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VINEYARD WIND

Draft Construction and Operations Plan

Volume III Appendices

Vineyard Wind Project

October 22, 2018

Submitted by
Vineyard Wind LLC
700 Pleasant Street, Suite 510
New Bedford, Massachusetts 02740

Submitted to
Bureau of Ocean Energy Management
45600 Woodland Road
Sterling, Virginia 20166

Prepared by
Epsilon Associates, Inc.
3 Mill & Main Place, Suite 250
Maynard, Massachusetts 01754

Epsilon ASSOCIATES INC.

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In Association with:

Biodiversity Research Institute
C2Wind
Capitol Air Space Group
Clarendon Hill Consulting
Ecology and Environment
Foley Hoag
Geo SubSea LLC
Gray & Pape
JASCO Applied Sciences
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October 22, 2018

Appendix III-C

Avian Appendix

Appendix to the Avian COP: Exposure Assessment for Marine Birds for the Vineyard Wind Project

Exposure Assessment Framework

To assess the exposure of marine birds in the Wind Development Area ("WDA"), two data sources were used to evaluate local and regional marine bird use: the Massachusetts Clean Energy Center ("MACEC") seabird surveys (Veit et al., 2016; referred to as 'Veit survey data', 'MassCEC data' or 'Veit MassCEC data'), and the Marine-life Data and Analysis Team ("MDAT") marine birds abundance and occurrence models (Curtice et al., 2016;Kinlan et al., 2016; referred to as the 'MDAT data' or 'MDAT abundance models'). We believe these to be the two best available sources of information on marine bird populations for the area, each of which provides context at different spatial scales. To describe local-scale patterns of abundance, we used data from 38 aerial surveys that Veit et al. (2016) conducted between November 2011 and January 2015 for the MassCEC and the BOEM. These surveys provided baseline information on the distribution and abundance of marine birds for the BOEM Wind Energy Area ("WEA") off of Massachusetts, south of Martha's Vineyard and Nantucket. We used the original count data that were collected over three annual survey periods and occurred across all seasons. Seasons were chosen to describe broad changes in weather patterns in the offshore environment: spring (March–May), summer (June–August), fall (September–November), and winter (December–February).

To describe regional-scale patterns of abundance, we used seasonal predictions of density that were developed as part of the MDAT regional analysis of boat and aerial survey data (Curtice et al., 2016; Kinlan et al. 2016). This analysis integrated survey data from the Northwest Atlantic Seabird Catalog (including surveys from 1978-2014) with a range of environmental variables to produce long-term average annual and seasonal models. Models developed by MDAT were used and acquired through the Northeast Regional Ocean Council ("NROC") data portal (http://www.northeastoceandata.org/). These models were developed to support marine spatial planning in the northeast by the Northeast Regional Planning Body, but are also available to support other planning efforts. Abundance and occurrence models were produced for 40 avian species for the US Atlantic waters from Florida to Maine, and thus provide an excellent context for relative densities estimated from the MassCEC surveys.

The MDAT and MassCEC data sets each have strengths and limitations. The MassCEC data were collected in a standardized, comprehensive way, and the data are recent (<10 years old), so they describe recent distribution patterns in the WDA and surrounding areas. However, these surveys covered a fairly small area relative to the Northwest Atlantic distribution of most marine bird species, and the limited number of surveys conducted in each season means that individual observations (or lack of observations, for rare species) may in some cases carry substantial weight in determining seasonal density scores. These visual aerial surveys also produced

"unidentified" observations (e.g., "unidentified gull" or "unidentified medium tern") which were excluded from this species-specific analysis. With the exception of terns, there were relatively few unidentified observations for most species groups, so our assumption is that this had a limited influence on results for most taxa. In the case of terns, Common Terns (*Sterna hirundo*) and Roseate Terns (*Sterna dougalli*) were not often differentiated from one another in the MassCEC surveys, so species-specific patterns were not derived from the data set, and these species are thus represented in the exposure analysis via the regional MDAT model results.

The MDAT model outputs, in contrast, are based on data collected at much larger geographic and temporal scales. These data were also collected using a range of survey methods. The larger geographic scale is helpful for determining the importance of the WDA to marine birds relative to other available locations in the northwestern Atlantic, and is thus essential for determining overall exposure. However, these models are based on long-term survey data sets and long-term climatological averages for dynamic covariates, and given changing climate conditions, may no longer accurately reflect current distribution patterns. Model outputs that incorporate environmental covariates to predict distributions across a broad spatial scale may also vary in the accuracy of those predictions at a local scale.

Because each data set is largely complementary and of strong scientific value, we have used both data sets and weighted them equally in analysis. In many cases, the suggested relative densities predicted by the MDAT and MassCEC data sets are not substantially different from each other, which increases our confidence in the resulting exposure assessment. In a few cases, the two data sets differ substantially in their suggested relative densities for the WDA; for example, the MDAT results suggest high relative densities of wintering Common Eiders ((*Somateria mollissima*) in the WDA but zero Common Eiders were observed in three winters of MassCEC surveys. Given the high quality nature of both data sources, we generally view these discrepancies as a product of temporal variation in species distribution from daily to yearly timeframes, which may result from changing habitat use, random chance, or other covariates. Thus, we think the combination of the data sets is particularly important in these cases such that historical evidence is balanced with newer, local data. Therefore, our final exposure assessment score is between both extremes and represents a holistic view of exposure risk for these species.

Exposure Mapping

A three-part map was developed for each species-season combination that includes both the MDAT and MassCEC data and uses the BOEM lease block system to summarize survey data over the region around the MDA. The first map panel (A) presents the MassCEC data as proportions of total effort-corrected counts. The number of animals detected in each lease block was divided by the survey area to calculate effort-corrected counts. Then, for each BOEM lease block or partial lease block, we calculated the proportion of all effort-corrected counts in the surveyed area that were located in that lease block (across all surveys in a given season). We used six quantiles to rank the lease block proportion values from low to high. Blocks with zero counts

were always the lowest, and blocks with observations were divided into five equal quantiles. This method was useful as it scaled all density data from 0-1 to standardize data among species. Note that areas within the BOEM lease blocks within the WEC without density data represent areas where data collection did not occur; therefore, density estimates were not calculated. The next two map panels (B and C) include data from MDAT models presented at different scales; Panel B shows the modeled densities in the same area as the MassCEC surveys, while Panel C shows the density output over the entire Northwest Atlantic. Density data are scaled in a similar way to the MassCEC data, so that the low-high designation for density is similar for both data sets. However, there are no true zeroes in the model outputs, and thus no special category for them in the MDAT data. Additionally, while the color scale for the MDAT data is approximately matched to that used for the MassCEC data, the values that underlie them are different (the MDAT data are symbolized using an ArcMap default color scale, which uses standard deviations from the mean to determine the color scale rather than quantiles).

Exposure Assessment

We chose two metrics to evaluate exposure after evaluating multiple metrics for sensitivity, distribution of values across species/seasons, and ability to accurately describe observed patterns of species' behavior and habitat use. These metrics were relative effort-correct count density at both the local and regional scales, which we chose for the final analysis based on their relative simplicity and ability to address variance and spatial autocorrelation in the data sets.

To assess exposure at the local and regional scales, we compared the WDA to other similarly-sized areas in each data set for each season and species. Using the MDAT data, we divided the predicted seasonal density surface for a given species into a series of rectangles that were approximately the same size as the WDA, and calculated the mean density estimate for all lease blocks in each of the rectangles. This process compiled a data set of density estimates across the entire surveyed range of the species for areas the same size as the WDA. We calculated the 25th, 50th, and 75th weighted quantiles of this data set, and identified the quantile into which the density estimate for the WDA fell for a given species and season combination. Quantiles were weighted by using the proportion of the total density across the entire study area that each sample represented. Thus, quantile breaks represent proportions of the total seabird density rather than proportions of the raw data. These reduces the impact skewed distributions—commonly achieved through high spatial clustering in species distributions—have on quantile assignment. A categorical score was assigned to the WDA for each season/species: 0 (insignificant) was assigned when the density estimate for the WDA was in the bottom 25%, 1 (low) when the area was between 25% and 50%, 2 (medium) when the area was between 50% and 75%, and 3 (high) when the WDA was in the top quartile (>75%).

A similar process was used to categorize each species-season combination using the MassCEC data set. We calculated the mean relative density for the WDA (an area composed of 11 lease blocks). To compare the WDA to other similarly sized locations, we identified the nearest 10 lease blocks to each lease block surveyed in each season (winter, n=162; spring, n=166; summer,

n=171; and fall, *n*=175), created a new 11 block WDA-sized area around that block, then calculated the relative density of this WDA-sized area. This process compiled a data set of relative densities for all possible WDA-sized areas within the MassCEC study and used this data set to assign scores to all species-season combinations, based on the same quartile categories described for the MDAT models above.

Once we calculated the weighted quantiles of each of the areas, we then went through a multi-stage process to determine a final exposure category for each species (Figure 1). A more detailed description follows, but this process follows these general steps:

1. Sum the local and regional seasonal weighted quartile scores (both ranging from 0-3) to determine the seasonal exposure assessment. The combined score is used to assign an assessment category of insignificant, low, medium, and high for that season.
2. To determine annual exposure, the four seasonal exposure scores (ranging from 0-3 to match the four exposure assessment categories) are summed. A new scale is used to classify annual exposure assessment in four categories: insignificant, low, medium, and high.
3. Finally, species are assigned to their relative taxonomic group (e.g., White-Winged Scoters as seaducks) and the range and average of the species' annual exposure scores are used to describe the exposure risk for the taxonomic group.

While decisions are often made at the scale of the species group, the goal of this assessment was to provide a clear and repeatable process for how we described risk at this taxonomic scale. Thus, we provide all season and annual species exposure scores in this appendix and all data sets are publicly accessible.

Seasonal Exposure Assessment

To determine the seasonal exposure risk for a given species in the WDA compared to all other areas, we added the MDAT weighted quartile score and MassCEC weighted quartile score together to create a final exposure metric that ranged from 0 to 6. We chose to equally weight density information at both spatial scales, and thus account for both the local and regional importance of the WDA to a given species during a given season. However, if a species-season combination was not available for the MDAT regional assessment, then the score from the local assessment (MassCEC study) was accepted as the best available information for that taxon-season, and it was scaled to range from 0 to 6 (e.g., essentially doubled to match the final combined score). If MassCEC data were not available for a particular species-season combination, then we categorized that species-season combination as insignificant and scored it a 0.

The combined seasonal exposure score was categorized as insignificant (a combined score of 0), low (combined score of 1-2), medium (combined score of 3-4) or high (combined score of 5-6; Table 1). In general terms, species-season combinations labeled as "Insignificant" had low densities at both the local and regional scales. "Low" exposure was assessed for species with

below-average densities at both spatial scales, or above-average density at one of the two scales and low density at the other scale. “Medium” exposure describes several different combinations of densities; one or both scales must be at least above-average density, but this category can also include species-season combinations where density was high for one scale and low for another. “High” exposure is when both scales are high density, or one is high and the other is above average. While multiple local and regional score combination exist for each exposure category, any single combination can only be found in one exposure category.

Creating Annual and Multi-species Scores

We aggregated the seasonal scores into annual scores for each species and taxonomic group (Table 2). We grouped all species into the appropriate taxonomic group (e.g., Herring Gull in ‘Gulls and Jaegers’; Black Scoter in ‘Seaducks’; etc.) as defined in the Construction and Operations Plan (“COP”). To understand the total exposure risk across the annual cycle for each species, we summed all the seasonal scores to obtain an annual score. After the combined seasonal exposure score was recategorized into four categories (insignificant, low, medium, and high) these categories were given a score from 0-3 (with insignificant scored as 0, low scored as 1, medium scored as 2, and high scored as 3). We then summed the seasonal scores across all four seasons to calculate the annual exposure score. These annual exposure scores (ranging from 0-12), were mapped to exposure risk categories of insignificant (scores of 0-2), low (3-5), medium (6-8), and high (9-12). The annual rating for a species does not indicate potential seasonal variation in exposure between seasons, but rather represents the integrated risk relative to season distribution of the species across the entire annual cycle. We summarized annual scores by species and taxonomic group (by taking the mean of all annual species scores within that group) to compare relative risk (Table 2).

For each taxonomic group, the number of species in every season/exposure group combination is shown in Table 3, which indicates the degree of species- and season-level variance in these metrics. To describe the range of annual exposure for each taxonomic group, we used the minimum and maximum annual exposure scores for species within the taxonomic group (see Species Impact Table in main text). These ranges vary among taxonomic groups; for example, exposure for the species in the ‘Gulls and Jaegers’ group range from Insignificant to Medium whereas both tern species have insignificant annual exposure scores. These ranges indicate the variance in exposure category across the species within each taxonomic group.

Interpreting Exposure Scores

Seasonal exposure scores should be interpreted as a measure of the relative importance of the WDA for a species/group, as compared to other surveyed areas in the region and in the northwest Atlantic. It does not indicate the absolute number of individuals likely to be exposed. Rather, the exposure score is our attempt to provide regional and population-level context for each taxon. As such, annual scores are a summation of these seasonal scores with each season weighted equally; thus, these scores should be viewed as the relative importance of the WDA for a species/group aggregated across an entire annual cycle.

A high exposure score indicates that the observed and predicted densities of the taxon in the WDA were high *relative to densities of that taxon in other surveyed areas*. Conversely, a low or insignificant exposure score means that the taxon was predicted to occur at lower densities in the WDA than in other locations. Insignificant exposure scores have densities that are substantially lower than the mean scores for the region, but animals with exposure risk classified as such may still be present in the WDA because the evaluation is relative to the total count density in the study area, common species may receive an "insignificant" exposure score even if there are still substantial numbers of individuals in the WDA, so long as their predicted densities *outside* the WDA are much higher.

As an example, a larger total number of wintering Northern Gannets (*Morus bassanus*) may be exposed to the WDA than wintering Dovekies (*Alle alle*). Northern Gannets are predicted to occur at higher densities than Dovekies in the WDA, using both the MDAT and MassCEC data sets (Table 4). However, the density of Northern Gannets in the WDA is quite low (below the 25th weighted percentile for both data sets) relative to areas outside the WDA, so wintering gannets received a final exposure score of "insignificant". For Dovekies, even though the WDA densities are much lower, the areas outside the WDA also have lower densities; and MassCEC dataset suggests a higher regional importance of the WDA—in the top weighted quartile. Thus, wintering Dovekies received a final exposure score of "medium".

To provide additional context to the exposure scores, we provided estimates of count density for each species from the MassCEC data (Table 4). Uncommon animals with few detections in the WDA may be somewhat over-rated for exposure using this method, while common animals with relatively few detections in the WDA may be effectively under-rated in terms of total exposure to the project. So density estimates per survey kilometer are presented to provide context for the exposure scores.

Literature Cited

Curtice, C., Cleary, J., Shumchenia, E., & Halpin, P. (2016). Marine-life Data and Analysis Team (MDAT) technical report on the methods and development of marine-life data to support regional ocean planning and management. Prepared on behalf of the Marine-life Data and Analysis Team (MDAT). [Online.] Retrieved from: http://seamap.env.duke.edu/models/MDAT/MDAT-Technical-Report-v1_1.pdf

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Veit, R. R., White, T.P., Perkins, S.A., & Curley, S. (2016). Abundance and Distribution of Seabirds off Southeastern Massachusetts, 2011-2015: Final Report. In. OCS Study. U.S. Department of the Interior, Bureau of Ocean Energy Management, Sterling, Virginia.

Table 1. Definitions of exposure levels developed for the COP for each species and season. The seasonal scores column represents the exposure scores from the local MassCEC data and the regional MDAT that are associated with the written definition (with the local score first and the regional score second).

Exposure Score	Definition	Seasonal Scores
Insignificant	WDA densities at both local and regional scales are below the 25th percentile.	0, 0
Low	WDA local and/or regional density is between the 25th and 50th percentiles.	1, 1
	OR	
	WDA local density is between the 50th and 75th percentiles and regional density is below the 25th percentile, or vice versa.	2, 0
Medium	WDA local or regional density is between the 50th and 75th percentiles.	2, 2
	OR	
	WDA local density is between the 50th and 75th percentiles and regional density between the 25th and 50th percentiles, or vice versa.	2, 1
	OR	
	WDA local density is greater than the 75th percentile and regional density is below the 25th percentile, or vice versa.	3, 0
	OR	
	WDA local density is greater than the 75th percentile of all densities and regional density is between the 25th and 50th percentiles of all densities (or vice versa).	3, 1
High	WDA densities at both local and regional scales are above the 75th percentile.	3, 3
	OR	
	Local densities are greater than the 75th percentile and regional densities are between the 50th and 75th percentiles, or vice versa.	3, 2

Table 2. Annual exposure scores for all species in the MassCEC and MDAT data sets. Species are organized by taxonomic group, and an average score for each group is also provided.

Taxonomic Group	Average Annual Exposure Score for the Taxonomic Group	Species	Annual Species Exposure Score	Annual Species Exposure Category
Auks	2.3	Common Murre	1	Insignificant
		Dovekie	2	Insignificant
		Razorbill	4	Low
Gannets and Cormorants	1.5	Double-crested Cormorant	0	Insignificant
		Northern Gannet	3	Low
Gulls, Skuas, and Jaegers	3.0	Black Kittiwake	3	Low
		Bonapart's Gull	3	Low
		Great Black-backed Gull	6	Medium
		Herring Gull	6	Medium
		Iceland Gull	0	Insignificant
		Laughing Gull	2	Insignificant
		Pomarine Jaeger	1	Insignificant
Loons and Grebes	0.7	Common Loon	2	Insignificant
		Red-necked Grebe	0	Insignificant
		Red-throated Loon	0	Insignificant
Seaducks	0.8	Black Scoter	0	Insignificant
		Common Eider	1	Insignificant
		Long-tailed Ducks	0	Insignificant
		Red-breasted Merganser	0	Insignificant
		Surf Scoter	2	Insignificant
		White-winged Scoter	2	Insignificant
Shearwaters, Petrels, and Storm-Petrels	2.2	Cory's Shearwater	5	Low
		Greater Shearwater	1	Insignificant
		Manx Shearwater	3	Low
		Northern Fulmar	0	Insignificant
		Sooty Shearwater	2	Insignificant
		Wilson's Storm-Petrel	2	Insignificant
Shorebirds	0.0	Red Phalarope	0	Insignificant
Terns	1.0	Common Tern	0	Insignificant
		Roseate Tern	2	Insignificant

Table 3. Number of species in each exposure category by season for each taxonomic group. (The list of species included in each group is included in Table 2, above).

Taxonomic Group	**Season**	**Exposure Category**			
		Insignificant	*Low*	*Medium*	*High*
Auks	Spring	2		1	
	Summer	3			
	Fall	2	1		
	Winter		2	1	
Gannets and Cormorants	Spring	1	1		
	Summer	1	1		
	Fall	1	1		
	Winter	2			
Gulls, Skuas, and Jaegers	Spring	4	2		1
	Summer	4	1	1	1
	Fall	3	1	3	
	Winter	5	1	1	
Loons and Grebes	Spring	3			
	Summer	2	1		
	Fall	3			
	Winter	2	1		
Seaducks	Spring	5	1		
	Summer	6			
	Fall	5	1		
	Winter	3	3		
Shearwaters, Petrels, and Storm-Petrels	Spring	5	1		
	Summer	1	1	2	2
	Fall	5	1		
	Winter	6			
Shorebirds	Spring	1			
	Summer	1			
	Fall	1			
	Winter	1			
Terns	Spring	1	1		
	Summer	2			
	Fall	1	1		
	Winter	2			

Table 4. Average relative species densities (count/km^2) by season and annually inside the WDA and over the entire MassCEC survey area.

	Average counts/km^2									
	Winter		Spring		Summer		Fall		Annual	
Species	WDA	Survey area	WDA	Survey area	WDA	Survey area	WDA	Survey area	WDA	Survey area
Auks										
Common Murre	0.0072	0.0069	0	0.0011	0	0	0	0	0.0012	0.0015
Dovekie	0.029	0.0048	0	0.0024	0	0	0	0	0.0050	0.0013
Razorbill	6.23	1.78	1.1	1.28	0	0	0	0.0179	1.24	0.60
Gannets and Cormorants										
Double-crested Cormorant	0	0	0	0	0	0	0	0.0025	0	0.0007
Northern Gannet	0.058	0.21	0.073	0.16	0.0072	0.0017	0.27	0.38	0.11	0.17
Gulls, Skuas, and Jaegers										
Black-legged Kittiwake	1.55	0.48	0	0.052	0	0	0.063	0.074	0.29	0.13
Bonaparte's Gull	0.036	0.12	0.18	0.015	0	0	0.0039	0.014	0.035	0.03
Great Black-backed Gull	0.036	0.064	0	0.028	0.13	0.027	0.028	0.014	0.037	0.029
Herring Gull	0.072	0.20	0.016	0.14	0.59	0.052	0.061	0.053	0.14	0.085
Iceland Gull	0	0	0	0	0	0	0	0	0	0
Laughing Gull	0	0	0	0	0	0.0003	0.010	0.0009	0.0033	0.0003
Pomarine Jaeger	0	0	0	0	0	0	0	0.0002	0	7.12E-05
Loons and Grebes										
Common Loon	0.043	0.037	0.0081	0.029	0.0072	0.0014	0.016	0.037	0.015	0.026
Red-necked Grebe	0	0	0	0	0	0	0	0	0	0
Red-throated Loon	0	0.087	0.041	0.11	0	0	0.0079	0.072	0.0087	0.056
Seaducks										
Black Scoter	0	0.045	0	0	0	0	0	0.015	0	0.013
Common Eider	0	0.018	0	0.0048	0	0	0	0.0007	0	0.005
Long-tailed Duck	0	1.64	0.024	3.49	0	0	0	0.0012	0.0037	0.98
Red-breasted Merganser	0	0.0010	0	0	0	0	0	0	0	0.0002
Surf Scoter	0	0.14	0	0.029	0	0	0	0.012	0	0.03
White-winged Scoter	0.0072	2.69	0	8.42	0	0	0.0039	0.41	0.0025	2.18
Shearwaters, Petrels, and Storm-Petrels										
Cory's Shearwater	0	0.0003	0	0	0.77	0.35	0.27	0.13	0.22	0.10
Greater Shearwater	0	0	0	0	0.067	0.058	0	0.041	0.012	0.025
Manx Shearwater	0	0	0	0	0.007	0.0007	0	0.0065	0.0012	0.0019
Northern Fulmar	0.051	0.12	0	0.017	0	0	0.051	0.091	0.025	0.050
Sooty Shearwater	0	0	0	0	0.0072	0.0007	0	0.0002	0.0013	0.0002
Wilson's Storm-petrel	0	0	0	0.0020	0.46	0.14	0	0	0.080	0.028
Shorebirds										
Red Phalarope	0	0	0	0.024	0	0	0	0.0003	0	0.0043
Terns										
Common Tern	0	0	0	0	0	0.013	0	0.0066	0	0.0043
Roseate Tern	0	0	0	0	0	0.0003	0	0	0	6.72E-05

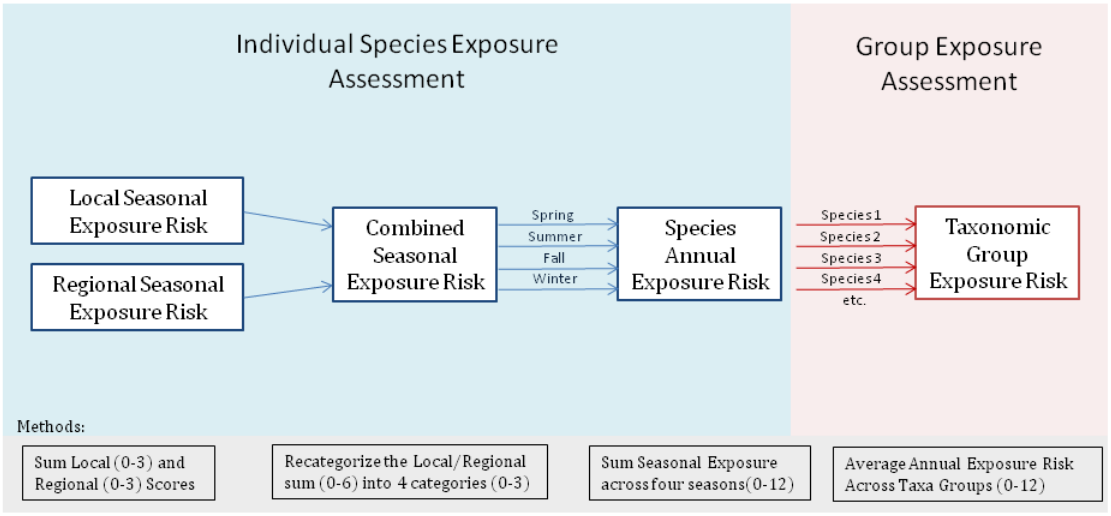

Figure 1. An influence diagram that describes the process of exposure score assessment from local and regional scales to the taxonomic group. Boxes represent nodes where we assessed a species or species group for exposure risk and arrows indicate transitions where data were combined together. The numerical ranges in the methods section represent the range of values each risk calculation has at each step in the process.

Table of Figures

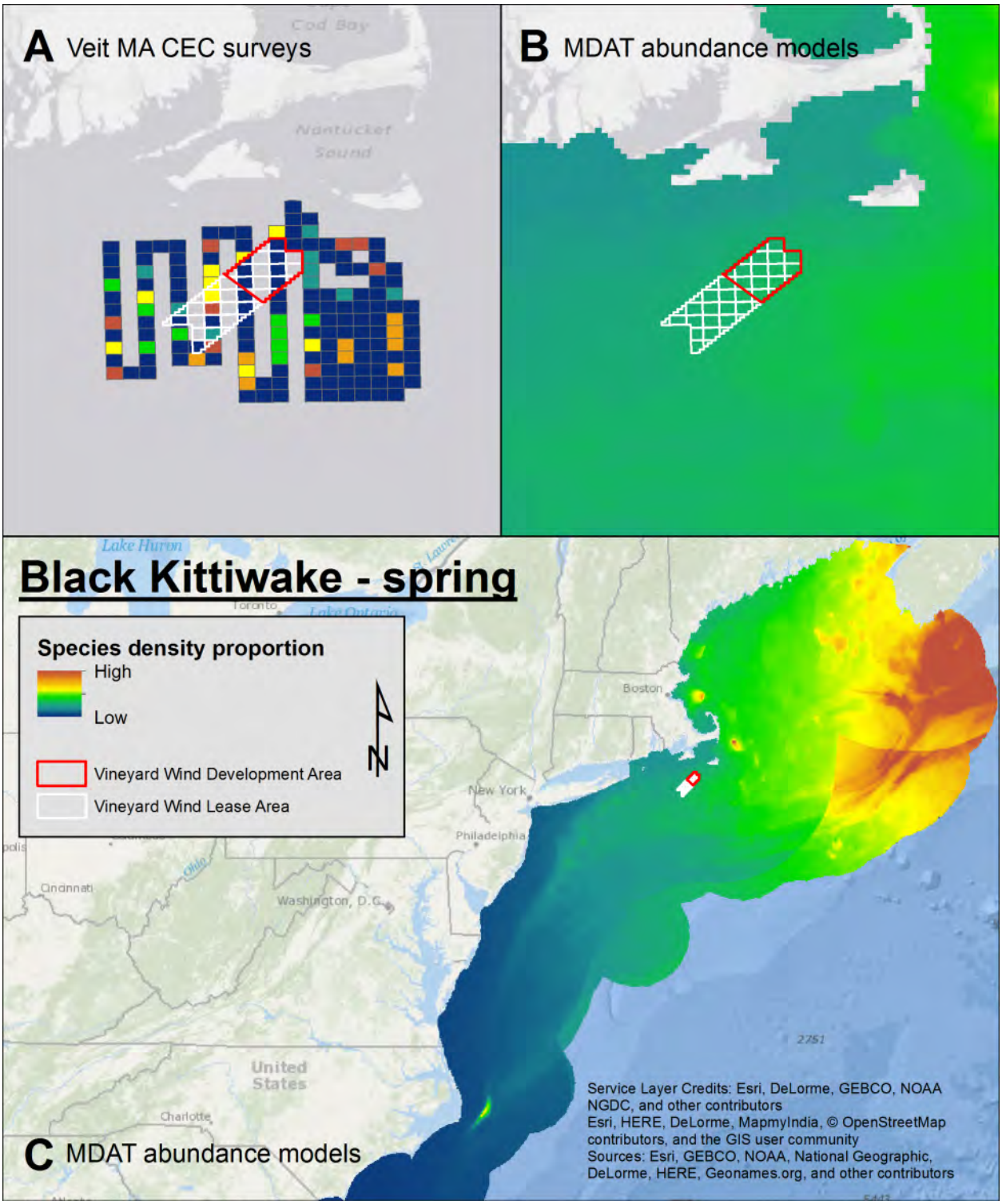

Figure 1. Spring Black Kittiwake density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

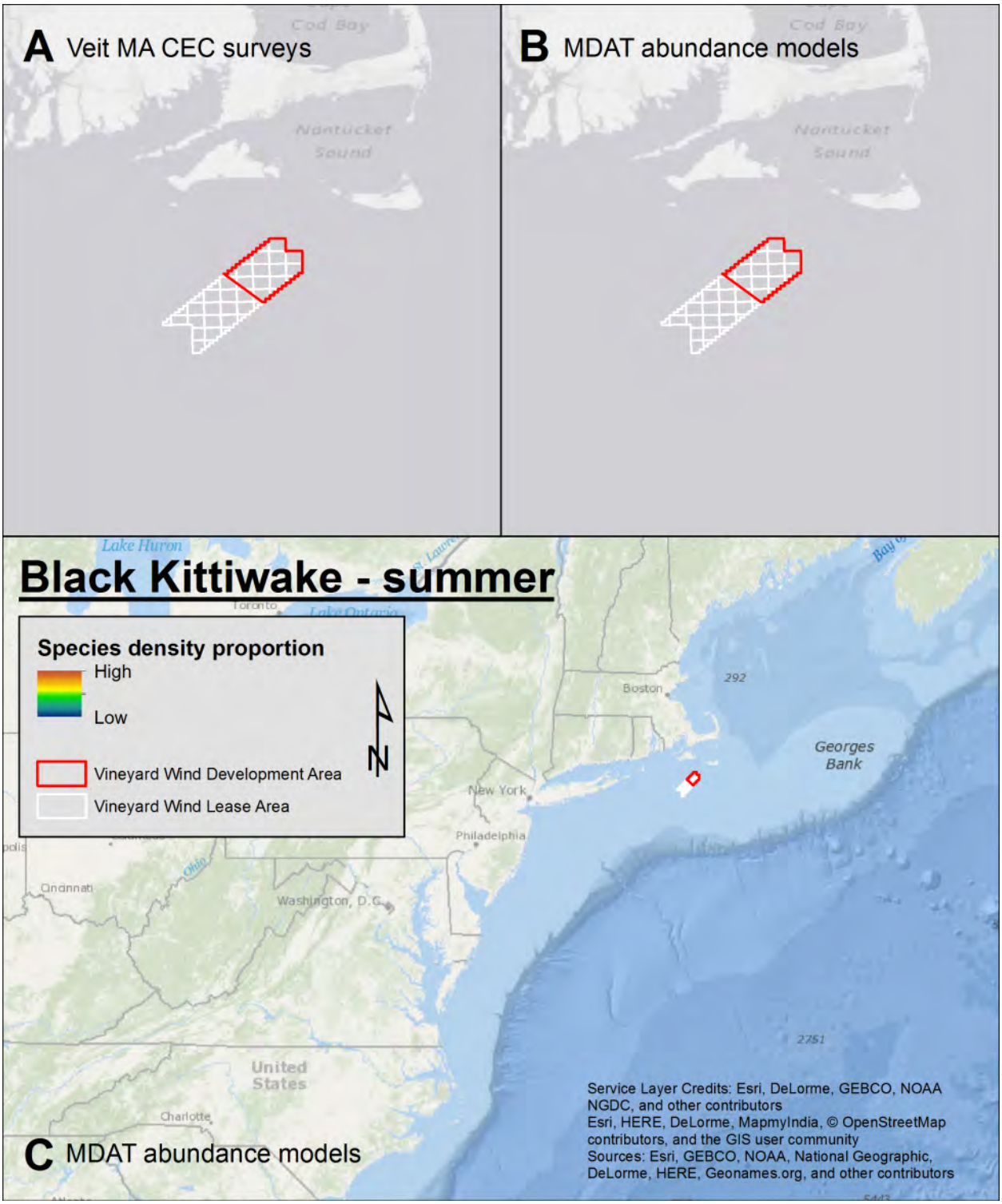

Figure 2. Summer Black Kittiwake density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

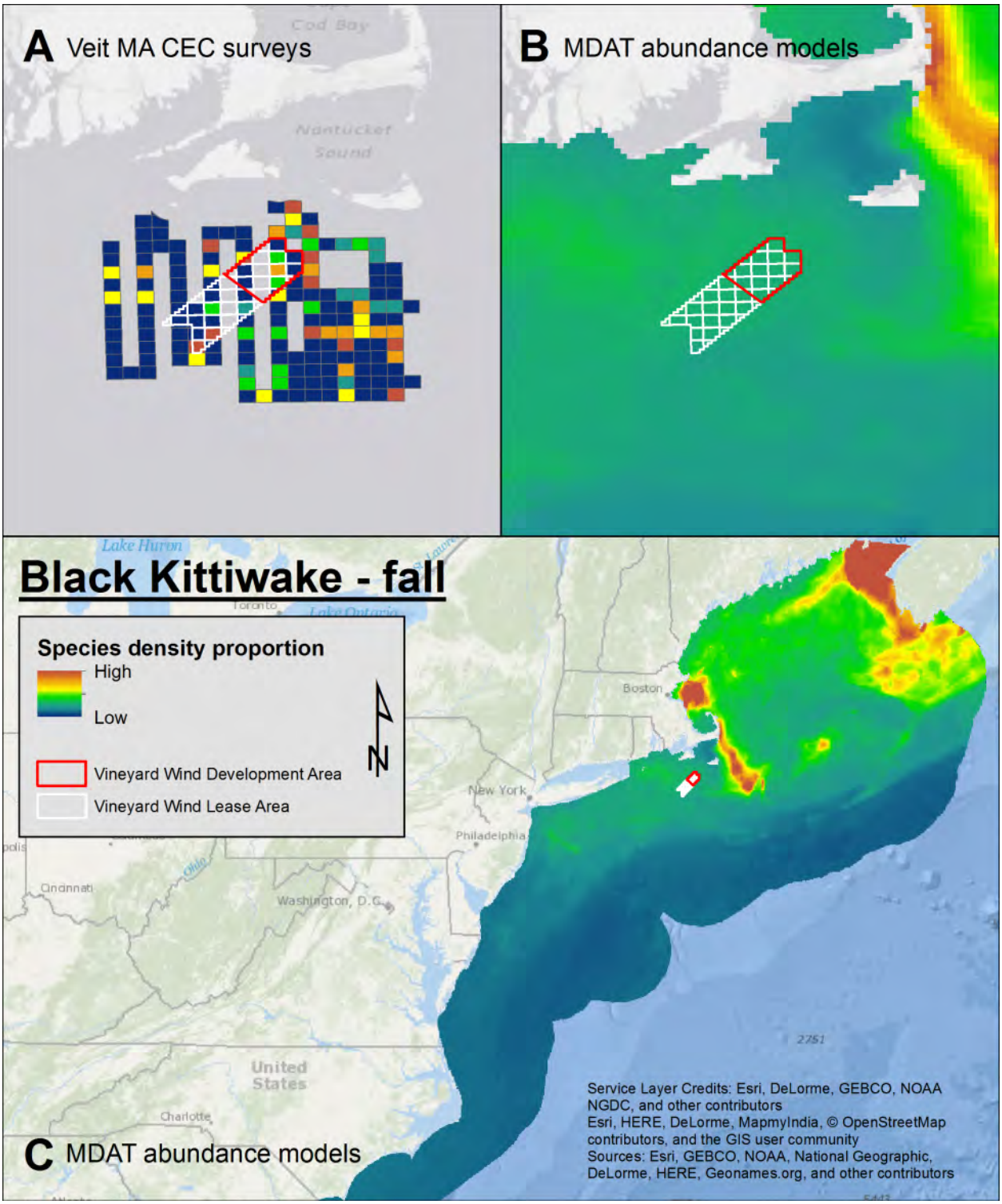

Figure 3. Fall Black Kittiwake density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

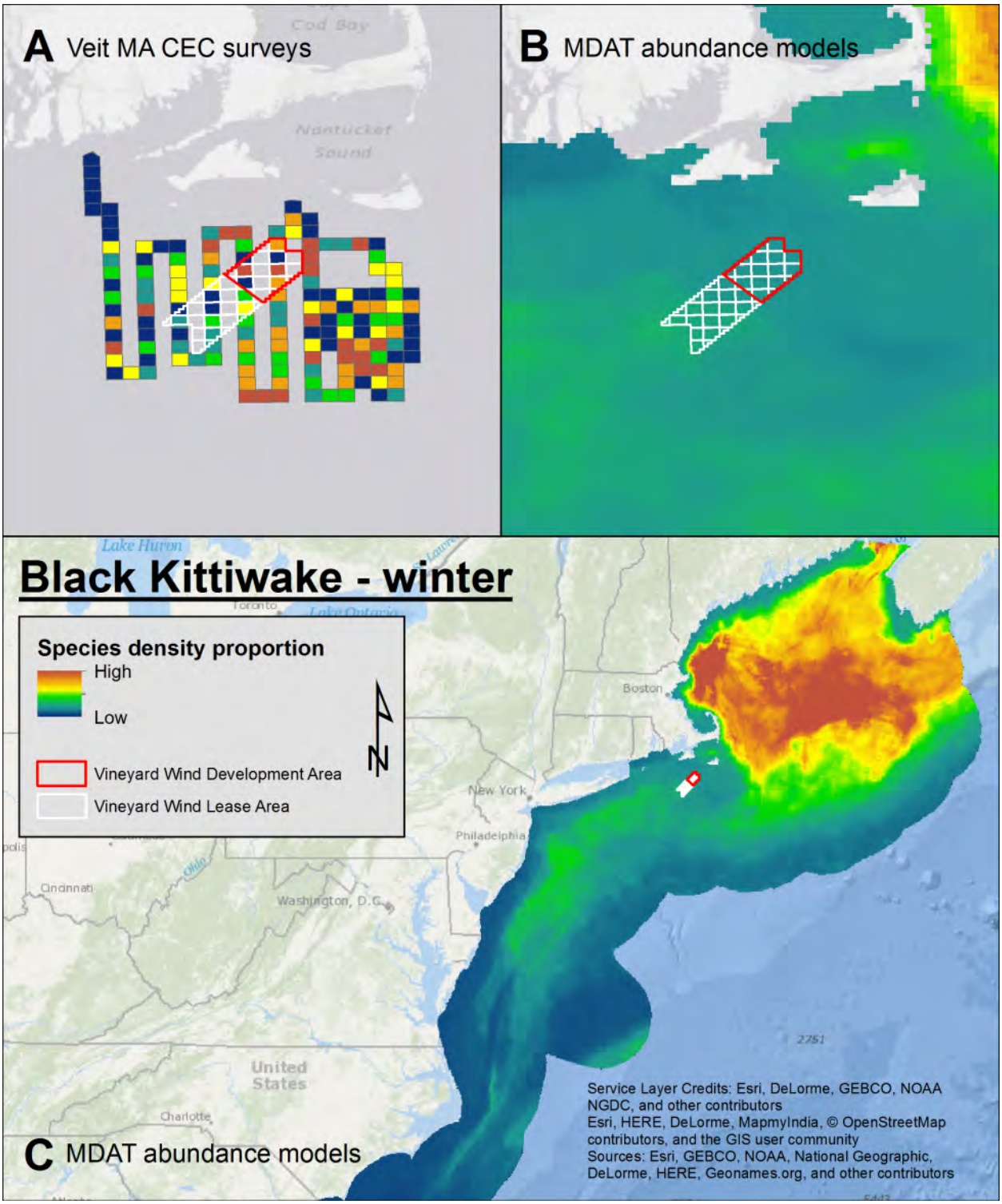

Figure 4. Winter Black Kittiwake density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

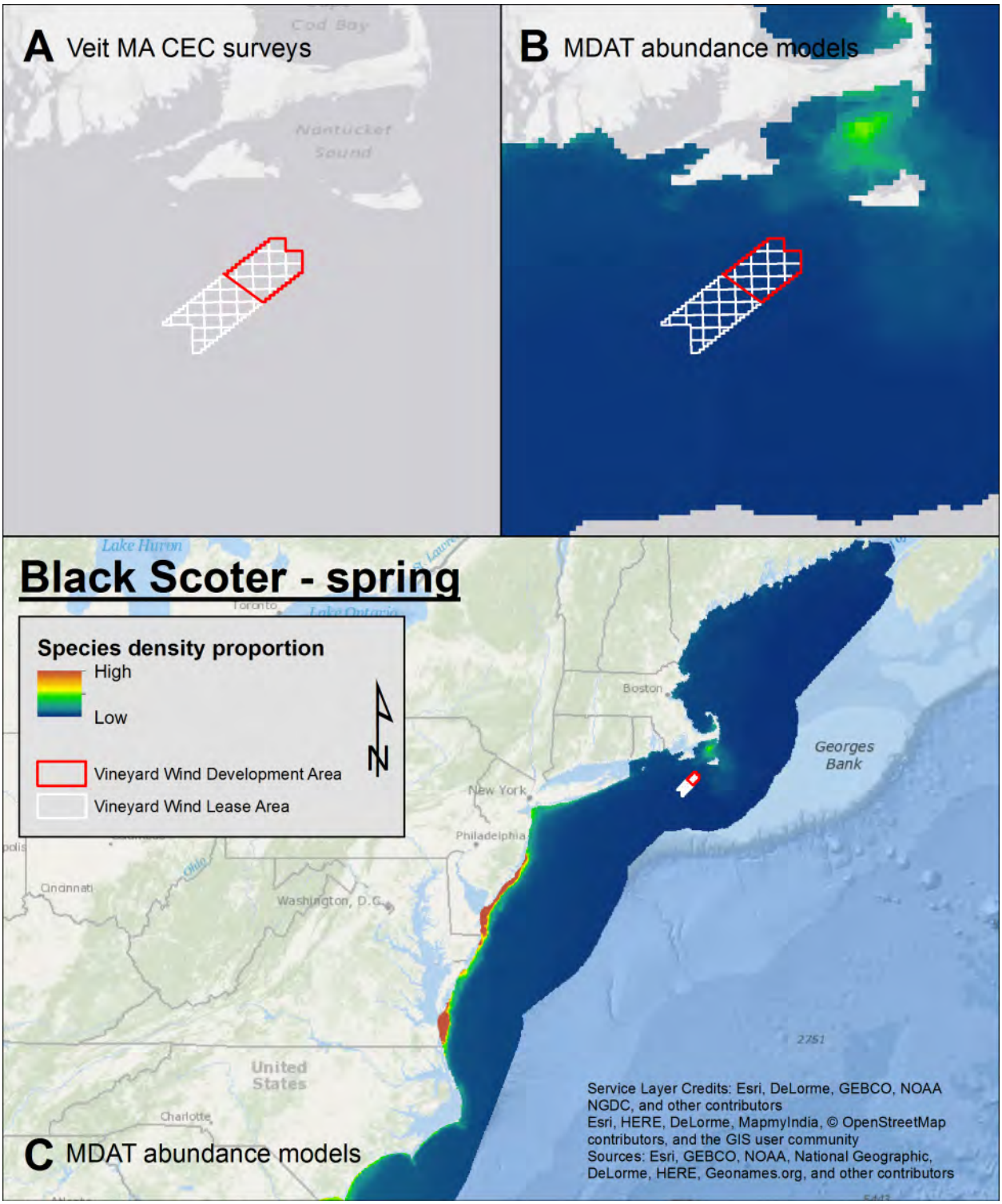

Figure 5. Spring Black Scoter density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

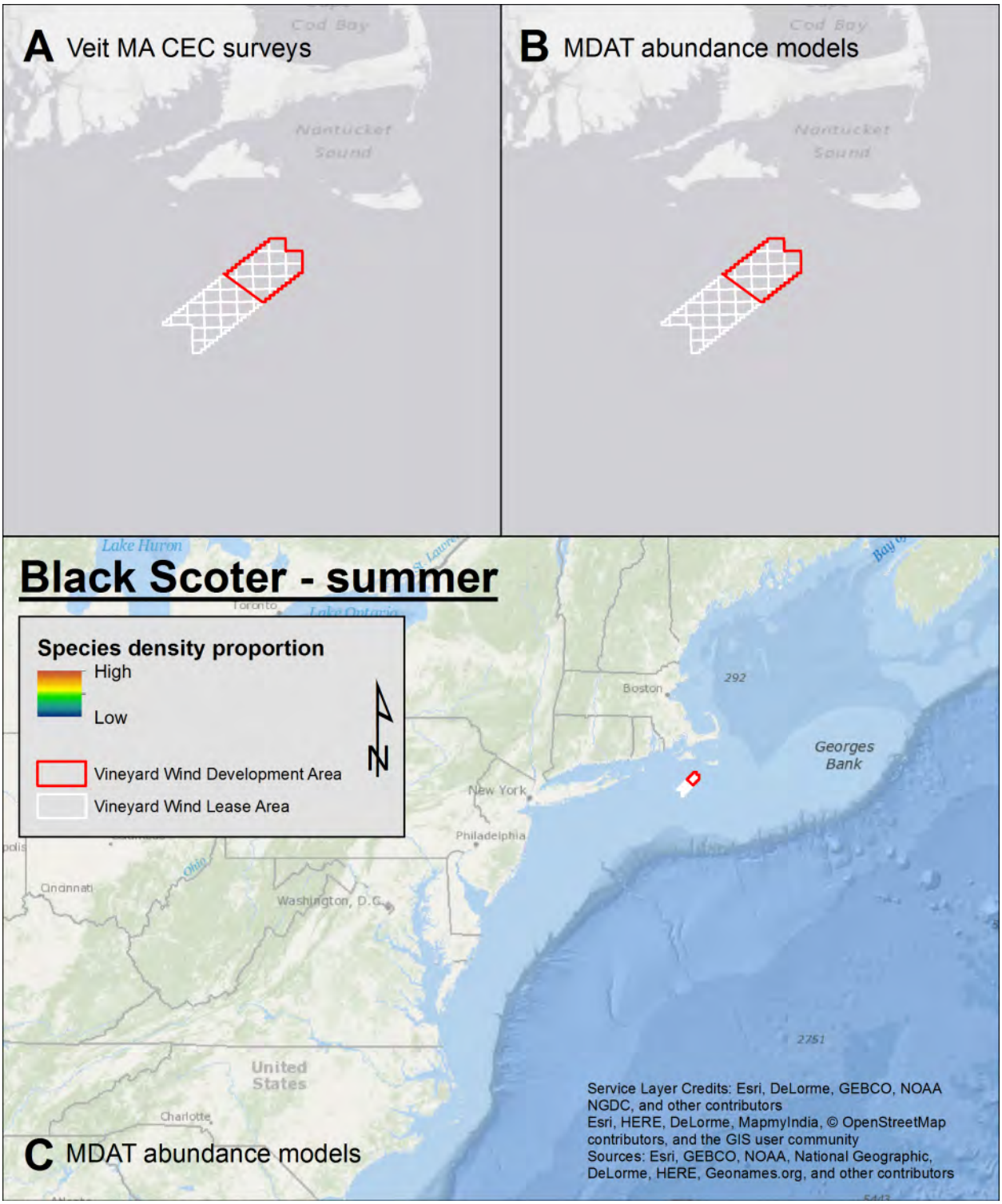

Figure 6. Summer Black Scoter density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

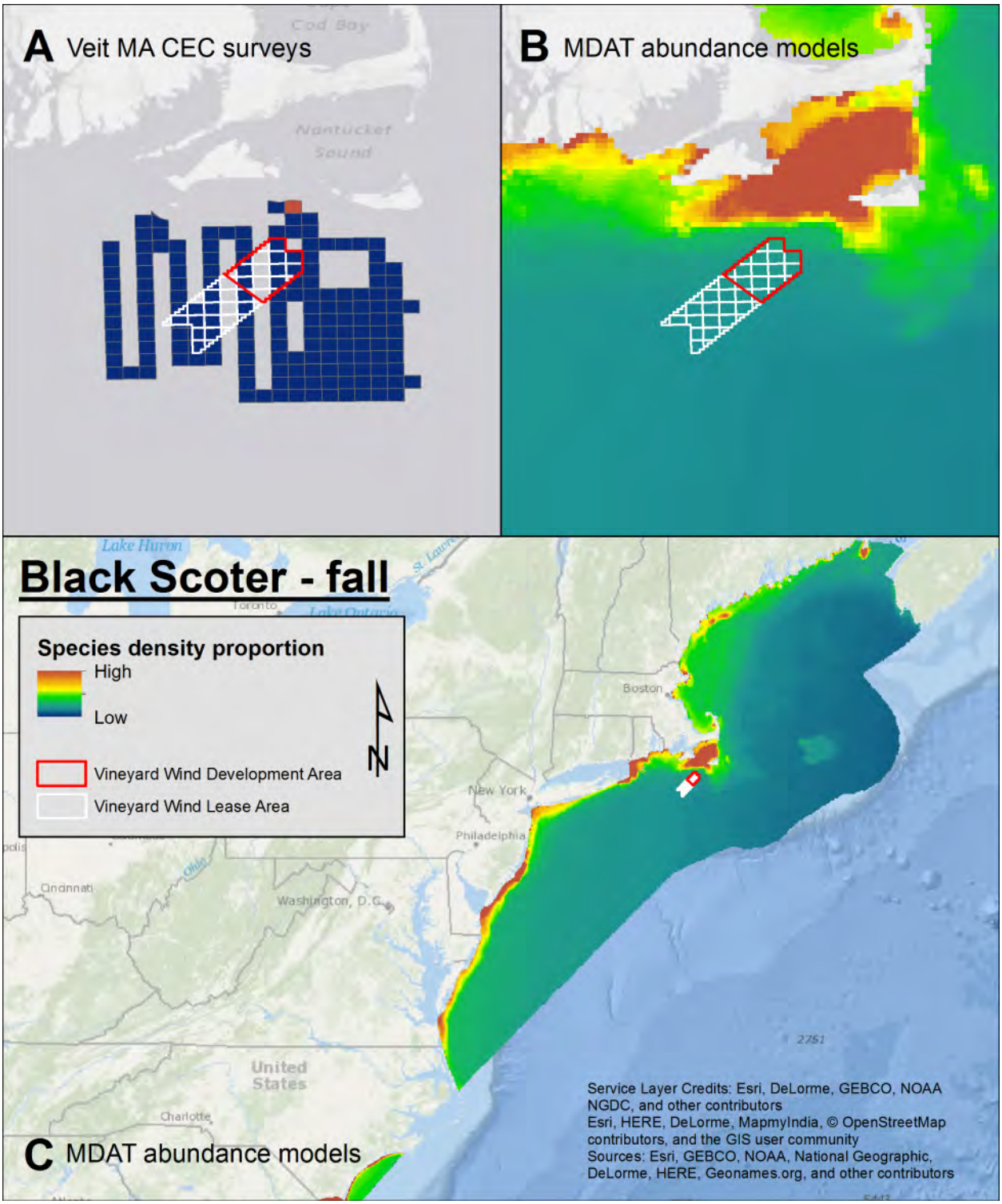

Figure 7. Fall Black Scoter density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

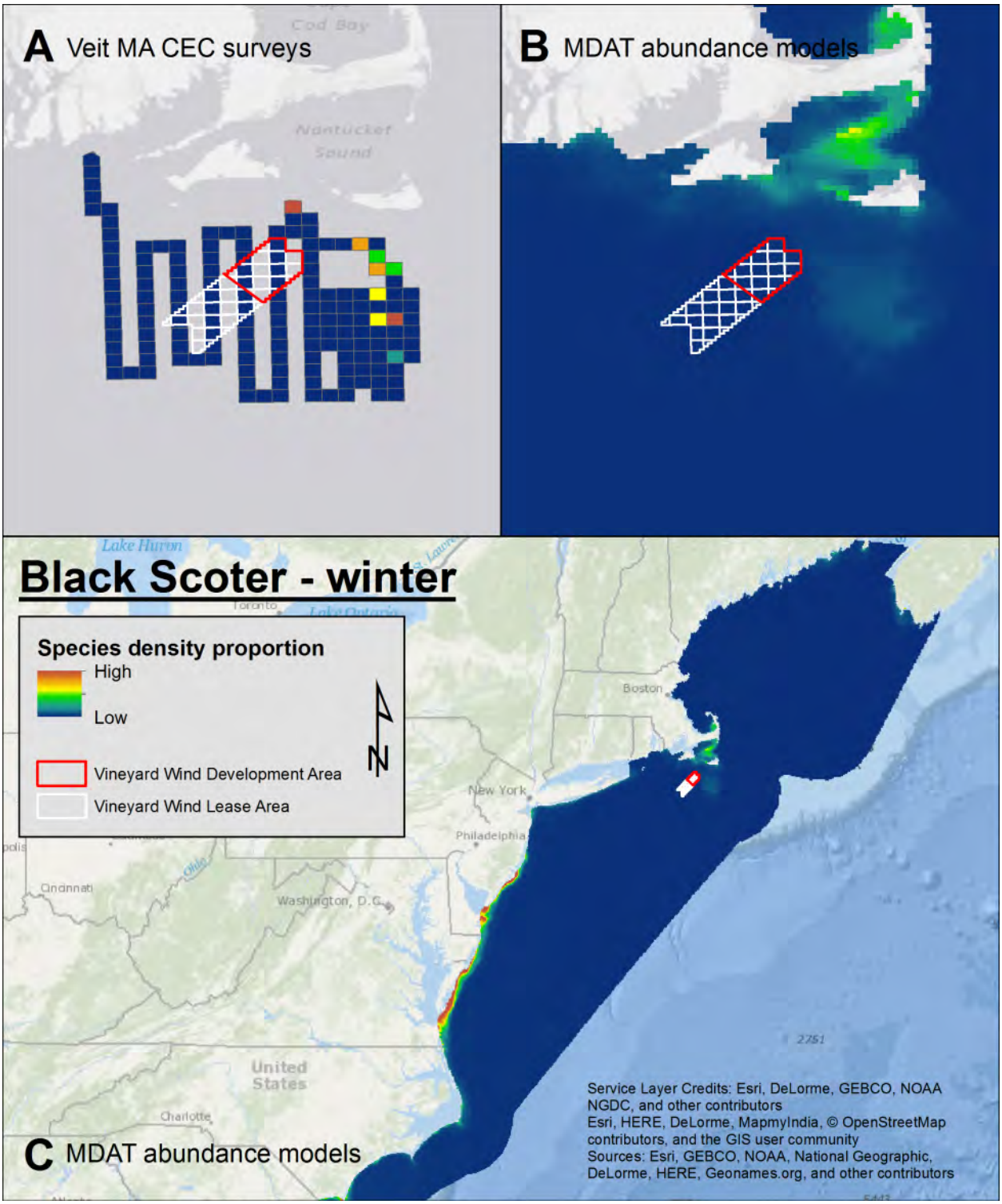

Figure 8. Winter Black Scoter density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

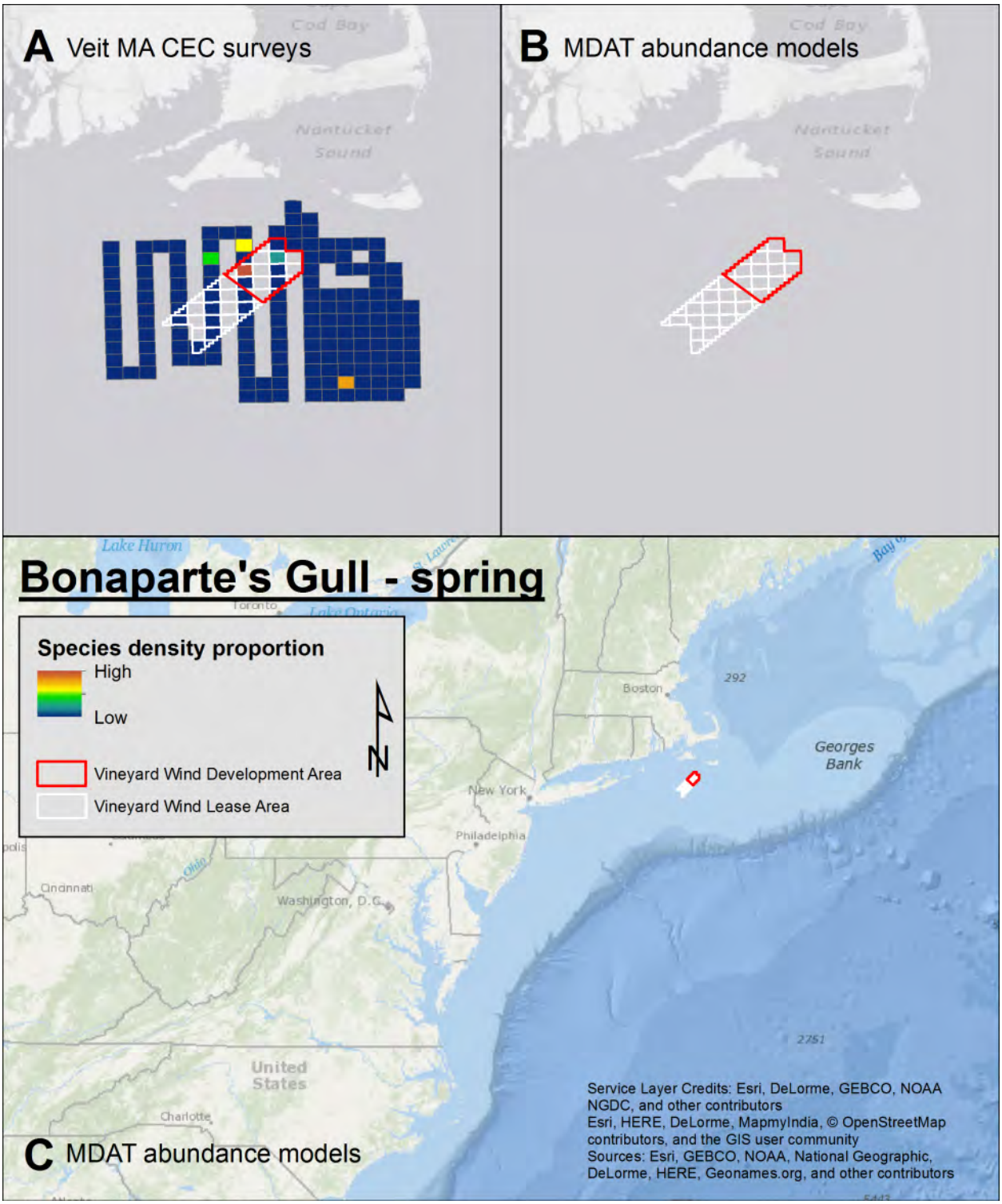

Figure 9. Spring Bonaparte's Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

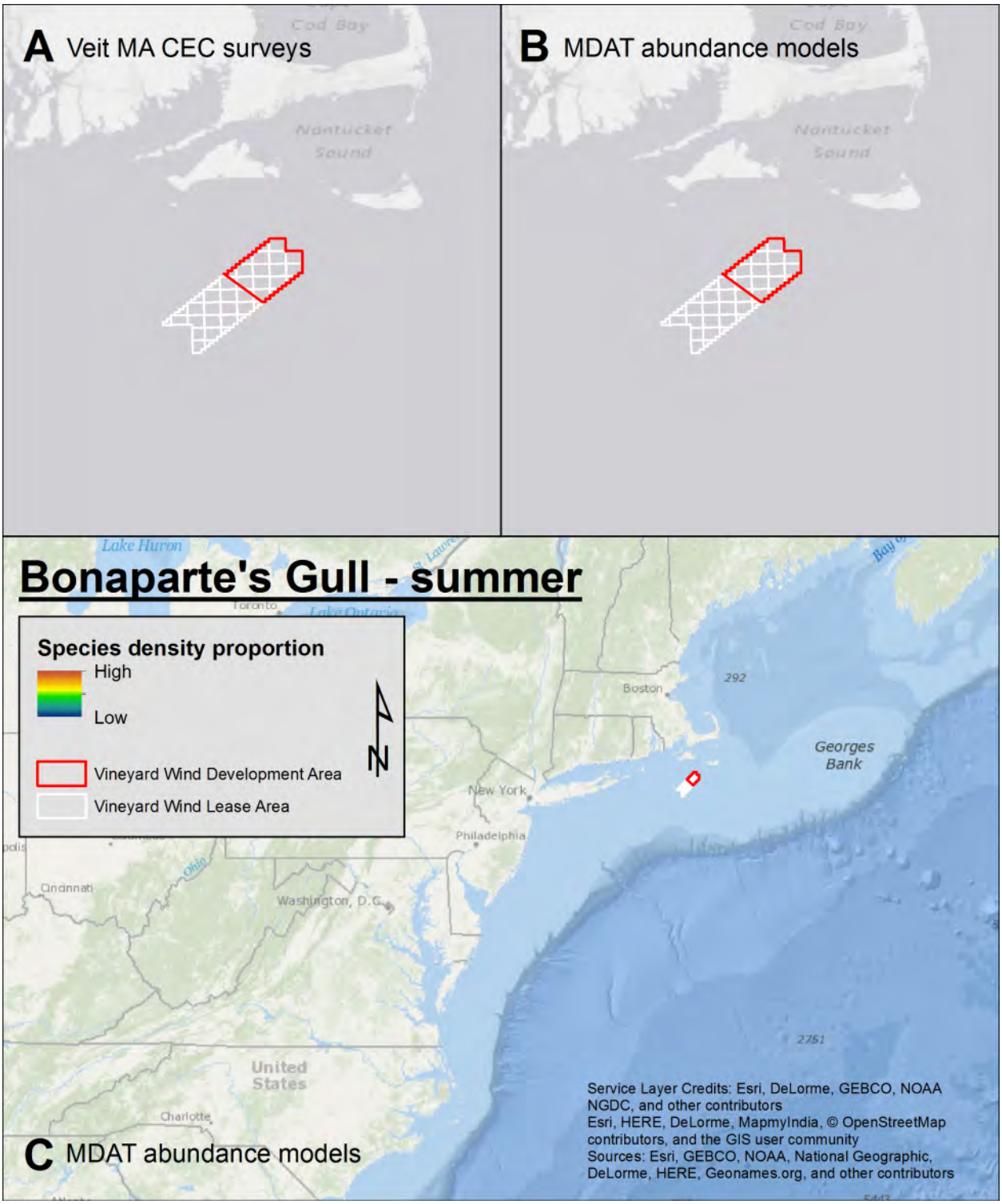

Figure 10. Summer Bonaparte's Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

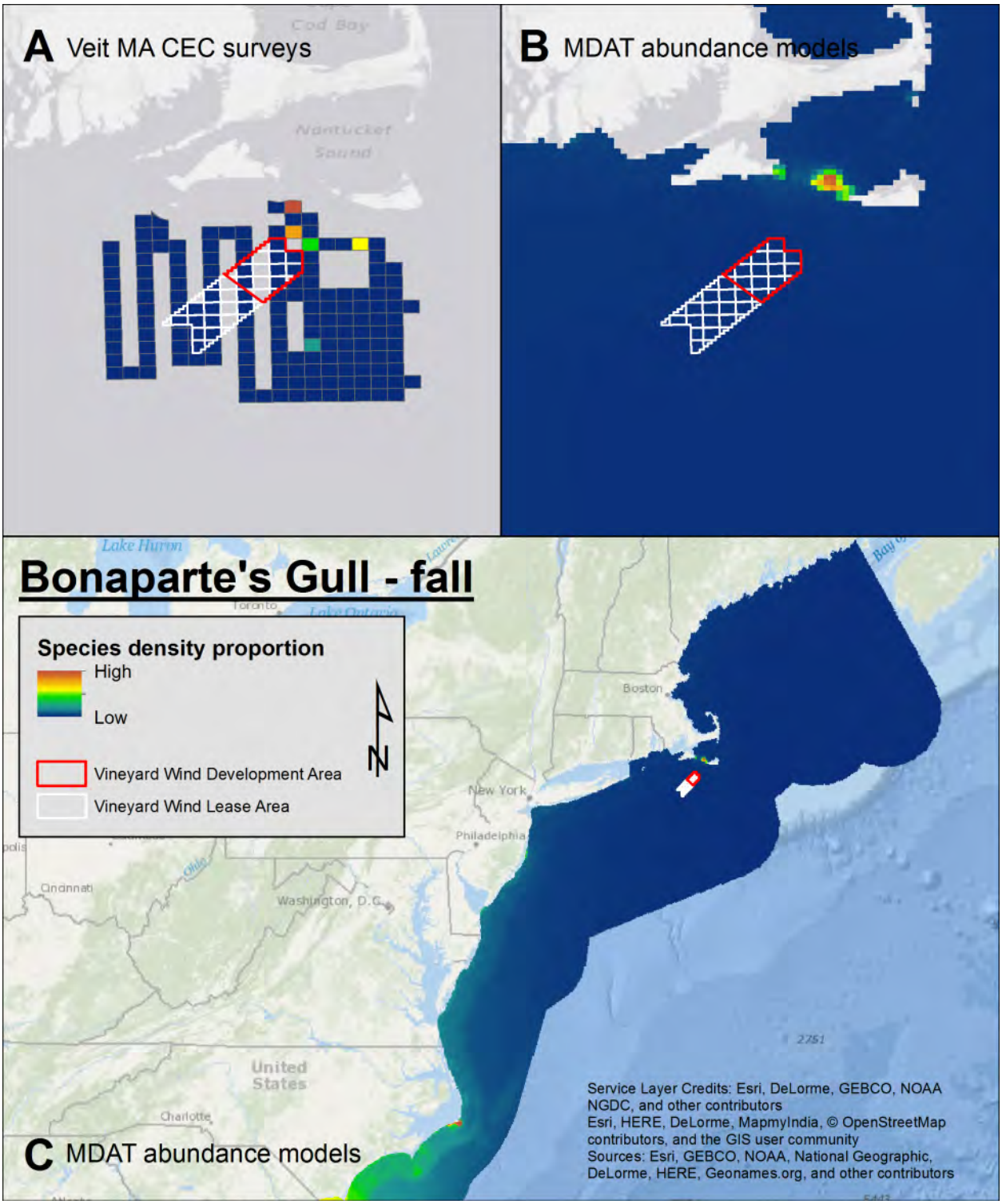

Figure 11. Fall Bonaparte's Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

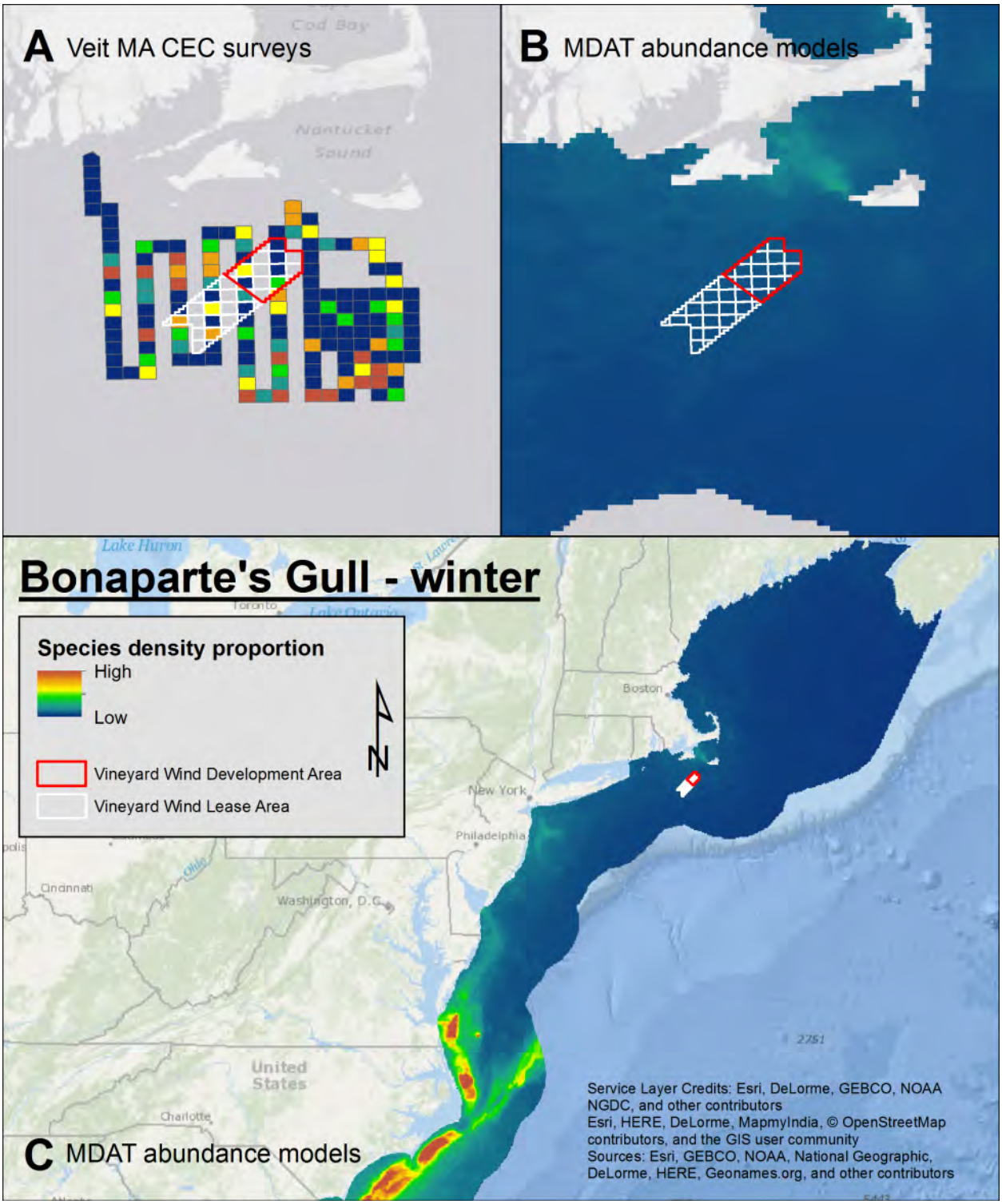

Figure 12. Winter Bonaparte's Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

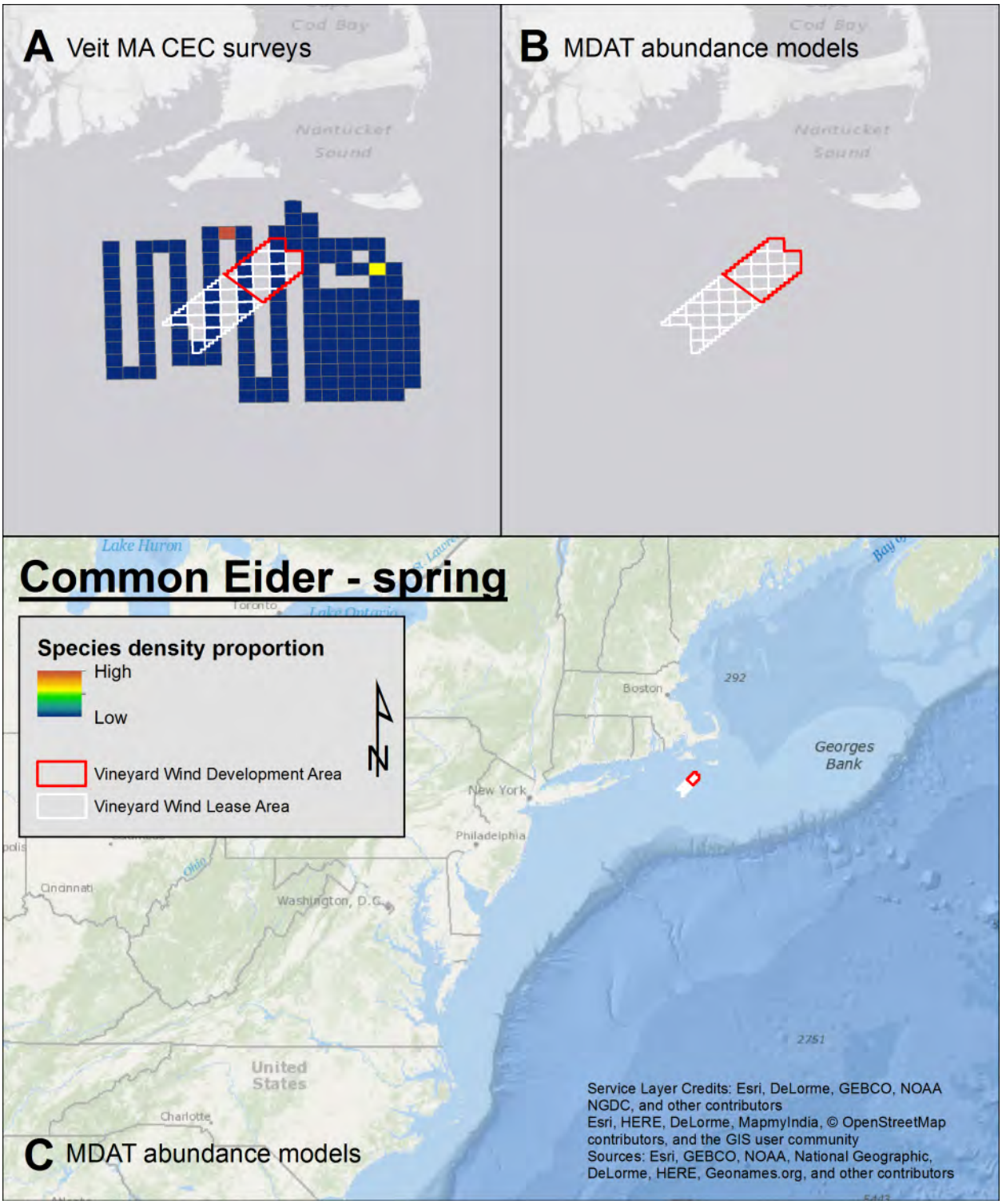

Figure 13. Spring Common Eider density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

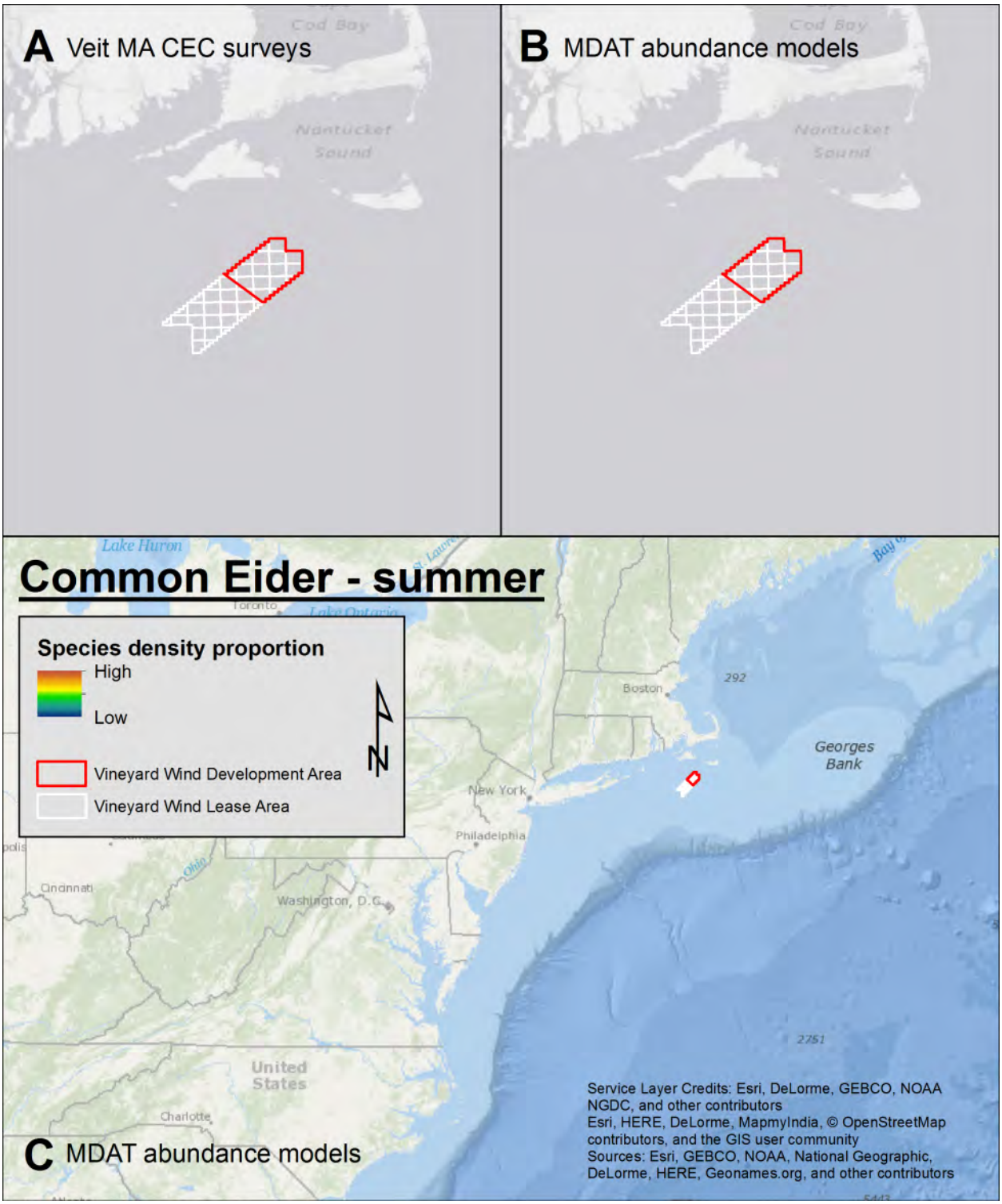

Figure 14. Summer Common Eider density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

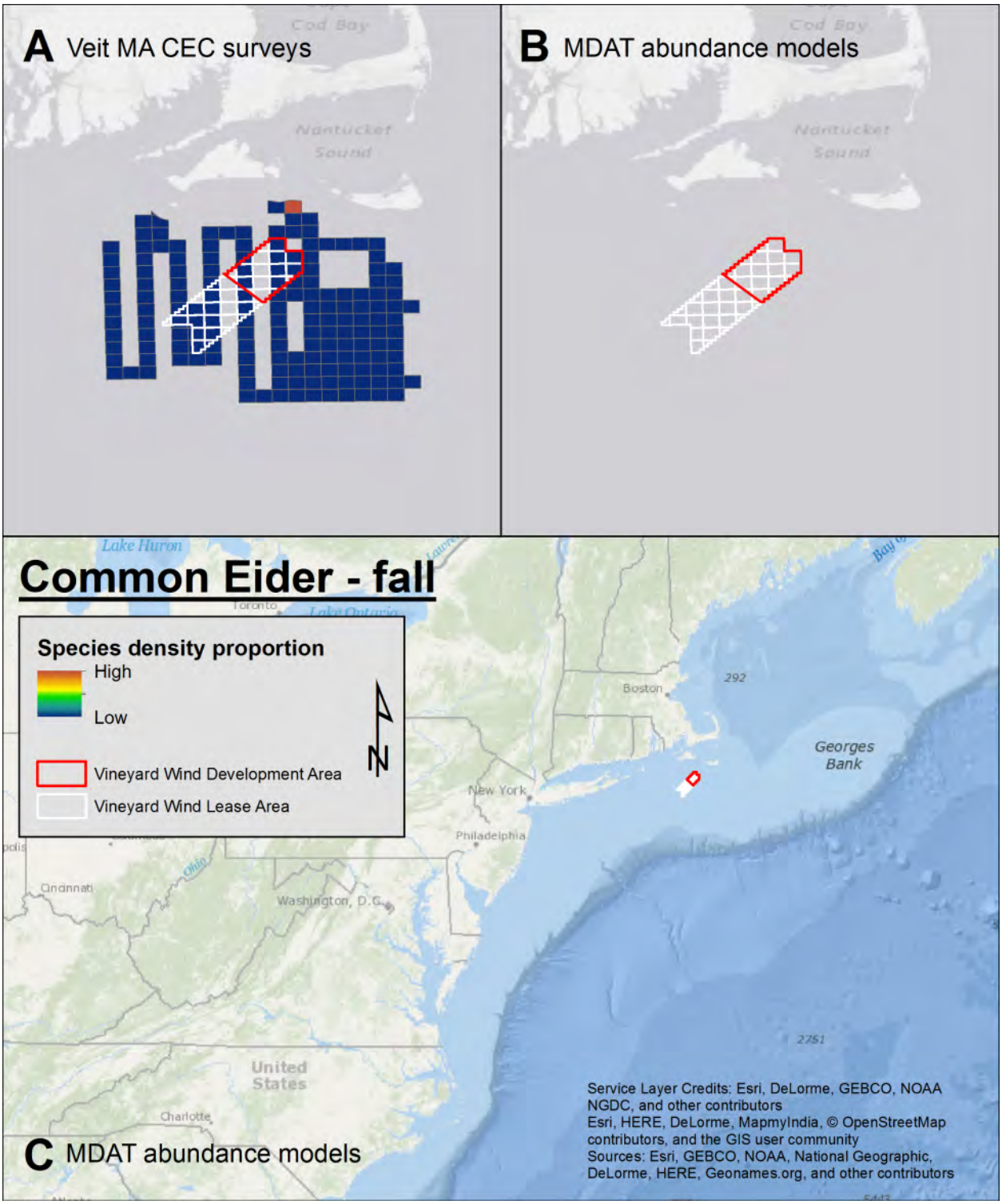

Figure 15. Fall Common Eider density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

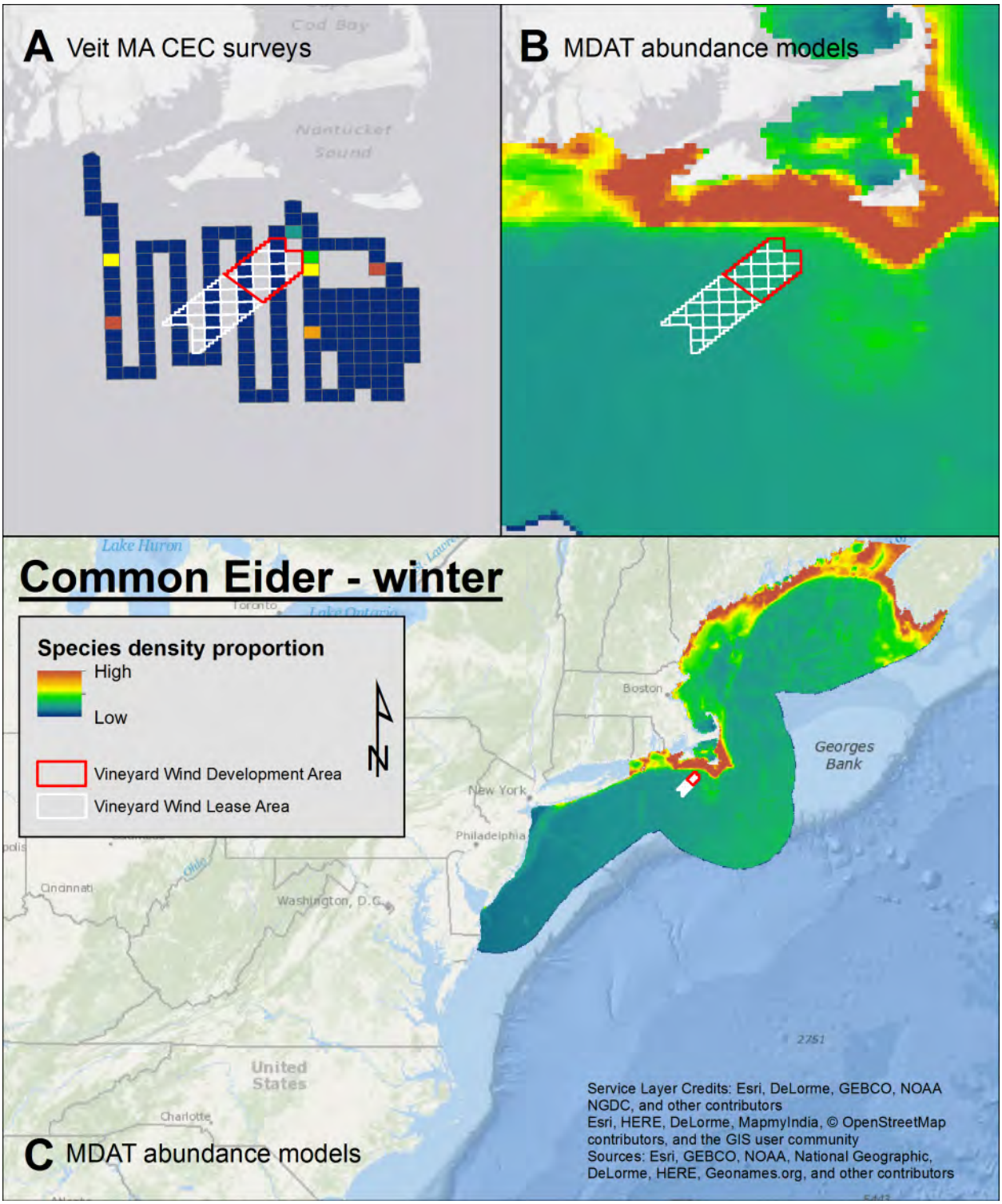

Figure 16. Winter Common Eider density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

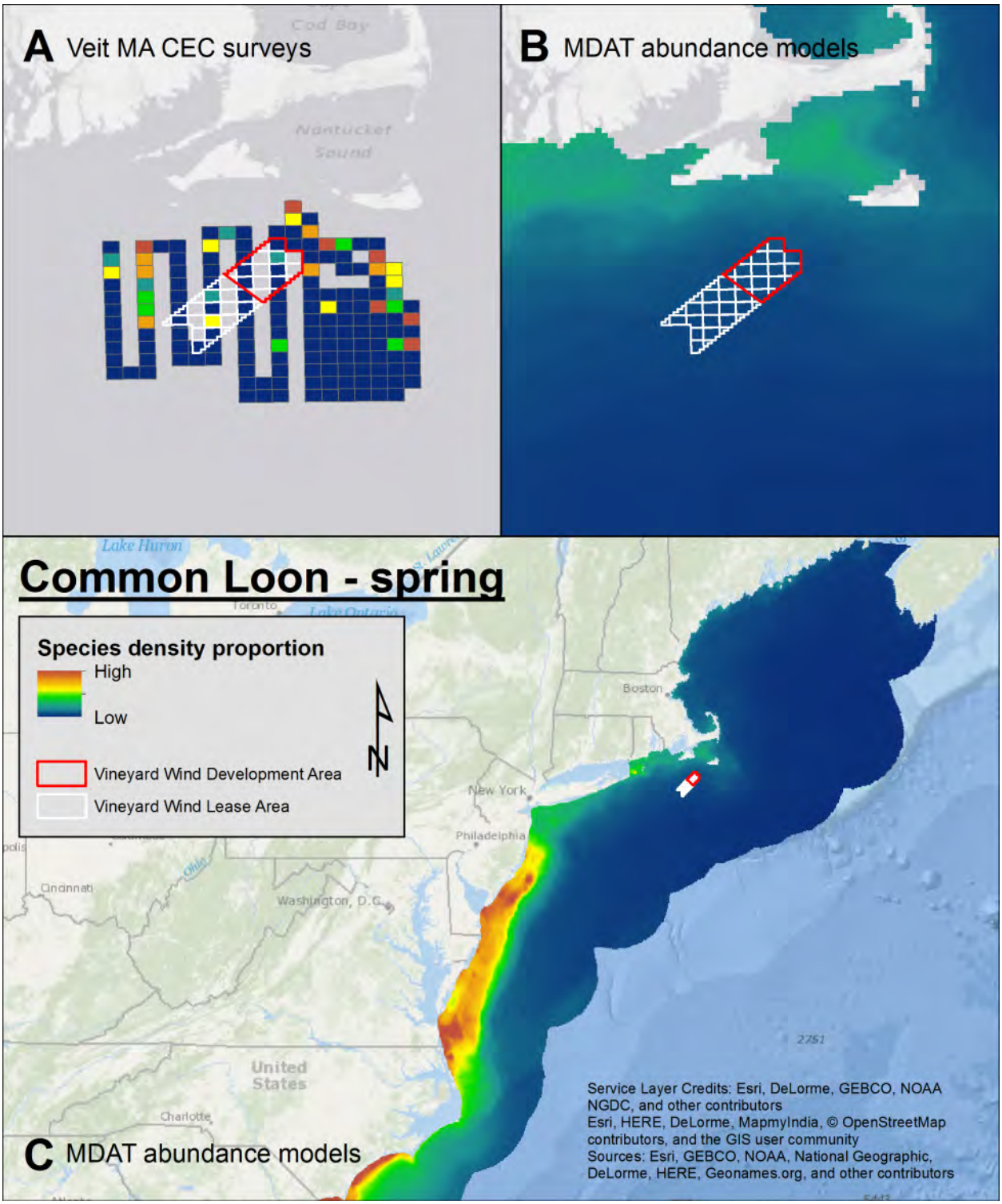

Figure 17. Spring Common Loon density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

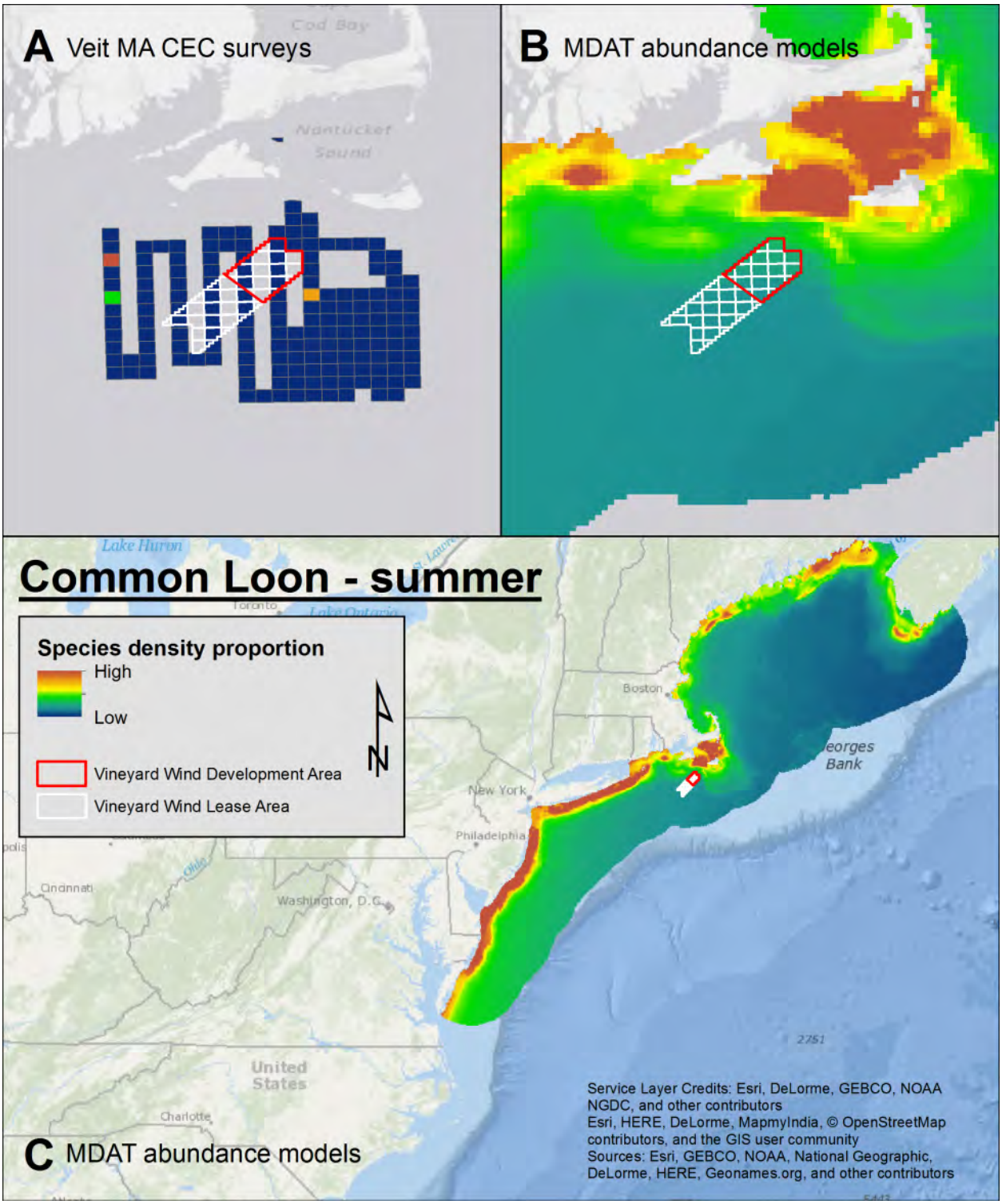

Figure 18. Summer Common Loon density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

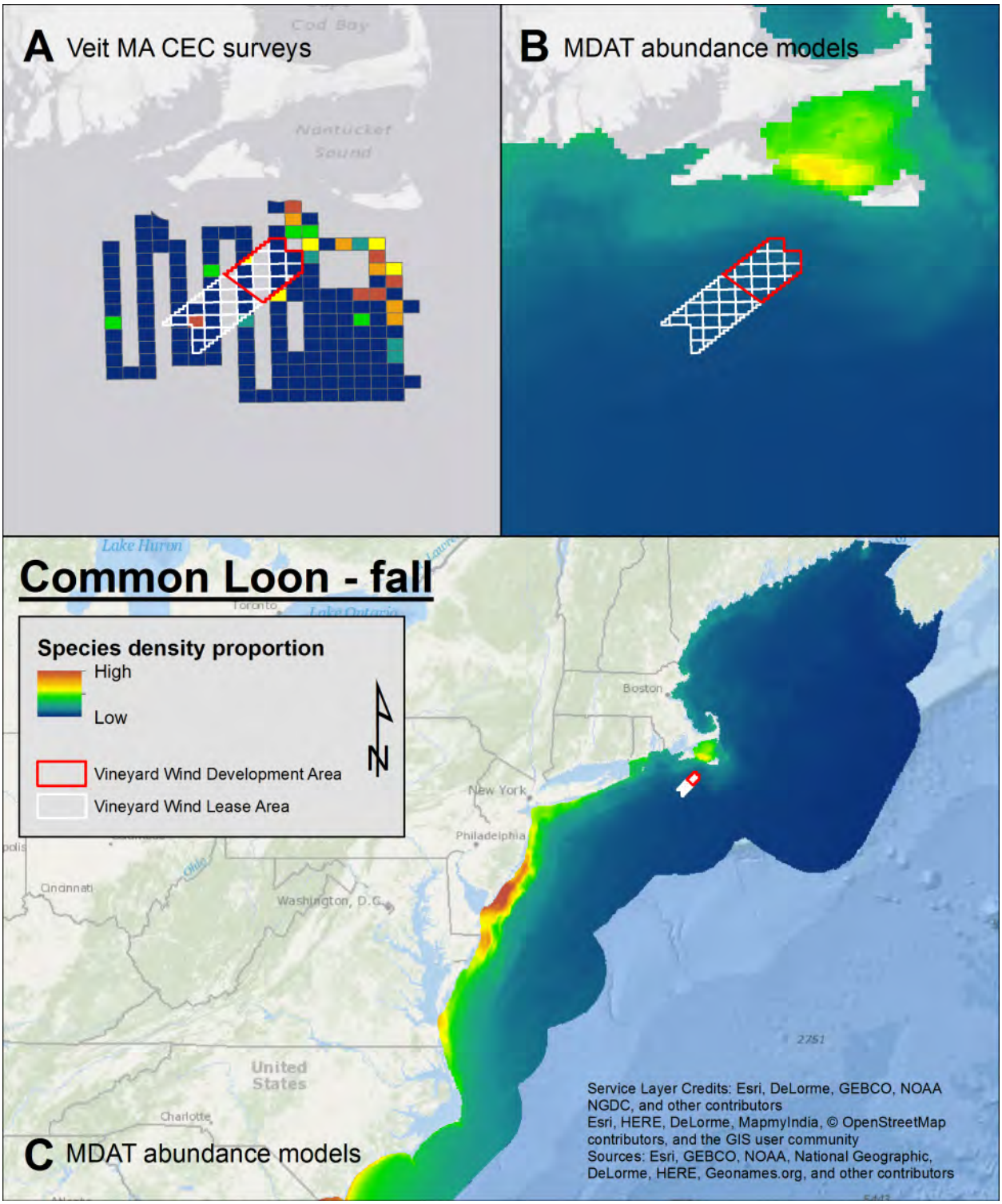

Figure 19. Fall Common Loon density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

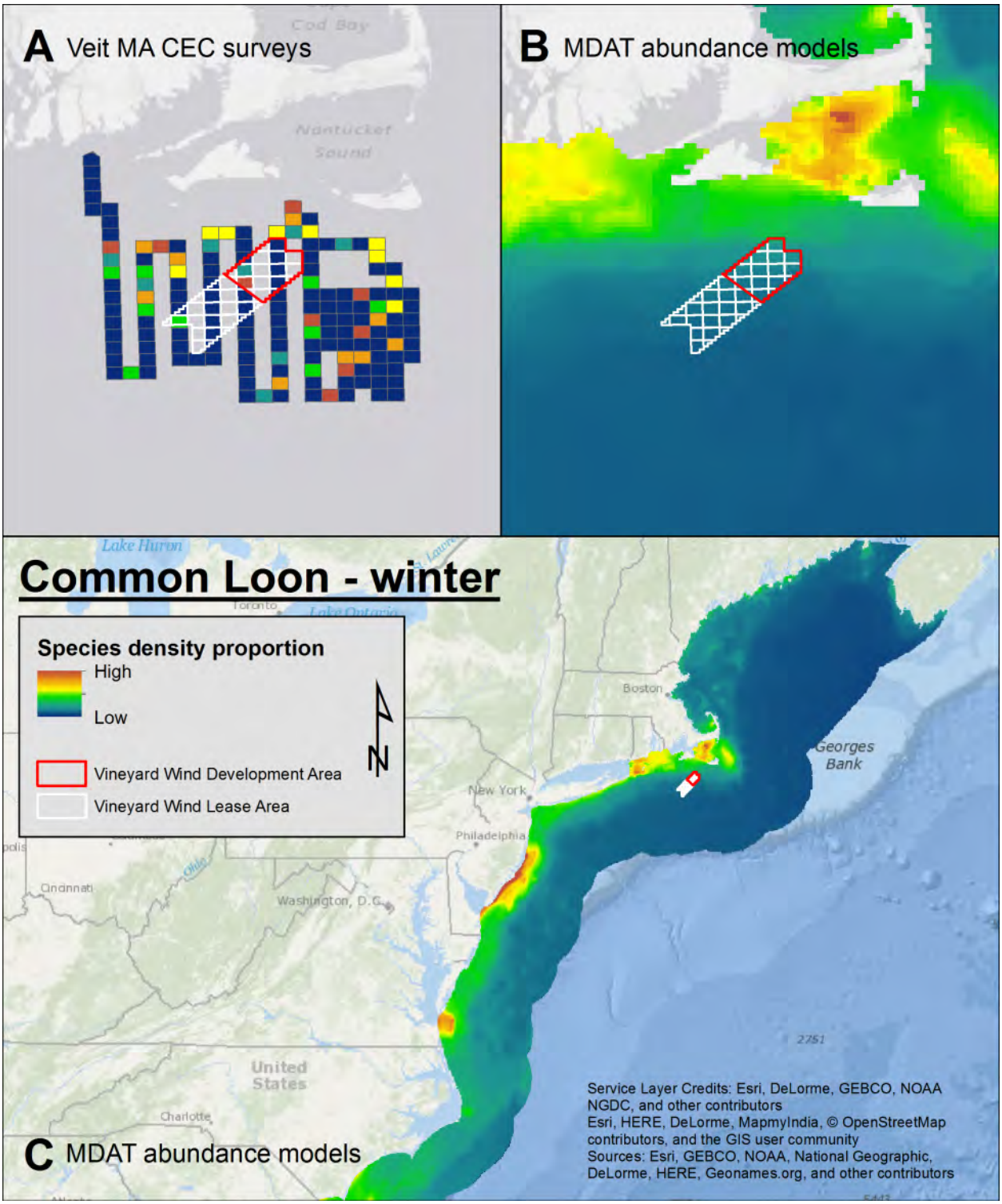

Figure 20. Winter Common Loon density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

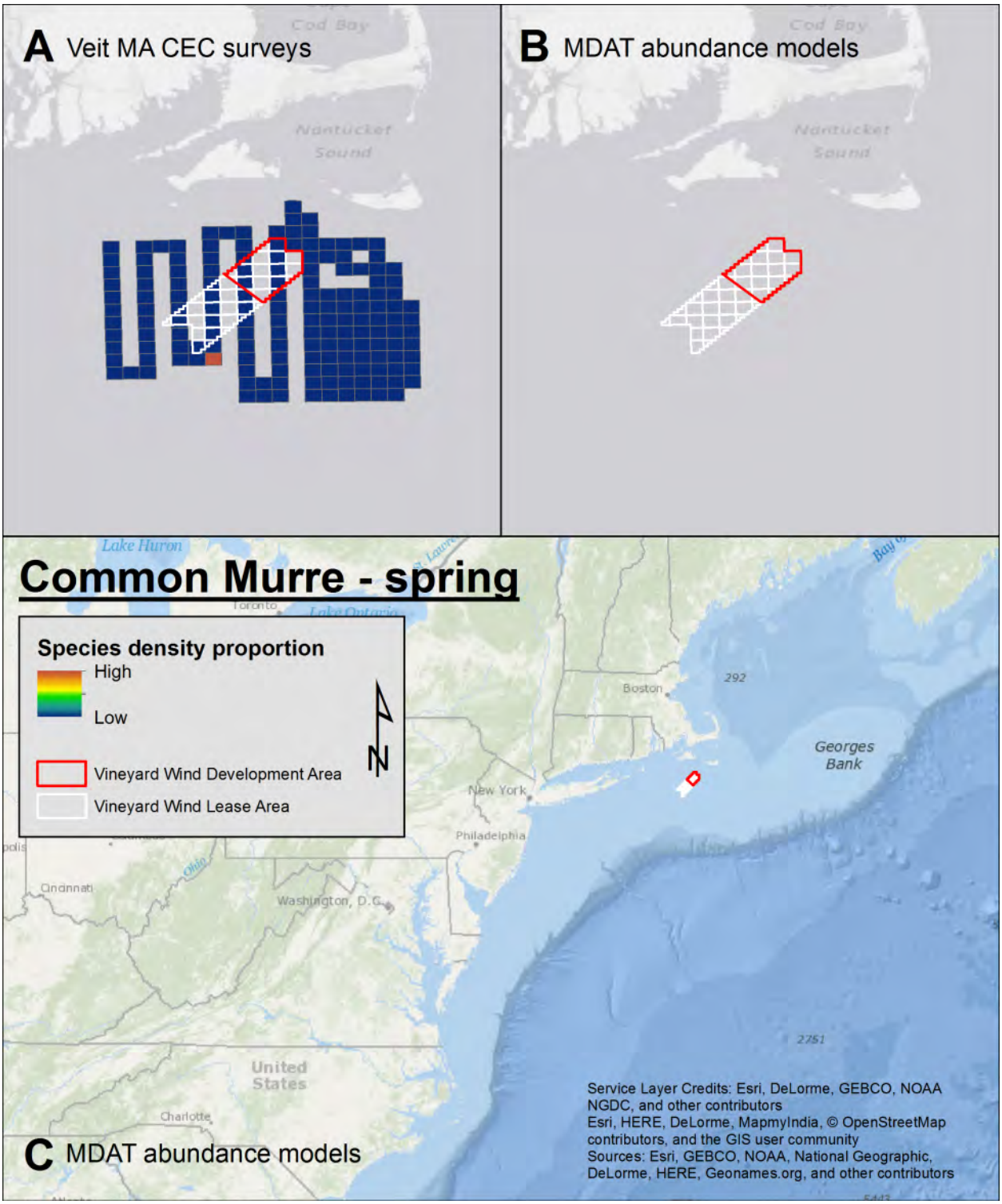

Figure 21. Spring Common Murre density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

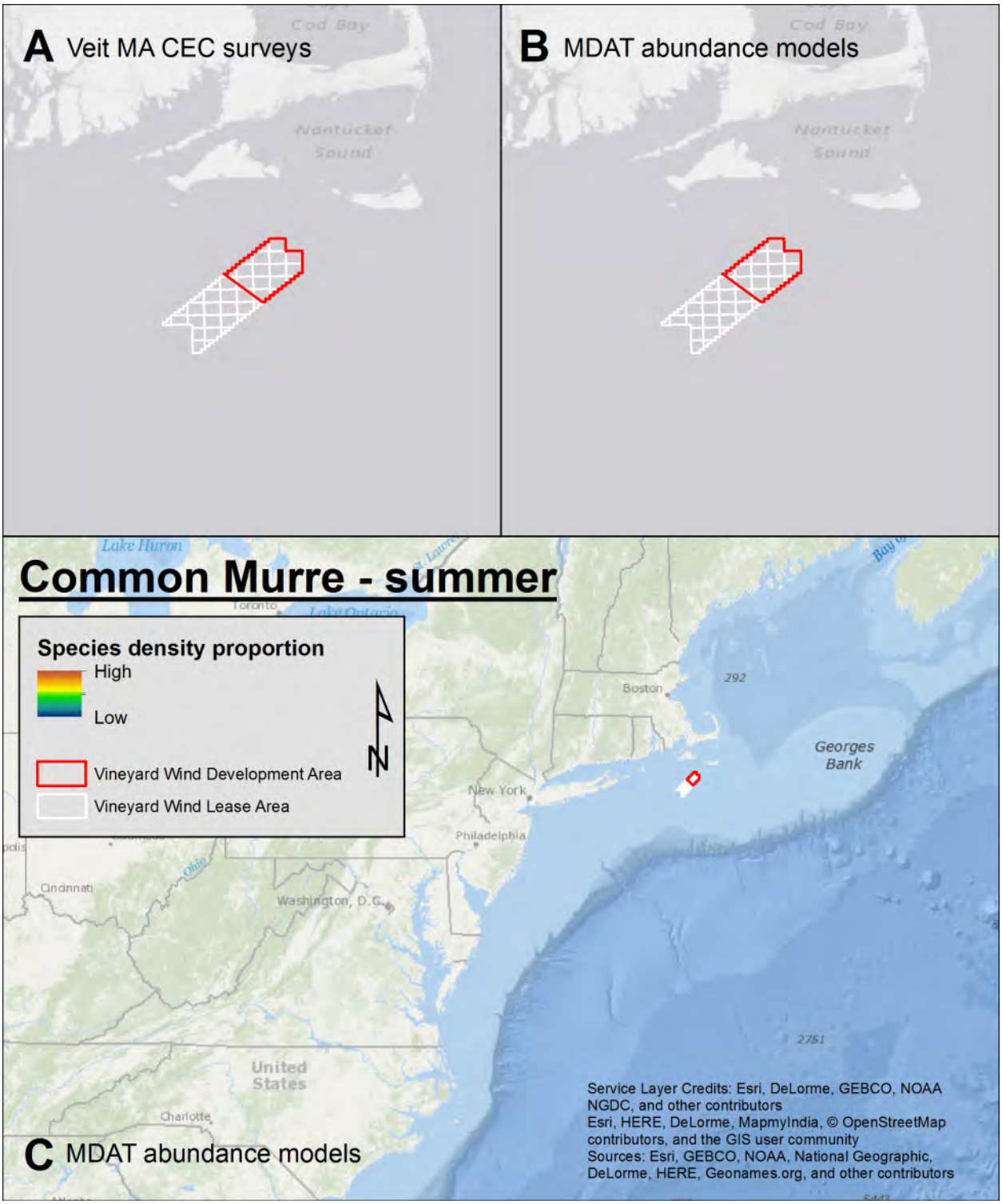

Figure 22. Summer Common Murre density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

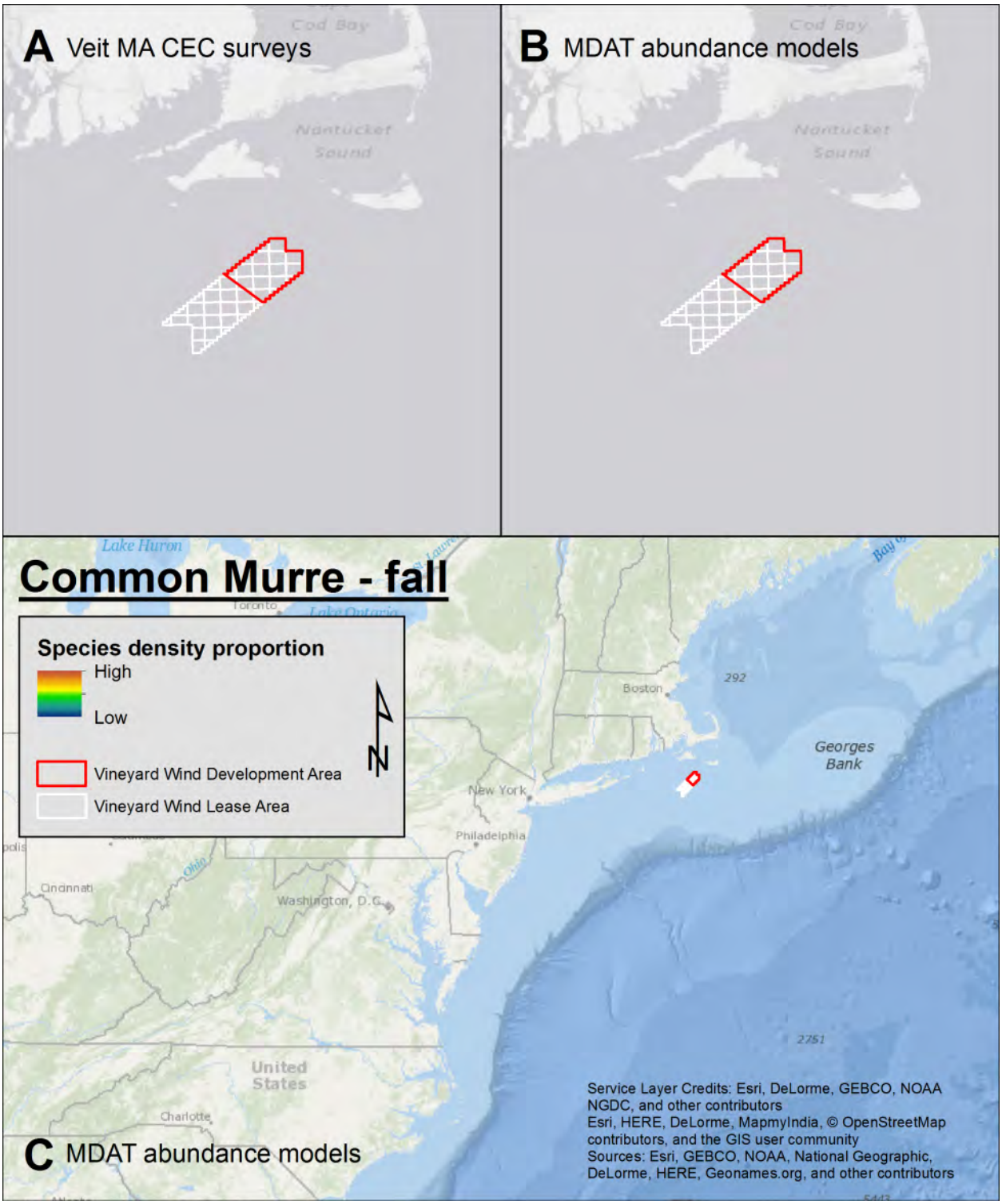

Figure 23. Fall Common Murre density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

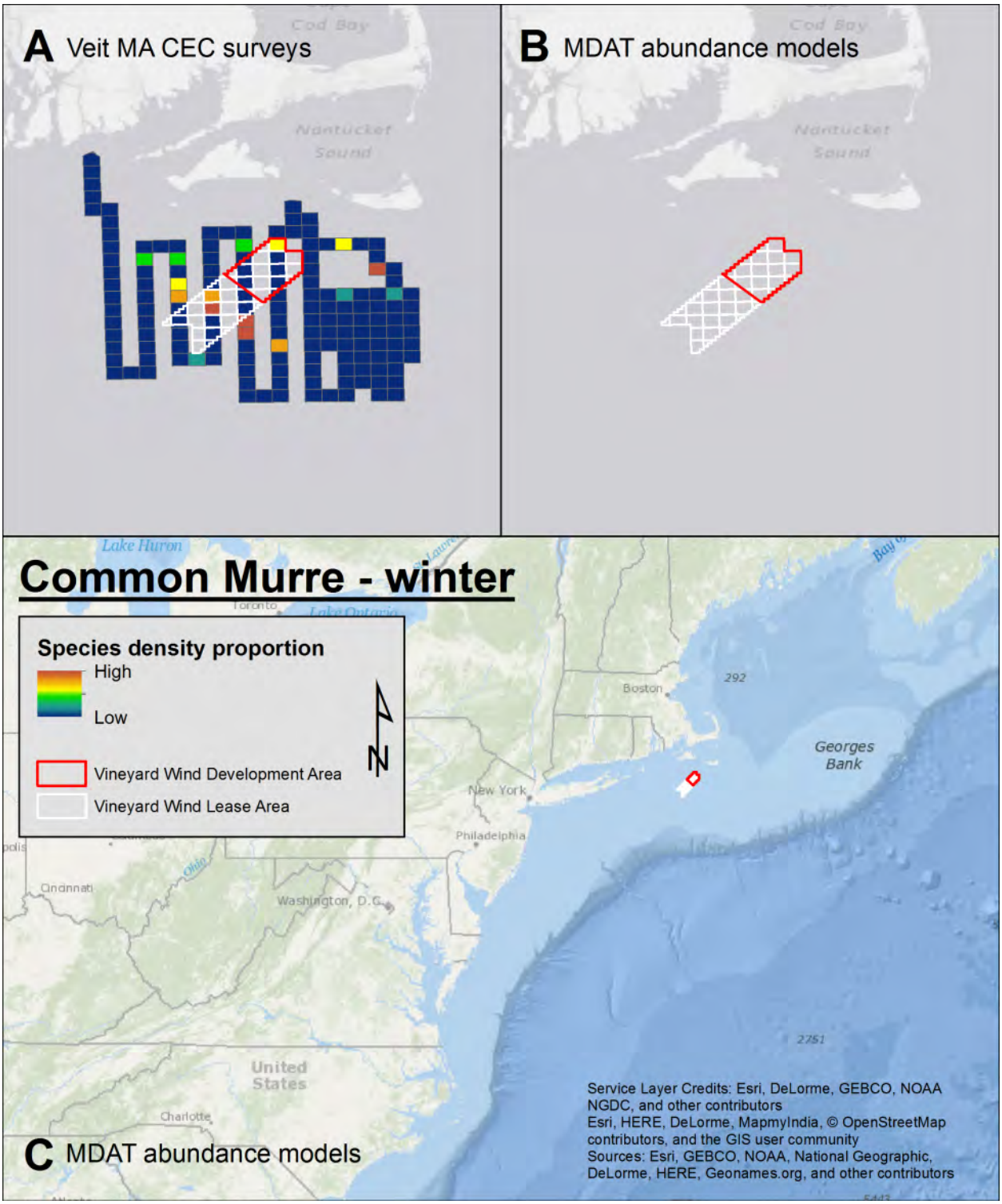

Figure 24. Winter Common Murre density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

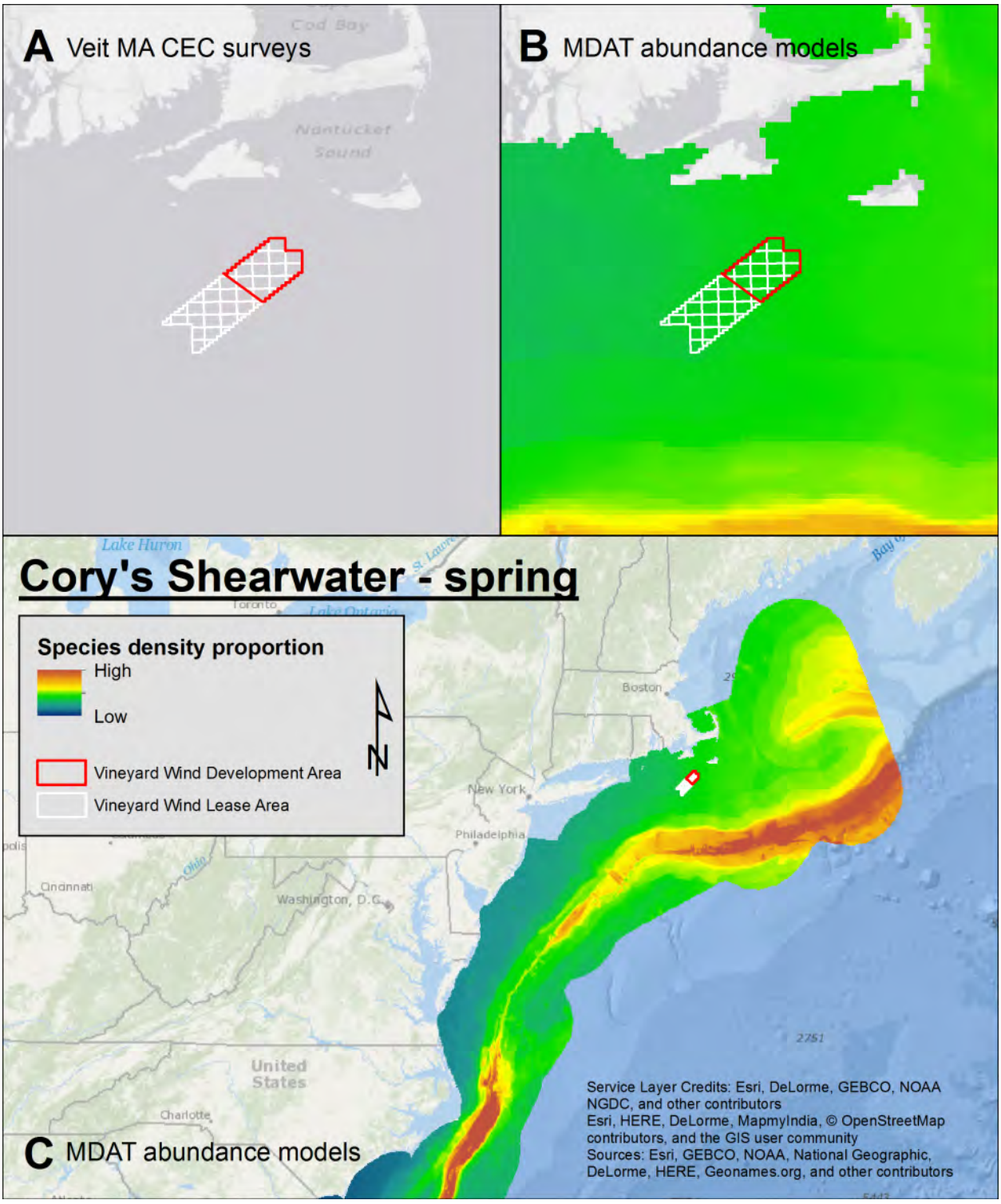

Figure 25. Spring Cory's Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

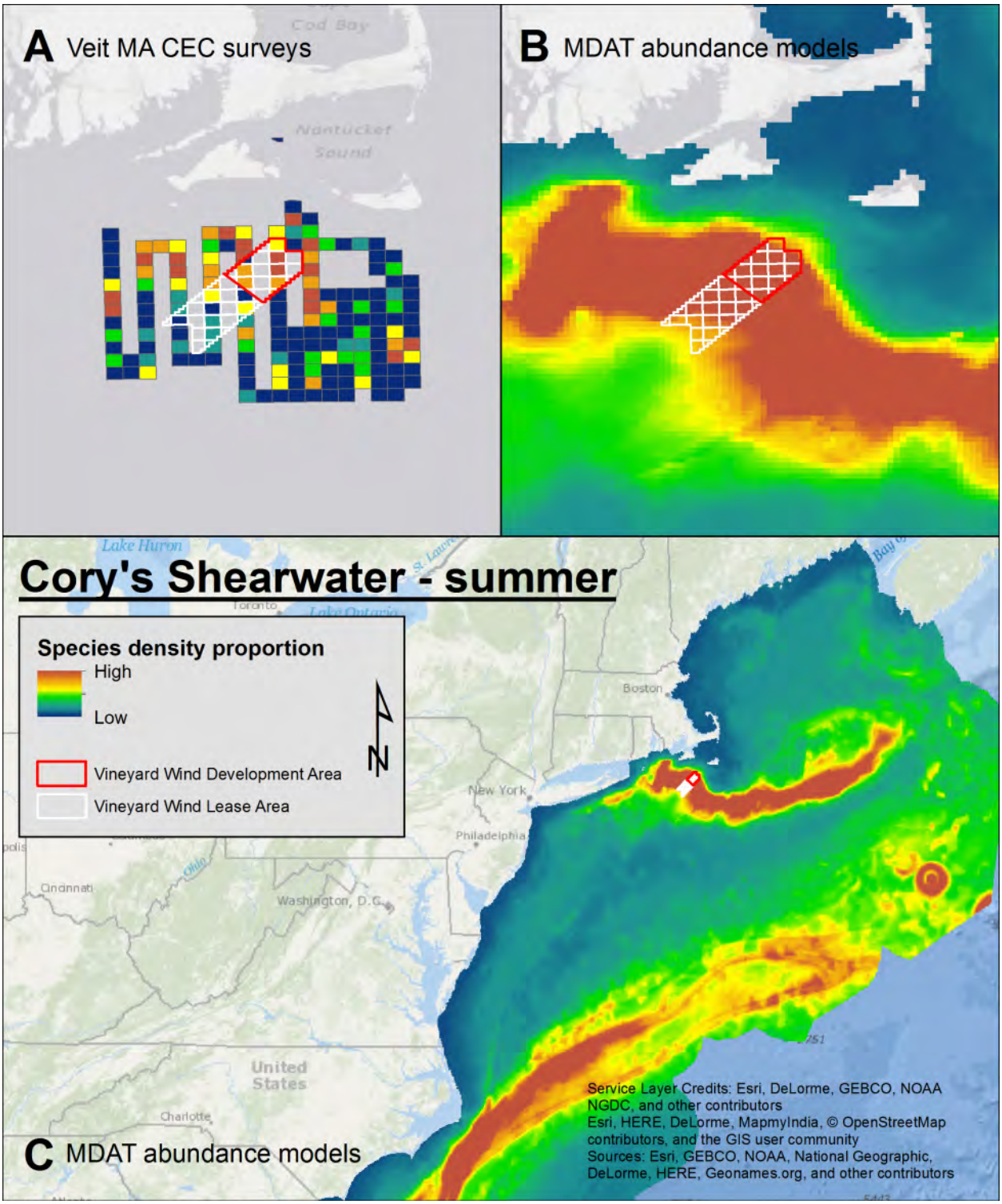

Figure 26. Summer Cory's Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

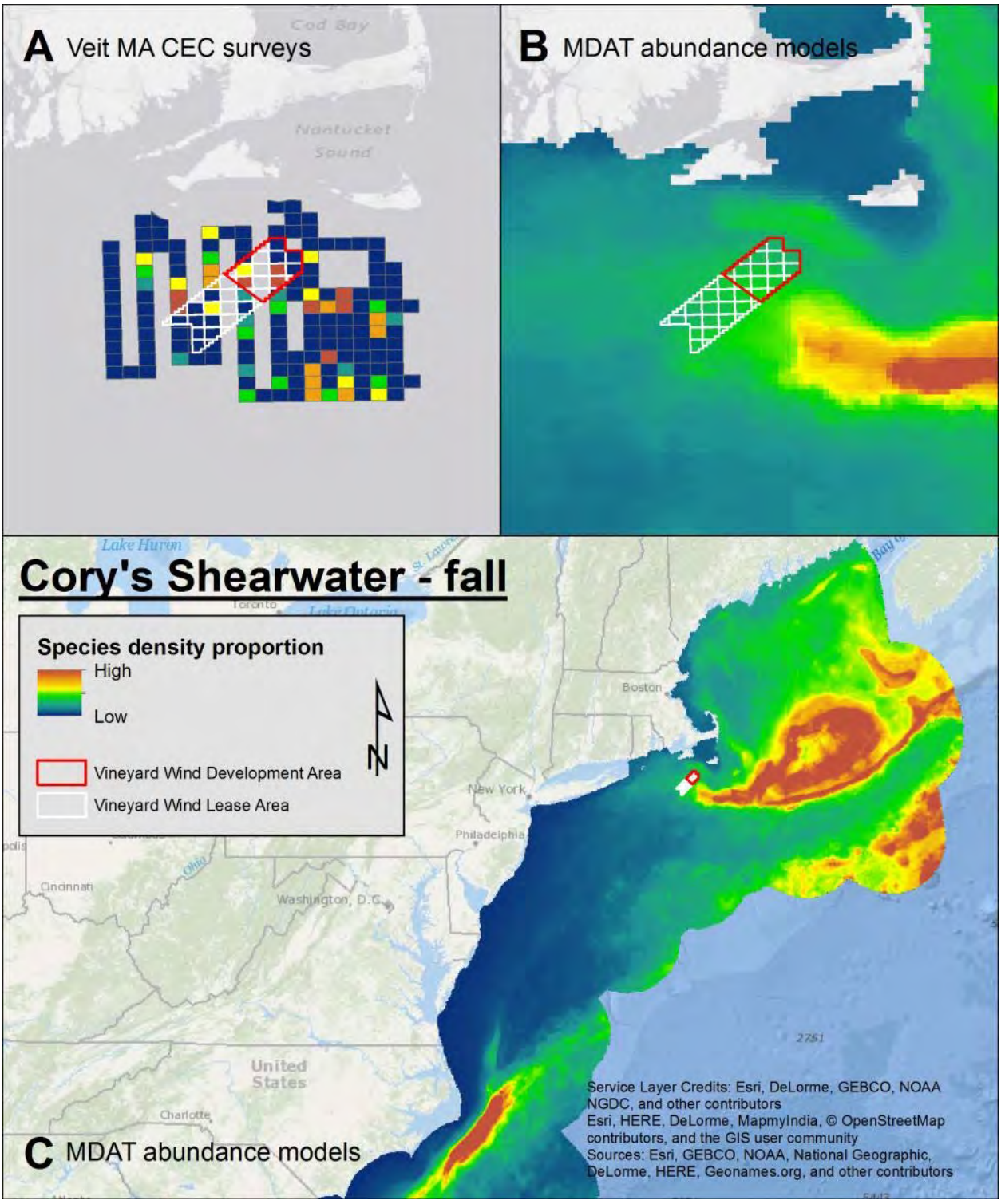

Figure 27. Fall Cory's Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

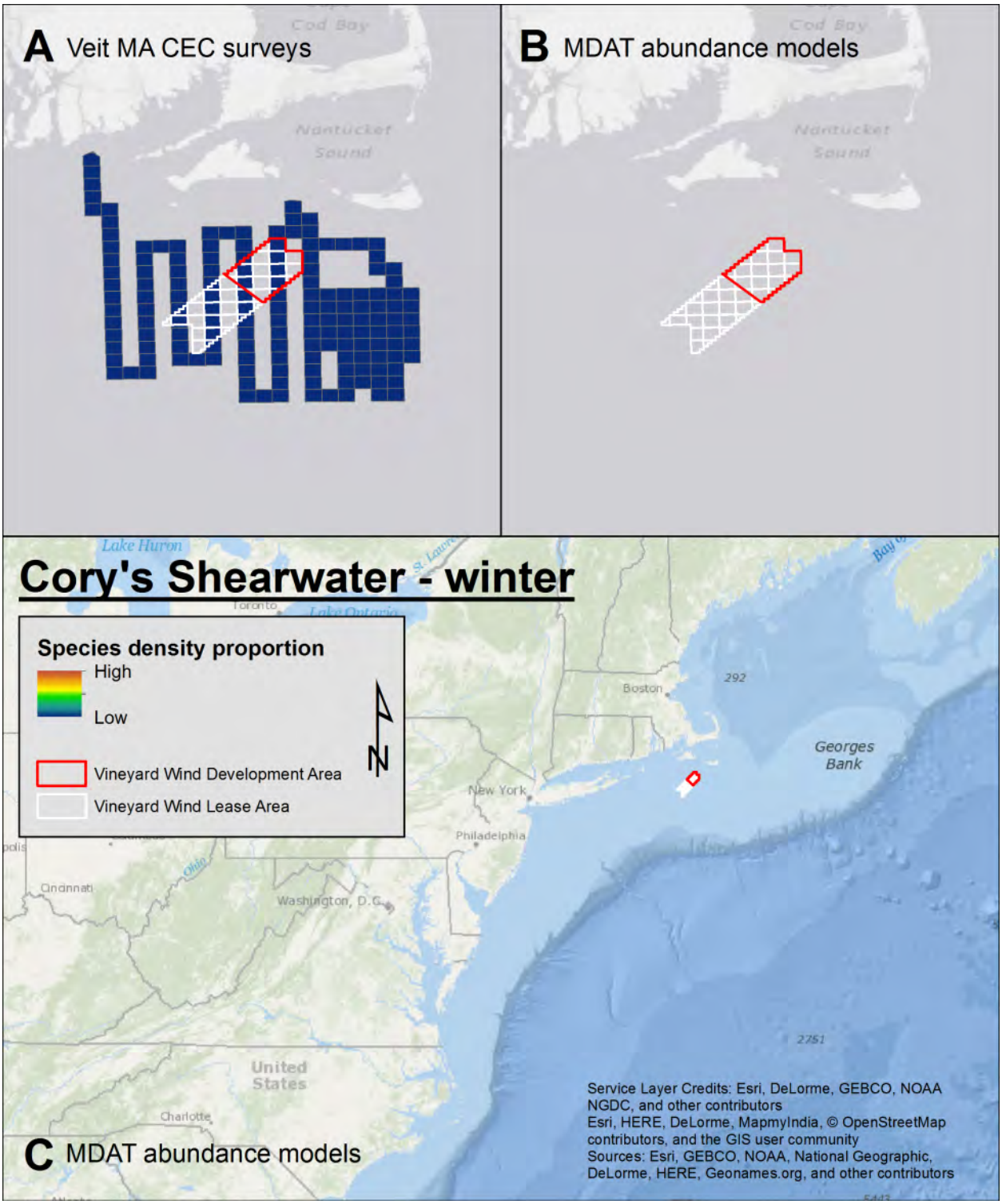

Figure 28. Winter Cory's Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

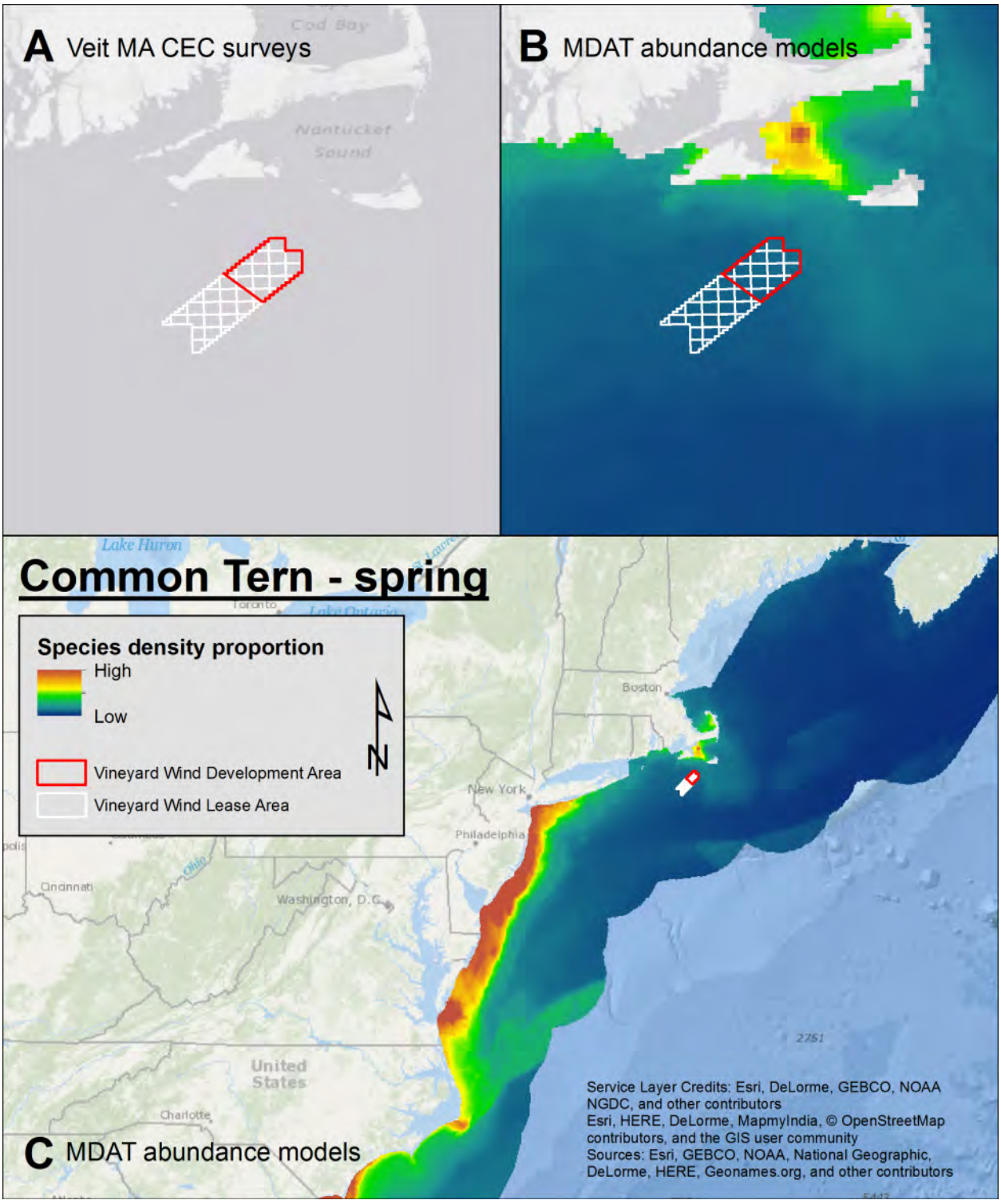

Figure 29. Spring Common Tern density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

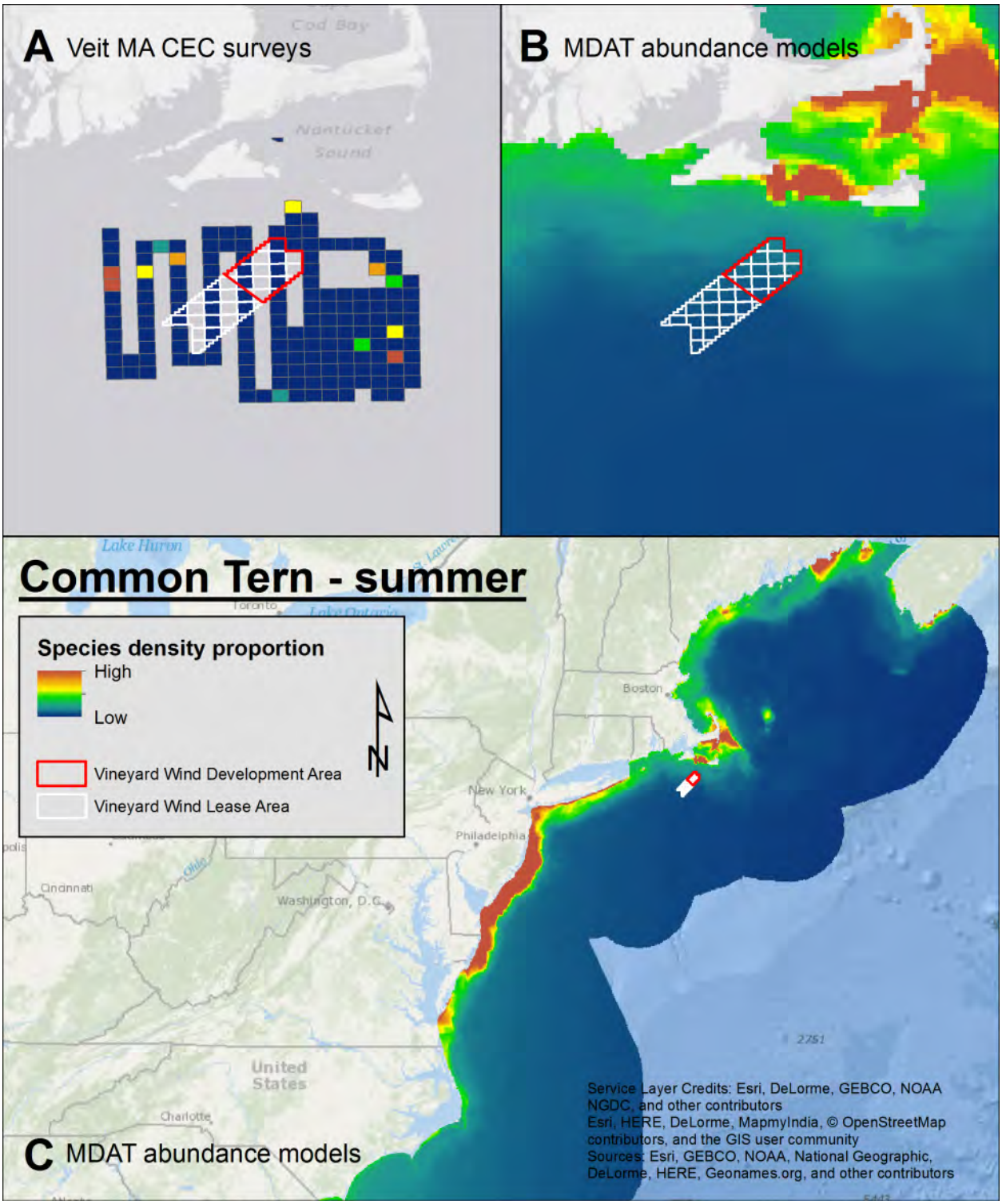

Figure 30. Summer Common Tern density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

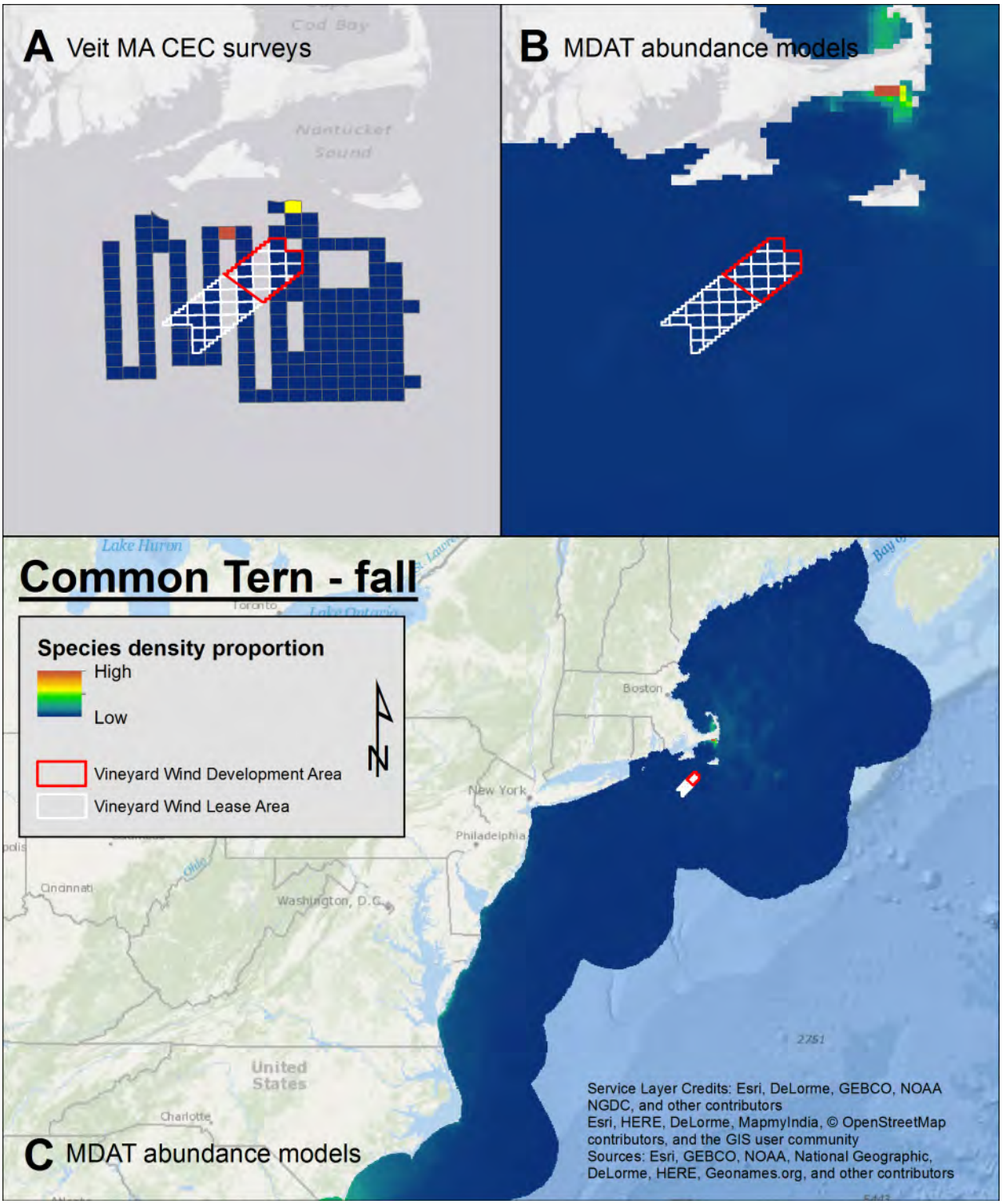

Figure 31. Fall Common Tern density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

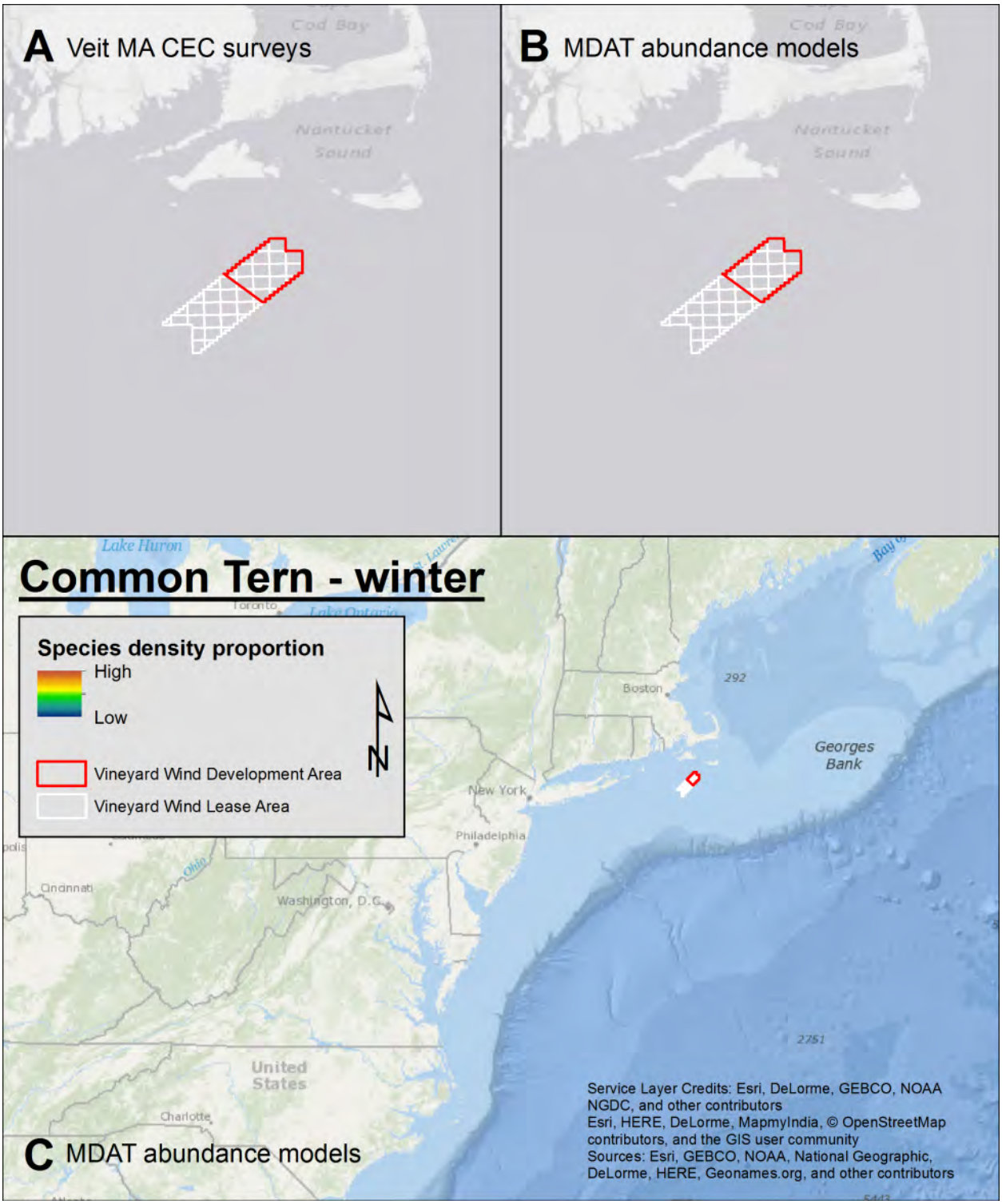

Figure 32. Winter Common Tern density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

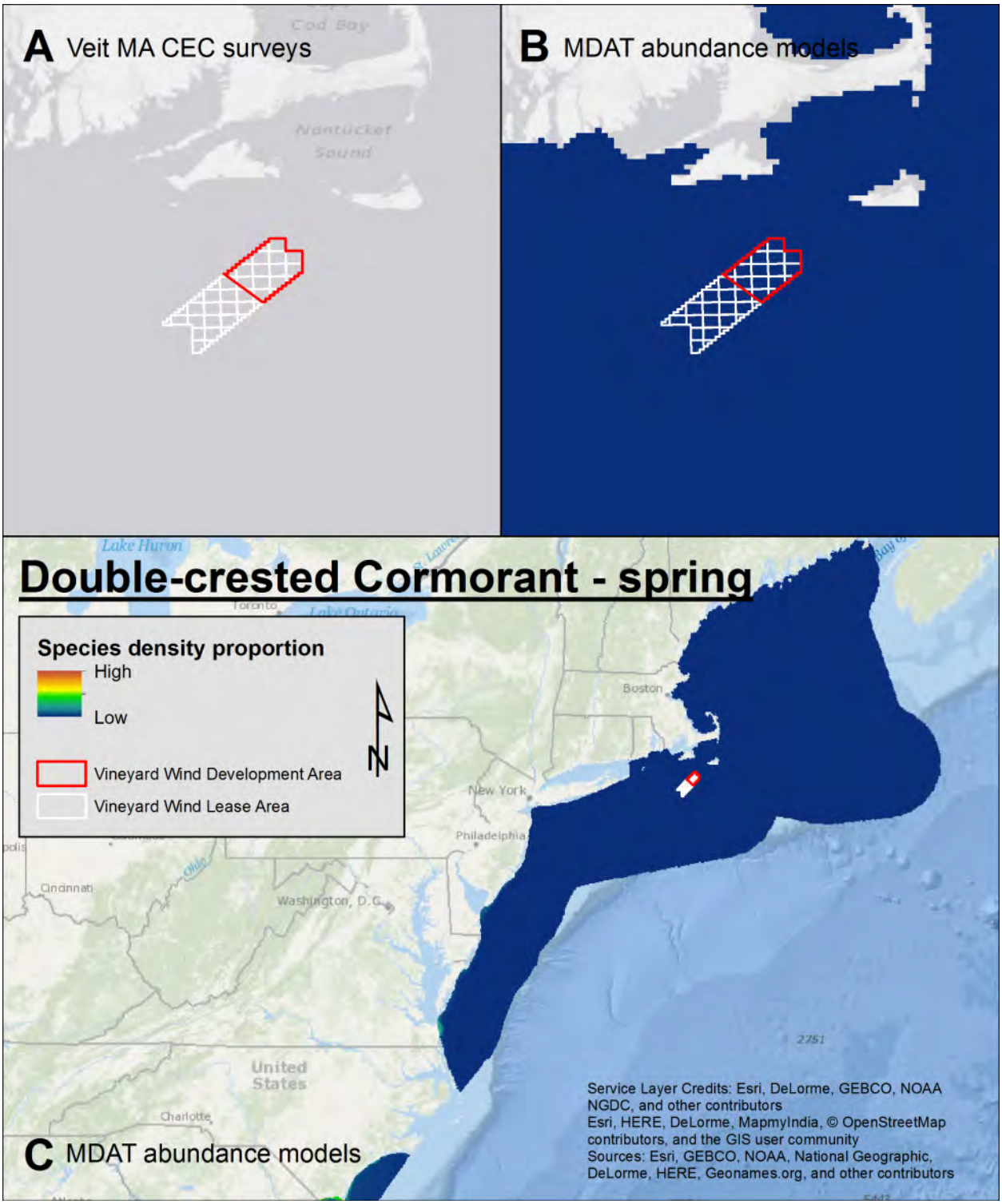

Figure 33. Spring Double-crested Cormorant density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

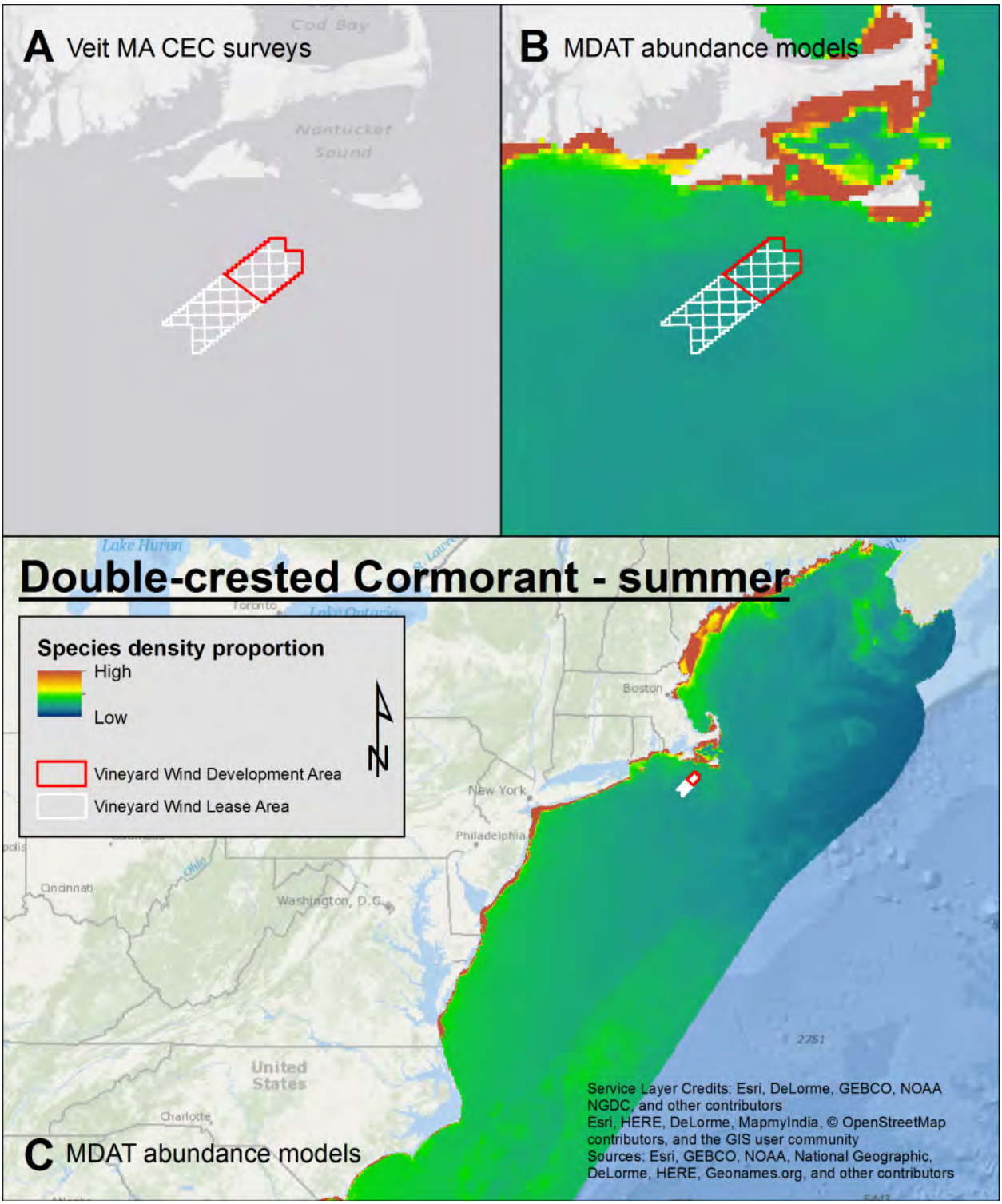

Figure 34. Summer Double-crested Cormorant density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

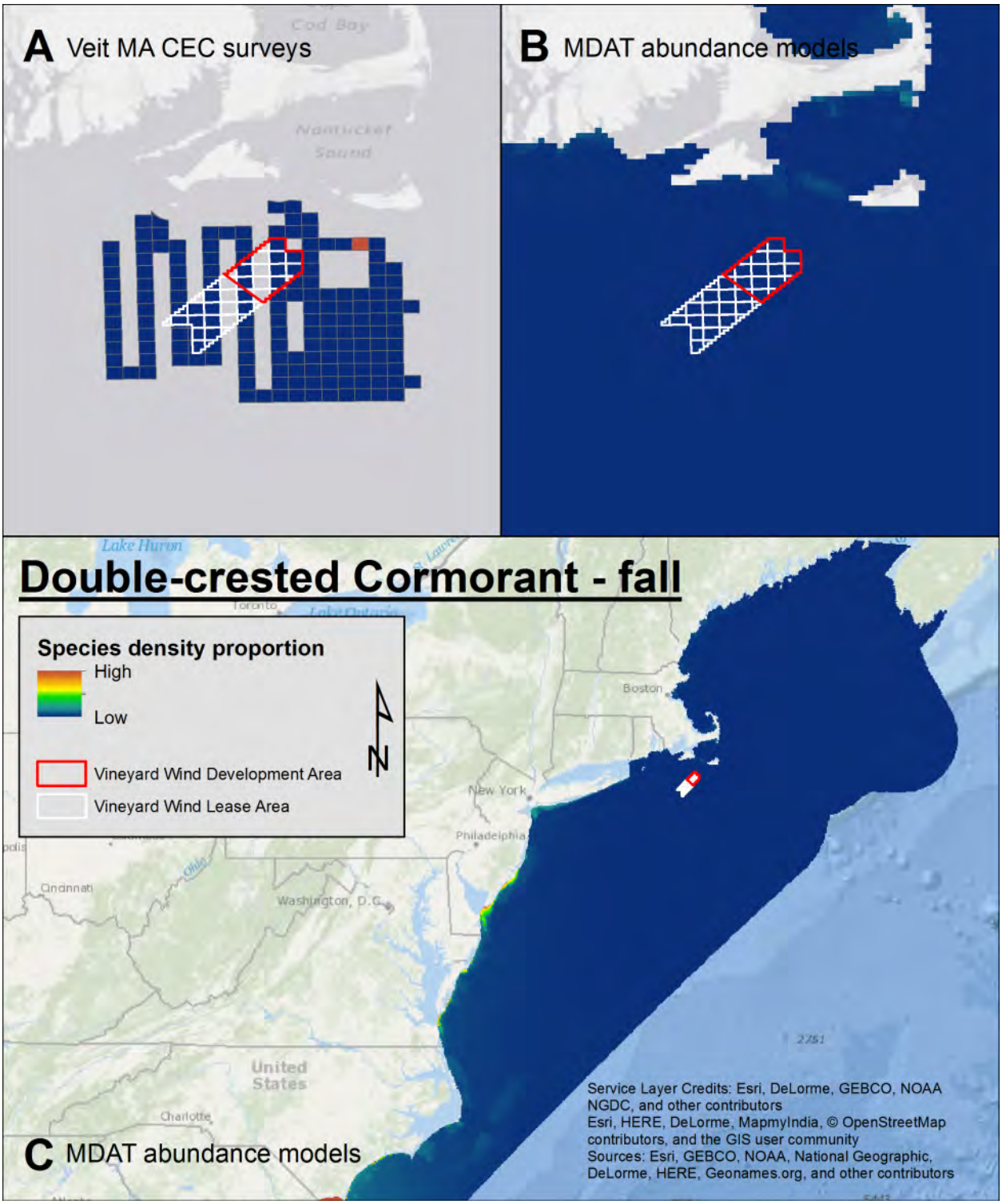

Figure 35. Fall Double-crested Cormorant density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

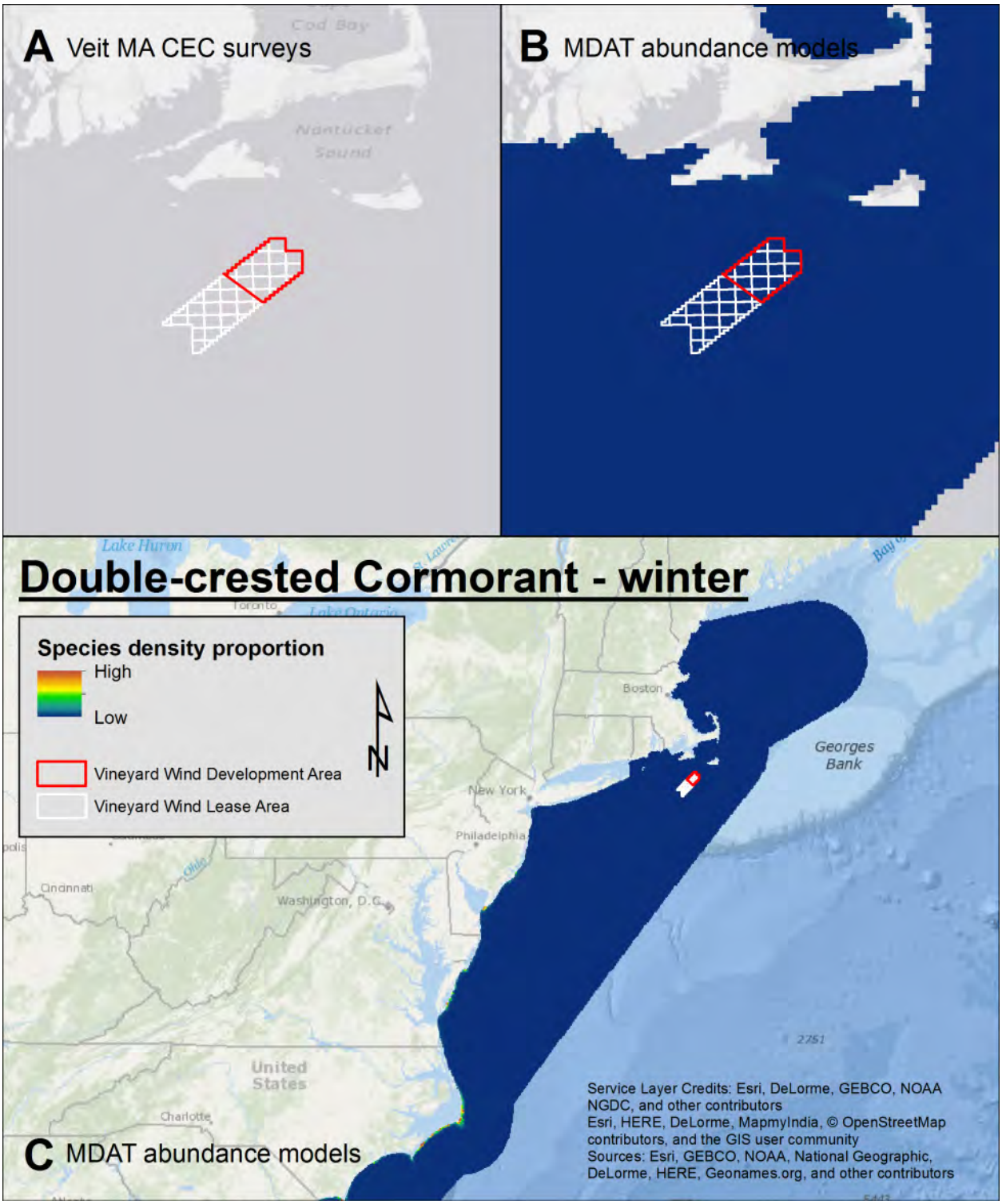

Figure 36. Winter Double-crested Cormorant density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

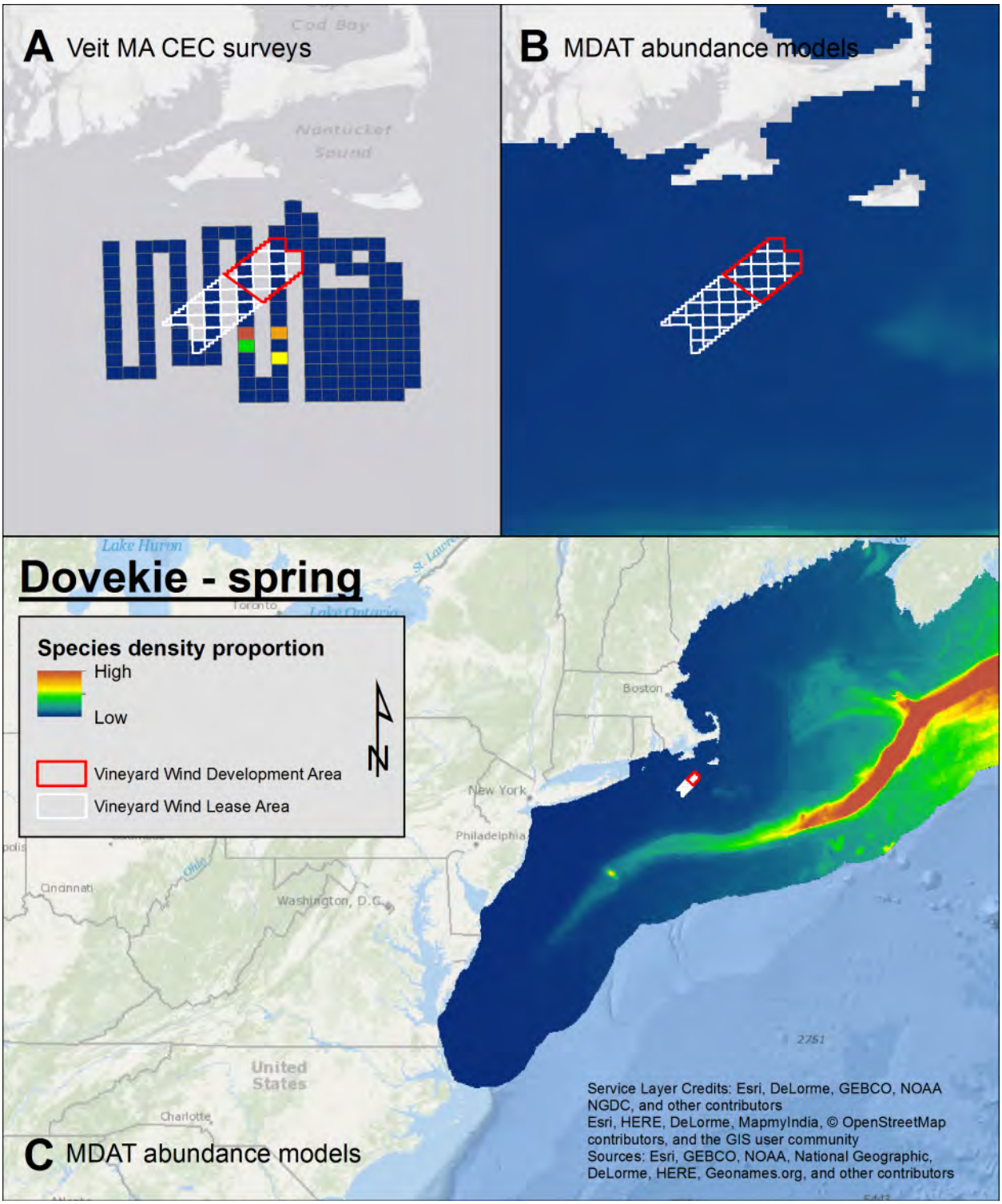

Figure 37. Spring Dovekie density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

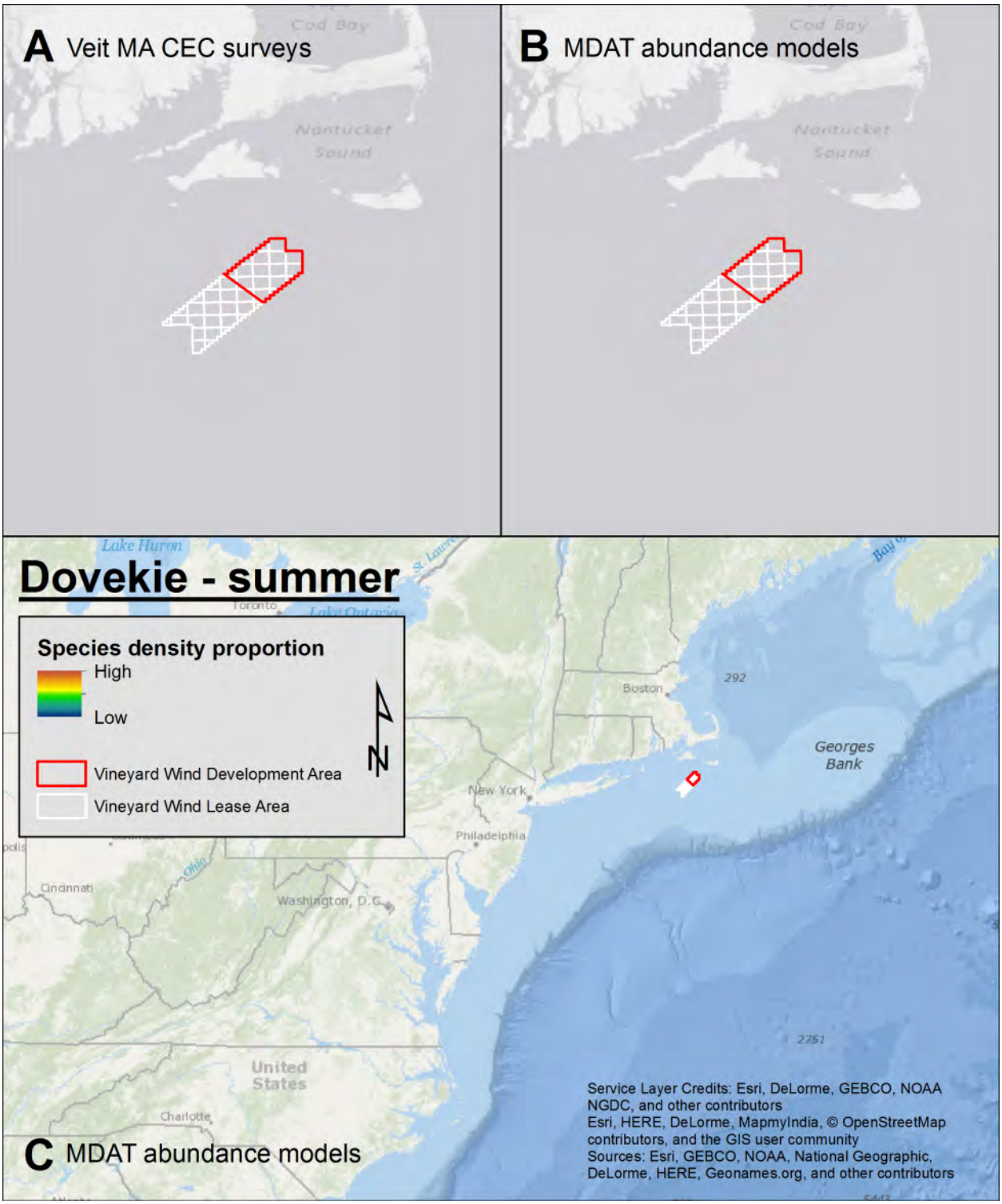

Figure 38. Summer Dovekie density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

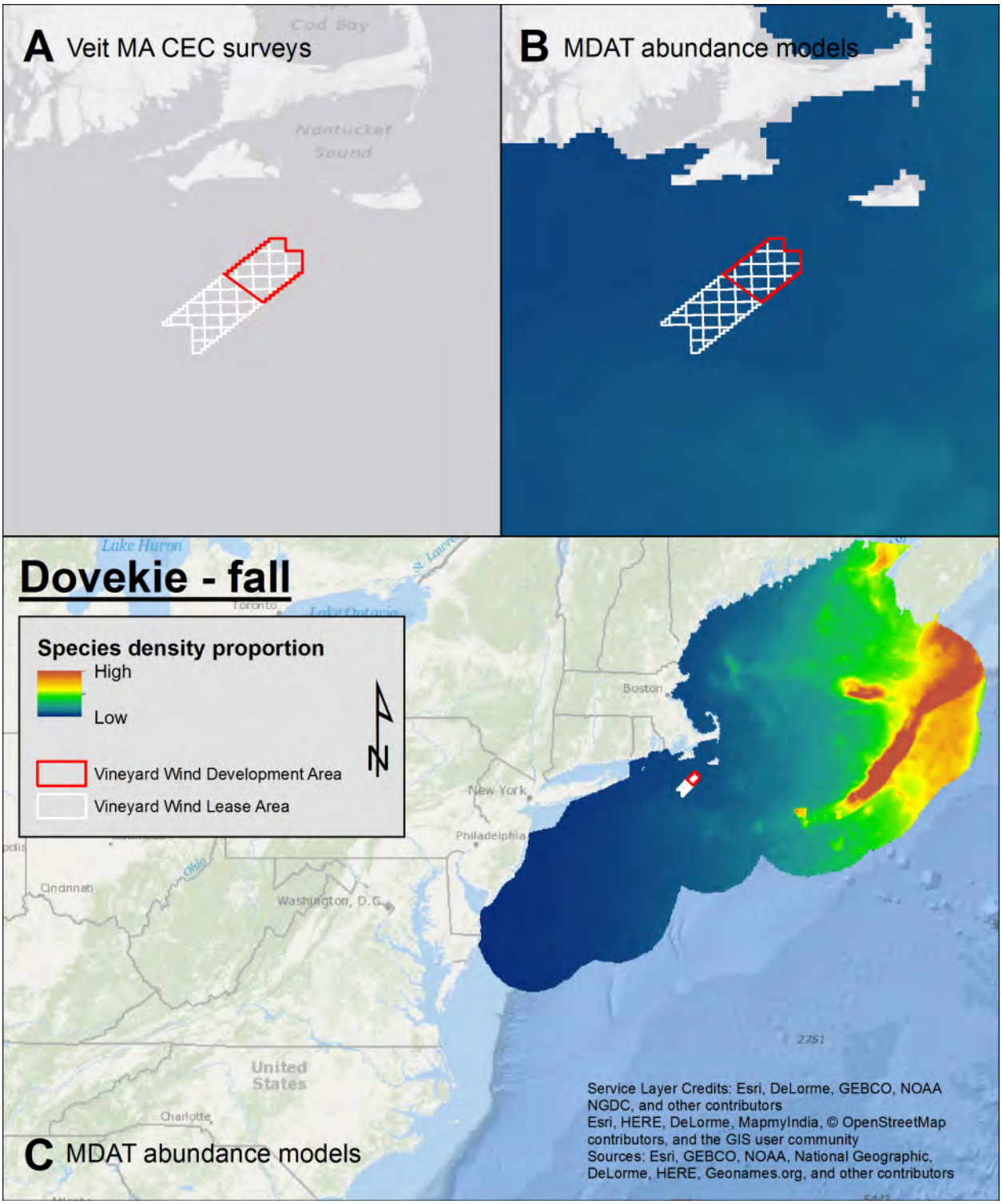

Figure 39. Fall Dovekie density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

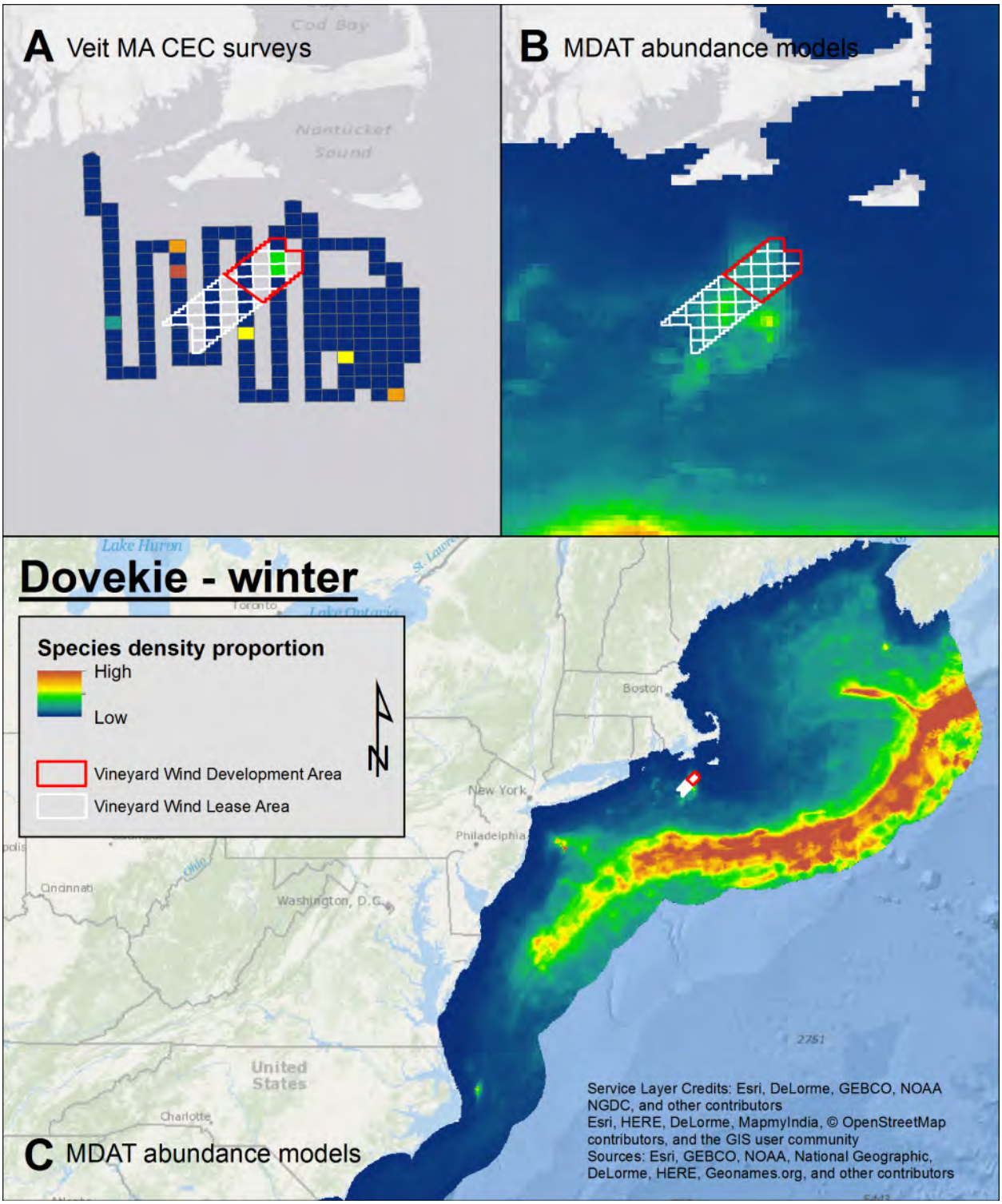

Figure 40. Winter Dovekie density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

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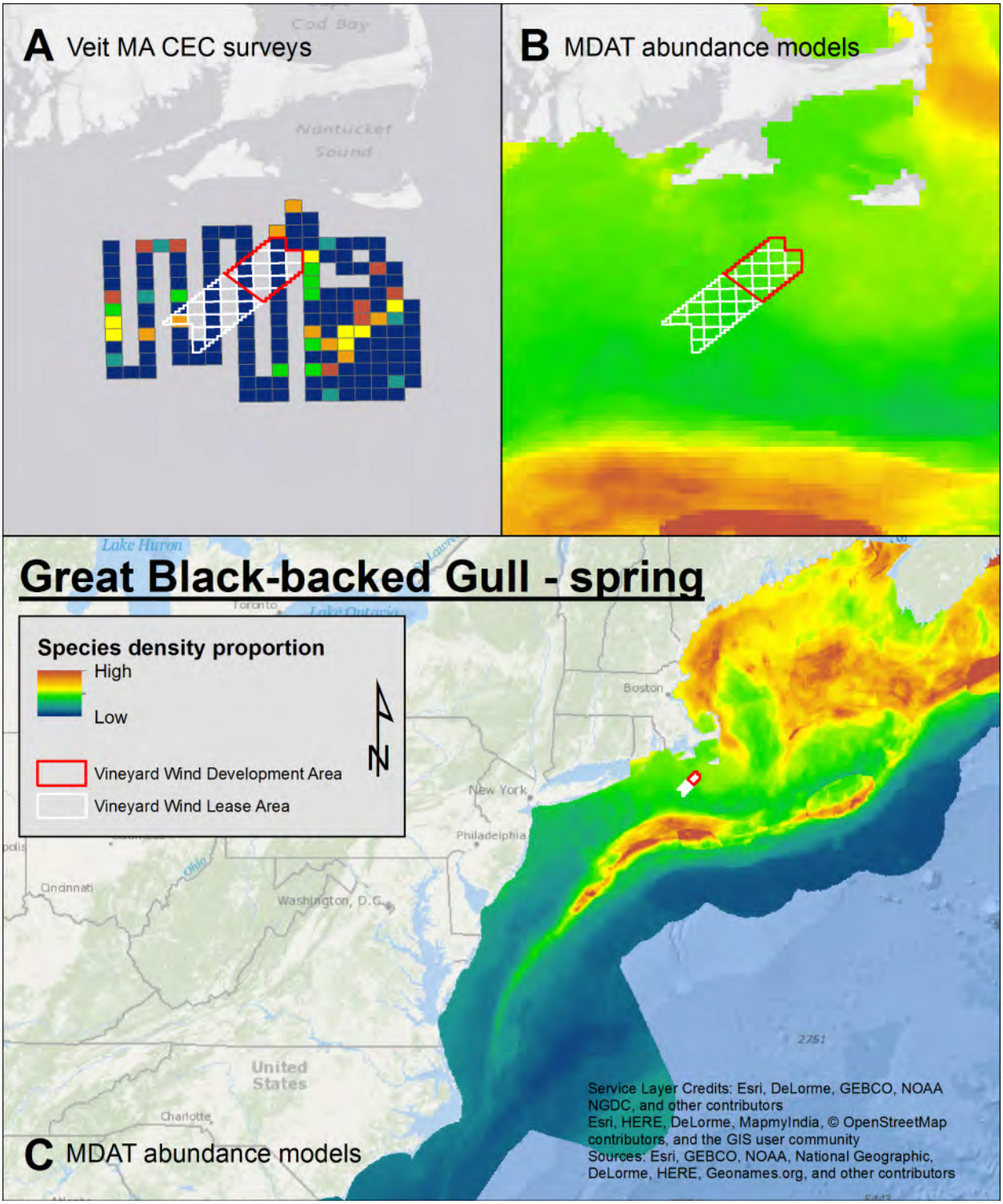

Figure 41. Spring Great Black-backed Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

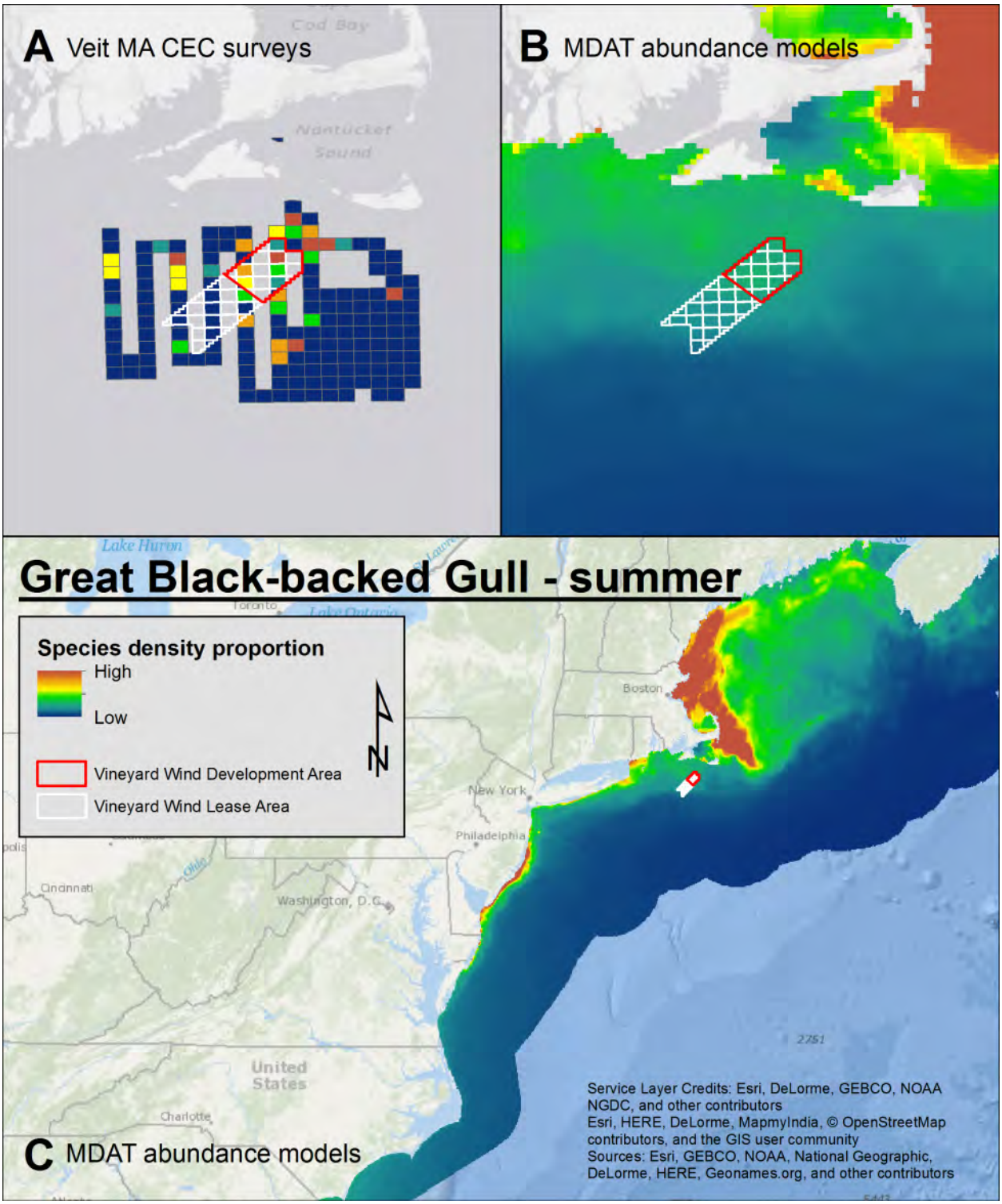

Figure 42. Summer Great Black-backed Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

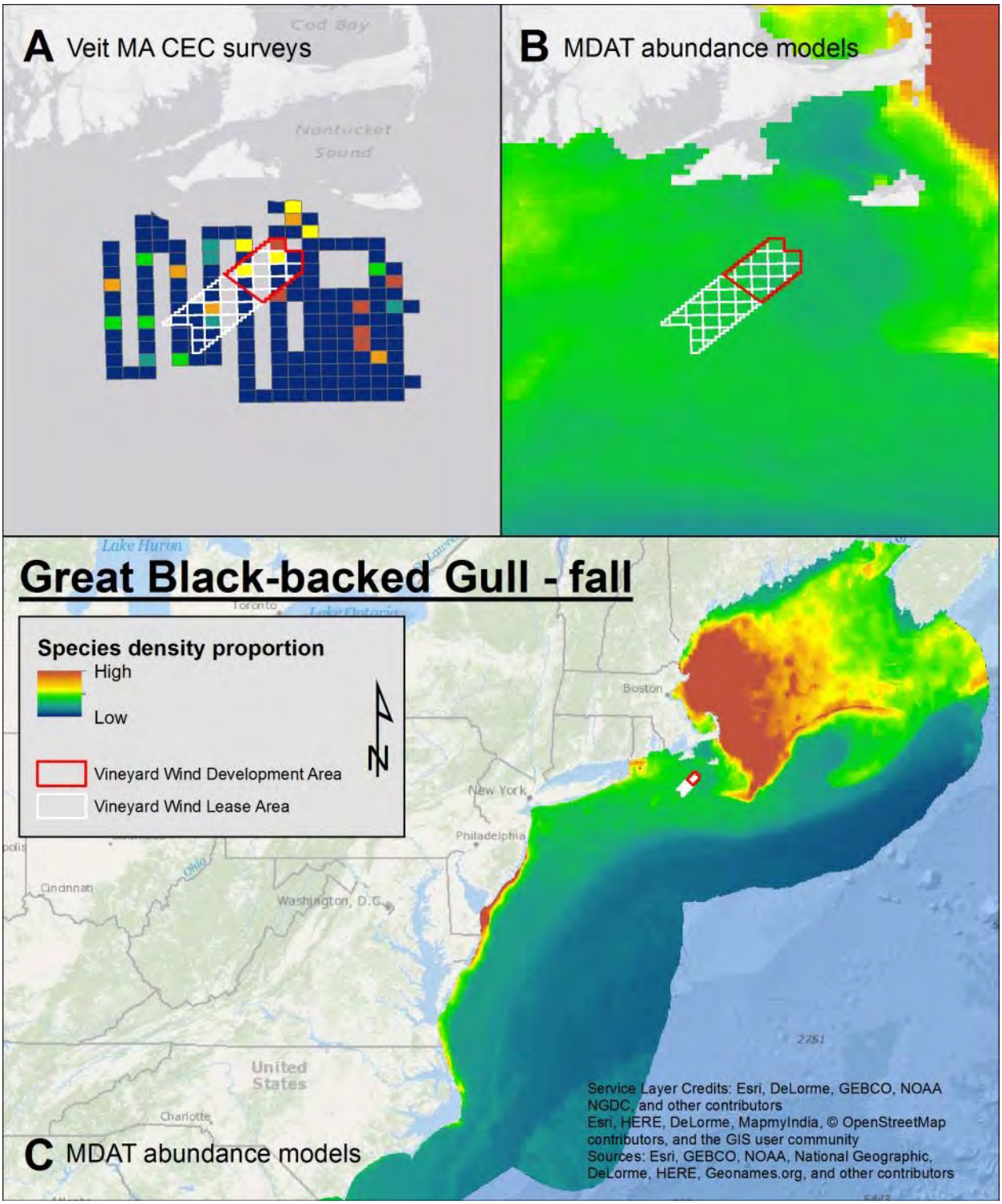

Figure 43. Fall Great Black-backed Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

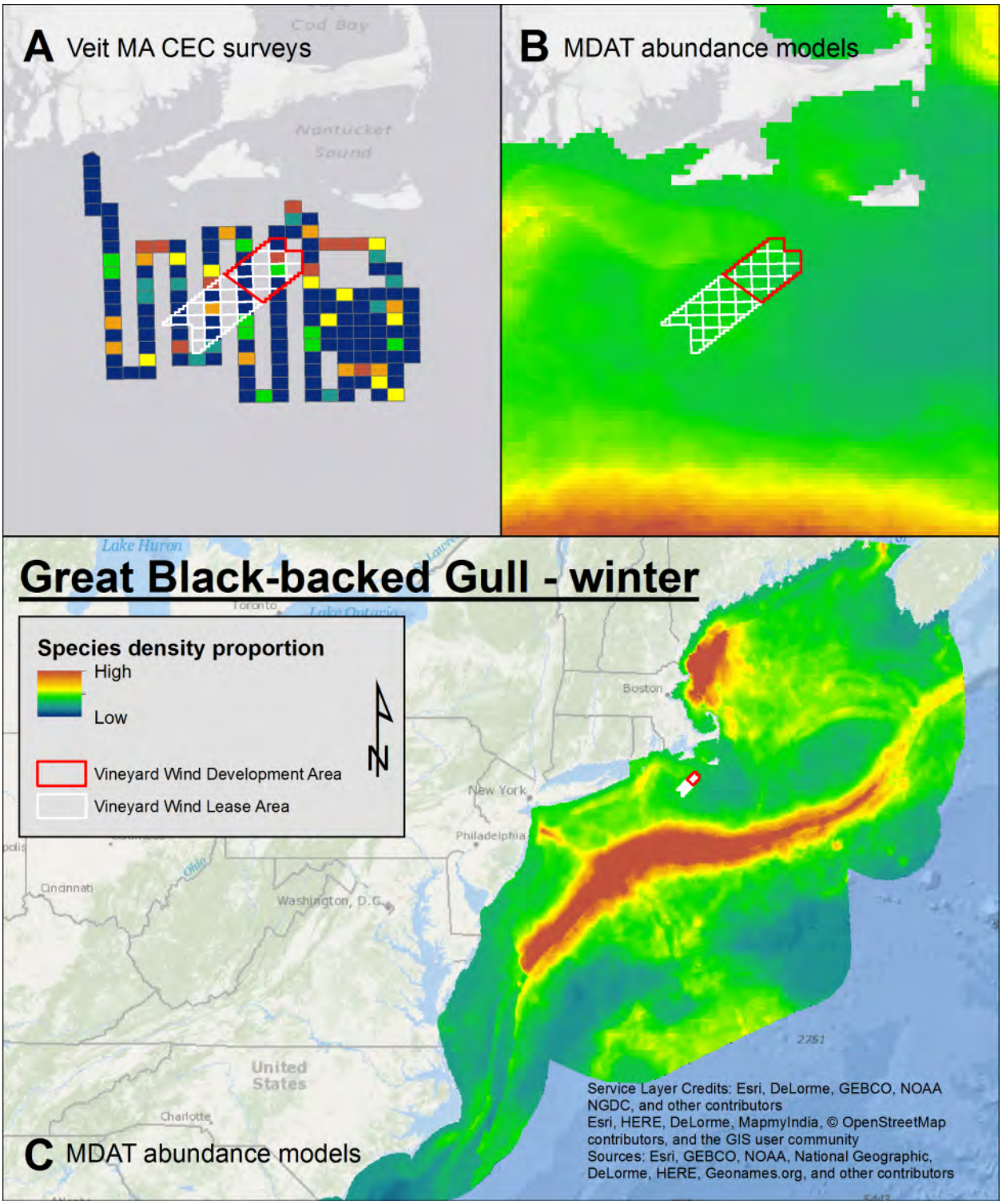

Figure 44. Winter Great Black-backed Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

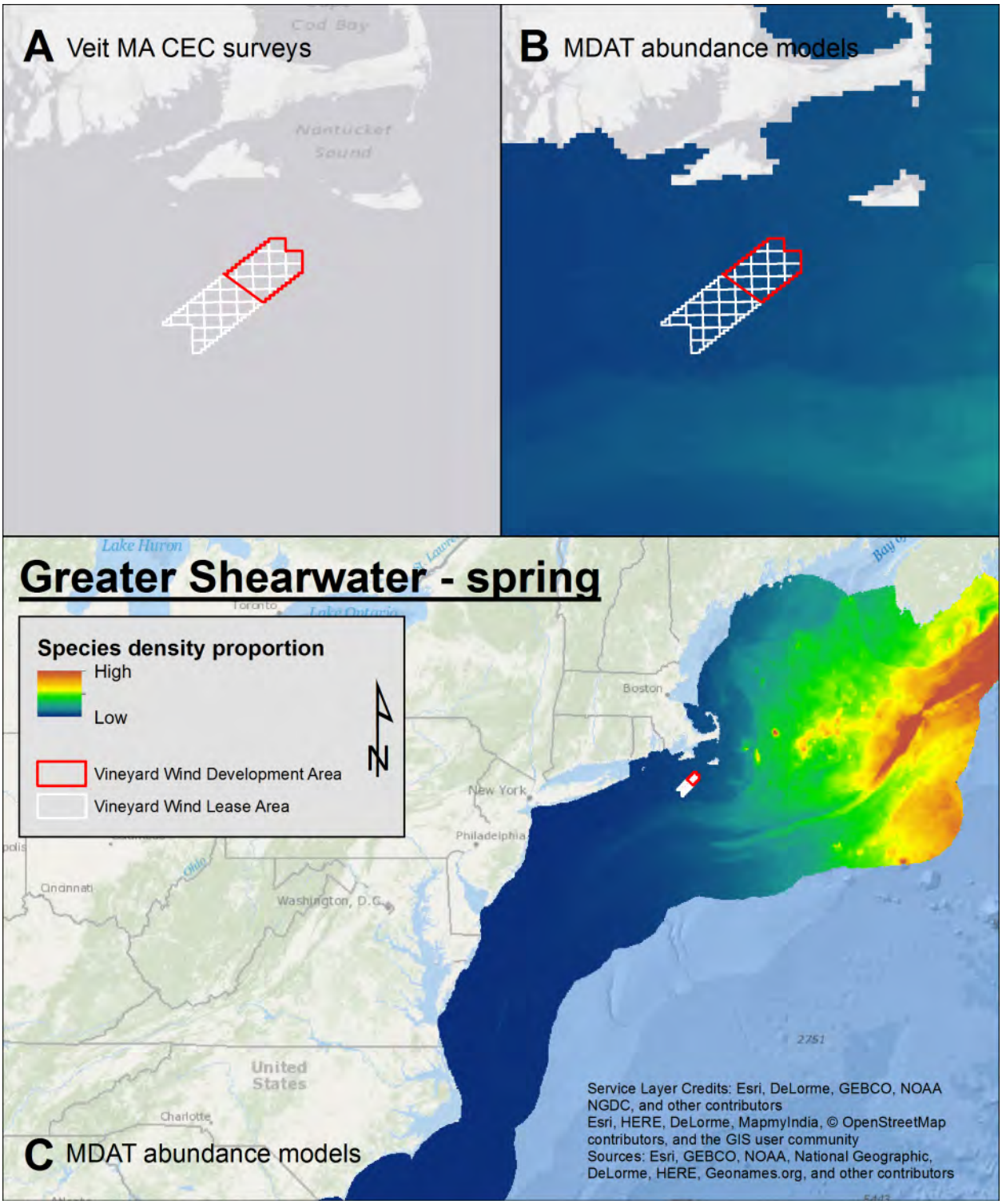

Figure 45. Spring Greater Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

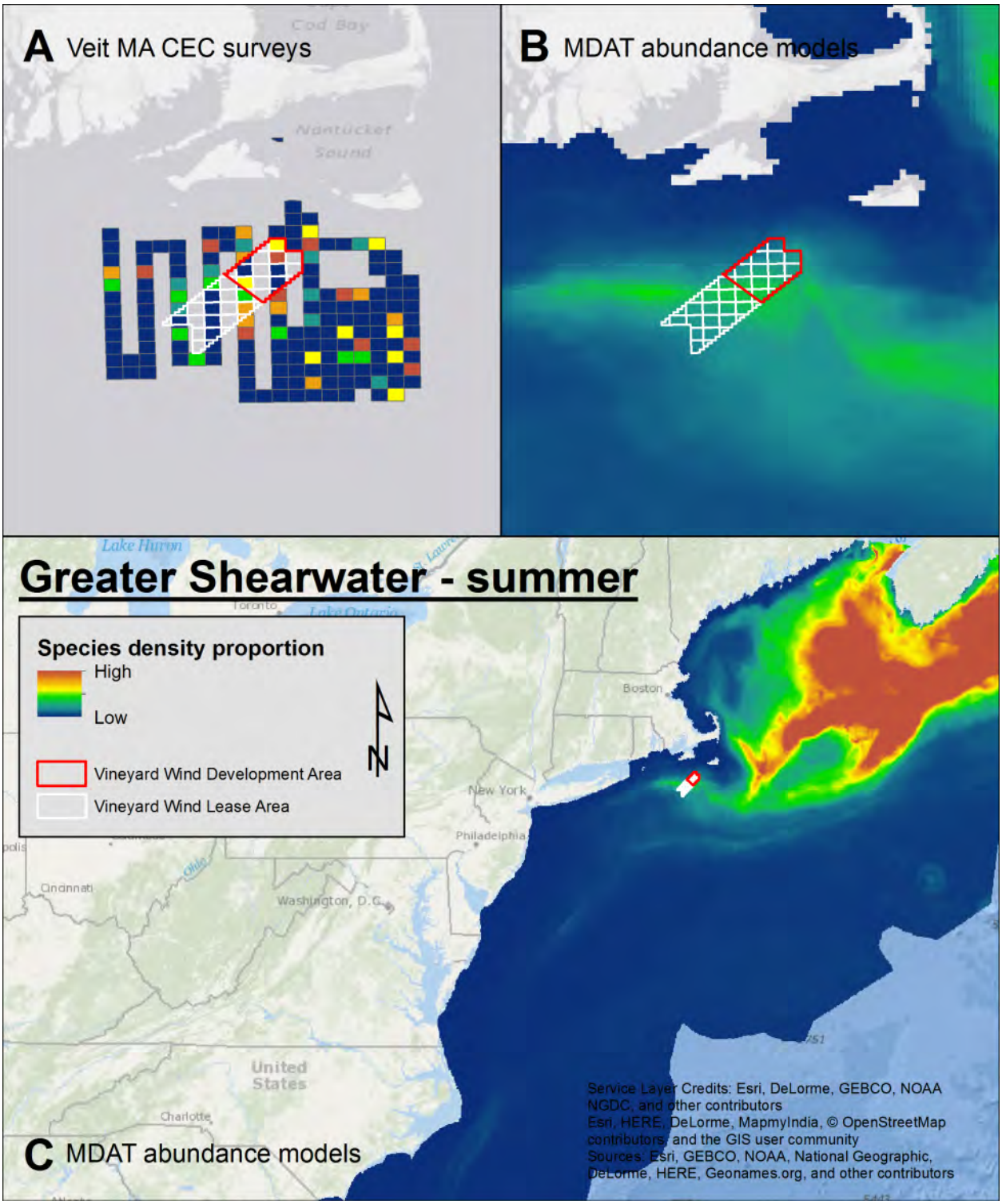

Figure 46. Summer Greater Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

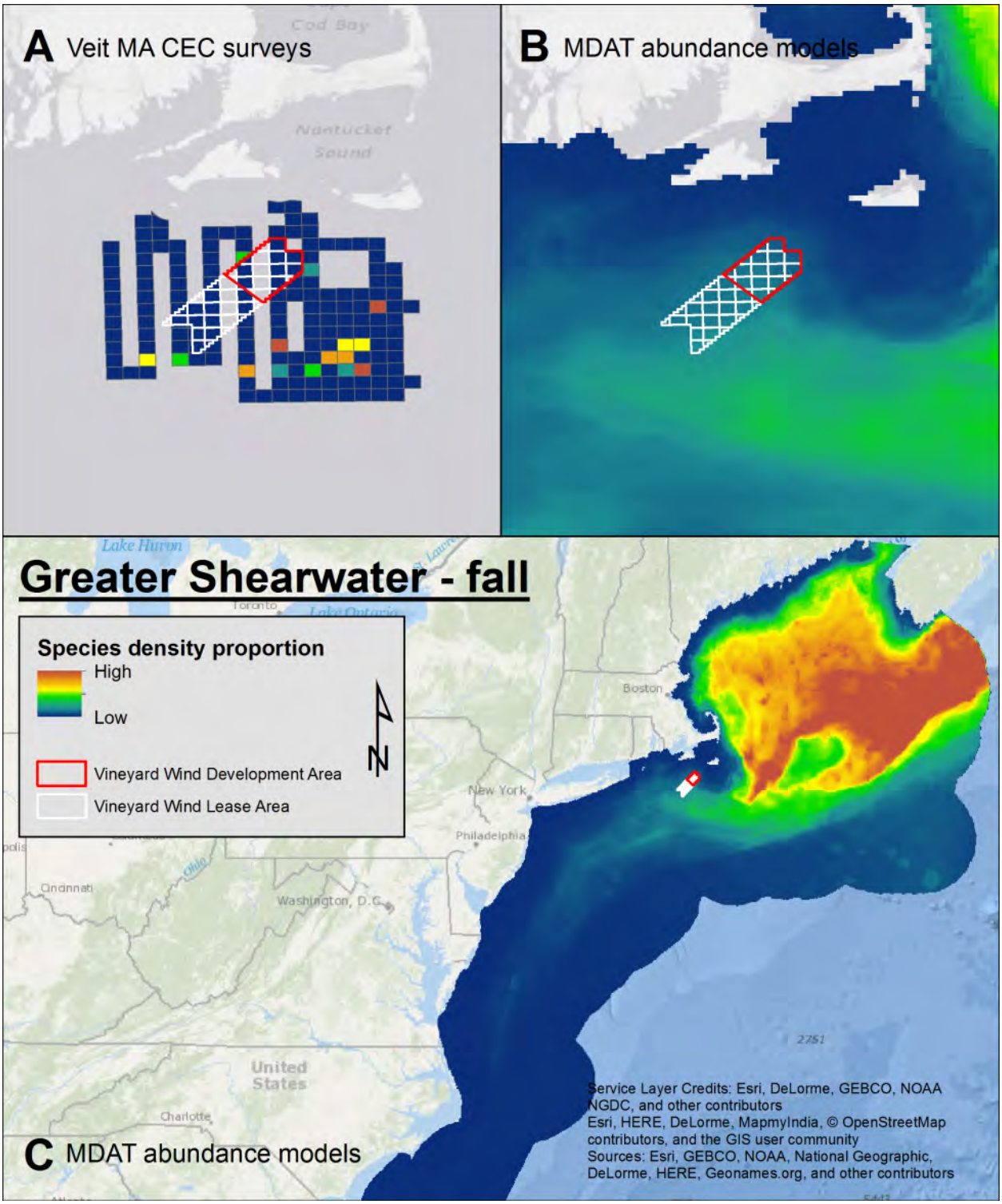

Figure 47. Fall Greater Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

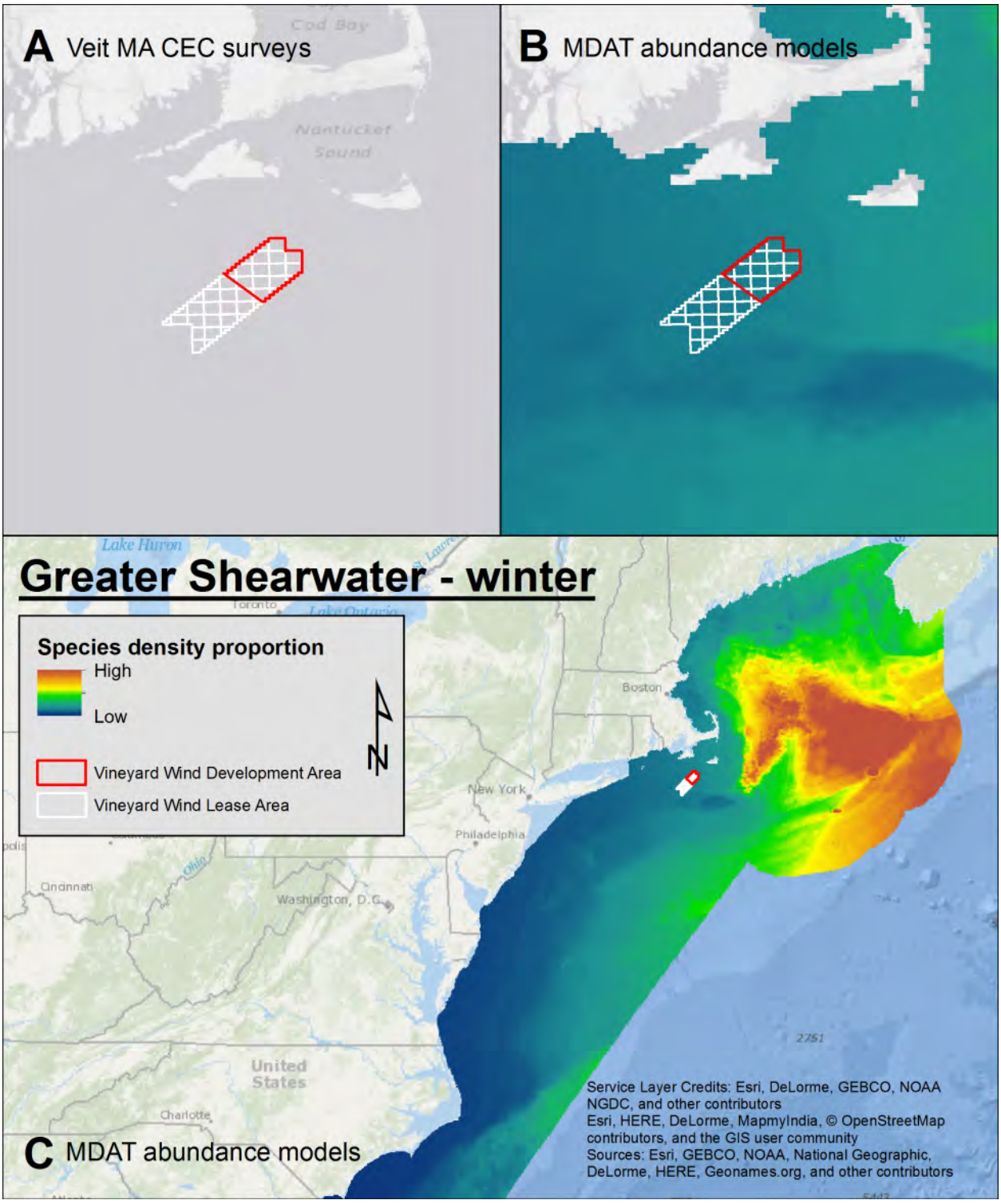

Figure 48. Winter Greater Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

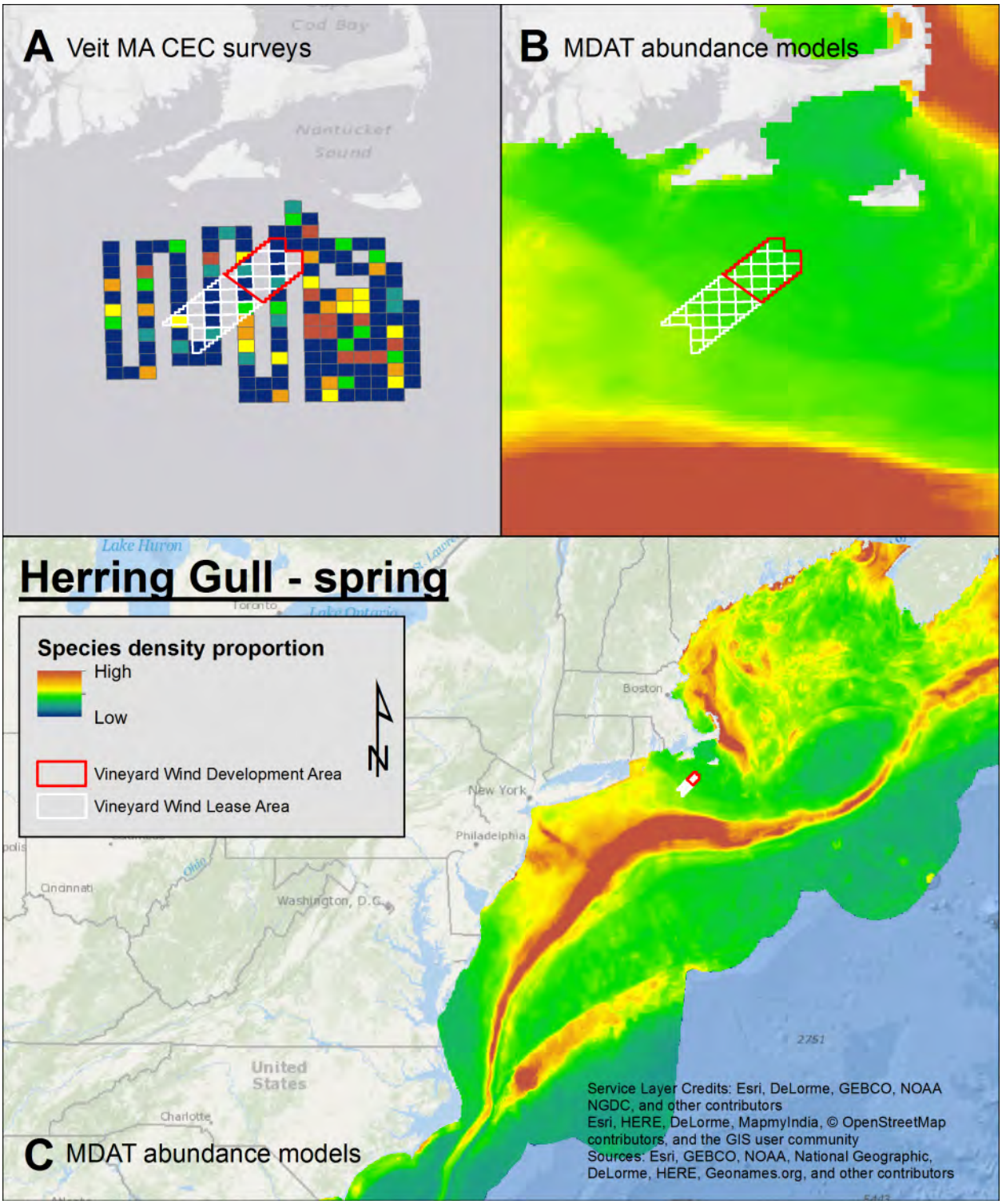

Figure 49. Spring Herring Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

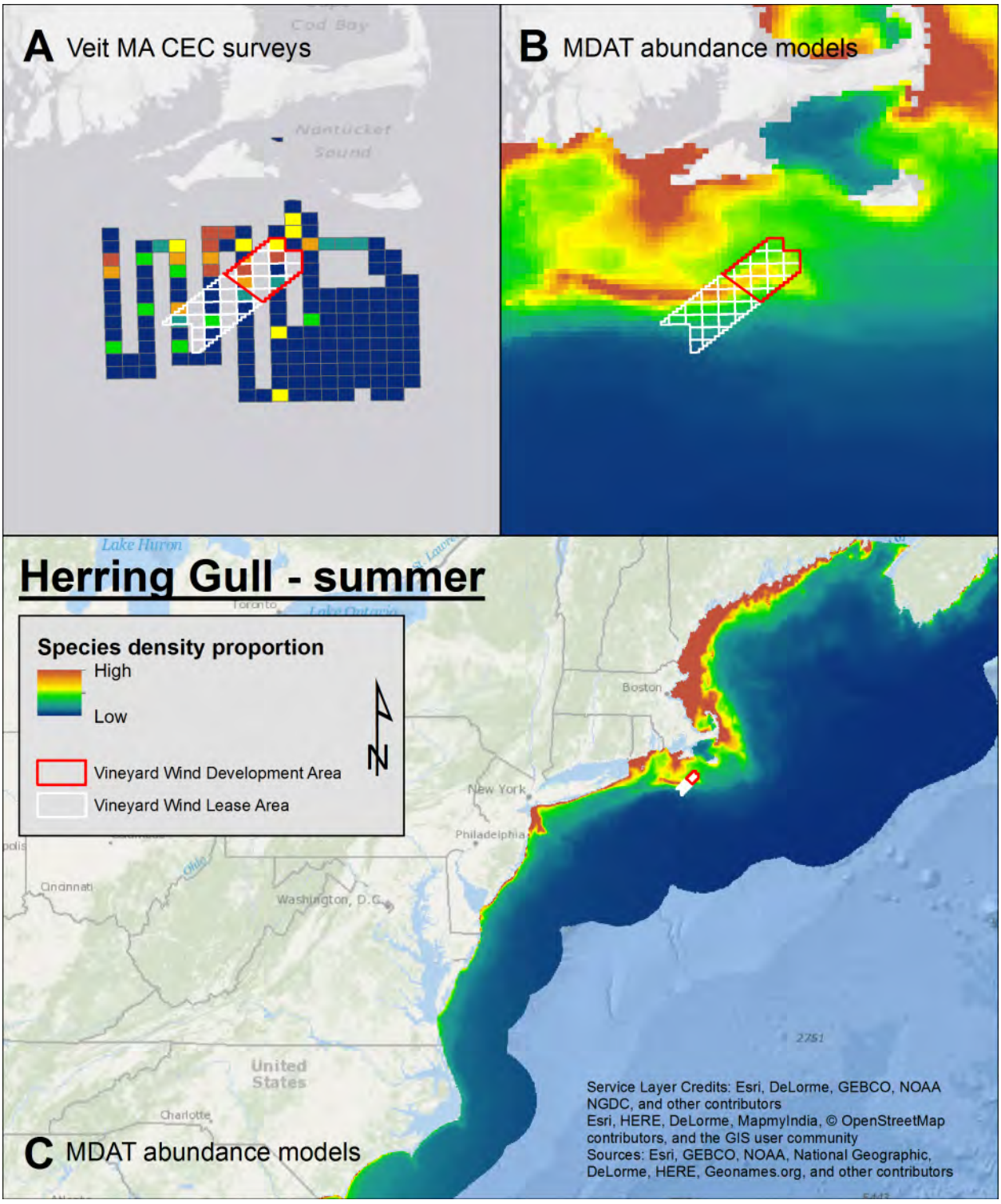

Figure 50. Summer Herring Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

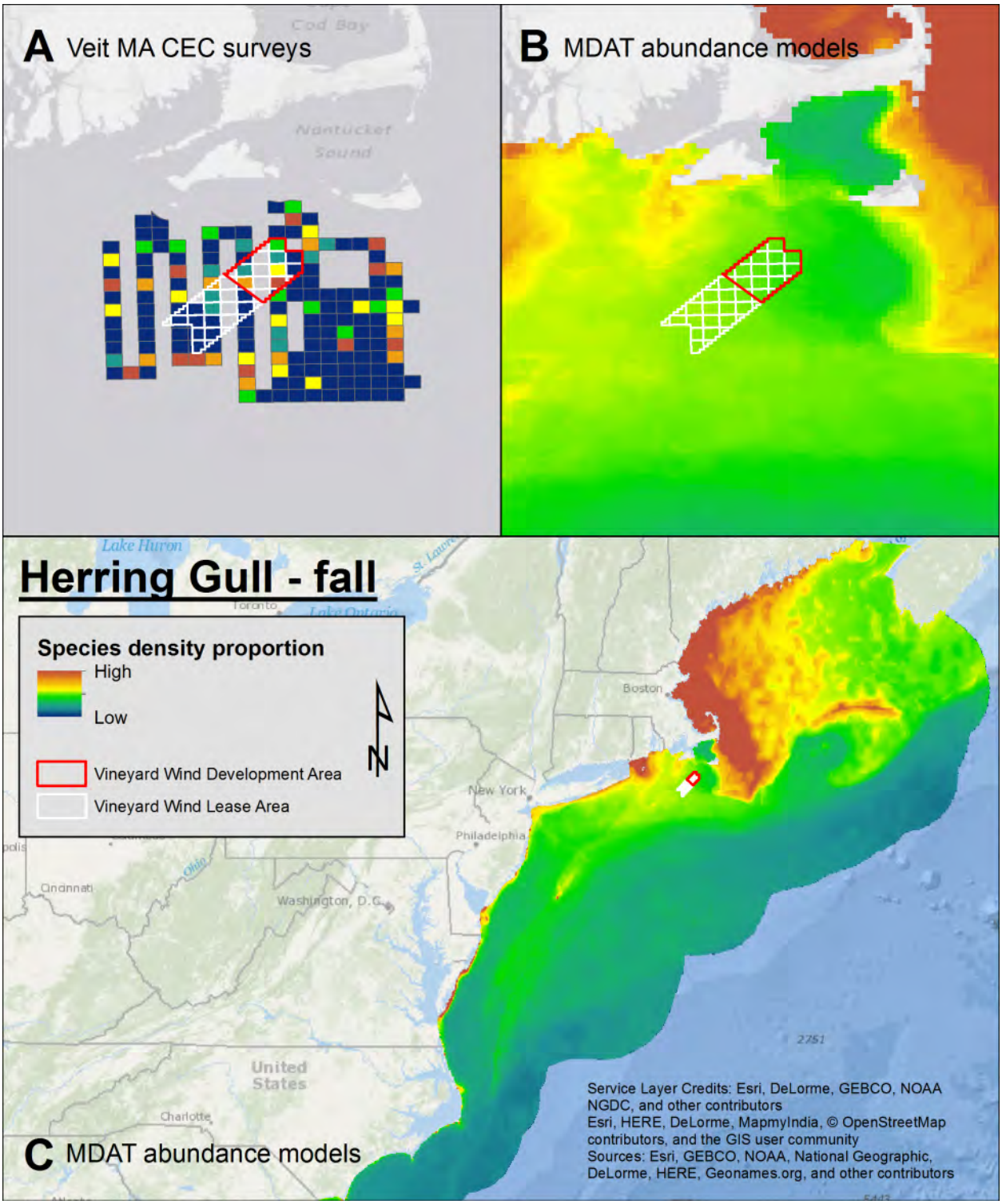

Figure 51. Fall Herring Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

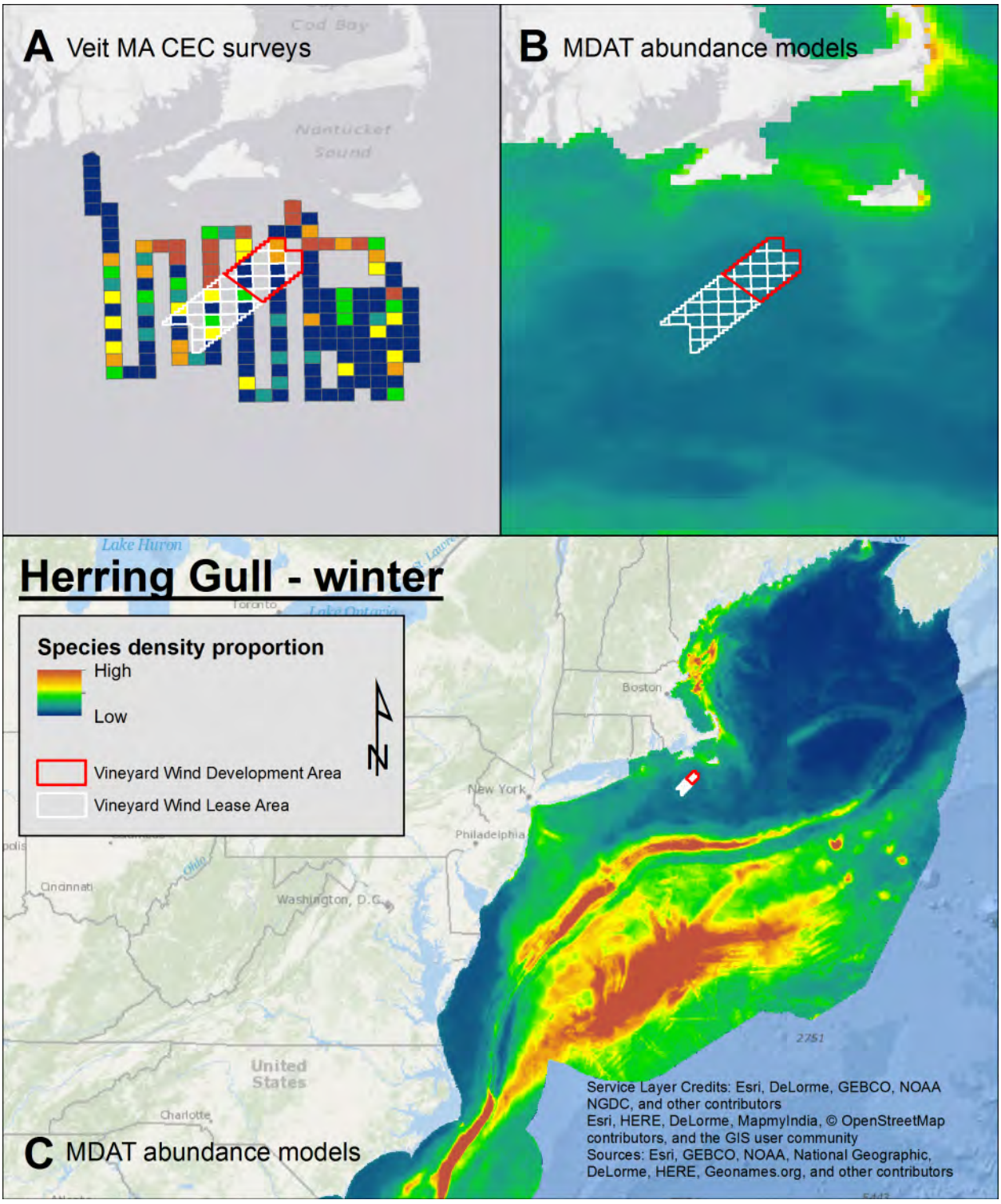

Figure 52. Winter Herring Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

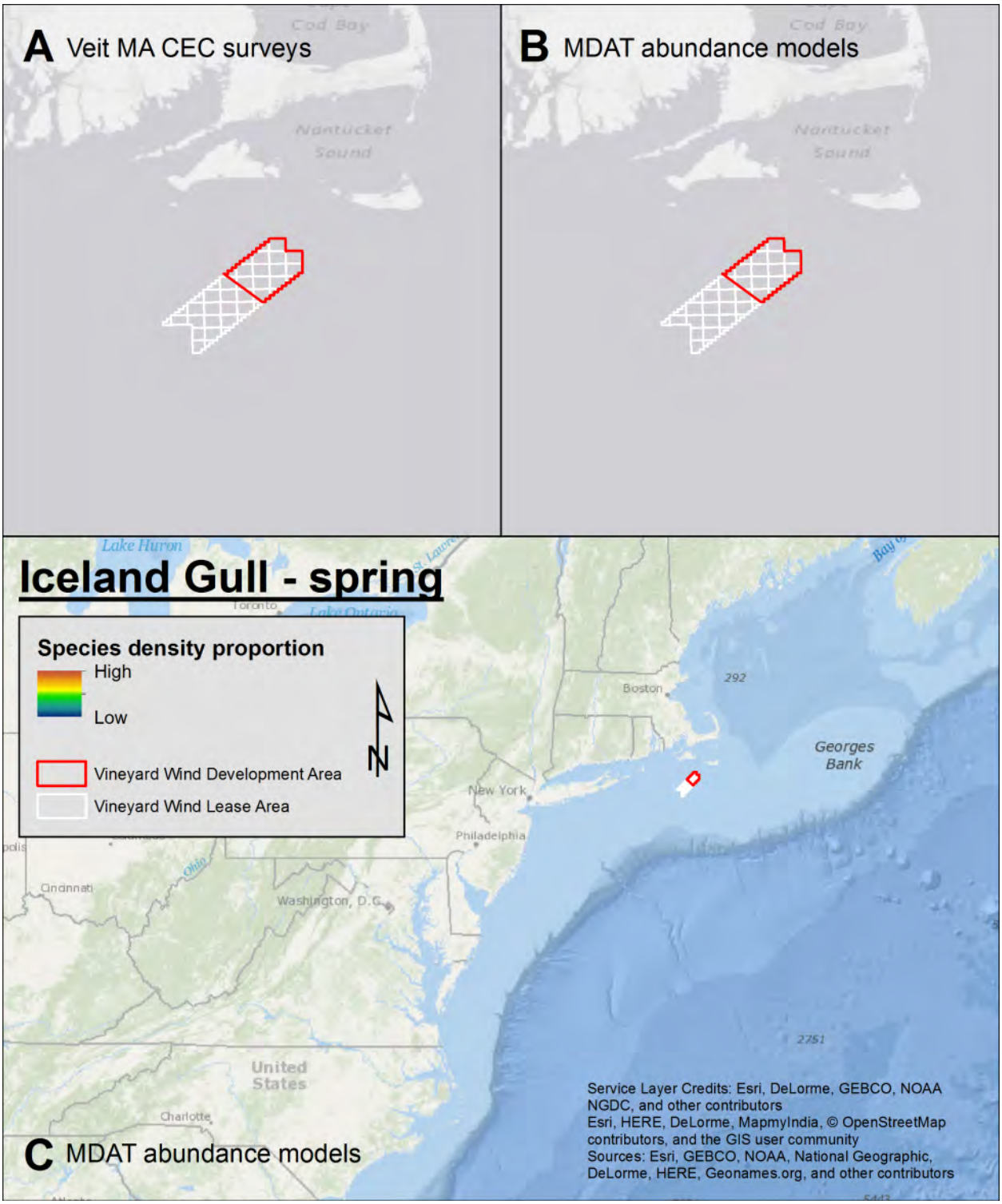

Figure 53. Spring Iceland Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

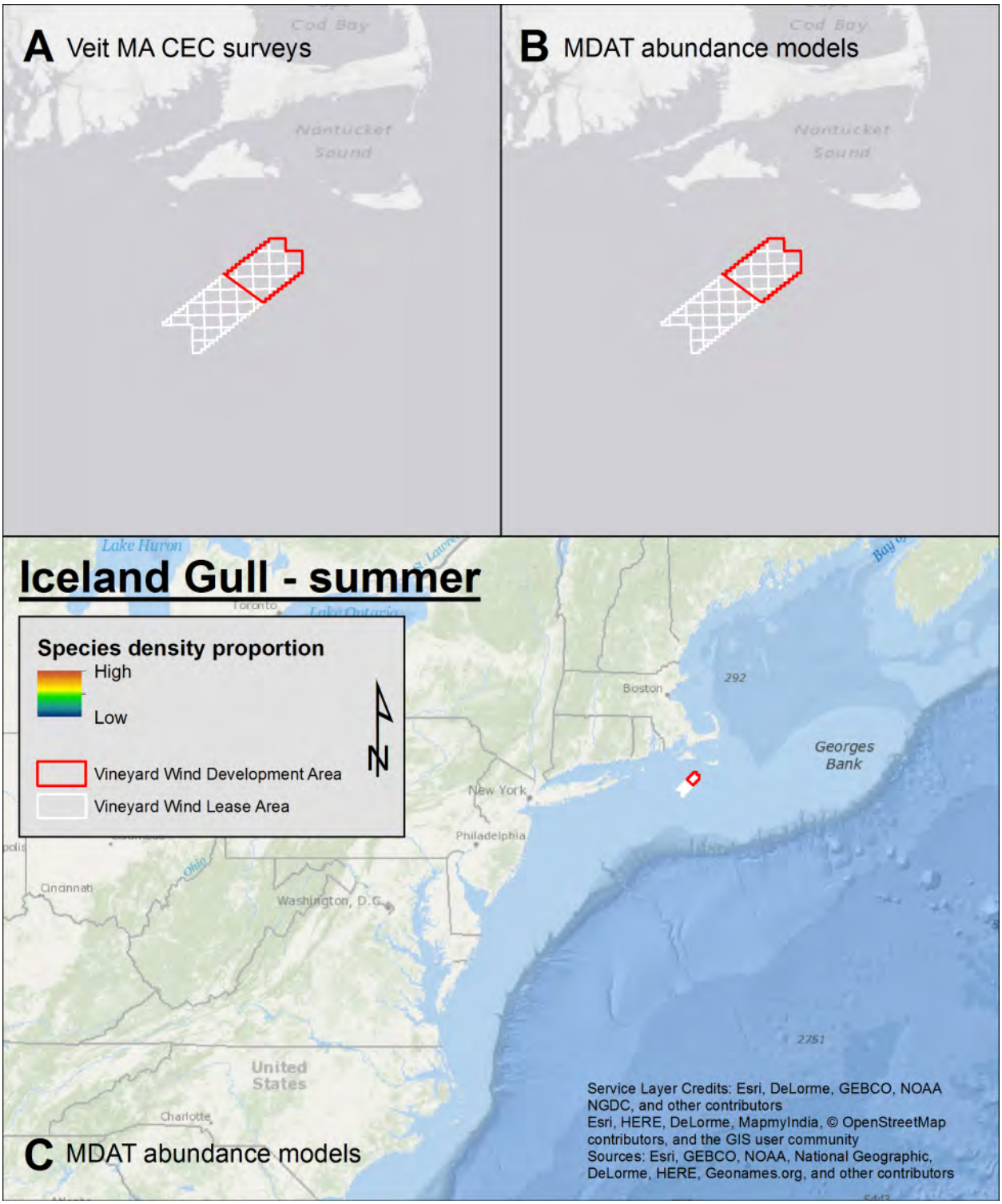

Figure 54. Summer Iceland Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

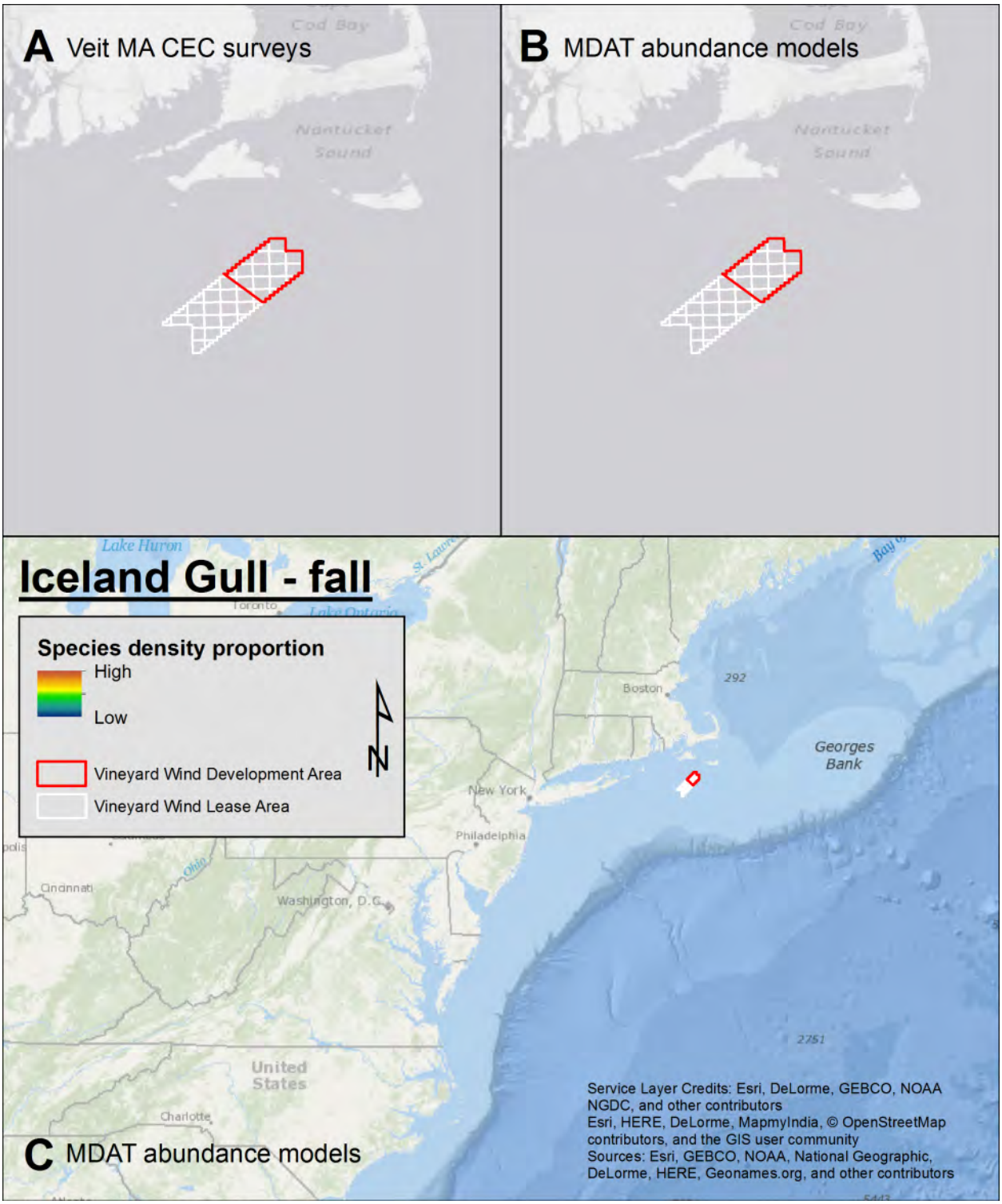

Figure 55. Fall Iceland Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

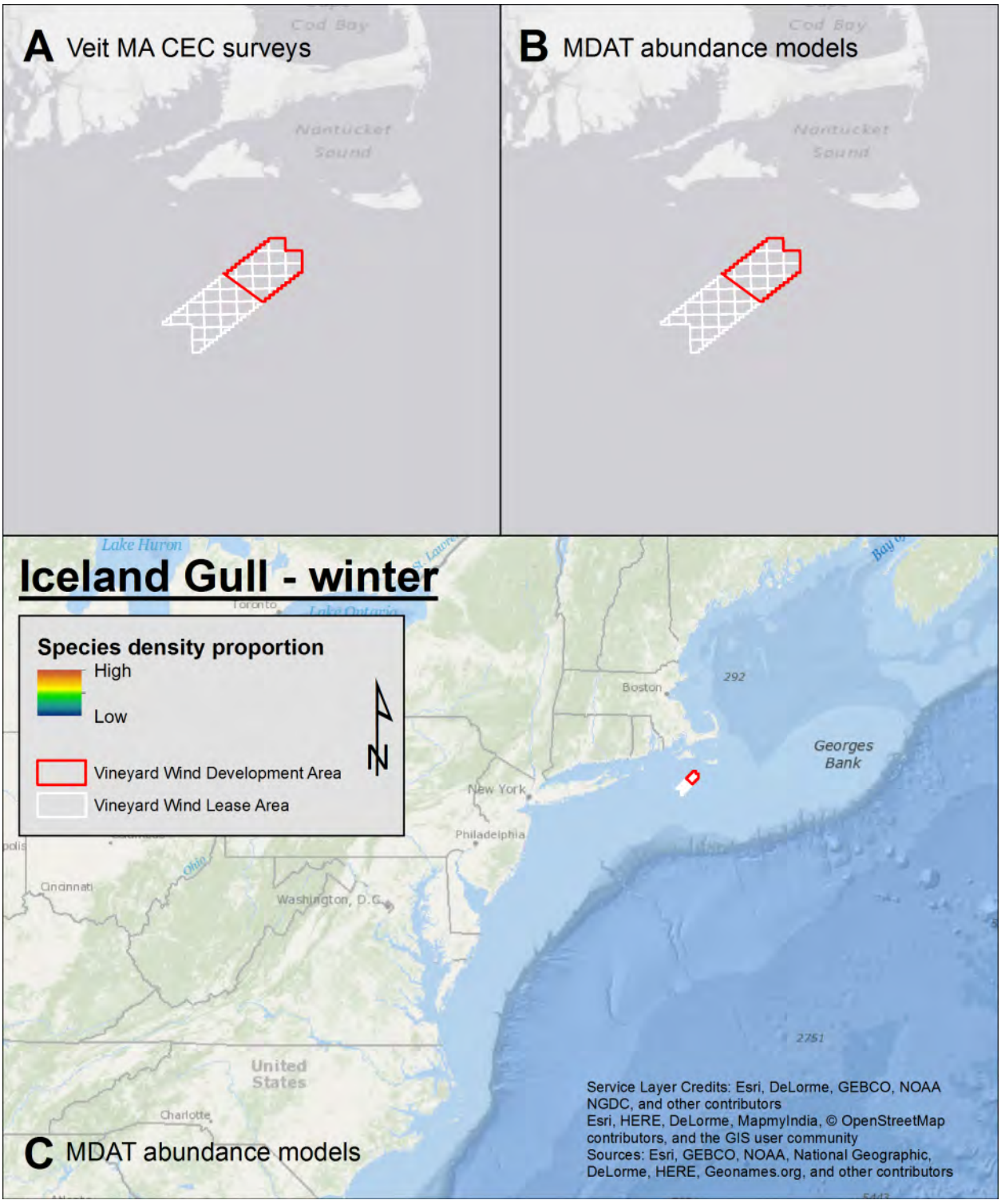

Figure 56. Winter Iceland Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

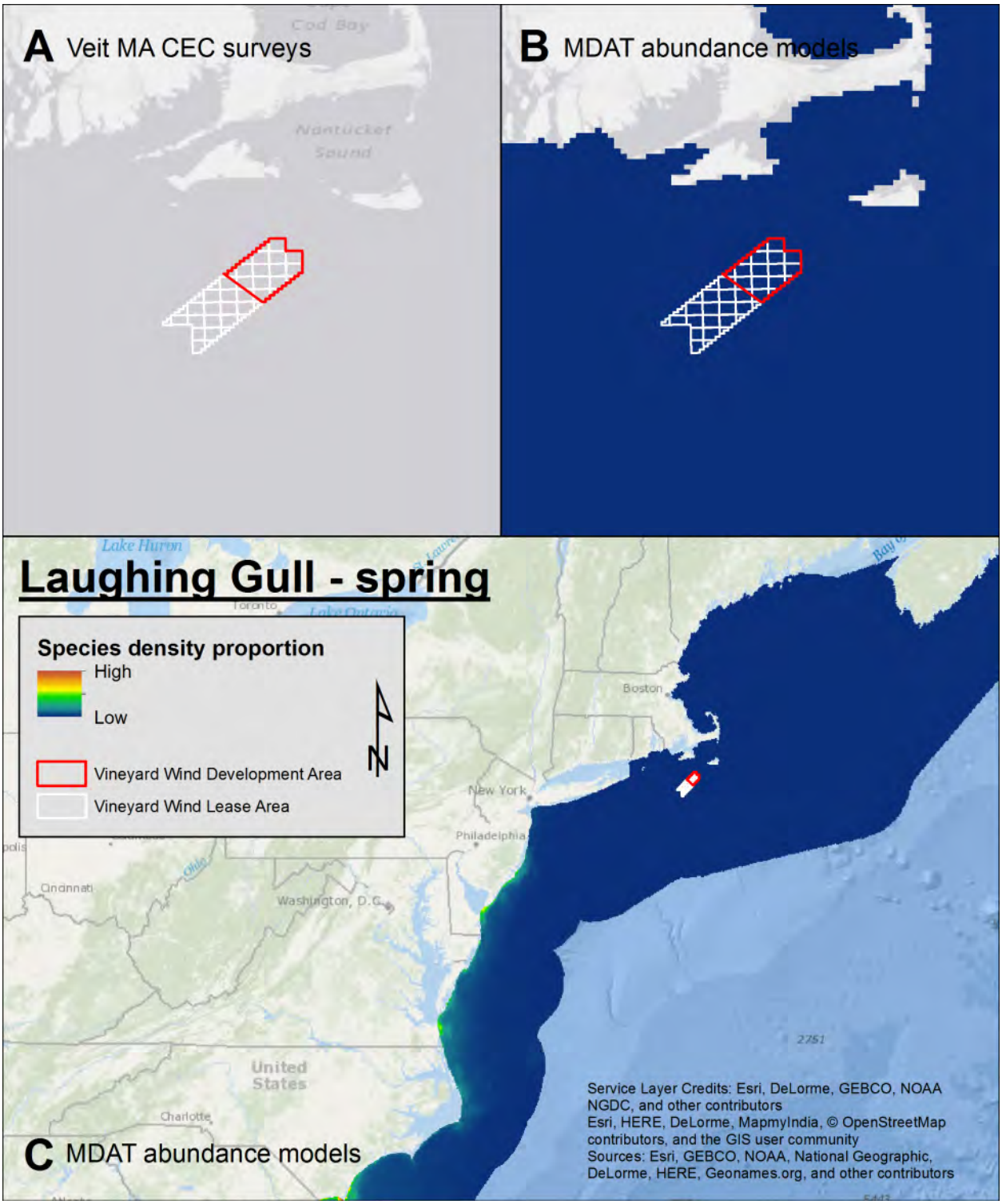

Figure 57. Spring Laughing Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

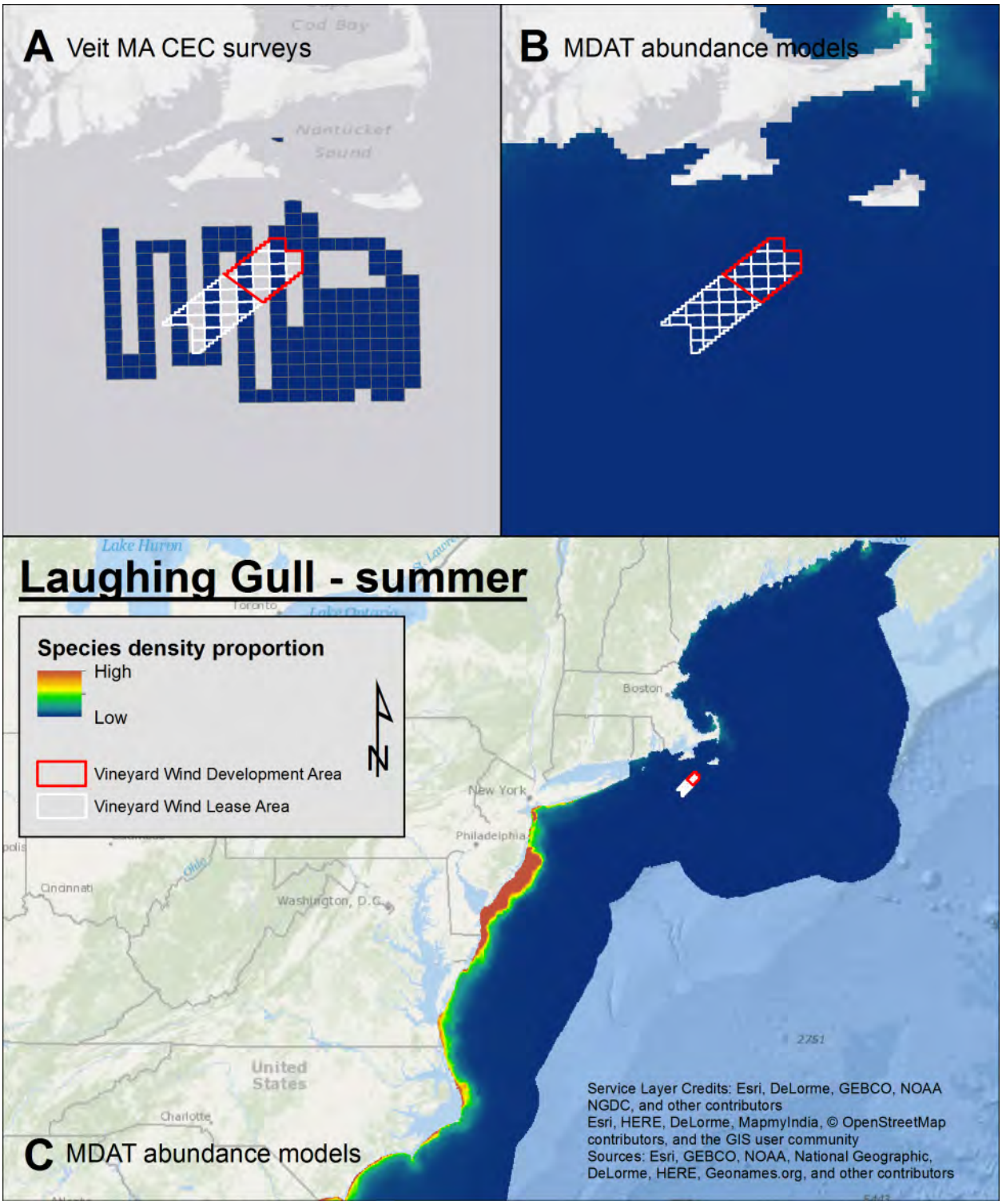

Figure 58. Summer Laughing Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

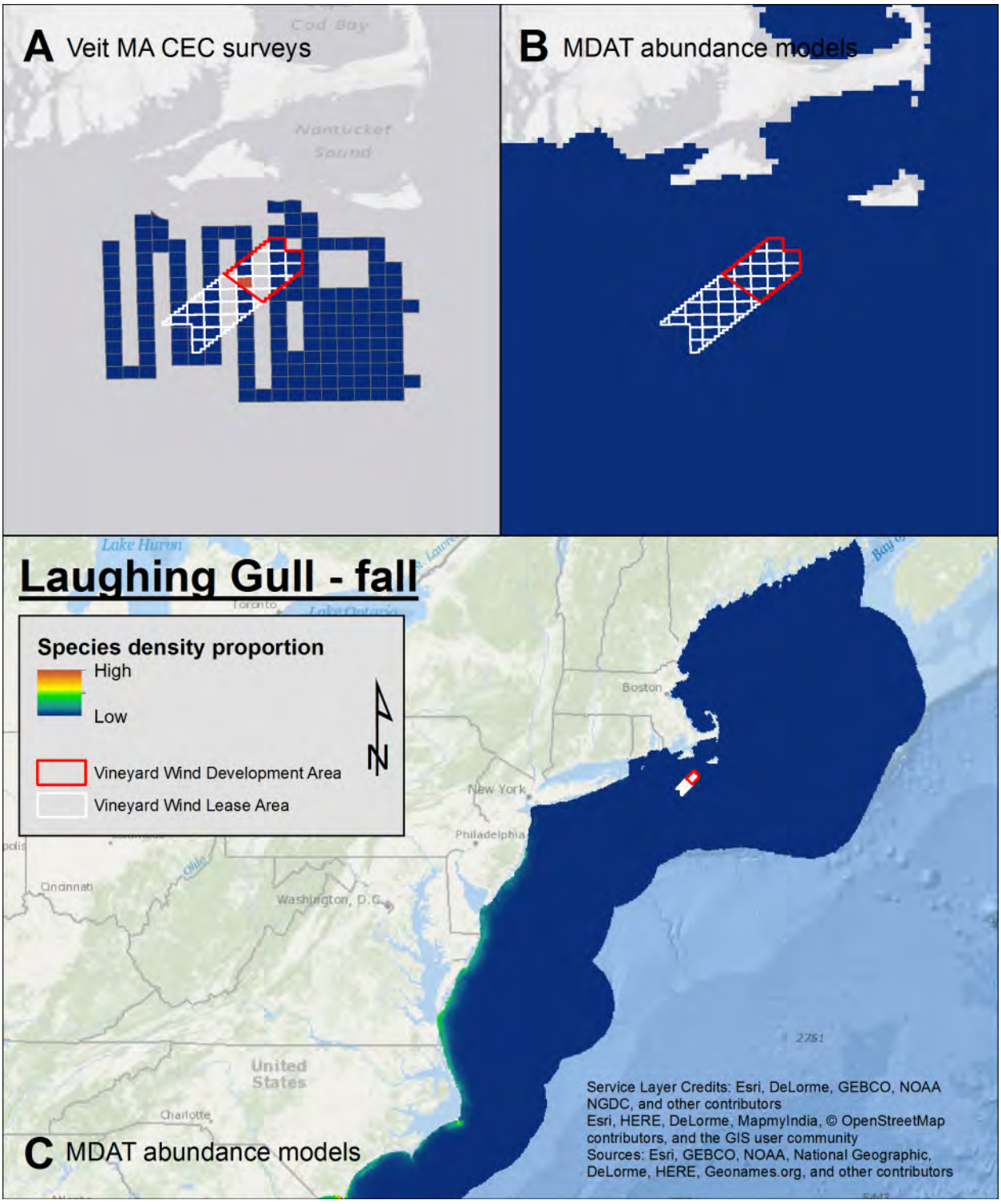

Figure 59. Fall Laughing Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

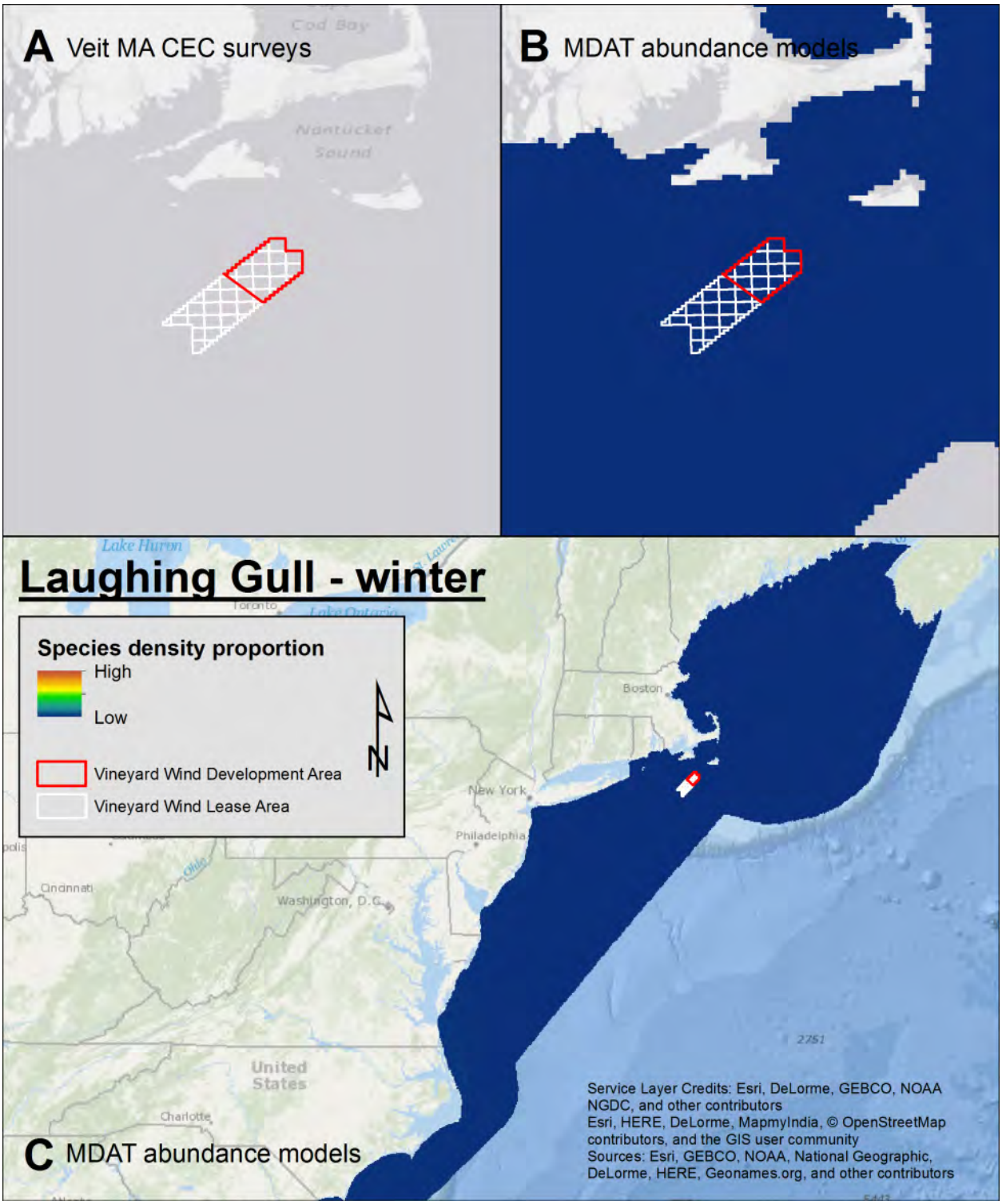

Figure 60. Winter Laughing Gull density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

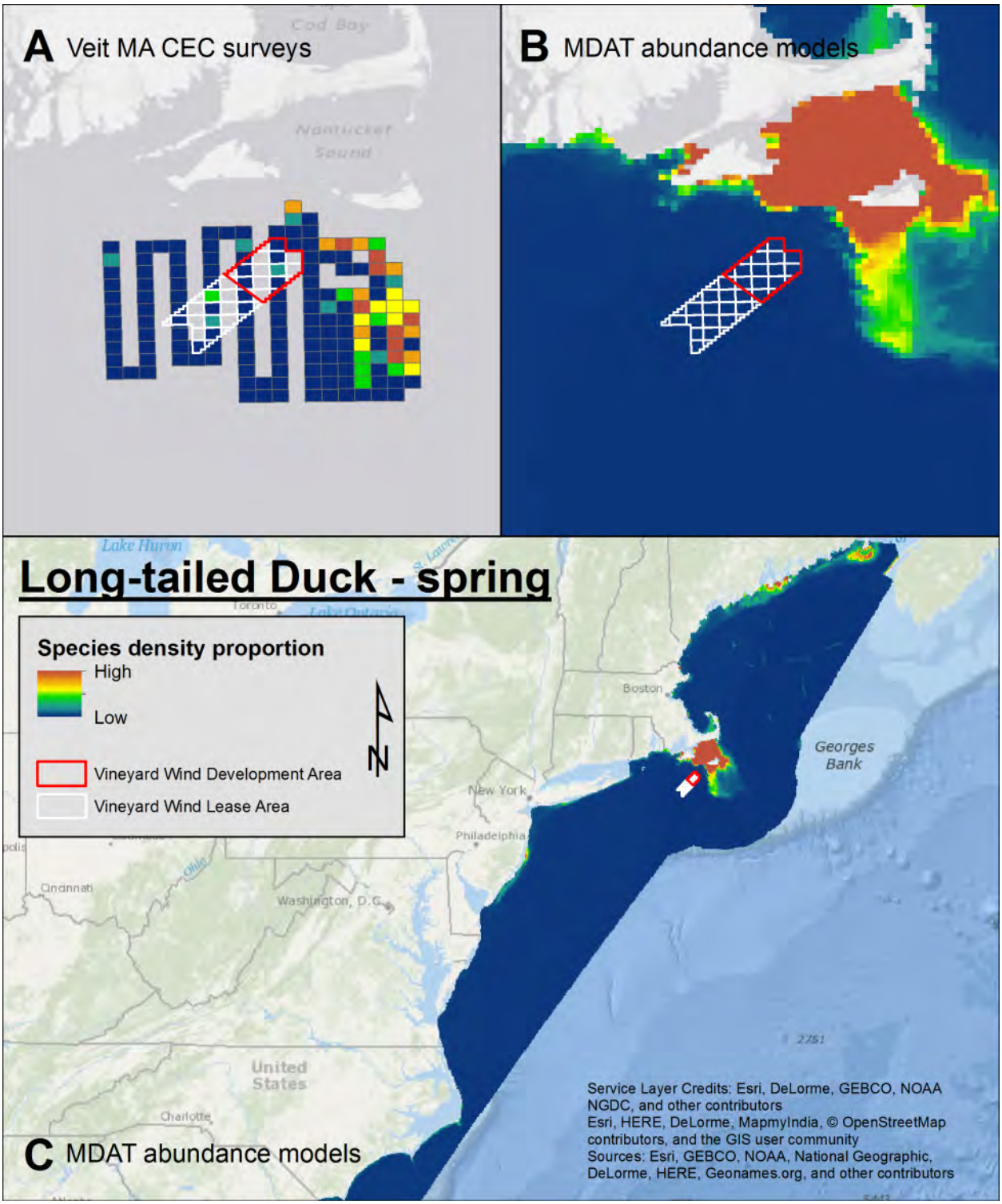

Figure 61. Spring Long-tailed Duck density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

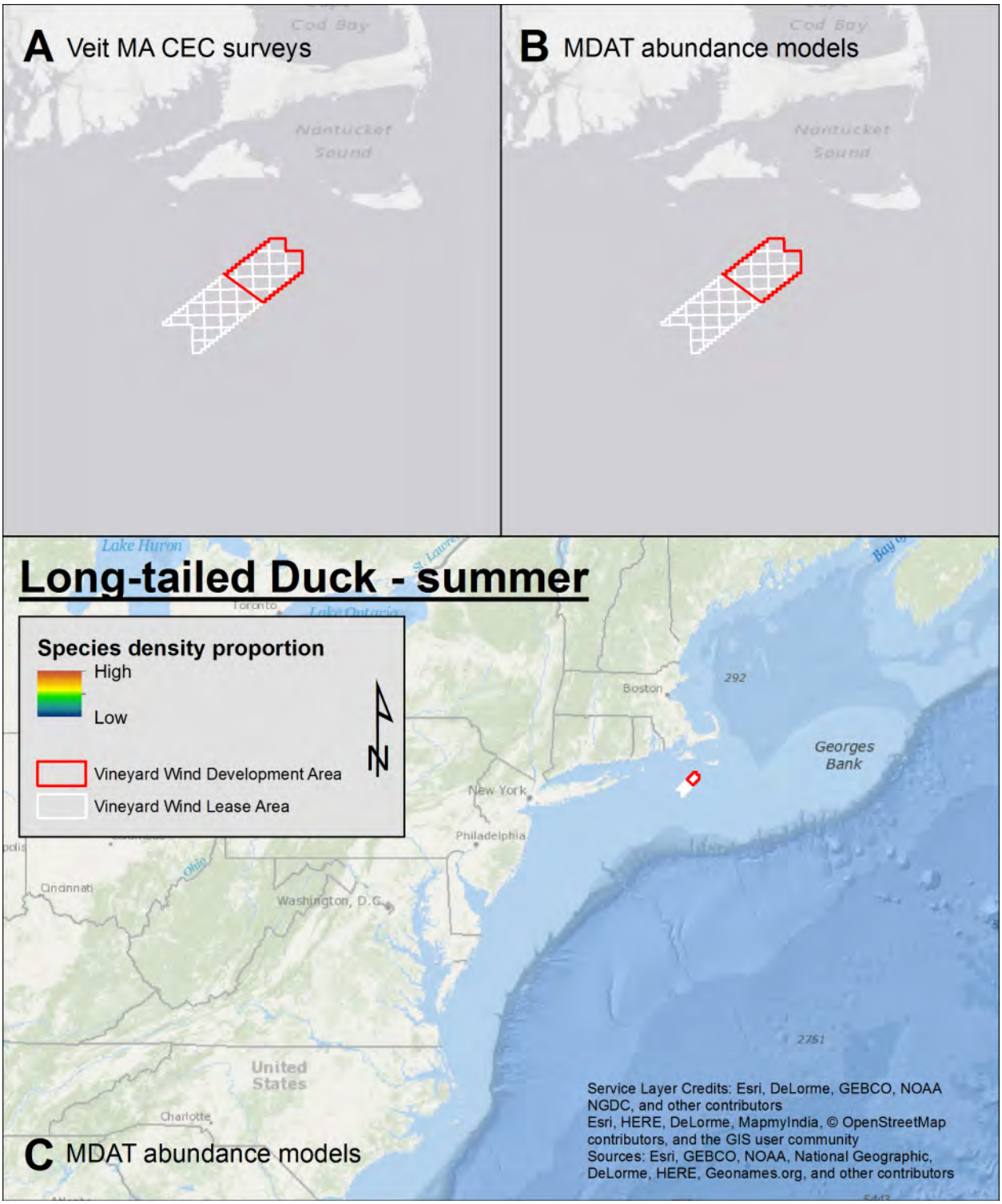

Figure 62. Summer Long-tailed Duck density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

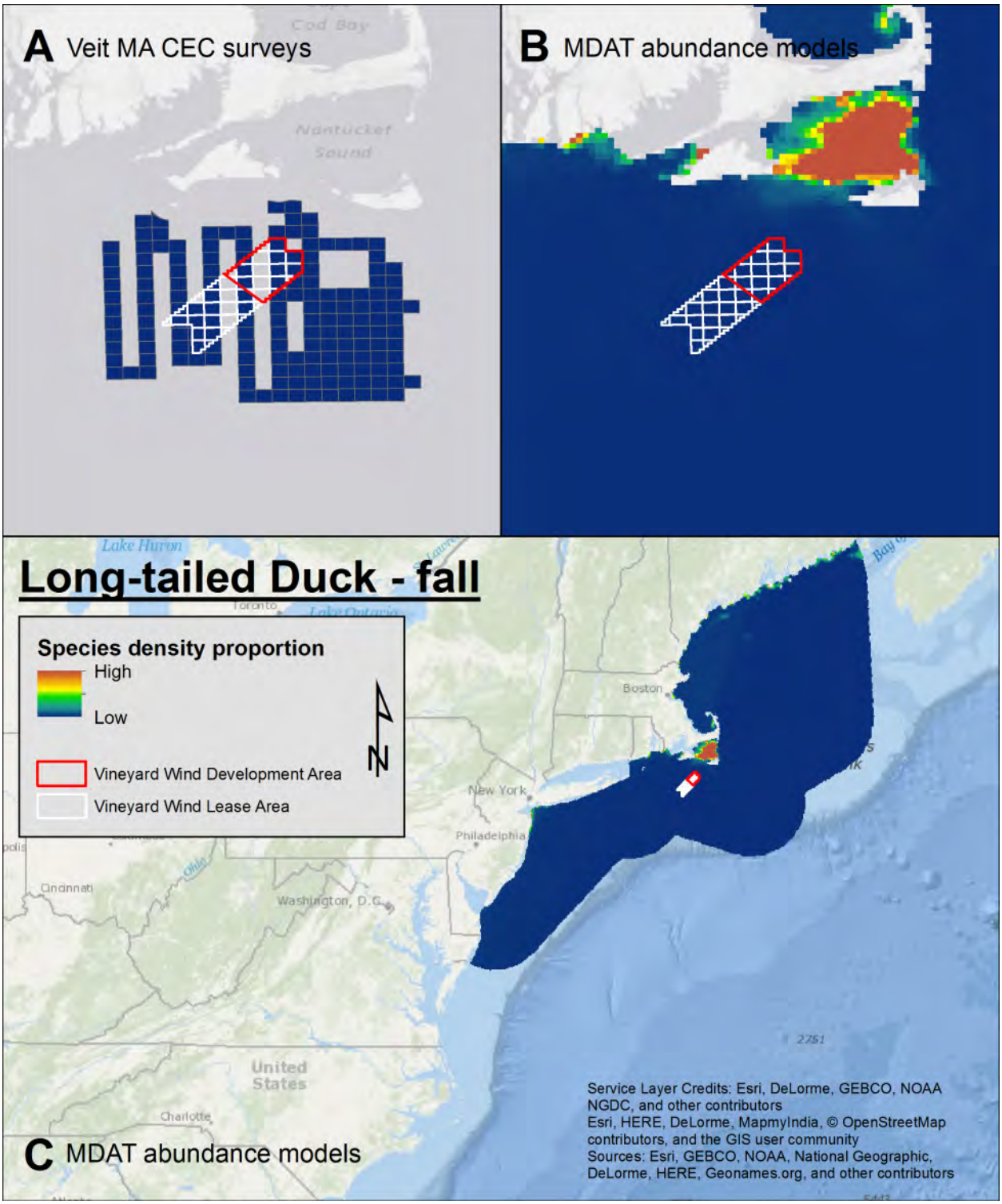

Figure 63. Fall Long-tailed Duck density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

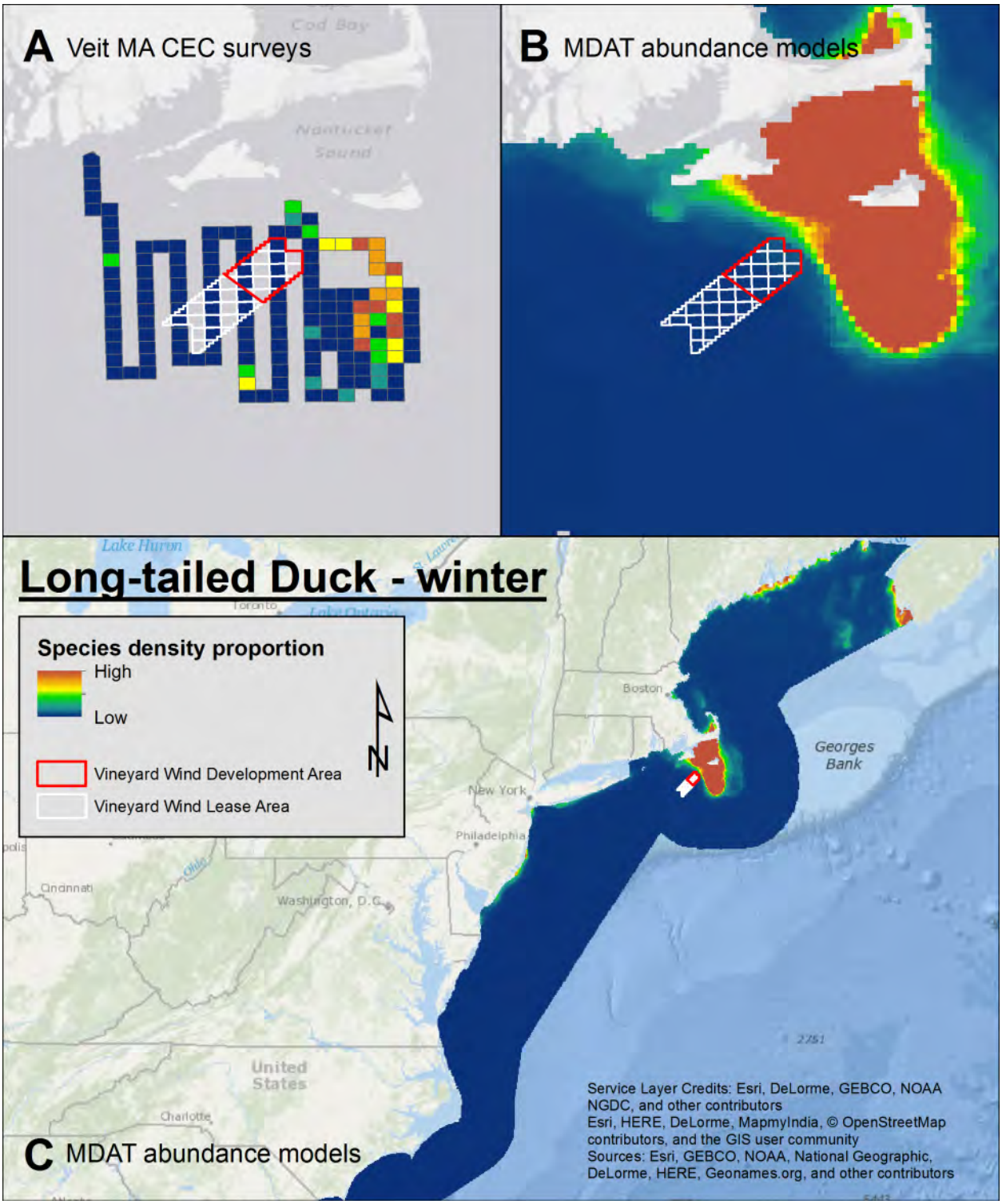

Figure 64. Winter Long-tailed Duck density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

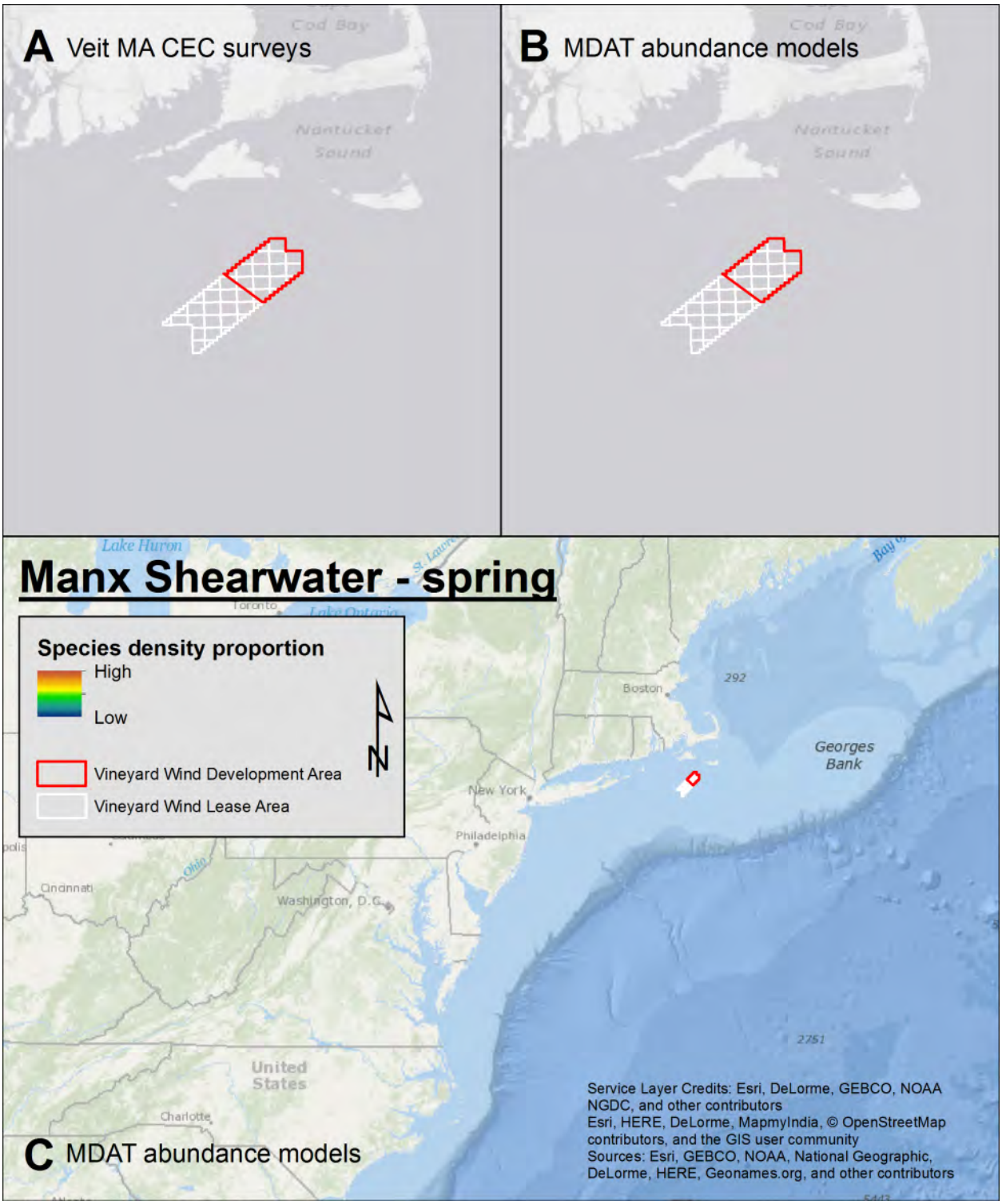

Figure 65. Spring Manx Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

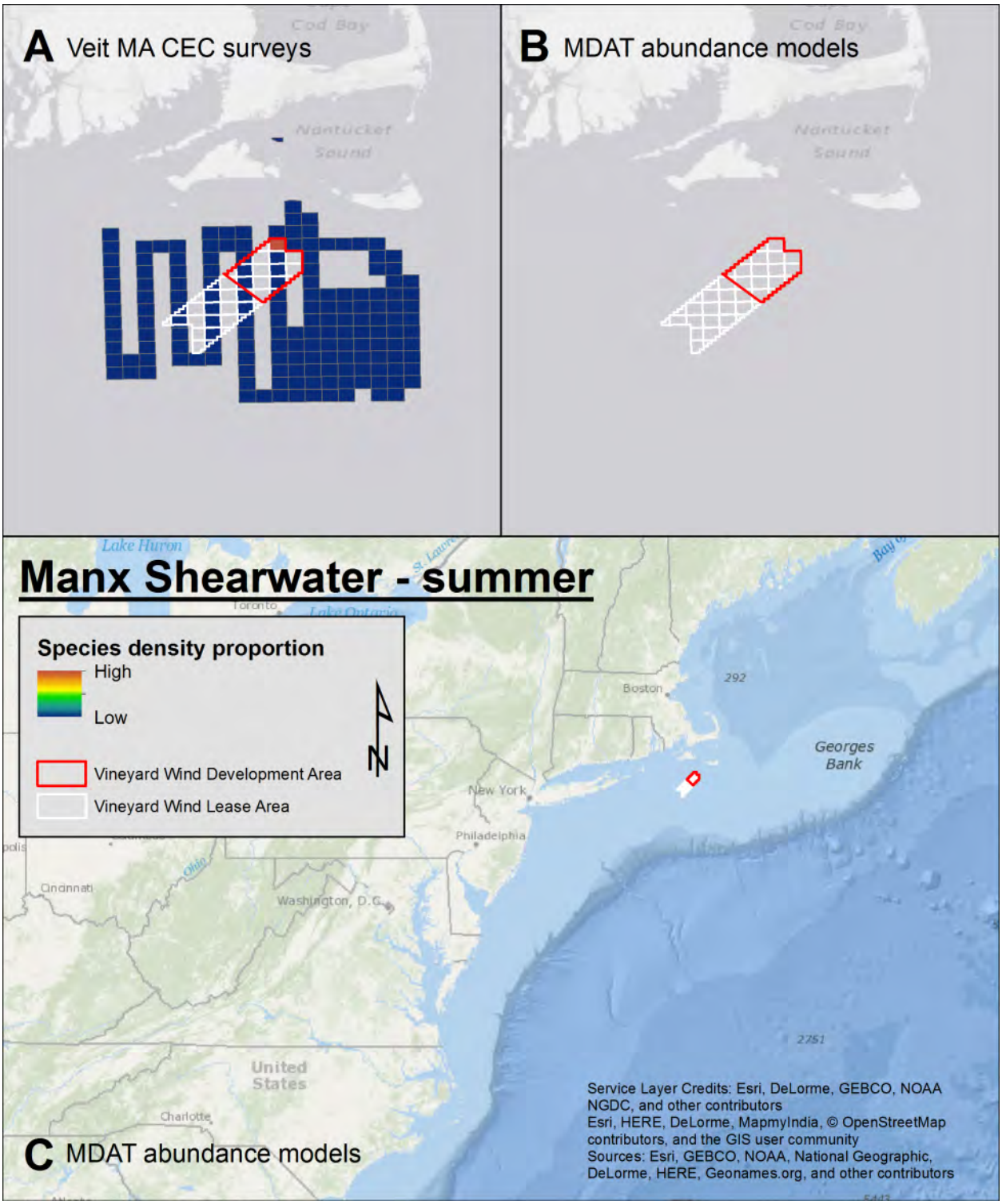

Figure 66. Summer Manx Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

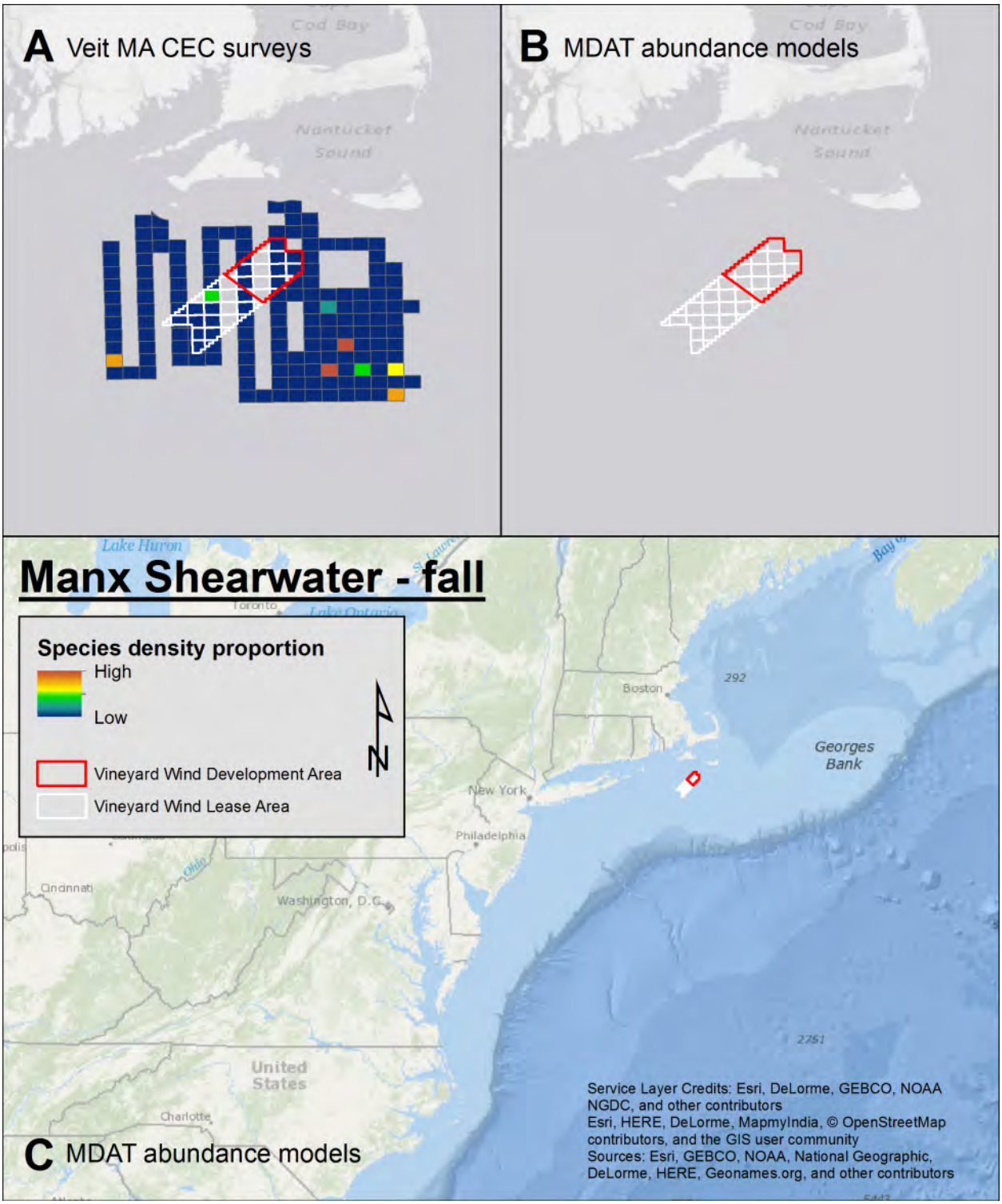

Figure 67. Fall Manx Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

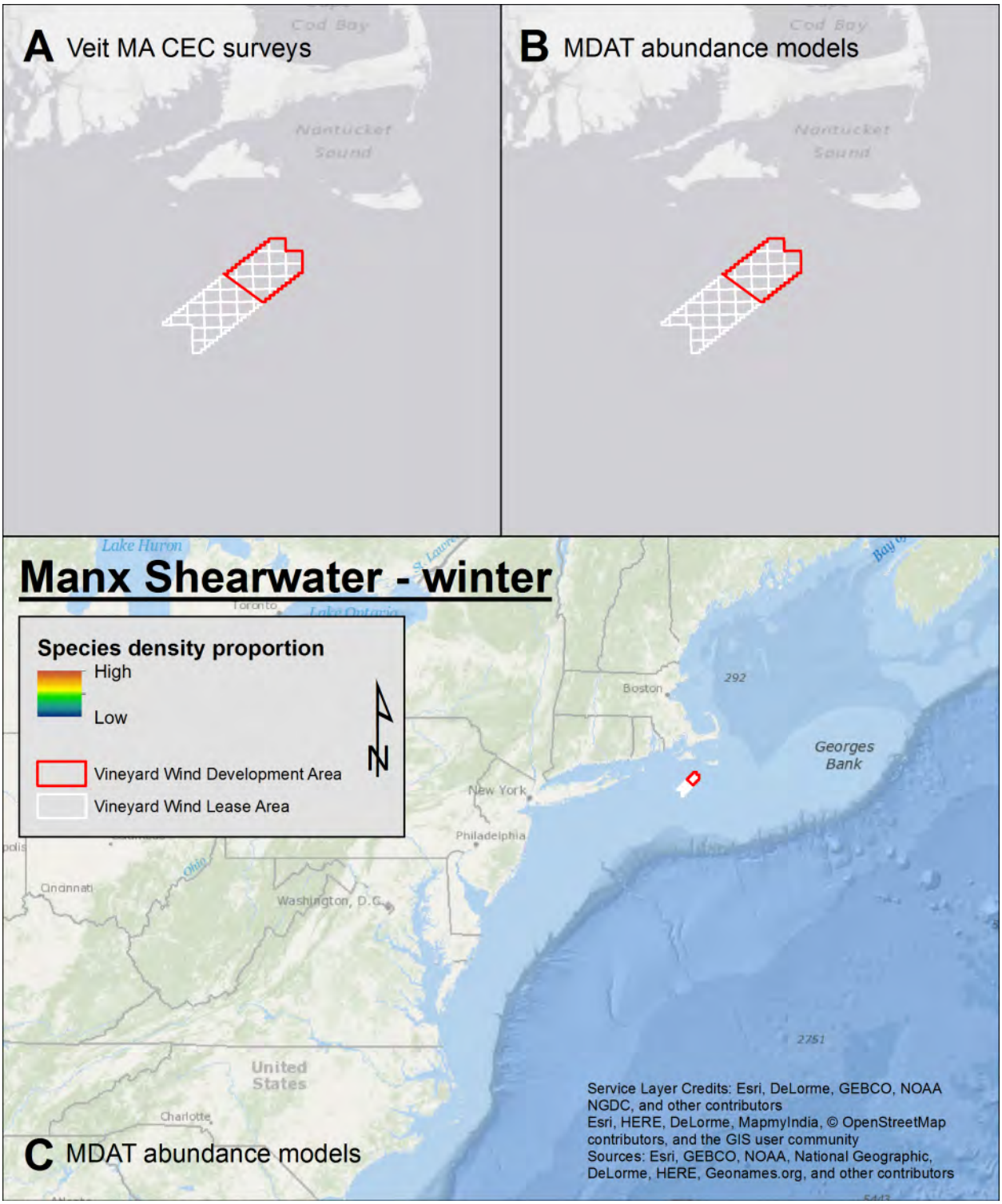

Figure 68. Winter Manx Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

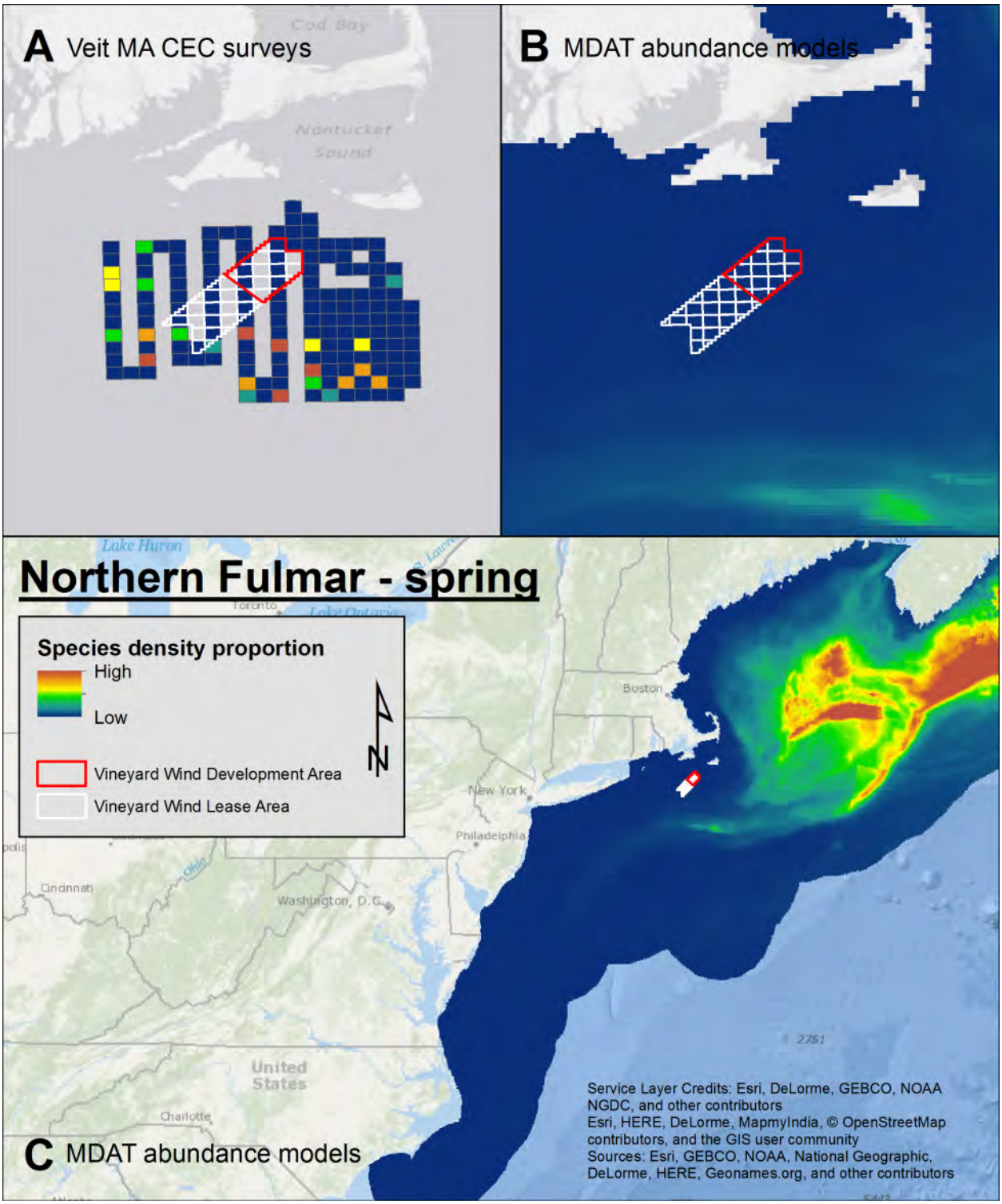

Figure 69. Spring Northern Fulmar density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

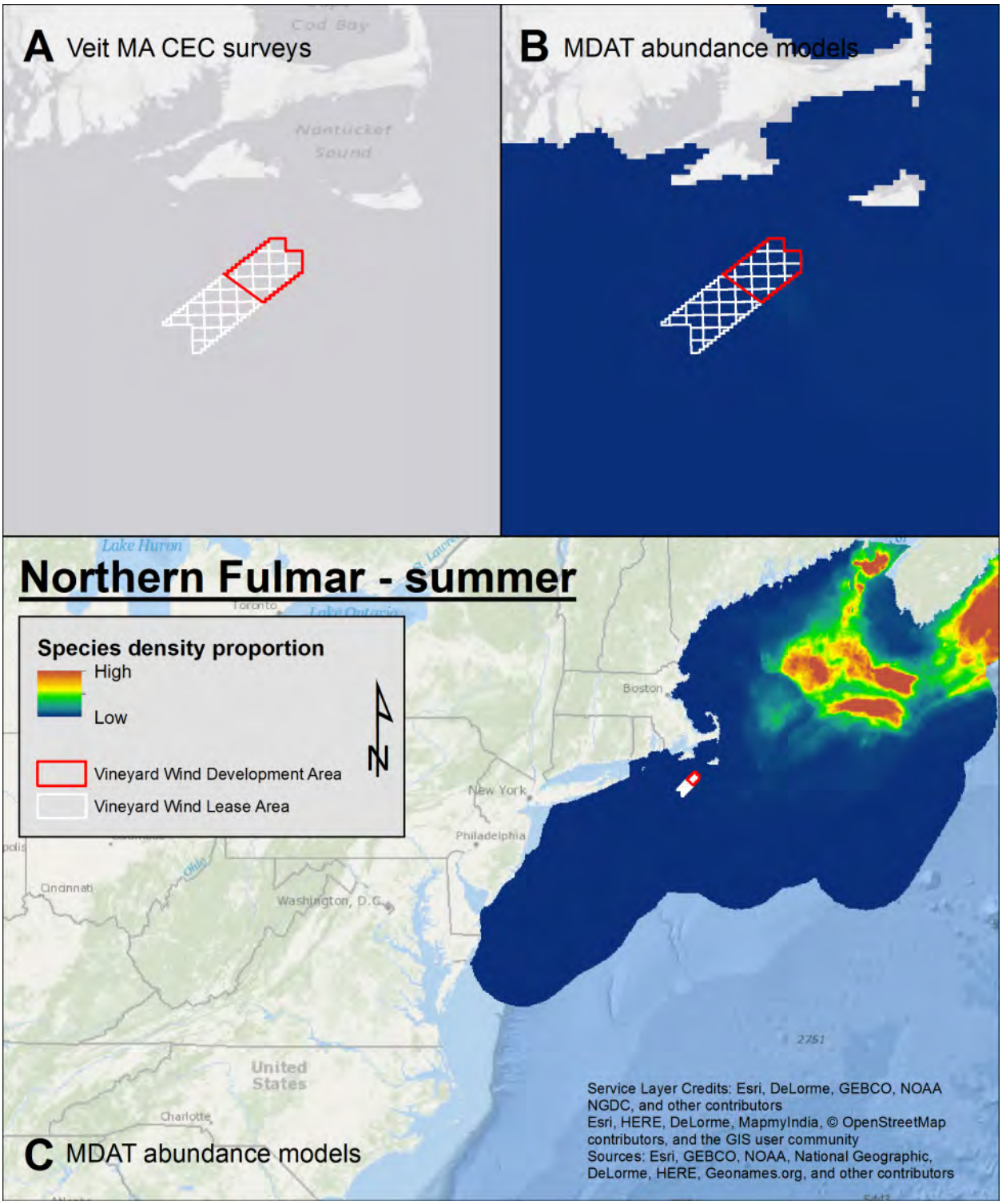

Figure 70. Summer Northern Fulmar density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

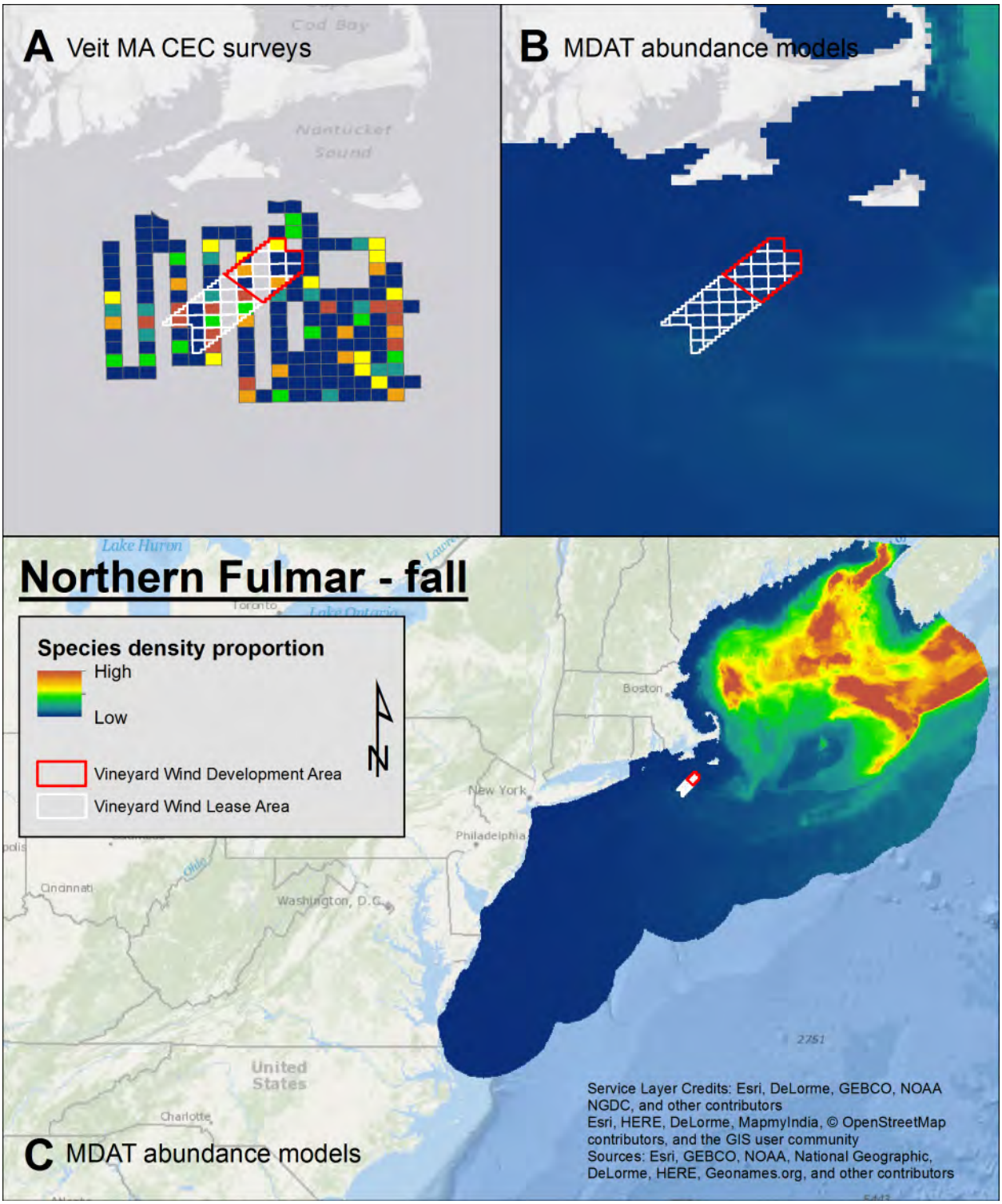

Figure 71. Fall Northern Fulmar density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

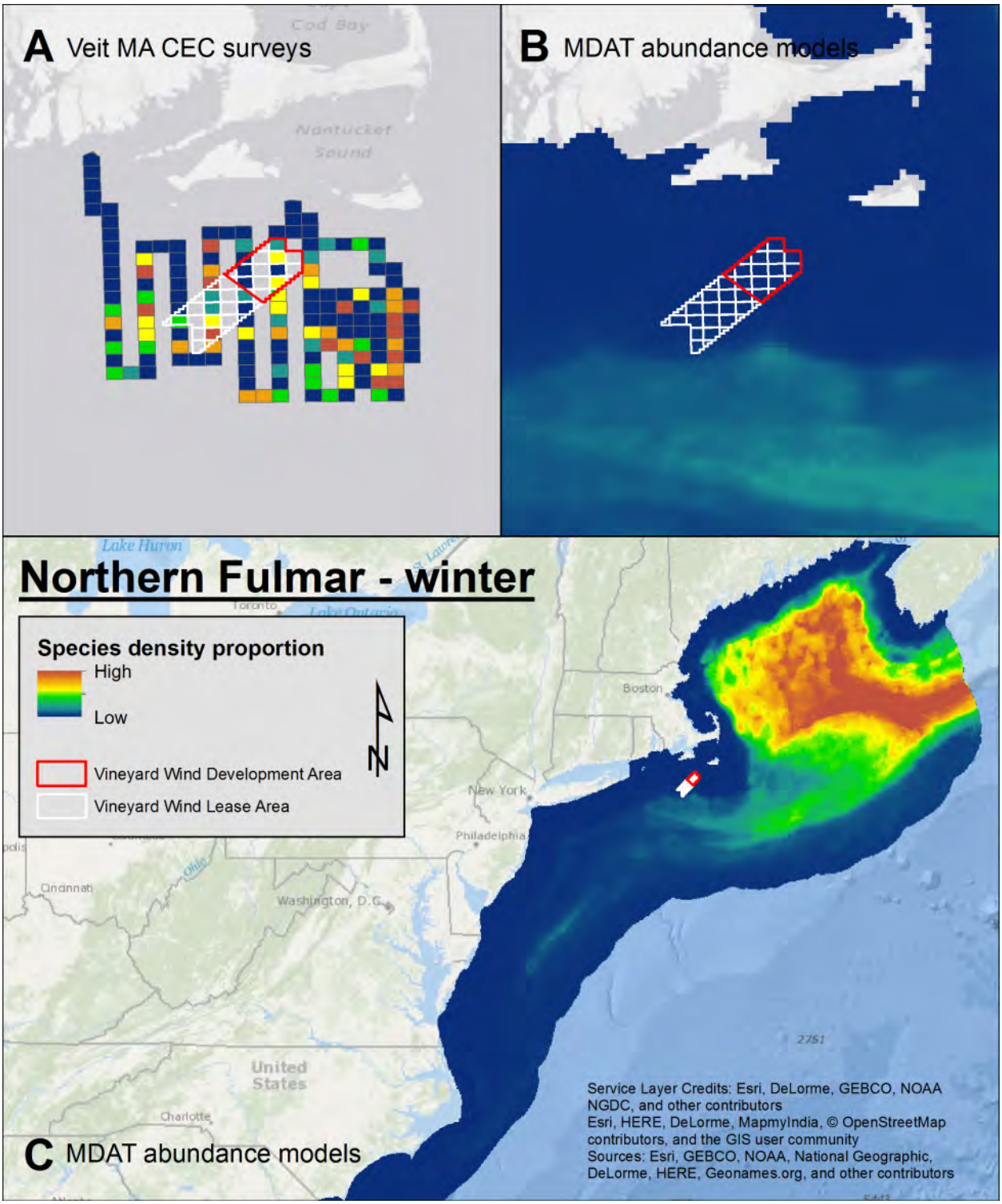

Figure 72. Winter Northern Fulmar density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

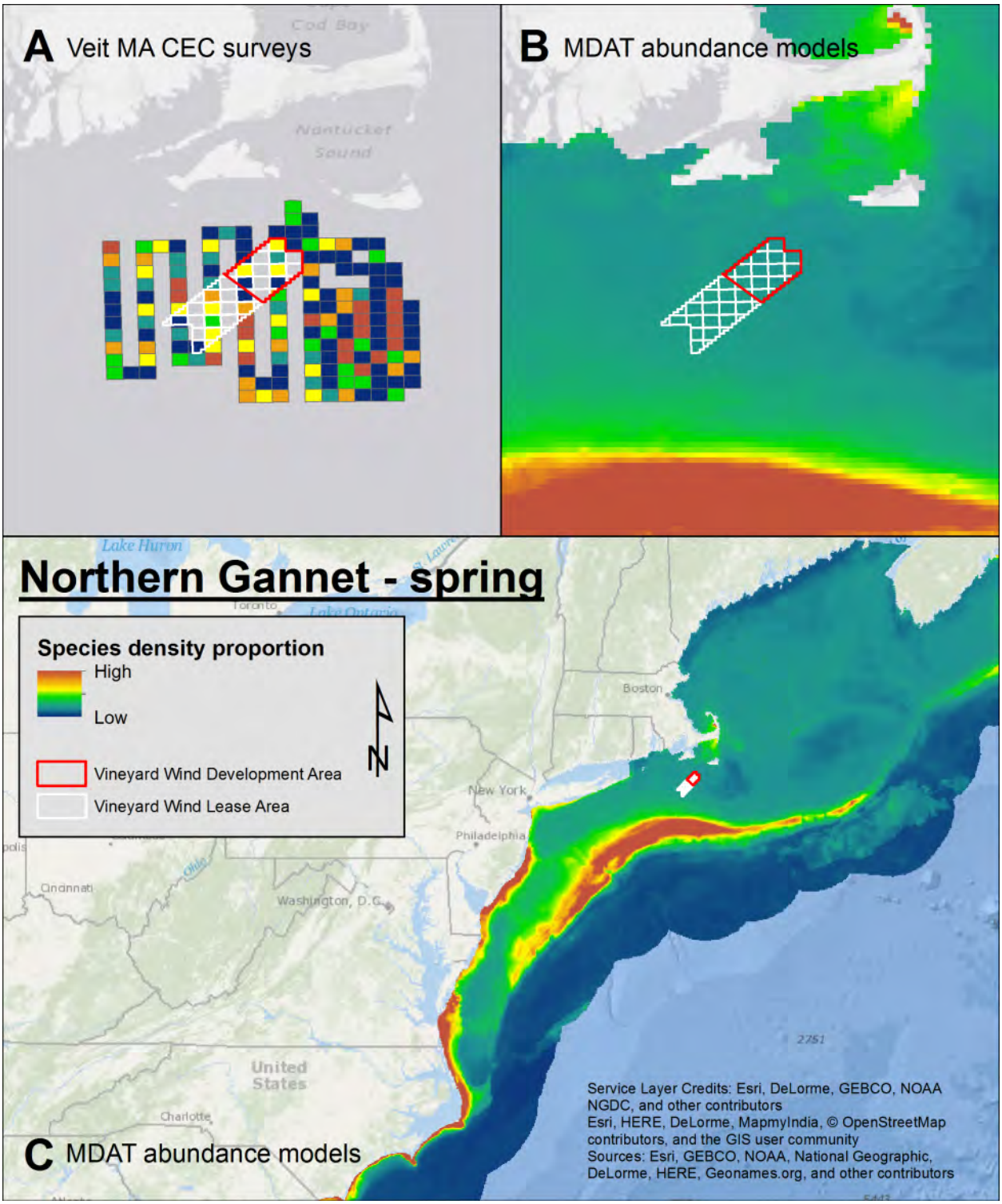

Figure 73. Spring Northern Gannet density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

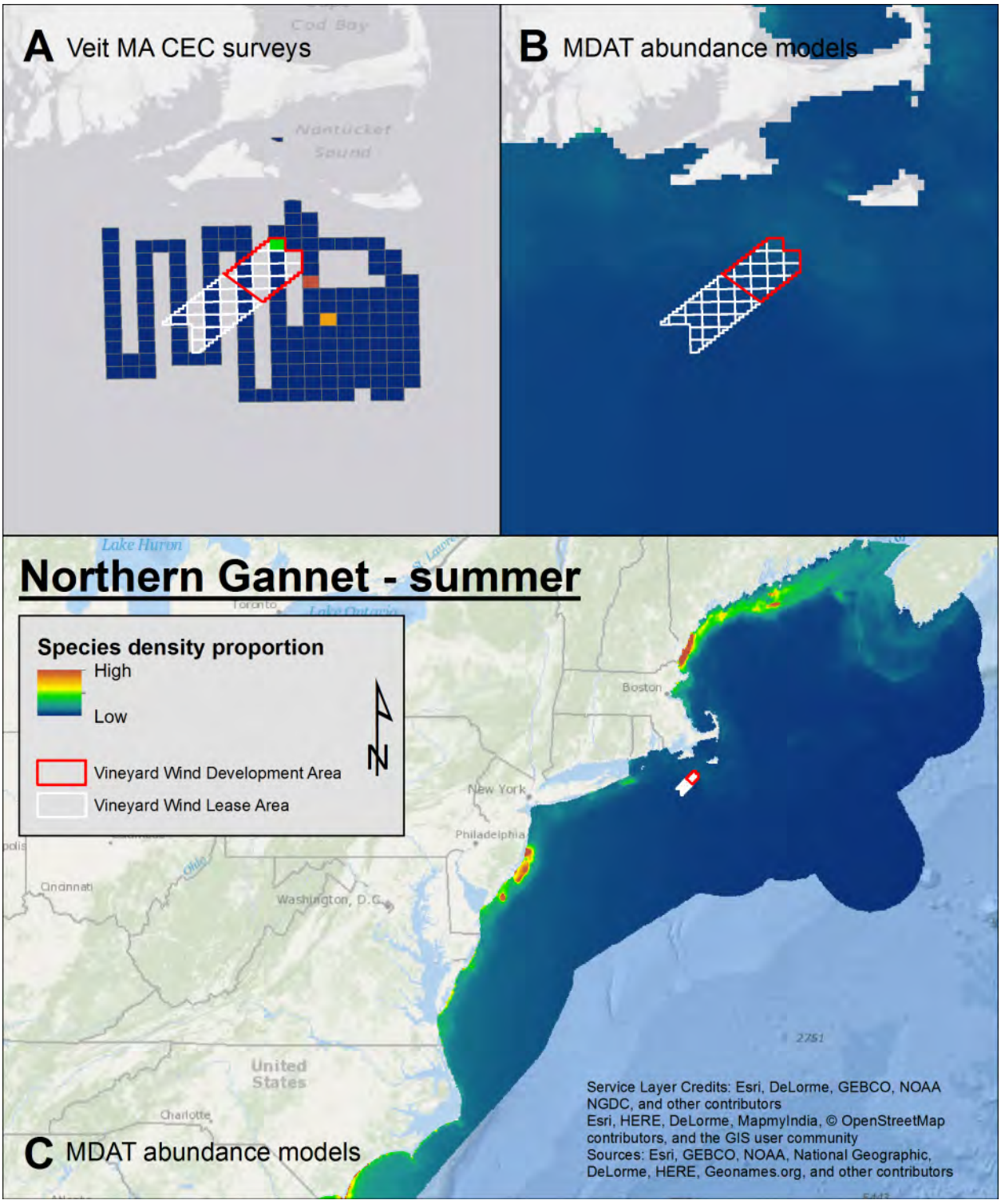

Figure 74. Summer Northern Gannet density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

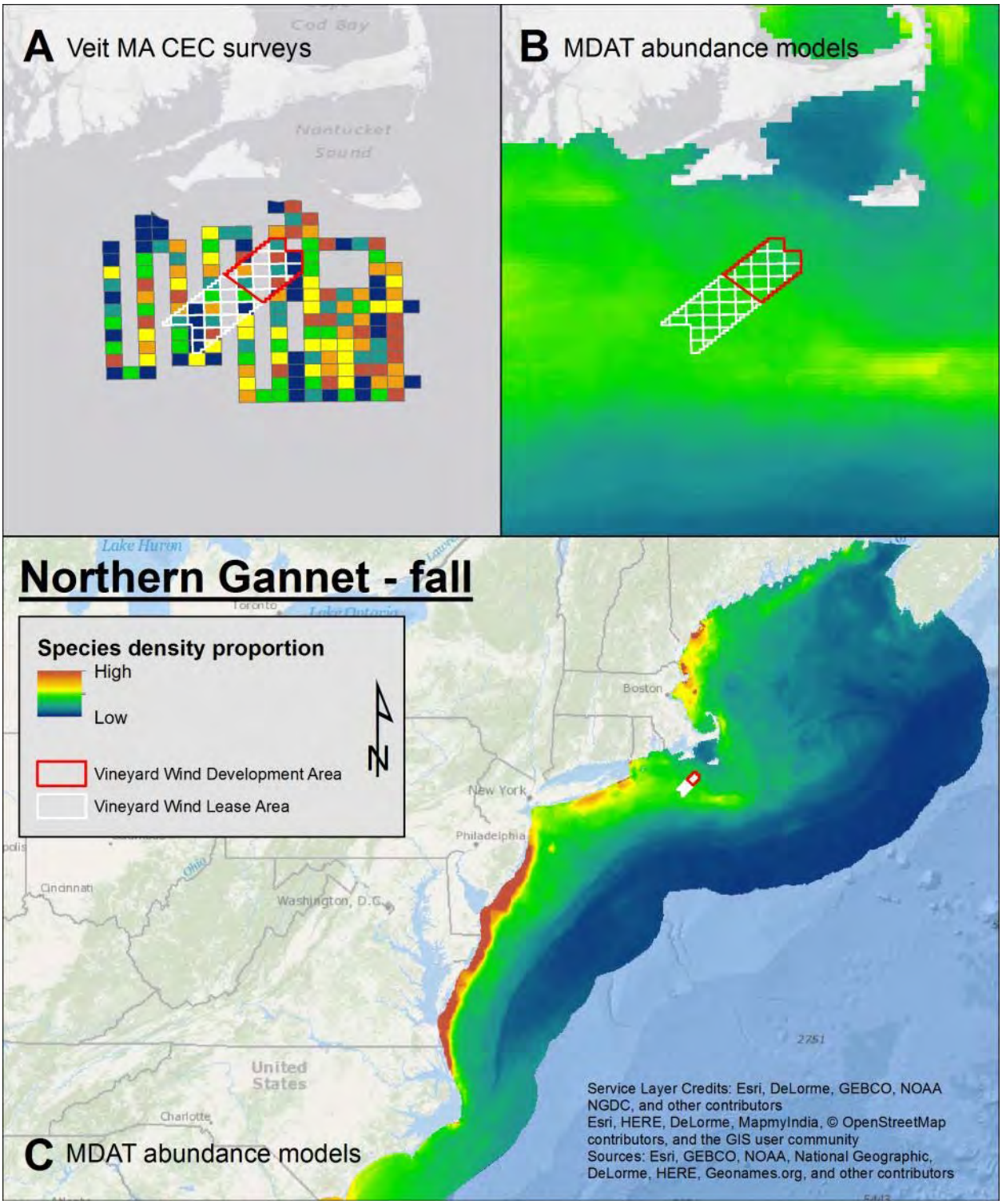

Figure 75. Fall Northern Gannet density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

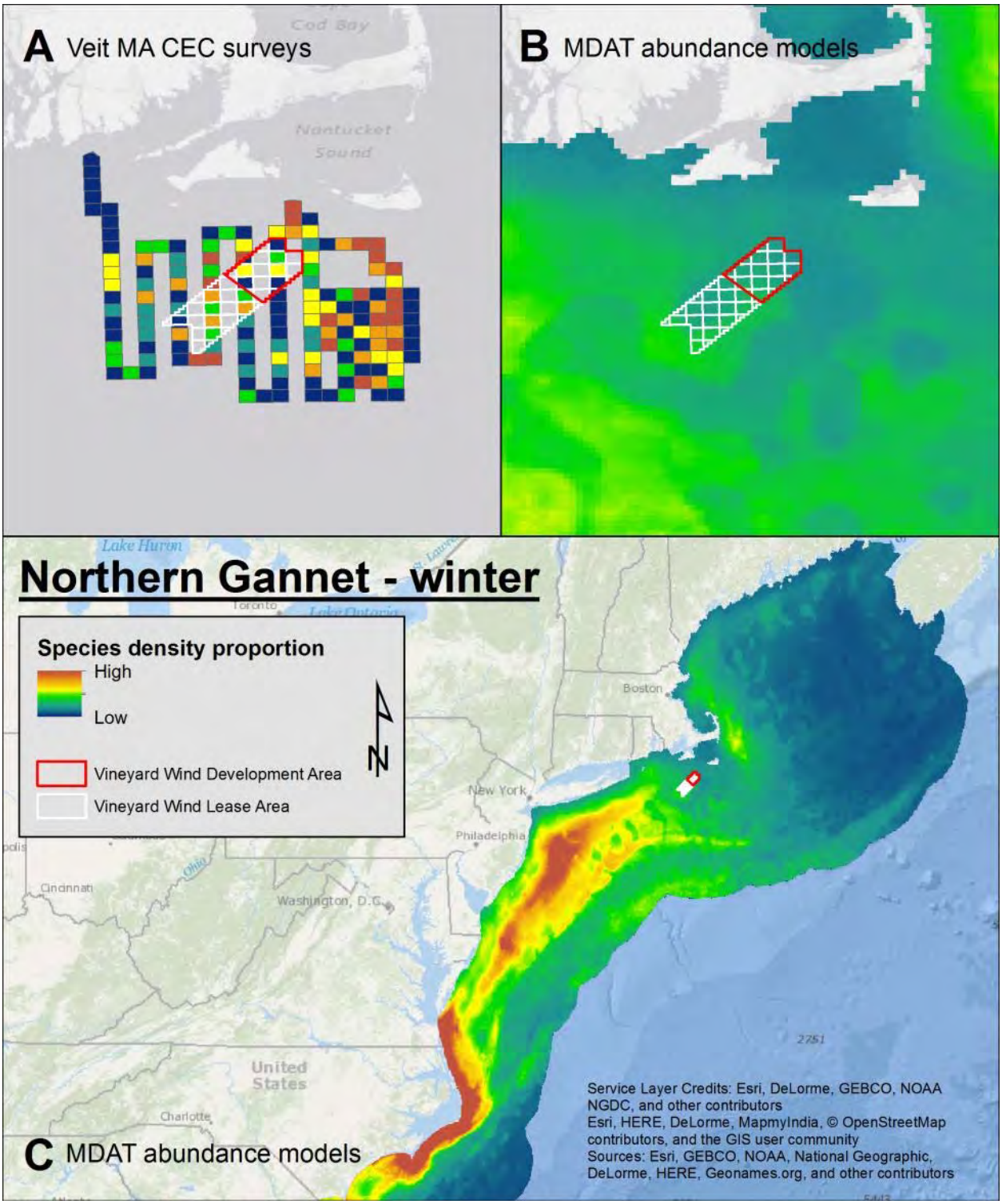

Figure 76. Winter Northern Gannet density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

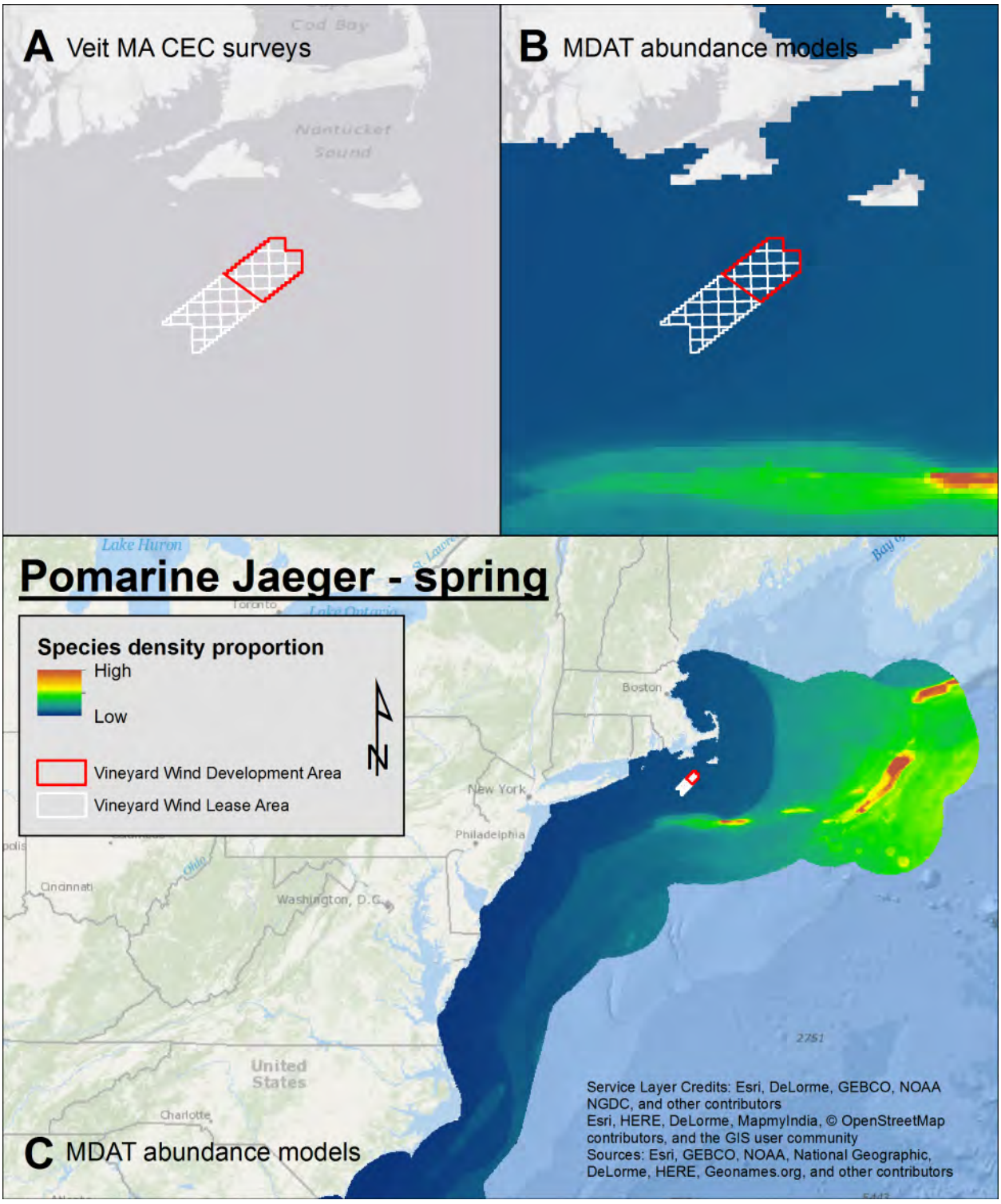

Figure 77. Spring Pomarine Jaeger density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

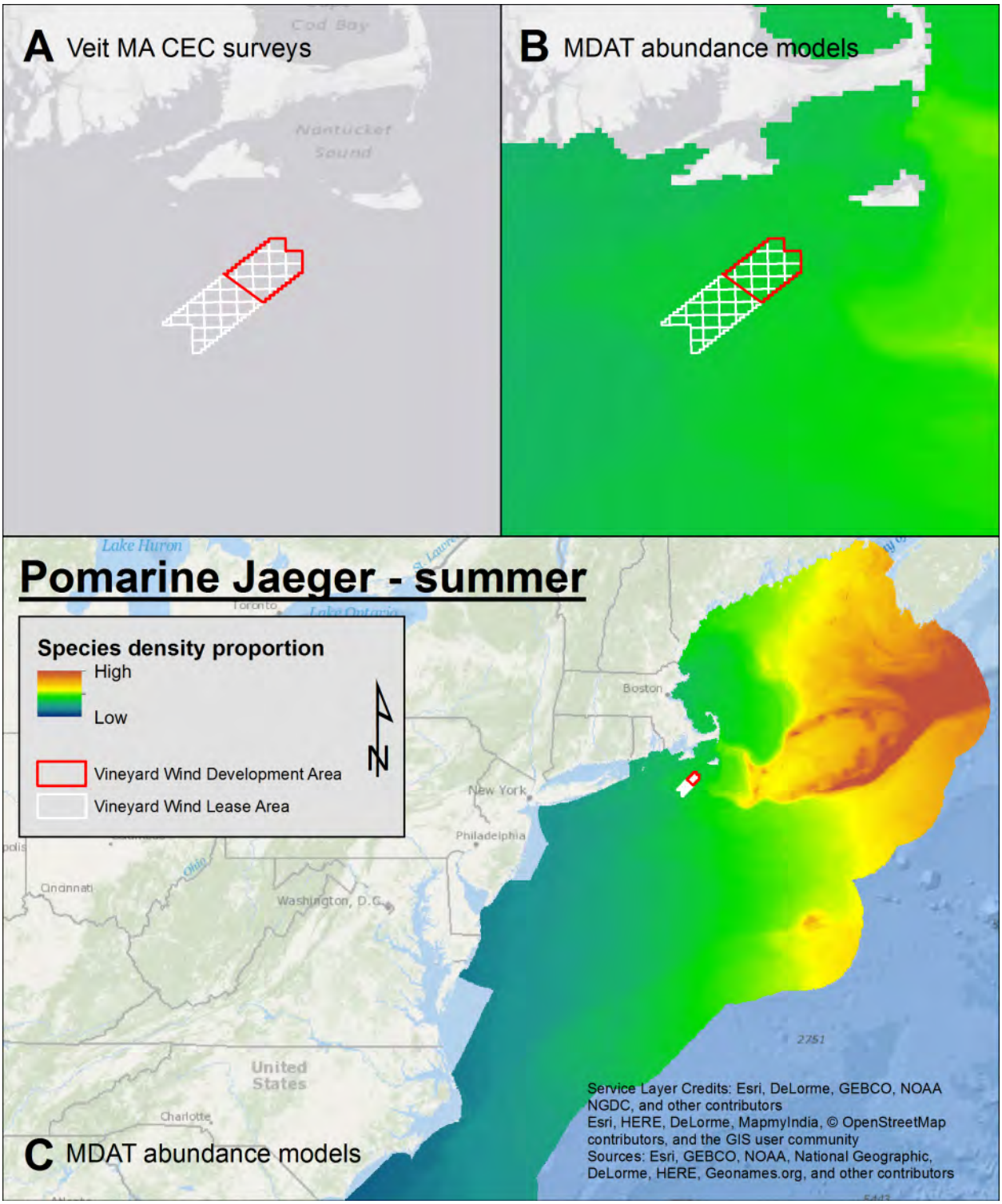

Figure 78. Summer Pomarine Jaeger density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

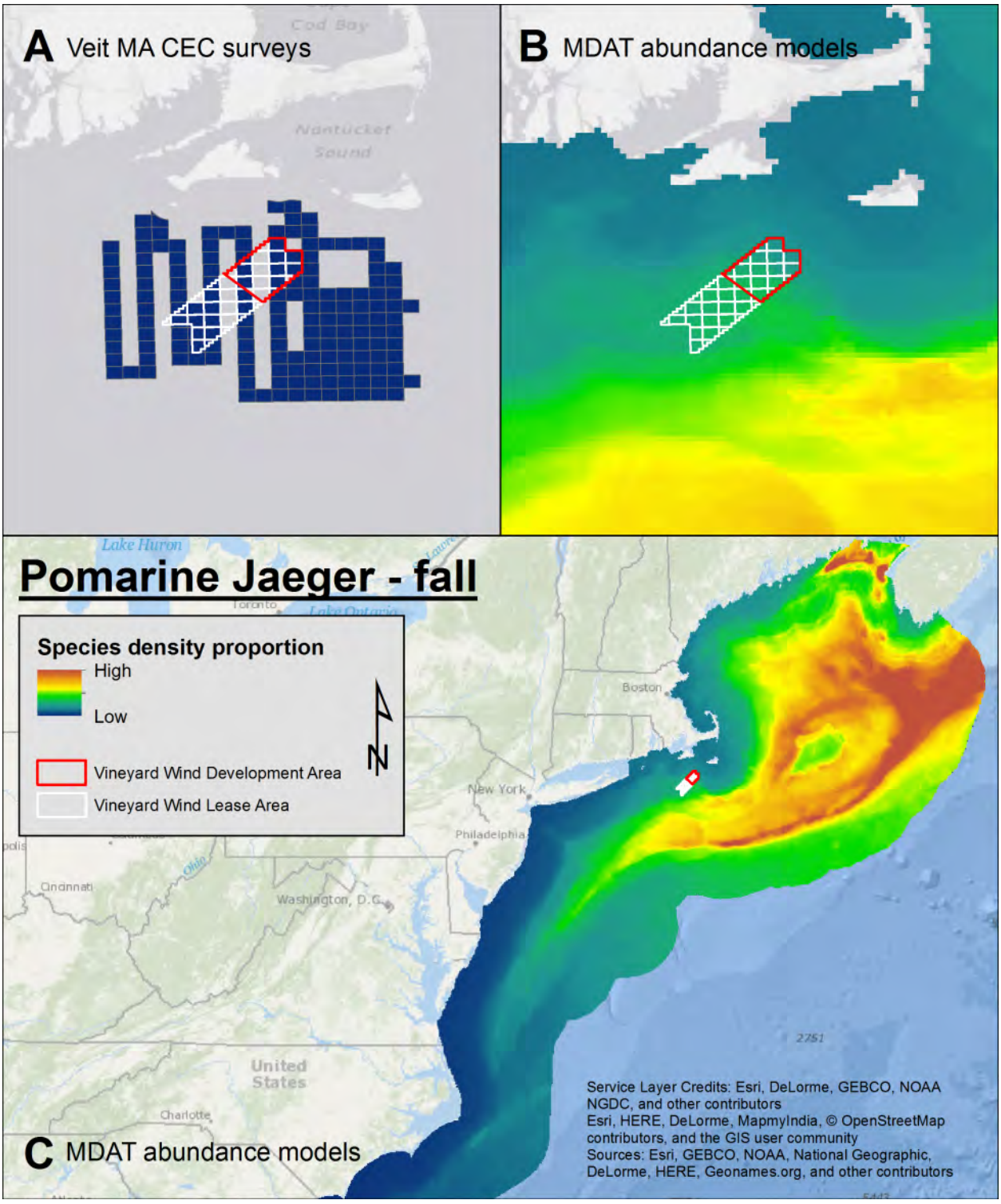

Figure 79. Fall Pomarine Jaeger density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

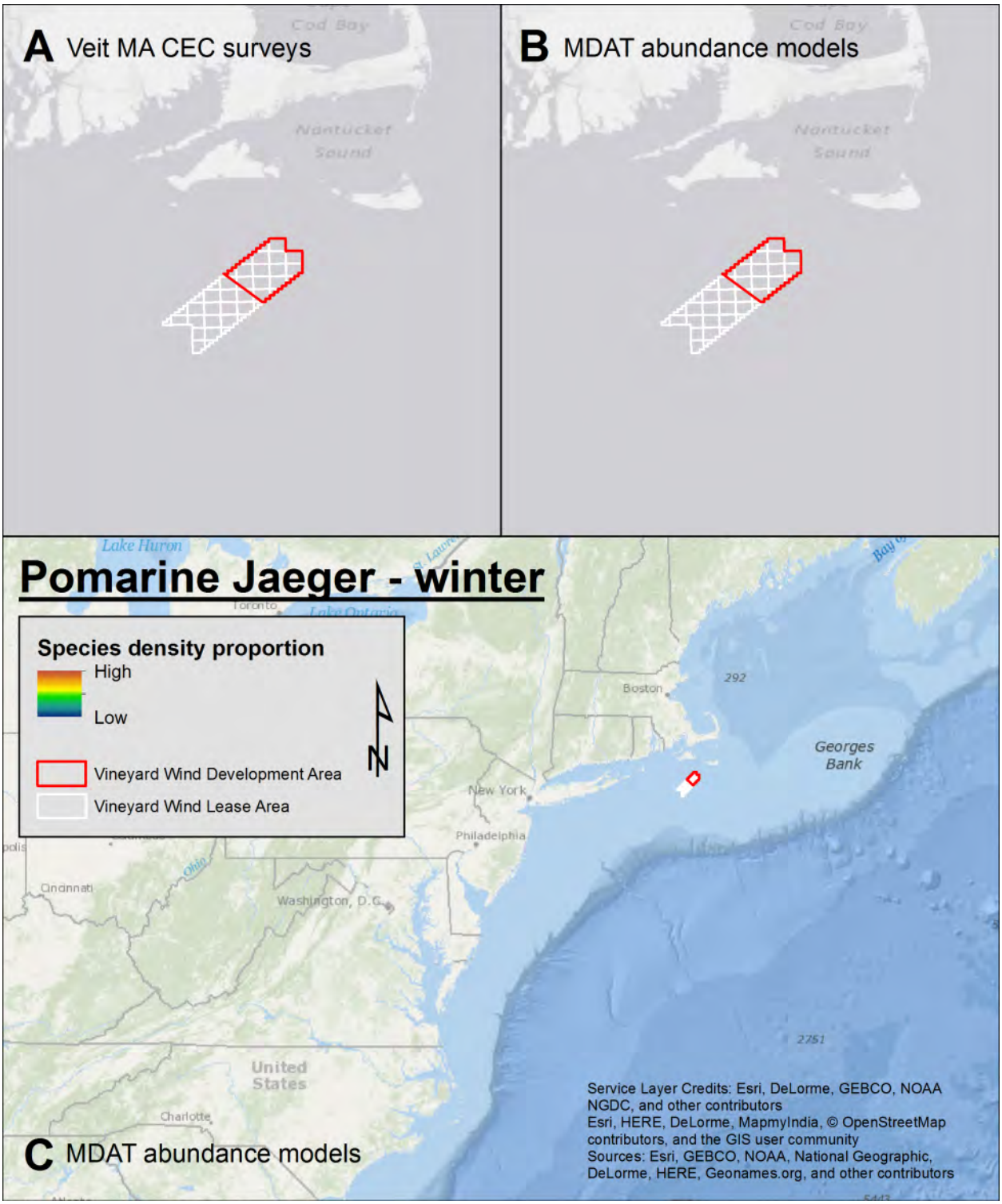

Figure 80. Winter Pomarine Jaeger density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

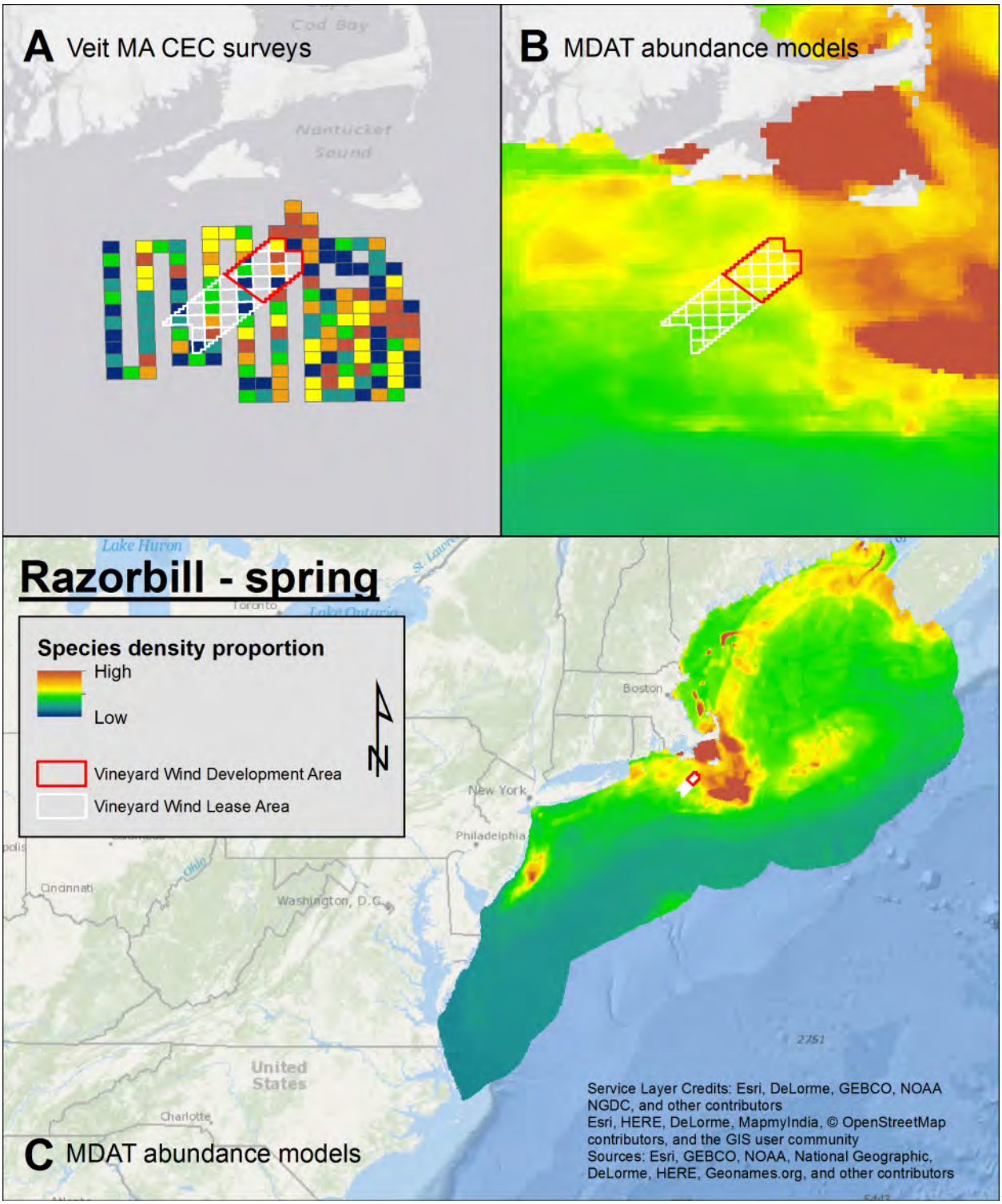

Figure 81. Spring Razorbill density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

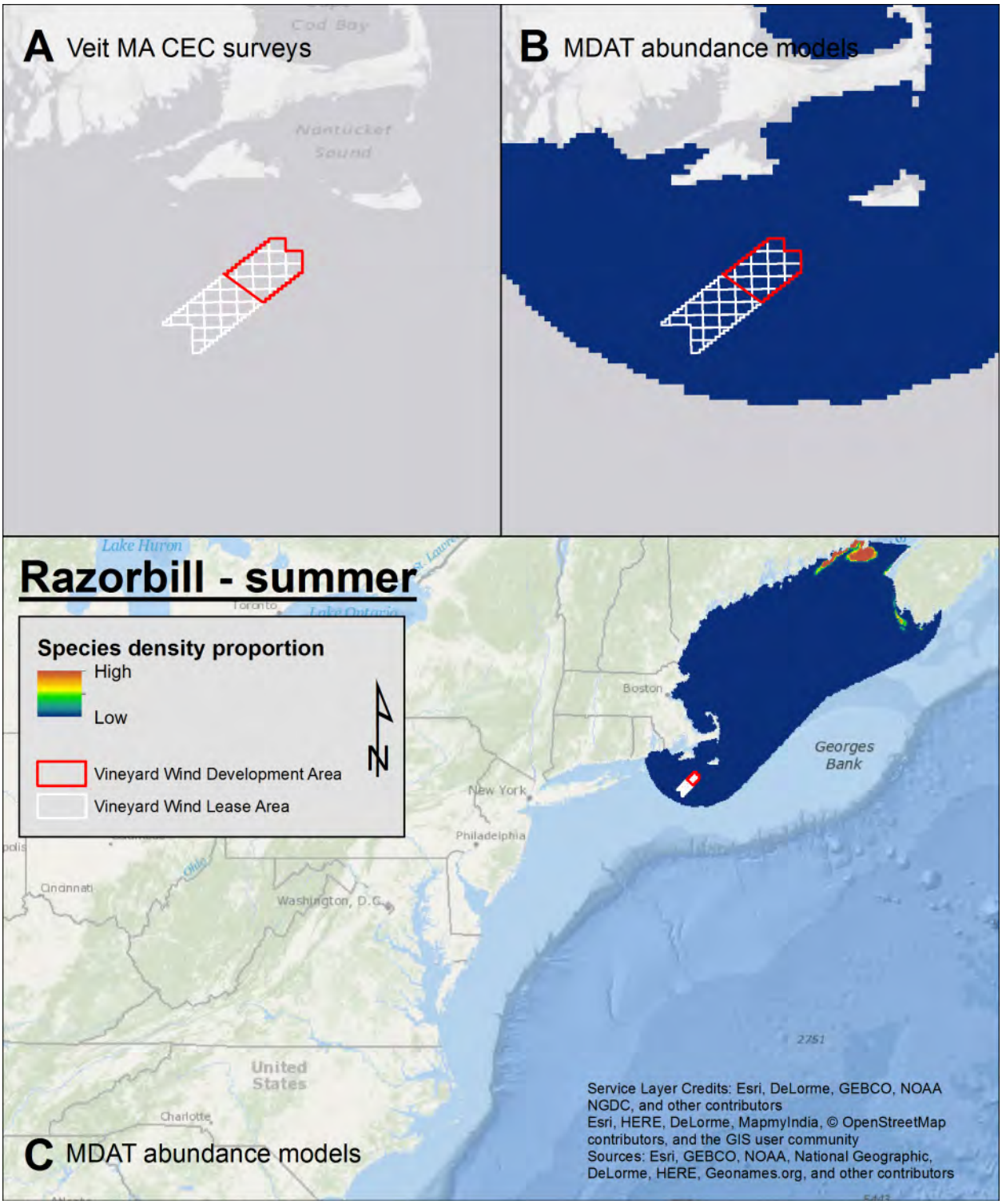

Figure 82. Summer Razorbill density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

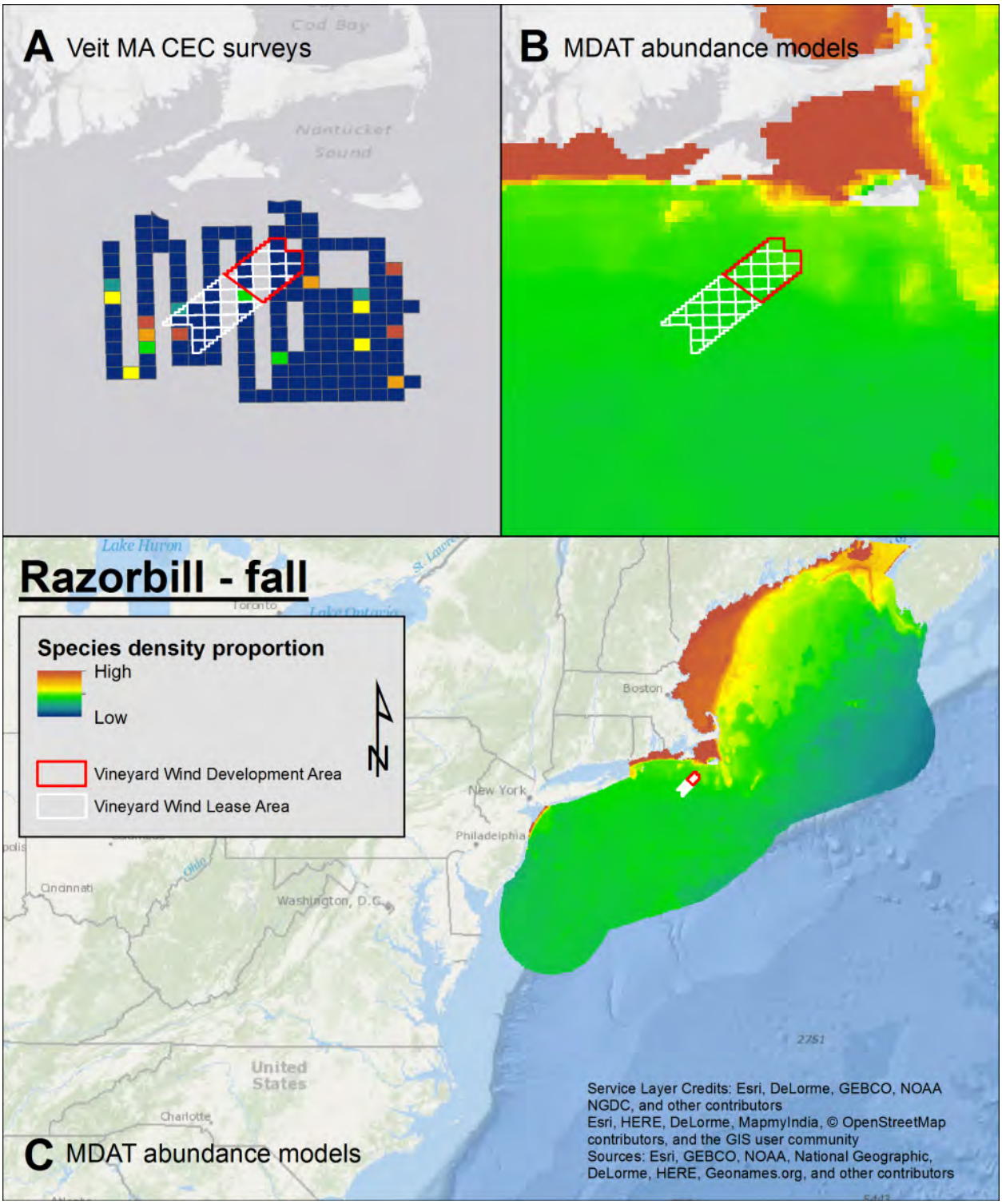

Figure 83. Fall Razorbill density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

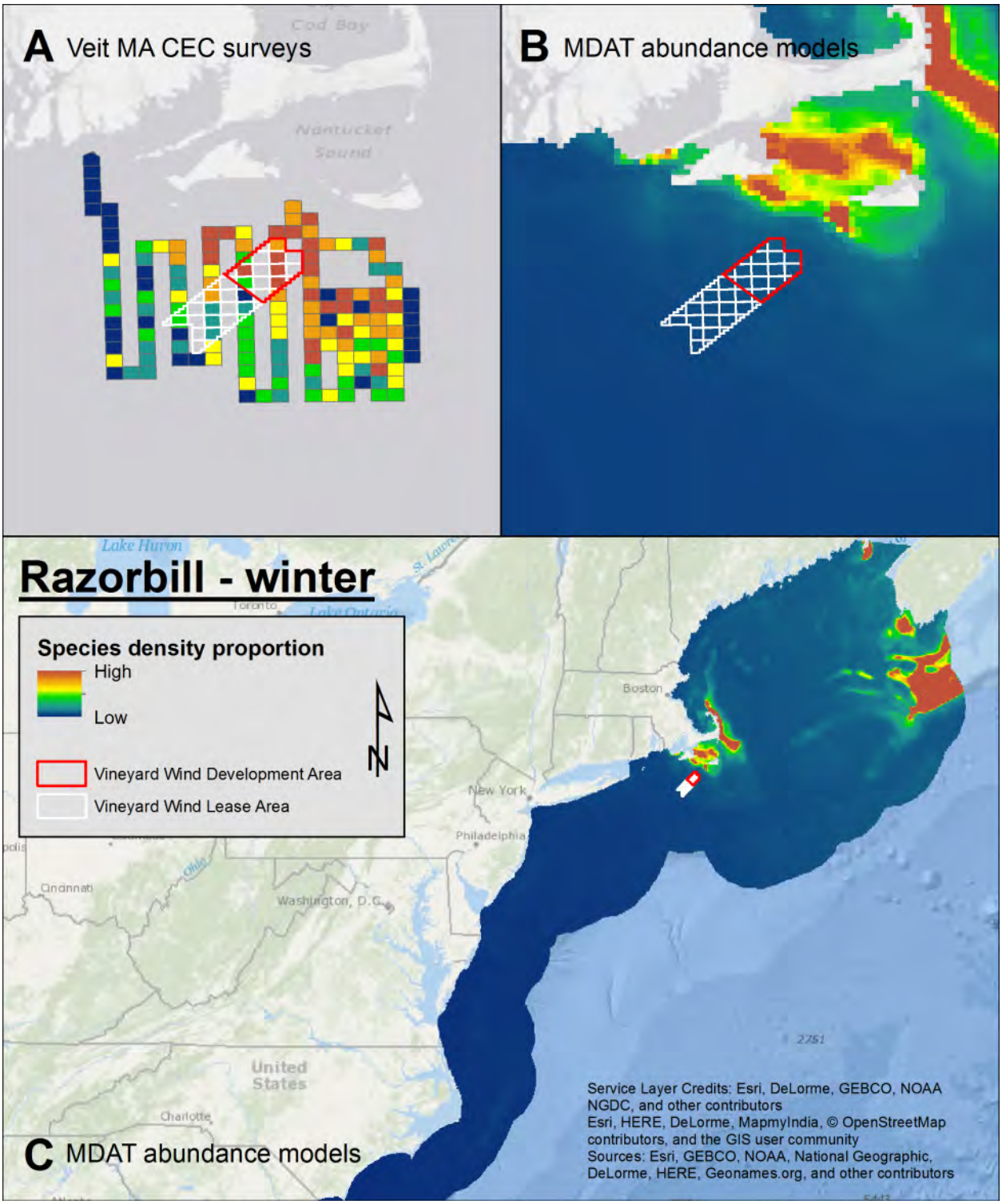

Figure 84. Winter Razorbill density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

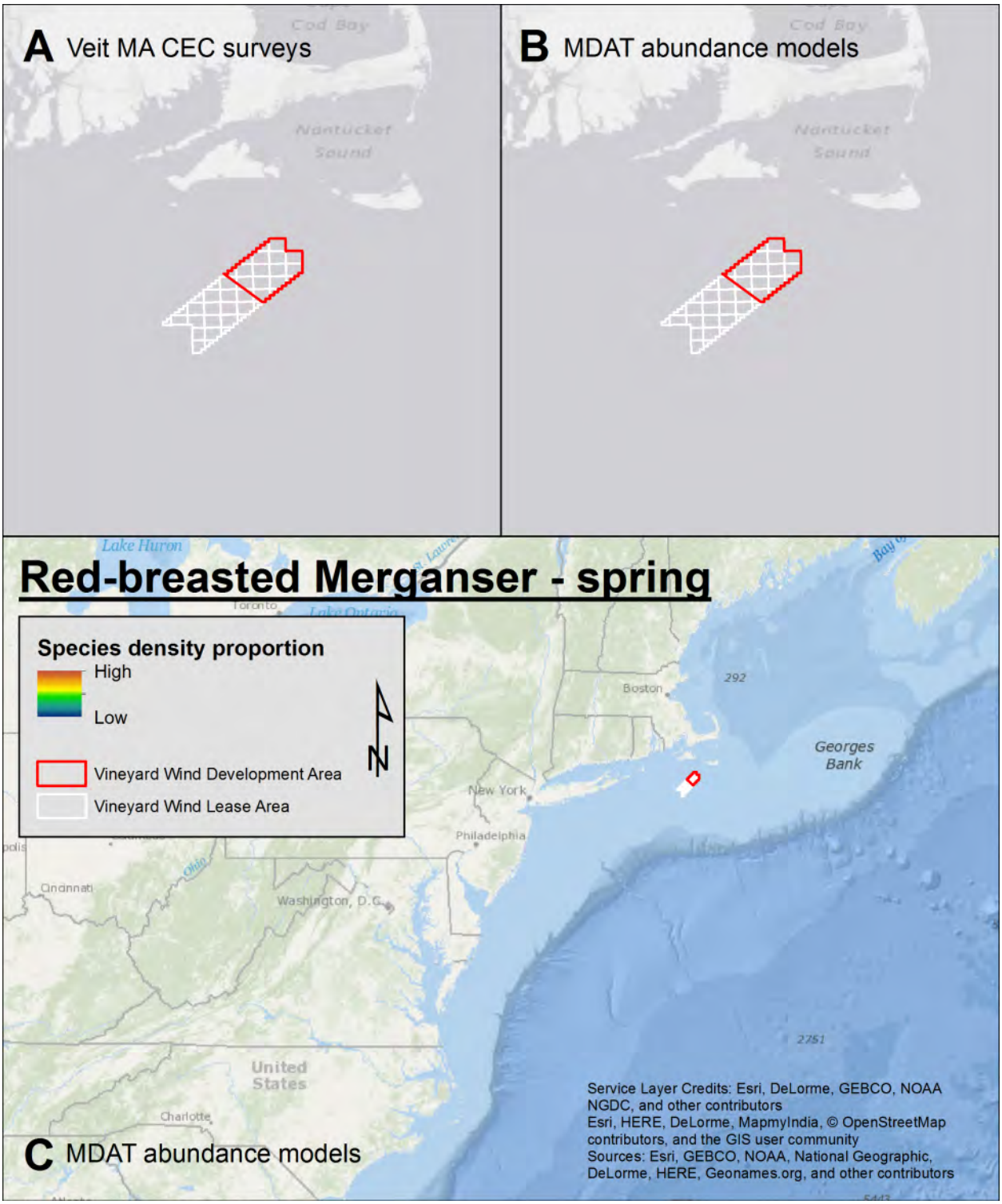

Figure 85. Spring Red-breasted Merganser density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

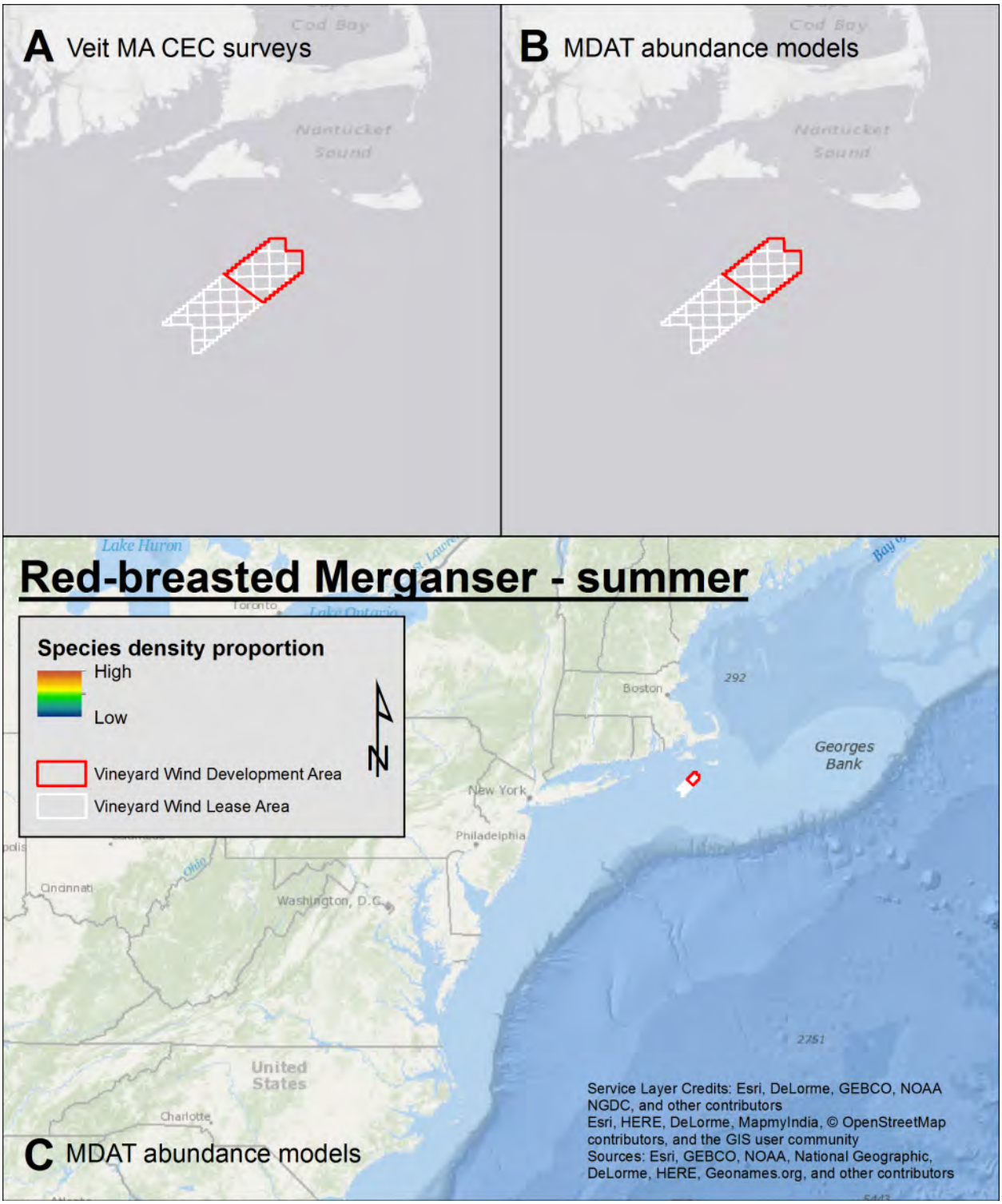

Figure 86. Summer Red-breasted Merganser density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

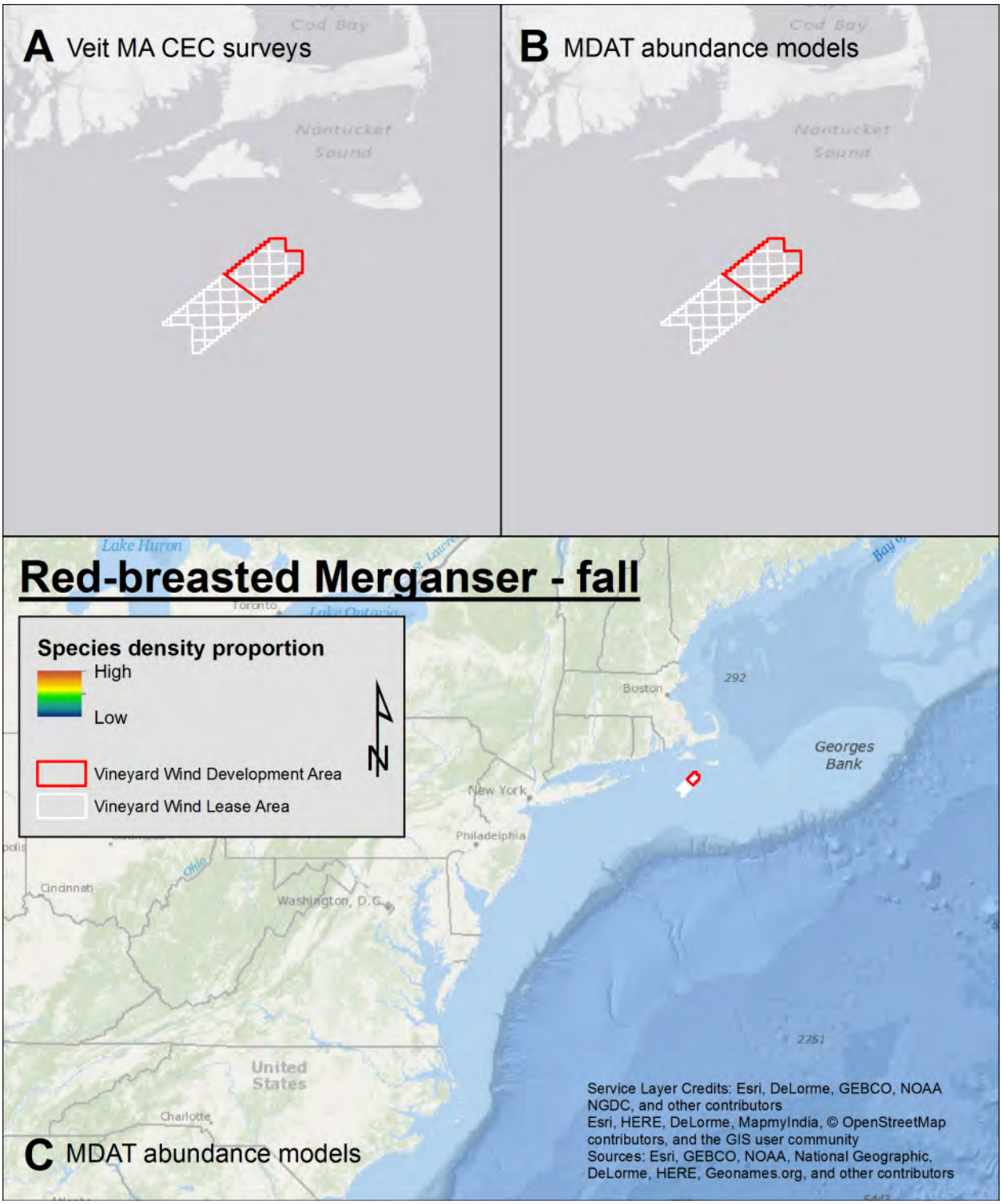

Figure 87. Fall Red-breasted Merganser density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

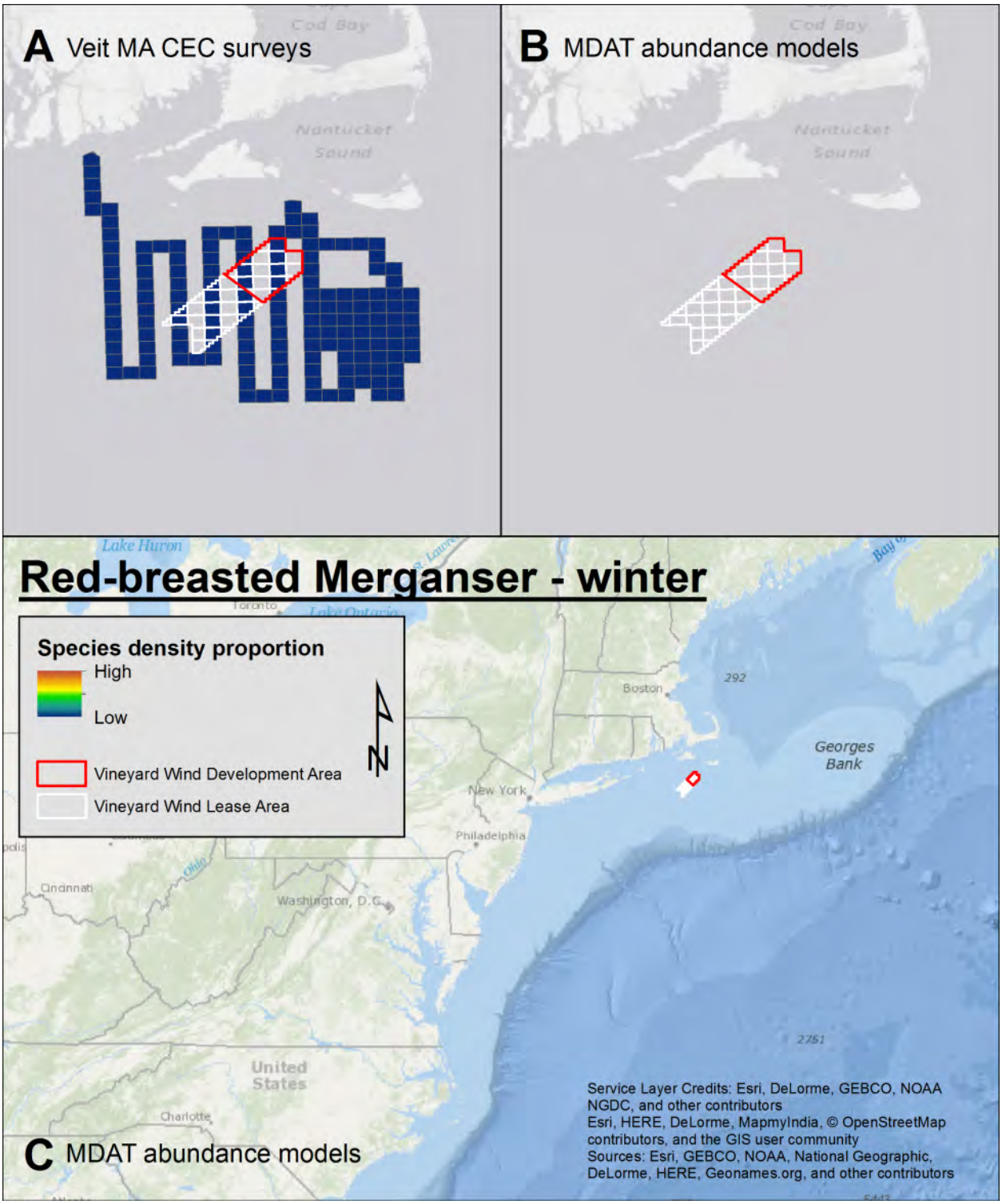

Figure 88. Winter Red-breasted Merganser density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

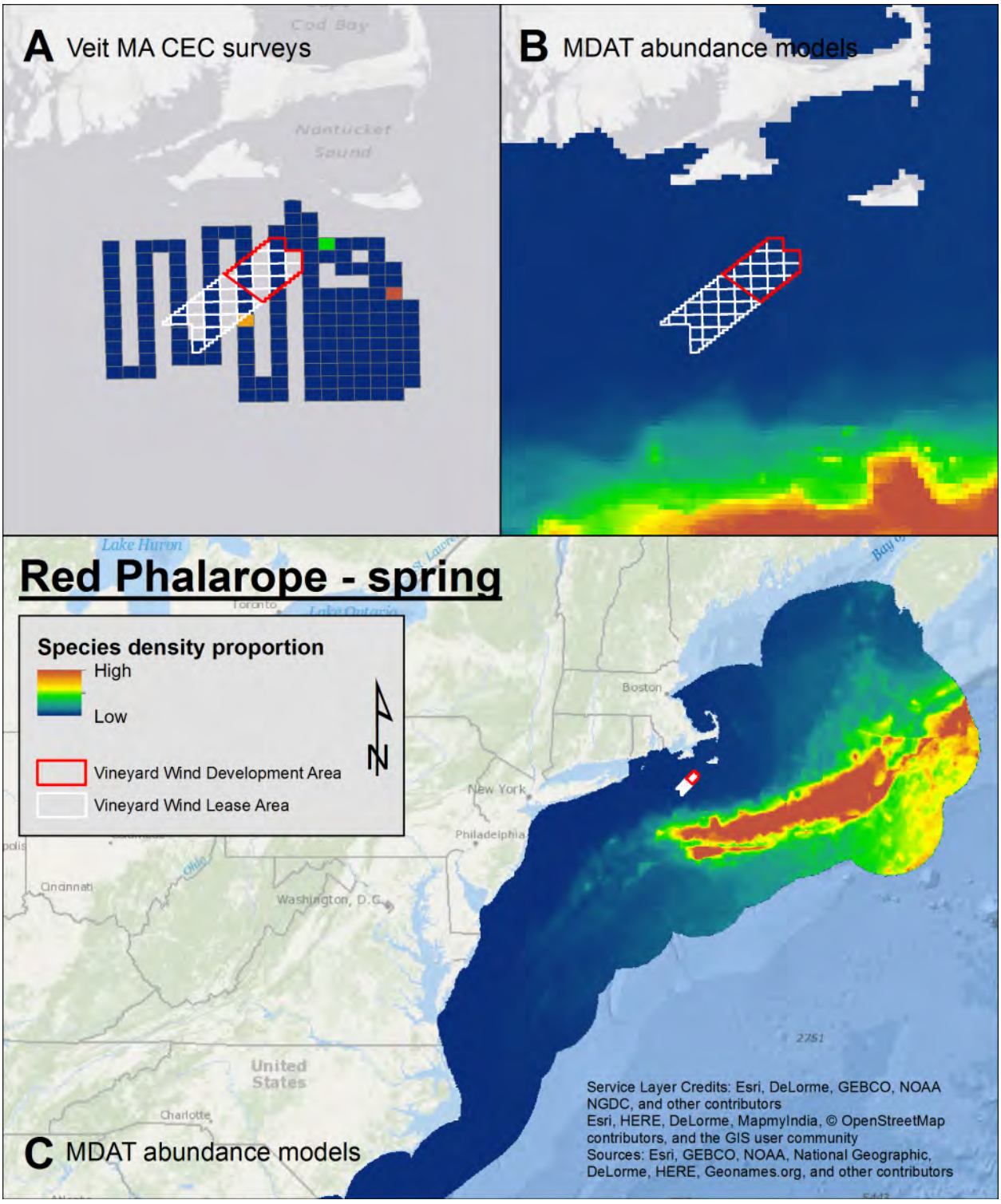

Figure 89. Spring Red Phalarope density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

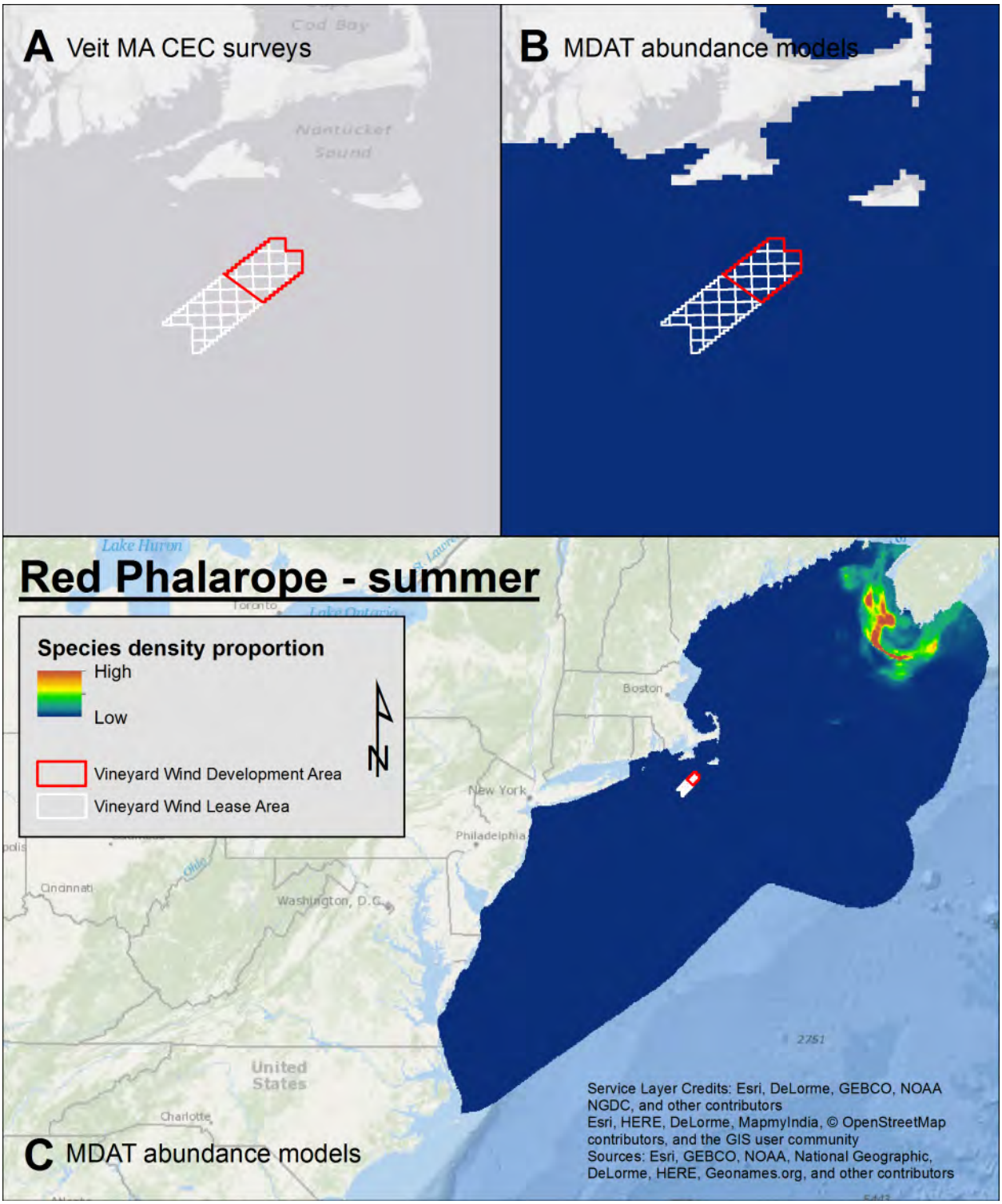

Figure 90. Summer Red Phalarope density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

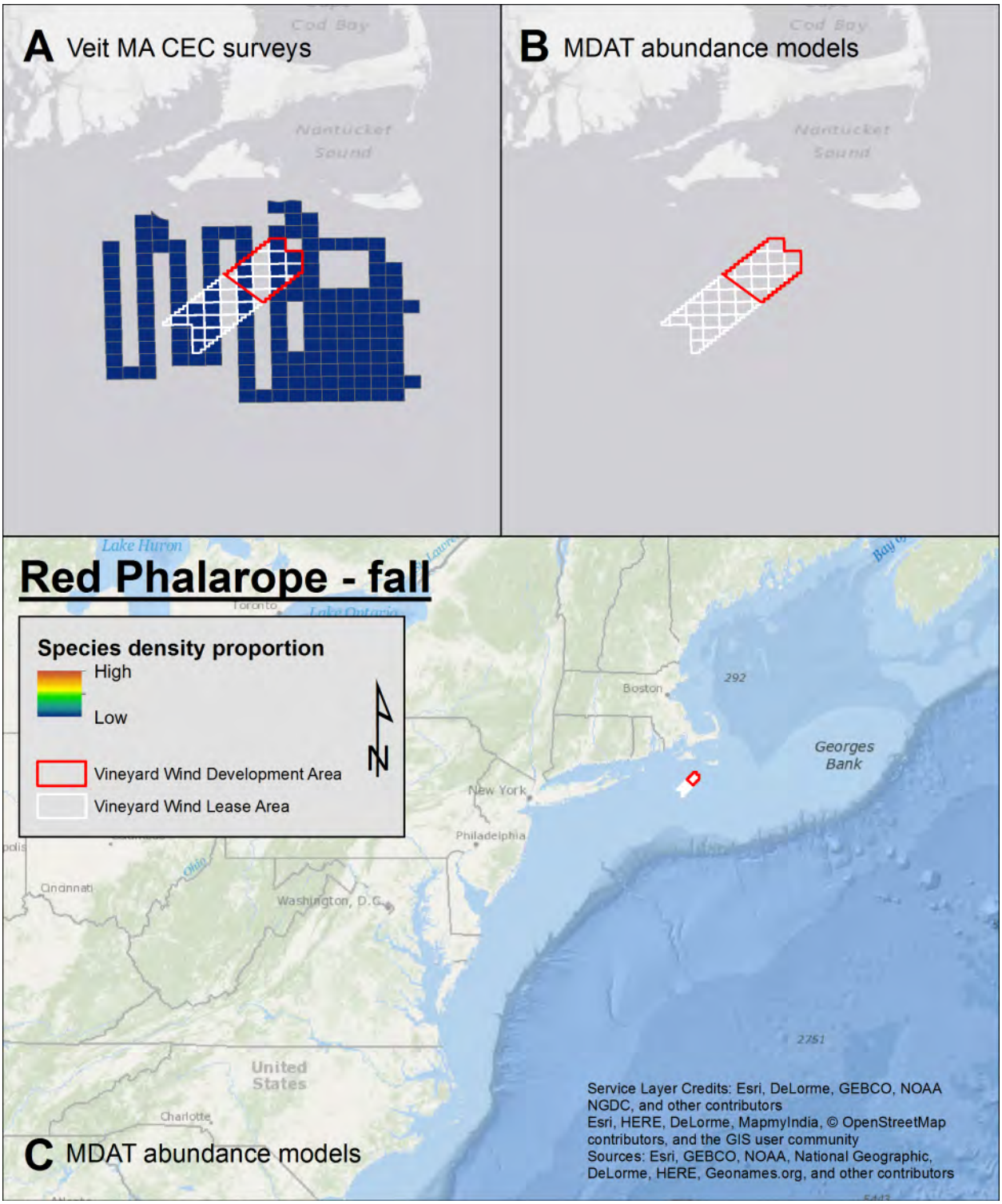

Figure 91. Fall Red Phalarope density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

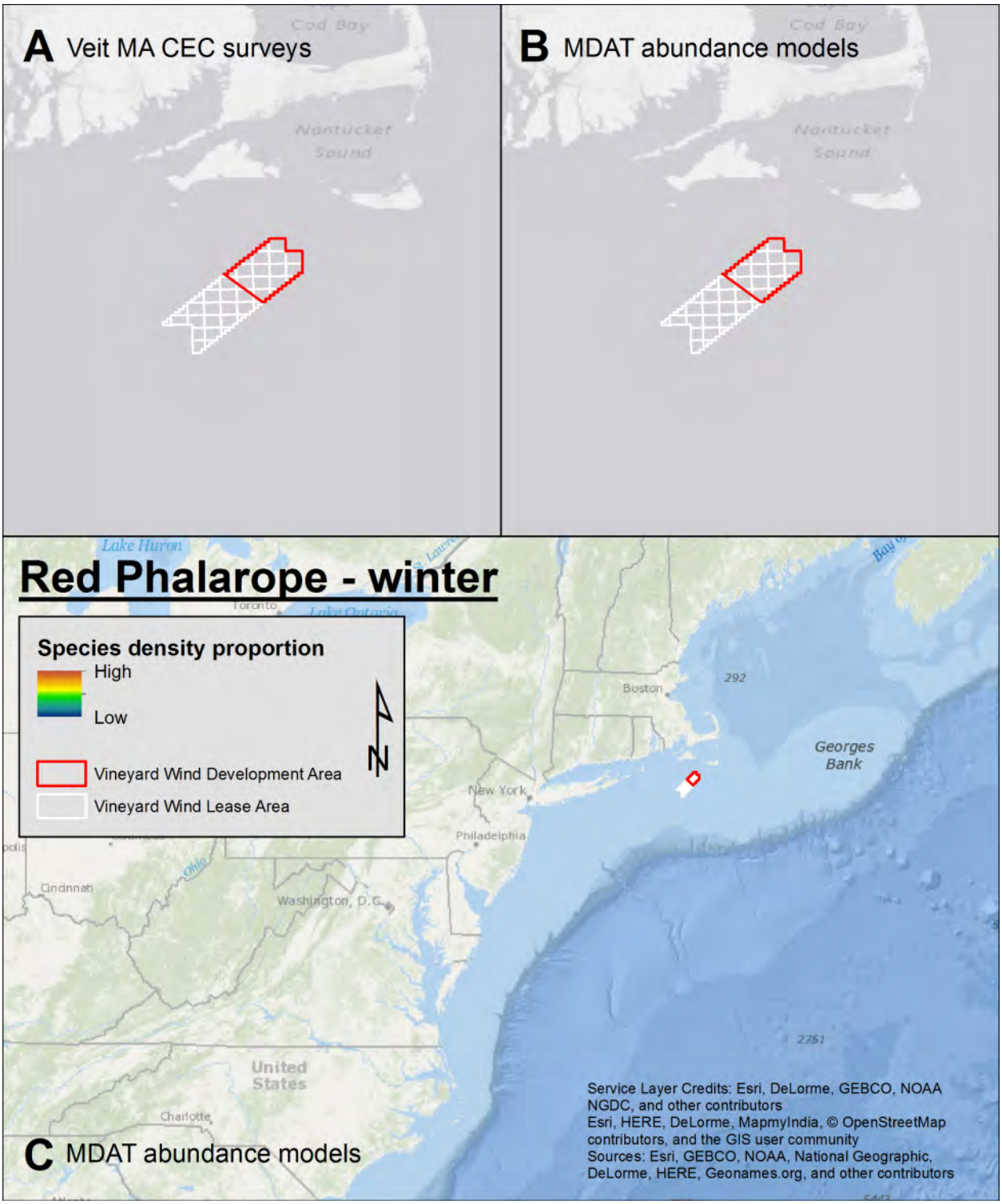

Figure 92. Winter Red Phalarope density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

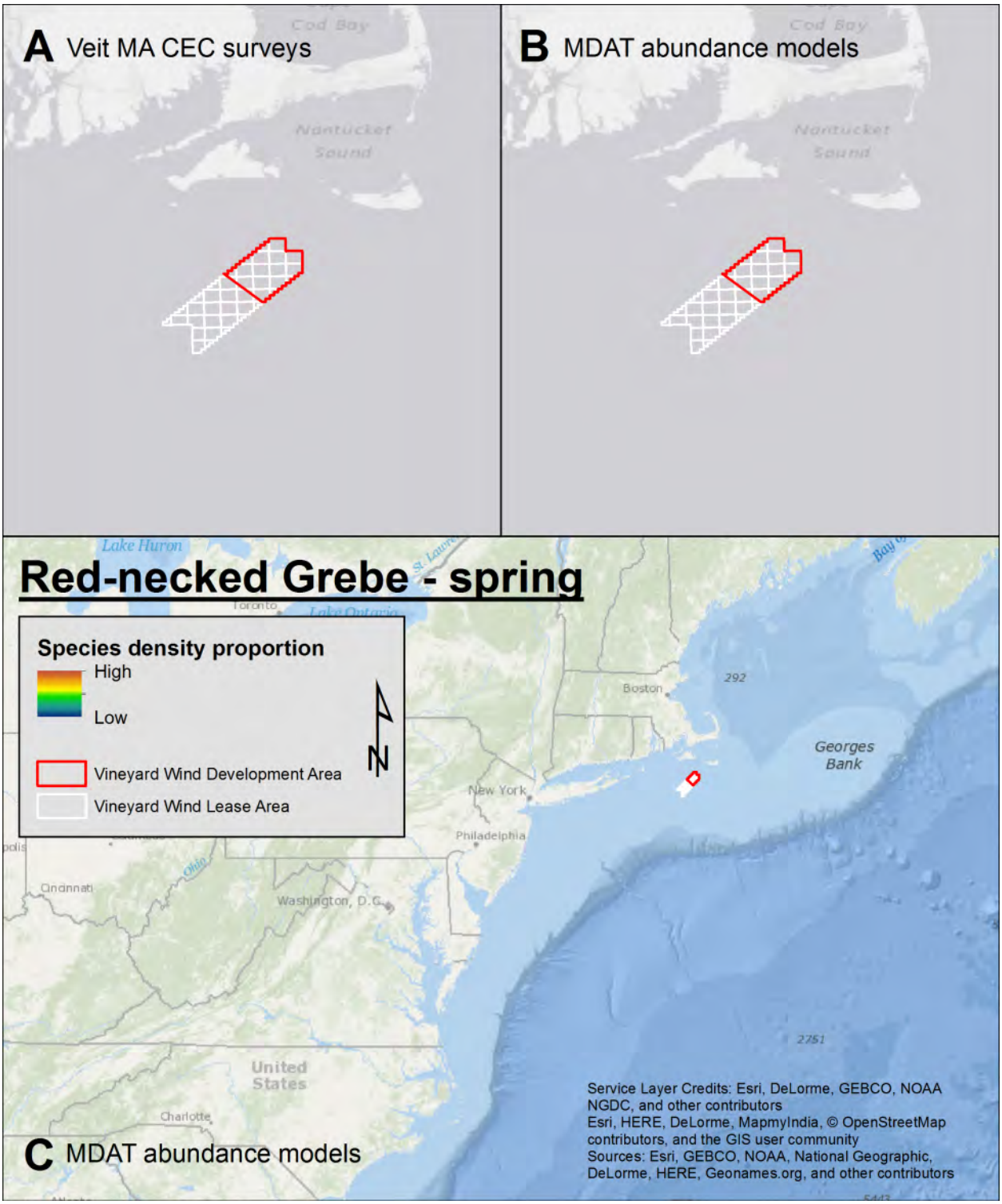

Figure 93. Spring Red-necked Grebe density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

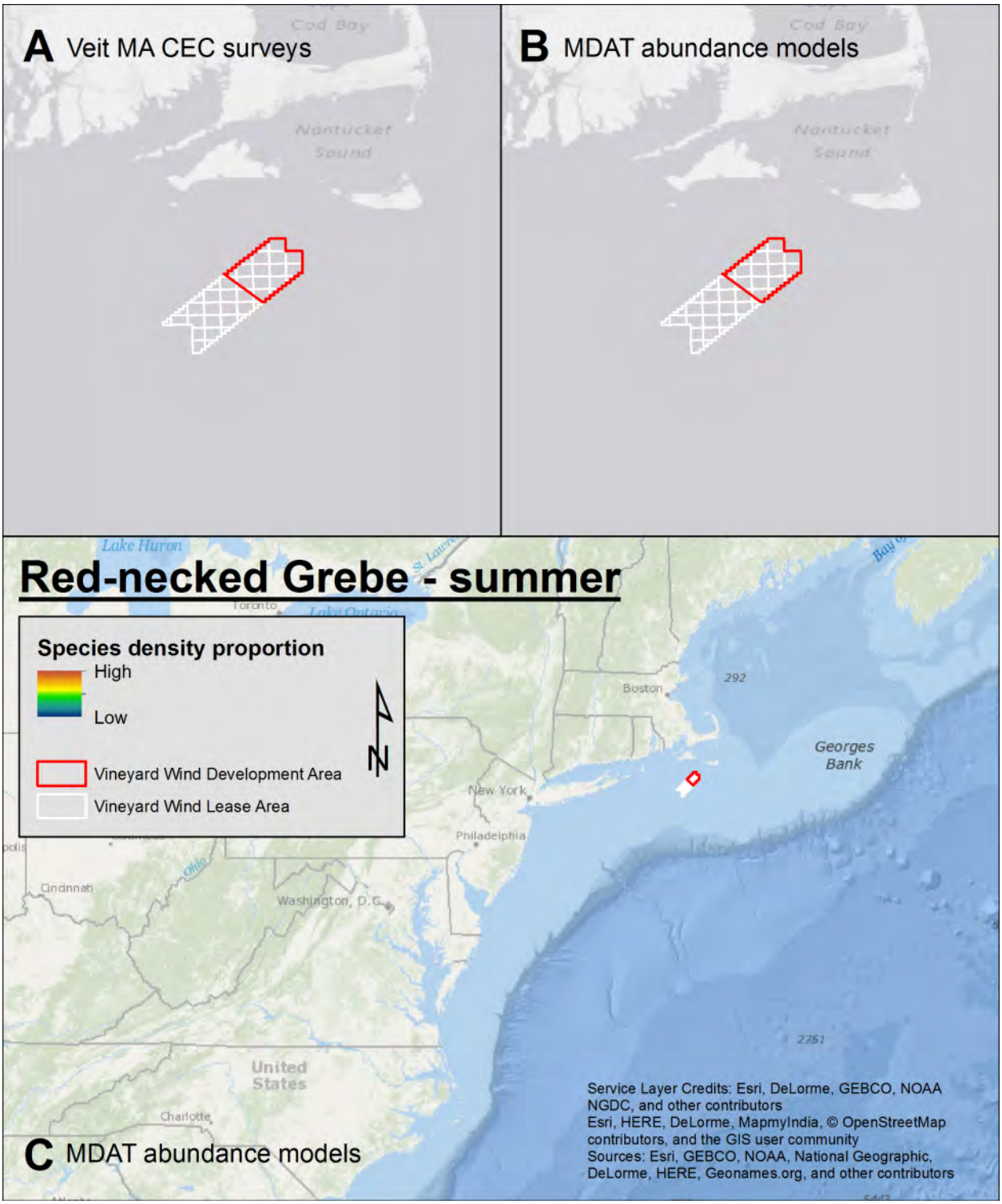

Figure 94. Summer Red-necked Grebe density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

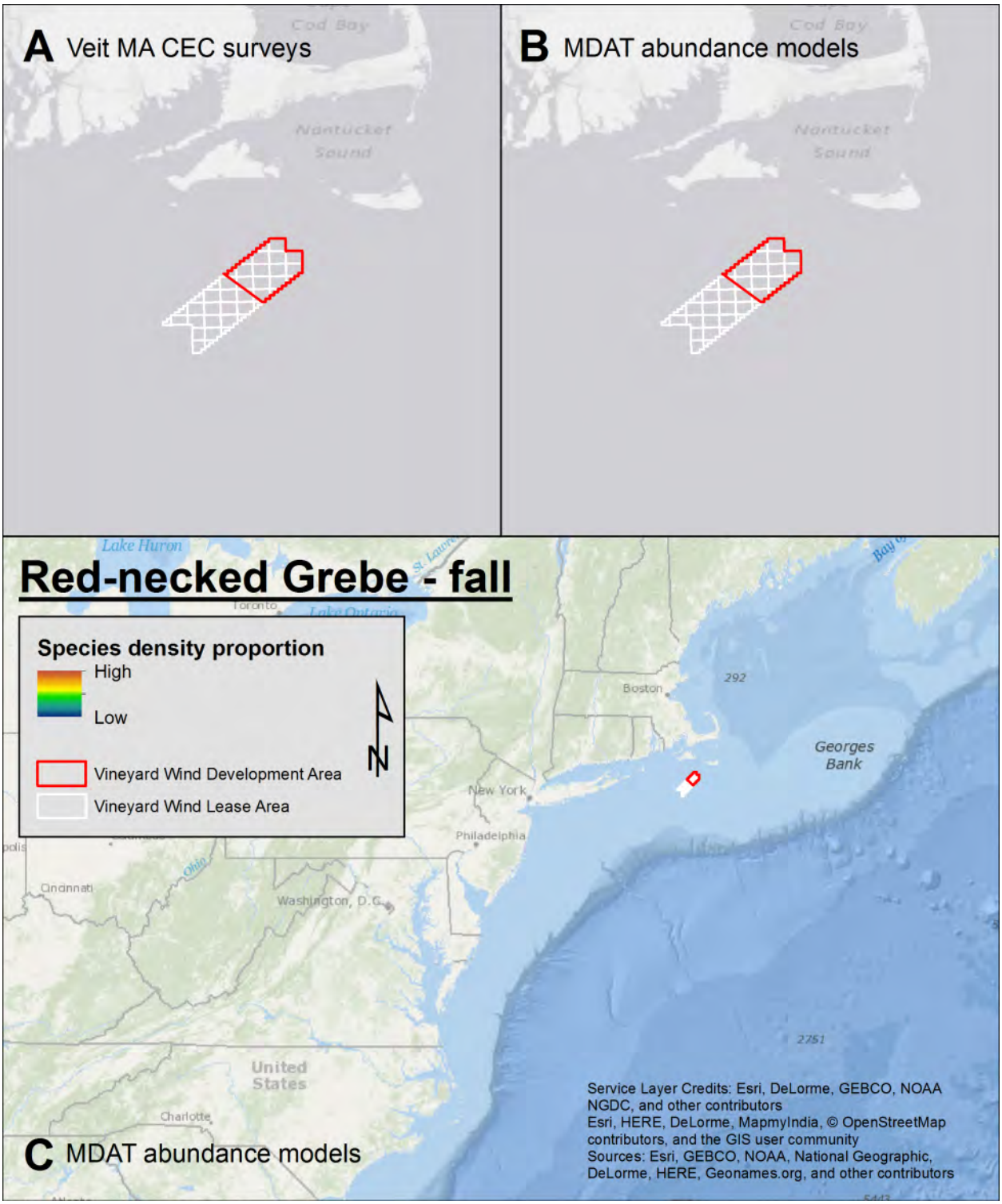

Figure 95. Fall Red-necked Grebe density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

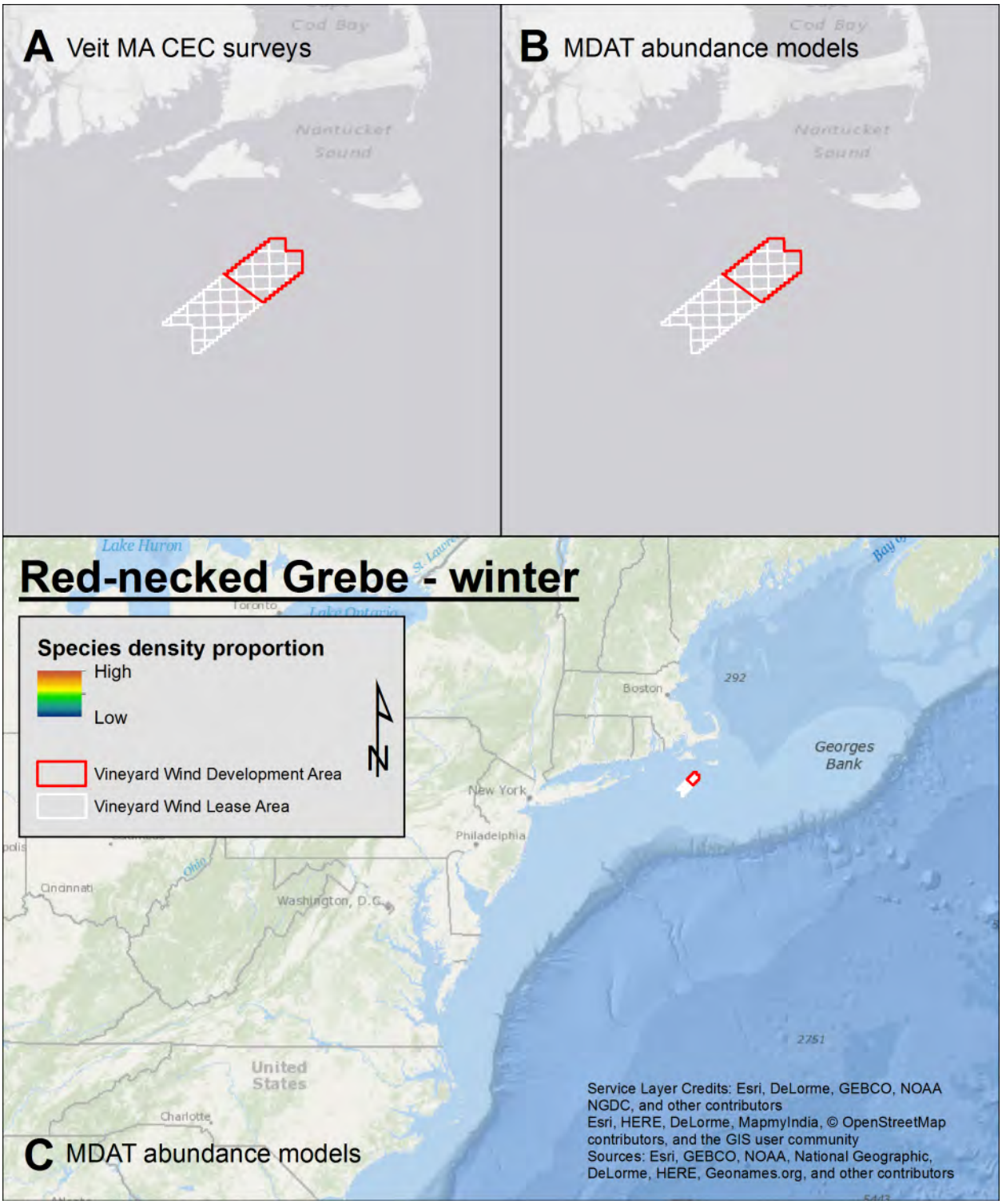

Figure 96. Winter Red-necked Grebe density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

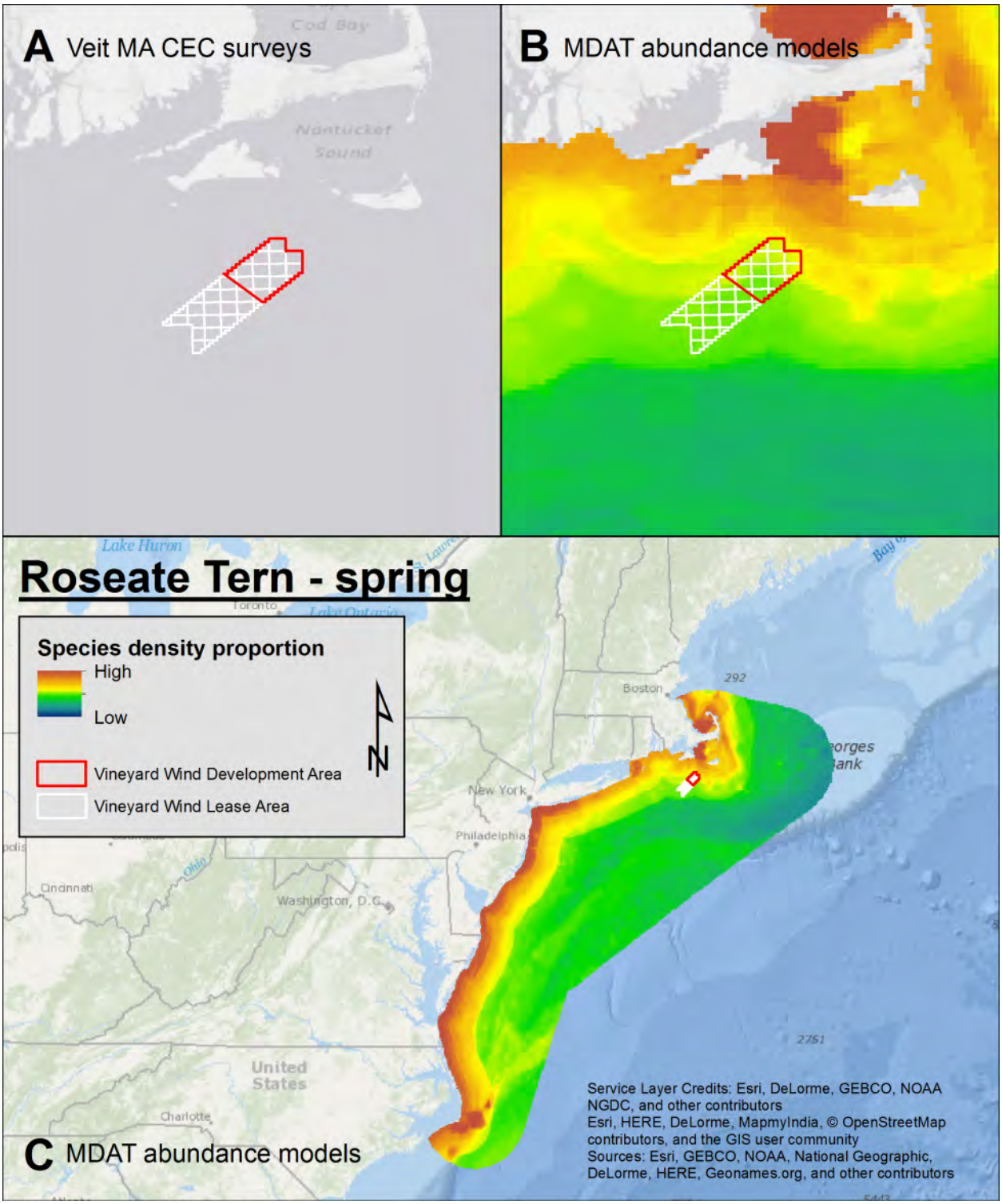

Figure 97. Spring Roseate Tern density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

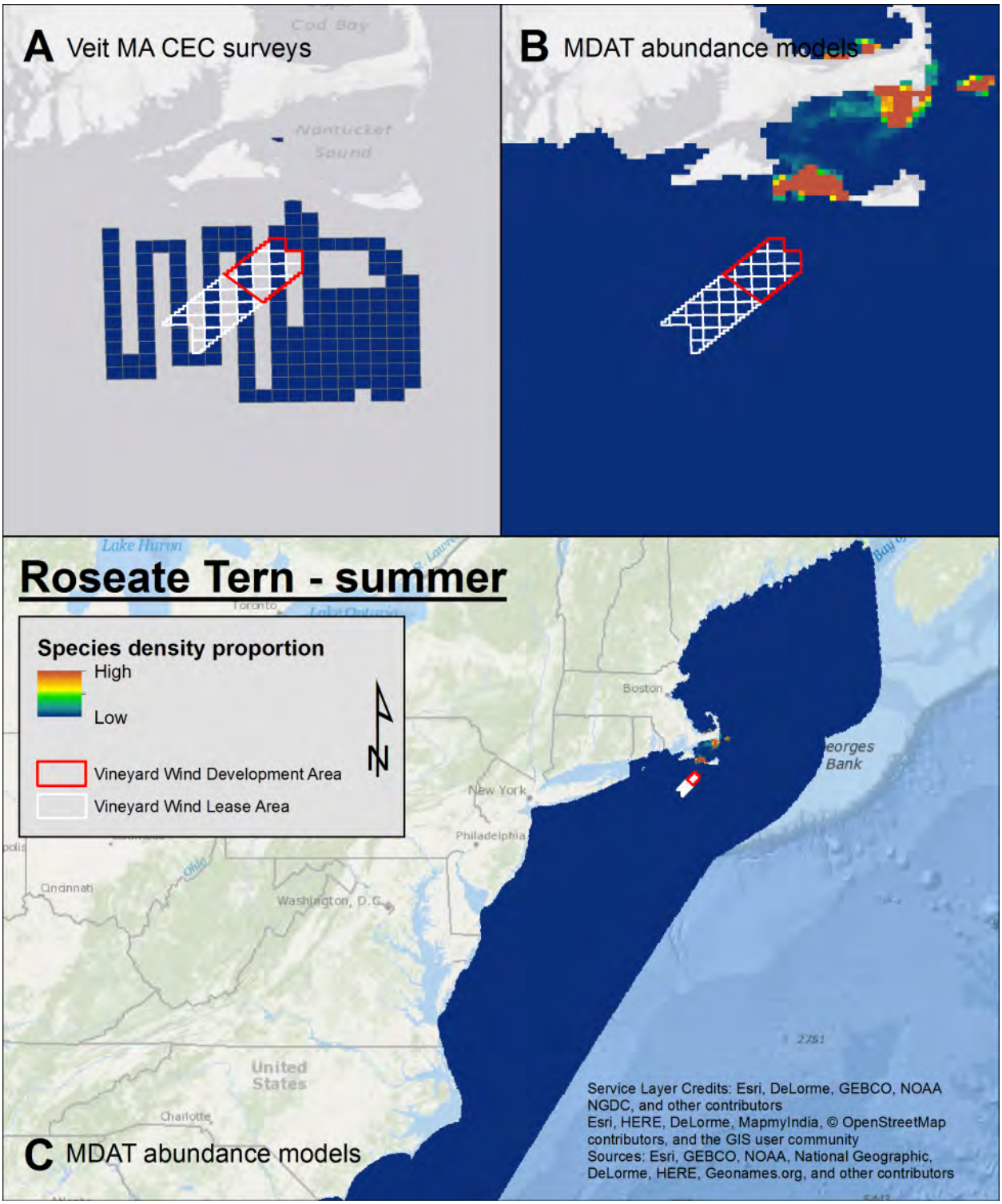

Figure 98. Summer Roseate Tern density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

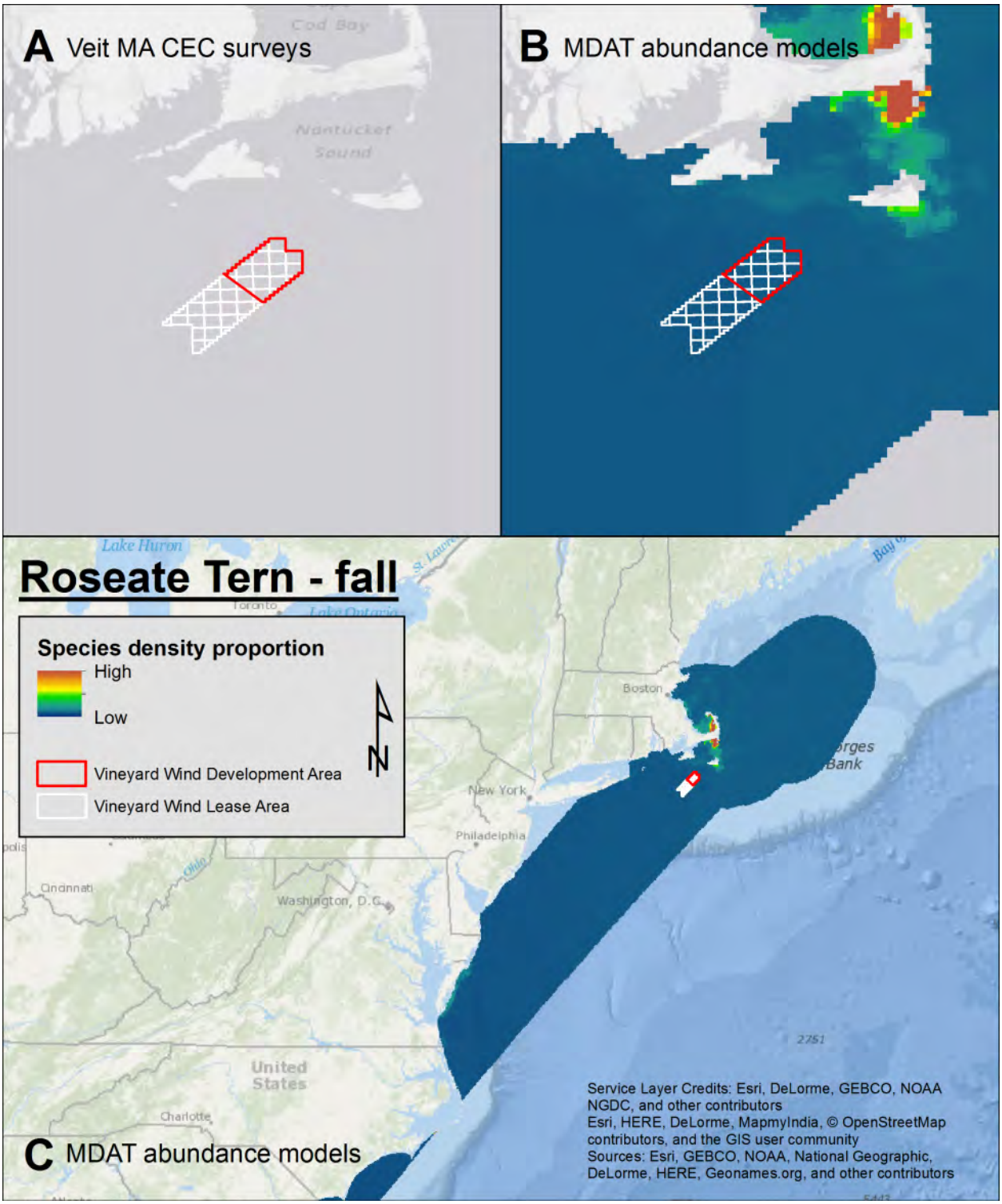

Figure 99. Fall Roseate Tern density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

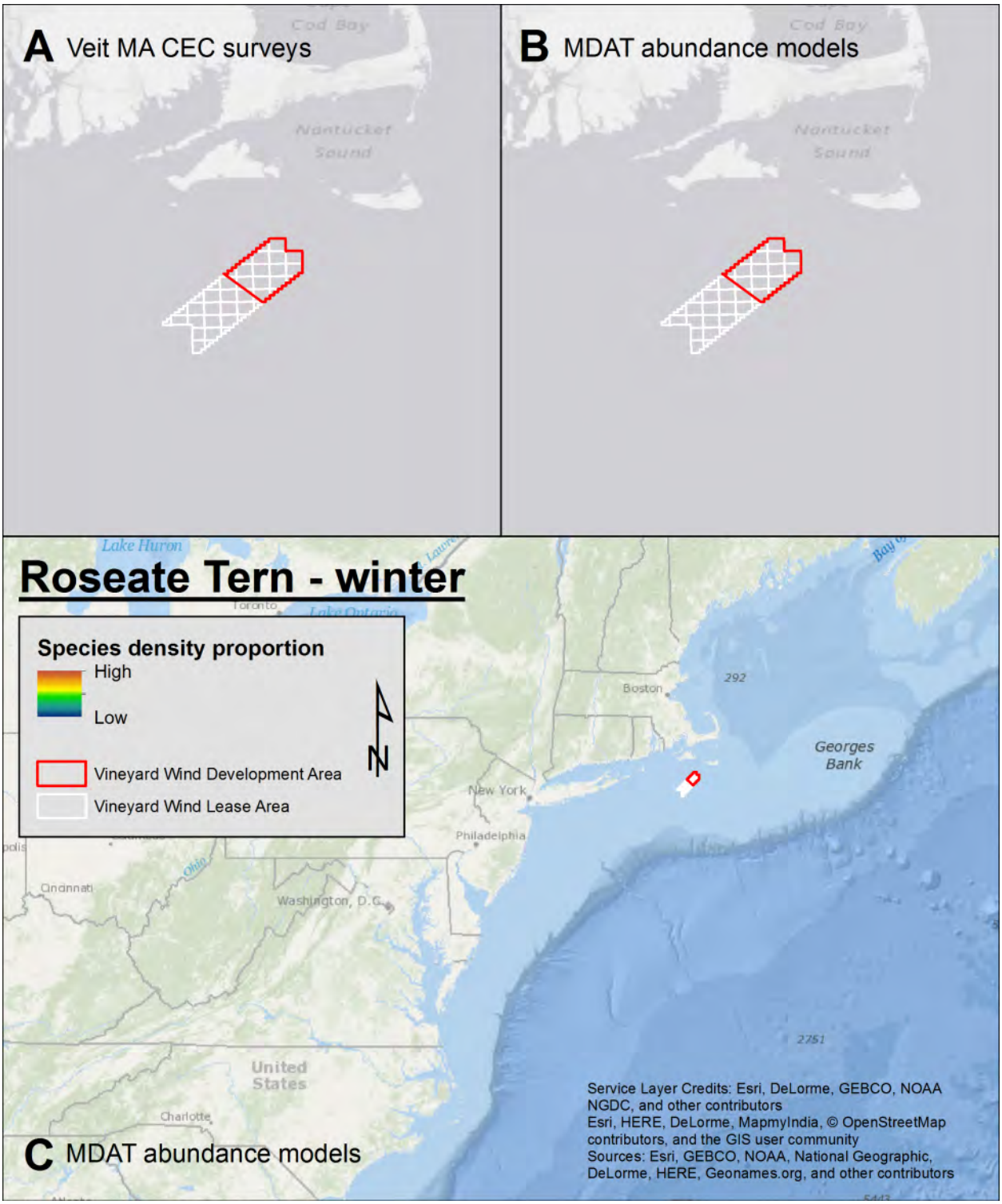

Figure 100. Winter Roseate Tern density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

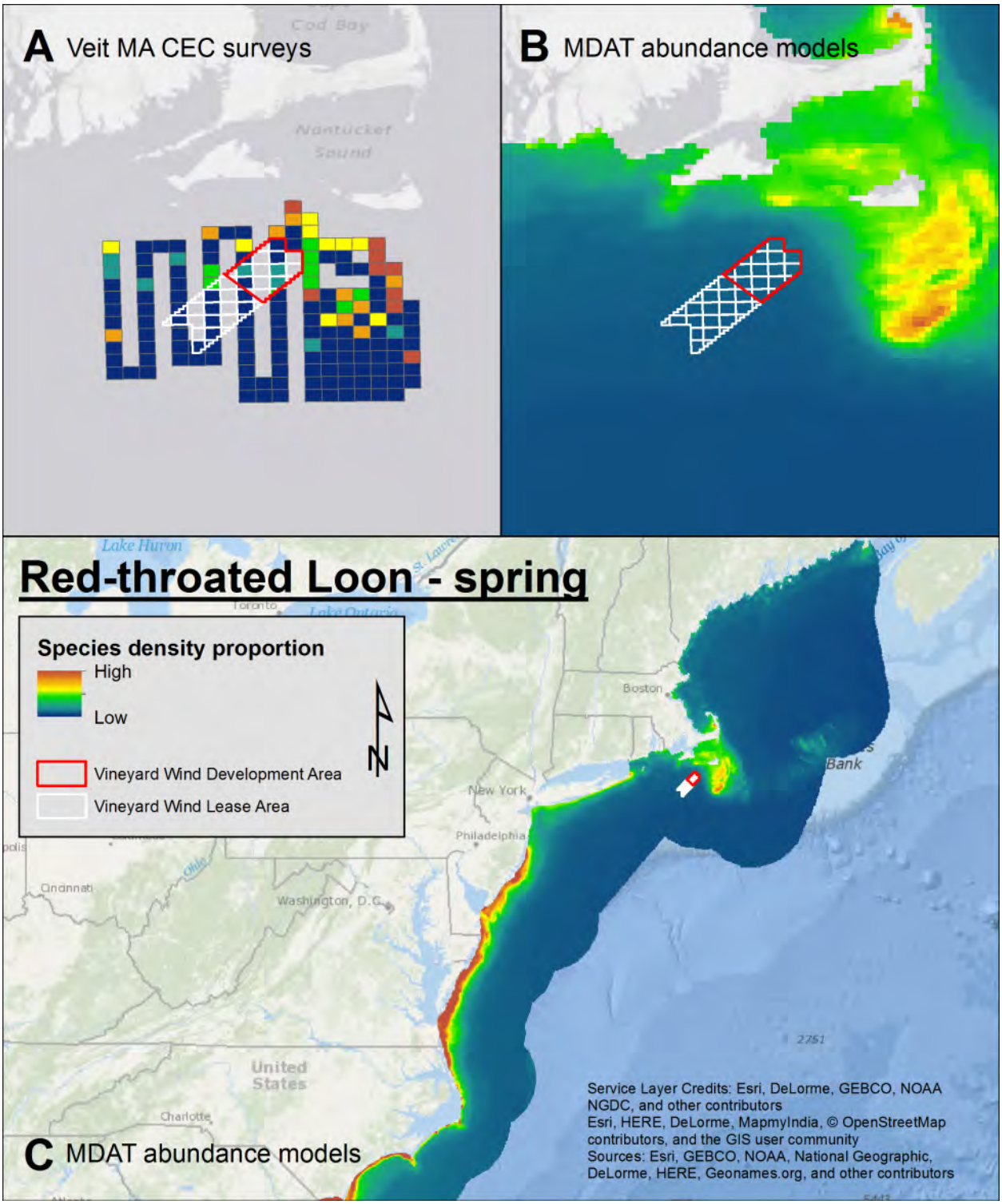

Figure 101. Spring Red-throated Loon density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

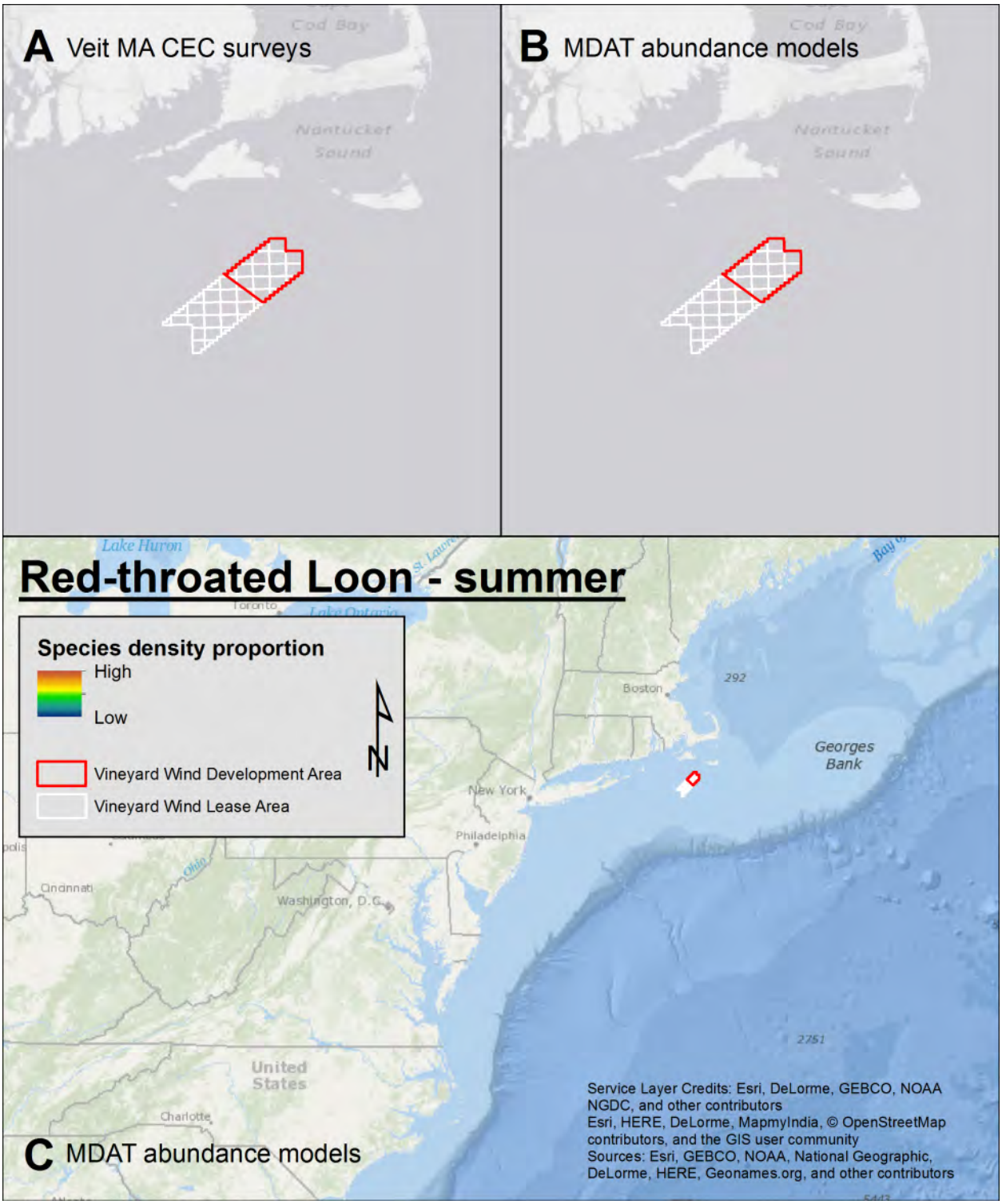

Figure 102. Summer Red-throated Loon density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

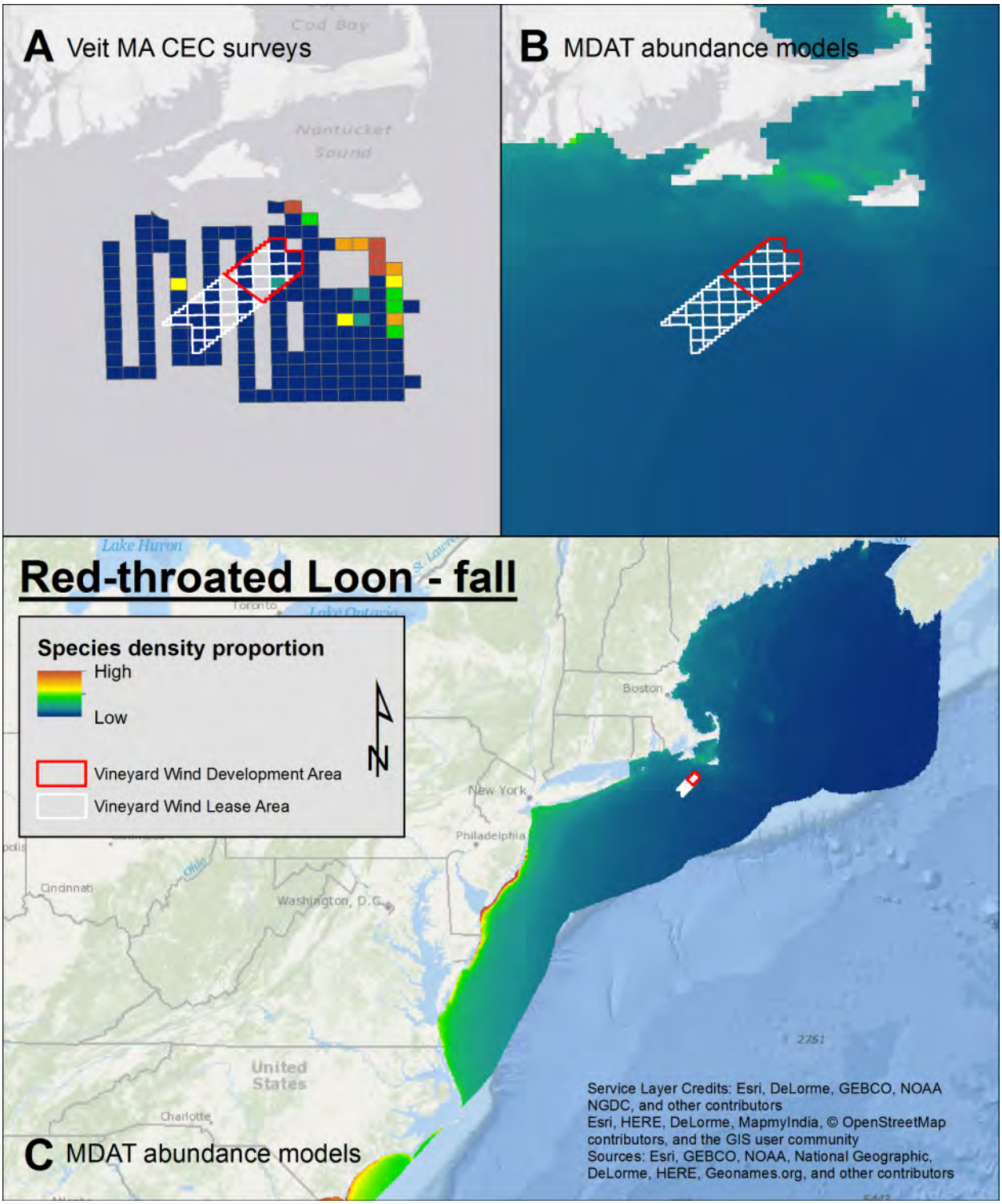

Figure 103. Fall Red-throated Loon density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

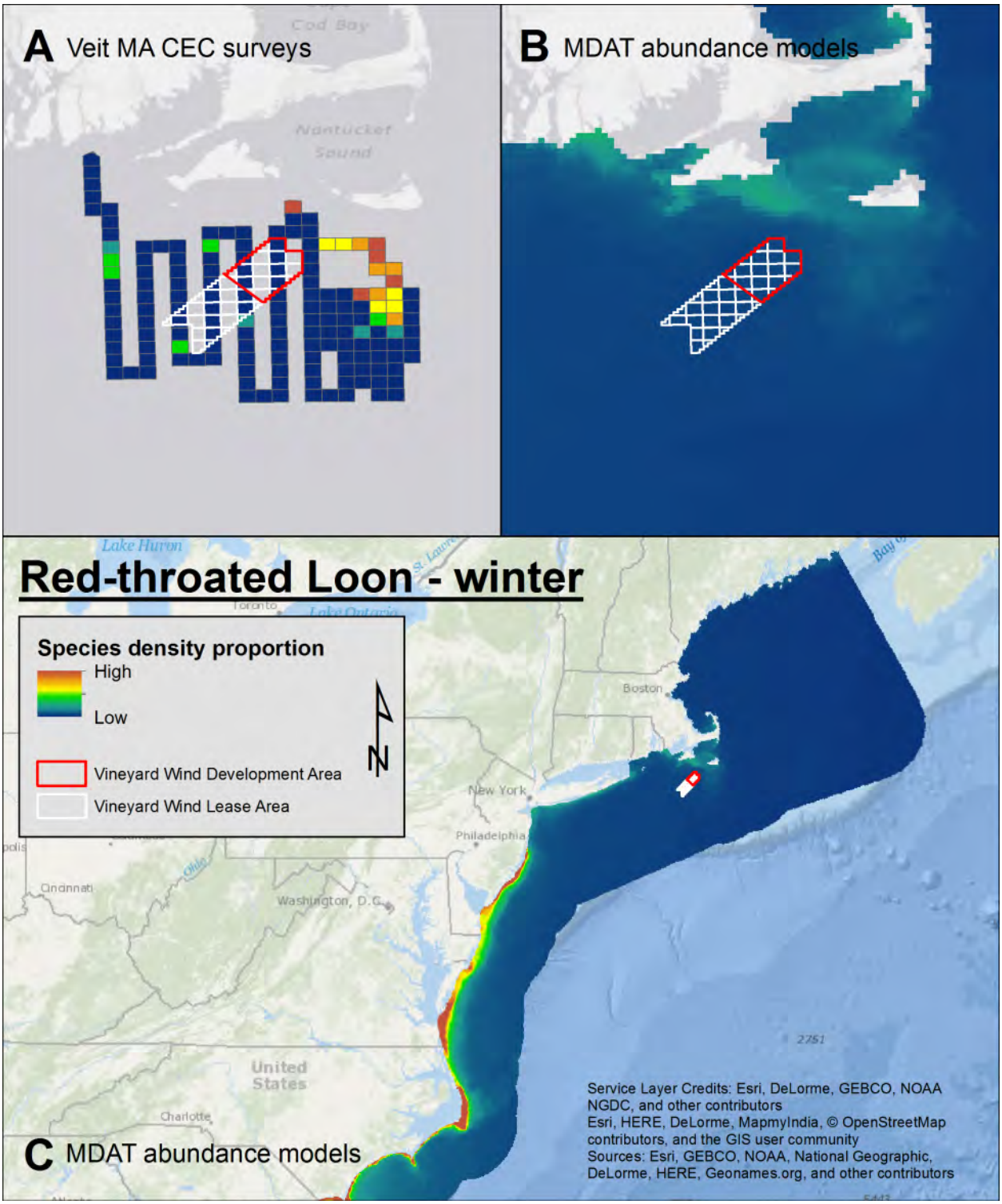

Figure 104. Winter Red-throated Loon density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

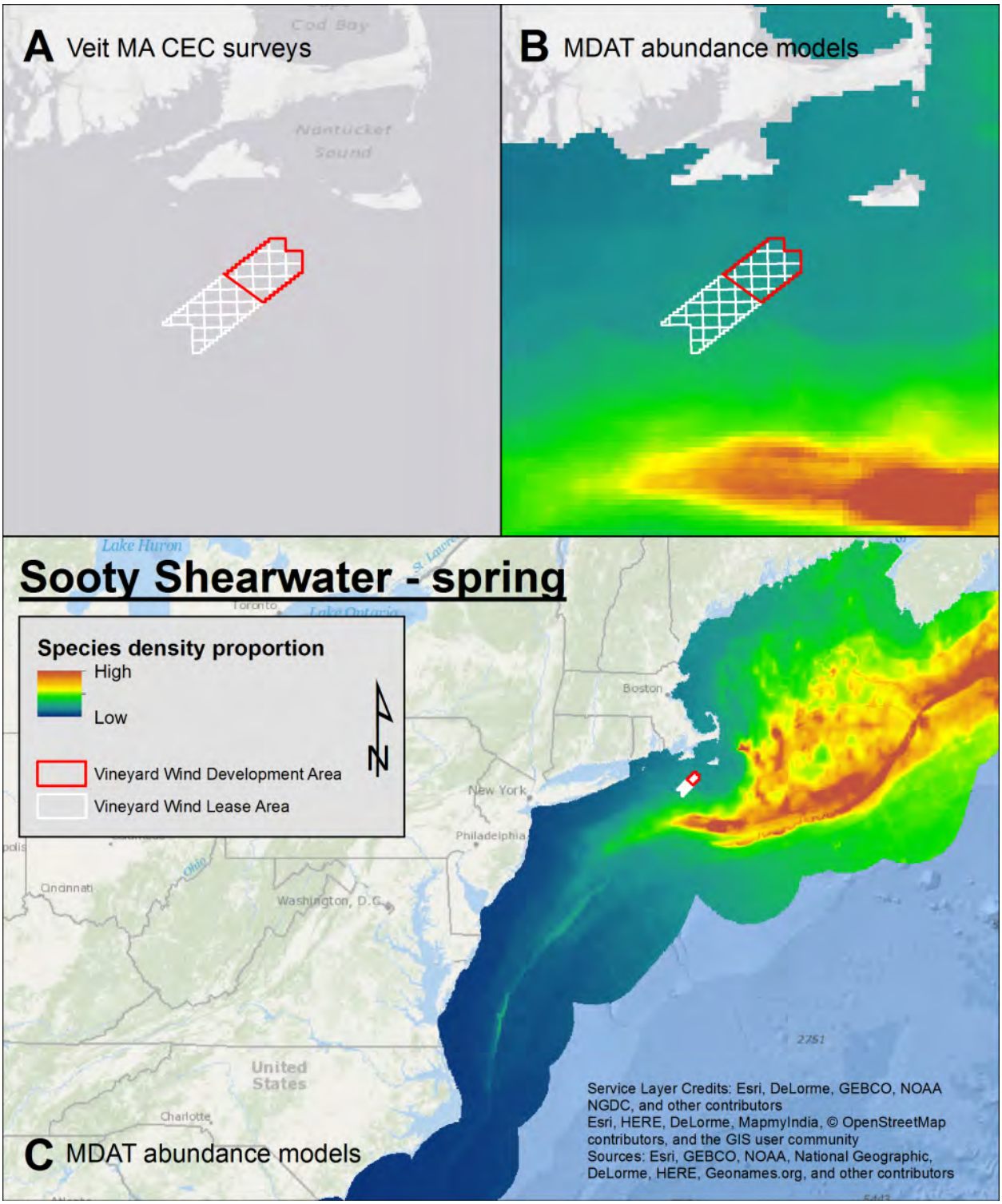

Figure 105. Spring Sooty Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

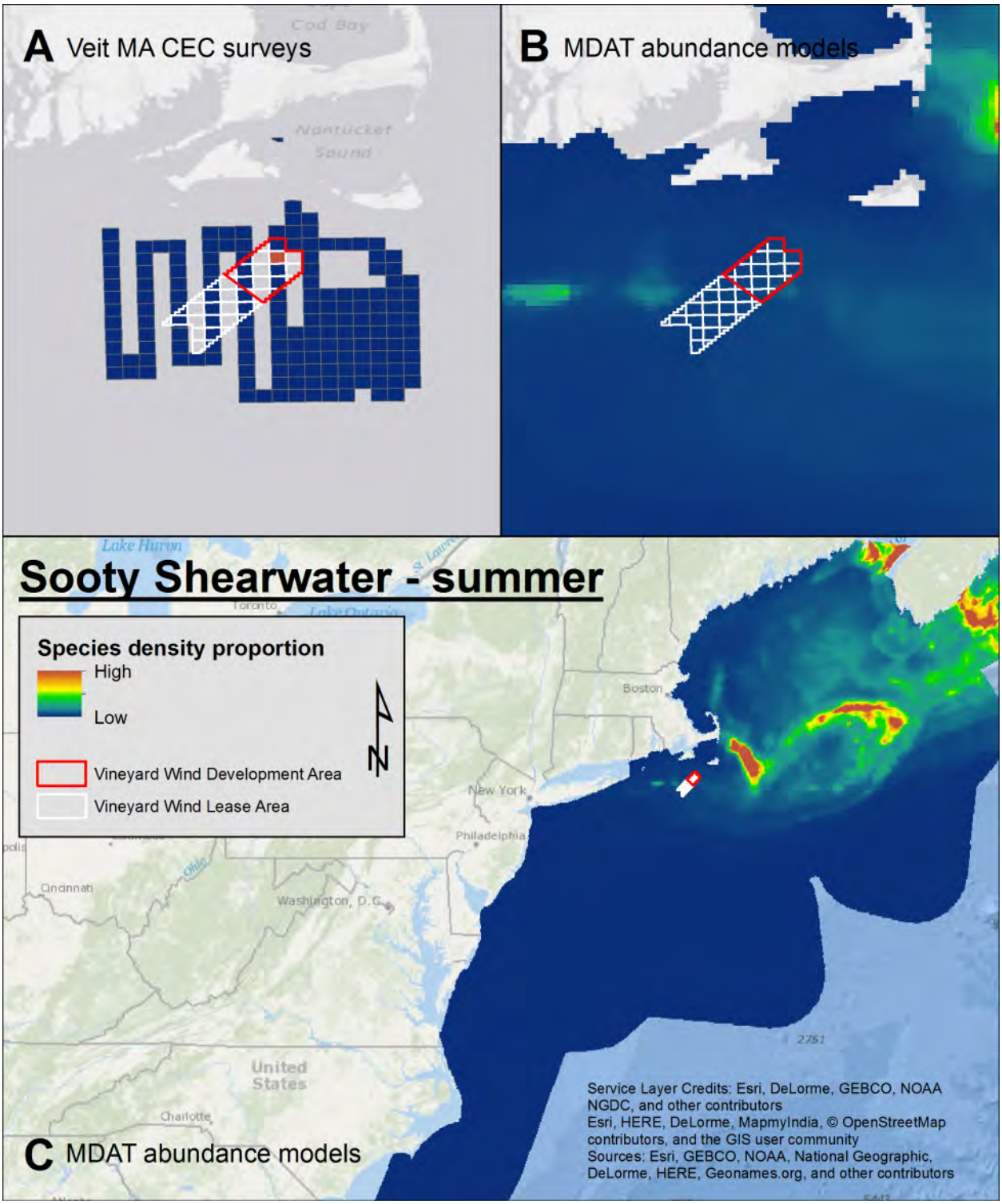

Figure 106. Summer Sooty Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

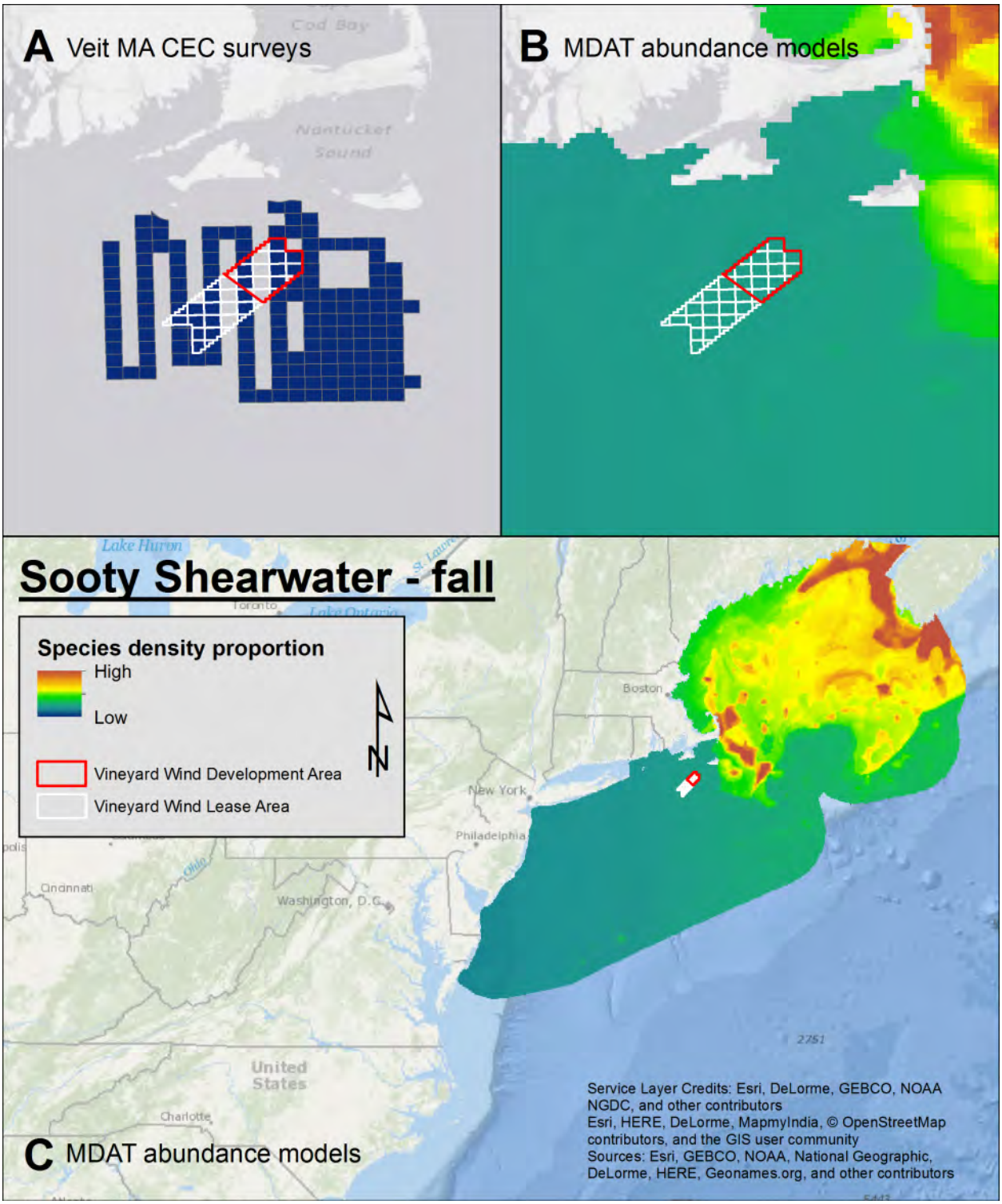

Figure 107. Fall Sooty Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

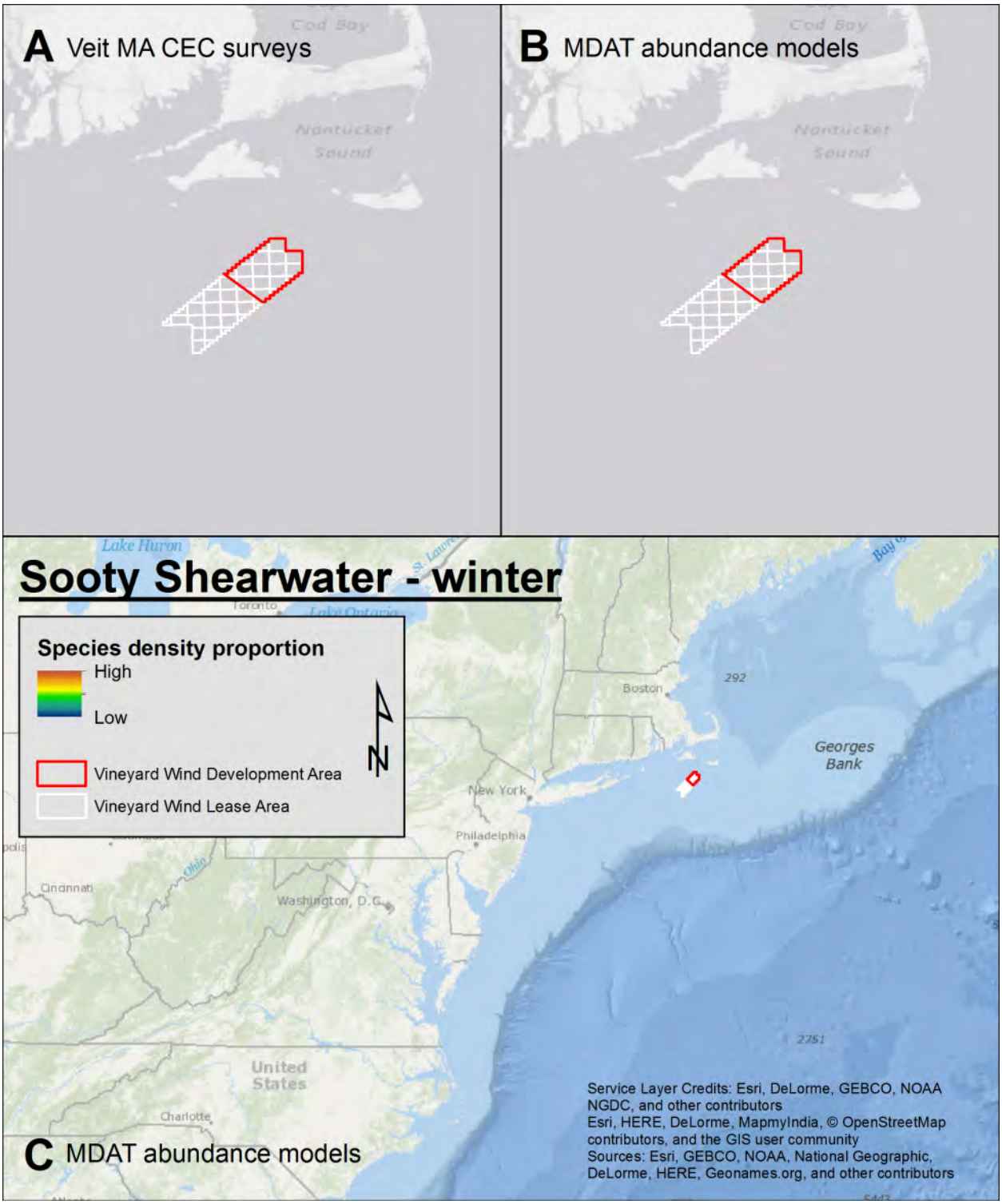

Figure 108. Spring Sooty Shearwater density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

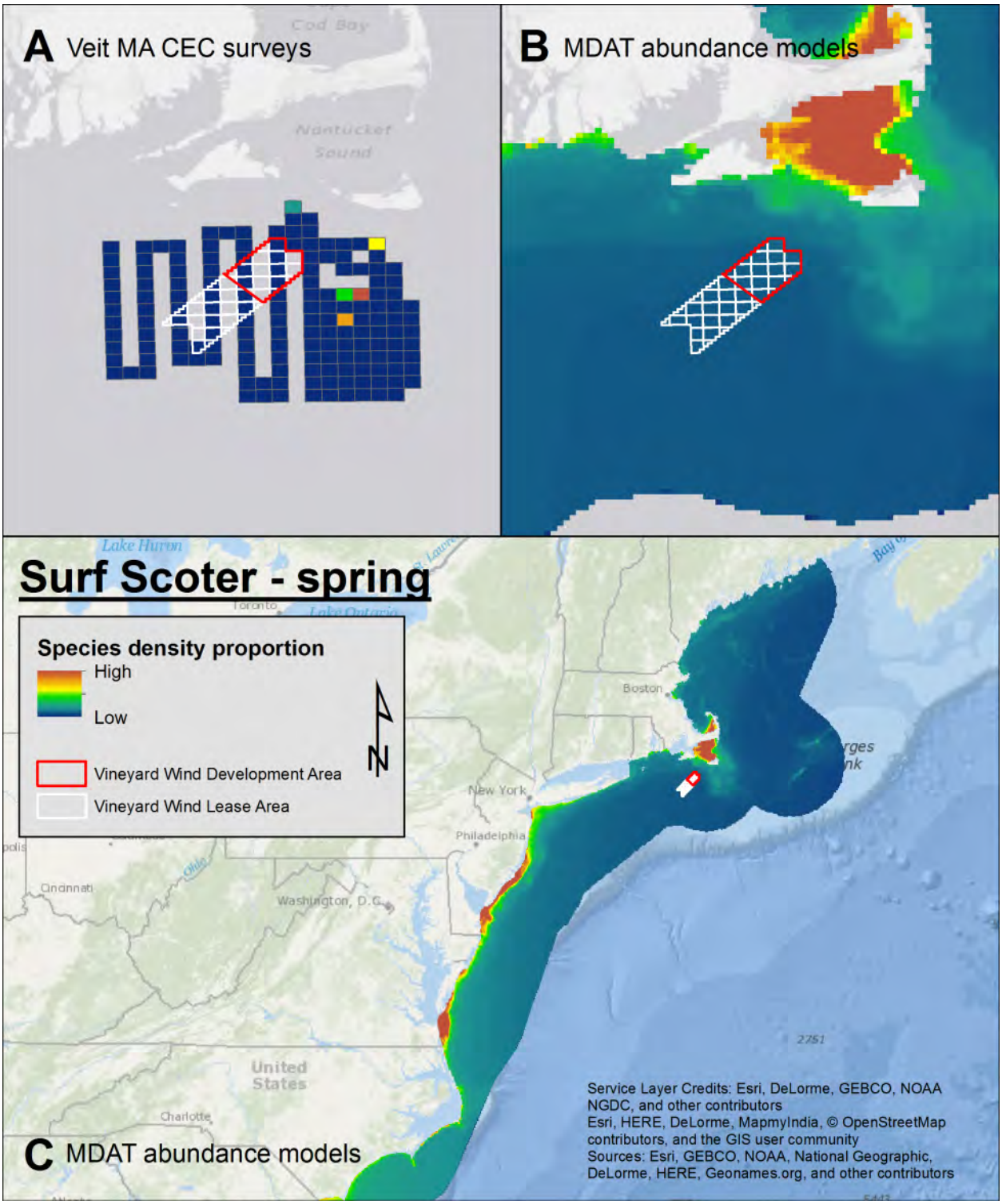

Figure 109. Spring Surf Scoter density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

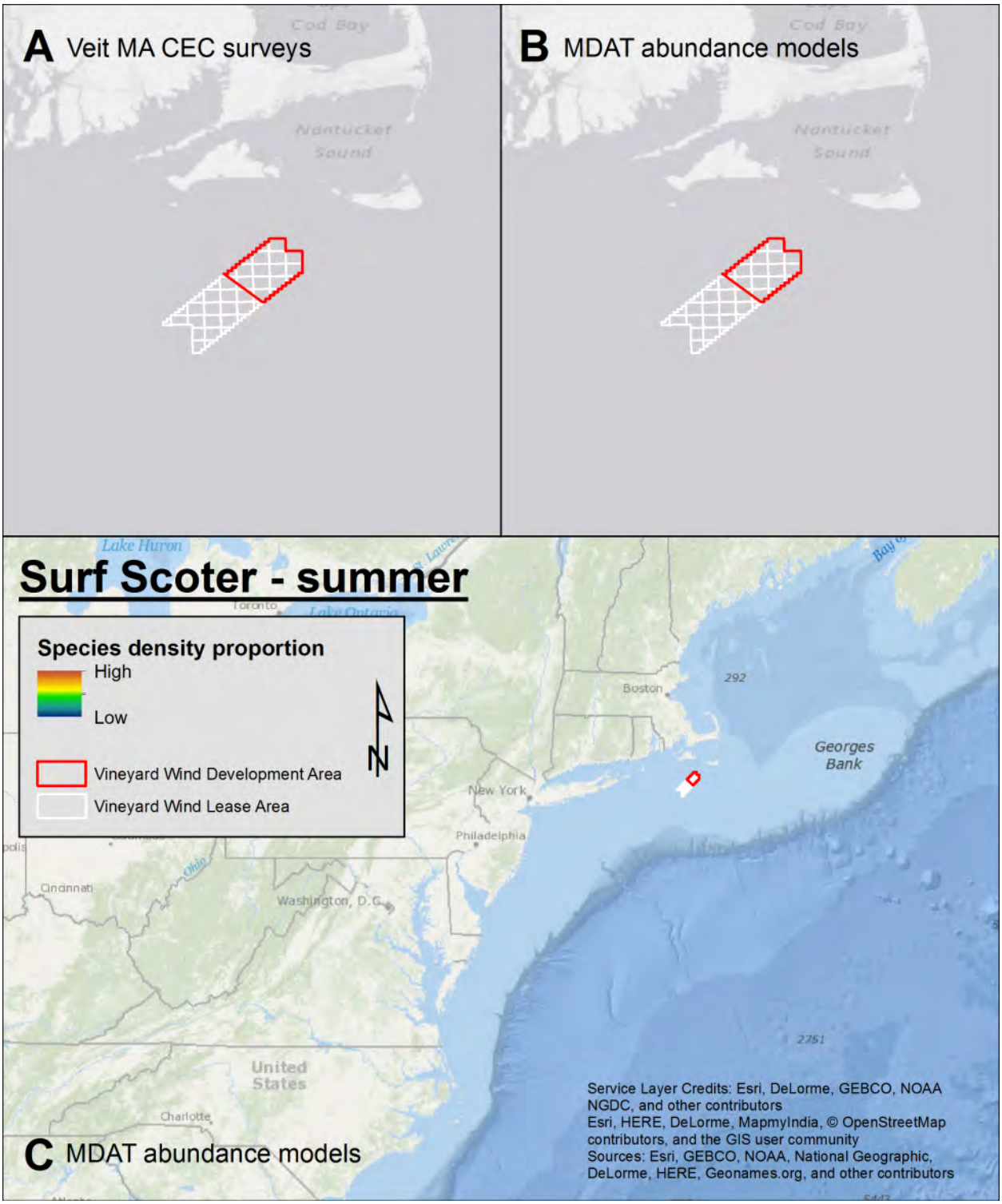

Figure 110. Summer Surf Scoter density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

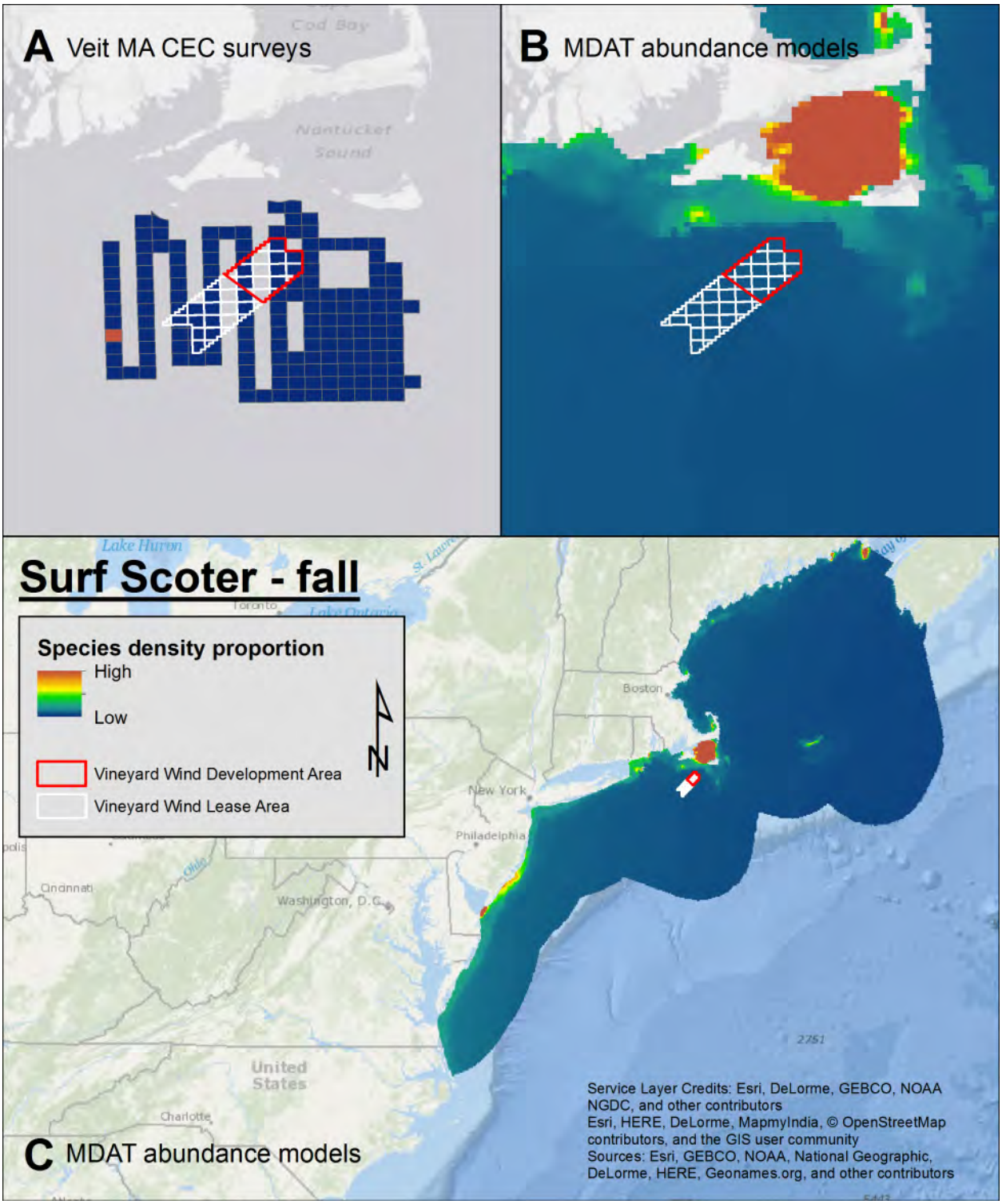

Figure 111. Fall Surf Scoter density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

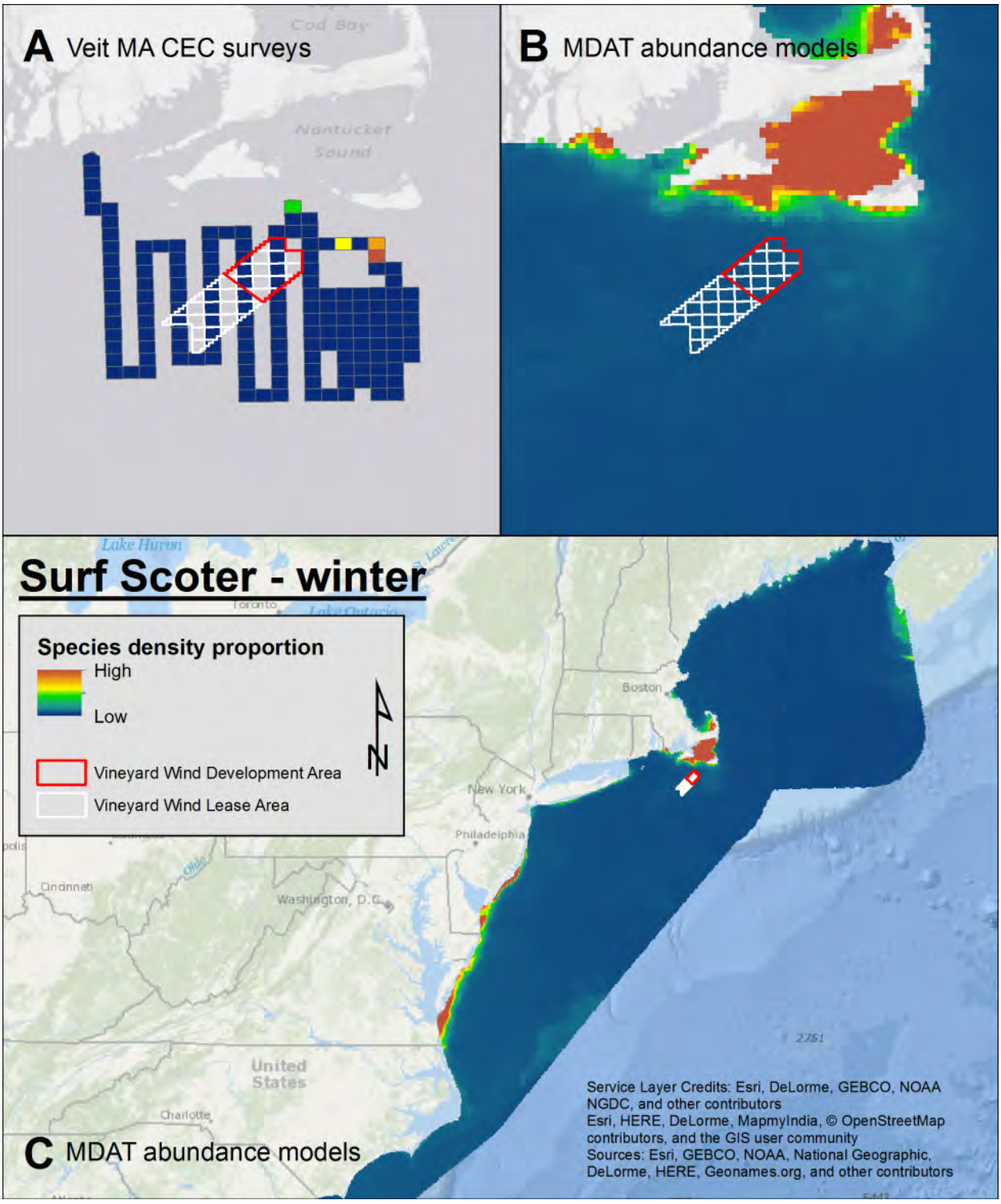

Figure 112. Winter Surf Scoter density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

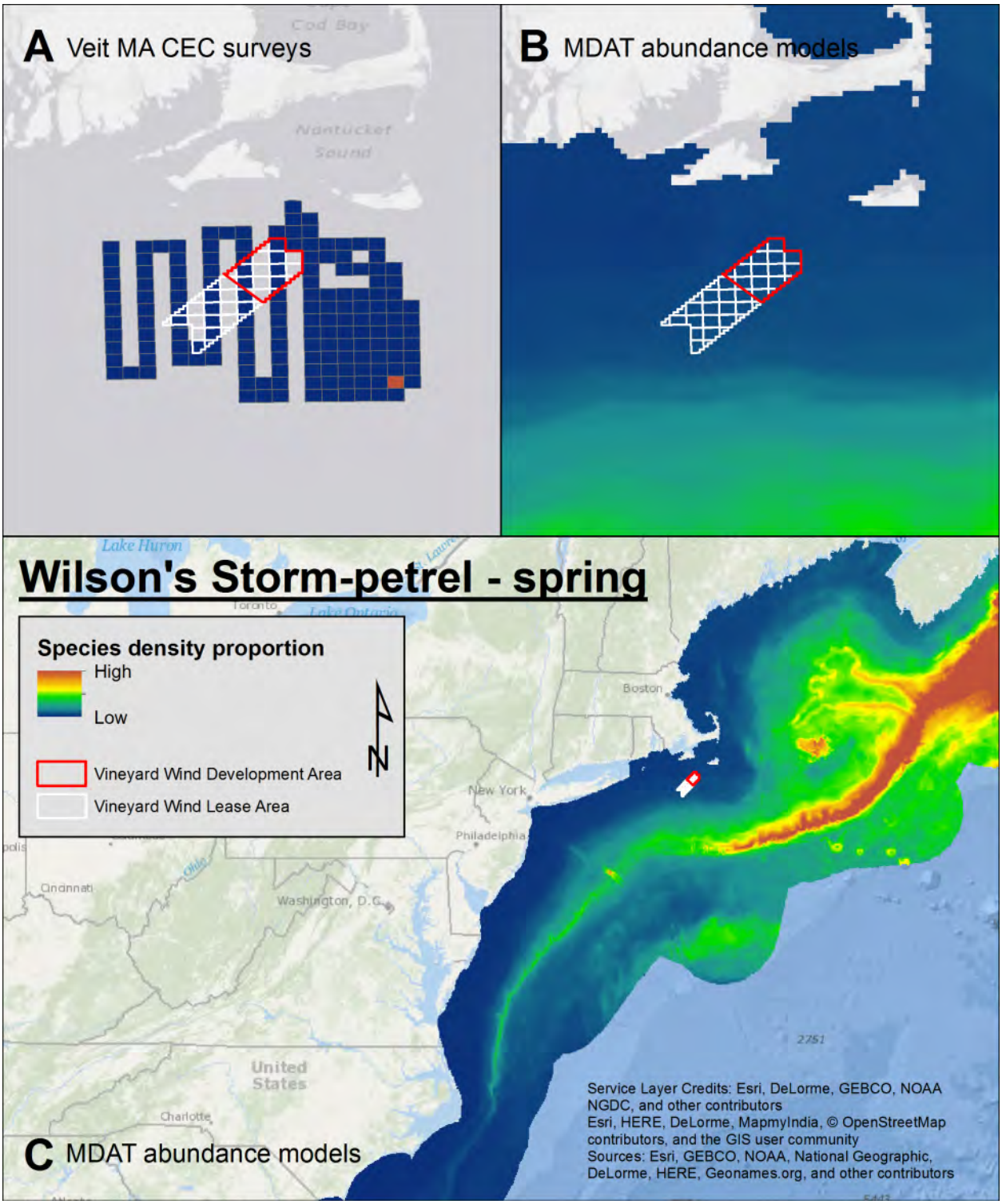

Figure 113. Spring Wilson's Storm-petrel density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

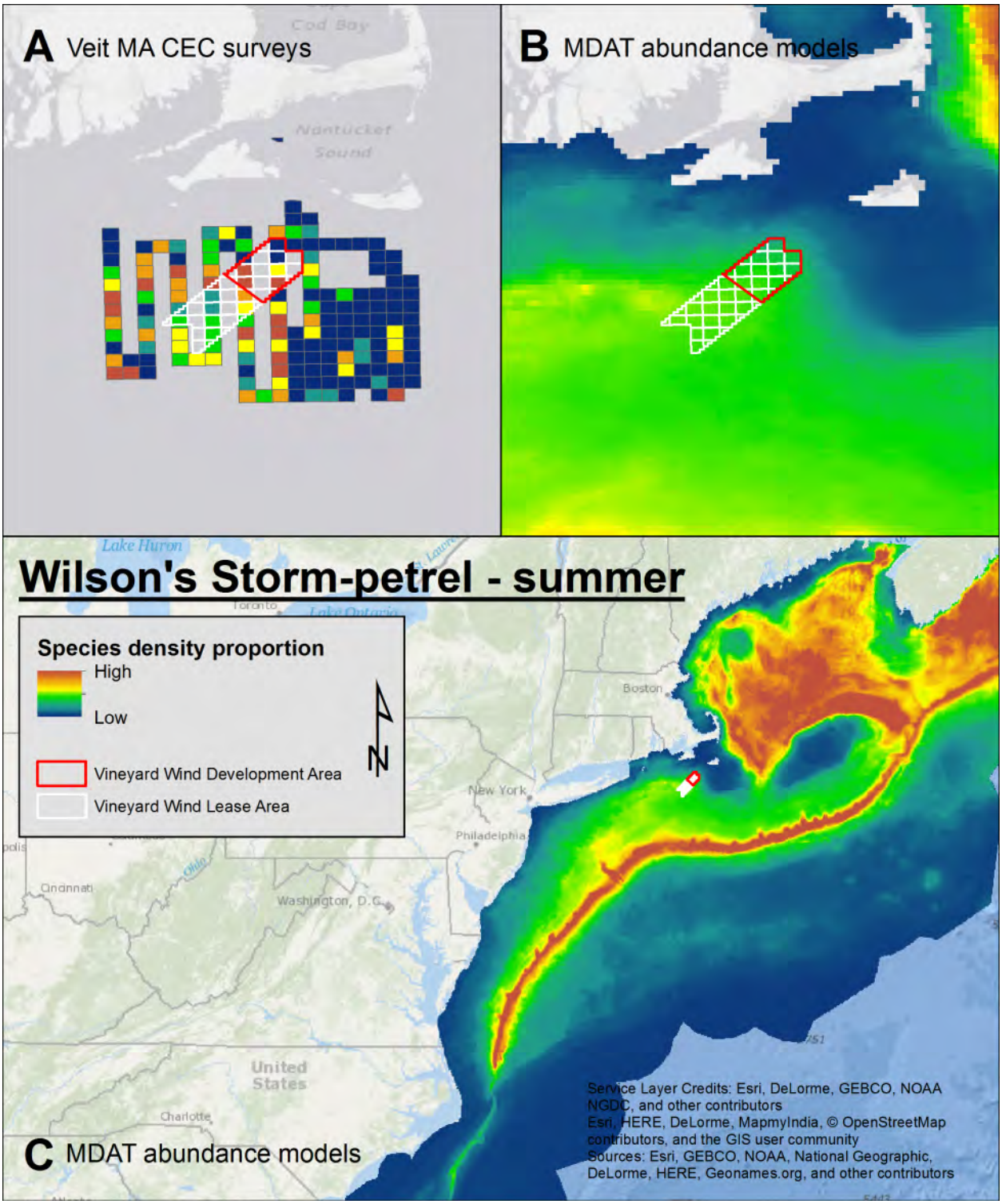

Figure 114. Summer Wilson's Storm-petrel density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

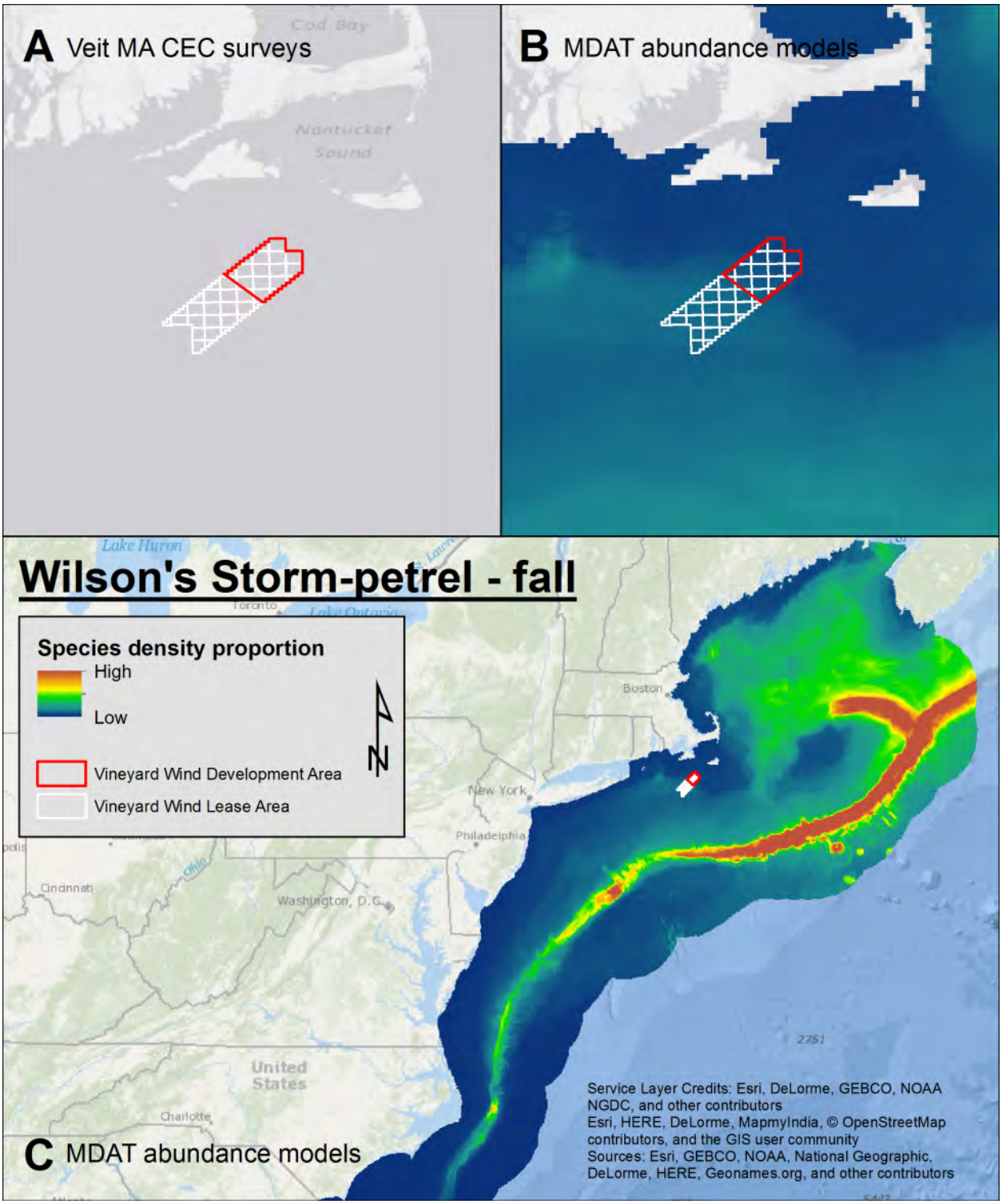

Figure 115. Fall Wilson's Storm-petrel density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

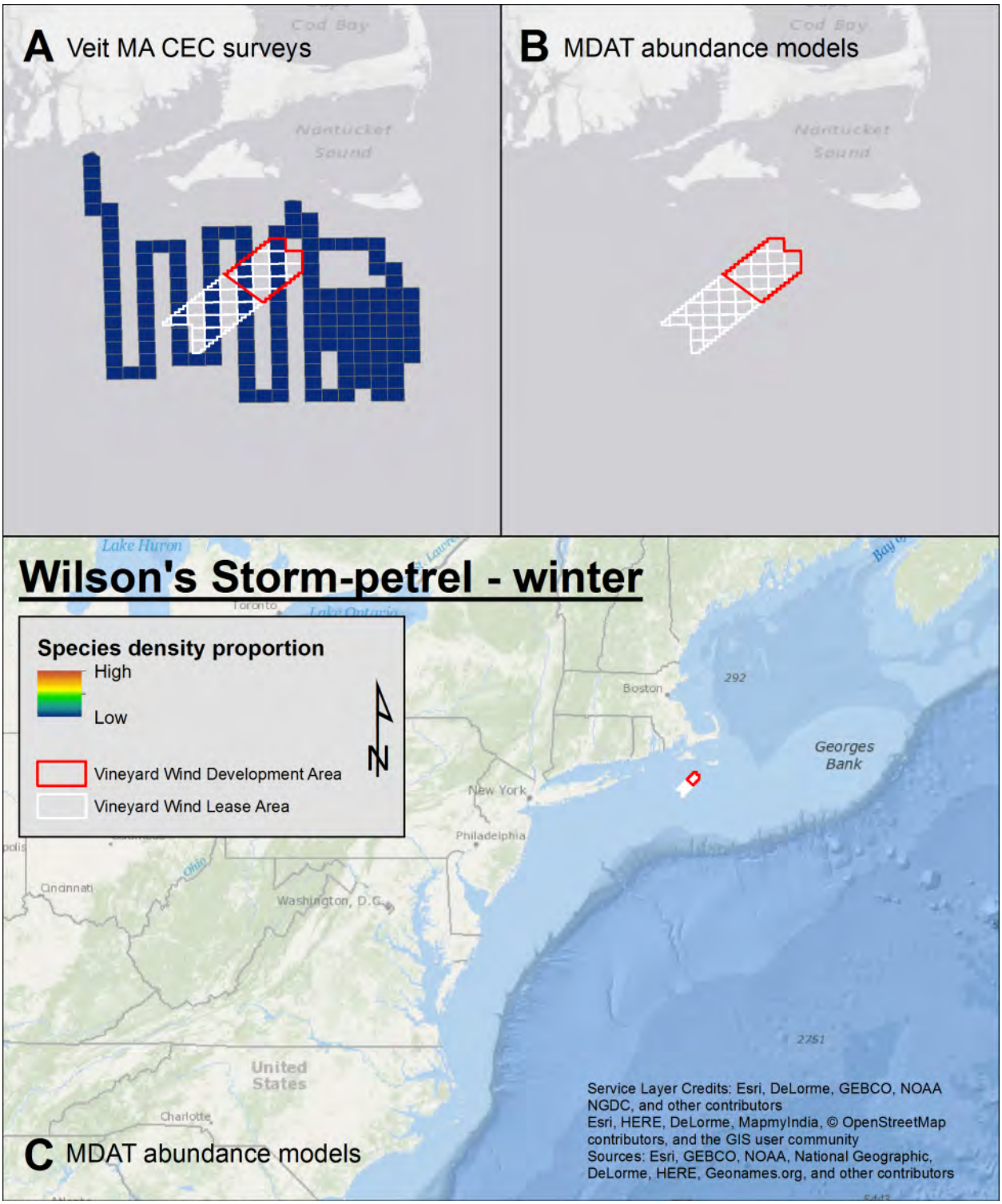

Figure 116. Winter Wilson's Storm-petrel density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

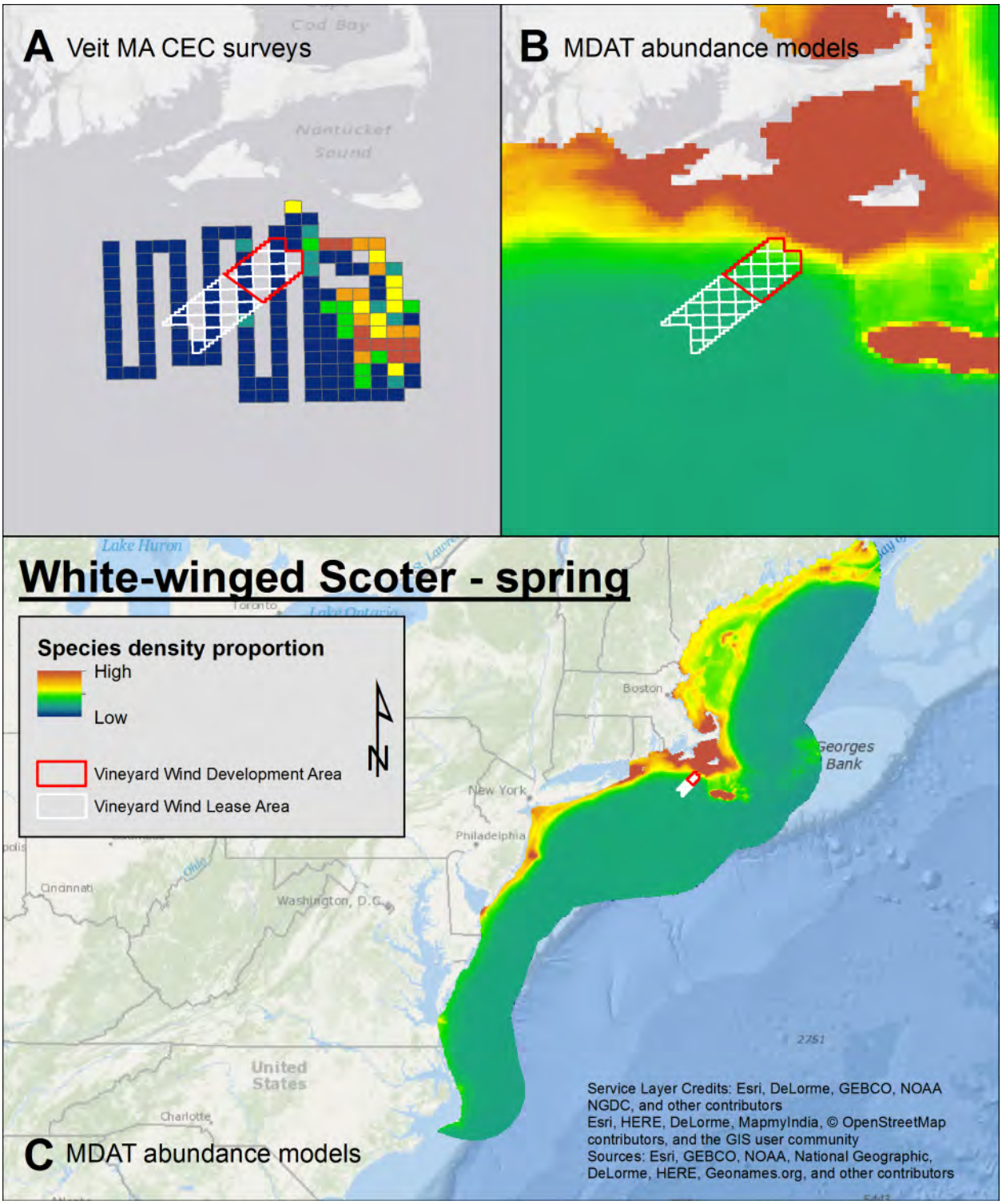

Figure 117. Spring White-winged Scoter density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

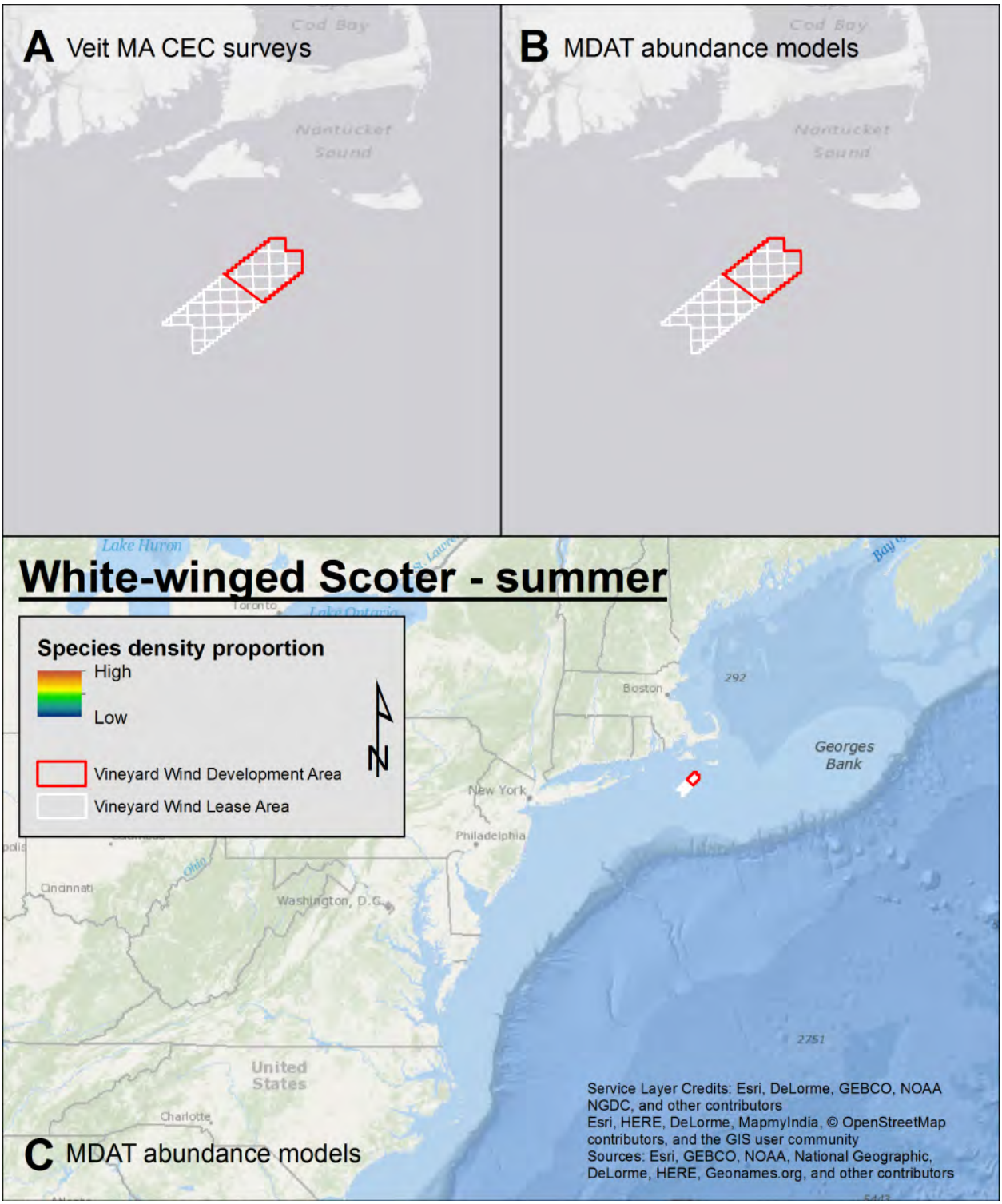

Figure 118. Summer White-winged Scoter density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

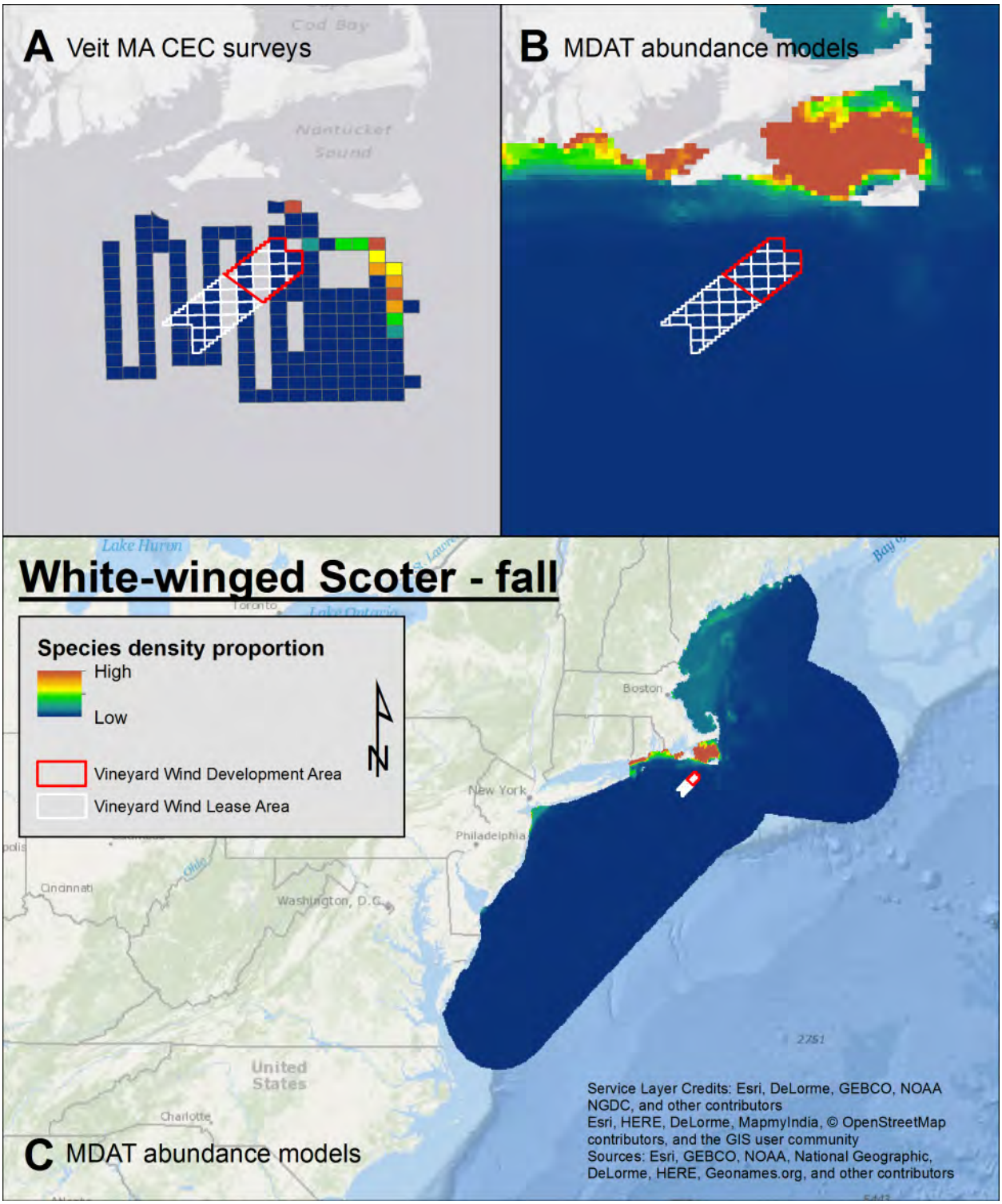

Figure 119. Fall White-winged Scoter density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.

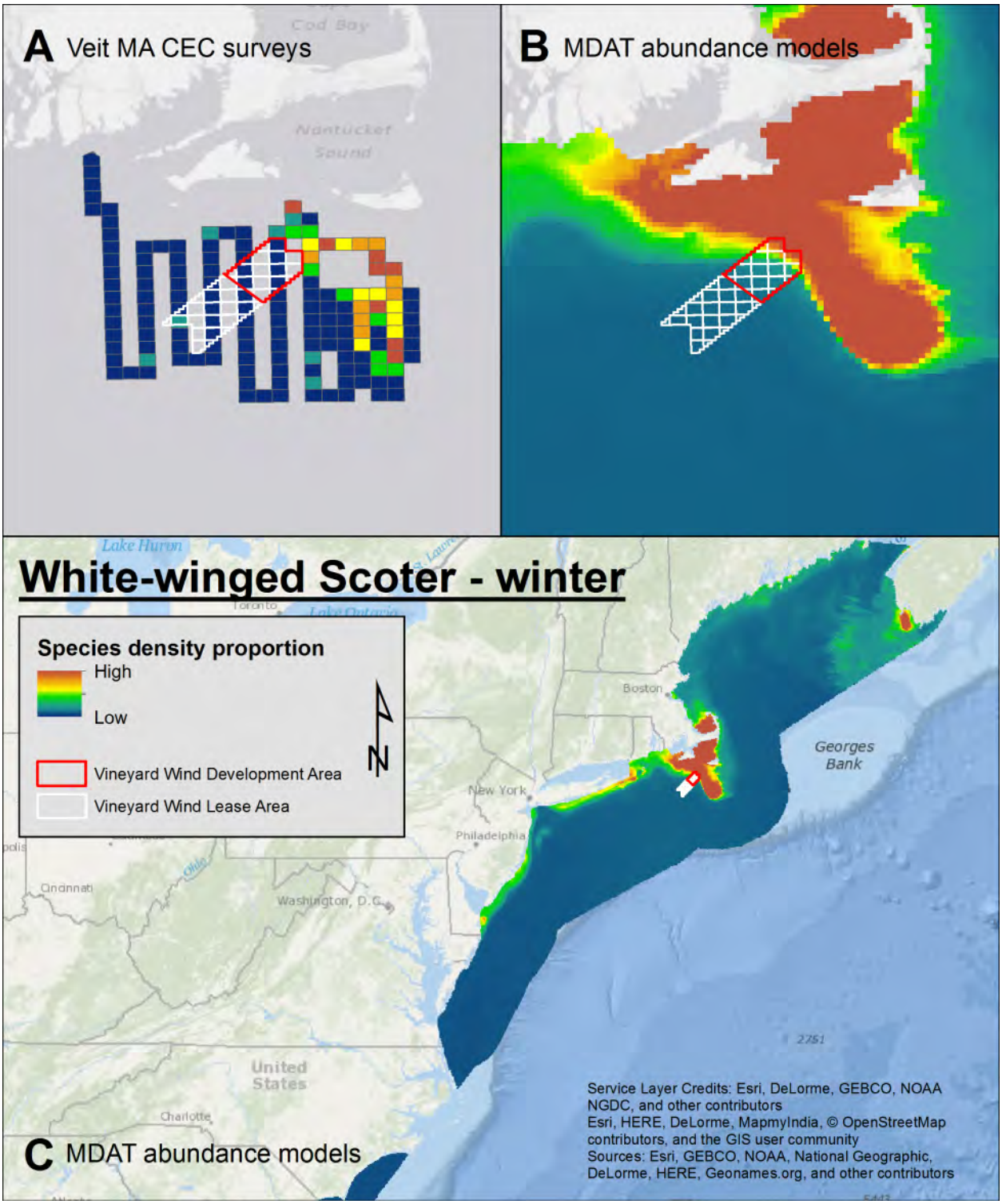

Figure 120. Winter White-winged Scoter density proportions in the MassCEC data (A) and the MDAT data at local (B) and regional scales (C). The scale for all figures is representative of relative spatial variation in the sites within the season for each data source.