3.11	0.33	0.91	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.13	57.50	21.62
Total	182.71	18.00	8.48	17.23	30.97	42.20	22.49	3.72	7.97	21.01	0.33	2.03	0.32	1.05	3.49	11.75	5.78	14.24	100.72	19.52

Table 56. Pink shrimp nominal CPUE (number per trawl-hour) by shrimp statistical zone for the SEAMAP Fall Groundfish Survey.

Year	Shrimp Statistical Zone																			
	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	Total
1987									9.59	16.65	7.44	2.65	0.82	0.12	6.13	0.00	0.72	21.87	2.86	7.17
1988									1.50	19.29	0.86	7.23	1.54	1.13	4.18	10.70	2.05	1.23	21.90	7.35
1989									13.86	2.30	0.72	0.00	0.00	0.67	0.44	21.12	2.95	26.62	8.49	
1990									14.00	1.00	1.25	1.39	0.00	0.19	0.00	7.69	4.72	57.62	11.43	
1991									9.83	0.00	0.37	2.54	1.33	5.59	0.19	1.00	44.85	10.17	9.03	
1992									7.69	0.00	3.39	1.71	0.17	3.11	0.00	0.68	2.59	7.21	3.05	
1993									10.61	0.00	6.44	7.56	3.80	6.56	0.00	26.95	21.27	145.40	20.55	
1994									3.98	0.00	0.00	0.29	0.04	4.82	6.92	15.17	55.55	4.80	9.72	
1995									20.23	3.49	7.78	6.85	1.85	1.69	1.81	7.27	17.81	47.33	13.01	
1996									2.87	0.83	1.01	0.55	0.18	2.40	7.63	5.27	7.56	30.81	6.28	
1997									7.83	0.00	0.13	0.58	0.20	0.64	10.58	4.13	14.75	19.59	6.53	
1998									27.58	25.80	2.54	0.07	0.23	2.05	3.12	4.36	1.68	19.18	9.69	
1999									0.44	0.00	0.24	0.56	0.00	0.02	7.50	1.56	0.93	10.07	1.84	
2000									5.26	6.72	0.46	0.09	0.28	1.30	1.18	1.93	8.54	19.70	4.66	
2001									4.77	0.00	0.00	0.15	3.34	0.53	11.95	4.57	0.83	25.25	5.28	
2002									14.05	12.74	0.58	0.00	0.47	0.10	1.61	0.31	2.83	1.52	5.57	4.12
2003									0.00	9.47	0.00	0.73	0.00	1.01	2.92	3.02	0.15	3.97	33.90	6.78
2004									10.48		7.51	0.09	0.13	0.50	0.48	1.98	1.14	5.24	3.65	
2005									3.30	0.00	0.00	0.10	0.23	0.42	0.70	5.45	0.24	21.27	3.81	
2006									0.00	10.40	0.46	0.48	0.00	0.00	1.26	0.30	2.18	12.70	36.33	7.53
2007									8.36	1.57	0.00	0.00	0.00	1.31	0.18	0.93	4.84	20.95	4.76	
2008		5.03	0.86	24.88	1.50	0.00	0.50	9.71	0.00	0.07	0.06	0.81	1.90	6.71	3.68	2.38	45.27	5.52		
2009	8.70	14.57	41.84	94.00	31.71	1.07	5.26	7.29	0.17	0.30	0.27	0.00	3.22	0.68	1.67	3.16	22.72	10.17		

2010		25.06	0.48	3.61	12.07	0.00	0.18	1.00	3.47	0.00	0.13	0.11	0.00	0.00	2.34	0.22	0.00	1.71	2.28	
2011						6.83	0.36	0.00	0.27	0.00	0.14	0.00	0.00	0.13	0.57	0.19	1.11	2.92	0.73	
2012		55.81	29.21	1.66	74.71	59.70	34.86	5.70	4.00	1.50	0.00	0.00	0.76	0.00	2.33	0.72	1.23	20.79	2.89	12.69
2013	129.00	8.11	9.20	0.40	1.09	10.60	3.00	0.33	0.00	0.80	0.00	0.00	0.00	0.00	0.37	6.92	0.00	1.10	5.43	
2014	0.50	15.35	0.80	4.18	29.62	19.69	58.28	0.00	0.00	1.50	0.00	0.31	0.00	8.95	0.15	3.98	0.40	4.59	29.76	9.60
2015	147.00	5.57	0.40	0.64	4.84	43.86	55.33	1.11	8.18	2.49	0.00	0.00	0.00	0.21	0.88	0.09	1.49	0.94	27.18	11.33
2016	15.48	0.50	4.98	9.61	31.42	11.94	16.86	0.40	0.00	0.50	0.00	0.17	0.00	0.00	1.54	1.06	0.15	0.00	58.09	6.94
2017	132.67	113.89	5.93	35.77	19.04	52.39	19.10	0.56	0.00	1.20	0.00	0.00	0.00	0.00	0.00	1.44	0.80	0.11	9.84	18.99
2018	128.67	15.17	2.00	23.35	36.53	58.26	45.54	0.00	1.14	22.95	0.00	0.17	0.00	0.00	0.24	3.09	0.77	0.80	9.12	14.15
2019	131.82	59.06	4.35	4.00	15.32	54.31	15.06	1.78	2.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	9.22	13.70
2020	38.44	6.67	6.94	15.10	4.25	20.95	14.00	0.55	0.22	2.67	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.57	2.54	5.09
2021	42.33	29.22	14.57	14.79	11.69	201.66	2.83	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	8.13
2022	84.33	414.45	123.00	33.29	9.50	53.33	21.60	1.14	0.00	1.00	0.00	0.00	0.00	0.72	0.00	0.50	0.50	15.44	68.13	
Total	90.59	70.38	17.13	11.44	18.17	43.39	23.37	0.92	2.71	9.04	1.92	1.36	0.78	0.72	1.63	2.46	4.17	7.76	24.21	9.57

Table 57. Summary of pink shrimp abundance indices calculated from the SEAMAP Summer and Fall Groundfish Surveys. Indices are provided for each season, year range, and area as defined by the shrimp statistical zones that it encompasses.

Species	Season	Year	Area	Size Class	Final Model								Tables	Figures
					Binomial Submodel				Lognormal Submodel					
Pink shrimp	Summer	2010-2022	SZ0210	Large	Year + TOD + SZ + Depth				Year + TOD + SZ + Depth				58	17A
Pink shrimp	Summer	2010-2022	SZ0210	Medium	Year + TOD + SZ + Depth				Year + TOD + SZ + Depth				59	17B
Pink shrimp	Summer	2010-2022	SZ0210	Small	Year + TOD + SZ + Depth				Year + TOD + SZ + Depth				60	17C
Pink shrimp	Fall	2014-2022	SZ0210	Large	Year + TOD + SZ + Depth				Year + TOD + SZ + Depth				61	18A
Pink shrimp	Fall	2014-2022	SZ0210	Medium	Year + TOD + SZ + Depth				Year + TOD + SZ + Depth				62	18B
Pink shrimp	Fall	2014-2022	SZ0210	Small	Year + TOD + SZ + Depth				Year + TOD + SZ				63	18C

Table 58. Large (<= 30 count) pink shrimp abundance index for statistical zones 10-02 from the SEAMAP Summer Groundfish Survey, 2010-2022. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2010	0.18954	153	3.61370	0.87387	0.35682	0.43727	1.74639
2011	0.21831	142	1.78688	0.43211	0.35391	0.21738	0.85895
2012	0.19807	207	1.62939	0.39402	0.31025	0.21489	0.72249
2013	0.25532	141	6.45798	1.56168	0.32056	0.83549	2.91905
2014	0.17544	171	2.83870	0.68646	0.35947	0.34184	1.37850
2015	0.20904	177	2.06657	0.49974	0.32873	0.26334	0.94838
2016	0.20755	159	4.06414	0.98280	0.33385	0.51299	1.88287
2017	0.27083	144	6.42575	1.55389	0.30700	0.85260	2.83200
2018	0.20915	153	4.61111	1.11507	0.34225	0.57309	2.16959
2019	0.31884	138	5.62813	1.36100	0.28194	0.78278	2.36634
2021	0.21429	98	3.06710	0.74169	0.41454	0.33445	1.64478
2022	0.26230	122	7.43392	1.79768	0.34335	0.92205	3.50489

Table 59. Medium (31-67 count) pink shrimp abundance index for statistical zones 10-02 from the SEAMAP Summer Groundfish Survey, 2010-2022 The nominal frequency of occurrence, the number of samples (N),the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV),and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

SurveyYear	NominalFrequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2010	0.17647	153	6.75653	1.51532	0.39232	0.71098	3.22962
2011	0.21127	142	4.24883	0.95291	0.38306	0.45462	1.99734
2012	0.21739	207	3.32297	0.74526	0.32105	0.39835	1.39429
2013	0.19149	141	5.17587	1.16082	0.38935	0.54757	2.46086
2014	0.18713	171	4.09868	0.91923	0.37247	0.44705	1.89016
2015	0.19209	177	1.96998	0.44182	0.36318	0.21853	0.89326
2016	0.20126	159	4.47700	1.00408	0.35859	0.50080	2.01311
2017	0.22917	144	6.81161	1.52767	0.35622	0.76528	3.04960
2018	0.14379	153	3.72495	0.83541	0.42915	0.36710	1.90117
2019	0.17391	138	4.15710	0.93233	0.40214	0.42982	2.02236
2021	0.16327	98	2.90130	0.65069	0.49205	0.25640	1.65127
2022	0.22131	122	5.86098	1.31447	0.39235	0.61671	2.80169

Table 60. Small (> 67 count) pink shrimp abundance index for statistical zones 10-02 from the SEAMAP Summer Groundfish Survey, 2010-2022. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2010	0.12418	153	1.33612	1.98306	0.67165	0.58524	6.71953
2011	0.13380	142	0.61106	0.90694	0.67437	0.26655	3.08581
2012	0.17391	207	1.04383	1.54925	0.55528	0.54933	4.36929
2013	0.13475	141	0.92558	1.37374	0.65292	0.41718	4.52362
2014	0.11696	171	0.81770	1.21363	0.67970	0.35383	4.16273
2015	0.12429	177	0.17421	0.25857	0.64212	0.07984	0.83738
2016	0.11321	159	0.75054	1.11395	0.65710	0.33612	3.69174
2017	0.13889	144	0.90635	1.34520	0.65495	0.40724	4.44351
2018	0.12418	153	0.30937	0.45917	0.66487	0.13691	1.53993
2019	0.10870	138	0.64392	0.95571	0.70657	0.26766	3.41242
2021	0.07143	98	0.22540	0.33454	0.96340	0.06617	1.69141
2022	0.09016	122	0.34109	0.50625	0.80050	0.12392	2.06818

Table 61. Large (<= 30 count) pink shrimp abundance index for statistical zones 10-02 from the SEAMAP Fall Groundfish Survey, 2014-2022. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2014	0.19595	148	2.3451	0.46720	0.35374	0.23510	0.92843
2015	0.20000	155	2.1382	0.42598	0.35303	0.21464	0.84540
2016	0.29231	65	4.3936	0.87531	0.42648	0.38644	1.98260
2017	0.32540	126	8.1074	1.61518	0.29638	0.90403	2.88573
2018	0.34746	118	10.4004	2.07200	0.28776	1.17870	3.64231
2019	0.38583	127	6.1853	1.23224	0.27631	0.71630	2.11981
2020	0.20619	97	2.3440	0.46697	0.41764	0.20942	1.04128
2021	0.23529	102	2.9507	0.58784	0.37916	0.28243	1.22349
2022	0.28182	110	6.3110	1.25729	0.33408	0.65599	2.40975

Table 62. Medium (31-67 count) pink shrimp abundance index for statistical zones 10-02 from the SEAMAP Fall Groundfish Survey, 2014-2022. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2014	0.17568	148	2.1466	0.43438	0.41592	0.19540	0.96566
2015	0.18710	155	1.3801	0.27927	0.40702	0.12763	0.61108
2016	0.20000	65	1.1286	0.22838	0.54914	0.08180	0.63764
2017	0.31746	126	6.5663	1.32871	0.33395	0.69342	2.54604
2018	0.25424	118	5.3856	1.08980	0.37846	0.52427	2.26533
2019	0.29134	127	3.3750	0.68294	0.35551	0.34256	1.36155
2020	0.21649	97	1.3889	0.28104	0.45472	0.11809	0.66886
2021	0.24510	102	4.8283	0.97703	0.42102	0.43554	2.19174
2022	0.30909	110	18.2770	3.69845	0.35601	1.85342	7.38013

Table 63. Small (> 67 count) pink shrimp abundance index for statistical zones 10-02 from the SEAMAP Fall Groundfish Survey, 2014-2022. The nominal frequency of occurrence, the number of samples (N), the delta-lognormal index (LoIndex) (number per trawl-hour), the delta-lognormal index scaled to a mean of one for the time series (ScaledLoIndex), the coefficient of variation on the mean (CV), and lower and upper confidence limits (LCL and UCL) for the scaled index are listed.

Survey Year	Nominal Frequency	N	LoIndex	ScaledLoIndex	CV	LCL	UCL
2014	0.07432	148	0.16353	0.11492	0.60786	0.03744	0.3527
2015	0.09677	155	0.13302	0.09348	0.54756	0.03357	0.2603
2017	0.09524	126	0.71445	0.50207	0.56817	0.17432	1.4461
2018	0.10169	118	0.34027	0.23912	0.58699	0.08054	0.7099
2019	0.12598	127	0.50989	0.35832	0.51600	0.13560	0.9469
2020	0.14433	97	0.52393	0.36819	0.55123	0.13142	1.0315
2021	0.15686	102	0.55936	0.39308	0.54126	0.14263	1.0833
2022	0.22727	110	8.43957	5.93083	0.42746	2.61392	13.4567

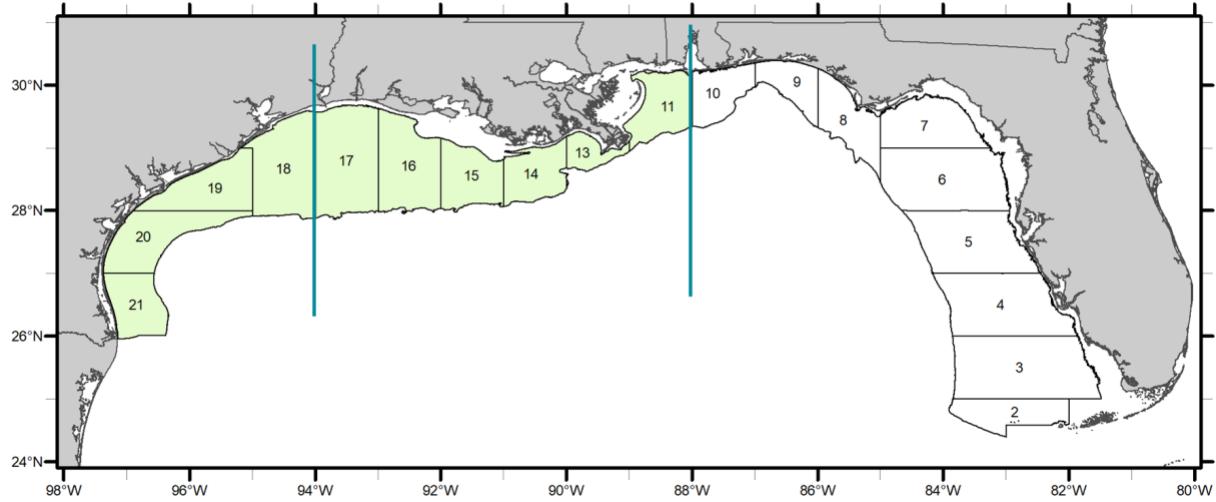


Figure 1. Shrimp statistical zones covered by the SEAMAP Summer and Fall Groundfish Surveys. The green shaded areas represent the historic survey universe, prior to the design change in 2008, with the white areas representing the survey expansion. The teal line represent the geographical breaks for the abundance indices for brown, pink, and white shrimp.

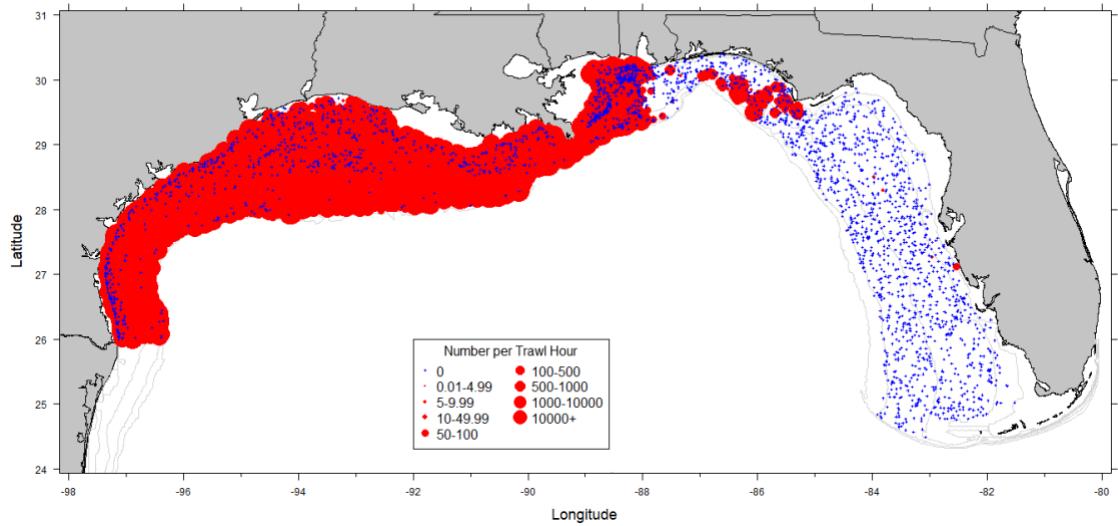
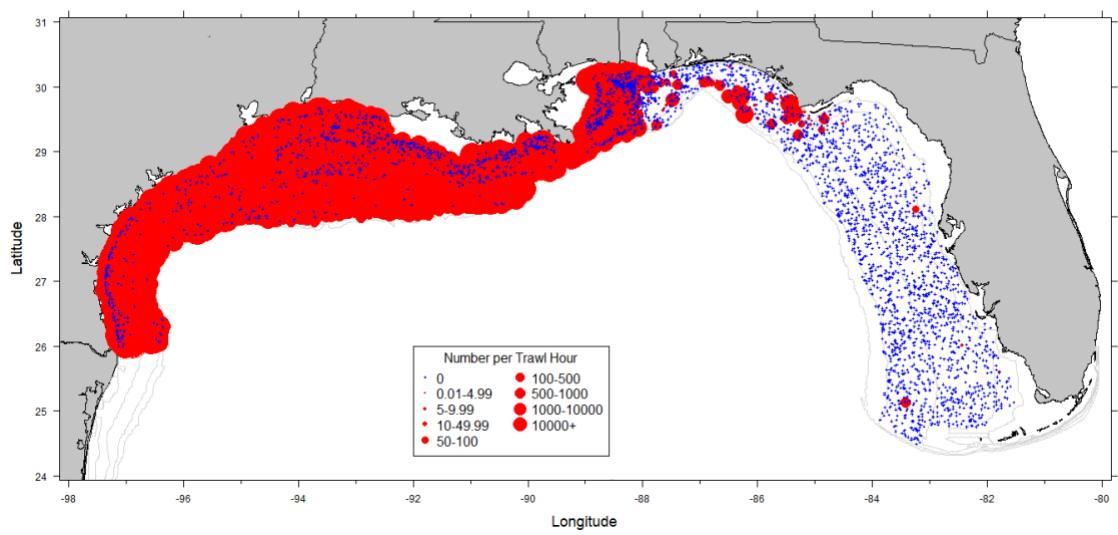


Figure 2. Stations sampled during the SEAMAP Summer (top) and Fall (bottom) Groundfish Surveys with CPUE for brown shrimp from 1987-2022.

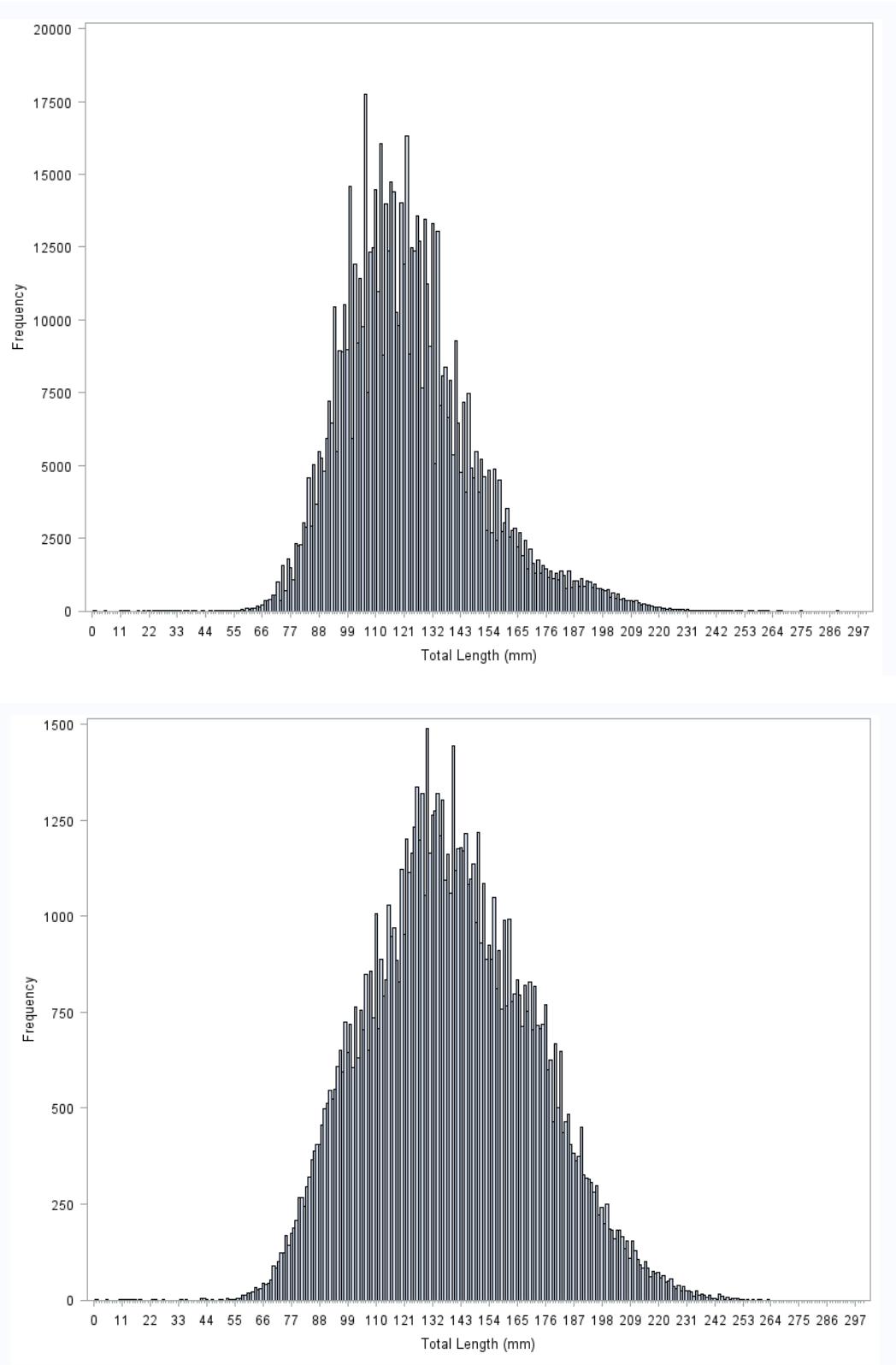


Figure 3. Length distribution of brown shrimp captured during the SEAMAP Summer (top) and Fall (bottom) Groundfish Surveys from 1987-2022.

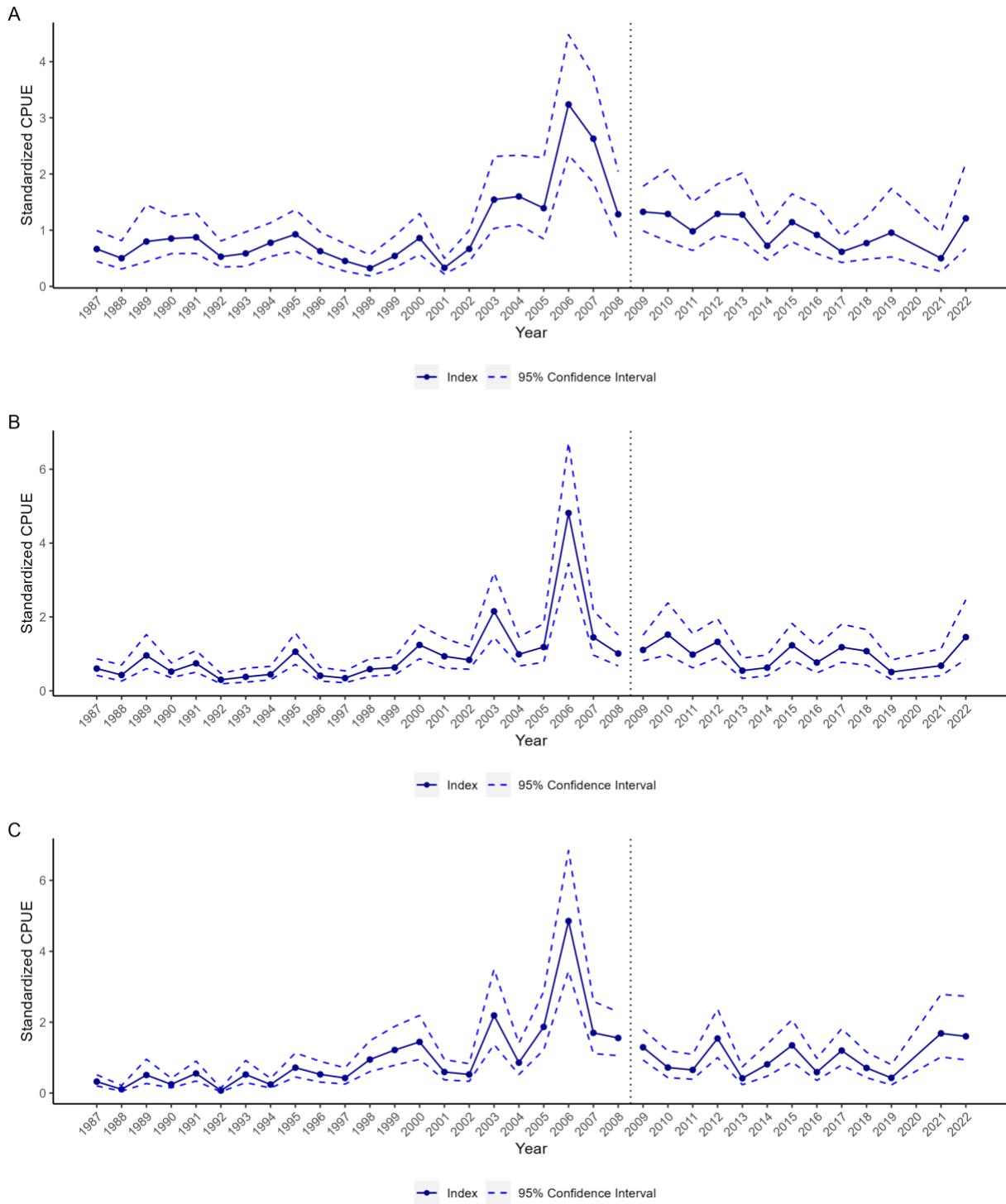


Figure 4. Annual indices of abundance for A. large (<30 count), B. medium (30-60 count), and C. small (>67 count) brown shrimp from the SEAMAP Summer Groundfish Survey in shrimp statistical zones 17-11. The dotted line represents the survey design change, which led to a separate abundance indices for the two time series.

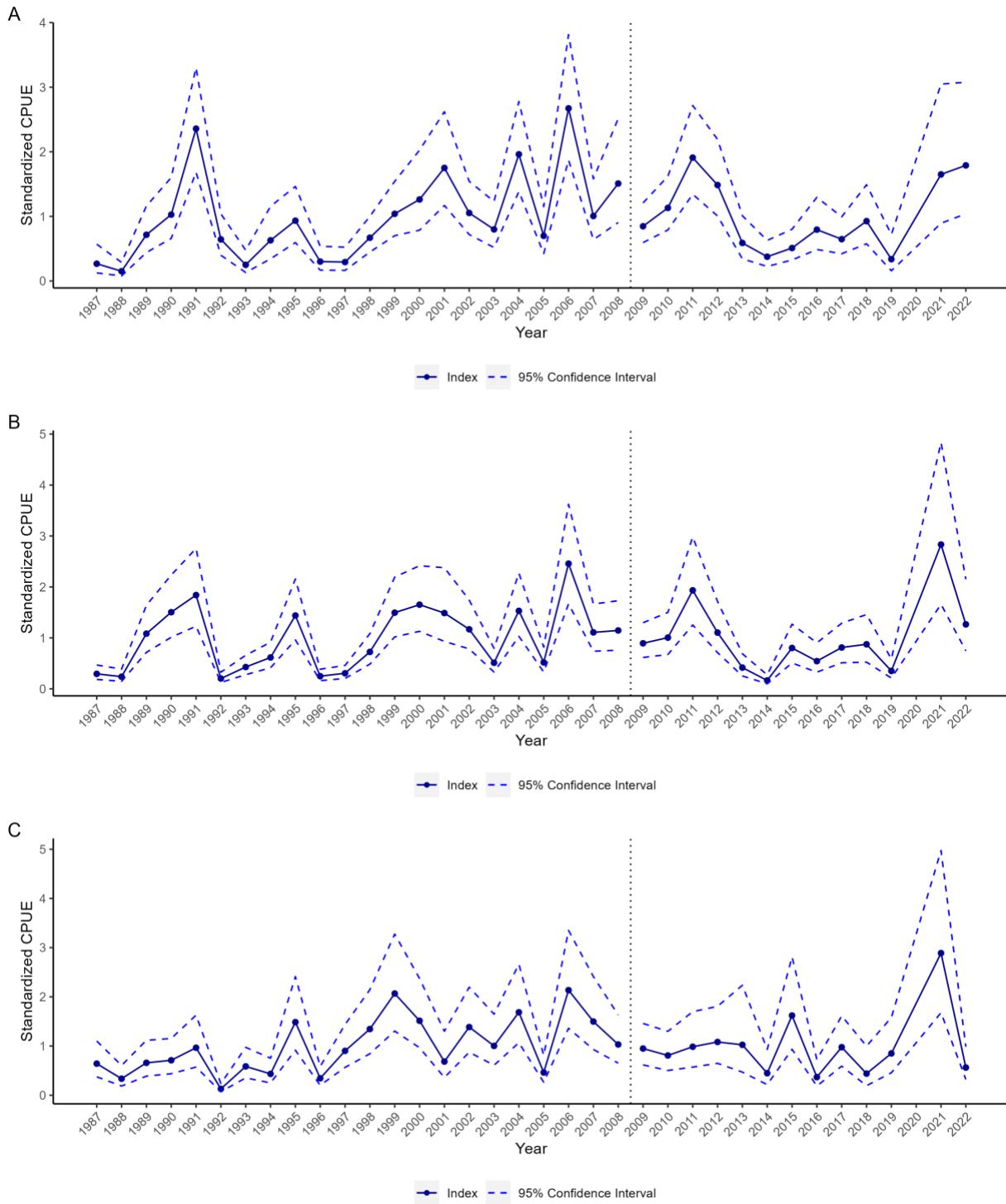


Figure 5. Annual indices of abundance for A. large (<30 count), B. medium (30-60 count), and C. small (>67 count) brown shrimp from the SEAMAP Summer Groundfish Survey in shrimp statistical zones 21-18. The dotted line represents the survey design change, which led to a separate abundance indices for the two time series.

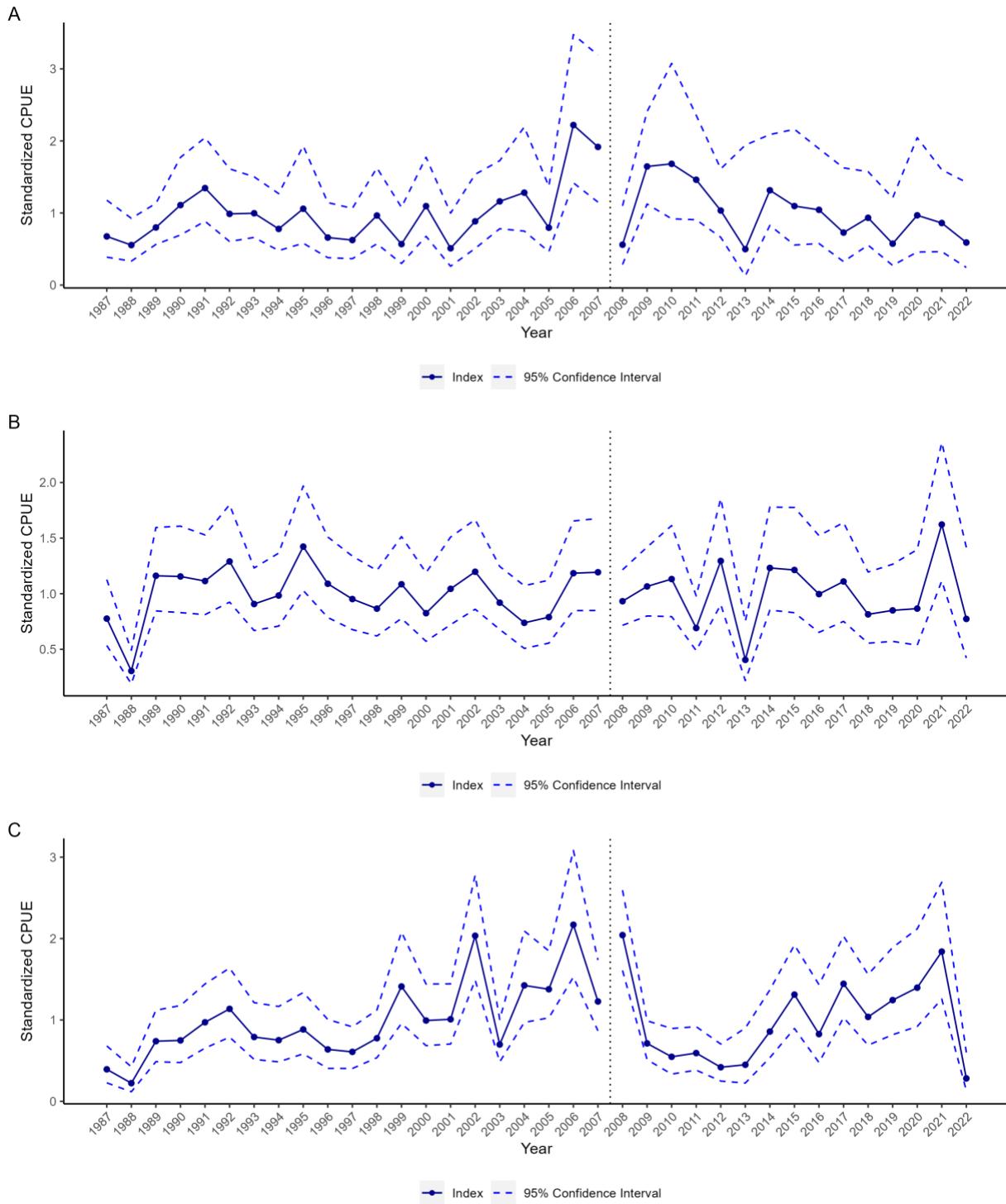


Figure 6. Annual indices of abundance for A. large (<30 count), B. medium (30-60 count), and C. small (>67 count) brown shrimp from the SEAMAP Fall Groundfish Survey in shrimp statistical zones 17-11. The dotted line represents the survey design change, which led to a separate abundance indices for the two time series.

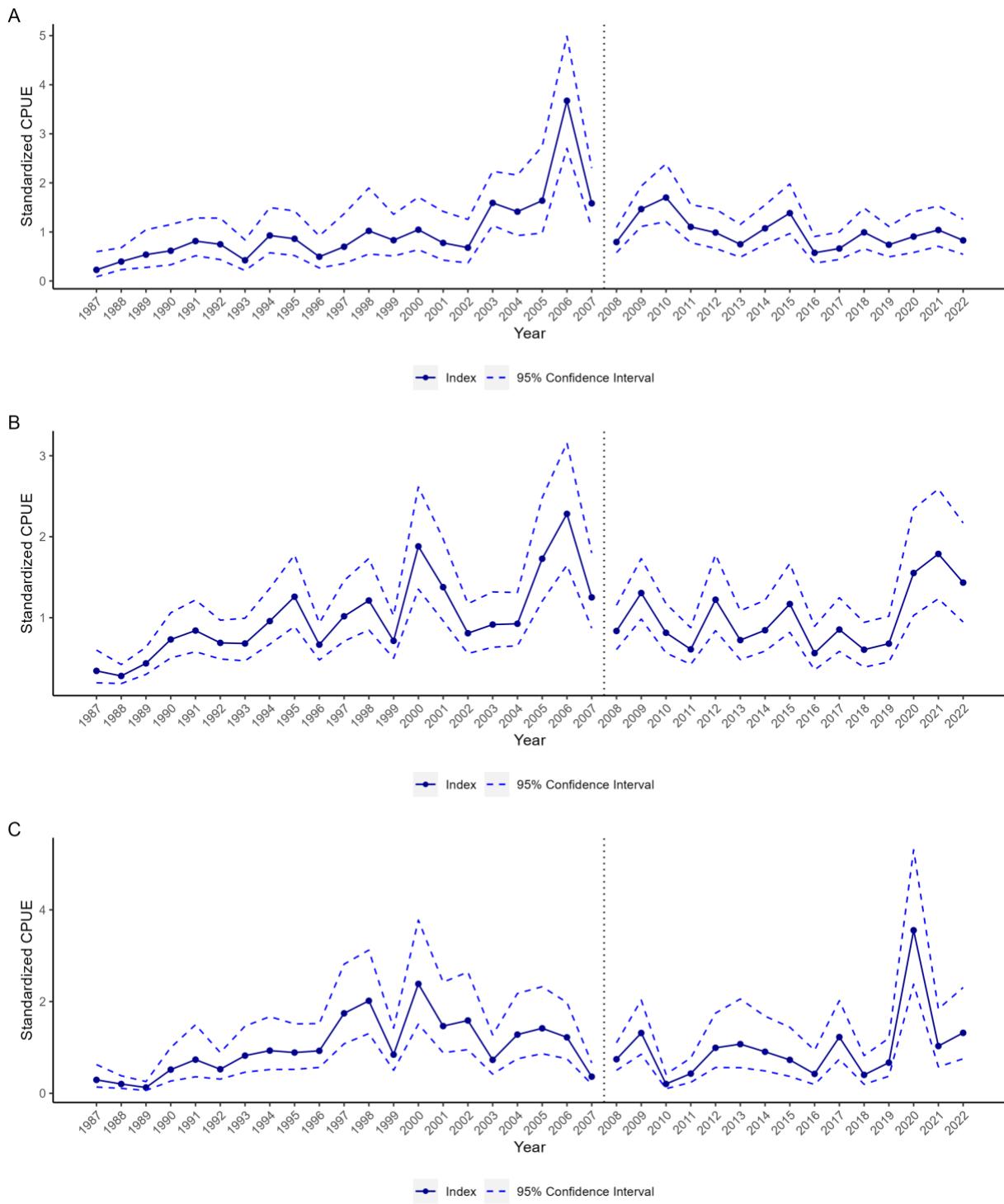


Figure 7. Annual indices of abundance for A. large (<30 count), B. medium (30-60 count), and C. small (>67 count) brown shrimp from the SEAMAP Fall Groundfish Survey in shrimp statistical zones 21-18. The dotted line represents the survey design change, which led to a separate abundance indices for the two time series.

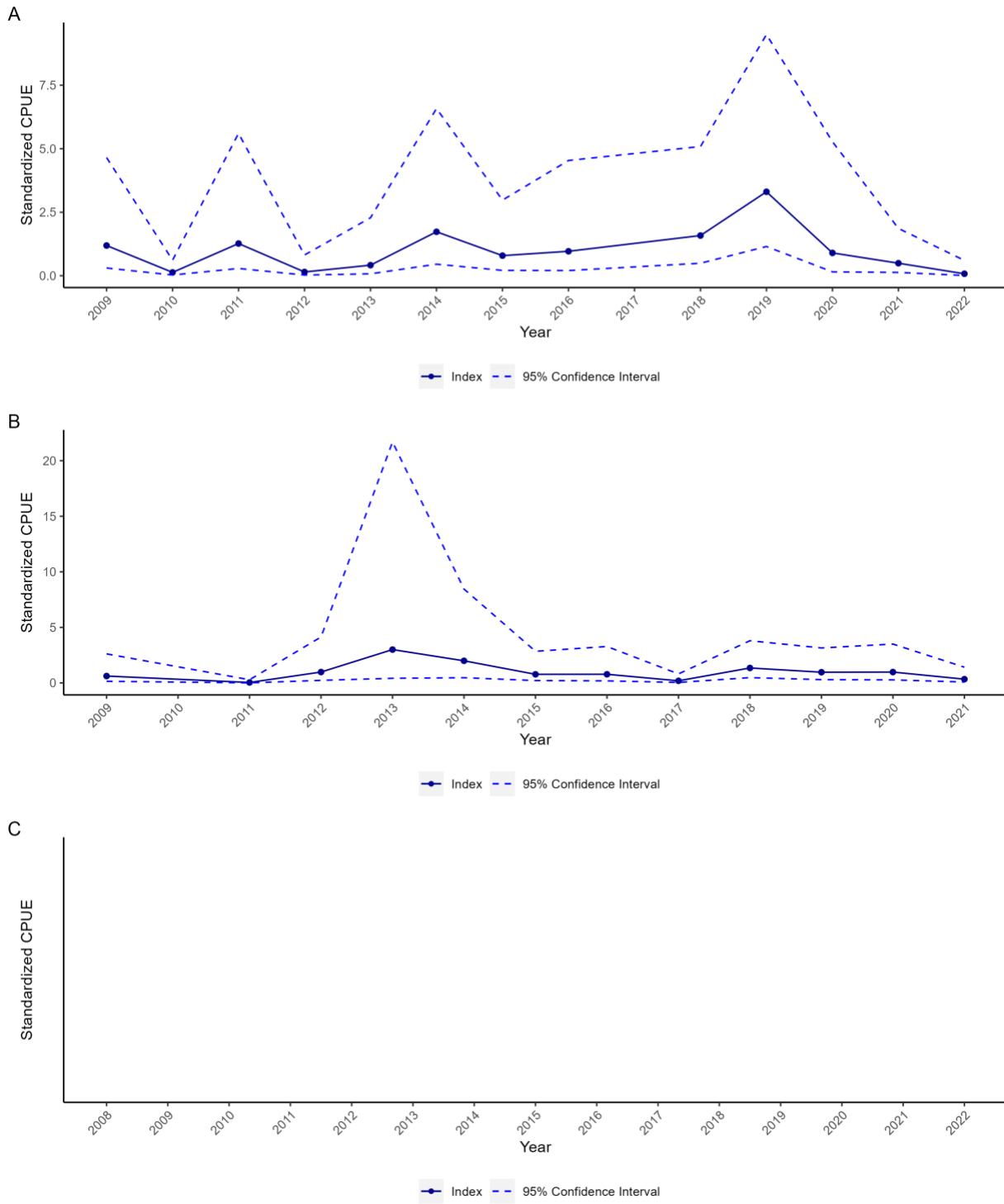


Figure 8. Annual indices of abundance for A. large (<30 count), B. medium (30-60 count), and C. small (>67 count) brown shrimp from the SEAMAP Fall Groundfish Survey in shrimp statistical zones 10-8. The dotted line represents the survey design change, which led to a separate abundance indices for the two time series.

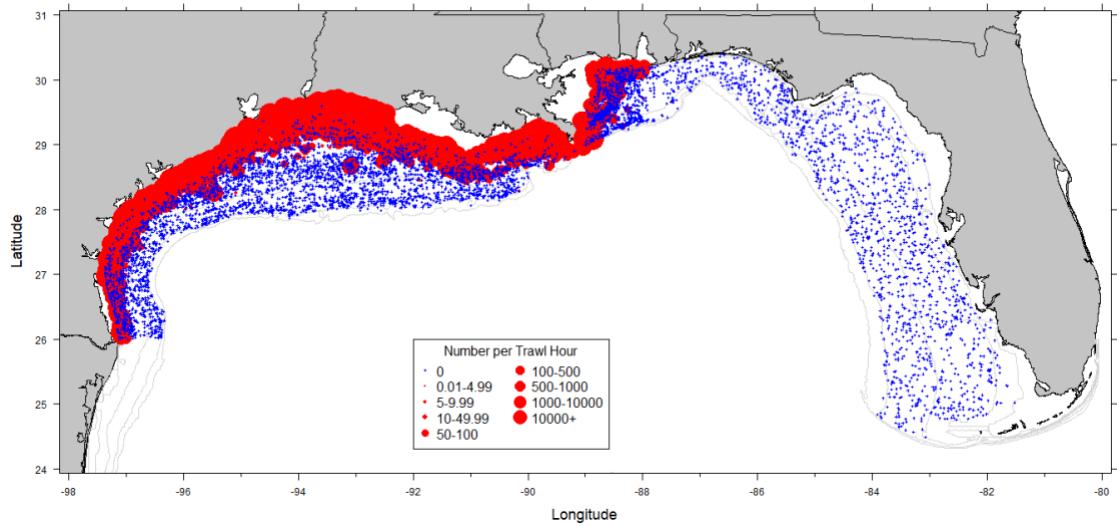
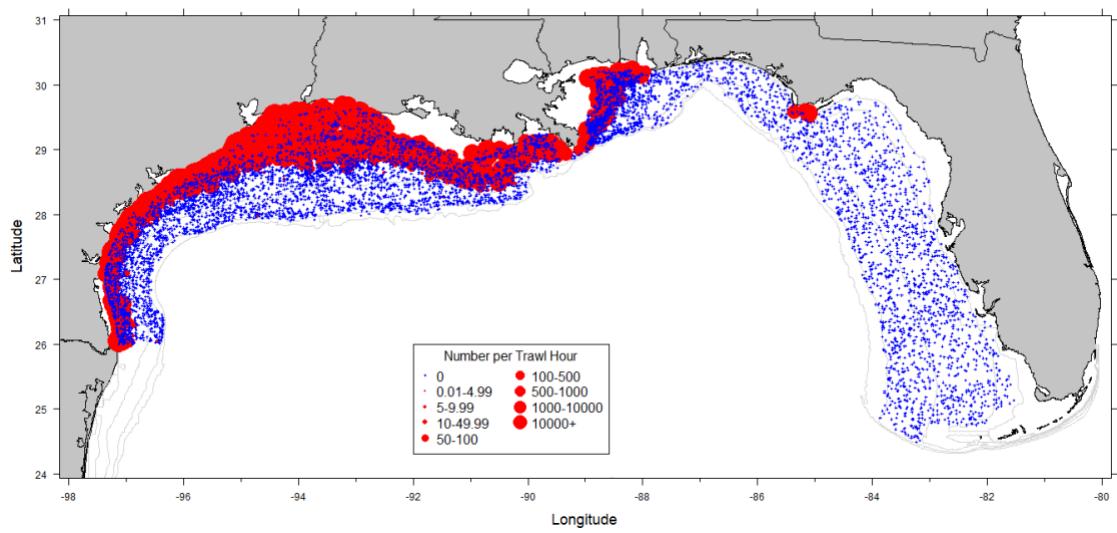


Figure 9. Stations sampled during the SEAMAP Summer (top) and Fall (bottom) Groundfish Surveys with CPUE for white shrimp from 1987-2022.

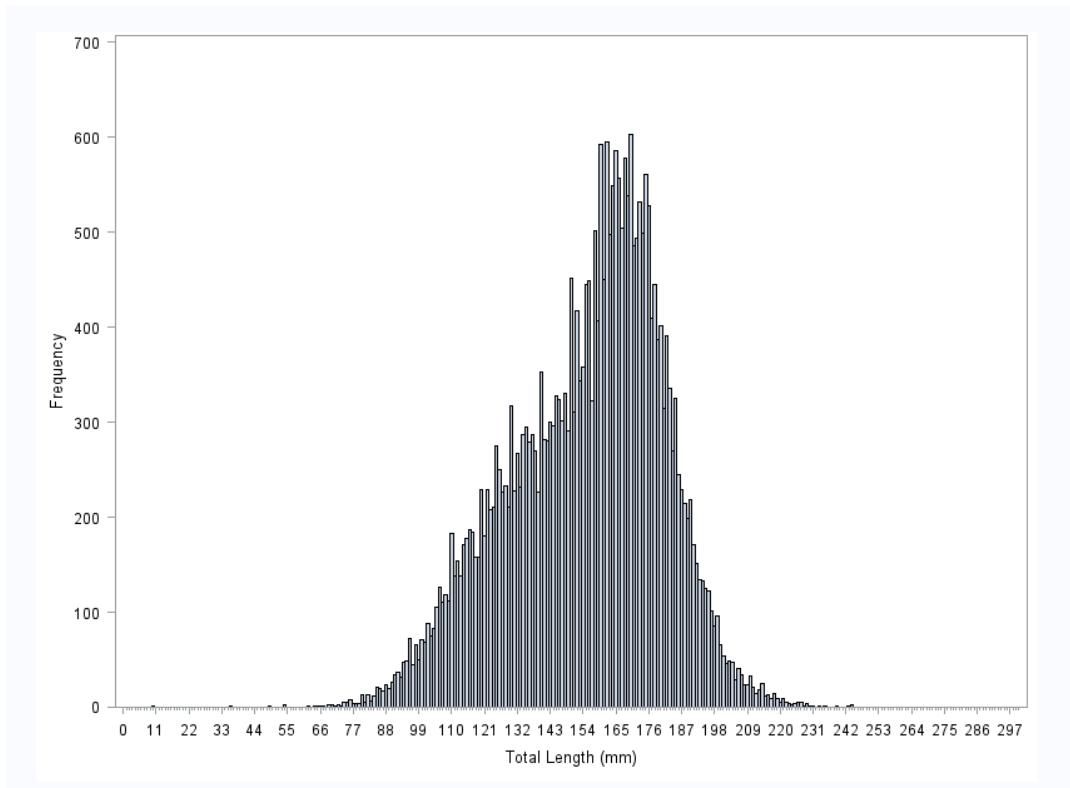
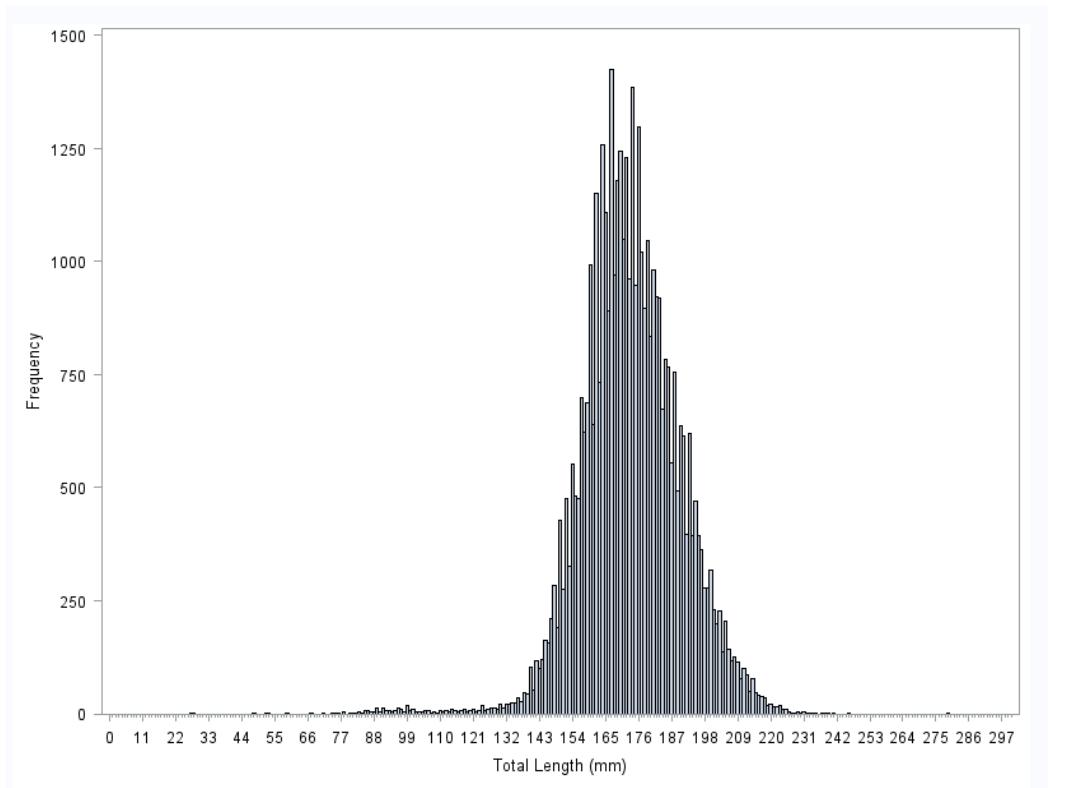


Figure 10. Length distribution of white shrimp captured during the SEAMAP Summer (top) and Fall (bottom) Groundfish Surveys from 1987-2022.

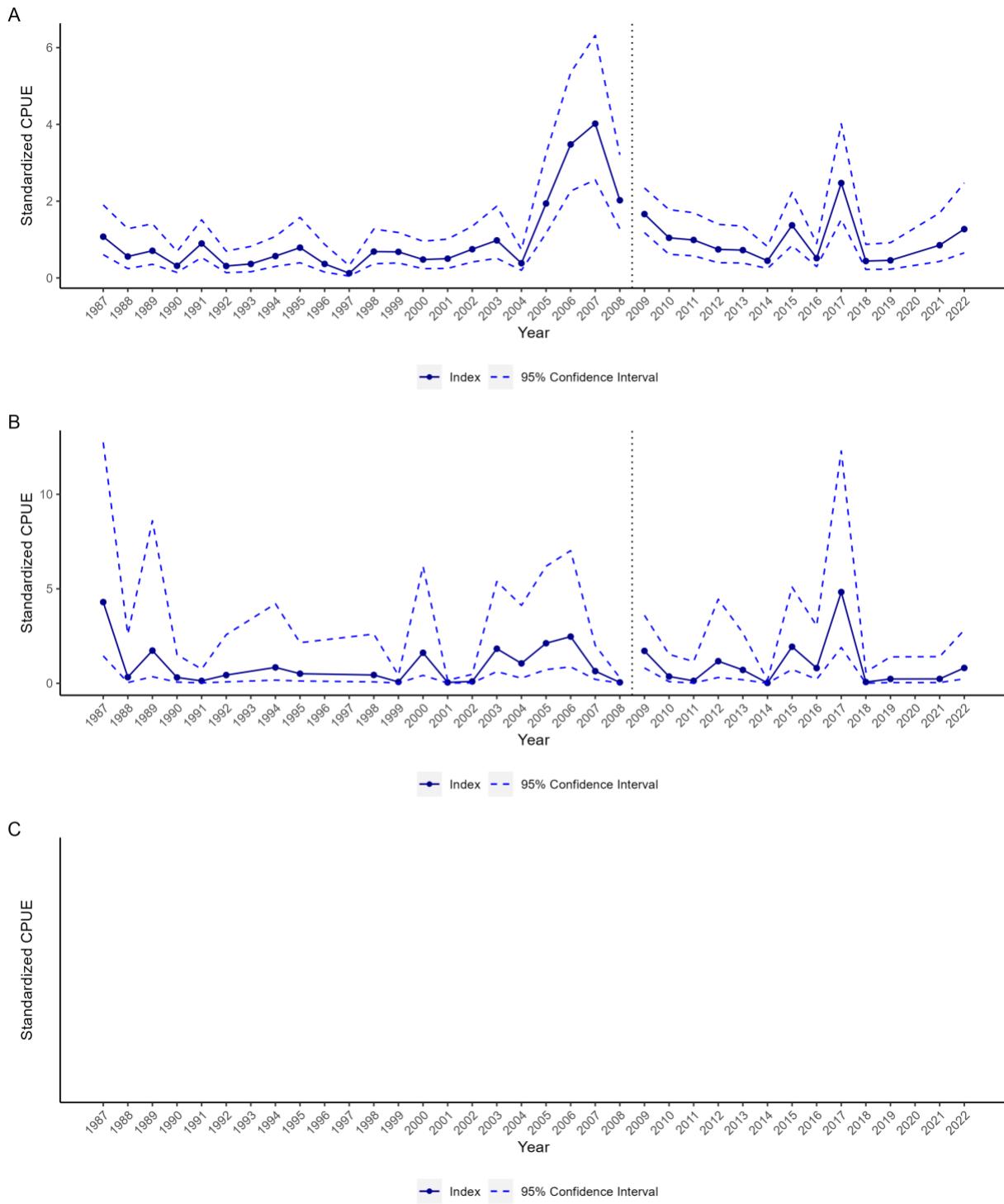


Figure 11. Annual indices of abundance for A. large (<30 count), B. medium (30-60 count), and C. small (>67 count) white shrimp from the SEAMAP Summer Groundfish Survey in shrimp statistical zones 17-11. The dotted line represents the survey design change, which led to a separate abundance indices for the two time series.

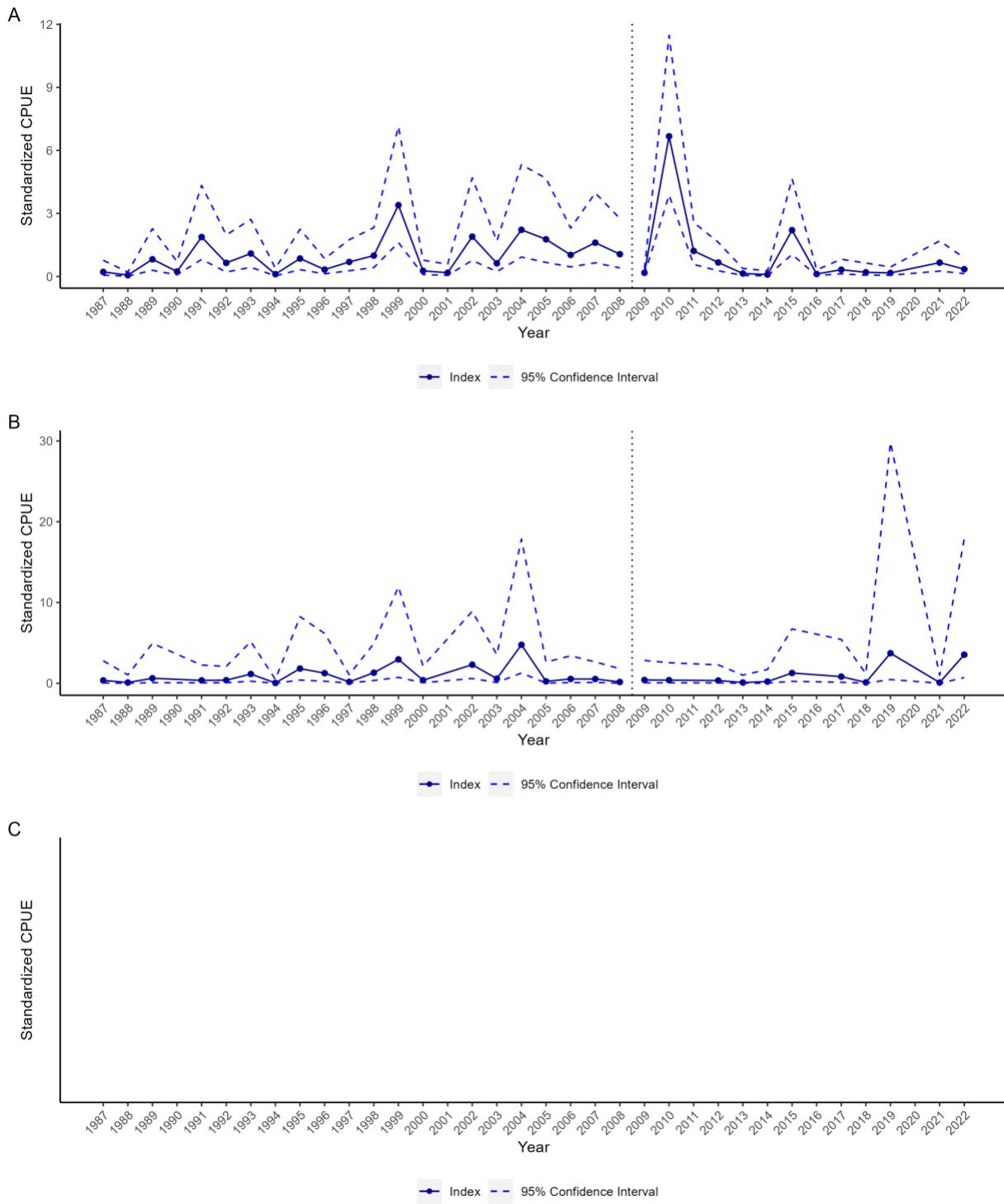


Figure 12. Annual indices of abundance for A. large (<30 count), B. medium (30-60 count), and C. small (>67 count) white shrimp from the SEAMAP Summer Groundfish Survey in shrimp statistical zones 21-18. The dotted line represents the survey design change, which led to a separate abundance indices for the two time series.

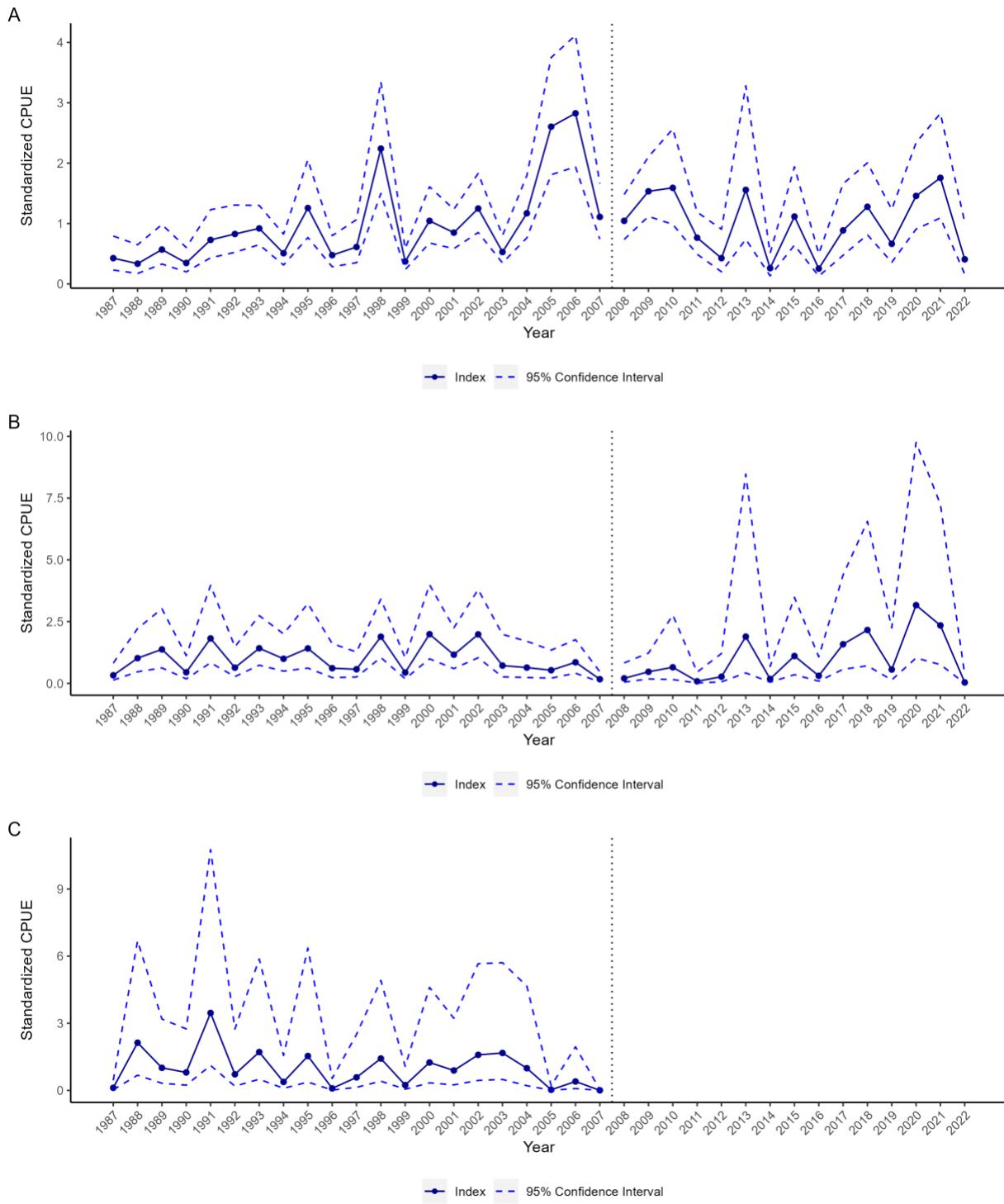


Figure 13. Annual indices of abundance for A. large (<30 count), B. medium (30-60 count), and C. small (>67 count) white shrimp from the SEAMAP Fall Groundfish Survey in shrimp statistical zones 17-11. The dotted line represents the survey design change, which led to a separate abundance indices for the two time series.

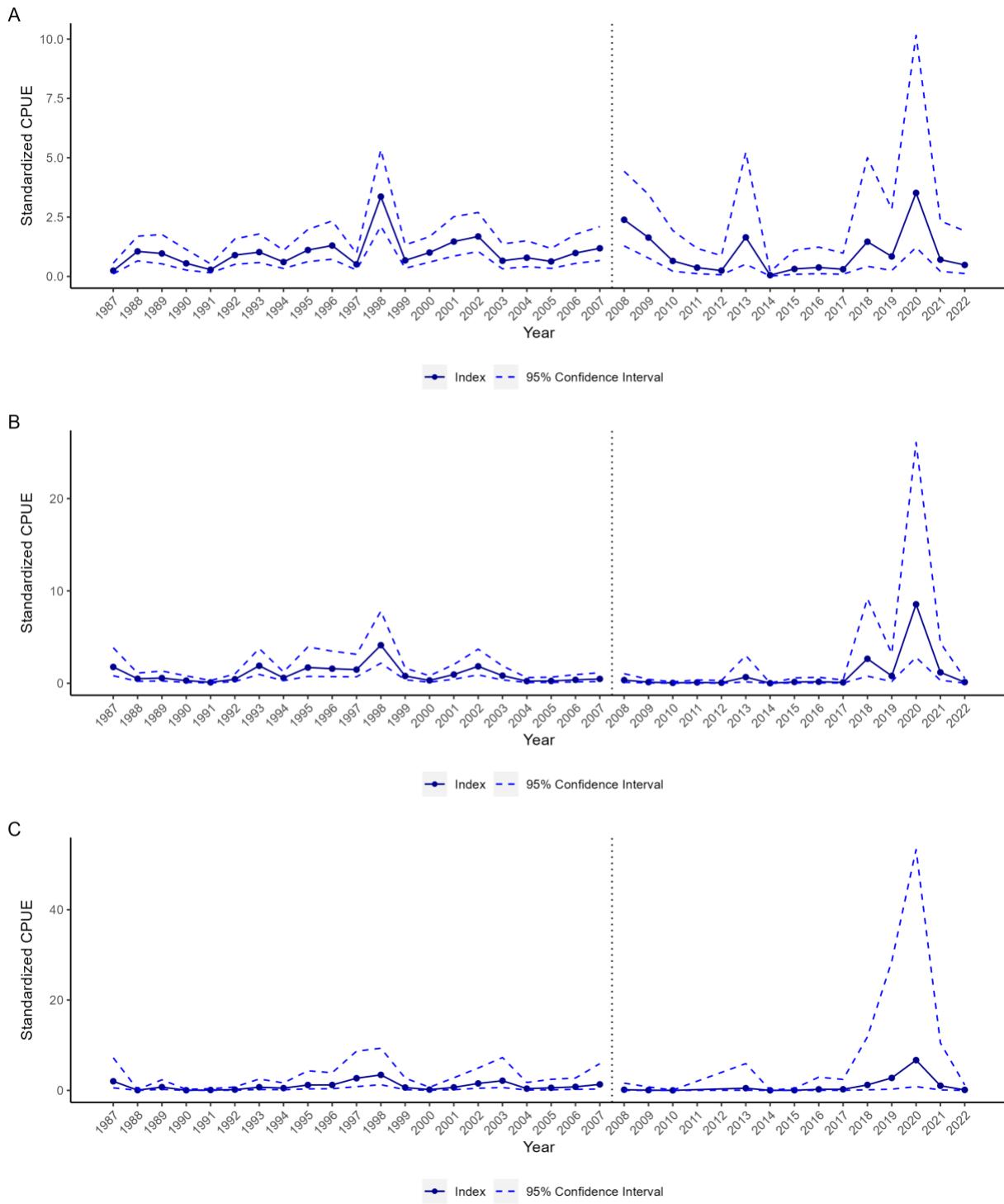


Figure 14. Annual indices of abundance for A. large (<30 count), B. medium (30-60 count), and C. small (>67 count) white shrimp from the SEAMAP Fall Groundfish Survey in shrimp statistical zones 21-18. The dotted line represents the survey design change, which led to a separate abundance indices for the two time series.

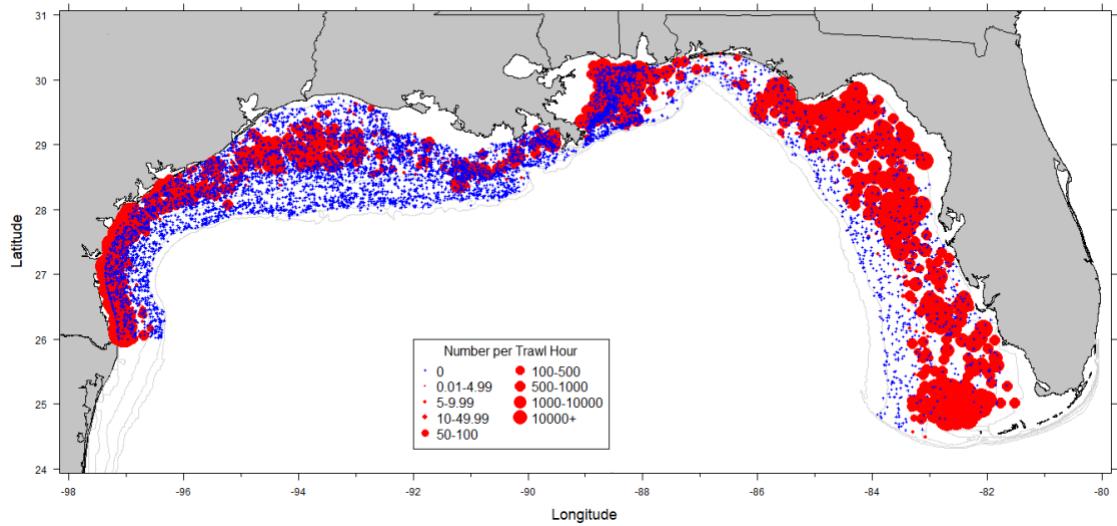
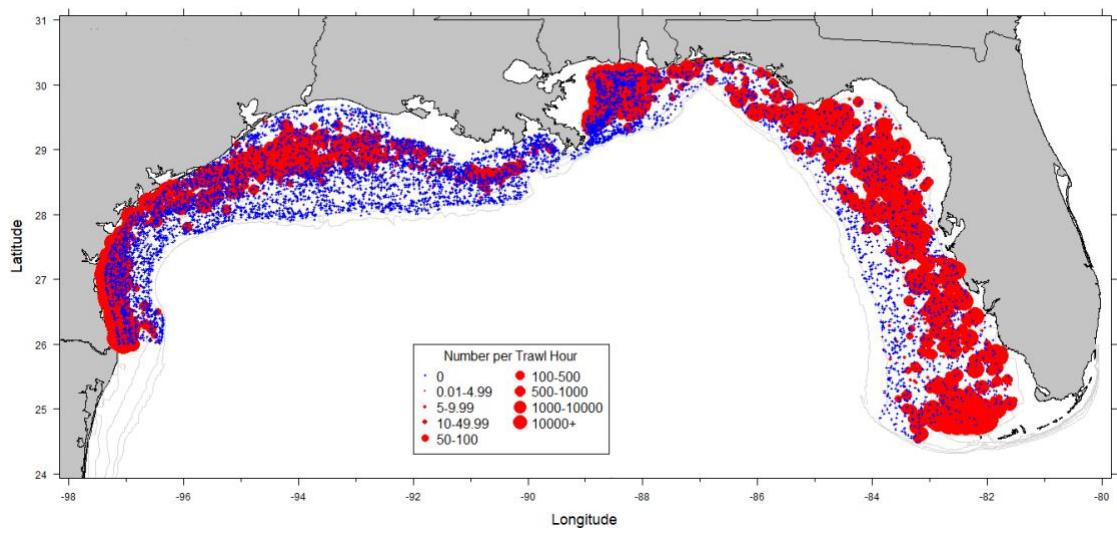


Figure 15. Stations sampled during the SEAMAP Summer (top) and Fall (bottom) Groundfish Surveys with CPUE for pink shrimp from 1987-2022.

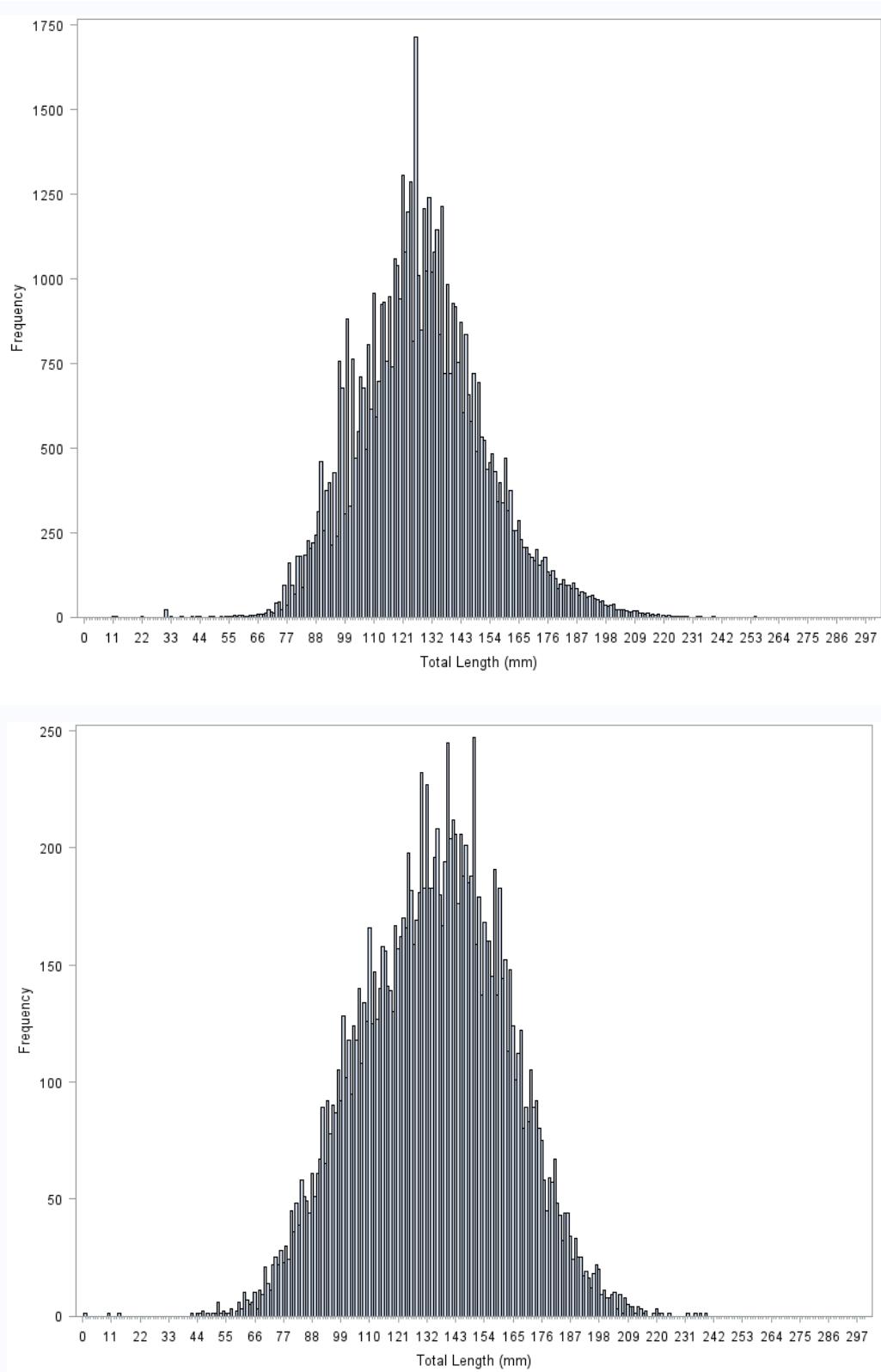


Figure 16. Length distribution of pink shrimp captured during the SEAMAP Summer (top) and Fall (bottom) Groundfish Surveys from 1987-2022.

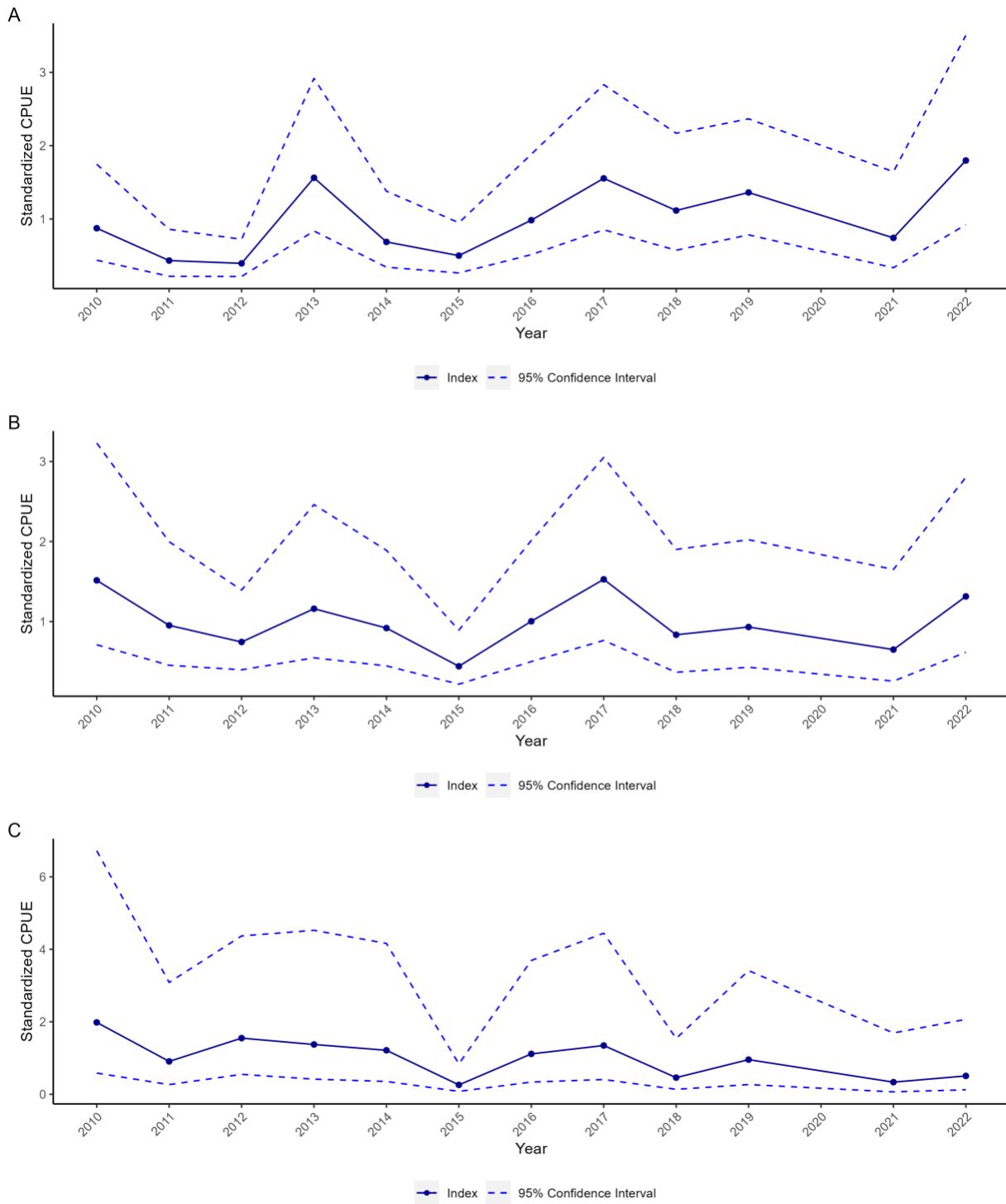


Figure 17. Annual indices of abundance for A. large (<30 count), B. medium (30-60 count), and C. small (>67 count) pink shrimp from the SEAMAP Summer Groundfish Survey in shrimp statistical zones 10-2.

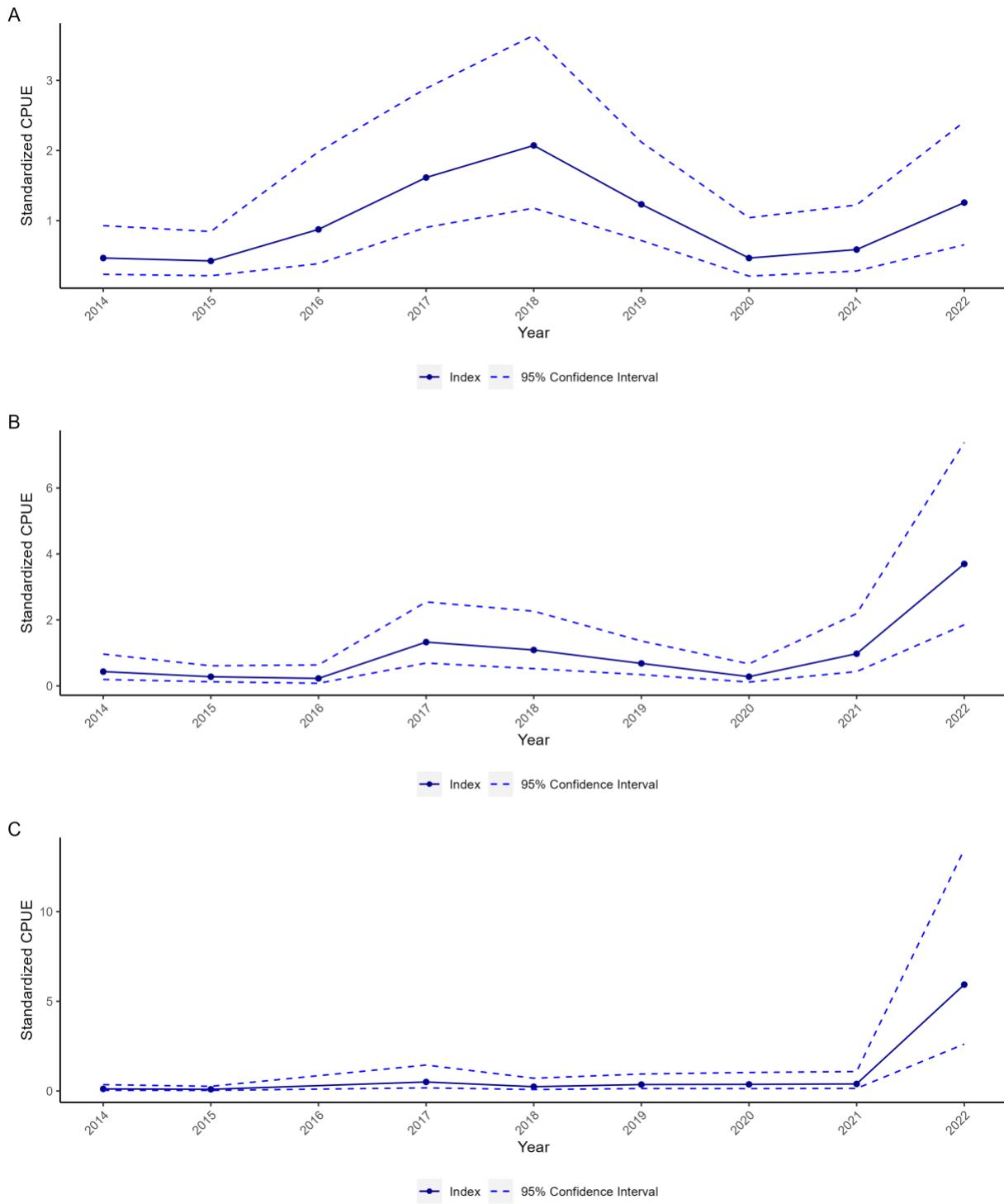
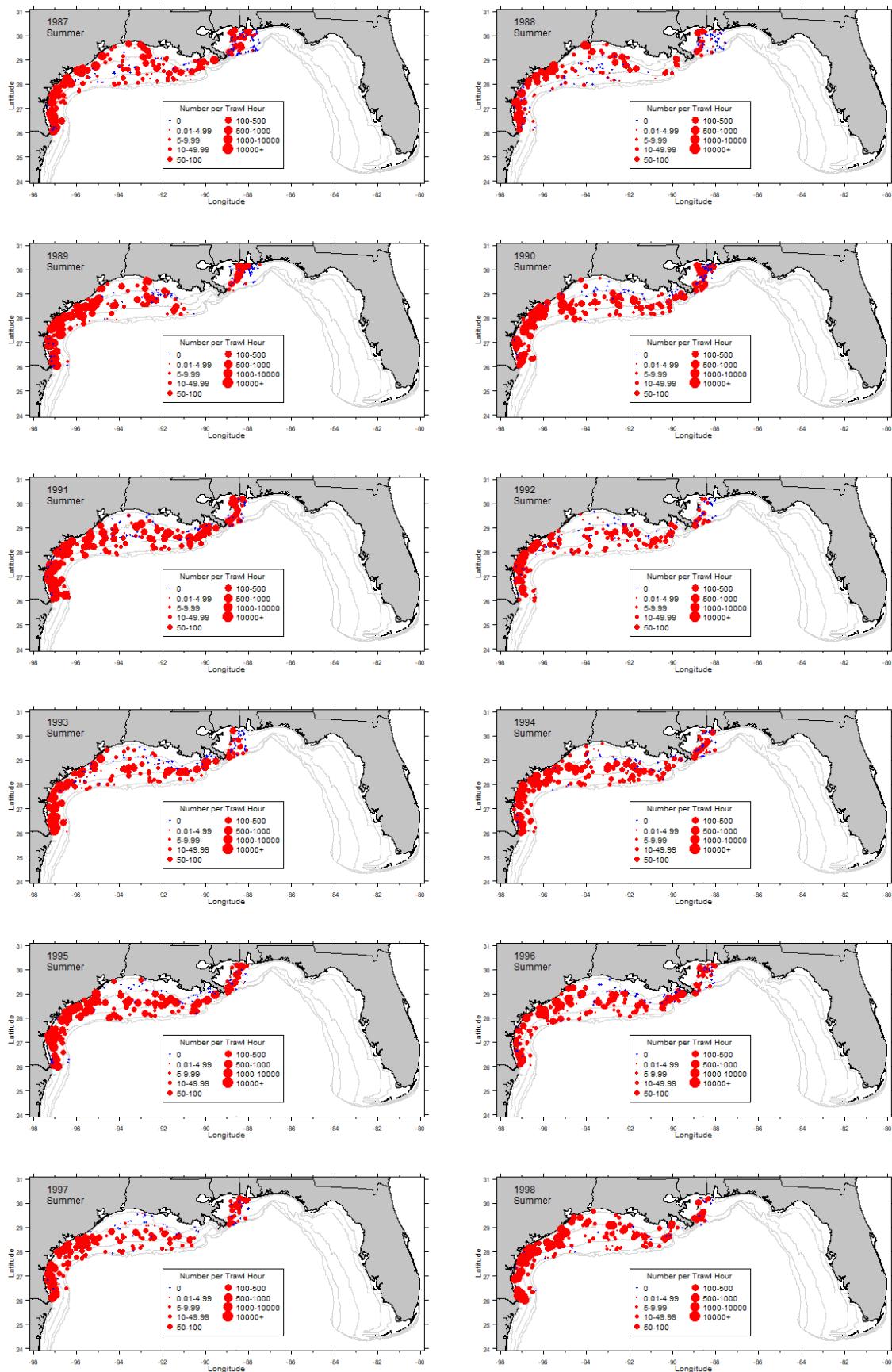
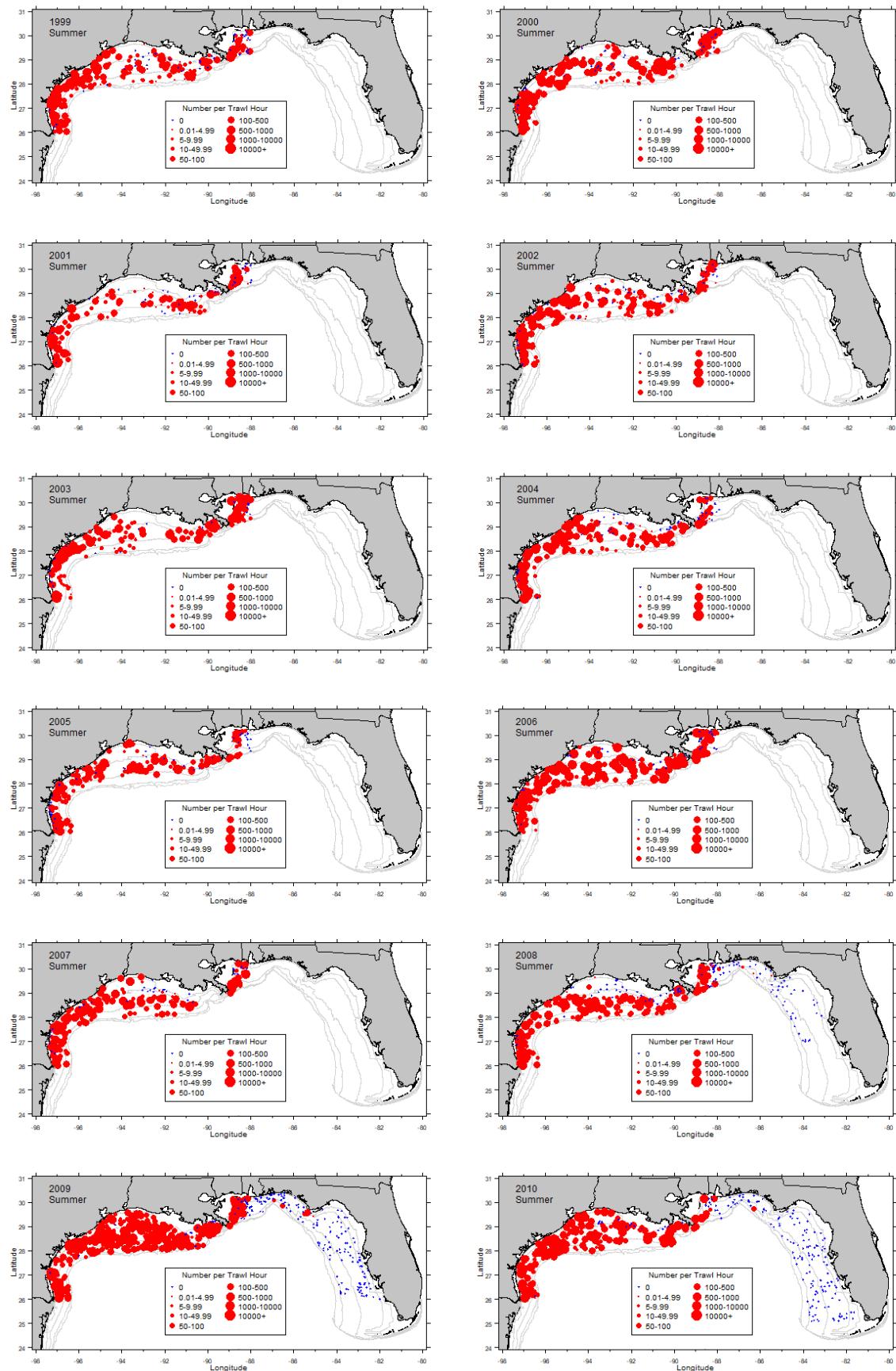


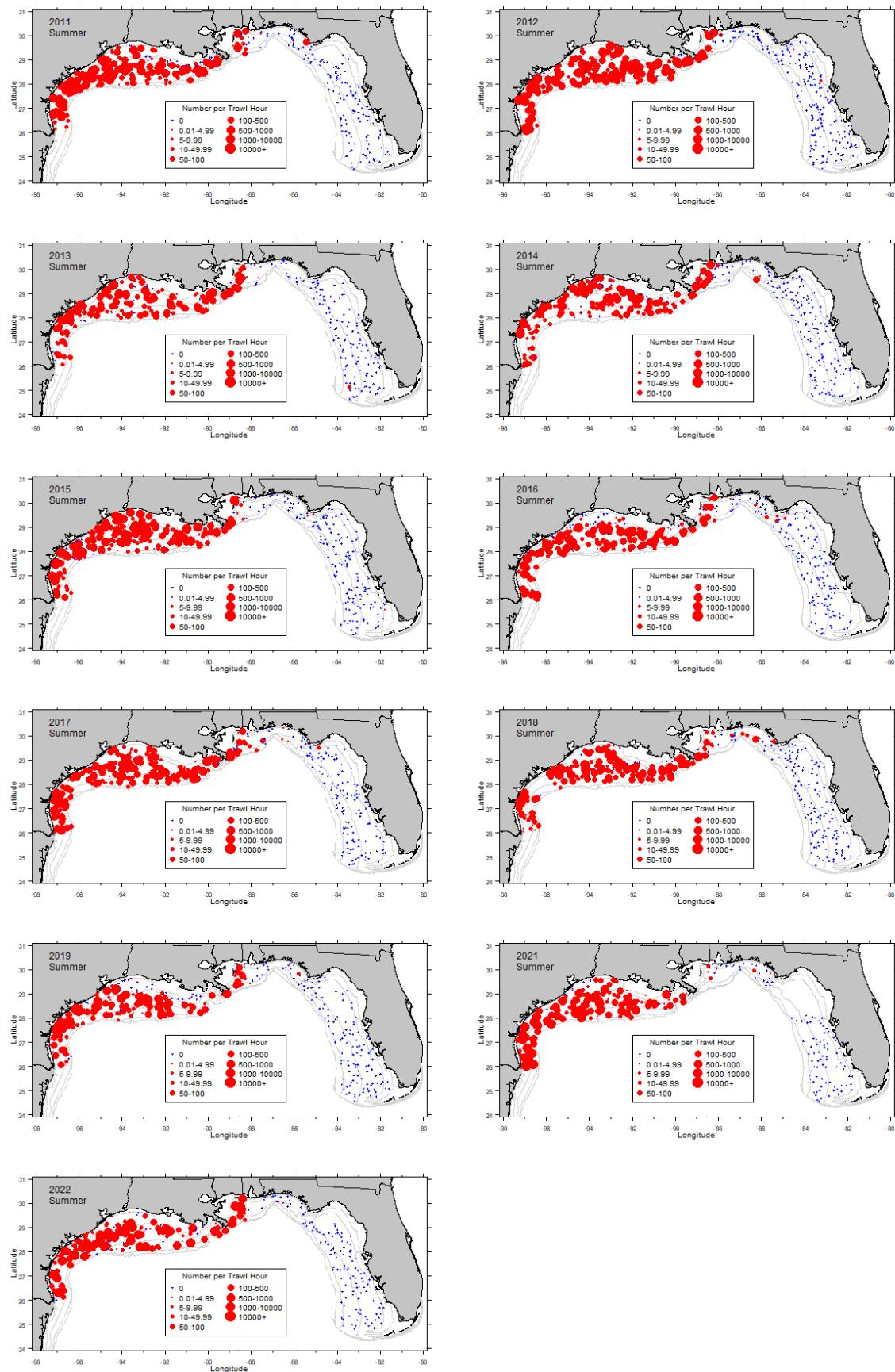
Figure 18. Annual indices of abundance for A. large (<30 count), B. medium (30-60 count), and C. small (>67 count) pink shrimp from the SEAMAP Fall Groundfish Survey in shrimp statistical zones 10-2.

## **Appendix**

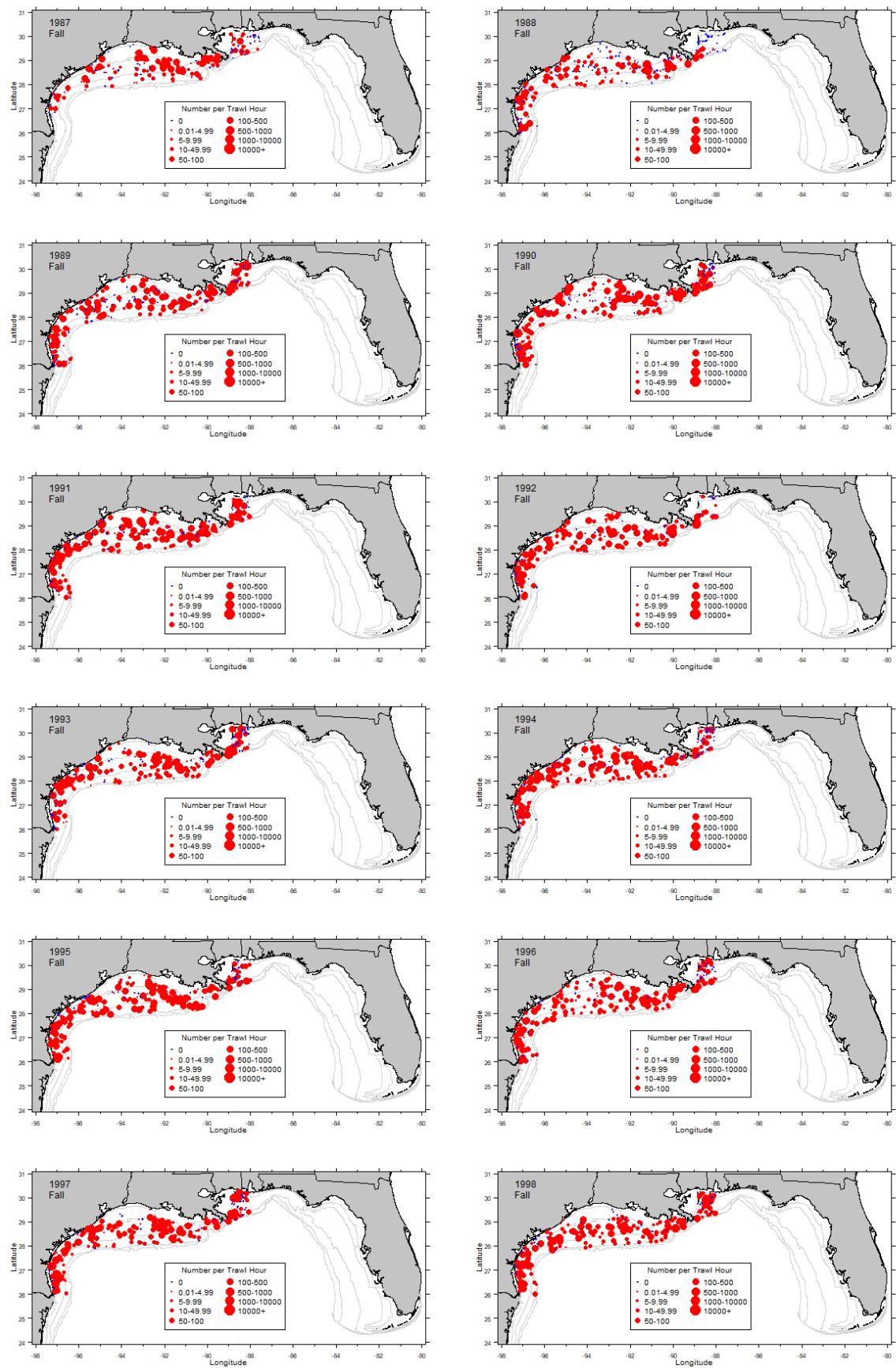
Appendix Figure 1. Annual survey effort and catch of brown shrimp from the SEAMAP Summer Groundfish Survey.

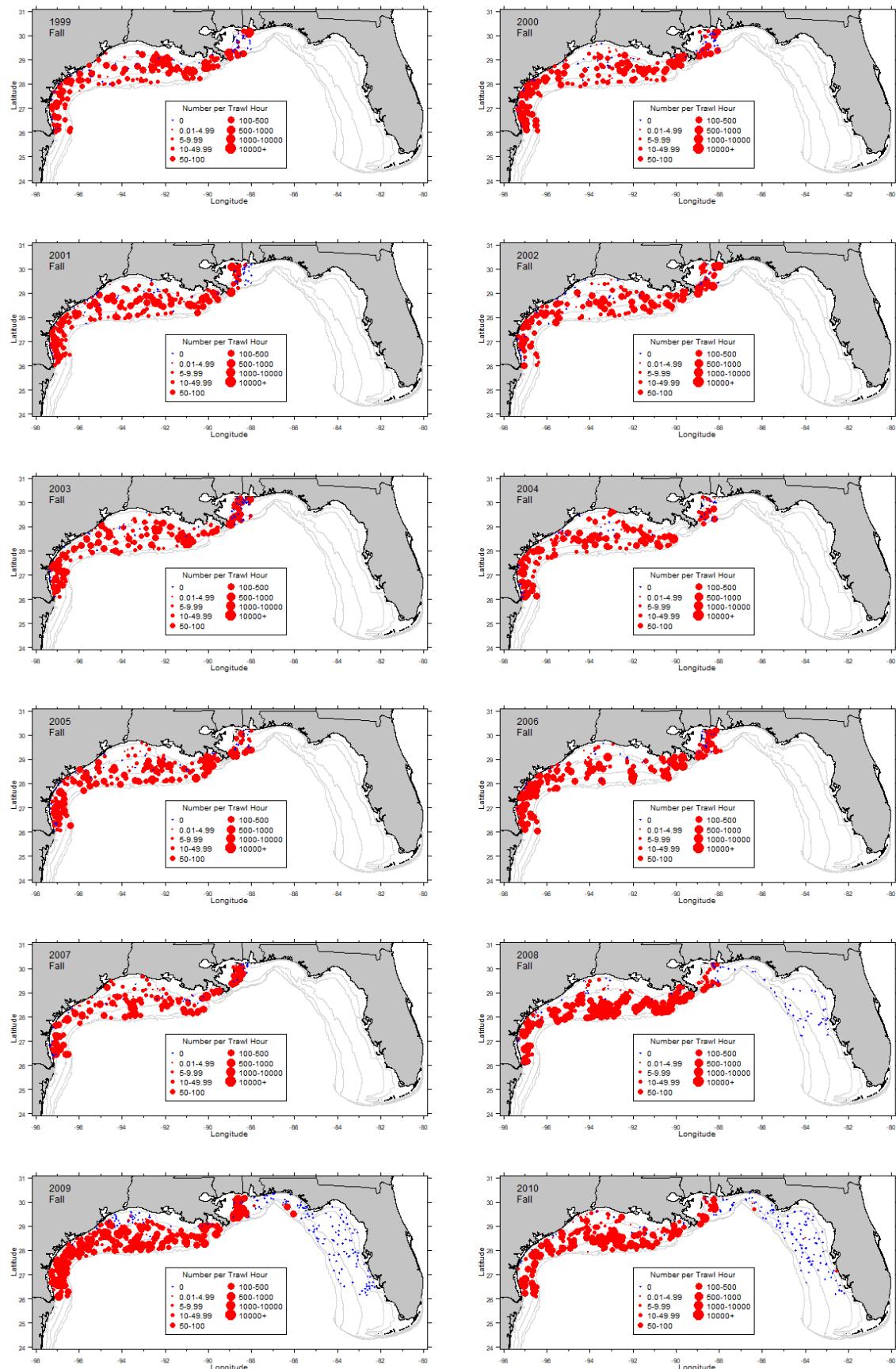


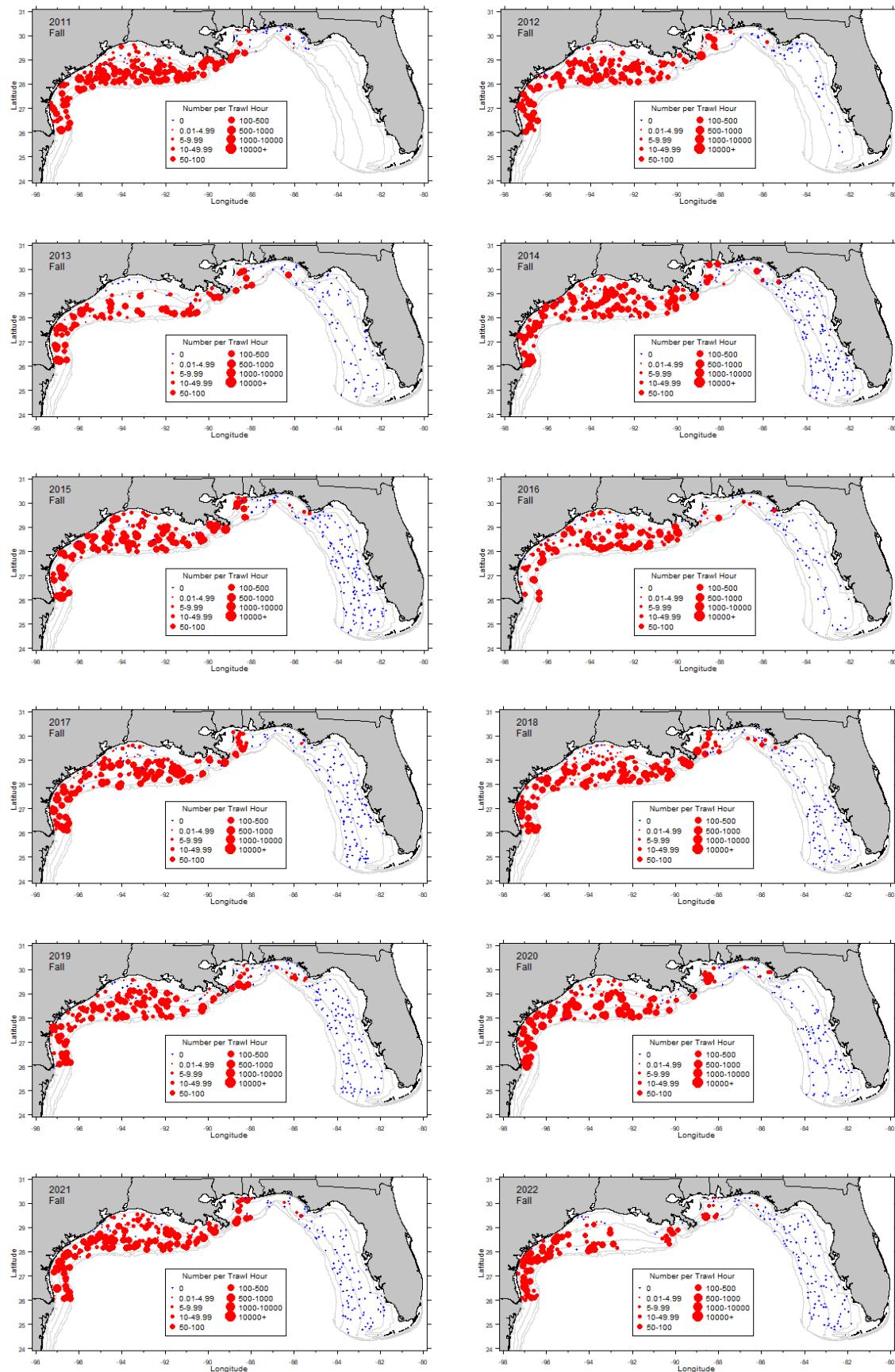




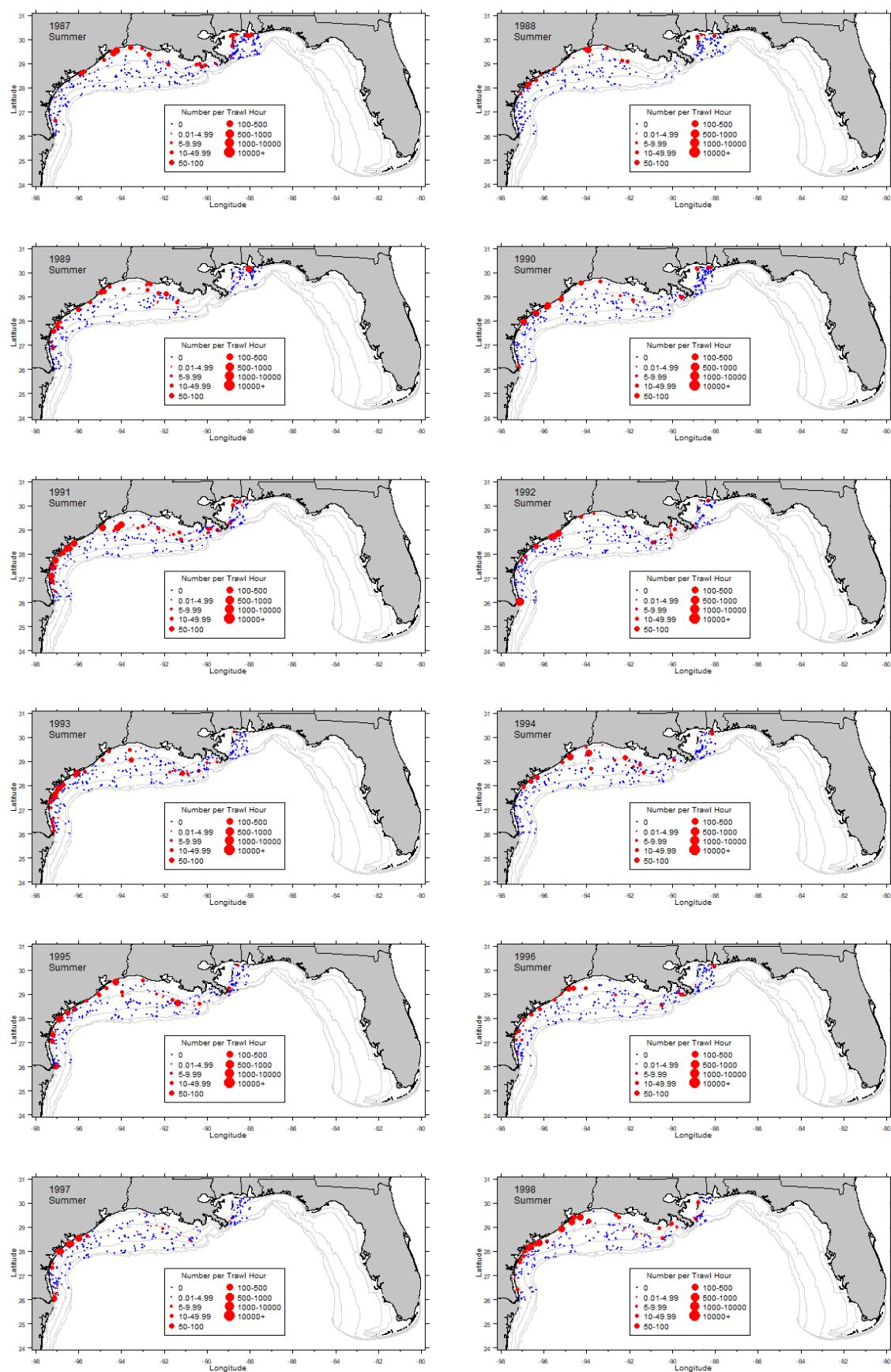
Appendix Figure 2. Annual survey effort and catch of brown shrimp from the SEAMAP Fall Groundfish Survey.

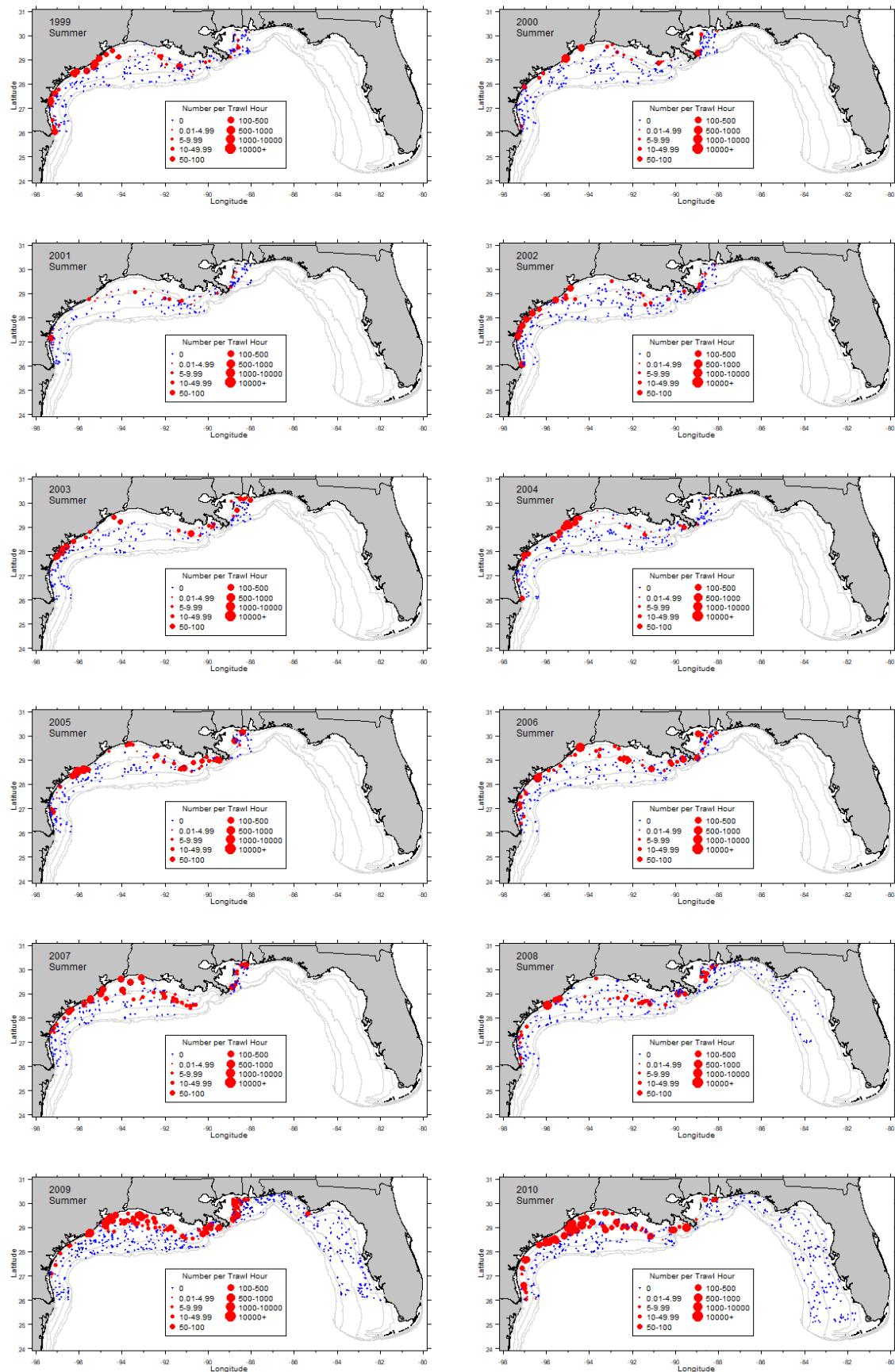


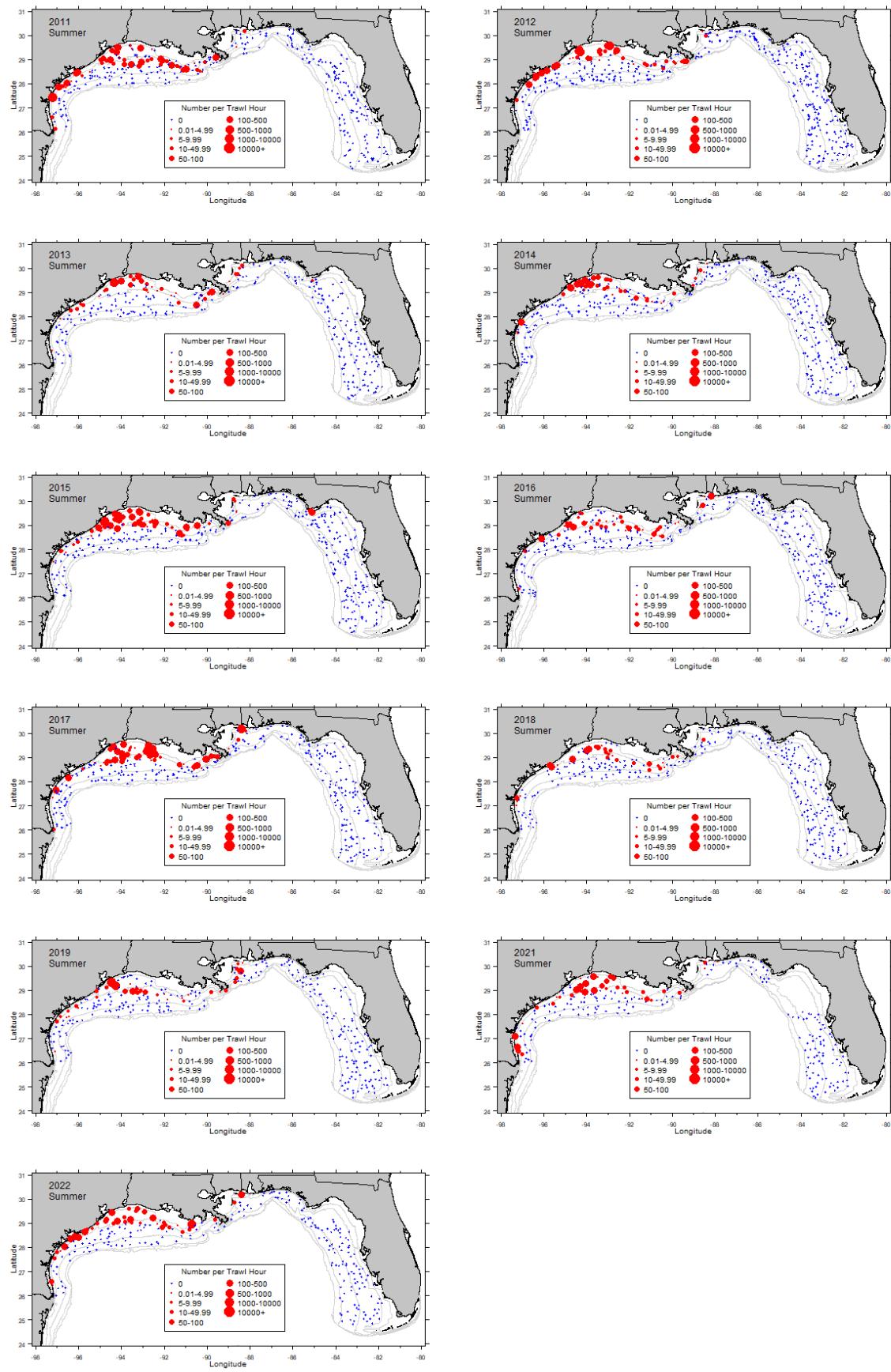




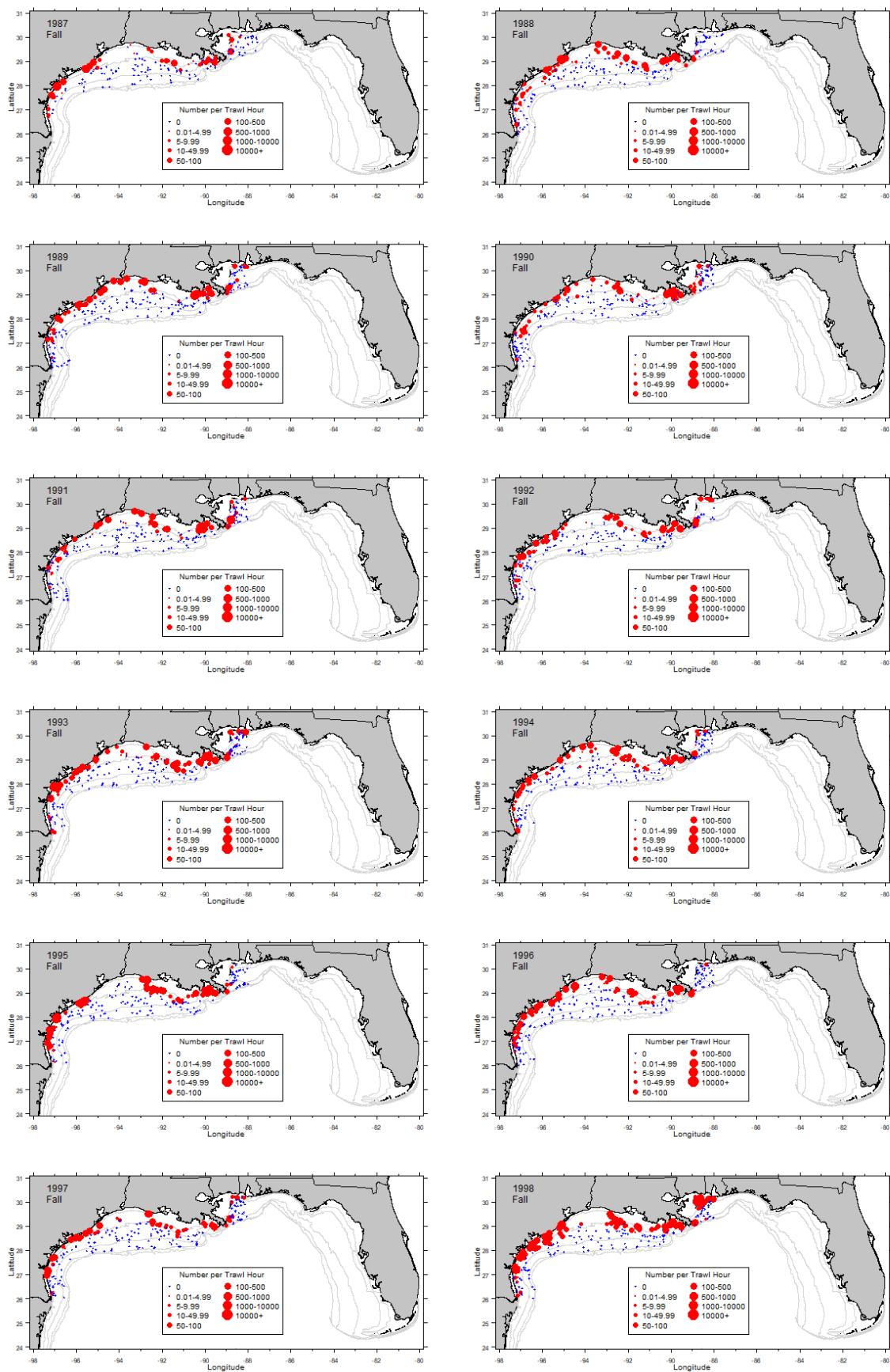
Appendix Figure 3. Annual survey effort and catch of white shrimp from the SEAMAP Summer Groundfish Survey.

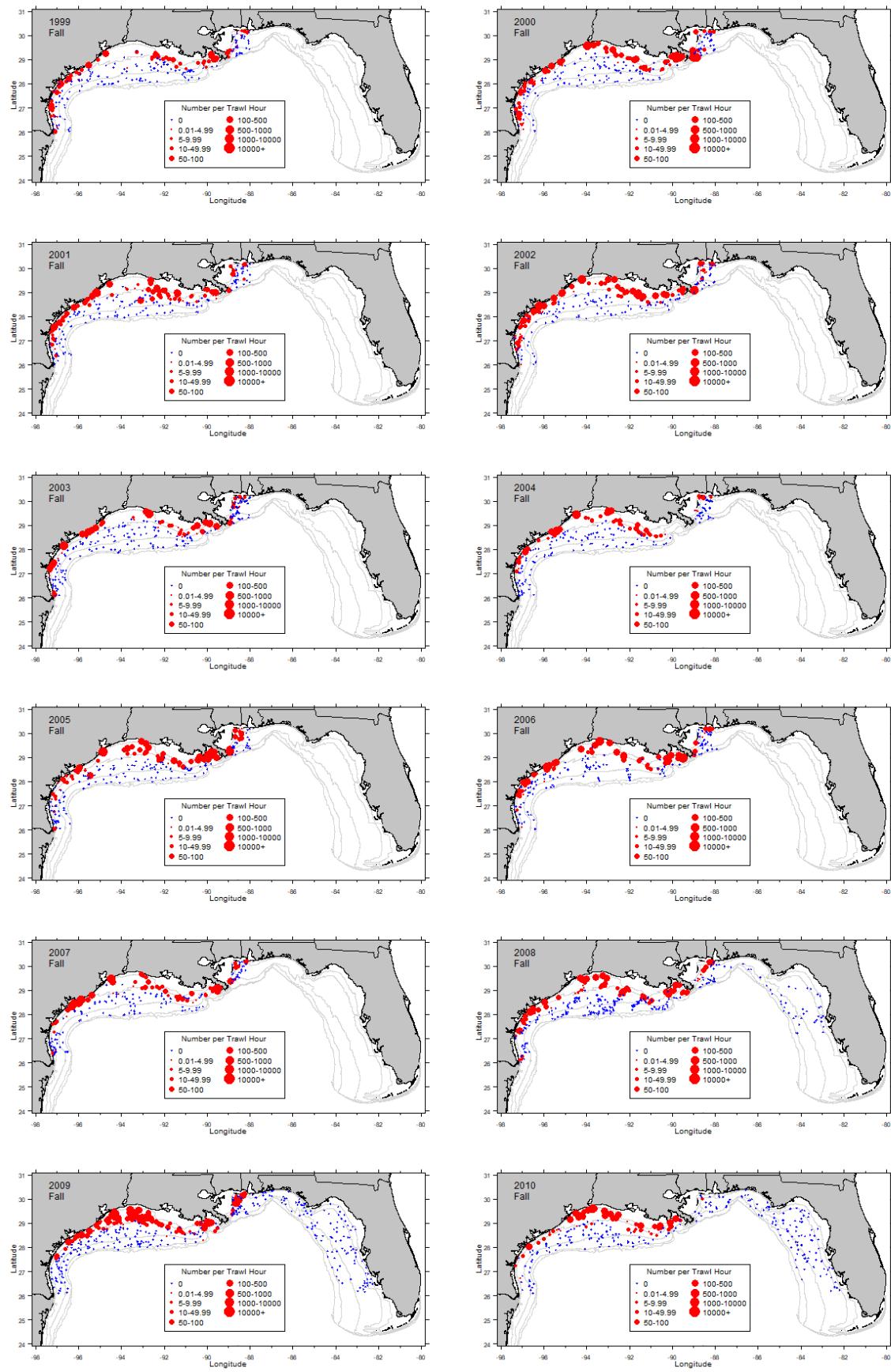


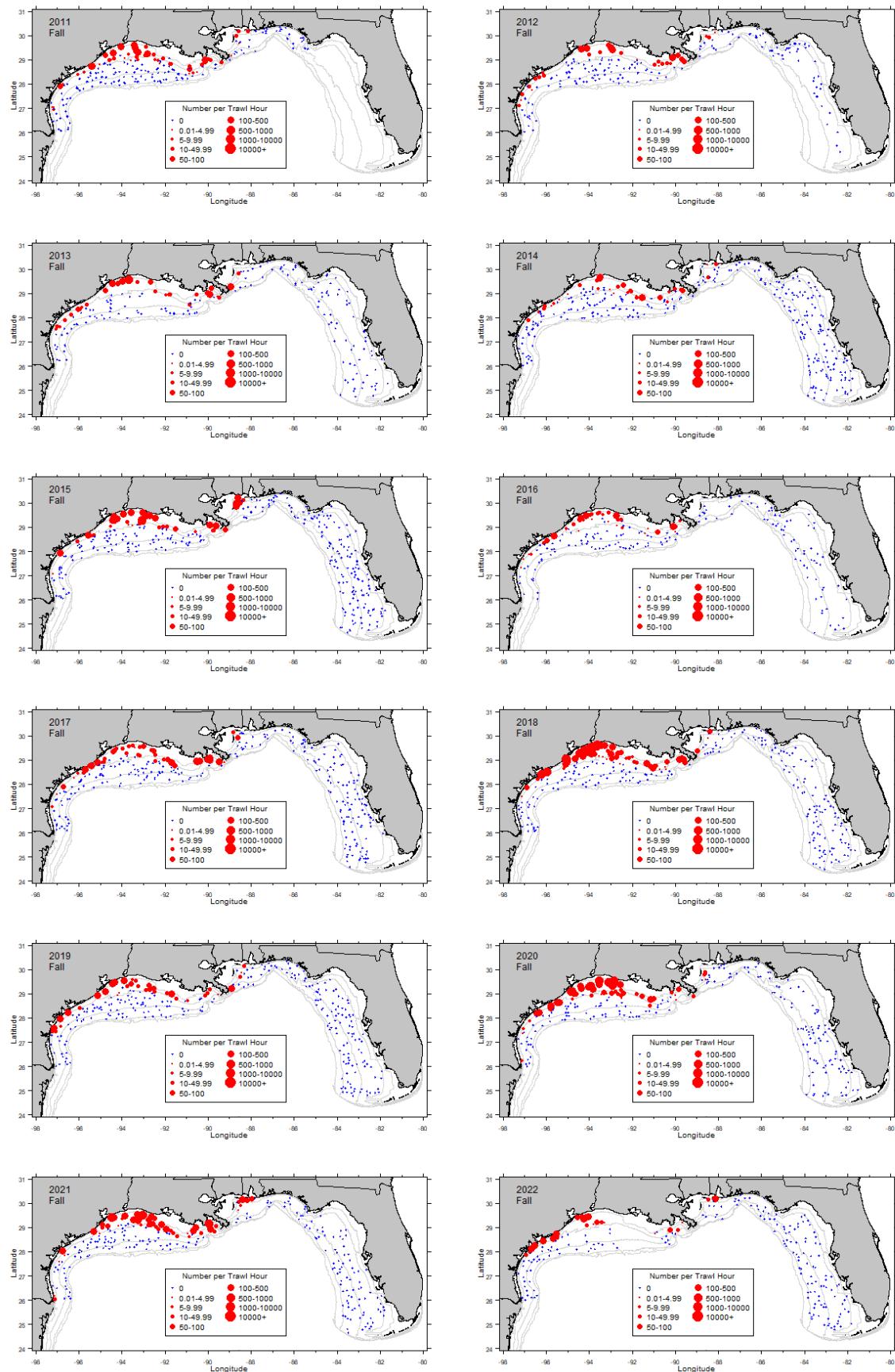




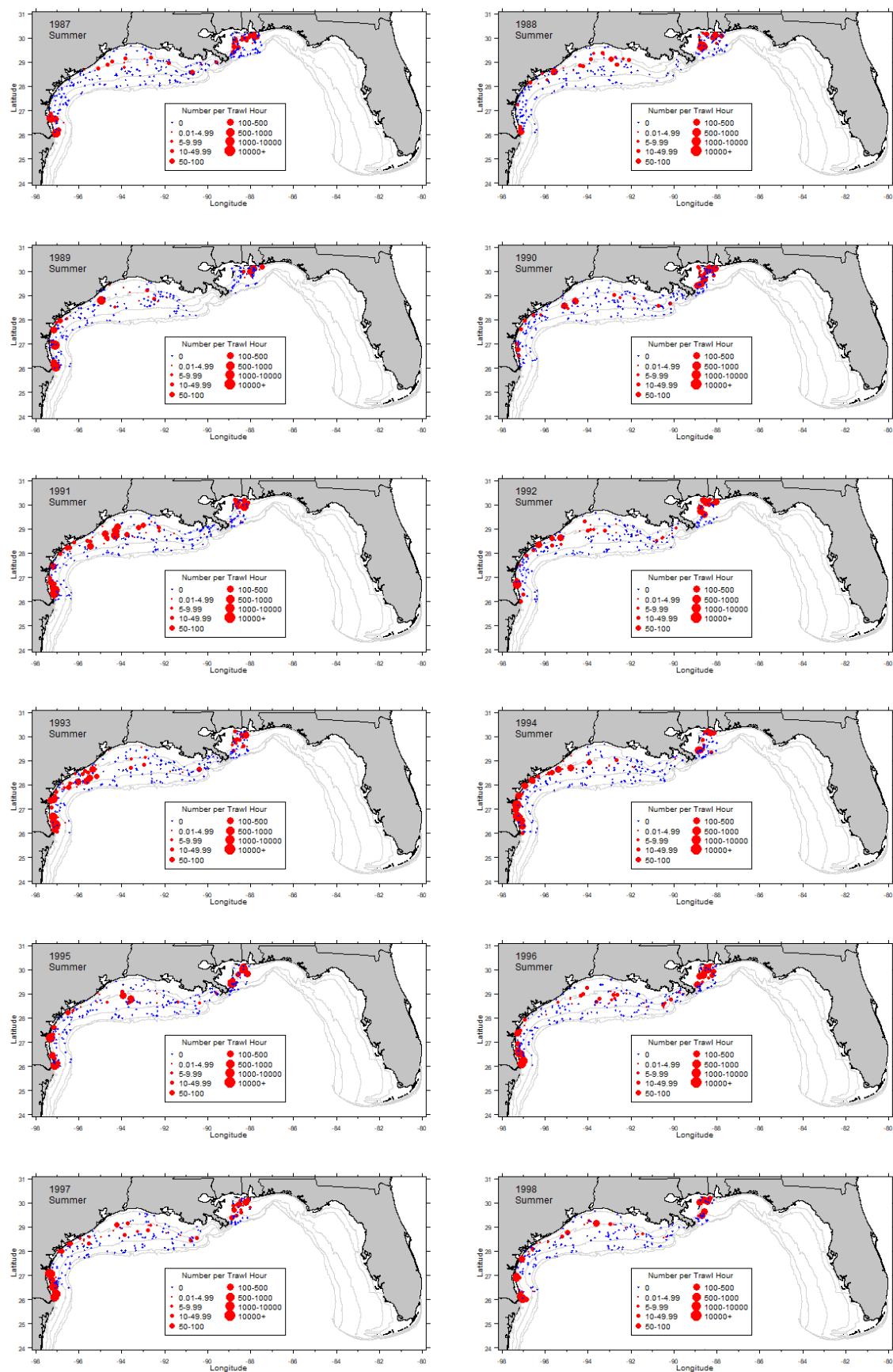
Appendix Figure 4. Annual survey effort and catch of white shrimp from the SEAMAP Fall Groundfish Survey.

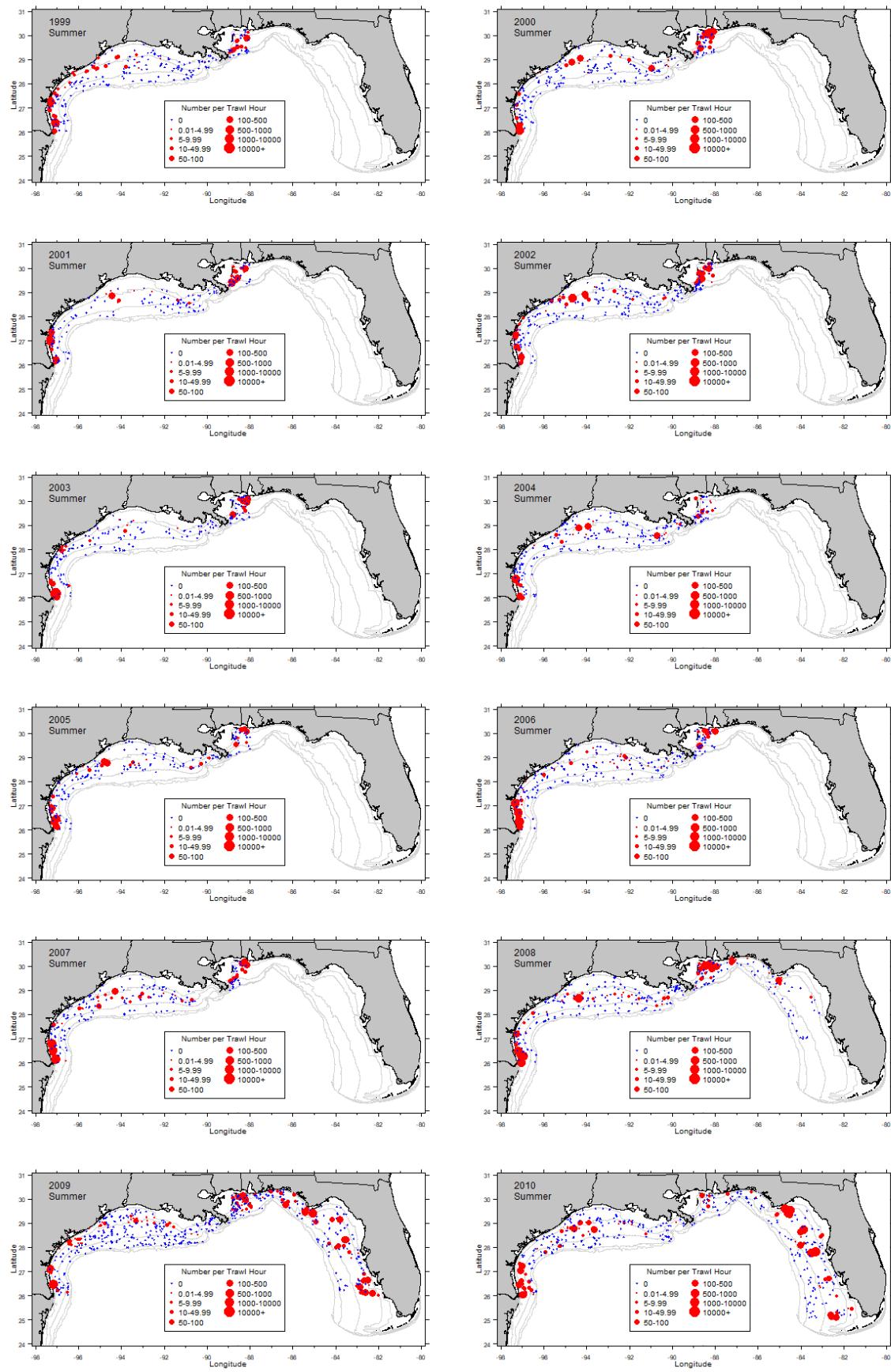


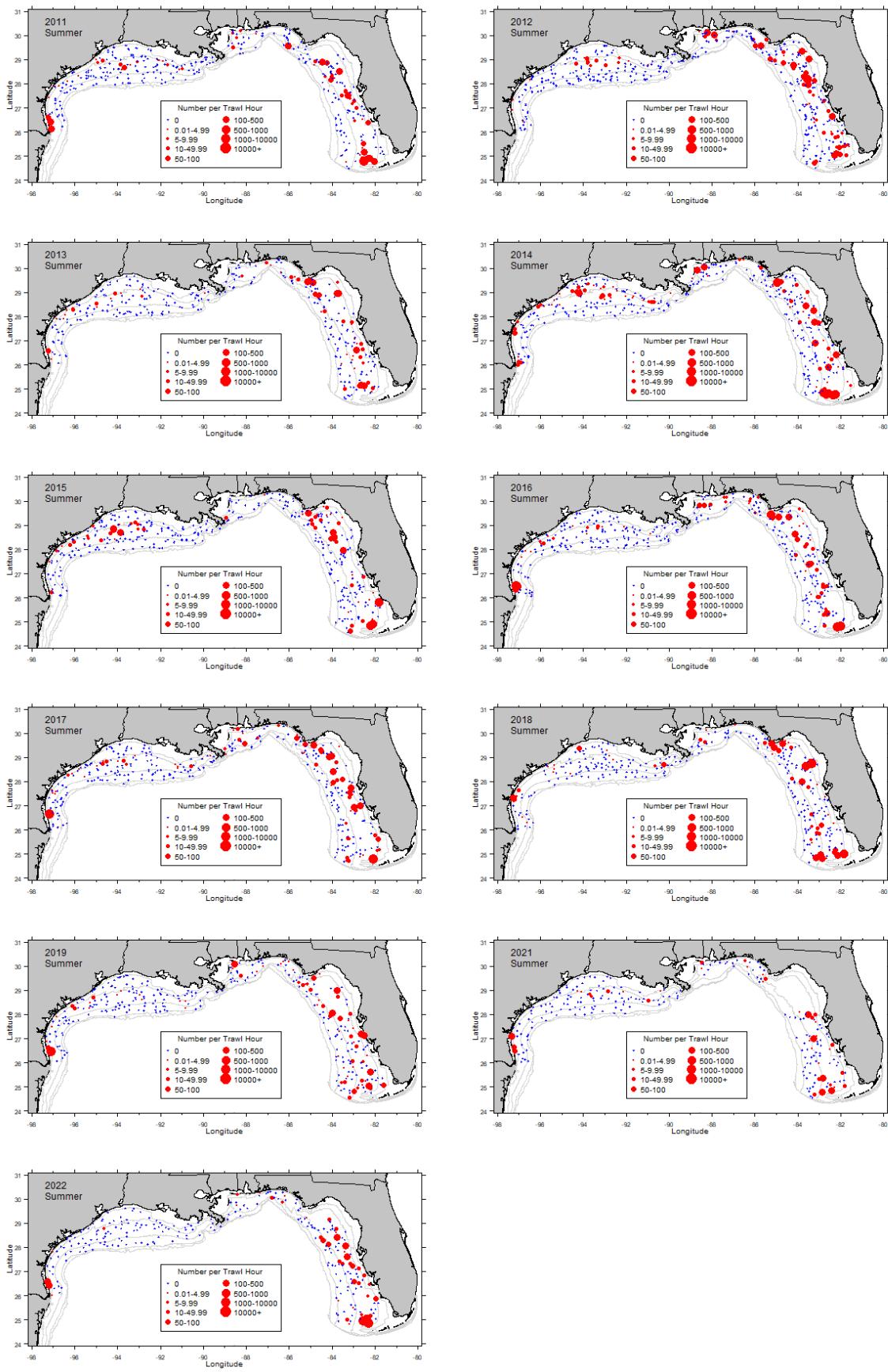




Appendix Figure 5. Annual survey effort and catch of pink shrimp from the SEAMAP Summer Groundfish Survey.







Appendix Figure 6. Annual survey effort and catch of pink shrimp from the SEAMAP Fall Groundfish Survey.

