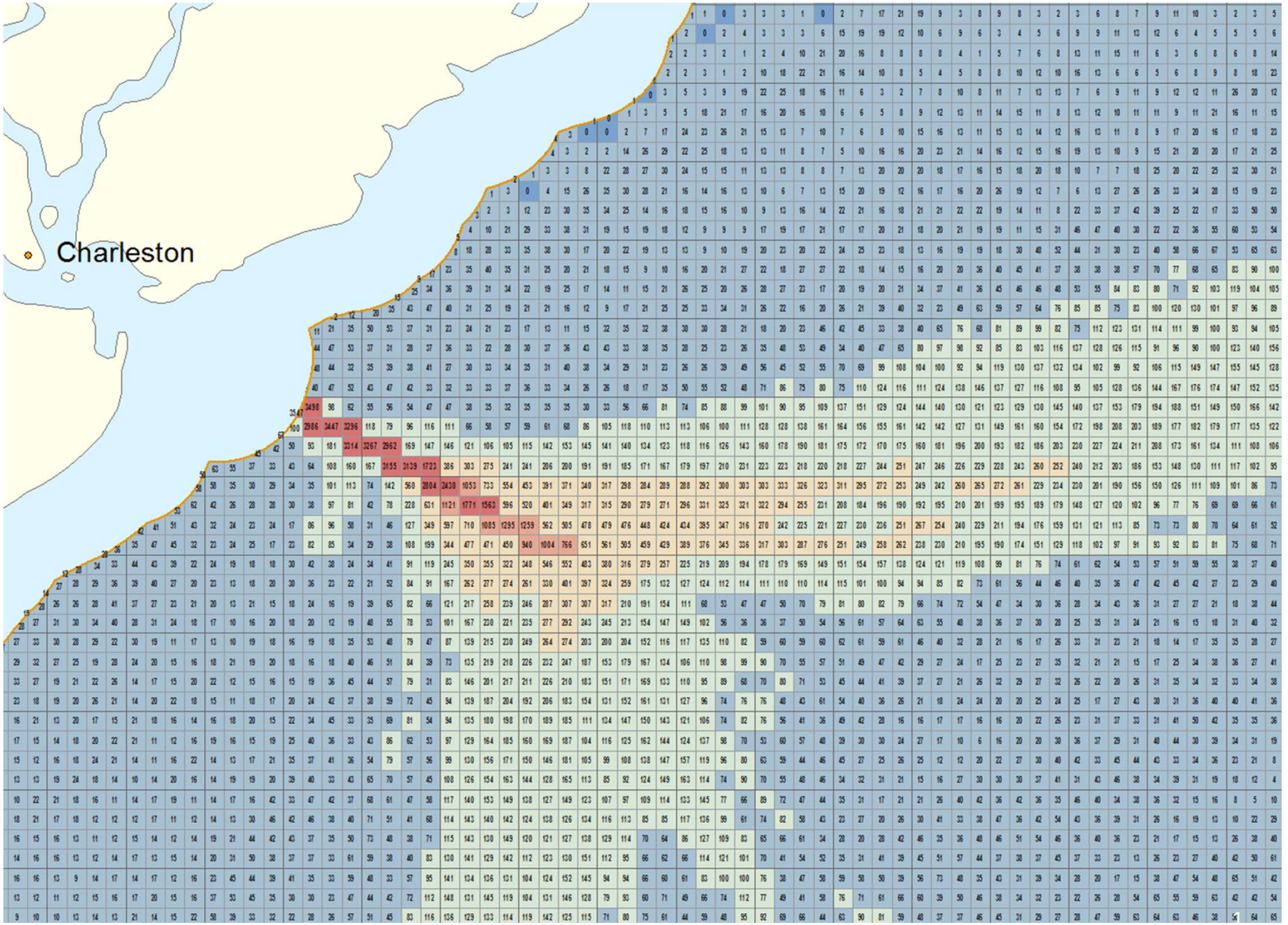
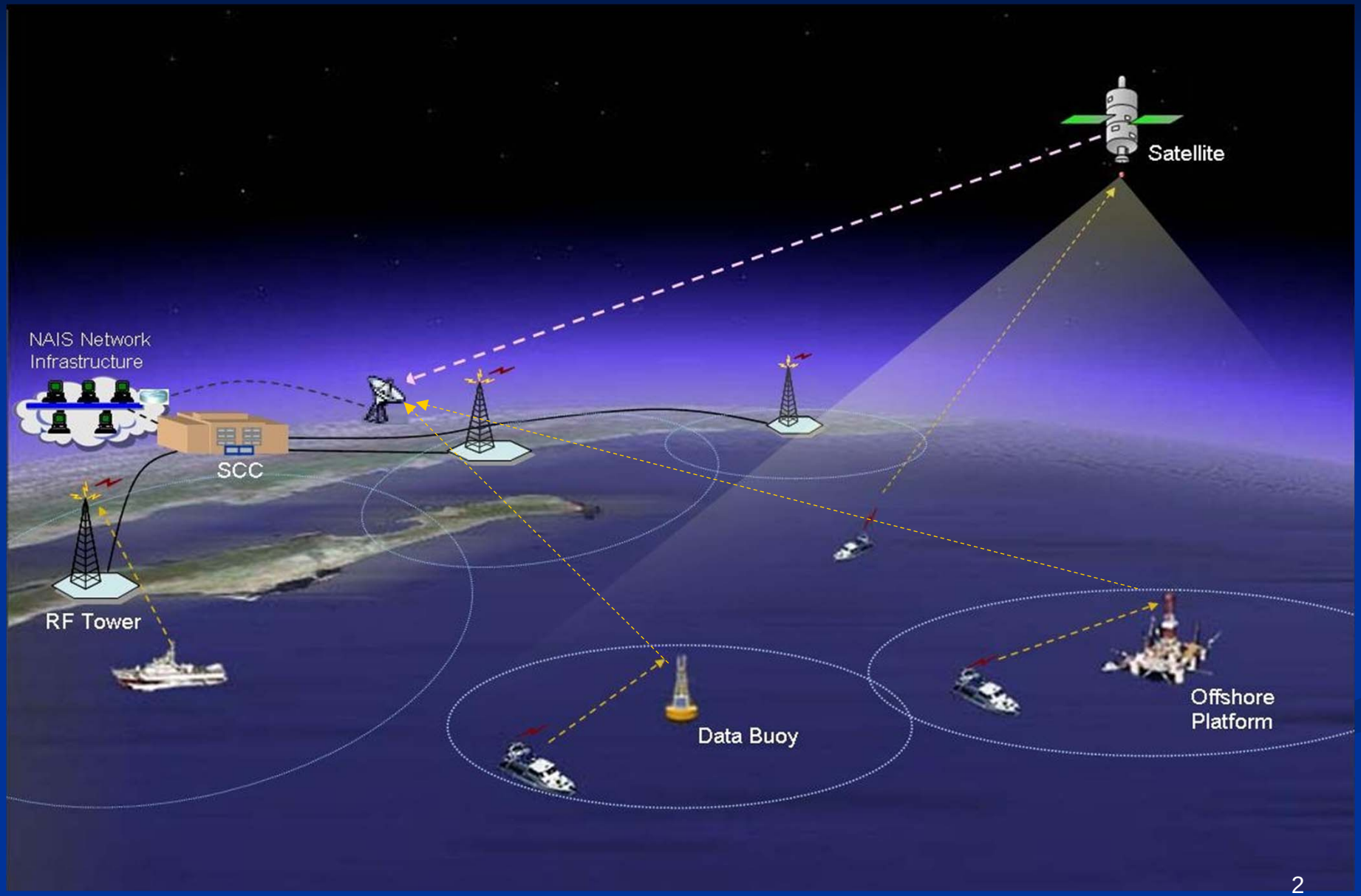
# Vessel Traffic Data and Analysis



# NAIS Overview



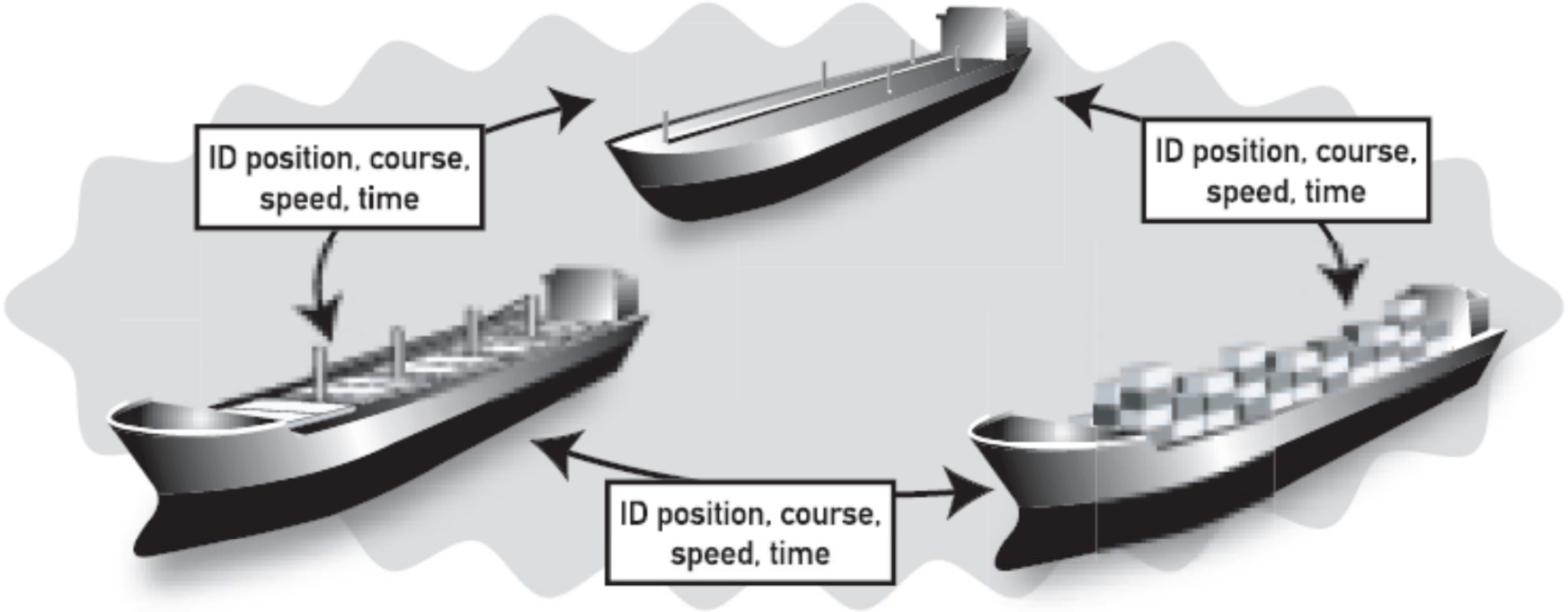
- NY/NJ, LMR, HOU/GAL, Tampa, Port Arthur, Berwick Bay, LA/LB, SF, Puget and Prince Wm. Sound

# Shipboard AIS



## Autonomous Ship-to-Ship Reporting

Figure 1

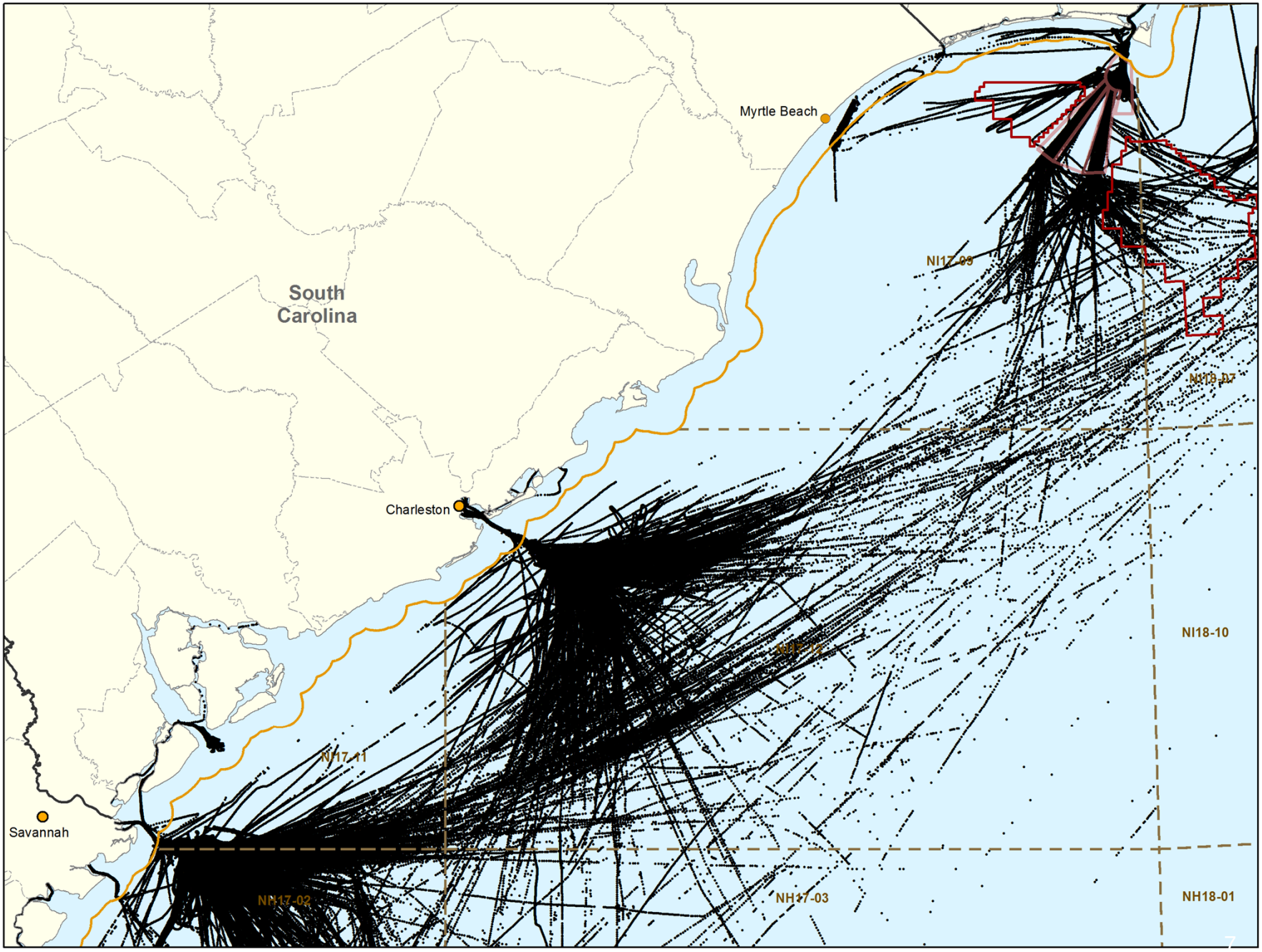



Ships transmit AIS reports automatically on a common VHF channel. Timeslots for each data transmission are synchronized by the precise GPS time standard.

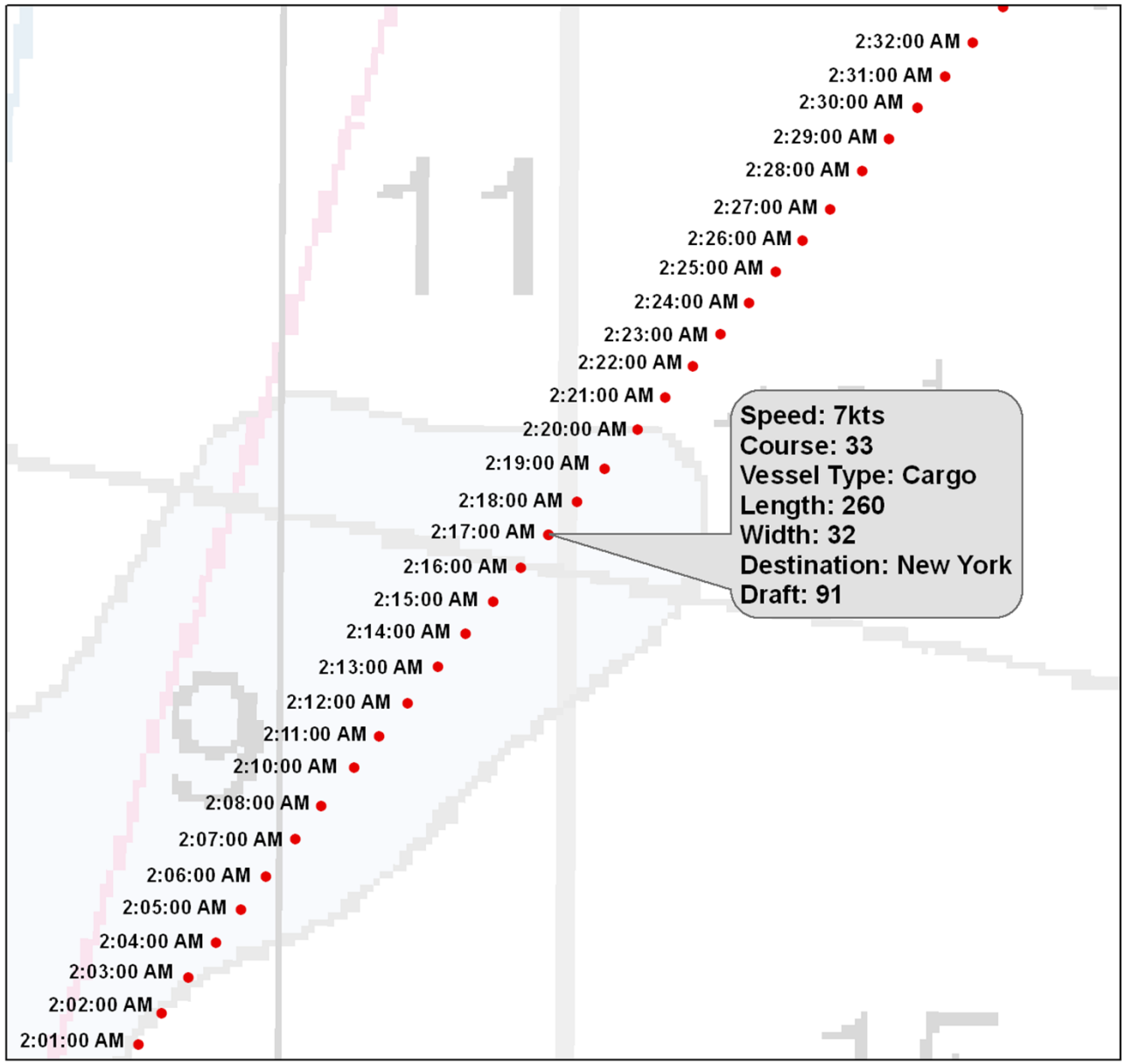
# AIS Analysis Input Data

- AIS Returns for 2009
- Monthly Data for UTM Zones 17,18,19
- Each Month is Clipped by Protraction, then Merged
- AIS Analysis Input Includes all Months for 2009

# AIS returns – January 2009



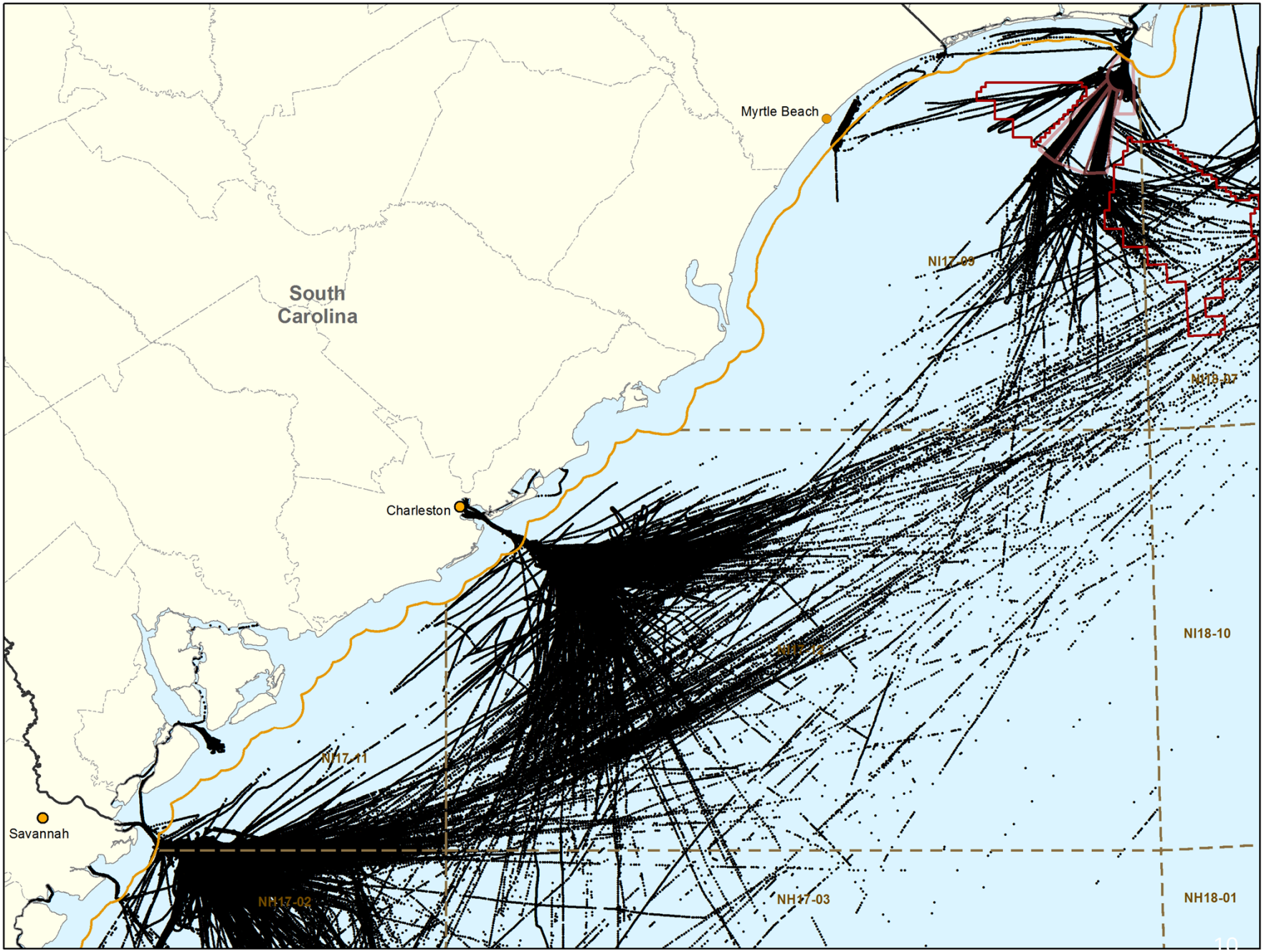
# AIS returns – Vessel Data



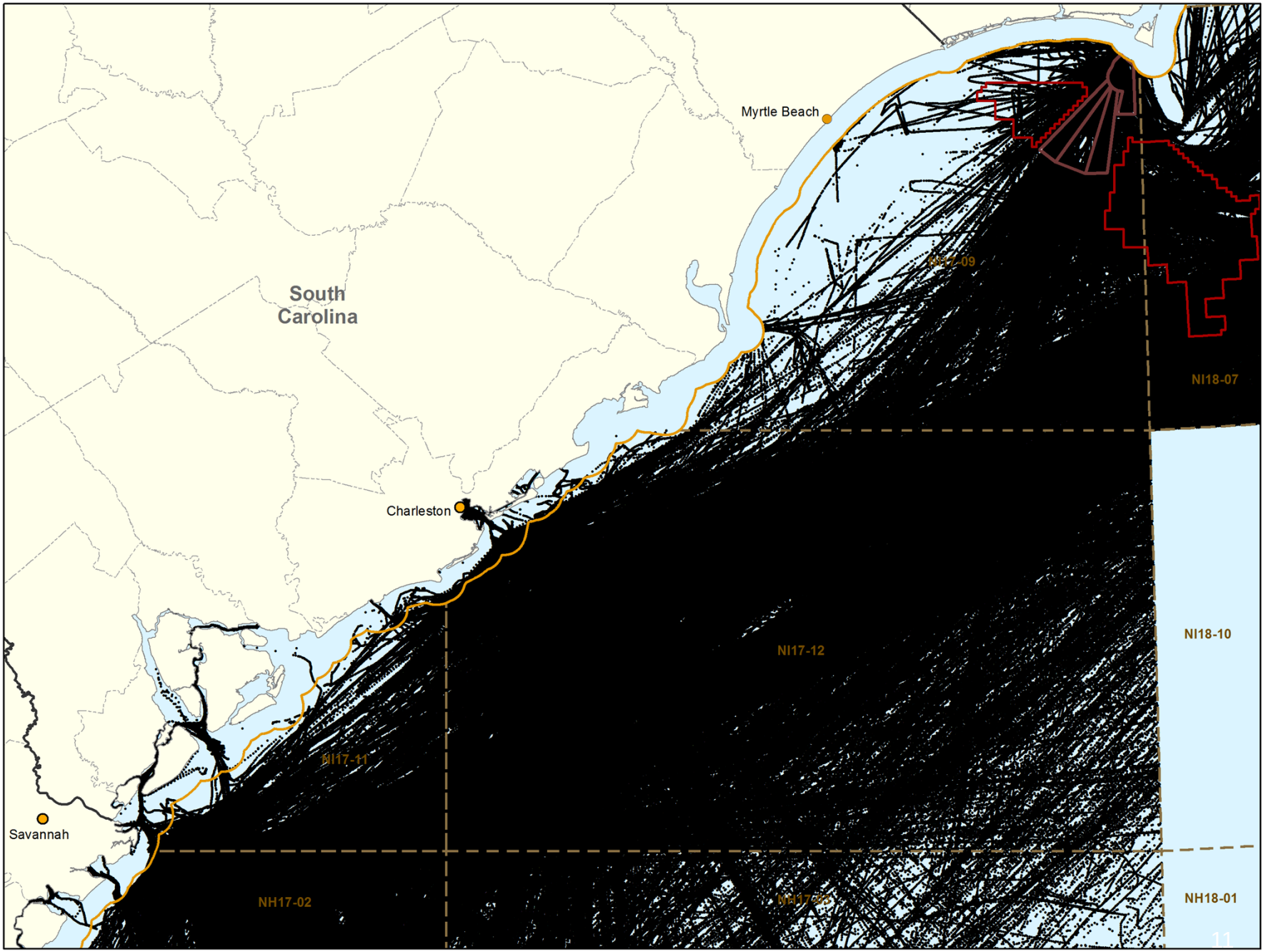
# AIS returns – Vessel Data

| OID * | Shape * | SOG | COG | Heading | ROT | BaseDateTime | VoyageID | MMSI | MMSI * | IMO | VesselType | Length | Width | DimensionCompon | VoyageID * | Destination | Cargo | Draught | ETA | StartTime | EndTime |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Point | 10 | 124 | 125 | 0 | 12/1/2009 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 2 | Point | 16 | 215 | 214 | 0 | 12/1/2009 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 3 | Point | 10 | 123 | 124 | 0 | 12/1/2009 12:01:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 4 | Point | 17 | 215 | 214 | 0 | 12/1/2009 12:01:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 5 | Point | 17 | 215 | 214 | 0 | 12/1/2009 12:02:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 6 | Point | 10 | 123 | 125 | 0 | 12/1/2009 12:02:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 7 | Point | 17 | 215 | 214 | 0 | 12/1/2009 12:03:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 8 | Point | 10 | 123 | 124 | 0 | 12/1/2009 12:03:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 9 | Point | 17 | 214 | 214 | 0 | 12/1/2009 12:04:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 10 | Point | 10 | 124 | 125 | 0 | 12/1/2009 12:04:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 11 | Point | 17 | 215 | 214 | 0 | 12/1/2009 12:05:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 12 | Point | 10 | 122 | 124 | 0 | 12/1/2009 12:05:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 13 | Point | 16 | 215 | 214 | 0 | 12/1/2009 12:06:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 14 | Point | 10 | 123 | 124 | 0 | 12/1/2009 12:07:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 15 | Point | 16 | 215 | 214 | 0 | 12/1/2009 12:07:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 16 | Point | 16 | 215 | 214 | 0 | 12/1/2009 12:08:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 17 | Point | 11 | 124 | 125 | 0 | 12/1/2009 12:08:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 18 | Point | 16 | 215 | 214 | 0 | 12/1/2009 12:09:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 19 | Point | 11 | 122 | 124 | 0 | 12/1/2009 12:09:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 20 | Point | 16 | 215 | 214 | 0 | 12/1/2009 12:10:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 21 | Point | 17 | 215 | 214 | 0 | 12/1/2009 12:11:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 22 | Point | 12 | 123 | 124 | 0 | 12/1/2009 12:11:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 23 | Point | 16 | 215 | 214 | 0 | 12/1/2009 12:12:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 24 | Point | 13 | 123 | 124 | 0 | 12/1/2009 12:12:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 25 | Point | 17 | 214 | 214 | 0 | 12/1/2009 12:13:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 26 | Point | 13 | 124 | 124 | 0 | 12/1/2009 12:13:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 27 | Point | 16 | 215 | 214 | 0 | 12/1/2009 12:14:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 28 | Point | 16 | 214 | 214 | 0 | 12/1/2009 12:15:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 29 | Point | 14 | 110 | 108 | 0 | 12/1/2009 12:16:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 30 | Point | 16 | 215 | 214 | 0 | 12/1/2009 12:16:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 31 | Point | 14 | 99 | 96 | 129 | 12/1/2009 12:17:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 32 | Point | 16 | 214 | 214 | 0 | 12/1/2009 12:17:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 33 | Point | 14 | 88 | 85 | 0 | 12/1/2009 12:18:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 34 | Point | 16 | 215 | 214 | 0 | 12/1/2009 12:18:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 35 | Point | 14 | 80 | 79 | 0 | 12/1/2009 12:19:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 36 | Point | 17 | 215 | 214 | 0 | 12/1/2009 12:19:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 37 | Point | 15 | 75 | 74 | 0 | 12/1/2009 12:20:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 38 | Point | 17 | 214 | 214 | 0 | 12/1/2009 12:20:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 39 | Point | 15 | 71 | 71 | 0 | 12/1/2009 12:21:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 40 | Point | 16 | 216 | 215 | 0 | 12/1/2009 12:21:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 41 | Point | 15 | 69 | 70 | 0 | 12/1/2009 12:22:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 42 | Point | 16 | 214 | 213 | 0 | 12/1/2009 12:22:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 43 | Point | 16 | 72 | 73 | 0 | 12/1/2009 12:23:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 44 | Point | 17 | 215 | 214 | 0 | 12/1/2009 12:23:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 45 | Point | 16 | 68 | 66 | 0 | 12/1/2009 12:24:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 46 | Point | 17 | 214 | 213 | 0 | 12/1/2009 12:24:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 47 | Point | 16 | 63 | 65 | 0 | 12/1/2009 12:25:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |
| 48 | Point | 17 | 214 | 213 | 0 | 12/1/2009 12:25:00 | 178 | 354745000 | 354745000 | 9351579 | Cargo ships | 265 | 32 | 197,68,16,16 | 178 | NEW YORK | No additional information | 119 | 11/28/2009 | 12/1/2009 12:0 | 12/31/2009 |
| 49 | Point | 17 | 65 | 66 | 0 | 12/1/2009 12:26:00 | 140 | 211208940 | 211208940 | 9038907 | Cargo ships | 294 | 32 | 15,279,16,16 | 140 | NEW YORK | No additional information | 115 | 12/1/2009 8: | 12/1/2009 12:1 | 12/30/2009 |

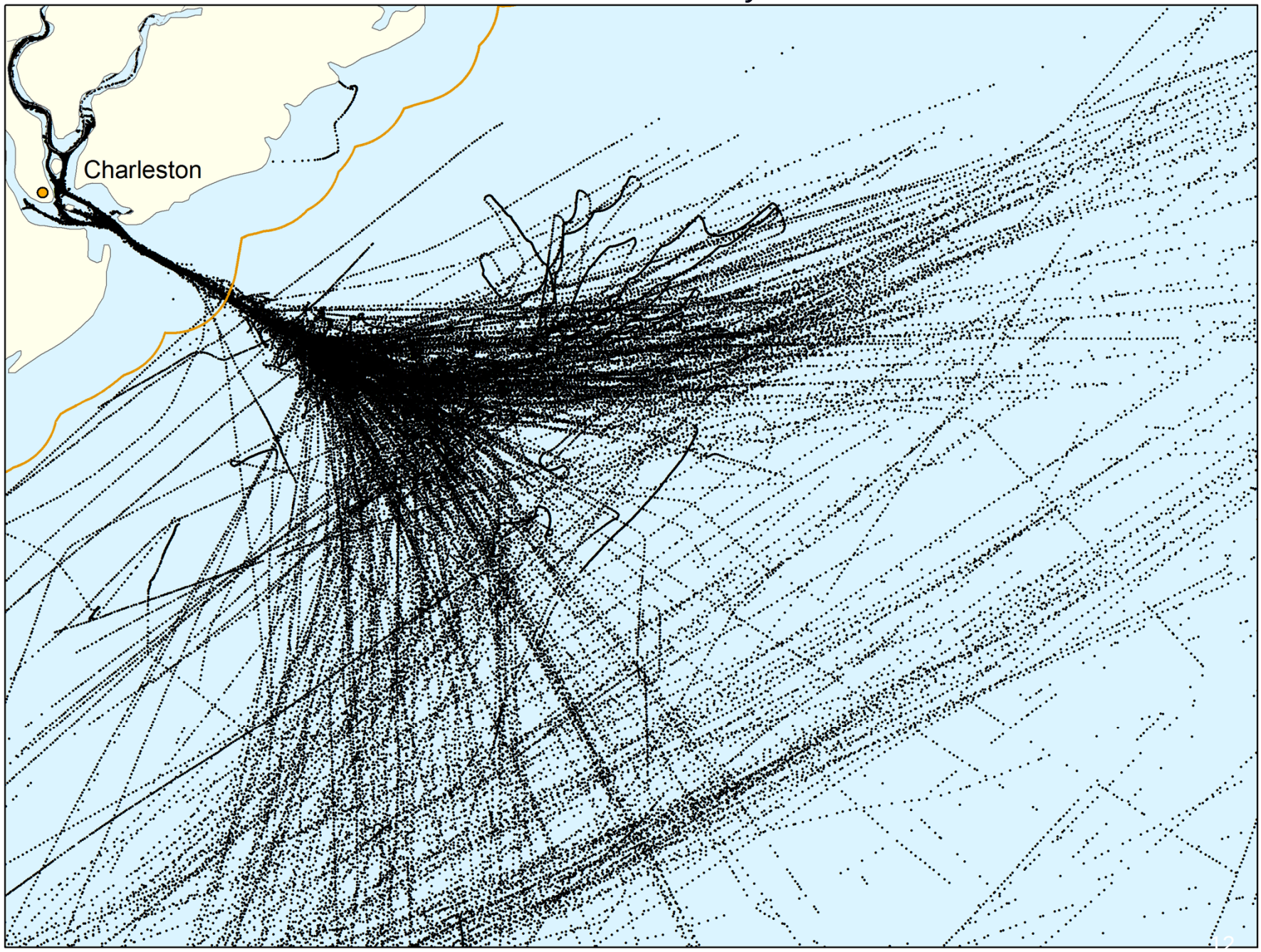
# AIS returns – January 2009



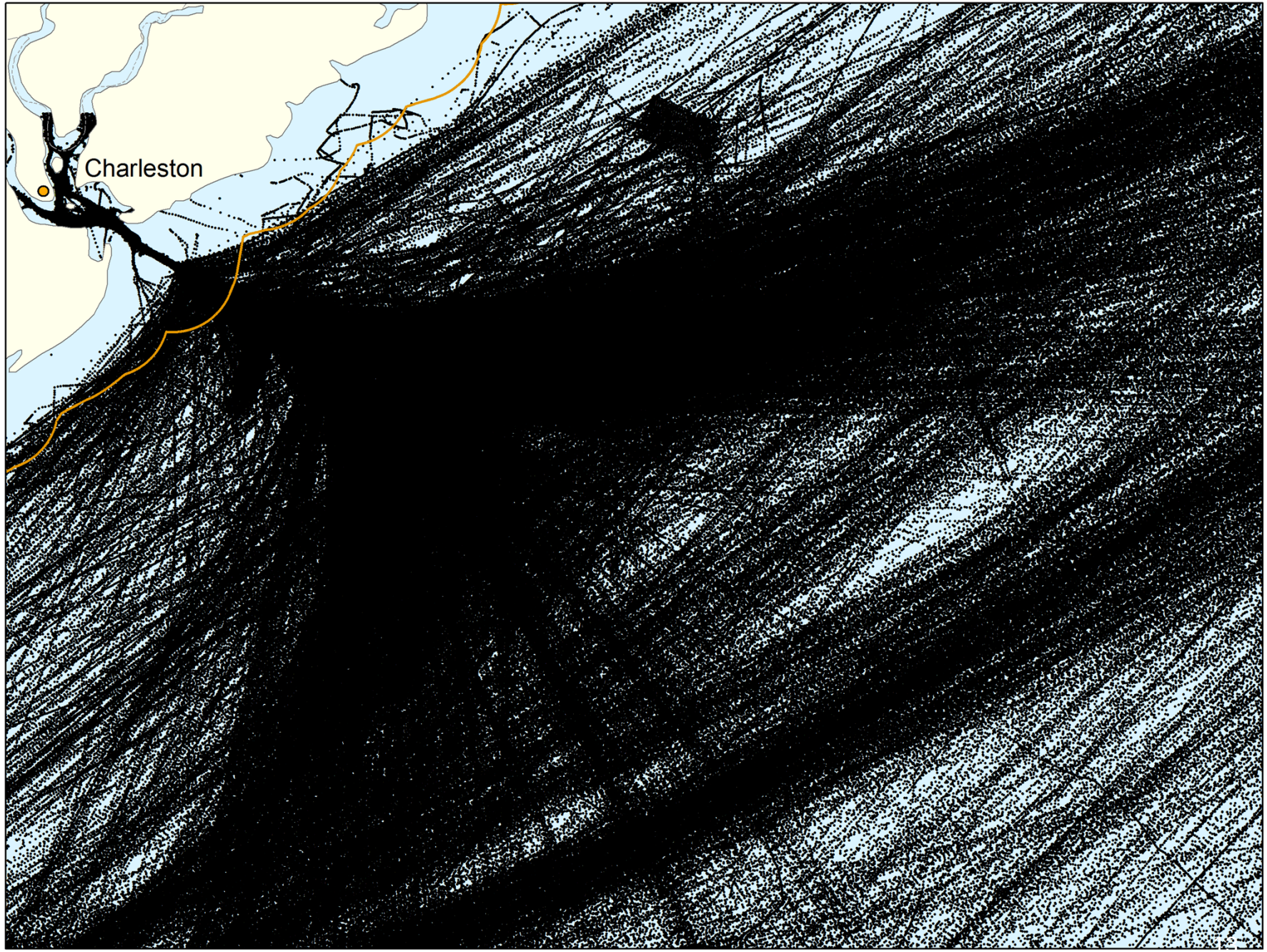
# AIS returns – All Months 2009



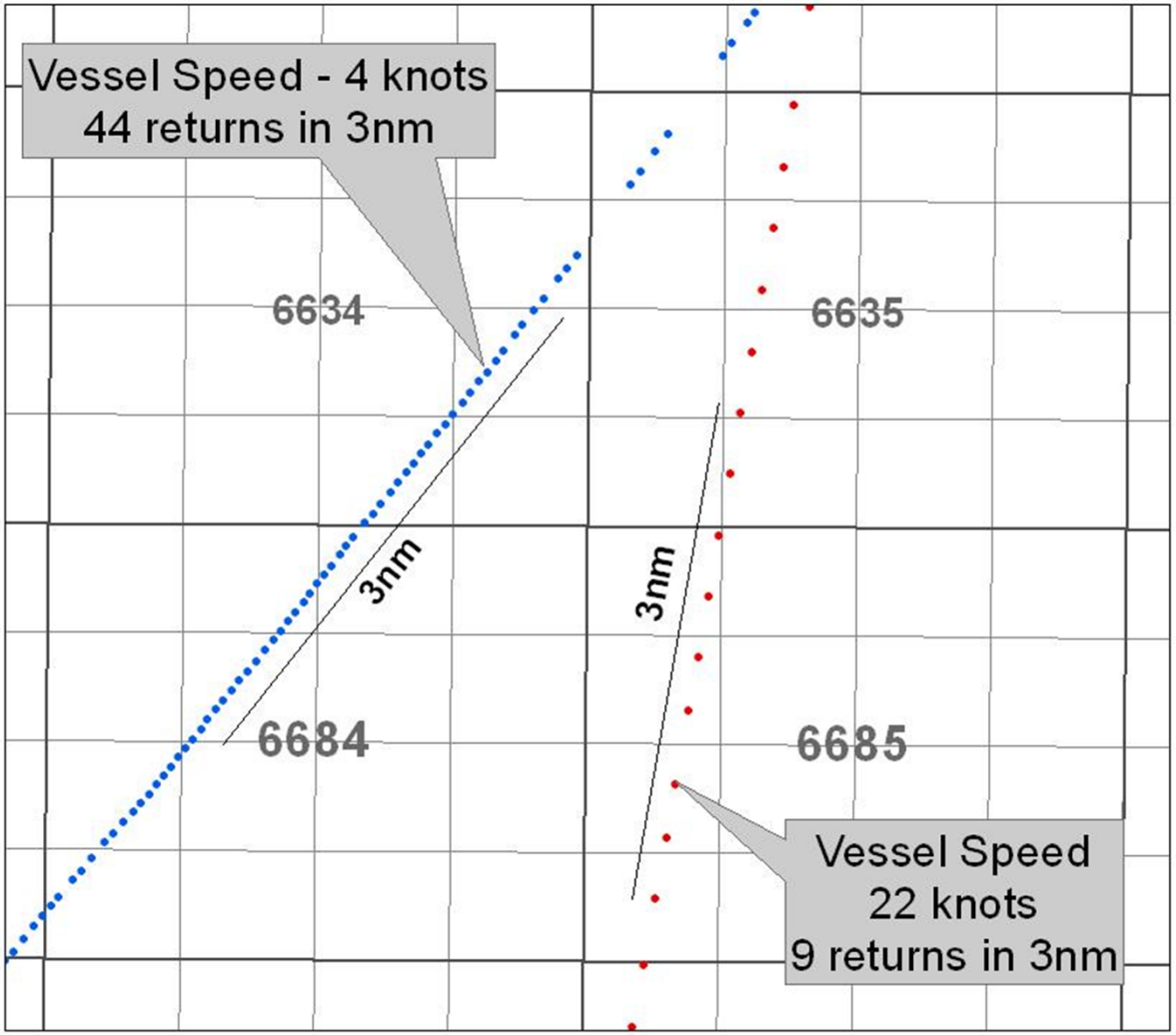
# AIS returns – January 2009

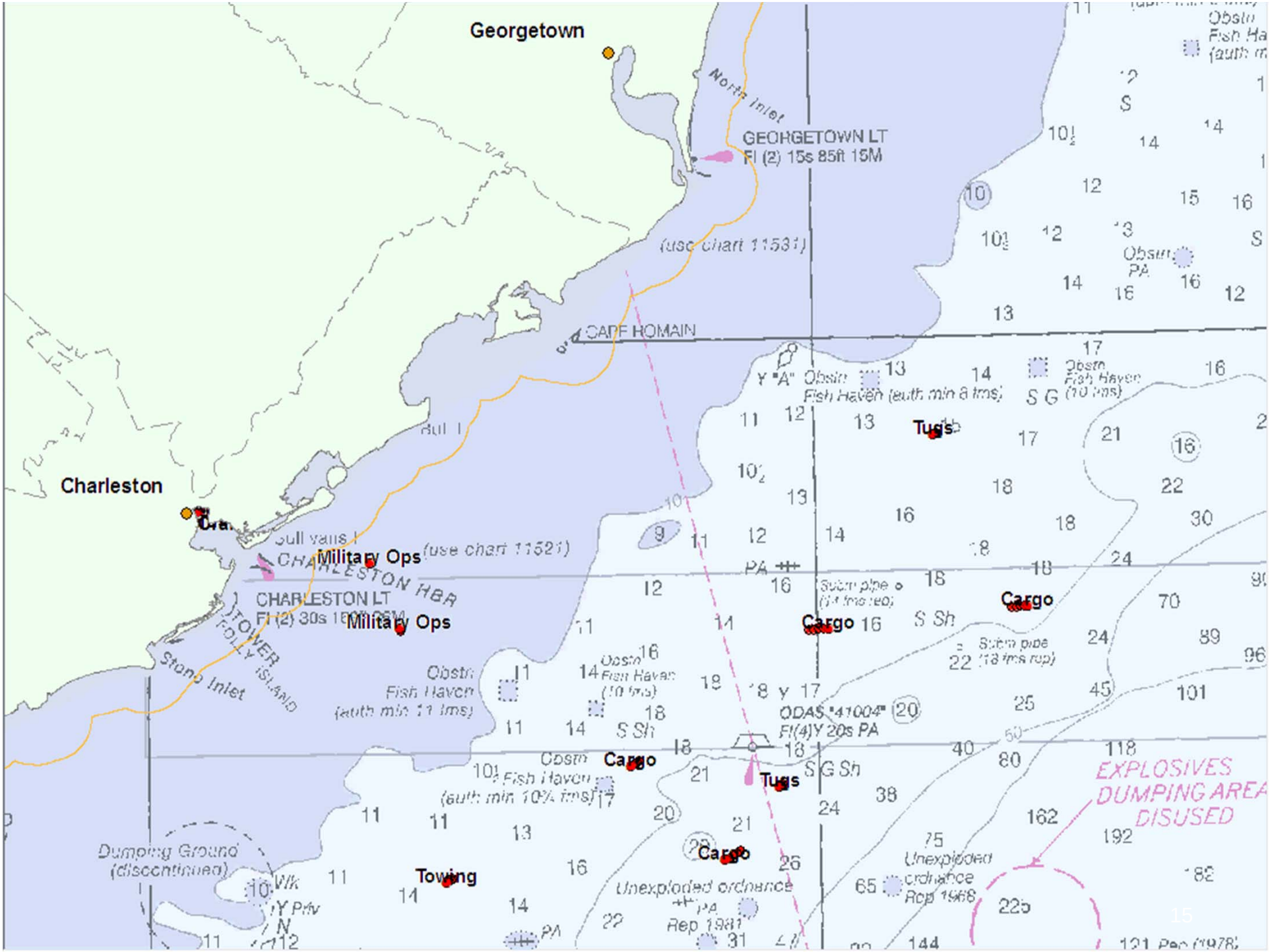


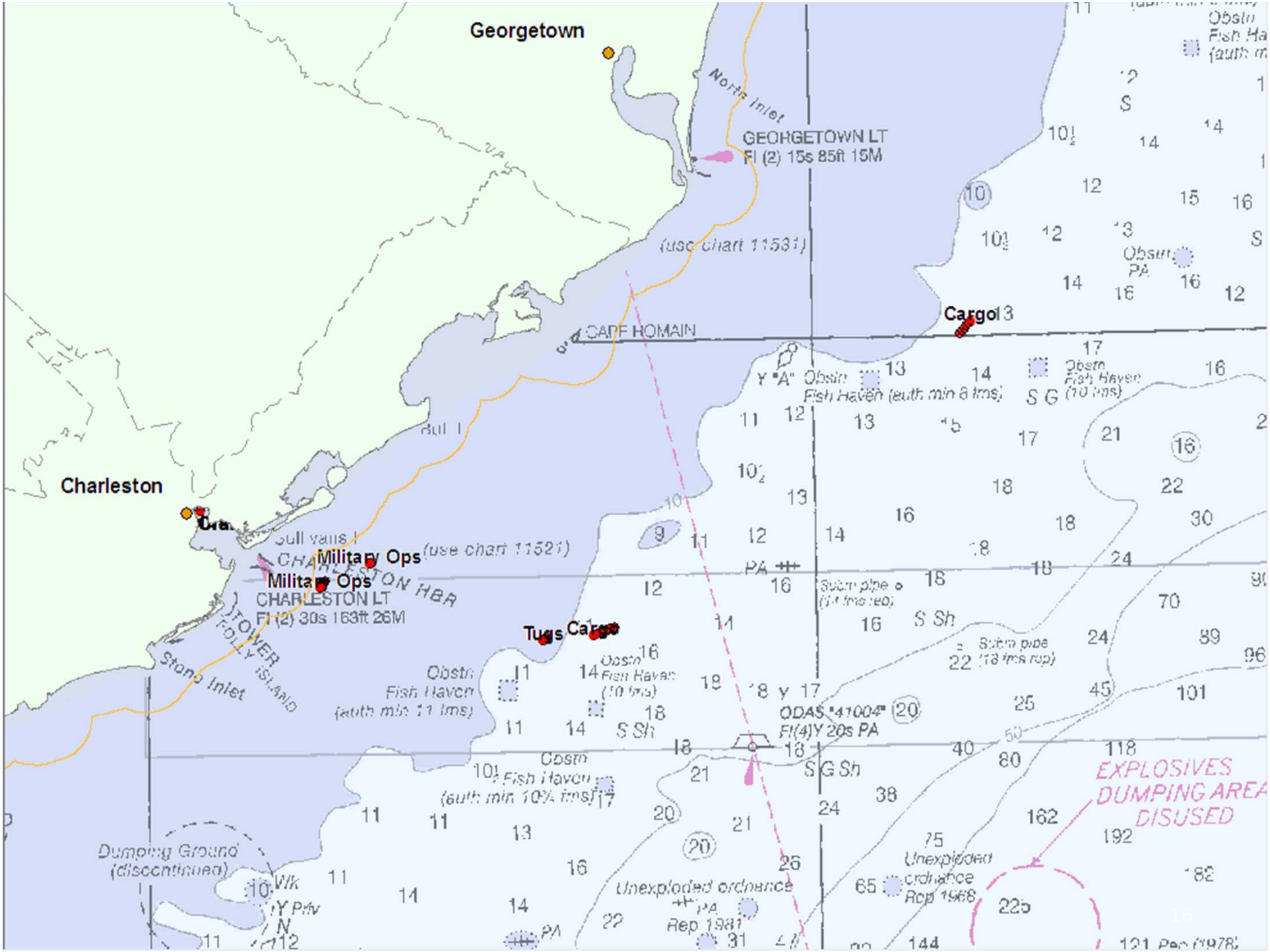
# AIS returns – All Months 2009



# Vessel Speed and AIS Point Density



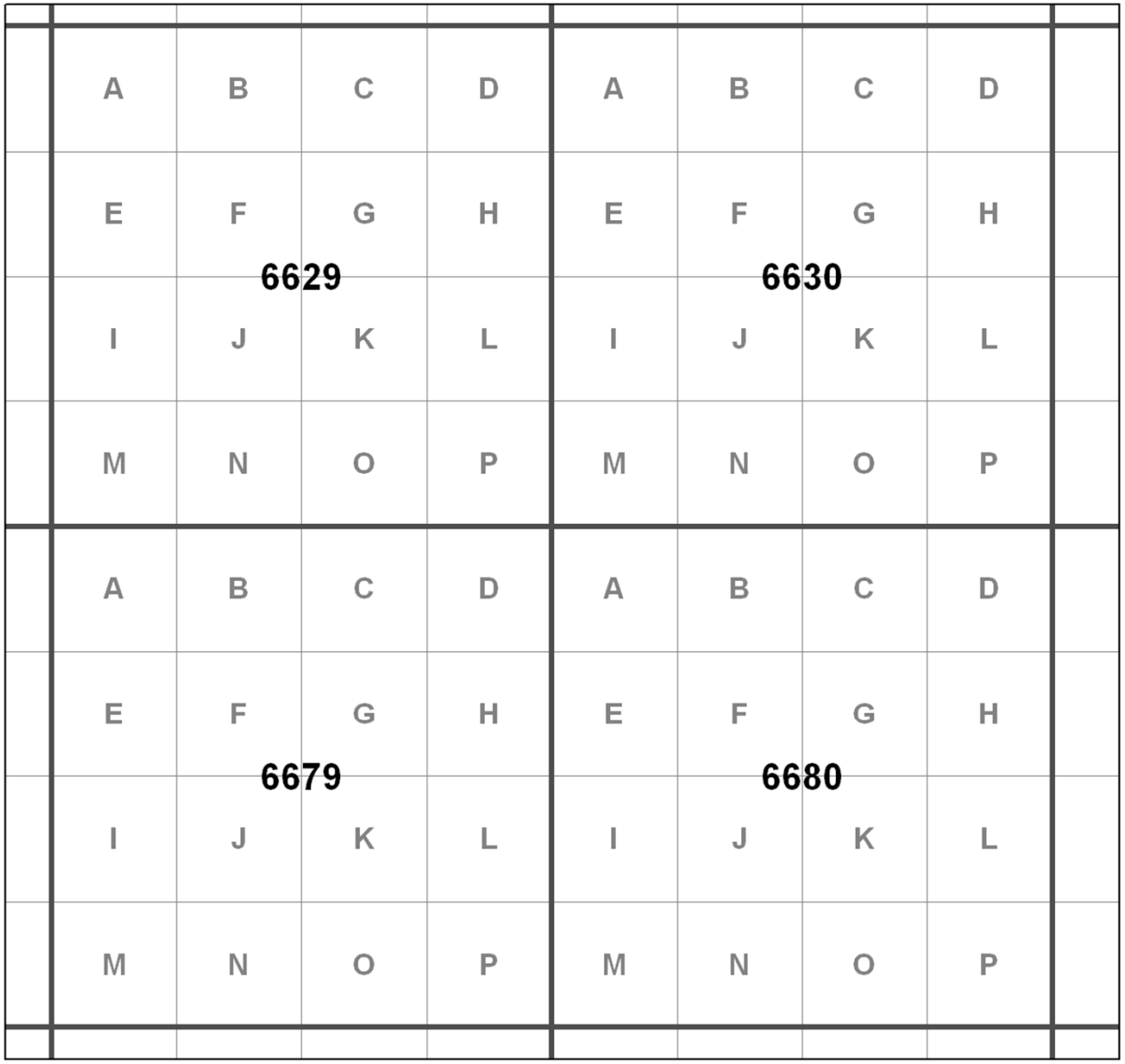

Georgetown
North Inlet
GEORGETOWN LT
Fl (2) 15s 85ft 15M
(use chart 11531)
CAPE ROMAIN
Obstn
Fish Haven (auth min 8 fms)
Tugs
Charleston
Bull Vans
Military Ops
(use chart 11521)
CHARLESTON HBR
CHARLESTON LT
Fl (2) 30s
Military Ops
Cargo
Stono Inlet
Obstn
Fish Haven
(auth min 11 fms)
Obstn
Fish Haven
(10 fms)
ODAS "41004"
Fl(4)Y 20s PA
Obstn
Fish Haven
(auth min 10½ fms)
Cargo
Tugs
EXPLOSIVES
DUMPING AREA
DISUSED
Dumping Ground
(discontinued)
Towing
Cargo
Unexploded ordnance
Rep 1981
Unexploded ordnance
Rep 1968


Georgetown
North Inlet
GEORGETOWN LT
Fl (2) 15s 85ft 15M
(use chart 11531)
CAPE ROMAIN
Cargo
Charleston
Bull Vans
(use chart 11521)
Military Ops
Military Ops
CHARLESTON HBR
CHARLESTON LT
Fl (2) 30s 163ft 26M
TOWER
FOLLY ISLAND
Stono Inlet
Tugs
Cargo
Obstn
Fish Haven
(auth min 11 fms)
Obstn
Fish Haven
(10 fms)
Obstn
Fish Haven
(auth min 10½ fms)
ODAS "41004"
Fl(4)Y 20s PA
Dumping Ground
(discontinued)
Unexploded ordnance
Rep 1981
Unexploded ordnance
Rep 1968
EXPLOSIVES
DUMPING AREA
DISUSED

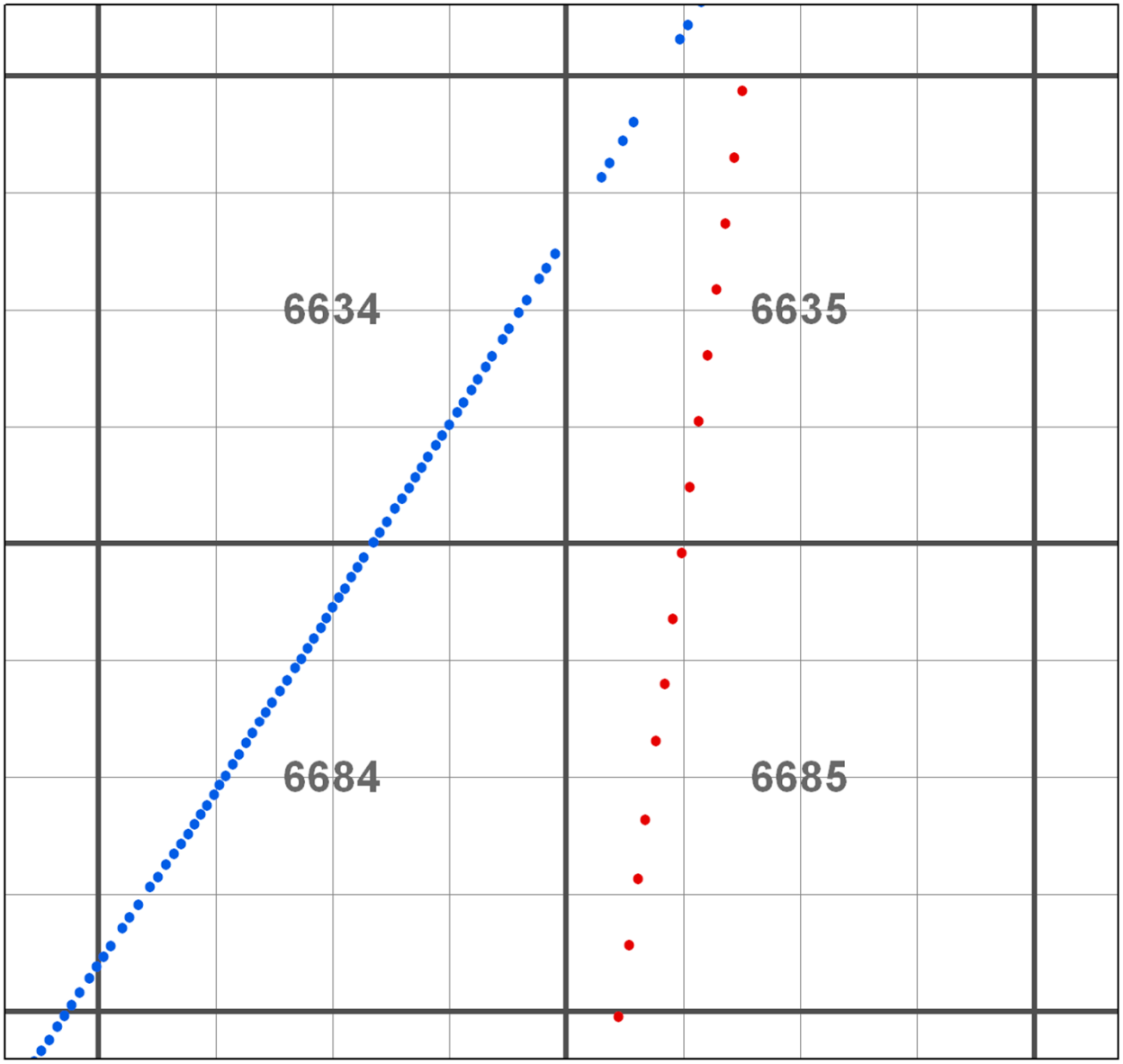
## AIS Density Mapping

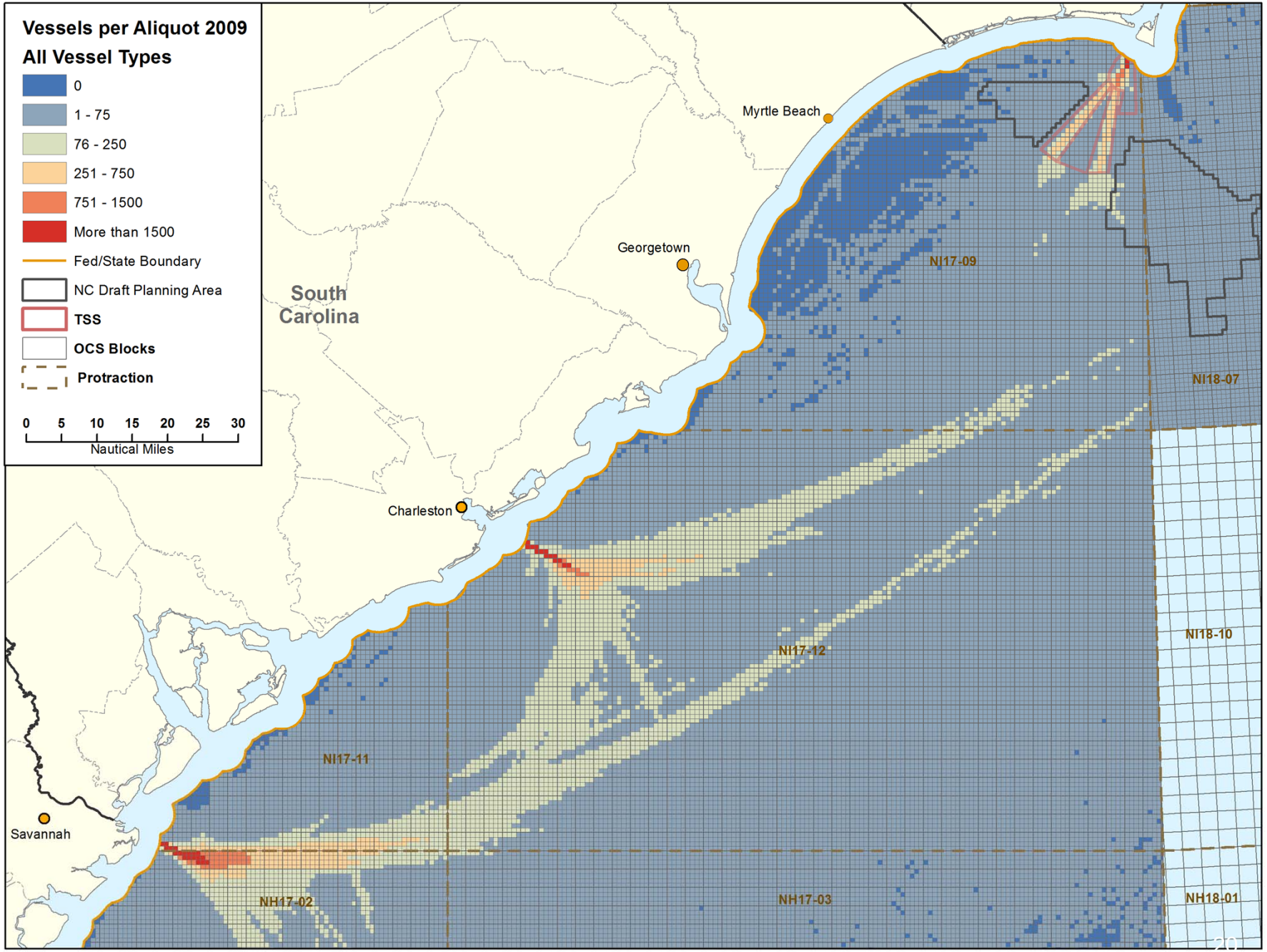
- Quantify unique vessels (MMSI) passing through each leasing unit (aliquot) per year.
- Extract deep draft vessel types for depicting traffic volume for larger vessels.
- Other mapping includes avg. vessel time in aliquot, avg. speed, etc.

# OCS Blocks – 2.6nm x 2.6nm, Aliquots (sub-blocks) - .65nm x .65nm

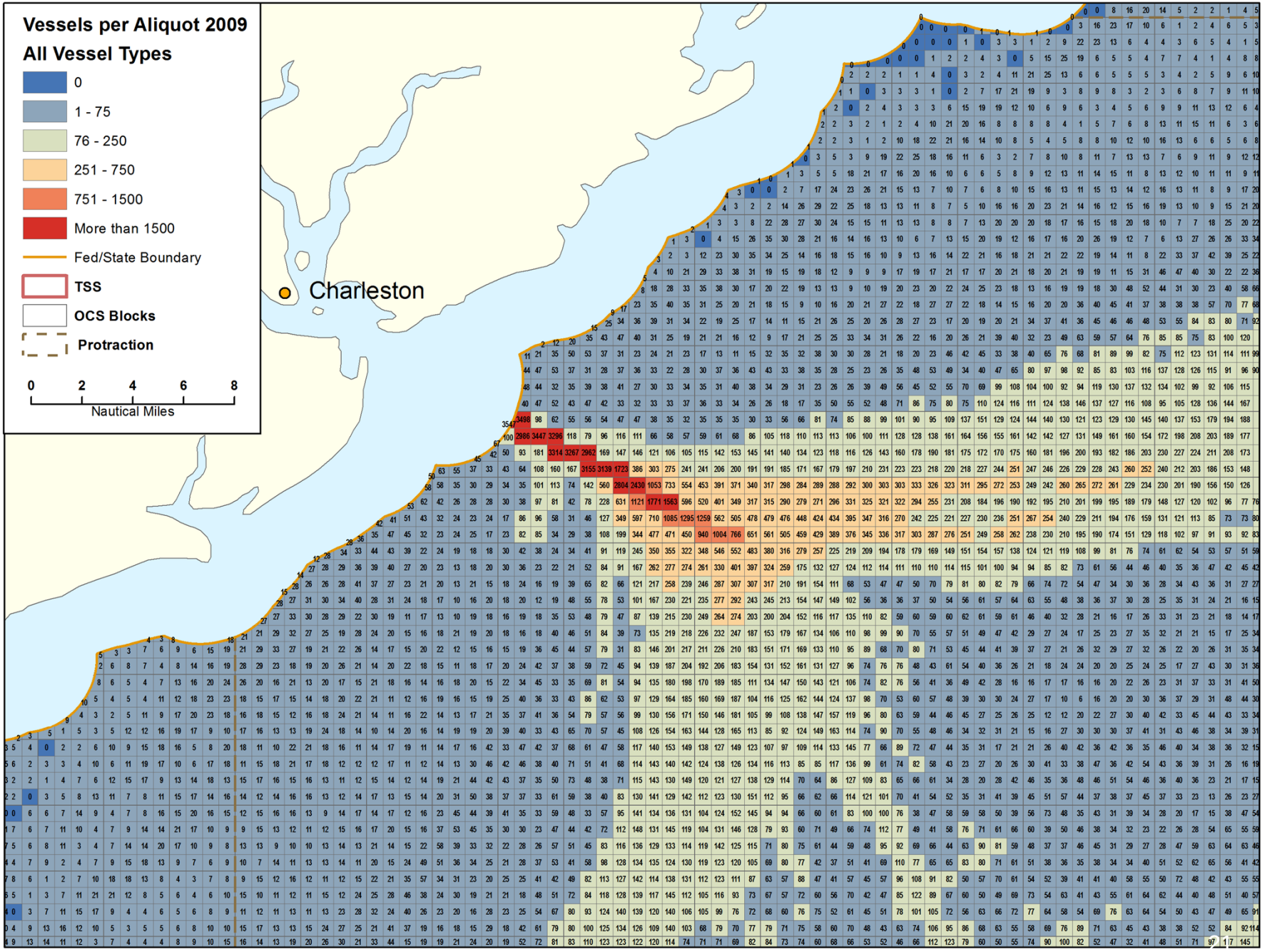


# Filtering by Date to Remove Duplicate Returns




Vessels per Aliquot 2009
All Vessel Types
0
1 - 75
76 - 250
251 - 750
751 - 1500
More than 1500
Fed/State Boundary
NC Draft Planning Area
TSS
OCS Blocks
Protraction
0 5 10 15 20 25 30
Nautical Miles
Myrtle Beach
Georgetown
South Carolina
Charleston
Savannah
NI17-09
NI18-07
NI18-10
NI17-12
NI17-11
NH17-02
NH17-03
NH18-01

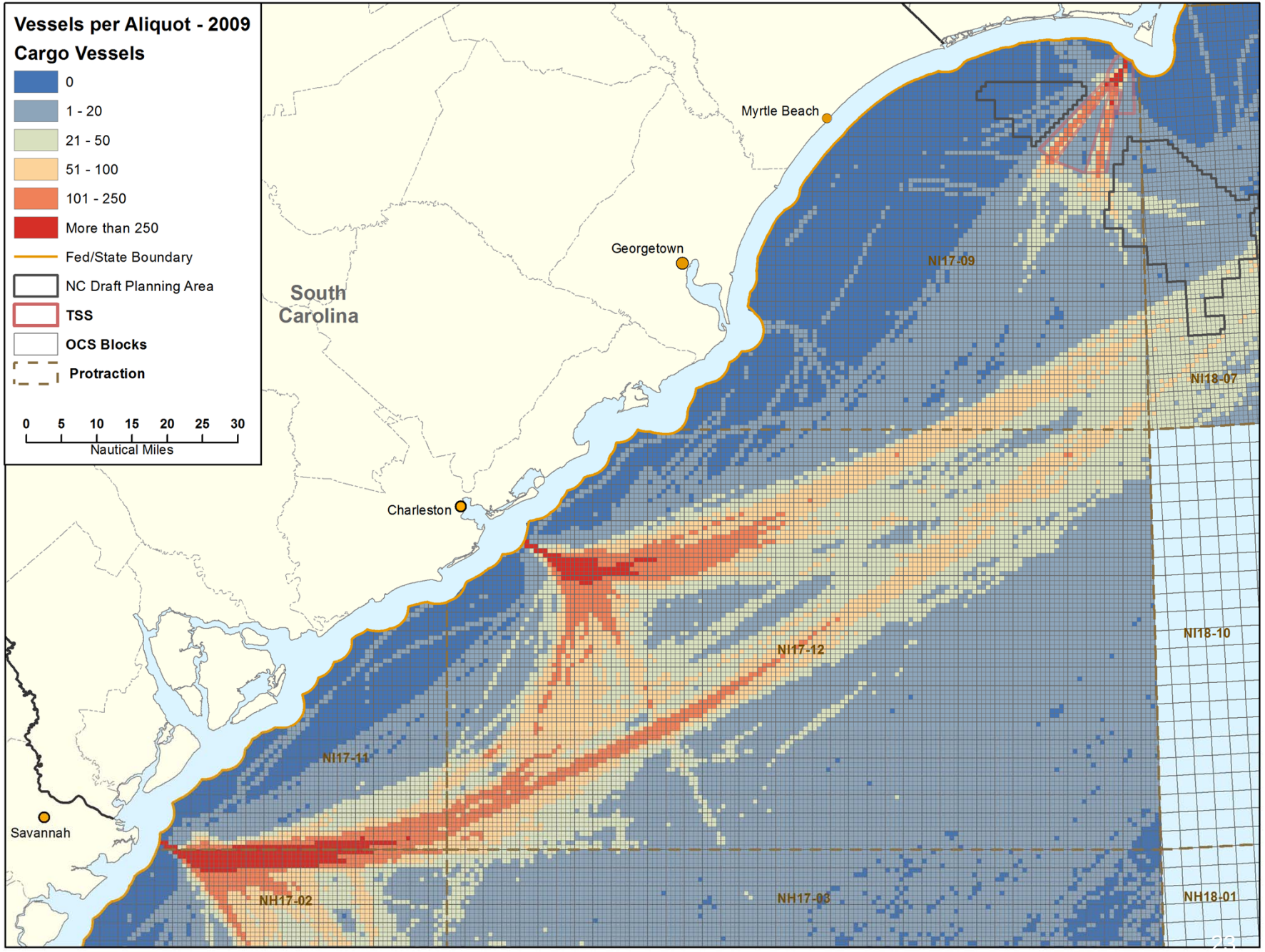
# Vessels per Aliquot - 2009



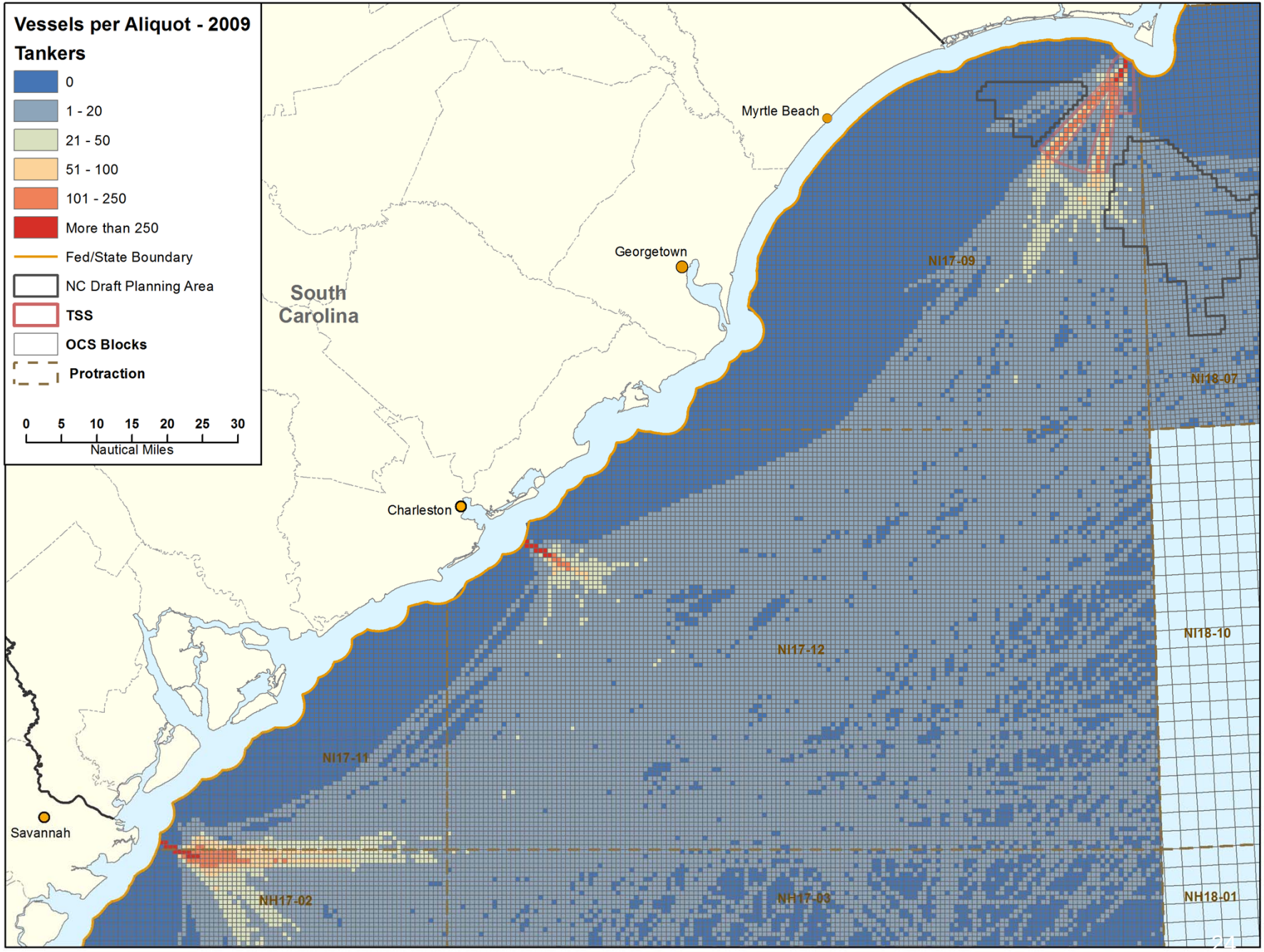
## Extracting Vessels by Deep Draft Type

- Cargo Vessels, Tankers, Tugs, Towing, Towing > 200m
- Comparison of unique traffic patterns by type.
- Maps use a more sensitive color scale to display lower volume types.

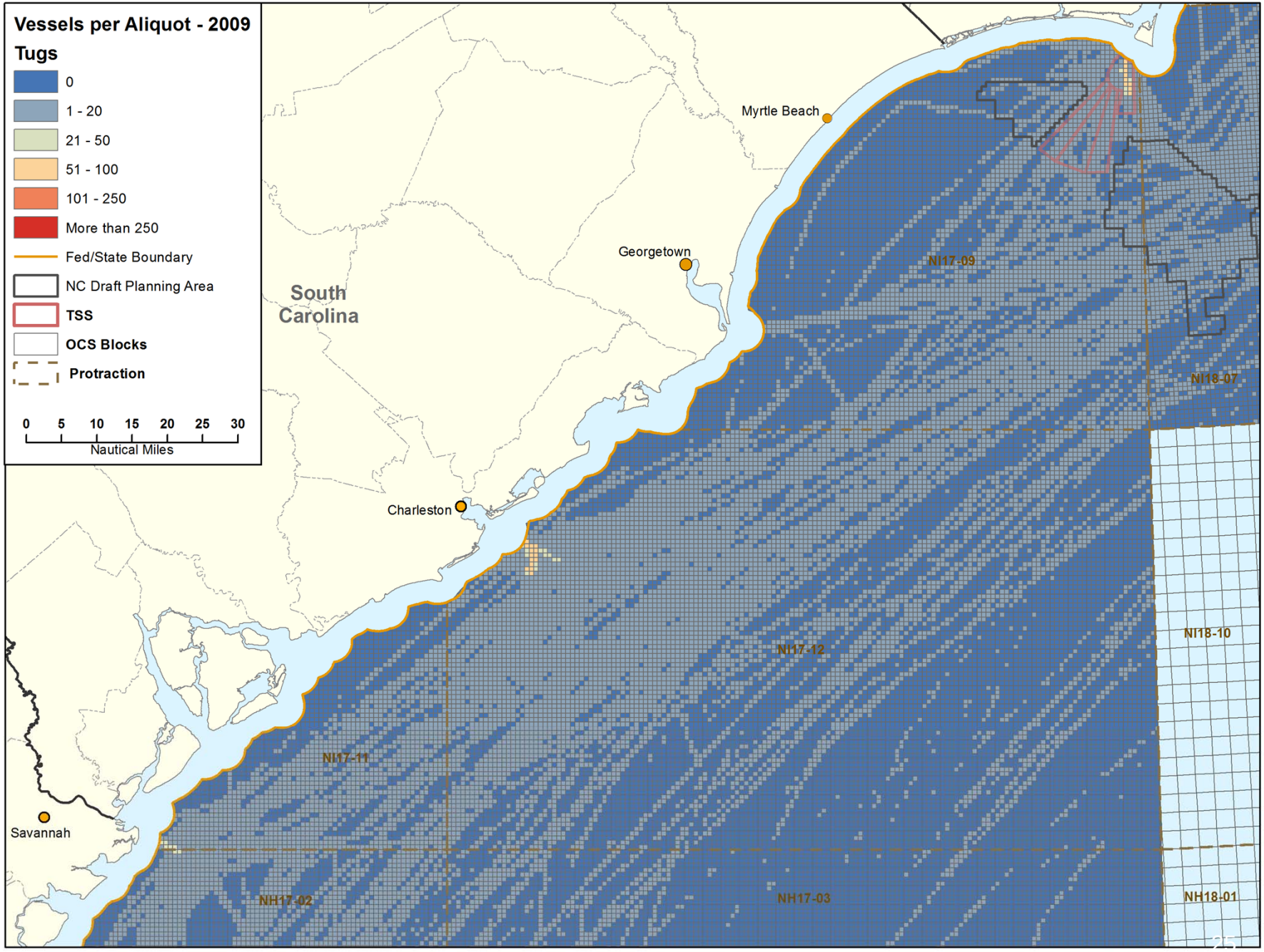
# Cargo Vessels per Aliquot - 2009



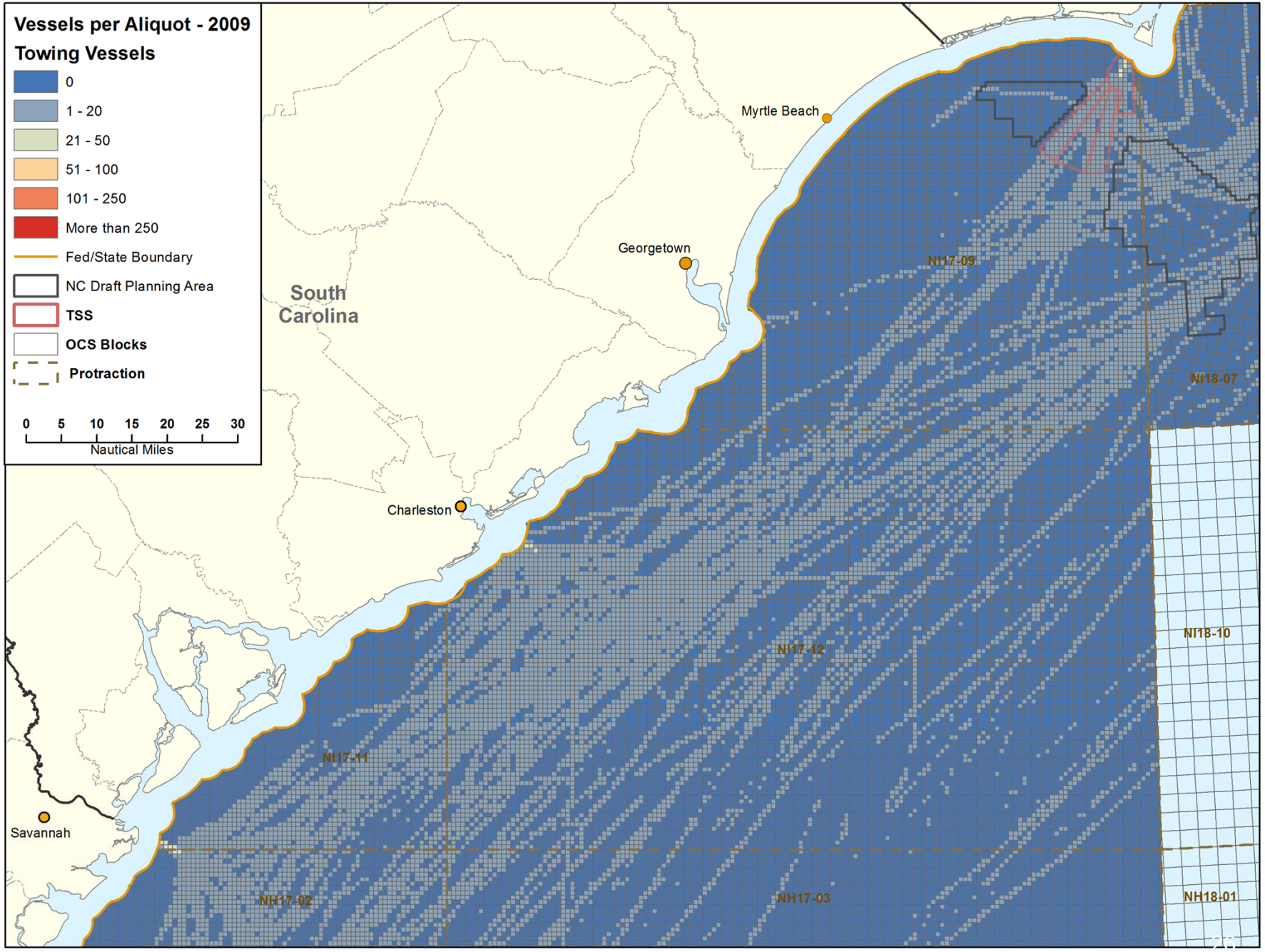
# Tankers per Aliquot - 2009



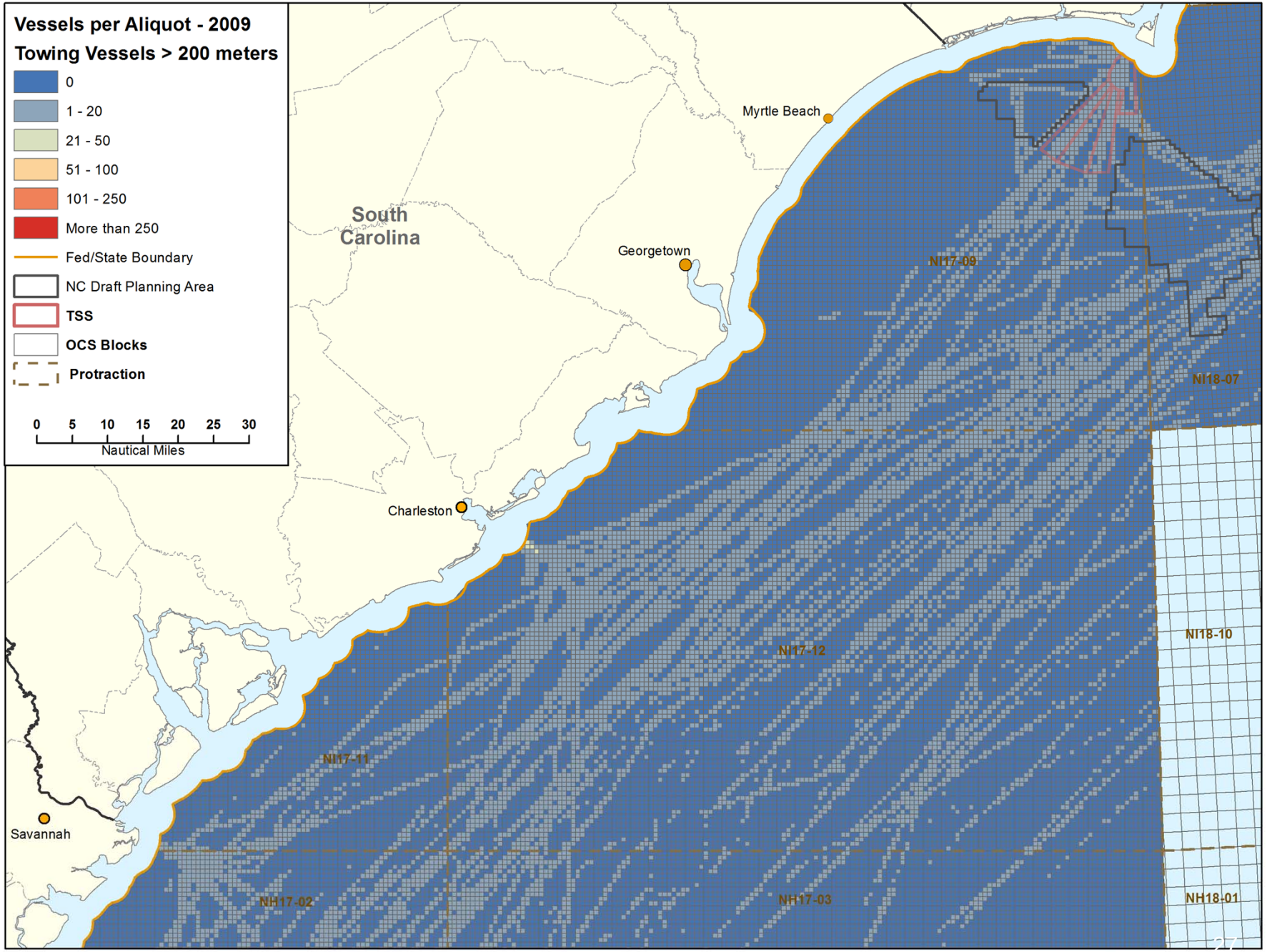
# Tugs per Aliquot - 2009

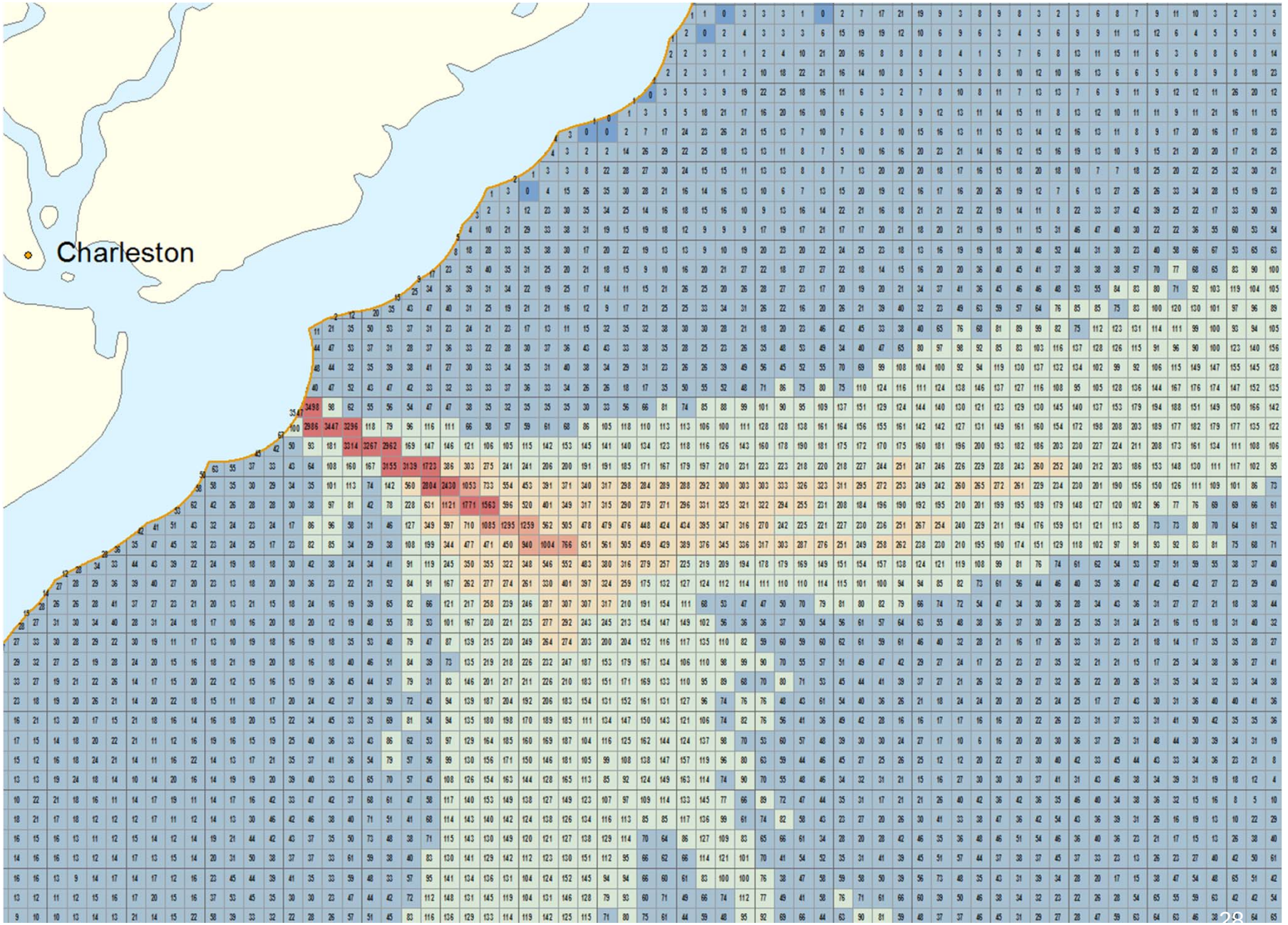


# Towing Vessels per Aliquot - 2009



# Towing Vessels > 200 m per Aliquot - 2009




Charleston