

NORTH ATLANTIC LANDSCAPE CONSERVATION COOPERATIVE GRANT 2012 PROGRESS REPORT

Quarter: (circle one)

2013 1st

2013 2nd

2013 3rd

2013 4th

Grant Number and Title: NALCC 2011 (11) Mapping Marine Birds NW Atlantic: Phase 1

Grant Receipt/Organization: NCSU

Grant Project Leader: Gardner

Were planned goals/objectives achieved last quarter? Yes

NALCC Conservation Need Addressed:

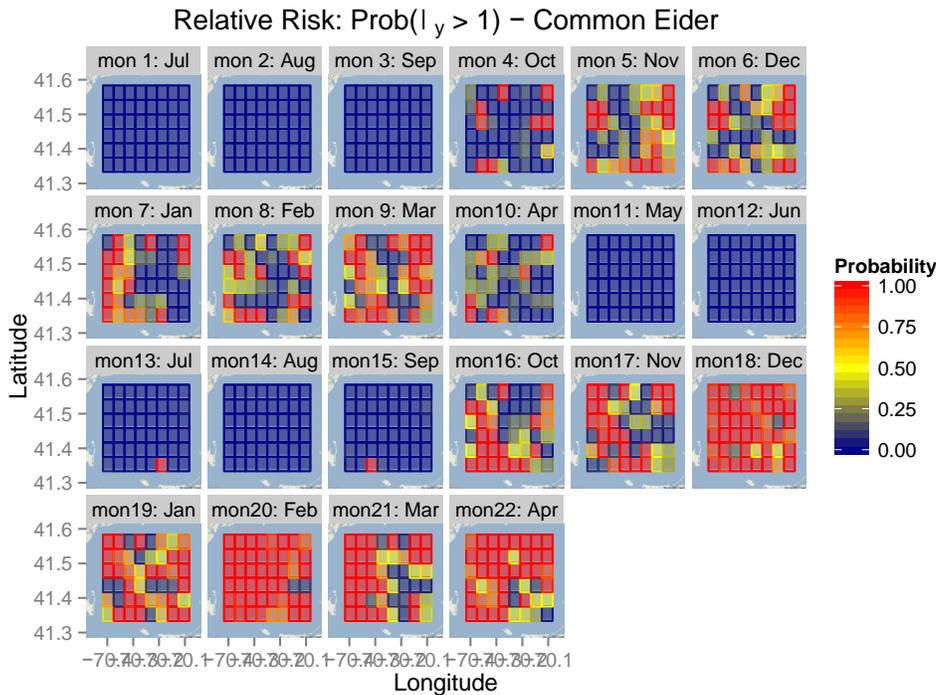
Progress Achieved: (For each Goal/Objective, list Planned and Actual Accomplishments)

1. Develop models for estimation of sea bird distributions, particularly in regards to potential areas of aggregation
Planned Goal for this period– Define, code, and fit several types of models, then assess and compare the performance of each model.
Accomplished – We have defined models that use different formulations of conditional autoregressive random effects for spatial heterogeneity. We have defined labeling and mixture models as well to attempt to capture other features of the data include extreme observations (which happens for species that aggregate like common eiders) and the high number of zero observations, which is common in many datasets. We are also using model checking and comparison tools including the posterior predictive interval, Brier scores, and quantile scores.
2. Determine statistically appropriate models for assessing risk
Planned Goal – derive a potential risk metric
Accomplished – We have fit several hierarchical random effects models in a Bayesian framework that estimates relative risk in different areas. When count data is modeled as a Poisson random variable, i.e. $y[i] \sim \text{Poisson}(E[i] * \mu[i])$, then the estimated mean $\mu[i]$ is termed the risk relative to the expected count $E[i]$. Risk is then related to species abundance. We currently have estimates from our models for Common Eider and Common Loon within the area of Nantucket Sound, and hope to refine these estimates as we further develop our models.
This is just one simple metric to evaluate risk. Our goal is to continue to refine this or to propose various metrics for assessing spatial risk.

Summary of Progress: (Provide a paragraph describing progress, work to come, and timelines)

To reach goals 1 and 2, we developed hierarchical random effects models within a Bayesian framework that begins with the modeling of seabird counts as a Poisson random variable at the first level of the hierarchy. The next level of hierarchical models the Poisson means using random effects model that includes a log-linear function of site-level covariates (sea surface temperature, bathymetry, etc.) and a random effect parameter that

accounts for the spatial correlation inherent in the data. We have defined several different extensions of conditional autoregressive (CAR) models to assess the spatial dependence structure through this random effect parameter. Each extension purports to account for one or both of two features of the data: the high number of zero observations and the few extreme observations that skew the data.



For the specification of our mixture model, we add an additional random effects parameter in the estimation of the Poisson means in order to capture extra-Poisson variability. This is specified by a Gaussian prior distribution with zero mean. Another model we are looking into is a model that considers a labeling scheme to determine which areas (and months) are statistically similar so that they can be modeled the same way. A Potts model is used for the labeling scheme.

We are currently performing model checking and comparison using select model diagnostic statistics. We are looking at statistical tests using posterior predictive distributions to assess the predictive performance of each model on future observations. Some of these include coverage probability for predictive accuracy, and Brier scores and quantile scores for measuring a model's performance in predicting extreme values.

Work to come: Draft a paper for journal publication, produce species maps, and present at future conferences. The project is currently on track to finish by Dec. 2013 as originally stated.

Difficulties Encountered:

- Finding a good model that captures both the many zeros and the extreme values.

Activities Anticipated Next Quarter:

- Determine the spatial model that we wish to move forward with
- Extend work to the broader region of the Western North Atlantic that borders the US

Expected End Date: 12/31/2013

Costs:

Funds Expended to Previous to this Report: 26,350.96

Amount of NALCC Funds Requested within this Report: 20107.64

Total Approved Budgeted NALCC Funds: 115,000.00

Are you within the approved budget plan? yes

Are you within approved budget categories? yes

Signature: Beth Gardner

Date: 04/15/2013

NORTH ATLANTIC LANDSCAPE CONSERVATION COOPERATIVE GRANT 2013 PROGRESS REPORT

Quarter: (circle one)

2013 1st

2013 2nd

2013 3rd

2013 4th

Grant Program, Number and Title: Sub-award Number 2011-13: MAPPING THE DISTRIBUTION, ABUNDANCE AND RISK ASSESSMENT OF MARINE BIRDS IN THE NORTHWEST ATLANTIC: PHASE 1: SUBPROJECT – SEABIRD PREDICTIVE MONITORING INTEGRATION

Organization: CONSOLIDATED SAFETY SERVICES, INC.

Project Leader: Brian Kinlan, Ph.D.

Abstract: Please provide a short (1-2 paragraphs) abstract that addresses EACH of the following: the objectives of your project, accomplishments to date, future plans and timelines with an estimate for when the project will be completed.

Objectives: The goal of this project is to demonstrate an improved framework for marine bird risk assessment in the U.S. North Atlantic that integrates spatial patterns in seabird occurrence and abundance with information on species-specific vulnerability and sensitivity to potential impacts from marine offshore wind development. This sub-award supports a small amount of Dr. Kinlan's time and his travel expenses to participate in relevant workshops and meetings, and to coordinate with other sub-award PIs, to make his marine bird predictive modeling results for the New York Bight and Mid-Atlantic available to demonstrate approaches for marine bird risk assessment.

Previous work: Initial discussions among sub-award PI's took place via email and phone in the 2nd quarter of 2012. In the 3rd quarter of 2012, sub-award PI's Brian Kinlan and Beth Gardner (NC State) met in Silver Spring on July 24. They discussed recent seabird modeling results and approaches and made plans for coordinated work once the NC State Postdoc is hired this Fall. These discussions continued in the 4th quarter of 2012. On December 21, 2012, a day was spent on data analysis, data processing and project-related communication.

Work that took place this quarter (1st quarter of 2013): Dr. Kinlan traveled to attend two face-to-face project-related meetings/workshops, where he presented and discussed marine bird spatial risk assessment modeling in the mid-Atlantic. These meetings included time spent in discussions with other sub-award PI's and collaborators. In February, Kinlan participated and presented in a special session on marine spatial planning and seabirds at the Pacific Seabird Group annual meeting in Portland, OR. In March, Kinlan attended and presented at the Atlantic Marine Bird Conservation Cooperative meeting in Charleston, SC.

Future plans and timelines: Project-related communications and analyses will continue and Kinlan will provide modeling results to other sub-award PI's as requested. No additional travel is planned. This project is expected to be completed by December 31, 2013.

Were planned goals/objectives achieved last quarter?

YES

Progress Achieved: (For each Goal/Objective, list Planned and Actual Accomplishments)

This project has one deliverable: "Participation in project-related meetings, workshops, phone calls, and email communication". This goal was met this quarter through Kinlan's participation in two face-to-face project-related meetings/workshops. In February, he participated and presented in a special session on marine spatial planning and

seabirds at the Pacific Seabird Group annual meeting in Portland, OR. In March, he attended and presented at the Atlantic Marine Bird Conservation Cooperative meeting in Charleston, SC. Dr. Kinlan's time and travel expenses for these activities are included with this quarter's invoice.

Difficulties Encountered:

NONE

Activities Anticipated Next Quarter: Project-related communications and analyses will continue. No additional travel is anticipated.

Expected End Date: December 31, 2013

Costs:

Total life to date expenses (include this quarter): \$7,687.83

Total Approved Budgeted Funds: \$10,000.00

Are you within the approved budget plan and categories? YES

Signature:

A handwritten signature in black ink that reads "Brian F. Kinlan". The signature is written in a cursive style with a long horizontal flourish at the end.

Date: 4/19/2013

NORTH ATLANTIC LANDSCAPE CONSERVATION COOPERATIVE GRANT 2013 PROGRESS REPORT

Quarter: (circle one)

2013 1st

2013 2nd

2013 3rd

2013 4th

Grant Program, Number and Title: 2011-14 Best Darn Bird Map

Organization: Biodiversity Research Institute

Project Leader: Andrew Gilbert

Abstract: Please provide a short (1-2 paragraphs) abstract that addresses EACH of the following: the objectives of your project, accomplishments to date, future plans and timelines with an estimate for when the project will be completed.

The Best Darn Bird Map project will pull together existing information on marine bird distribution and abundance, including modeled distributions, vessel and aerial survey information, and data from individually marked birds, and create mapping products useful for planning uses of the marine environment, including sighting alternative energy projects.

The objectives of our contribution to the BDBM are to 1) produce model data appropriate for BDBM and 2) deliver seabird model input for BDBM.

We have continued to compile the latest seabird data to date and are working with modelers at NC State and USGS database personnel to provide the latest and highest quality data for modeling. We will continue to work at least through summer 2013 so that the latest model runs can use the most up to date data.

Were planned goals/objectives achieved last quarter? Yes.

Progress Achieved: (For each Goal/Objective, list Planned and Actual Accomplishments)

1. Consult with project PI and USGS to produce model data appropriate for BDBM.

Actual - We communicated with Beth Gardner to discuss the project and determined the best strategy moving forward to help with modeling. We will continue to work to update seabird database with the latest survey data. Models can be developed and re-run. We have a plan to continue discussing current and future needs with Beth Gardner to insure highest quality data.

2. Deliver seabird model input for BDBM

Actual – in progress with USGS help.

Difficulties Encountered:

None. We consulted with Beth Gardner, modeler and worked out a plan to get data into the Atlantic Seabird Compendium.

Activities Anticipated Next Quarter:

Continue compiling and adding data to the Atlantic Seabird Compendium to update the database with the latest seabird data for the Atlantic.

Expected End Date: September 2013

Costs:

Total life to date expenses (include this quarter): \$1602.56

Total Approved Budgeted Funds: \$9967

Are you within the approved budget plan and categories? YES

Signature:

A handwritten signature in black ink, appearing to read 'Andrew T. Gilbert', with a long horizontal line extending to the right.

Andrew T. Gilbert

Date:

4/30/2013

Summary of Progress 1 April 2013

Richard R. Veit

(Vetting Best Darn Bird Map)

I began by scanning entries for "ROTE" because of potential ambiguity between Roseate Tern (which should be coded as "ROST") and Royal Tern (which should be coded as "ROYT"). One immediate conclusion is that "4-letter codes" should be immediately abandoned in favor of more detailed codes which can be easily loaded to "Hot keys" so that species names can be entered in a single keystroke, and adjusted for geographical location and season so that hot keys capture all commonest species. The original reason for 4-letter codes (saving of space for entry on 128 space IBM cards) is now obviously obsolete.

The accompanying pictures plot all birds entered as "ROTE", "ROST" and "ROYT". I will discuss all changes with Andrew Gilbert, but I am quite sure all red dots south of the letters "New Jersey" on Figure 4 are meant to be Royal (not Roseate) Terns. Changing these data points alone which have a huge impact on models of Roseate Tern habitat use. Furthermore, the white dots on Figure 3 encircled in red are suspect, as Royal Terns are rare this far offshore (but recent geolocator work shows that Roseate Terns regularly migrate across these waters). The white dots encircled by yellow on Figure 3 could be Royal Terns, but are far more likely to have been Roseates. I will make recommendations on how best to deal with this issue in Discussions with modelers Beth Gardner and Brian Kinlan.

I am now focusing on Razorbills, whose codes have also caused confusion, and continue scanning through the entire dataset. I anticipate completing the job by 30 April or maybe one week later than that. I am now increasing effort and spending almost all my time on this project.

ATTACHMENT 1
GRANTEE QUARTERLY REPORT

Grant Number: 2011-12

Grant Title: Data Vetting for Best Darn Bird map

Grant Recipient: Richard R. Veit

Grant Contact Name: Richard R. Veit

Report #: 1

Were planned goals/objectives achieved last quarter? If not, please detail the reasons why not.

Yes.

Progress Achieved: (For each goal/objective, list planned and actual accomplishments and findings)

Completed 1/3 of vetting of database; identified cause of problems with Raster data.

Summary of Progress: (Provide a paragraph describing progress, work to come, and timelines)

attached

Difficulties Encountered:

None. I would like to purchase software to work with Google Earth to easily plot data.

Activities Anticipated Next Quarter:

Finish remainder of vetting by 30 April.

Expected End Date:

30 April 2013

Costs:

Are you within the approved budget plan? If not, please explain.

Yes.

Are you within approved budget categories? If not, please explain.

Would like to spend \$1400. on Google Earth software.

Signature:



[GRANTEE ENTITY NAME]

By: _____

Name: _____

Title: _____

Date: 31 March 2013

ATTACHMENT 2
GRANTEE EXPENDITURE REPORTING FORM

Grant Number: 2011-12

Grant Title: Data Vetting for Best Darn Bird map

Grant Contact Name: Richard R Veit

Reporting Period for Costs Claimed On This Voucher: 1/1/2013 - 3/31/2013

A. List Total Eligible Cost Summary For This Reporting Period Only:

Time Period	FEDERAL FUNDS	NON-FEDERAL MATCH	TOTAL
1/1/2013 - 3/31/2013			
Salaries and/or Wages	\$ 2000.00	0	\$ 2000.00
Fringe Benefits			
Travel			
Equipment			
Supplies & Materials			
Contractual Services			
Total			2000.00

B. List Cumulative Total Eligible Costs Claimed From The Beginning of Agreement Up To And Including Those Listed Above:

Total Life-to-Date Expenses	\$ 2000.00
Less Previous Payments Processed	\$ 0
Total Amount Due Grantee Now:	\$ 2000.00

Signature: 

By: 
 Name: Richard R Veit
 Title: Professor

Date: 4/1/2013

Atlantic Seabird Database Review

Figures to go with Notes

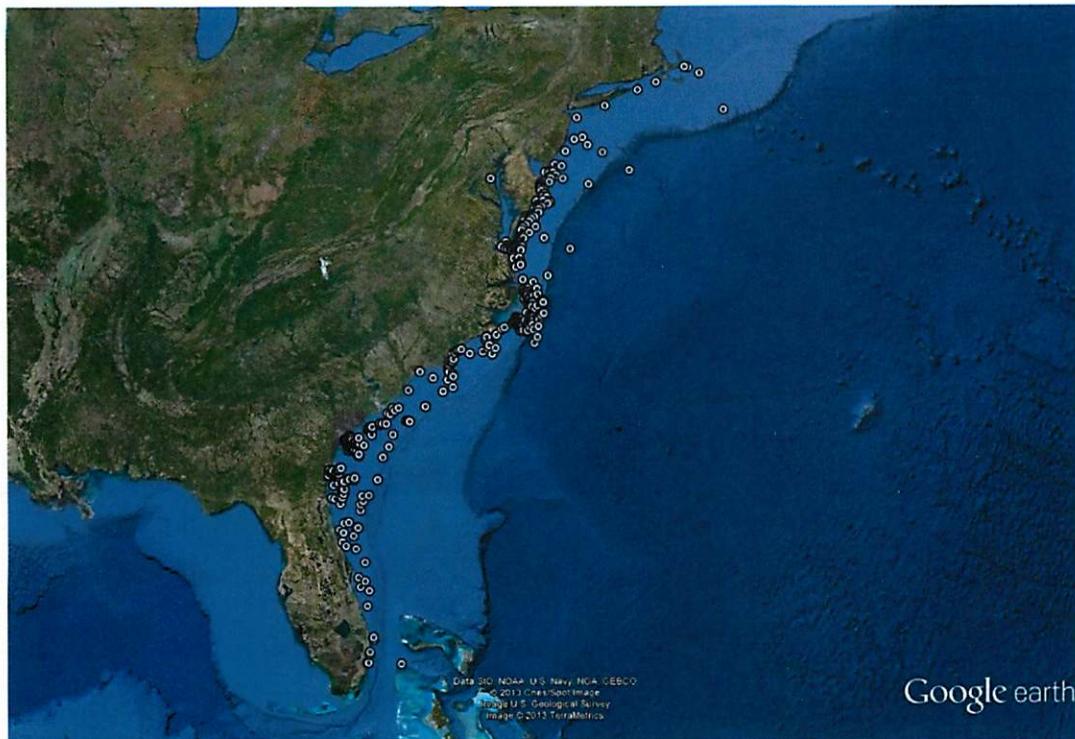


Fig 1. All Royal Tern records in database.

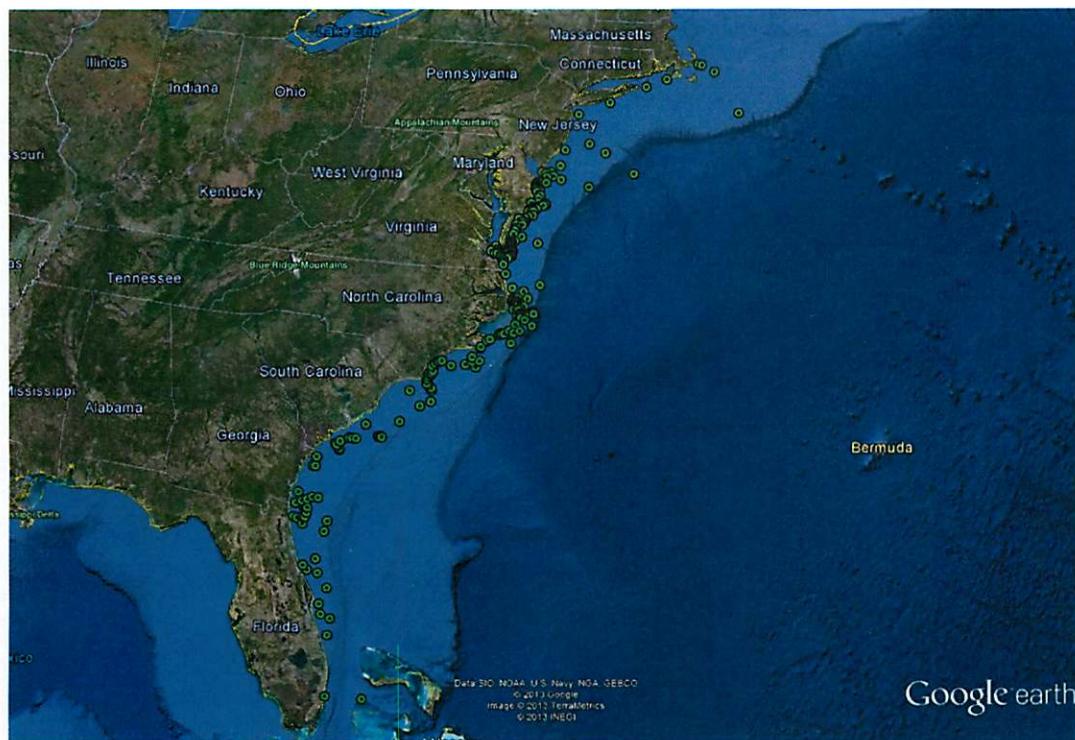


Fig 2. Records originally coded as ROTE and designated as Royal Tern (248 records).

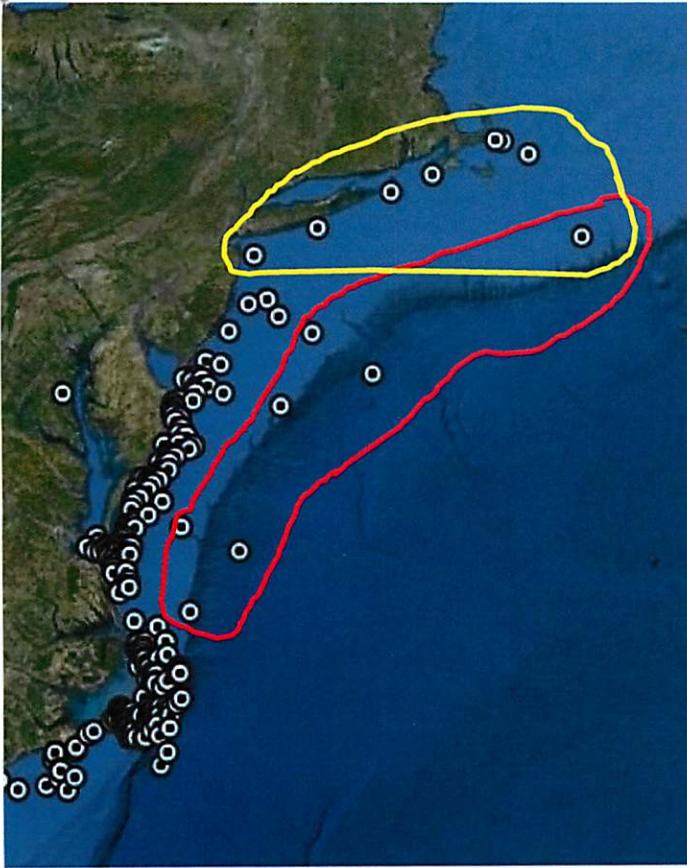


Fig. 3 Suspect Royal Tern records flagged in database as “way offshore” or “North of 40.”

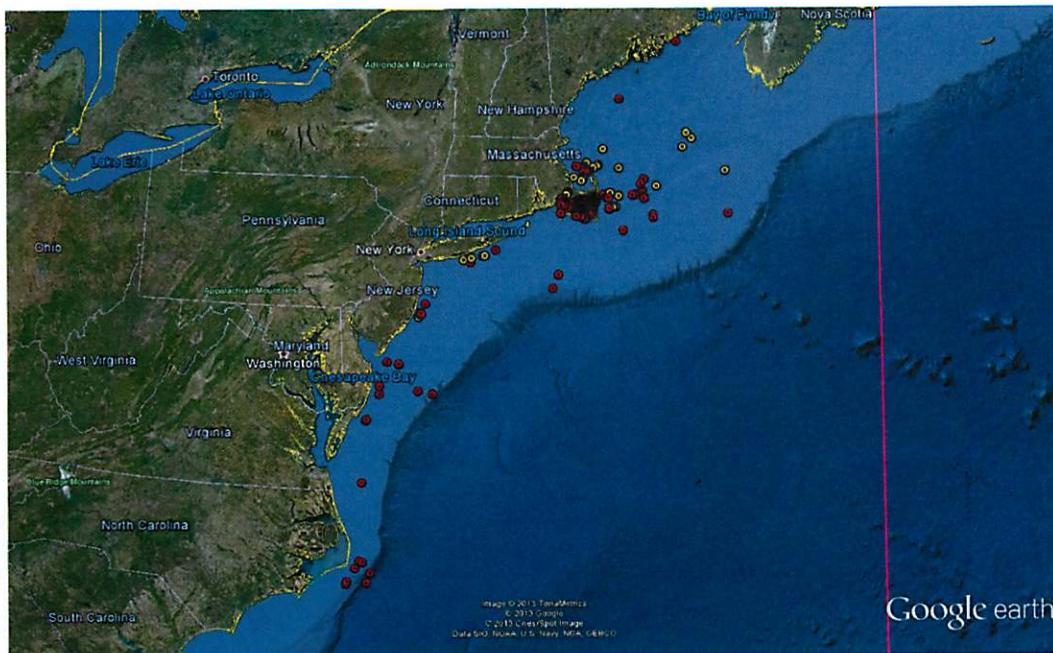


Fig 4. Roseate Tern records showing those originally coded as ROTE in yellow (56), others in red.