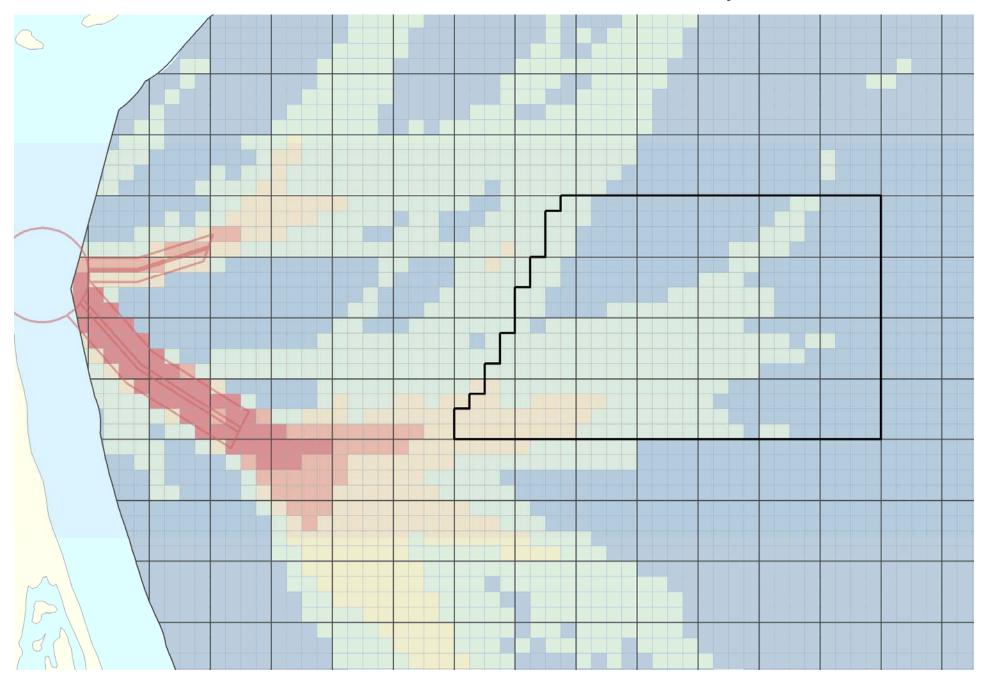
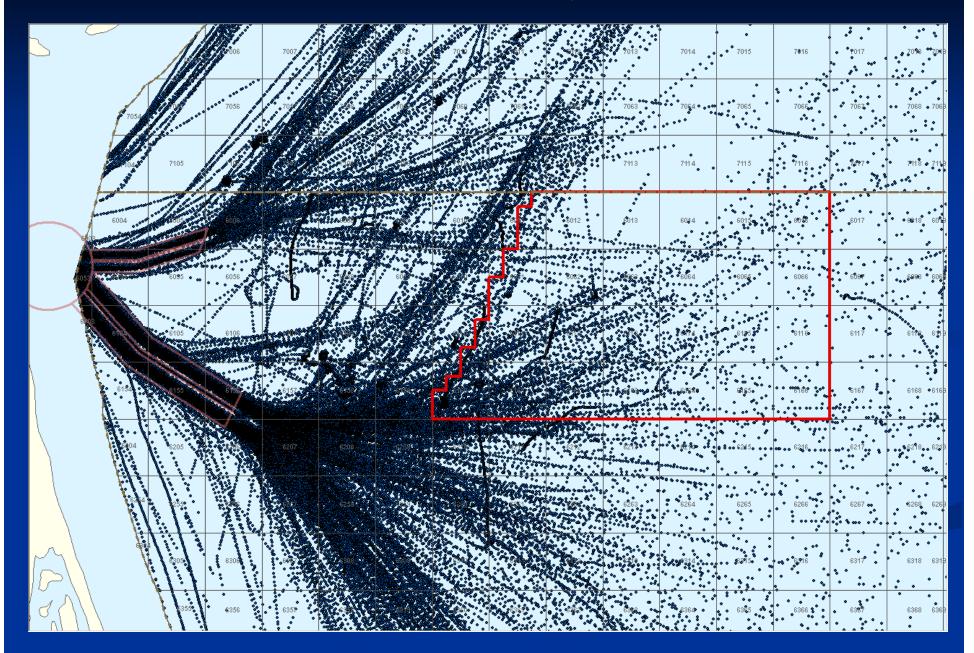
# Vessel Traffic Data and Analysis



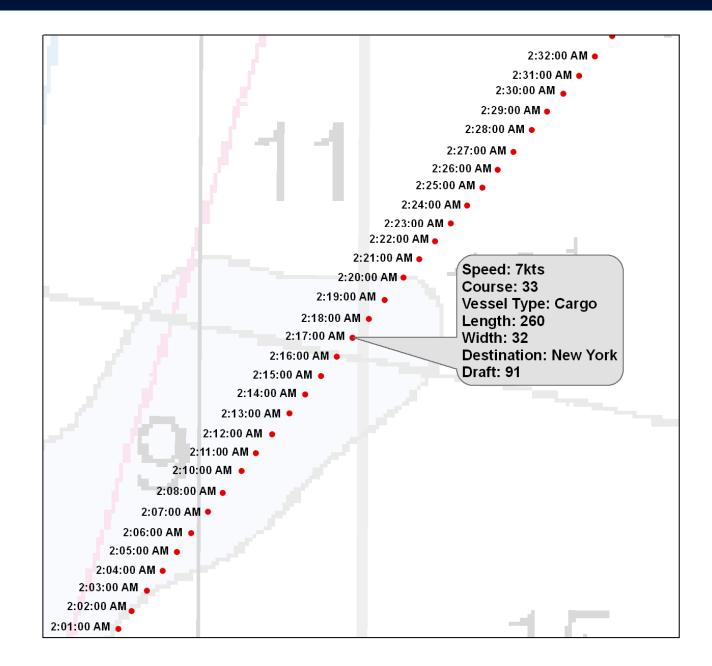
**AIS Analysis Input Data** 

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



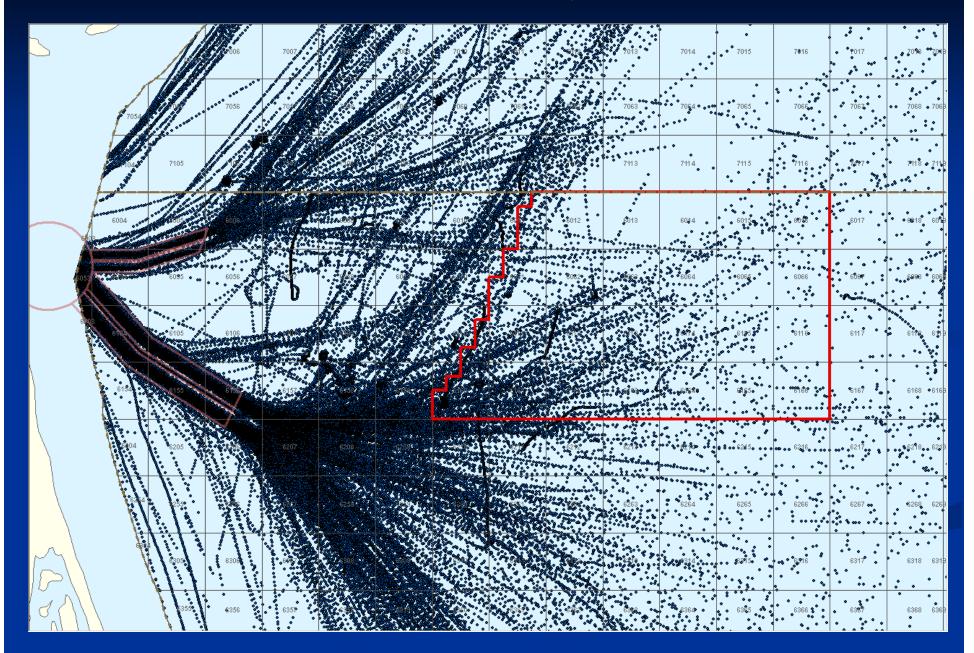
### AIS returns – Vessel Data



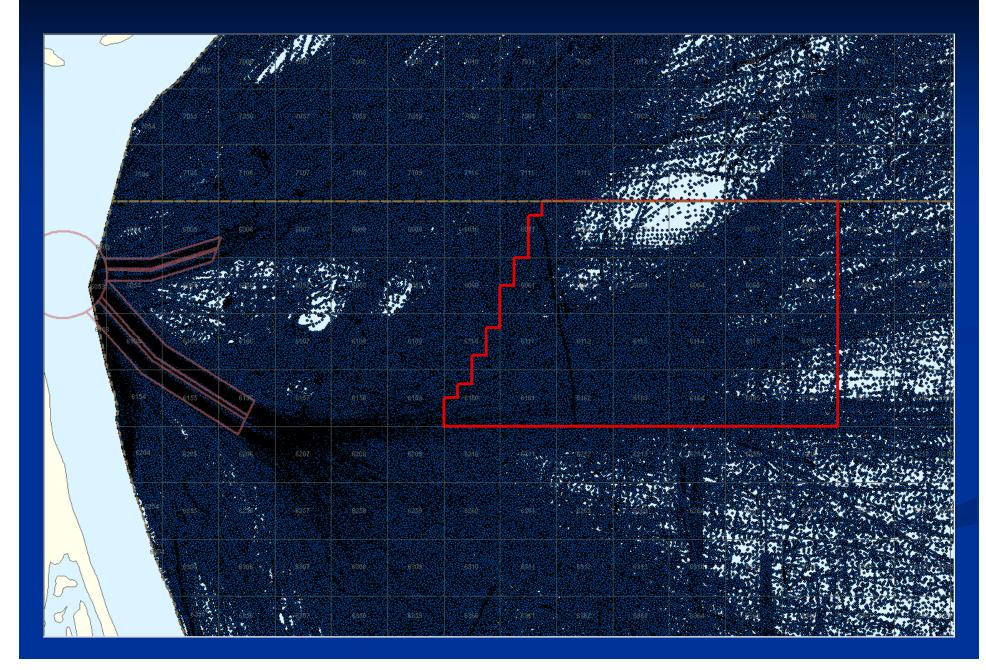
## AIS returns – Vessel Data

OID * Shape *	SOG	COG	Heading	ROT	BaseDateTime	VoyageID	MMSI	MMSI *	IMO	VesselType	Length	Width	DimensionCompon	VovagelD *	Destination	Cargo	Draught ETA	StartTime EndTime
1 Point	10	124	125		0 12/1/2009	VoyageiD 140	211208940	211208940	9038907		294		15.279.16.16		NEW YORK	No additional information		8: 12/1/2009 12:1 12/30/2009
2 Point	10		125			140	354745000	354745000		Cargo ships			15,279,16,16		NEW YORK			8: 12/1/2009 12:1 12/30/2009 9: 12/1/2009 12:0 12/31/2009
2 Point 3 Point	16	215 123	214		0 12/1/2009 0 12:01:00	178		211208940	9351579 9038907	Cargo ships	265 294				NEW YORK	No additional information		8: 12/1/2009 12:0 12/31/2009 8: 12/1/2009 12:1 12/30/2009
3 Point 4 Point	10	123 215	124		0 12/1/2009 12:01:00	140	211208940 354745000	211208940 354745000	9038907 9351579	Cargo ships	294		15,279,16,16		NEW YORK	No additional information		8: 12/1/2009 12:1 12/30/2009
	17		214					354745000					197,68,16,16			No additional information		
5 Point		215			0 12/1/2009 12:02:00	178	354745000		9351579	Cargo ships	265		197,68,16,16		NEW YORK	No additional information		9 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		15,279,16,16		NEW YORK	No additional information		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		265		197,68,16,16		NEW YORK	No additional information		9 12/1/2009 12:0 12/31/2009
8 Point		123	124		0 12/1/2009 12:03:00	140	211208940	211208940 354745000	9038907	Cargo ships	294		15,279,16,16		NEW YORK	No additional information		8: 12/1/2009 12:1 12/30/2009
9 Point	17	214 124	214		0 12/1/2009 12:04:00	178	354745000		9351579	Cargo ships	265		197,68,16,16		NEW YORK	No additional information		9 12/1/2009 12:0 12/31/2009
10 Point			125		0 12/1/2009 12:04:00	140	211208940	211208940	9038907	Cargo ships	294		15,279,16,16		NEW YORK	No additional information		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		197,68,16,16		NEW YORK	No additional information		9 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		15,279,16,16		NEW YORK	No additional information		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		197,68,16,16		NEW YORK	No additional information		9 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		15,279,16,16		NEW YORK	No additional information		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		197,68,16,16		NEW YORK	No additional information		9 12/1/2009 12:0 12/31/2009
16 Point	16	215	214		0 12/1/2009 12:08:00	178	354745000	354745000	9351579		265		197,68,16,16		NEW YORK	No additional information		9 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		15,279,16,16		NEW YORK	No additional information		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		265		197,68,16,16		NEW YORK	No additional information		9 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		15,279,16,16		NEW YORK	No additional information		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		265		197,68,16,16		NEW YORK	No additional information		9 12/1/2009 12:0 12/31/2009
21 Point	17	215	214		0 12/1/2009 12:11:00	178	354745000	354745000	9351579		265		197,68,16,16		NEW YORK	No additional information		9 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		15,279,16,16		NEW YORK	No additional information		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		197,68,16,16		NEW YORK	No additional information		9 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		15,279,16,16		NEW YORK	No additional information		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		197,68,16,16		NEW YORK	No additional information		9 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		15,279,16,16		NEW YORK	No additional information		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		265		197,68,16,16		NEW YORK	No additional information		9 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		197,68,16,16		NEW YORK	No additional information		9 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		15,279,16,16	140	NEW YORK	No additional information		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	9 12/1/2009 12:0 12/31/2009
31 Point	14	99	96	12	9 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	9 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	9 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		NEW YORK	No additional information		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	9 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	9 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	9 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	9 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	9 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		197,68,16,16	178	NEW YORK	No additional information		9 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		15,279,16,16	140	NEW YORK	No additional information	115 12/1/2009	8: 12/1/2009 12:1 12/30/2009
					0 40 8 8000 40 05 00	470	354745000	354745000	9351579	Cargo ships	265		197,68,16,16	470	NEADYOPIC	No additional information		9 12/1/2009 12:0 12/31/2009
48 Point	17	214	213		0 12/1/2009 12:25:00	178						34		1/0	NEW YORK	No additional information		

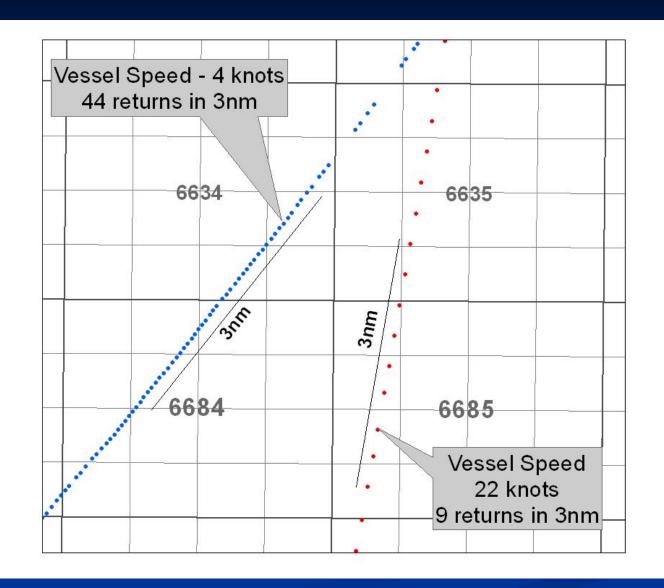
# AIS returns – January 2009

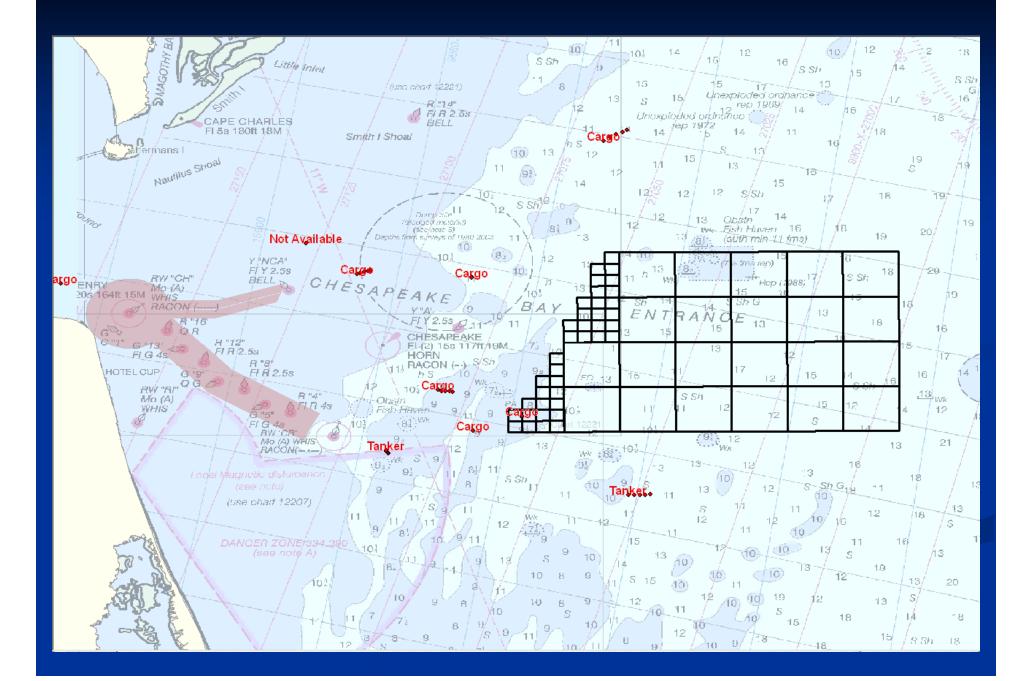


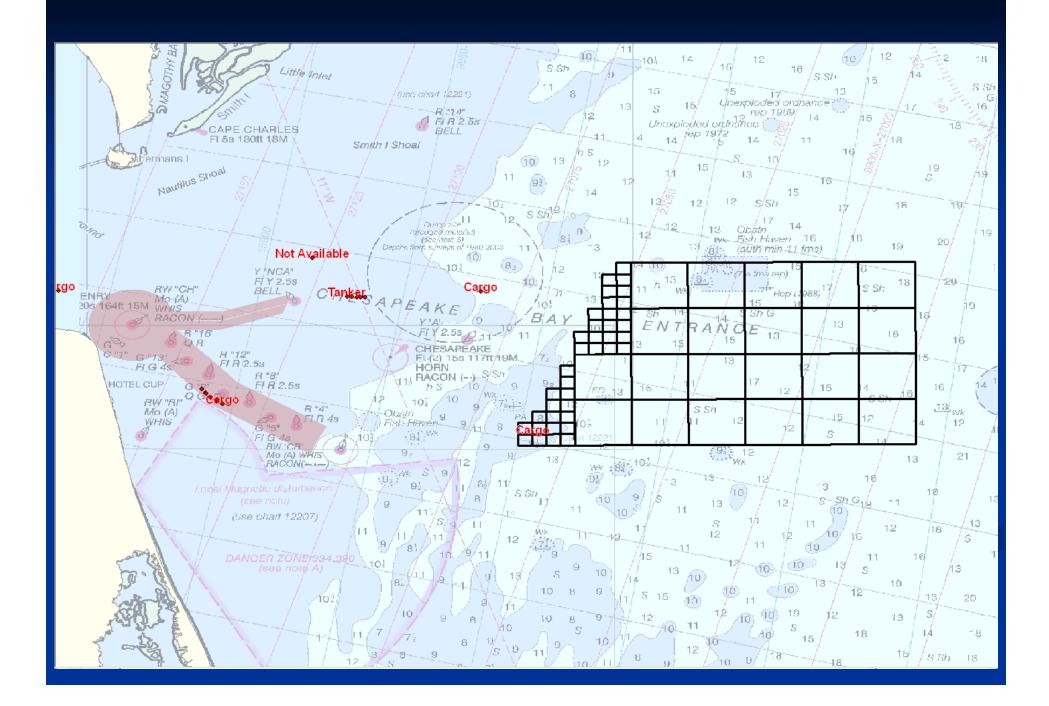
# AIS returns – All Months 2009



## Vessel Speed and AIS Point Density







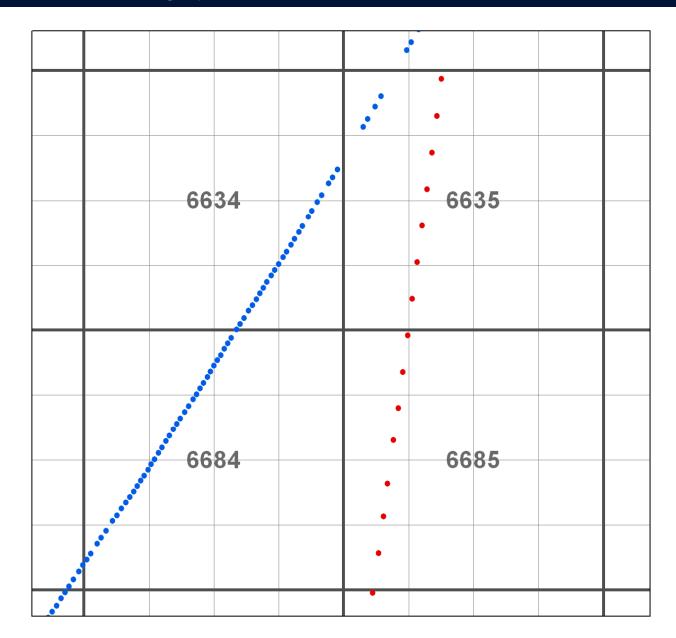
# **AIS Density Mapping**

- 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.

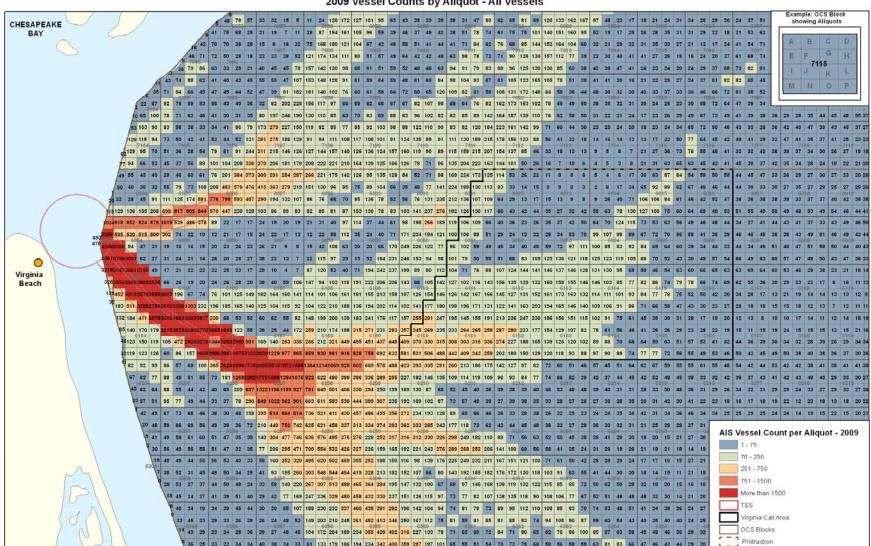
# OCS Blocks – 2.6nm x 2.6nm, Aliquots (sub-blocks) - .65nm x .65nm

A	В	С	D	А	В	С	D	
Е	F	G	Н	Е	F	G	н	
I	<b>66</b> ၂	<b>29</b> К	L	I	<b>66</b> Ј	30 К	L	
Μ	Ν	0	Ρ	Μ	Ν	0	Р	
A	В	С	D	А	В	С	D	
Е	F	G	Н	E	F	G	н	
I	J	79 K	L	I	J	K	L	
Μ	Ν	0	Ρ	Μ	Ν	0	Ρ	

# Filtering by Date to Remove Duplicate Returns



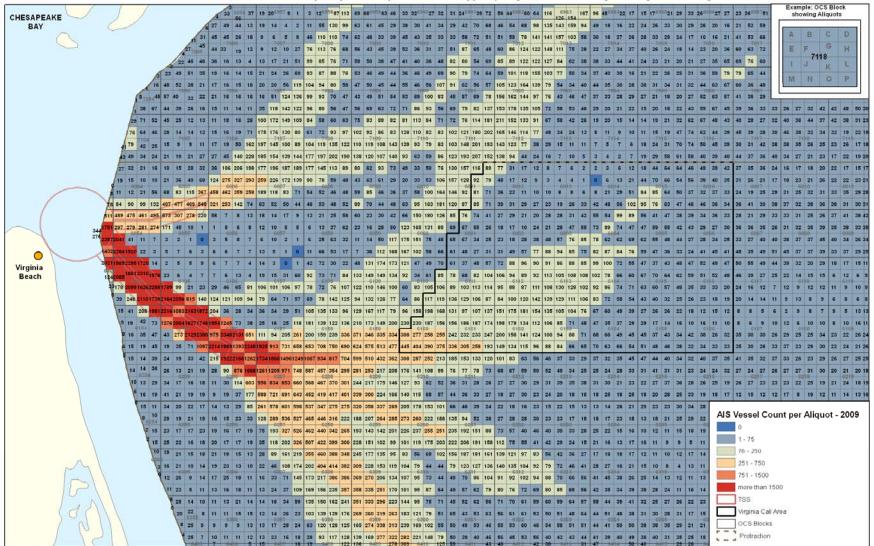
### All Vessel Types vs. Deep Draft



#### 2009 Vessel Counts by Aliquot - All Vessels

tan ID: PACE 201

### Deep Draft Vessel Types

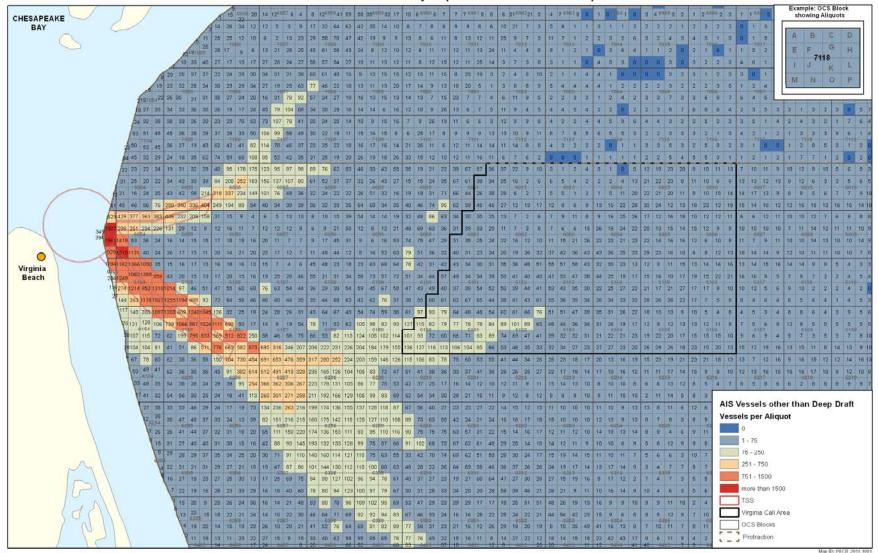


2009 Vessel Counts by Aliquot - Deep Draft Vessel Types (Cargo, Tanker, Towing, Towing >200m, Tugs

Map ID: PACB 2011.108

## Other than Deep Draft Vessels (Subtraction)

#### 2009 Vessel Counts by Aliquot - Vessels other than Deep Draft

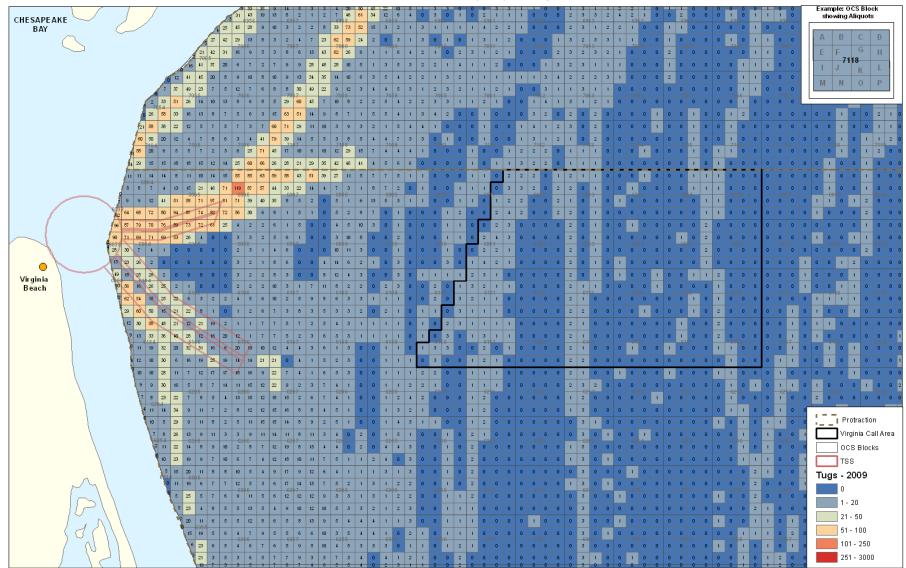


# **Extracting Vessels by Deep Draft Type**

- 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.

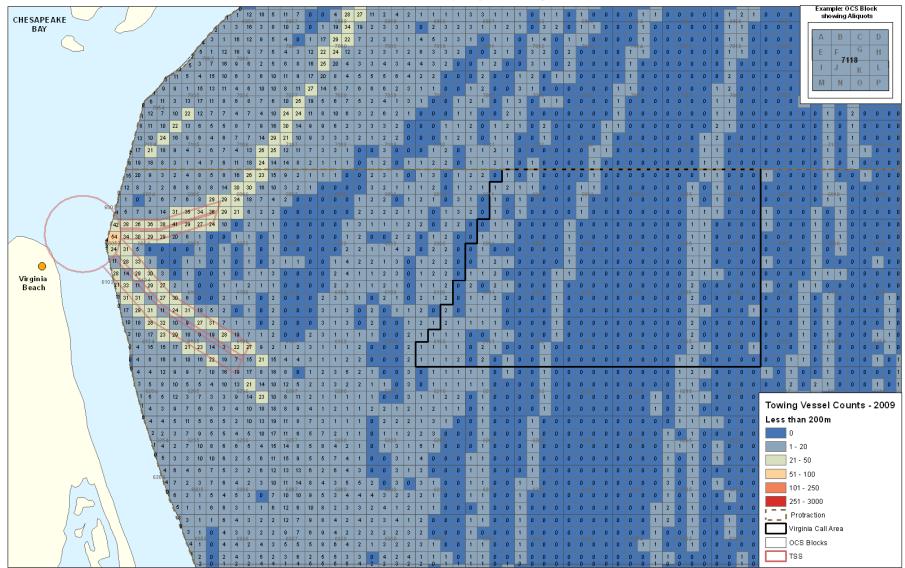
## Tugs - 2009

2009 Vessel Counts by Aliquot - Tugs

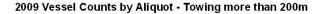


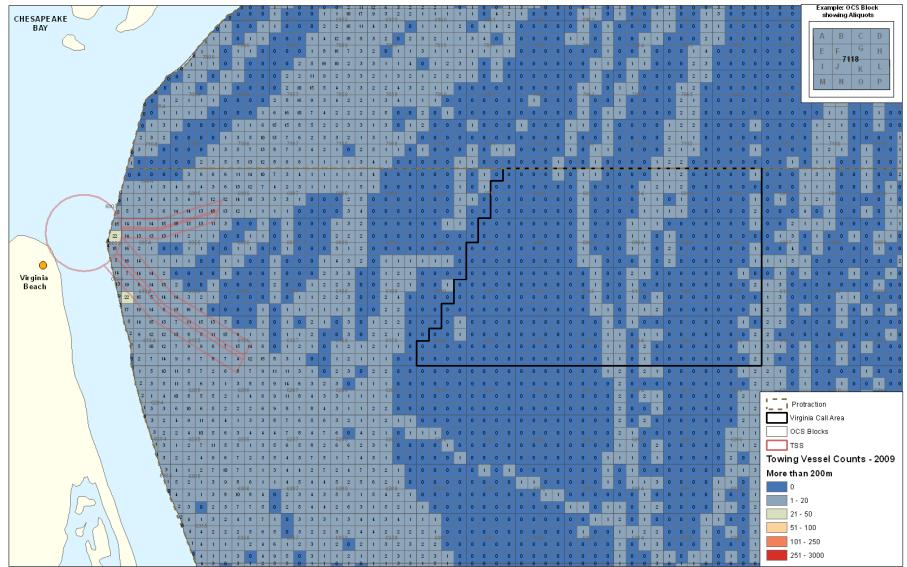
### Towing Vessels - 2009

2009 Vessel Counts by Aliquot - Towing less than 200m



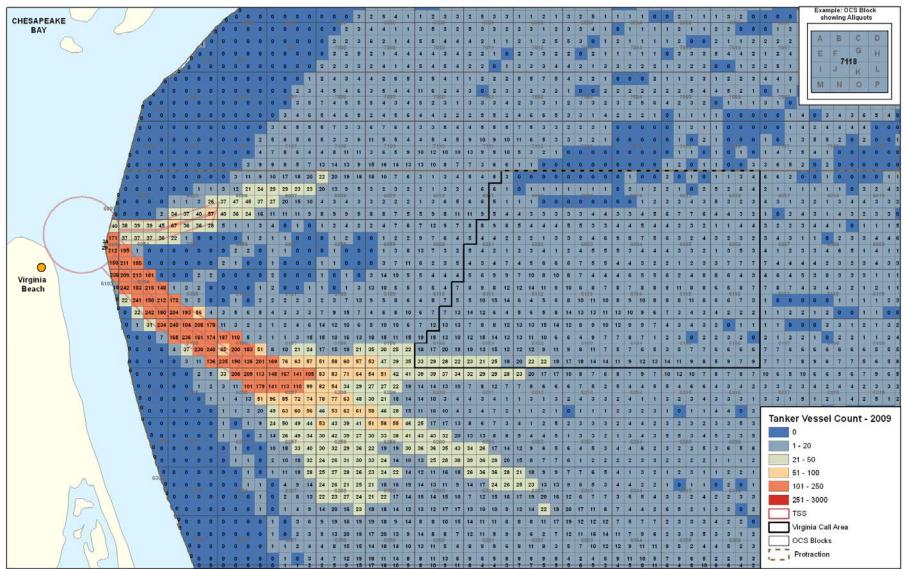
### Towing Vessels over 200m - 2009





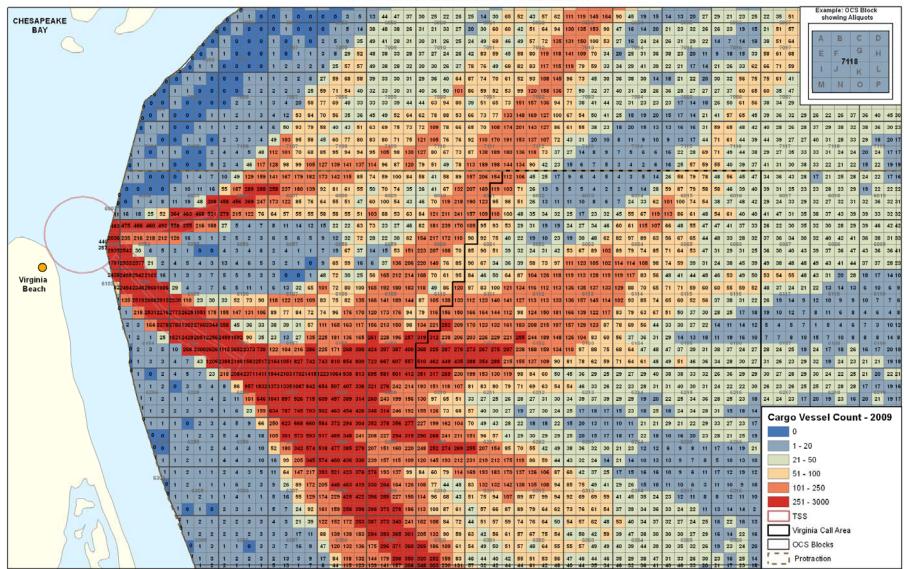
### Tankers - 2009

### 2009 Vessel Counts by Aliquot - Tankers

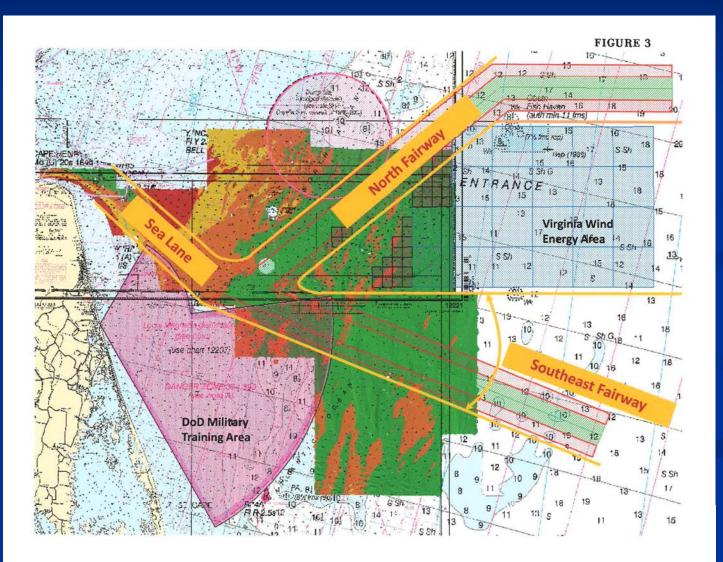


### Cargo Vessels - 2009

#### 2009 Vessel Counts by Aliquot - Cargo Vessels



- Navigational comments received from The Virginia Port Authority on Mid Atlantic WEA Draft EA.
- Delineation of a northern and southern route using existing deep water access.
- Analysis options for predicting "approximate" fairway traffic volume.



# **Current Traffic**

### 2009 Vessel Counts - Current Traffic

		200	o vessel oounts - ourrent ma		
	43         74         88         62         41         40         43         45         55           71         84         66         45         47         45         44         52         47		60 84 98 104 93 67 61 105 123 165 105 7		2 65 45 47 40 25 30 31 33 36 30 39 48
6	TOTAL ROLL BOR DE TOTAL DE CAL	7057 7059 7059	65 120 109 82 61 58 108 131 172 148 84 5 7051 7052	7000 7006 7006 7006	1 38 52 38 28 29 38 30 27 30 37 52 53 T055 T055 T055
2 22 67	92 75 59 53 56 43 40 36 32	82 202 228 156 117 97 66 59 62 66 67 67 82	107 98 68 64 76 82 162 173 153 102 78 4	45 49 50 38 35 32 31 30 24 25 23 30 58 72 64 4	17 39 34 37 29 34 27 27 36 44 58 53 52
10 65 100	78 71 62 46 41 30 31 35 80	197 246 190 130 110 85 63 70 83 69 88 83 96	102 82 82 85 89 142 164 187 139 110 76 6	62 58 50 31 22 21 24 17 23 26 29 49 67 73 49 4	11 39 38 36 29 28 35 44 45 48 55 37 40
53 103 90	83 58 38 33 34 41 86 79 173	<b>279</b> 227 150 119 82 85 77 85 92 103 98 88 12	2 110 90 83 82 120 184 223 161 142 99 71 6	60 44 30 23 25 24 20 18 23 24 34 65 72 50 46 4	13 33 28 36 42 40 47 39 43 45 37 27 22
129 115 94	73 50 42 41 52 44 52 121 281	275 188 129 91 94 111 108 117 108 101 91 134 13	99 91 111 130 189 215 178 156 123 88 56 4	41 32 18 14 16 14 13 13 17 22 50 77 64 45 42 4	19 41 29 32 47 41 35 37 41 25 23 23 22
62129 95 70	51 36 28 54 79 61 91 244 311	215 146 126 127 144 157 140 126 136 124 157 160 11	90 89 115 159 215 207 154 137 85 46 33 1	18 13 13 9 5 8 7 21 27 36 73 76 55 48 41 3	33 32 42 38 39 37 34 30 26 27 19 18 19
7 94 66 53	45 37 56 89 101 104 208 336 270	206 181 179 208 222 221 210 164 139 125 166 126 78	71 96 135 204 223 163 144 101 50 26 16	7 10 6 4 5 3 8 21 31 63 65 63 45 42 41 4	15 39 37 42 35 34 28 24 19 22 21 20 13
49 55 43 40	29 46 60 61 76 201 384 373 300	291 284 287 266 221 175 142 126 95 135 128 84 52	71 98 169 224 173 125 114 53 26 22 11	8 8 6 5 4 6 17 30 63 87 84 54 59 50 55 4	<b>14 45 47 33 26 29 27 30 27 23 20 20 19</b>
50 40 30 32	55 79 73 108 208 483 579 476 415	363 279 219 151 130 96 85 75 89 104 56 35 48	77 141 224 189 130 113 83 33 14 15 9	9 8 3 2 8 17 34 65 92 89 62 67 49 46 44 4	14 39 33 30 27 35 27 29 25 27 29 26 29
20 32 28 45 91	111 125 174 581 776 799 593 407 290	194 132 107 86 76 68 70 85 136 78 52 56 76	131 235 212 136 107 109 64 29 13 17 15 1	6015 6014 6015 6016 13 9 8 9 26 40 71 106 106 84 61 46 42 52 47 3	6017 6018 6019 6019 6019 6020 38 36 38 38 39 33 37 37 40 42 38 38 40
119129 136 155 208	695 817 805 944 570 447 230 128 103	86 89 83 82 85 81 87 153 130 78 83 103 14	237 276 182 126 130 117 66 43 42 44 35 2	27 32 42 55 63 78 130 127 100 75 60 64 69 48 53 5	51 55 40 50 49 48 53 49 54 46 44 41 44
1034918 852 824 878	1019 539 486 378 89 22 17 17 24	19 30 19 21 31 40 97 114 37 44 61 98 19	266 189 119 106 109 66 40 36 23 26 35 3	37 42 50 64 70 124 115 73 53 63 56 49 46 48 44 3	4 27 41 44 43 41 37 33 43 49 46 50 48
603 3258 595 530 515 500	302 74 22 10 13 21 17 15 24	22 17 13 12 22 58 112 35 24 40 71 171 23	194 121 100 106 88 51 29 24 13 32 28 3	34 53 70 99 107 98 69 67 72 70 56 58 41 36 39 4	16 46 45 36 38 43 49 51 46 49 43 44 47
6704248 <mark>3460</mark> 94 47 31	19 16 16 15 20 23 26 23 26	21 9 8 15 42 108 63 20 20 66 170 249 22	122 77 96 102 59 49 45 34 40 48 59 7	6053 6054 6055 6055 6055 72 97 111 100 85 83 92 84 69 64 60 39 34 44 33 4	6057 6058 6059 6070 14 34 49 51 48 47 51 58 50 44 40 43 34
		22 13 7 22 115 97 29 15 52 164 231 246 15	94 98 101 79 50 55 51 68 83 109 125 13	36 121 118 125 123 119 109 88 70 52 43 30 49 57 54 6	66 49 63 60 57 47 48 50 43 47 36 33 32
32153147 2750 49	17 21 22 22 22 25 23 17 29	10 4 7 87 120 53 40 71 194 242 237 199 85	80 112 104 71 78 88 107 124 144 141 146 13	37 146 128 131 130 95 68 59 46 54 63 60 66 65 63 6	53 69 64 60 53 46 29 38 23 21 18 14 14
328333429433665253	66 26 19 20 24 26 28 20 38	40 59 106 147 94 102 118 191 222 206 206 143 68	105 142 127 102 116 143 156 135 129 132 160 1	58 155 146 146 103 85 77 82 86 74 79 78 66 74 69 6	52 55 36 30 29 23 22 17 8 16 11 13 15
1394523313 3596	2803 196 67 74 76 101 125 149 182	6107 164 160 141 114 101 106 161 181 155 213 158 107 12	10 6112 154 146 126 142 167 166 145 127 131 152 161 1	6113 6114 6115 6116 73 163 132 114 111 101 93 84 77 78 75 52 50 42 30 3	6117 6118 6119 6120 34 28 17 13 21 19 14 14 13 13 12 9 11
32 183 511 3288276					28 18 18 15 15 18 12 13 7 12 11 11 16
132 184 411 3078	169234032917 330 68 53 53 60	62 55 82 148 199 200 139 183 241 176 117 157 25	291 247 195 145 155 191 213 236 247 230 186 1	56 151 115 102 91 75 61 45 39 39 31 28 17 19 20	12 13 8 10 10 17 14 11 12 14 18 19 10
		25 44 172 259 210 174 198 315 271 231 293 357 34			15 11 15 19 24 15 15 15 13 15 21 16 21
46123 150 119	2770 3260 105 472292432131344 2953 901 169	6157 140 263 336 266 212 321 449 495 451 437 448 409 37	150 330 315 308 303 316 336 274 227 188 165 139 12	6163 0194 6185 6186 26 120 102 89 88 70 68 64 59 63 51 57 53 41 42	6187 6188 6189 6170 14 36 39 30 34 32 28 39 26 29 34 34 35
6154		1229 977 865 859 930 981 916 828 759 692 632 581 53			0 42 45 49 50 38 40 38 36 37 30 36 35
					54 42 44 53 42 42 38 41 38 41 41 38 41
67 63 77	2425				89 37 43 41 42 43 48 40 29 33 30 27 27
0004	0.007	11961159 927 791 645 501 406 330 294 250 199 169 13		6216 53 48 48 39 40 31 31 28 33 50 48 36 31 29 26 3	6217 6218 6219 6220 34 32 31 2
		1022 962 901 663 611 583 530 444 399 307 235 192 16		الالمالا لا تداخلها فالمالي فالمالي	6 17 18 Vessel Count 2009
		814 864 814 736 521 411 430 457 486 455 356 272 23		والتاليا لنا لناليا لنا لناليا الا الاليا ال	25 29 25 2
20 48		440 752 742 625 621 458 337 313 334 374 393 362 33		33 27 28 30 30 32 31 21 25 29 28 37 31 37 29 2	
6254	6255 6256	6257 304 477 746 636 576 495 376 276 228 252 317 316 31	260 6261 6262	6260 6264 6265 6266	a 23 21 4 6287 1 - 75 1 - 75
		206 295 471 700 554 532 426 327 226 159 165 192 22		41 35 24 31 26 19 26 21 19 21 18 14 19 20 21 3	76 - 250
		160 252 329 495 620 502 469 355 252 198 150 116 96		بالمالية لتناقيا لمالية اتنا تما تمالية لتمالية لتعالما لت	33 30 23 1 251 - 750
6304		93 195 260 303 548 544 494 419 328 213 182 152 10			
	6305 6306	58 140 220 267 307 513 488 465 364 284 195 147 13	310 6311 6312	6310 6314 6315 6316	751 - 1800
		42 77 169 247 236 329 480 458 432 330 237 151 12			1801 - 3842
$\sum$		30 55 107 188 230 232 337 460 435 391 292 196 14			14 18 19 1 new route n
	33 45 23 29 33 36 39 26	24 48 53 149 203 210 245 361 452 413 346 250 16			
	14 43 29 23 24 28 36 39	27 48 45 104 172 204 189 234 355 420 402 316 22	300 0301 0302	Color         Color <th< th=""><th>virginia Can Area</th></th<>	virginia Can Area
	6 36 25 23 22 34 34 40	38 24 33 61 133 179 186 194 234 342 400 359 29			28 30 19 TSS
$\leq 1$	30 25 21 18 25 22 39	31 19 24 39 91 166 188 188 194 227 346 392 34			3 23 24 3 OCS Blocks
2 1 1	\$405 6406	33 20 25 30 51 115 168 163 164 159 227 372 36	410 6412	62 44 43 50 50 46 55 69 90 86 47 37 33 32 32 3	5417
	B 29 17 20 20 19 25				17 24 20 1 Protraction

## South Route vs. North Route -Mean Seaward Course Angle

7104     7105     7105     7107     7108     7107     7108     7109     7109     7109     7109     7109     7109     7109     7109     7109     7109     7109     7109     7110     7111     7112     7112     7112     7113	6016         70         70         71         70         67         73         77         87         74           62         68         69         74         69         79         89         76	64         58         88         117         78         62         72           69         53         87         134         67         59         63           73         82         88         81         69         78         72
73       76       70       59       67       71       69       66       49       57       64       69       71       73       69       66       49       57       64       69       71       73       69       66       74       69       66       49       57       64       69       74       82       74       88       32       30       33       77       66       50       25       58       53       60       62       84       64       64       67       63       74       82       74       88       32       30       33       77       64       65       64 <th< th=""><th>66         60         67         68         68         87         70         73           61         61         66         66         61         74         78         69           75         71         70         67         73         77         87         74           62         68         69         74         69         79         89         76</th><th>64         58         88         117         78         62         72           69         53         87         134         67         59         63           73         82         88         81         69         78         72</th></th<>	66         60         67         68         68         87         70         73           61         61         66         66         61         74         78         69           75         71         70         67         73         77         87         74           62         68         69         74         69         79         89         76	64         58         88         117         78         62         72           69         53         87         134         67         59         63           73         82         88         81         69         78         72
6004         69         71         73         69         58         44         59         67         72         73         75         85         93         66         84         73         65         84         73         65         64         73         65         64         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         84         73         65         74         86         68         68         73         44         96         44         103         86         64         61         85         84         86         86         75         74         80         86	601         61         66         66         61         74         78         69           76         71         70         67         73         77         87         74           62         68         69         74         69         79         89         76	69         53         87         134         67         59         63           73         82         88         81         69         78         72
75 74 68 67 68 71 66 67 76 82 87 96 84 82 87 89 85 73 60 68 79 85 79 66 7 76 82 87 96 84 82 87 89 85 73 60 68 79 85 79 66 61 59 70 76 74 86 68 68 73 49 79 86 92 79 76 73 69 64 62 66 78 70 76 75 74 75 75 75 75 75 75 75 75 75 75 75 75 75	76         71         70         67         73         77         87         74           62         68         69         74         69         79         89         76	73 82 88 81 69 78 72
76 75 73 72 72 71 77 74 63 92 71 68 79 83 101 67 50 50 94 83 84 74 55 58 68 79 62 86 84 68 69 87 88 82 78 82 68 67 64 62 66 56 61 67 71	62 68 69 74 69 79 89 76	
87 78 75 76 78 68 94 78 94 50 110 65 106 82 63 86 40 37 50 97 84 74 54 46 61 94 57 69 89 88 82 84 72 76 77 69 67 67 66 69 61 64 62 66 64 72	68 70 72 99 66 71 73 91	65 79 76 81 69 74 72
	E0155 60157	67 75 73 80 66 75 73 COE8 E009
	83 92 70 76 70 71 69 79	68 72 71 74 76 74 75
101 81 89 87 93 99 66 101 110 49 55 110 80 55 48 38 40 81 50 57 93 50 55 70 81 56 79 89 72 130 95 85 73 62 66 66 71 67 67 60 66 66 45 73 89	87 80 76 77 74 79 74 80	70 71 72 72 78 84 83
8 120 68 05 86 85 83 87 75 80 78 70 80 45 37 40 66 86 67 79 55 52 65 75 62 64 51 62 78 65 00 72 82 67 78 73 74 60 63 68 63 60 67 60 70 80	76 73 73 76 76 80 77 83	79 76 75 78 73 83 80
13191 90 80 76 81 77 95 98 75 95 83 84 71 55 68 73 71 56 96 61 77 93 78 57 68 58 86 83 74 76 68 72 70 76 73 69 74 61 65 78 77 78 72 75 89	69 79 76 81 75 75 80 70	90 74 74 74 69 88 75
131 84 84 82 86 94 93 83 79 92 79 86 75 71 98 95 81 82 68 70 74 81 88 61 51 58 65 79 63 86 65 81 69 68 68 73 75 64 73 81 77 76 75 70 78	68 75 69 85 71 74 86 72	94 61 98 62 89 101 62
125 113 86 84 85 87 92 88 85 85 85 85 87 72 97 83 89 70 80 67 84 105 71 88 56 66 98 67 82 68 82 69 76 84 75 72 67 84 71 75 80 82 79 78 91 71	82 76 82 85 73 66 81 77	94 80 86 76 76 76 66
125 123 120 109 72 65 93 69 90 95 74 87 92 92 96 80 68 85 62 76 63 68 73 67 72 76 69 72 70 70 82 68 53 88 63 77 83 81 81 83 78 82 78 100 79	72 85 77 112 45 57 63 55	91 92 86 78 88 83 85
129 124 123 122 119 81 84 67 69 81 60 75 81 85 94 79 80 80 92 89 67 70 69 74 78 87 70 72 73 74 74 70 63 89 76 72 78 86 86 92 94 84 80 109 65	75 108 93 87 75 82 64 71	67 107 88 73 79 85 77
135 134 126 122 122 120 120 66 86 95 60 59 67 83 93 78 61 83 78 83 64 86 92 78 77 78 74 76 76 79 82 78 76 92 84 81 58 91 93 95 93 100 96 96 88	78 107 90 94 81 83 76 72	77 92 88 73 81 90 89
148 145 138 128 123 122 121 114 93 89 81 80 82 77 79 73 74 83 89 82 82 89 85 80 87 82 80 79 84 82 96 82 85 84 103 89 90 94 93 91 95 102 92 90 98	84 103 96 98 82 91 82 71	80 87 77 76 83 81 82
147 146 144 137 116 125 123 121 108 88 84 87 85 84 85 81 83 89 88 89 88 89 88 89 87 85 84 85 81 83 83 89 88 83 93 81 82 88 85 91 82 83 89 98 62 88 82 109 94 98 75 95 93 102 106 103 93 98	91 95 100 91 81 87 81 84	91 87 85 71 78 82 91
133 148 139 126 129 132 124 130 122 108 97 93 89 91 93 91 90 90 97 92 94 85 81 97 84 89 88 98 92 102 89 83 96 116 88 93 96 104 91 93 101 106 104 100	94 92 99 87 75 83 74 81	93 99 88 84 88 87 89
143 148 149 153 145 145 135 140 140 132 149 109 103 99 97 101 99 402 78 103 104 87 78 93 123 71 85 87 118 101 104 81 99 100 132 91 92 107 107 95 85 96 112 107 101	107 101 121 85 78 72 79 89	87 93 88 96 96 96 90
139 152 149 139 141 139 125 140 147 141 133 124 114 113 124 114 110 105 109 105 106 140 110 84 104 10 84 08 103 18 86 82 93 94 96 108 100 115 100 101 112 91 98 93 105 86 110 118	117 106 116 85 71 Seawar	d Angle Mean COG
145 149 148 145 137 139 124 135 146 148 139 135 124 115 108 105 108 106 109 106 111 107 105 113 114 115 106 104 87 86 94 80 117 116 80 103 97 97 92 94 94 91 93 104 102 108	115 108 92 110 73	- 30
138 154 145 142 146 145 137 140 146 152 142 140 132 125 120 116 109 111 108 112 109 108 108 109 144 109 100 96 96 98 89 95 105 96 111 106 83 104 91 96 74 74 96 105 90	106 74 109 111 100 31	1 - 60
147 161 120 155 136 166 142 132 151 144 147 145 138 135 126 121 119 117 110 105 108 105 108 110 111 108 106 100 98 97 89 91 95 104 100 98 89 101 91 94 105 97 89 104 106	74 75 129 123 90 61	1 - 90
89 147 146 152 141 136 140 142 144 160 132 152 151 140 138 131 129 126 125 121 116 115 110 111 109 117 113 112 111 112 106 100 92 100 99 114 99 107 115 124 79 85 100 101 108 102	50 129 116 115 101 91	1 - 120
153 156 154 141 142 149 144 147 143 127 152 152 141 139 138 135 130 127 127 122 123 121 126 118 118 111 113 109 118 113 104 103 97 105 100 93 107 100 122 89 90 99 101 108 99	55 111 112 98 87	21 - 150
183 149 161 148 137 134 136 127 115 126 153 150 143 142 140 138 129 127 134 123 129 120 117 113 114 104 121 123 120 114 108 109 98 107 111 96 107 102 124 74 114 105 110 100 86	65 105 108 95 113	
140 160 137 133 137 145 141 99 131 157 145 148 144 141 139 139 136 130 132 136 129 126 115 111 103 136 125 125 119 416 104 113 116 113 106 109 107 116 99 111 109 103 118 112	129 128 100 80 110	51 - 180
159 165 161 145 157 153 137 121 131 153 141 147 147 141 142 137 131 128 129 137 132 131 125 100 112 130 129 126 123 112 119 121 113 117 114 111 111 115 93 117 114 119 108 106	112 117 121 45 105	A Port Authority Comments
168 163 162 158 161 152 150 131 92 131 127 147 146 147 137 135 135 136 139 139 123 132 114 115 113 122 112 113 127 125 120 110 109 94 117 114 110 121 110 116 125 119 119 111	102 110 119 73 98	SS
161 149 142 130 145 149 129 94 142 108 137 143 141 146 133 139 138 140 139 135 139 122 121 116 120 128 125 129 130 127 96 124 102 115 112 116 117 114 119 142 129 121 111	98 100 118 90 98	rginia Call Area
		CS Blocks
123 155 161 143 132 125 115 92 96 109 155 148 148 150 147 144 136 143 141 139 137 141 130 132 131 120 129 112 131 126 124 128 84 127 121 126 121 125 126 116 143 118 112		rotraction

## **Rerouted Traffic**

### 2009 Vessel Counts with Altered Traffic

	(157-80-80-10-10-10-10-10-10-10-10-10-10-10-10-10			
		104 93 67 61 105 123 165 105 78 51 38 41 41	And Designed and the second state of the secon	5 47 40 25 30 31 33 36 30 39 48 54 54 57 43
705		9 82 61 58 108 131 172 148 84 58 38 44 48 36	6 32 30 40 33 37 33 34 46 66 72 61 38 5	2 38 28 29 38 30 27 30 37 52 53 60 49 33 26
22 67 92 75 59 53 56 43 40 36 3	32 82 202 228 156 117 97 66 59 62 66 67 67 82 107 98 6	8 64 76 82 162 173 153 102 78 45 49 50 38 35	5 32 31 30 24 25 23 30 58 72 64 47 39 3	4 37 29 34 27 27 36 44 58 53 52 43 28 19 13
0 65 100 78 71 62 46 41 30 31 35 1	80 197 246 190 130 110 85 63 70 83 69 88 83 96 102 82 8	2 85 89 142 164 187 139 435 401 387 383 375 356 34	7 346 349 342 348 351 354 374 392 398 374 366 364 3	8 36 29 28 35 44 45 48 55 37 40 26 17 16 16
53 103 90 83 58 38 33 34 41 86 79 1	73 279 227 150 119 82 85 77 85 92 103 98 88 122 110 90 8	82 120 184 223 486 467 424 396 385 369 355 348 35	0 349 345 343 348 349 359 390 397 375 371 368 358 2	8 36 42 40 47 39 43 45 37 27 22 21 13 11 13
129 115 94 73 50 42 41 52 44 52 121 2	81 275 188 129 91 94 111 108 117 108 101 91 134 135 99 91 11	1 130 189 215 503 481 448 413 381 366 357 343 339 34	1 339 338 338 342 347 375 402 389 370 367 374 366 2	9 32 47 41 35 37 41 25 23 23 22 13 13 22 20
129 95 70 51 36 28 54 79 61 91 244 3	11 215 146 126 127 144 157 140 126 136 124 157 160 119 90 89 1	5 159 215 532 479 462 410 371 3 2 1 1 1 0	1 1 2 3 4 7 8 6 5 4 3 3 4	2 38 39 37 34 30 26 27 19 18 19 18 21 21 13
7 94 66 53 45 37 56 89 101 104 208 336 2	70 206 181 179 208 222 221 210 164 139 125 166 126 78 71 96 13	5 204 548 488 469 426 375 3 2 1 1 1 0 0	0 1 2 3 6 6 6 4 4 4 4 39 3	7 42 35 34 28 24 19 22 21 20 13 12 17 27 21
49 55 43 40 29 46 60 61 76 201 384 373 3	00 291 284 287 266 221 175 142 126 95 135 128 84 52 71 98 45	4 549 498 450 439 878 3 2 1 1 1 1 0 0	1 2 3 6 9 8 5 6 5 6 44 45 4	7 33 26 29 27 30 27 23 20 20 19 25 30 26 29
500 50 40 30 32 55 79 73 108 208 483 579 476 4	15 363 279 219 151 130 96 85 75 89 104 56 35 48 77 466 5	9 514 455 439 408 3 1 2 1 1 1 0 0 1	2 3 6 9 9 6 7 5 5 4 44 39 3	3 30 27 35 27 29 25 27 29 26 29 35 34 44 34
A32 28 45 91 111 125 174 581 776 799 593 407 2	90 194 132 107 86 76 68 70 85 136 78 52 56 76 456 560 53	7 461 432 434 6 3 1 2 2 1 1 1 1 3	4 7 11 11 8 6 5 4 5 5 38 38 3	8 38 39 33 37 37 40 42 38 38 40 41 42 35 38
6003 119129 136 155 208 695 817 805 944 570 447 230 128 1	03 86 89 83 82 85 81 87 153 130 78 83 103 466 562 601 50	7 451 13 12 7 4 4 4 4 3 3 4 6 6	8 13 13 10 8 6 6 7 5 5 51 55 4	0 50 49 48 53 49 54 46 44 41 44 46 46 53 60
1034918 852 874 878 019 539 486 378 89 22 17 17 3	24 19 30 19 21 31 40 97 114 37 44 61 423 523 591 514 44	4 11 11 7 4 4 2 3 4 4 4 5 6 7	12 12 7 5 6 6 5 5 5 4 34 27 4	1 44 43 41 37 33 43 49 46 50 48 43 44 54 49
6053 535 535 530 515 500 302 74 22 10 13 21 17 15 J	24 22 17 13 12 22 58 112 35 24 365 396 496 559 519 446 1	11 9 5 3 2 1 3 3 3 5 7 10 11	1 10 7 7 7 7 5 5 4 4 4 45 46 4	5 36 38 43 49 51 46 49 43 44 47 43 53 42 42
42483468 94 47 31 19 16 16 15 20 23 26 23 1	26 21 9 8 15 42 108 63 20 345 391 495 574 551 12 8 1	10 6 5 4 3 4 5 6 7 10 11 10 8	8 9 8 7 6 6 4 3 4 3 44 34 4	8 51 48 47 51 58 50 44 40 43 34 30 40 33 32
23613799305162 27 31 24 21 14 26 20 28 27 3	38 22 13 7 22 115 97 29 340 377 489 556 571 15 9 10 1	8 5 6 5 7 8 11 12 14 12 12 12 12	2 12 11 9 7 5 4 3 5 6 5 66 49 6	3 60 57 47 48 50 43 47 36 33 32 28 26 22 24
3753147 7753 49 17 21 22 22 22 25 23 17	29 10 4 7 87 120 53 365 396 519 567 562 20 8 8 11 1	7 8 9 11 12 14 14 15 14 15 13 13 13	3 10 7 6 5 5 6 6 7 6 6 63 69 6	4 60 53 46 29 38 23 21 18 14 14 11 9 19 22
3203334 30055253566 26 19 20 24 26 28 20 3		5 10 12 14 16 14 13 13 16 16 16 16 15 15		5 30 29 23 22 17 8 16 11 13 15 18 13 14 25
	82 164 160 141 439 426 431 486 506 480 21 16 11 13 15 15 1		1 10 9 8 8 8 8 5 5 4 3 34 28 1	7 13 21 19 14 14 13 13 12 9 11 12 13 27 24
6103.	25 104 115 417 429 447 535 513 14 19 20 11 10 14 18 18 2		1 9 9 7 7 6 5 4 3 2 3 28 18 1	8 15 15 18 17 13 7 17 11 11 16 14 15 78 70
\$119	30 387 360 407 473 524 525 14 18 24 18 12 16 26 29 25 2			
0017	64 350 369 497 584 535 17 20 32 27 23 29 36 34 27 24 2			5 10 24 16 16 16 18 14 15 24 17 22 24 17
		20 20 20 20 20 20 22 10 10 13 11 0 0 0 1 30 32 34 27 23 19 16 14 13 12 10 9 9		0 10 24 10 10 10 10 10 21 10 21 22 24 30 30
32119 123 126 60 86 157 2990265119753123	4400 368 007 391 21 32 45 50 45 44 45 41 37 33 32 3 1554130266 66 93 96 92 63 76 69 63 58 53 51 49 4	41 34 26 20 18 15 13 12 12 9 9 10 9		5 49 50 38 40 38 36 37 30 36 35 37 40 41 38
82 92 99 86 57 69 100 365 2626 2896 1710	24252072 1767138 121 107 93 80 67 58 49 42 39 34 29 2			4 53 42 42 38 41 38 41 41 38 41 39 41 40 45
67 63 77 88 49 51 55 73 181 228217	773 1855 1235981 781 639 40 39 34 29 26 23 18 15 14 1			4 05 42 42 06 41 06 41 41 06 41 30 41 07 40 45 3 41 42 43 48 40 29 33 30 27 27 31 38 39 34
620		11 12 11 10 8 8 8 7 7 5 4 4 4	4 4 4 5 5 4 4 3 3 42 39 37 4 1 3 3 3 3 5 5 4 3 3 26 34 32 3	
43 62 64 88 55 44 42 40 69 209 857 1 43 57 51 95 77 49 44 53 37 78 290 8	3221355 1088950 804 660 565 489 29 25 20 17 13 9 7 5	4 4 4 4 4 4 4 5 5 5 5 4 4		이 있었던 문제가 있는 것은 가지 않는 것이 없다.
Contraction of the second s			3 4 2 3 4 3 4 2 2 18 10 17 1	Allered Vessel Could
42 49 67 73 68 46 38 30 48 158 3 20 48 59 66 69 56 49 39 36 72 2	95 814 864 814 736 680 570 589 616 645 614 515 431 393 19 13 1 10 440 752 742 625 621 458 337 472 493 533 552 521 492 444 462 3	1 1 5 4 3 3 4 3 3 2 2 2 2 2 2 6 12 7 6 4 4 4 5 4 3 3 3 3 3 3	4     3     4     3     3     4     5     3     3     25     25     29     2       3     3     2     2     3     3     4     3     37     29     28     23     2	0
625 641 49 58 61 60 51 47 35 39 1	and being the stand bank likes with birth and which have work have been been	7408341 11 9 7 6 6 5 5 4 4 4 4	3 3 2 2 3 3 4 3 37 24 28 23 2 3 3 2 2 2 2 3 3 3 32 37 37 28 2	
	ي المتا ومن الأبر الله على مثلا المن أخر الأبر المراجع من المد وم عال الأبر الأم الأر	1 408 341 11 9 / 5 5 5 4 4 4 4 4 8 427 411 385 400 10 7 6 6 4 4 2 3 3		1-75
		4408 391 370 326 310 789 259 7 6 5 4 3 3	2 3 2 2 2 2 1 19 20 21 37 30 2 3 2 2 2 2 3 21 30 25 33 30 2	76 250
eod	فريتها الما تيتين ليتنا البلين لينبنا بعند لينه القنا متنا ليعن بانتا بيندا يربيه وازر	A NEW YORK WAR AND		
7 38 52 31 45 48 50 34 25 4		3 192 344 341 335 331 289 277 262 250 6 6 4 4 3 97 146 168 297 278 291 281 274 244 244 231 209 6	3 3 2 1 2 1 2 18 16 27 26 28 2	201-100
28 53 27 37 44 50 48 24 3	33 58 140 220 267 307 513 488 465 364 284 195 147 132 100 67 6		5 3 3 2 2 2 16 18 20 23 27 19 2	751 1800
18 45 24 27 41 39 51 40 4		77 82 107 138 135 277 249 267 265 236 226 211 211		
<b>1</b> 40 34 19 34 39 45 44 1	30 30 55 107 188 230 232 337 460 435 391 292 196 142 104 94 7	Real Mail and Real Real Main Mark Whith ship with star with ship	2 207 210 200 3 4 4 24 27 24 21 14 18 1	1001-3042
North Route - Each aliquot gains			0 213 202 100 104 109 4 24 25 31 27 30 22 2	Virginia Call Area
an average of 325 vessels per		65 65 72 84 71 80 65 62 76 86 100 85 57		
year, per aliquot		and the second	1 83 66 206 205 201 44 29 20 35 24 28 30 1	white on the other of the other other of the other other of the other other of the other other other of the other oth
	9 31 19 24 39 91 166 188 188 194 227 346 392 342 265 162 7	44 50 55 55 73 58 67 58 58 49 42 59 43		TOO
	4 33 20 25 30 51 115 168 163 164 159 227 372 366 319 241 12	4 51 48 45 53 60 59 61 63 62 44 43 50 50	0 46 55 69 90 86 47 37 33 32 32 27 24 2	
South Route - Each aliquot gains		2 Sector Design Testing and the Design De	8 41 43 49 53 75 74 64 54 37 32 27 23 2	1 OCO DIOCKS
an average of 159 vessels per year,		9 144 79 61 37 30 52 60 44 62 49 43 31 33	3 41 50 49 51 58 44 55 61 68 42 33 28 2	
per aliquot		1 195 113 78 56 27 26 56 54 47 43 41 30 41	1 40 41 46 38 54 51 35 46 41 71 67 42 2	1
and the second sec	8 14 50 19 18 23 28 53 106 148 133 122 124 99 161 279 21	1 218 155 87 59 46 31 39 55 57 44 44 43 32	2 31 40 41 49 58 67 44 34 36 40 43 43 5	