Virginia Department of Health, Division of Shellfish Sanitation
Assessment of the Merits of a Ten-Hour, Four-Day Seasonal Workweek

Executive Summary

At the request of members of the 2010 General Assembly, the Virginia Department of Health (VDH) has conducted an assessment of the merits of a 10-hour per day, 4-day work week (4-day work week) for work conducted by the Division of Shellfish Sanitation's (DSS) shellfish specialists and field directors.

DSS has three field offices (White Stone, Norfolk and Accomac) and they all perform the same type of work: inspect onshore properties for sources of fecal contamination and collect seawater samples for fecal coliform analysis to use in the evaluation of the shellfish growing waters for direct harvest; inspect and certify shellfish and crab meat processing facilities; and conduct the microbial laboratory analyses of samples in support of both of these programs. Since the geography and population densities vary in the areas served by the field offices, the challenges associated with performing these uniform tasks vary somewhat in each field office. Each field office director convened with their staff and reported on the anticipated effects of implementing a 4-day work week. DSS central office staff reviewed the findings of the field directors.

The results of that assessment indicate that if DSS were to switch to a 4-day work week during the warm weather months, it could potentially save as much as $8,577 per year in personnel time, equipment and gasoline costs. However, the productivity of the program would likely decrease significantly. Each office's current operational mode has been honed over many years experience to provide the most work output when dealing with the vagaries of weather, tides, personnel absences, etc. By compressing 5 days' work into 4 days, the negative impacts of these vagaries are amplified when work is lost on a given day. Since DSS's ability to collect seawater samples is particularly affected by weather and tides, and since much of the work must be conducted by two people in one boat as opposed to one individual, this activity is impacted more by external condition than are other activities within the shellfish sanitation program. Furthermore, shellfish and crab processing facilities do not work late in the day, so with a 4-day work week more inspections would have to be conducted when facilities were not operating, thus decreasing the value of the inspection. As such, switching to a 4-day work week is not deemed practical for this program.

Introduction

During the 2010 legislative session, members of the General Assembly suggested that by switching from an 8-hour, 5-day work week to a 10-hour, 4-day work week DSS might greatly increase its productivity. This suggestion was in response to legislation (SB 447)proposing fees for some of the services performed by DSS. This bill was introduced because a portion of the DSS budget had previously been reduced for FY11 and FY12 based on the premise that these funds would be recovered by establishing fees, and the authority to establish these fees required legislative action. While the legislation was not enacted, the DSS general funds were restored for

FY11. VDH also agreed to fully explore cost savings associated with the implementation of a 4-day work week. The central tenet of this proposal was that by lengthening the work day for six months (May – October), enough additional seawater samples might be collected to significantly reduce the number of days needed each month to conduct seawater sampling. VDH indicated that it would undertake an internal review to assess such a potential change, and this report represents the results of that study.

Functional Operations of Field Offices and Central Office

DSS has three field offices (White Stone, Norfolk and Accomac) and the central office (Richmond). All three field offices conduct the same type of work, though their staff sizes vary, and each region faces different challenges due to its local geography and type of land development. The field offices carry out four primary types of work, as described below.

The shellfish specialists conduct shoreline surveys on the near-shore upland areas of the watersheds of shellfish growing areas. In conducting these surveys, the shellfish specialists conduct property-by-property inspections, looking for sources of fresh fecal material that have the potential to contaminate shellfish growing waters. The specialists compile a written report of their findings, which contains a map that shows the locations of the various potential sources of contamination. Central office personnel place the report and map on the VDH web site for correction or further investigation of potential sources of pollution by the variously responsible state and local agencies. For example, the local health departments require correction of malfunctioning onsite sanitary waste disposal facilities; the Department of Conservation and Recreation may investigate manure piles located close to flowing water and require their movement to a more remote location. In 2009 DSS specialists inspected 8,713 properties.

The shellfish specialists also collect seawater samples from the shellfish growing areas in their region for fecal coliform analysis. The results of these analyses are used along with the shoreline survey data by the central office in determining which portions of each shellfish growing area are acceptable or unacceptable for harvest of shellfish for direct human consumption. There are 107 shellfish growing areas that are divided into a series of "seawater runs" to collect the seawater samples. These runs are scheduled a month ahead of time to ensure that samples are collected randomly with respect to weather, as required by the National Shellfish Sanitation Program (NSSP). The NSSP allows for some deviation from this exact schedule to make up for missed runs due to hazardous conditions such as thunderstorms, excessive icing, high winds, etc.

The third primary duty of the shellfish specialists is to inspect shellfish and crab meat processing facilities. Generally, the specialists inspect these facilities monthly, however, the actual frequency is variable and is determined by a risk-based assessment that considers both the complexity of the processing operation and their compliance history. These inspections can be conducted on a more flexible schedule than the seawater runs, though they still often require scheduling with plant owners for certification inspections, and scheduling with the central office's plant processing manager for ensuring standardized inspections by the specialist and for problem-solving inspections.

The fourth primary duty of the field offices is to conduct microbial laboratory analyses of seawater, shellfish and crab meat samples in support of the growing water classification program and the plant processing program. In calendar year 2009 the laboratories analyzed 21,480 seawater samples, 553 plant processing water samples, and 521 shellfish and crab meat samples, along with 127 shellfish samples for *Vibrio* bacteria using genetic code (DNA) analytical techniques.

While the three field offices have identical overall responsibilities, they each face different types of challenges since they are located in different types of geographic areas with differing degrees and types of land development. The subtributaries of the Northern Neck and Middle Peninsula tend to consist of a larger water body with many small feeding streams requiring numerous sampling stations in order to fully assess the water quality. As such, the White Stone office has the greatest number of seawater stations to sample each month. The diversity of the geography does provide the field director with more options for places to collect samples when wind conditions are hazardous in more exposed areas.

The Norfolk office is responsible for the lower portion of Mobjack Bay and south through the York River, the lower Peninsula, the James River, Hampton Roads and areas east along the southern portion of the Chesapeake Bay. This area contains a higher percentage of open water than does the White Stone office's area, thus high winds can seriously interfere with sampling. Due to the greater population density, 7 runs must be made during the last 3 hours of ebb current to provide a better evaluation of the impact of upland runoff. These ebb current conditions only exist for a few days twice each month during times that staff can collect the samples, and high winds or staff shortages due to illness can easily prevent collection for that month.

The Accomac office is responsible for covering the entire Eastern Shore. Most of this area is quite rural, and ebb tide sampling due to population concerns is not an issue, though tidal height is quite important to access and egress many sampling areas. Sudden high winds in the open water of the bayside of the Eastern Shore pose a significant hazard, and the office clusters its growing area sampling into a series of seawater runs in a way to limit as many of these open water runs as possible.

The central office is located in Richmond. Its primary duties are to use the shoreline survey and seawater sampling data to classify shellfish growing areas; ensure the uniform application of processing facility inspections and certification; interface with local, state and federal agencies and the public; and provide support to the field offices in all aspects of the program.

Discussion of Individual Field Office Impacts

The field directors for the Division of Shellfish Sanitation's three field offices have independently assessed the potential impacts of a 4-day work week, if implemented in their offices. Their findings are based on their personal experience in supervising the semi-

autonomous, daily operations of their field offices. They have 103 collective years with the Division, of which 53 represent supervisory experience in modifying approaches to accomplish the many monthly tasks of their offices. Their processes and procedures have evolved over time in response to changing circumstances like temporary staff shortages, long term downsizing, and changes in the emphases on the various types of tasks assigned to the offices. In addition, the very nature of their work constantly changes with weather, responses to floods, processing emergencies, etc., which all interrupt the normal functioning of their offices. These field directors have honed their programs to be extremely efficient in terms of producing a maximum output with a minimum waste in time or resource.

White Stone Office Report

The White Stone field office is responsible for monitoring 47 shellfish growing areas. The current 8-hour, 5-day work week enables the White Stone office to seawater sample Monday through Thursday, with Fridays set aside for shoreline survey and marine maintenance. Current operations use 23 separate collection runs (Table I.a; Figure I.a-1; Figure I.a-2), requiring approximately 16 to 18 days depending on the month.

A 4-day work week would only allow for 3 days of seawater collection per week, with the fourth day being used for shoreline survey and equipment maintenance, thus providing approximately 11 to 13 seawater collection days per month. At best the White Stone office could combine some of the seawater collection runs into 19 separate runs instead of 23, thus saving 4 runs (Table I.b.; Figure I.b-1; Figure I.b-2). This would require two boats on the water for 7 of the 11 to 13 collection days. Under this scenario, only about 2 to 3 days would be available for plant inspections per month, providing the office uses three Thursdays for shoreline survey and one Thursday per month for equipment maintenance. The office would not recoup economies from less trailering (towing a boat on a trailer) under a 4-day work week, because boats are currently left at Virginia Department of Transportation facilities overnight at no charge when collecting seawater samples in areas distant from the office.

A 4-day work week would cause several scheduling problems. Extending the work days will not allow for more plant inspections per day since many of these facilities are only available for inspection for a limited time of the day, thus leaving fewer days available in the month to rearrange schedules and conduct inspections as needed. With the fewer sampling days, the office could not easily substitute protected or deep water areas for areas rendered unavailable due to high winds or low tides. Sampling runs cut short due to afternoon thunderstorms would compound work loss. Illness would cut time back for the three main elements of the program (seawater, plants and shoreline survey), because the unexpected lack of a person for a day would mean the loss of 10 hours of work apportioned to that day instead of 8 hours. Those two hours lost for an extended boat run could not be easily recouped later; the run might have to be cancelled for the day since two people are required, which could mean that the run would not be made that month.

The extended work day would increase the number of seawater samples collected per day and could increase the laboratory work beyond its analytical capacity on a regular basis. It is

difficult for the lab to analyze more than 100 seawater samples per day. The office averages 987 seawater samples per month, with some seawater runs collecting more samples than others, thus pushing the laboratory capability to its maximum in some instances. By increasing the laboratory workload close to its maximum capacity with seawater samples, little or no time may be left for shellfish or crab meat analyses collected during processing facility inspections. Shortage of analytical capability is already a problem at times due to staff vacations or illness.

Norfolk Office Report

The Norfolk field office is responsible for monitoring 31 shellfish growing areas. These areas are currently grouped into 20 different sampling runs (Table II. a; Figure II.a-1; Figure II.a-2) arranged in a specific sequence to facilitate meeting the NSSP-required systematic random sampling regime. With the currently available workforce the office averages about 17 boat-runs a month. Each run requires a 2-person boat crew, usually for safety reasons. The exact number of runs varies due to weather, personnel or equipment failure. This current sampling scheme allows some leeway to make up lost runs if only a couple of cancellations occur in a month. In addition to routine seawater collections, oysters are collected bi-monthly (May-October) from the James River for *Vibrio parahaemolyticus* analysis. When possible, oyster collection is combined with a seawater run in the area; otherwise a special run has to be made for this collection. The current sampling scheme typically allows shellfish specialists at least one day per week for plant work and shoreline survey, provided there are limited absences and/or cancellations during the week.

The 31 areas, which now consist of 20 runs, could only logically be regrouped into 14 runs plus at least one extra run for the collection of shellfish for *Vibrio parahaemolyticus* analysis (Table II.b; Figure II.b-1; Figure II.b-2) for a total of 15 runs at best, thus saving 5 runs. The present collection scheme provides the flexibility needed to accomplish the seawater, plant inspection, and shoreline survey assignments when dealing with weather, equipment, and personnel variables. Switching to a 4-day work week for 6 months a year would in all likelihood compromise the office's ability to do this for several reasons, as discussed below.

Under the 4-day approach, 2 runs would be made on Monday, 1 on Tuesday, and 1 on Wednesday. While it may seem that all areas could be sampled each month, provided there are no cancellations due to weather, etc, experience indicates otherwise. No make up runs could be accomplished on Thursdays, due to standard analytical method time restraints of laboratory analysis. A cancellation of one of these newly combined runs would result in missing more areas than occurs under the current sampling scheme. Weather, personnel absence, or equipment failure would thus have a greater impact on the office's performance than it currently does.

Plant inspections do not lend themselves well to 4-day work weeks, especially during summer months when many shellfish plants process infrequently. Combining shoreline survey field work with plant inspections would not be desirable because the travel distance between the two may not be practical and may end up costing more in time and travel than it saves. The only savings that the field director can foresee in a 4-day work week is some minor savings on fuel costs for the boats, tow vehicles, and other vehicles used for plant inspections, estimated at approximately $1,500 per year.

Accomac Office Report

The Accomac field office is responsible for monitoring 28 shellfish growing areas. The bayside of the Eastern Shore (areas #75 through #91) is collected in 8 runs and the seaside of the Eastern Shore (areas #92 through #102) is currently collected in 6 runs involving 14 days (Table III. a; Figure III.a). Five of the seaside runs are used to collect the entire area from the Chesapeake Bay Bridge Tunnel (CBBT) to the Maryland State line. The sixth run is used to sample around Chincoteague. All of these seaside runs are long with the exception of two areas (95 & 95RB). For example, one run is a round trip that starts in Oyster Harbor, proceeds north through Rams Horn Bay, then south to the CBBT and back. The 6 seaside runs are so long that they cannot be combined to shorten the work week.

On the bayside of the Eastern Shore, one could potentially combine several runs and reduce the 8 sample runs by 2, however, this would not be possible in all weather and tidal conditions. Some of these creeks can not be collected on low tides; Craddock Creek and Plantation Creek are very shallow. The Gulf is sanded in near the mouth, preventing access and egress for half of a complete tidal cycle. Creeks that do not have public boat ramps require motoring out into the open waters of the Chesapeake Bay (known as open-bay running) to reach adjacent creeks. The open waters of the Chesapeake Bay pose navigation hazards to boats when the winds are moderately strong. Fortunately, the office has permission to use private ramps on some creeks (Nassawadox and Hungars). Over the years, the office has determined the best grouping of creeks to provide the most favorable odds of successfully completing the maximum number of runs for the month. Under a 4-day work week, there are some changes the office could experiment with to try to reduce the runs by 2 days.

Combining these runs will shorten the month's seawater sampling from 14 days to 12 days (Table III.b; Figure III.b). It could be done under ideal conditions. Wind on the bayside of the Eastern Shore would turn some of these longer runs into a very long day. It would require using the larger 18' boat more in the summer to handle the wind. The office typically switches to the 15' boat in the summer, which uses far less fuel and is more successful in obtaining samples from the shallow creeks.

Safety of personnel is an important factor to consider. The office currently limits open-bay running as much as possible. One must consider the benefit of 2 fewer seawater runs under a 4-day work week against requiring boat crews to make runs on the open Chesapeake Bay that are currently avoided with the 5-day work week. Examples of new open-bay runs would involve motoring from Hungars Creek to Nassawadox Creek in the Bay, and from Cherrystone Creek up to the Gulf. Safety issues arise during these longer days when unexpected winds arise and when the crew is out on the open Bay late in the day and far from harbor. At times it would be possible to launch, trailer and relaunch at multiple ramps in one day to avoid long exposed runs, but the problem of low tides and lack of availability of boat ramps limits those options.

It would not be practical to try to increase the amount of plant inspection work conducted in a 10-hour day, because processing facilities do not work late in the day. Conducting inspections under such an extended day would result in a high percentage of inspections conducted when plants were not processing.

Central Office Review of Field Office Findings

DSS central office personnel have reviewed the findings of the field directors and found them to be logical. All three field directors independently expressed the same concern that unpredictable weather conditions would have a greatly magnified impact upon output if the work week were reduced by a day. Furthermore, due to the varying geography of the shellfish growing areas, many seawater sampling runs cannot be simply increased in length to accommodate a longer day.

Changing to a 4-day work week would also hamper DSS's ability to conduct special studies. Central office personnel are keenly aware that the shellfish industry will likely desire for DSS to undertake special studies to enable management of shellfish harvest condemnations on a rainfall-based, conditionally approved status. Such a procedure requires establishing, through extra sampling, the amount of rainfall that triggers unacceptably high concentrations of fecal coliforms in growing areas, which are carried into the water body by excessive upland runoff. Once this threshold rainfall amount is determined, and once additional sampling determines how long it takes for growing areas to flush out the contaminants, the potential exists to open up more grounds within the growing areas, and to close the rainfall-impacted areas for shorter periods of time. Such a procedure would allow the industry to harvest and directly market its shellfish during dry periods, and avoid the extra cost and loss of time incurred by relaying shellfish to clean water to purge contaminants.

DSS is conducting rainfall-based sampling in the Northern Neck on an experimental basis to try to open shellfish grounds there. DSS is also conducting this type of work in the Lynnhaven River complex out of concern for the dense population on the watershed. Both of these efforts involve cancelling normal seawater runs so that extra collections can be obtained from the study areas. A change to a 4-day work week would severely hamper this work, for several reasons. Fewer days would be available to sample, 3 instead of 4. Three days per week for sampling would likely prevent collection of a sufficient number of sampling events during the latter part of ebb current, thus compromising the study itself. In addition, leaseholders in areas far from the study area would likely complain about the loss of routine sampling in their area due to the need to send a boat crew back to the study area day after day when fewer days were available under the 4-day work week to conduct the work.

Within the past year DSS has been able to conduct work that is more statistically-significant for rainfall-based, conditionally approved areas because the National Ocean and Atmospheric Administration now provides accurate rainfall data specific to small areas. DSS has previously had to rely upon a few widely scattered official rain gauges which did not provide reliable data for individual creeks, particularly during thunderstorms. If DSS is successful with this new approach, it anticipates many requests from the shellfish industry to conduct this work, particularly with the increase in aquaculture. A 4-day work week would make such special studies nearly impossible to conduct in a reasonable time period of 6 to 12 months. DSS envisions the need will arise to conduct these rainfall-based evaluations for many years in the future.

Estimated Time and Financial Savings Associated with a 10-Hour, 4-Day Work Week

Converting to a 4-day work week would provide little in savings for the costs of heating and cooling field office space since these offices would be used for a few hours on the 5th day by the lab staff to interpret microbiological sample results that were started late in the 4-day week. However, an initial assumption was made that a significant savings in workforce time could be realized by extending the length of the work day to combine several seawater sampling runs into one day. An assessment of this assumption follows.

Field office estimates are that transportation and launching/trailering times are approximately 2-3 hours per trip. Approximately one hour of the savings in land transportation time would be lost due to additional travel required to navigate back to the launching site from the last station on the expanded sample collection runs. DSS would obtain a net savings of 1-2 hours per sampling run eliminated. Since two people are generally required in the boat, this equates to 2-4 personnel hours saved per sampling run eliminated. The average salary of DSS shellfish specialists is $40,000 per year; at 2,080 hours per year the salary is $19.23 per hour. The field offices estimate that they could save a maximum of 11 sampling runs per month (White Stone - 4 runs, Norfolk - 5 runs, Accomac - 2 runs) by changing to a 4-day work week for 6 months per year. Due to weather and safety concerns, extending the work day would not be practical during the coldest and shortest daylight times of the year. The resulting yearly savings in salary and personnel time for DSS is calculated below.

[(2-4 personnel hours per run saved each month) X (11 runs saved) X ($19.23/hour)*(6 months/year)] = $2,538 to $5,077 per year. There is no way to recoup these savings since employees are full-time employees working on a salary. However, this saved time of 132 to 264 hours could be used for other duties.

These savings in boat-run time theoretically achieved through a 4-day work week could be completely lost, and additional financial expenses could be incurred if DSS did not collect the NSSP-required minimum number of annual samples for an area. In that case shellfish specialists would have to work overtime. Since the shellfish specialists are not exempted from the federal Fair Labor Standards Act, any hours over 40 worked per week must be compensated at 1.5 times the hourly rate.

The Norfolk field director estimates a maximum savings of $1,500 in trailering expenses. One might assume a similar savings of $1,500 for the White Stone office, and a savings of $500 for the Accomac office (only two runs saved and with increased gas costs for the additional use of the 18´ boat). The total savings due to reduced trailering of boats resulting from fewer boat runs would equal an approximate maximum of $3,500. Thus, the total savings to DSS for converting to a 4-day work week are estimated to be $6,038 to $8,577.

Findings/Conclusions

By switching from a 5-day work week to a 4-day work week DSS could reduce the total number of boat runs required to collect seawater samples from 57 to 46 runs (White Stone from 23 to 19 runs, Norfolk from 20 to 15 runs, Accomac from 14 to 12 runs). The maximum

estimated savings in personnel time, gasoline and equipment is estimated to be $8,577 per year. The following negative consequences of changing to a 4-day work week were identified.

- Conducting inspections under such an extended day would result in a high percentage of inspections conducted when shellfish and crab plants were not processing, because processing facilities do not work late in the day.
- Combining shoreline survey field work with plant inspections may not be desirable in many instances because the travel distance between the two may require too much time.
- With fewer boat run days, an office would have fewer runs in protected areas available to collect when the scheduled area was rendered unavailable due to high winds or low tides. This would often result in lost boat runs for the month.
- A cancellation of one of these newly combined runs would result in missing more stations than occurs under the current sampling scheme. Weather, personnel absence, or equipment failure would thus have a greater impact on the office's performance than it currently does.
- Staff illness would cause a greater loss of time for work, because the negative impacts from the lack of a person for a day is amplified due to the increased loss of workload apportioned to that day, most significantly for boat runs since two people are required in a boat.
- Special studies to try to open productive shellfish harvesting areas on a rainfall-based, conditionally approved status would likely require more than a reasonable time period of 6-12 months to conduct.
- The longer boat runs would require the use of Accomac's larger 18′ boat more in the summer. The office typically switches to the 15′ boat in the summer, which uses far less fuel and is more successful in obtaining samples from the shallow creeks.
- Safety of boating personnel is a particularly important factor for the Accomac office, because the longer boat runs require the vessels to make extended runs on the open waters of the Chesapeake Bay. With the need to collect samples, boat captains would be more tempted to venture out when the conditions were marginally safe.
- The White Stone office laboratory would likely receive on a regular basis more samples than it can process within a day.

In conclusion, DSS considers the relatively small savings in personnel time (132 to 264 hours) and savings in trailering expenses ($3,500) to be outweighed by the negative consequences identified. The productivity of the program would likely decrease significantly, because the vagaries of weather, tides and personnel absences would cause an increased loss in the total work effort of the office, especially in the number of seawater sampling runs completed annually. Since DSS's ability to collect seawater samples is particularly affected by weather and tides, and since much of the work must be conducted by two people in one boat as opposed to one individual, this program is impacted more by outside variables than are other DSS activities.

Appendix

Table I.a. Current seawater collection runs made by the White Stone Office of the Division of Shellfish Sanitation, VDH

Runs	Growing areas included
1.	1, 1A, 2, 3, MS SS
2.	4
3.	5, 6
4.	7 with oysters collected for analyses of *Vibrio parahaemolyticus* strains
5.	8
6.	9
7.	10
8.	11, 12, 14A
9.	13
10.	14B, 15
11.	16, 17
12.	18, 20
13.	21N
14.	21S, 22
15.	23, 24
16.	25, 25A, 25U, 26, 26A
17.	27, 28, 29, 30L, 30W
18.	30M, 31, 32, 33B
19.	33J, 34, 35
20.	36, 37
21.	38, 39
22.	40, 41
23.	42, 43

Table I.b. Potential recombination of seawater runs made by the White Stone Office of the Division of Shellfish Sanitation, VDH under a 10-hour, 4-day work week.

Runs	Growing areas included
1.	1, 1A, 2, 3, MS SS
2.	4, 5, 6
3.	7 & 8 with oysters collected for analyses of *Vibrio parahaemolyticus* strains
4.	9
5.	10, 11, 12, 14A
6.	13
7.	14B, 15
8.	16, 17
9.	18, 20
10.	21N, 21S
11.	22, 23, 24
12.	25, 25A, 25U, 26, 26A
13.	27, 28, 29, 30L, 30W
14.	30M, 31, 32, 33B

15. 33J, 34, 35
16. 36, 37
17. 38, 39
18. 40, 41
19. 42, 43

Table II.a. Current seawater collection runs made by the Norfolk Office of the Division of Shellfish Sanitation, VDH

Runs	Growing areas included
1.	44
2.	45
3.	46
4.	52, 53B
5.	47
6.	48,49,50
7.	51
8.	53P- urban watershed area collected on last 3 hours of ebbing current (requires 2 boat crews due to time restraints, size of area, and no wake zones).
9.	54 – urban watershed area collected on last 3 hours of ebbing current
10.	55,56,66 unprotected open shore along Chesapeake bay (requires good weather)
11.	67,68 unprotected open shore along southern Chesapeake bay (requires good weather)
12.	69,72 unprotected open (requires good weather); 70- urban watershed, collected on last 3 hours of ebbing current
13.	71,73 – urban watershed collected on last 3 hours of ebbing current
14.	64,65 – urban watershed portion of 65 collected on last 3 hours of ebbing current
15.	57
16.	62
17.	58
18.	59,60
19.	61
20.	63 – urban watershed collected on last 3 hours of ebbing current.

Table II.b. Potential recombination of seawater runs made by the Norfolk Office of the Division of Shellfish Sanitation, VDH under a 10-hour, 4-day work week.

Runs	Growing areas included
1.	44,45
2.	46,52,53B
3.	47,51
4.	48,49,50
5.	53P
6.	54
7.	55,56,66,67,68 very large open area of bay requiring good weather
8.	69,72,70
9.	71,73
10.	64,65
11.	57,62

12. 58,59,60 expansive area in James River
13. 61
14. 63
15. Collection of oysters for Vp analysis would require 1 or 2 runs every other month

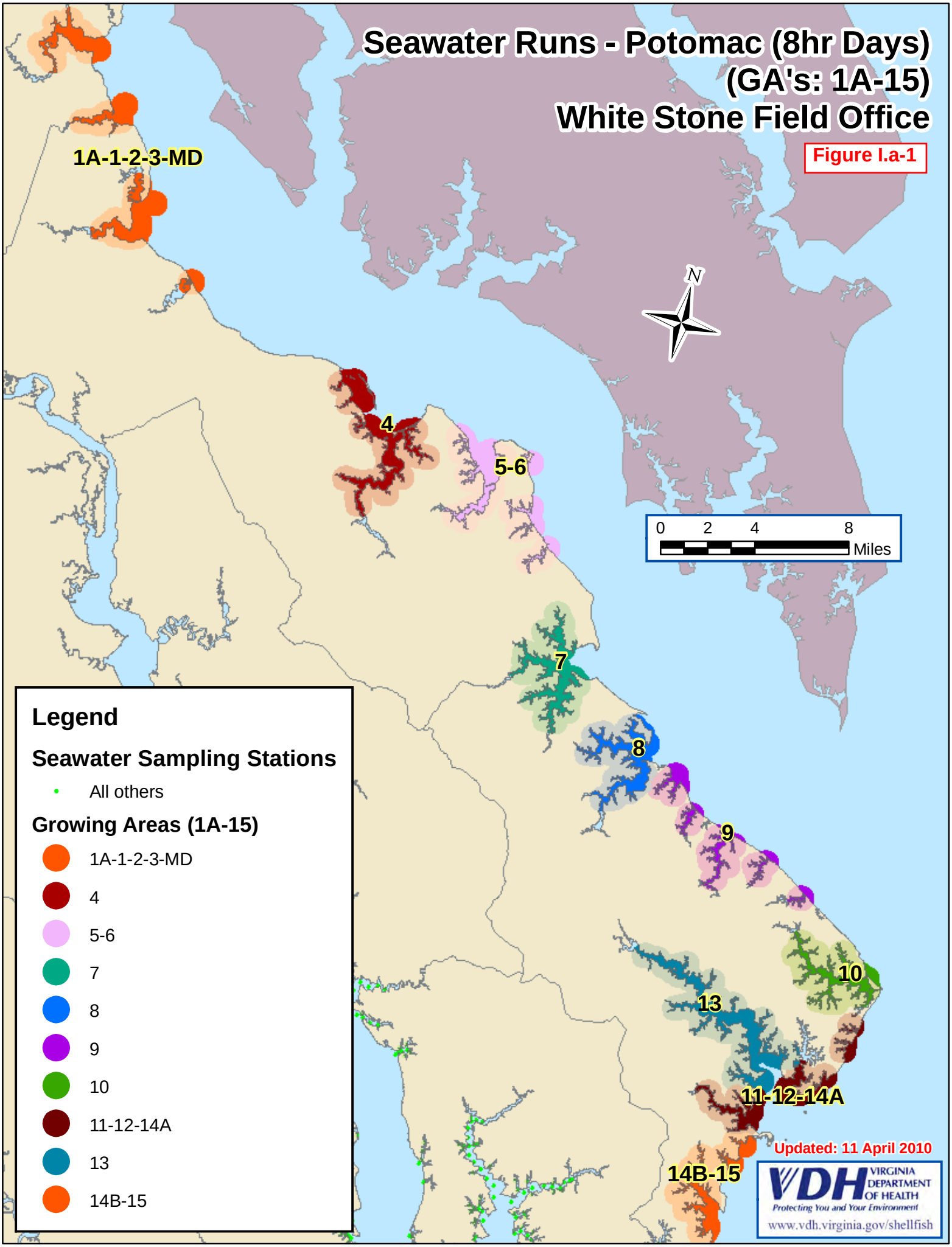
Table III.a. Current seawater collection runs made by the Accomac Office of the Division of Shellfish Sanitation, VDH

Runs	Growing areas included
1.	75 & 76
2.	78 (Tangier)
3.	77 & 79
4.	80, 81 & 82
5.	83 & 84
6.	85 & 85-W
7.	86 & 87
8.	88, 89, 90 & 91
9.	92, 93, 94
10.	95, 95RB
11.	96
12.	97, 98
13.	99, 100
14.	101, 102

Table III.b. Potential recombination of seawater runs made by the Accomac Office of the Division of Shellfish Sanitation, VDH under a 10-hour, 4-day work week.

Runs	Growing areas included
1.	75, 76 & 77
2.	78 & 79
3.	80, 81, 82
4.	83, 84
5.	85, 85W & 86
6.	87, 88, 89, 90 & 91
7.	92, 93, 94
8.	95, 95RB
9.	96
10.	97, 98
11.	99, 100
12.	101, 102

Figures I - III. Shellfish Growing Areas and Seawater Sampling Runs
These are contained in a separate electronic file “Figures I-III_VDH DSS 4-Day Work Week.pdf”


Seawater Runs - Potomac (8hr Days)
(GA's: 1A-15)
White Stone Field Office
Figure I.a-1
1A-1-2-3-MD
4
5-6
7
8
9
10
13
11-12-14A
14B-15
N
0 2 4 8
Miles
Legend
Seawater Sampling Stations
All others
Growing Areas (1A-15)
1A-1-2-3-MD
4
5-6
7
8
9
10
11-12-14A
13
14B-15
Updated: 11 April 2010
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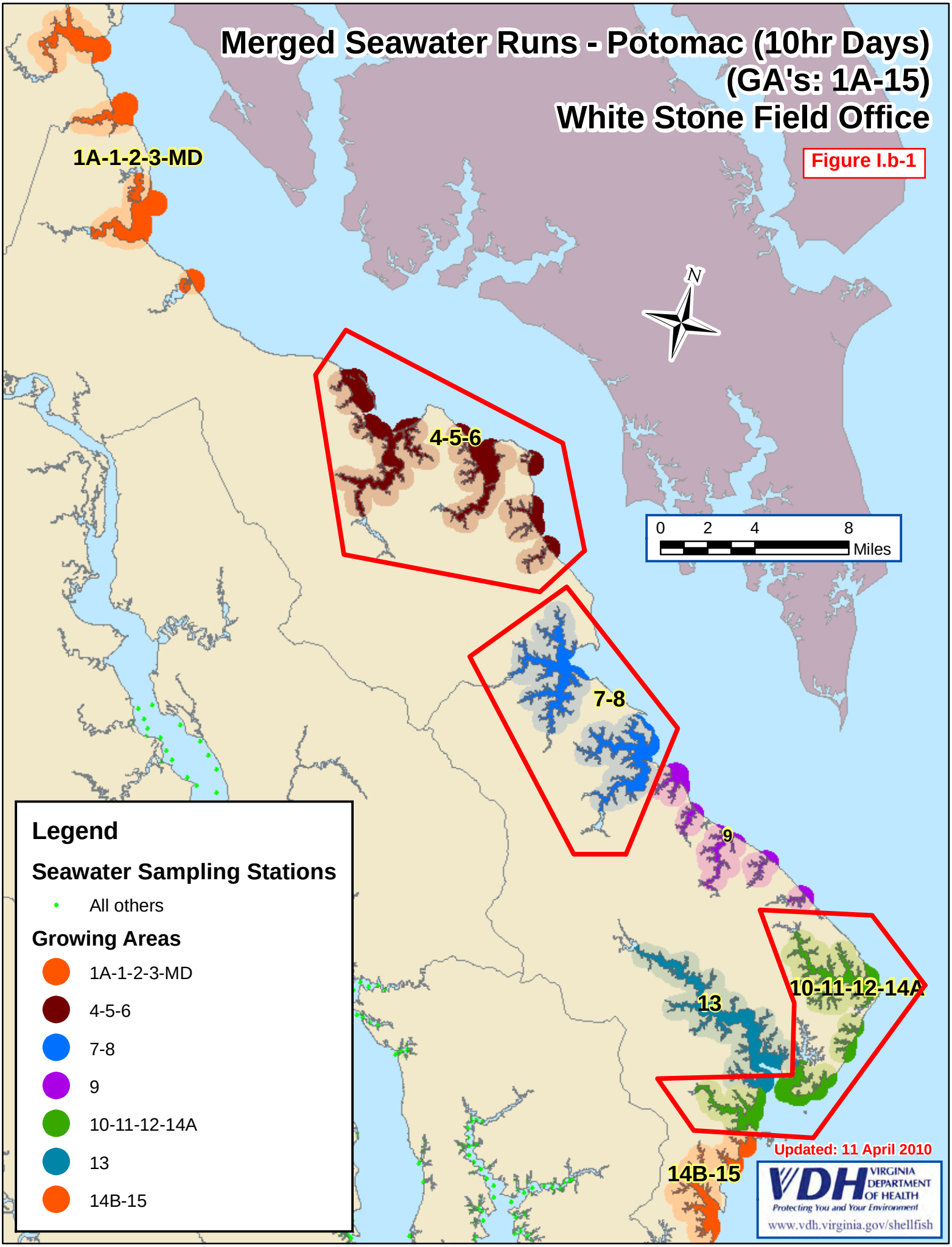
Merged Seawater Runs - Potomac (10hr Days)
(GA's: 1A-15)
White Stone Field Office
Figure I.b-1
1A-1-2-3-MD
4-5-6
7-8
9
10-11-12-14A
13
14B-15
N
0 2 4 8
Miles
Legend
Seawater Sampling Stations
All others
Growing Areas
1A-1-2-3-MD
4-5-6
7-8
9
10-11-12-14A
13
14B-15
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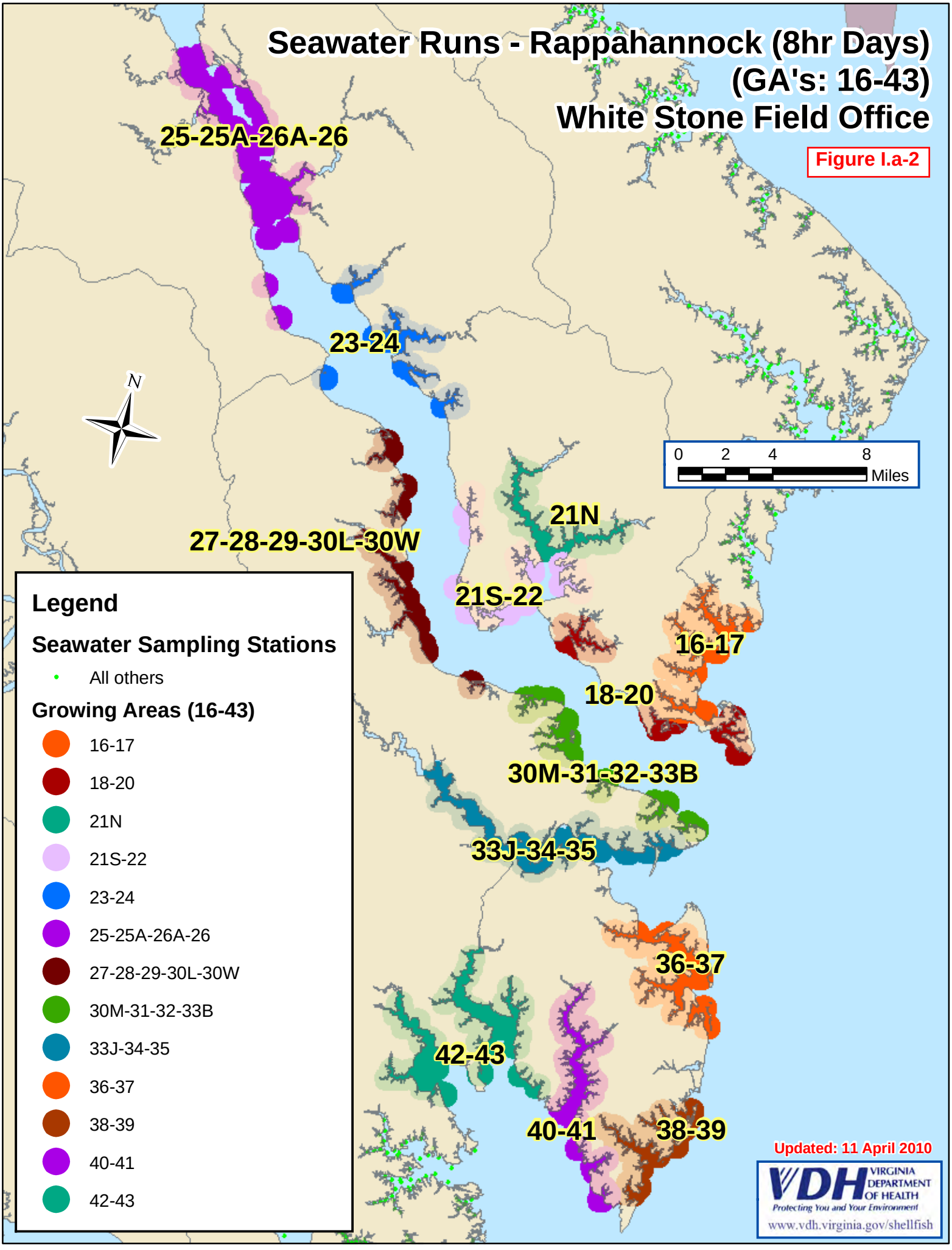
Seawater Runs - Rappahannock (8hr Days)
(GA's: 16-43)
White Stone Field Office
Figure I.a-2
25-25A-26A-26
23-24
N
0 2 4 8
Miles
21N
27-28-29-30L-30W
21S-22
16-17
18-20
30M-31-32-33B
33J-34-35
36-37
42-43
40-41
38-39
Legend
Seawater Sampling Stations
All others
Growing Areas (16-43)
16-17
18-20
21N
21S-22
23-24
25-25A-26A-26
27-28-29-30L-30W
30M-31-32-33B
33J-34-35
36-37
38-39
40-41
42-43
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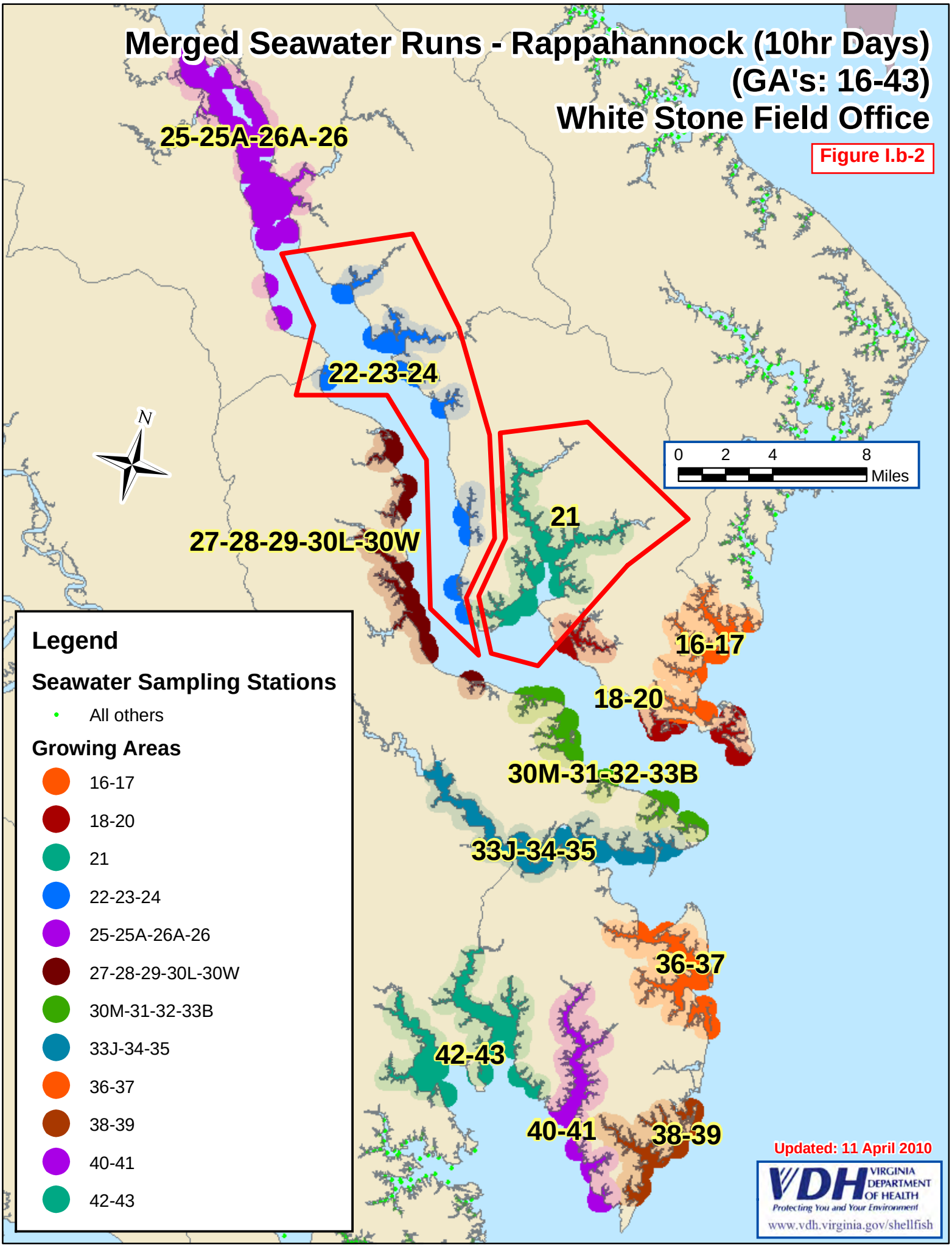
Merged Seawater Runs - Rappahannock (10hr Days)
(GA's: 16-43)
White Stone Field Office
Figure I.b-2
25-25A-26A-26
22-23-24
27-28-29-30L-30W
21
16-17
18-20
30M-31-32-33B
33J-34-35
36-37
42-43
40-41
38-39
N
0 2 4 8
Miles
Legend
Seawater Sampling Stations
All others
Growing Areas
16-17
18-20
21
22-23-24
25-25A-26A-26
27-28-29-30L-30W
30M-31-32-33B
33J-34-35
36-37
38-39
40-41
42-43
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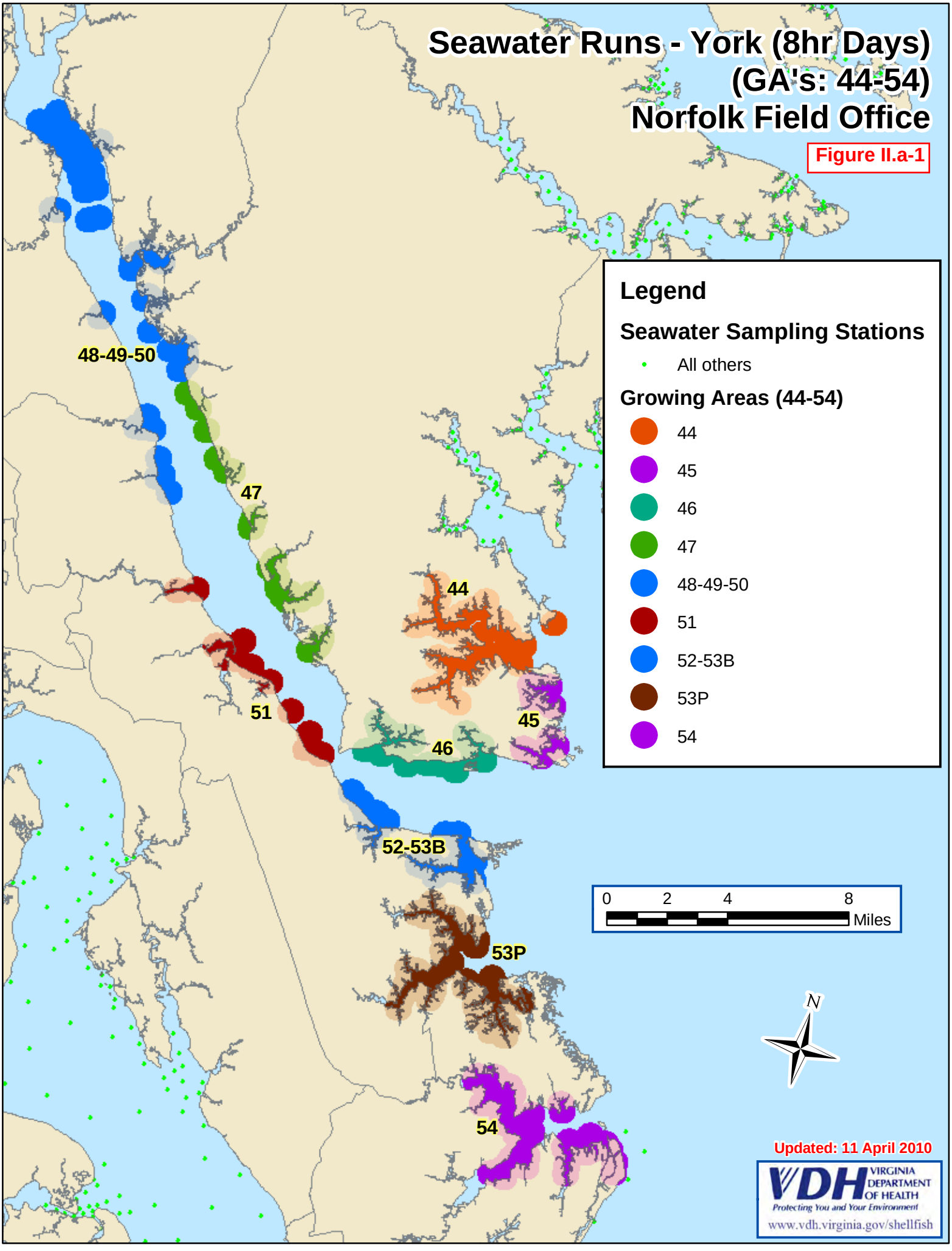
Seawater Runs - York (8hr Days)
(GA's: 44-54)
Norfolk Field Office
Figure II.a-1
Legend
Seawater Sampling Stations
All others
Growing Areas (44-54)
44
45
46
47
48-49-50
51
52-53B
53P
54
48-49-50
47
44
51
45
46
52-53B
53P
54
0 2 4 8
Miles
N
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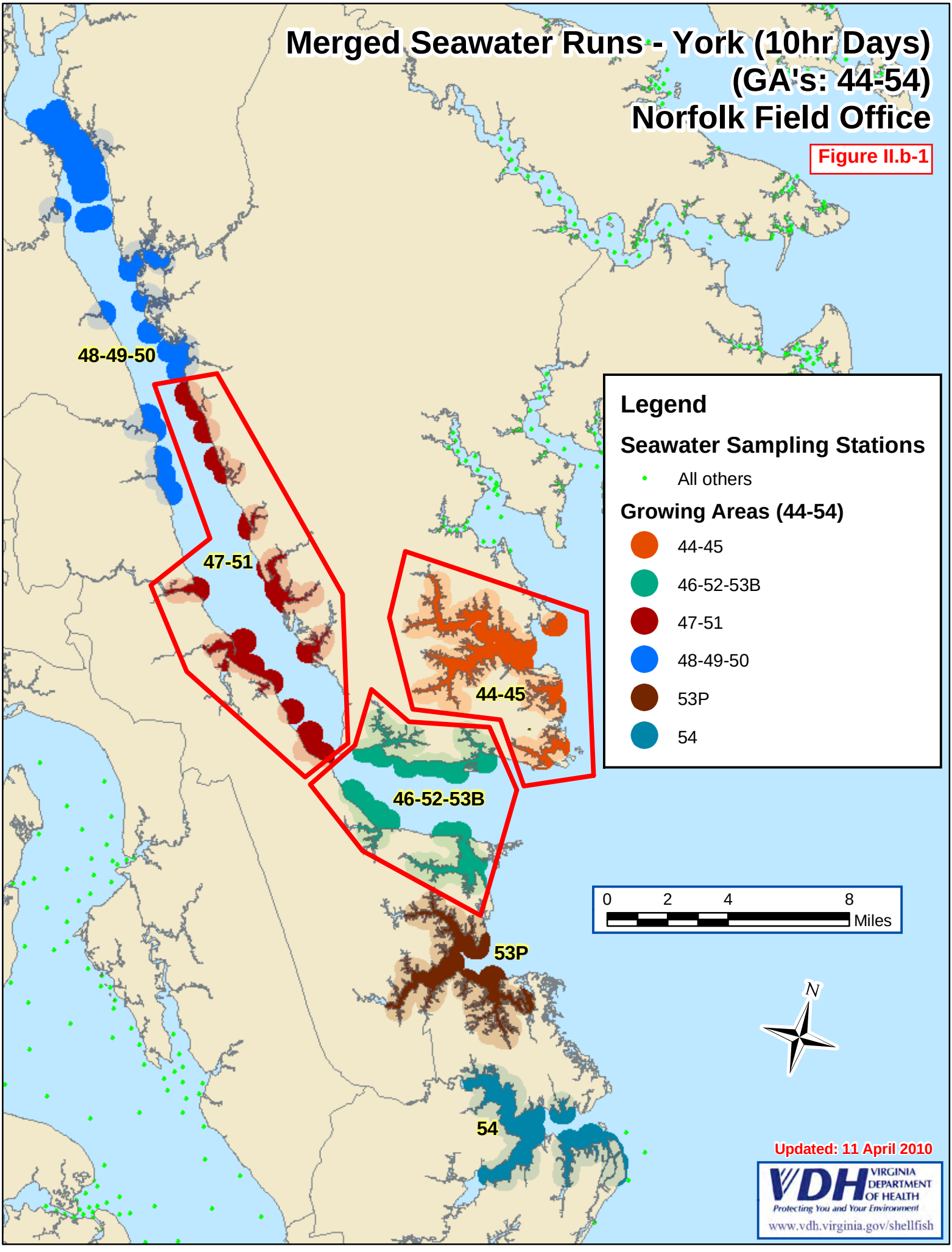
Merged Seawater Runs - York (10hr Days) (GA's: 44-54) Norfolk Field Office

Figure II.b-1



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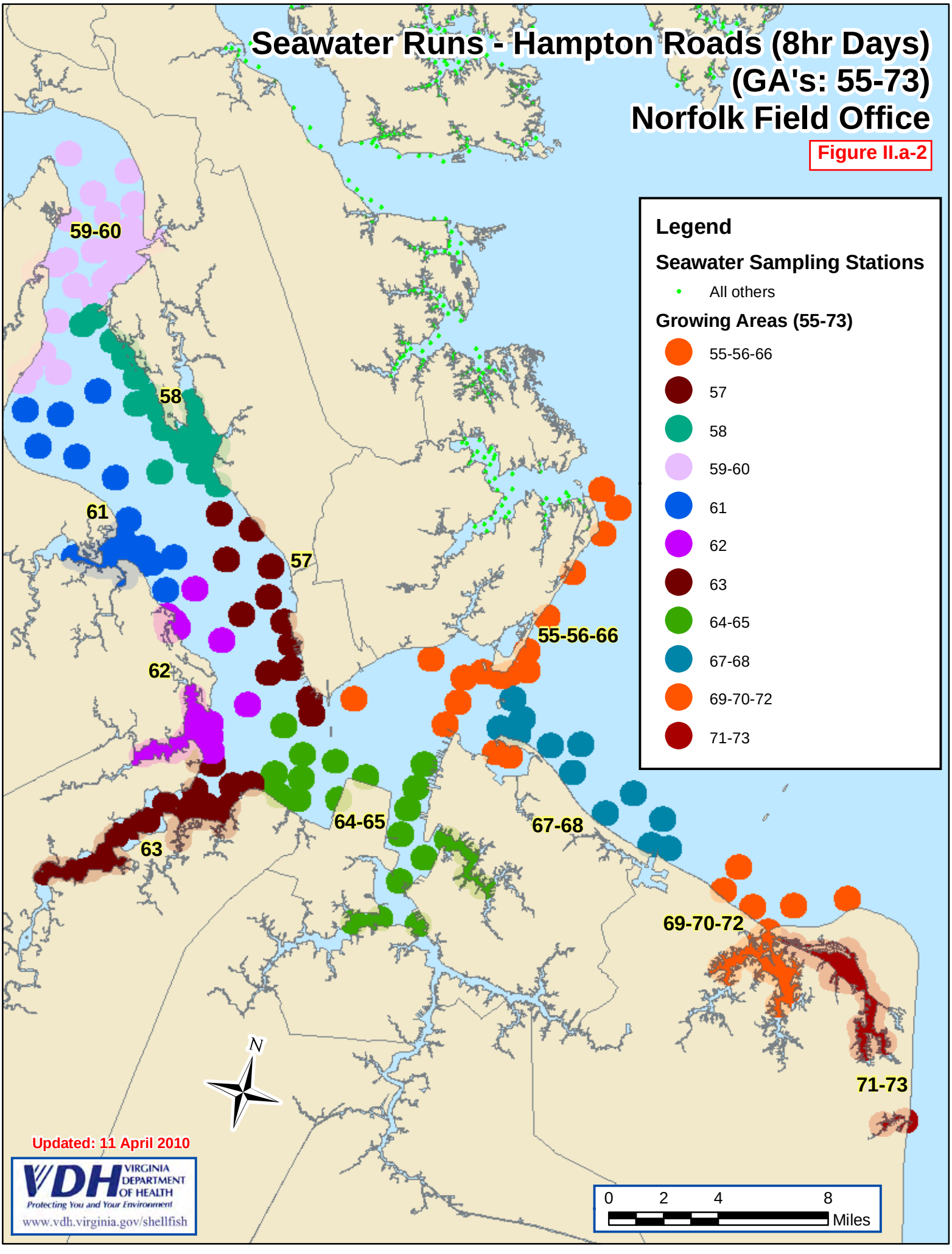
Seawater Runs - Hampton Roads (8hr Days)
(GA's: 55-73)
Norfolk Field Office
Figure II.a-2
Legend
Seawater Sampling Stations
All others
Growing Areas (55-73)
55-56-66
57
58
59-60
61
62
63
64-65
67-68
69-70-72
71-73
59-60
58
61
57
62
63
64-65
55-56-66
67-68
69-70-72
71-73
N
0 2 4 8
Miles
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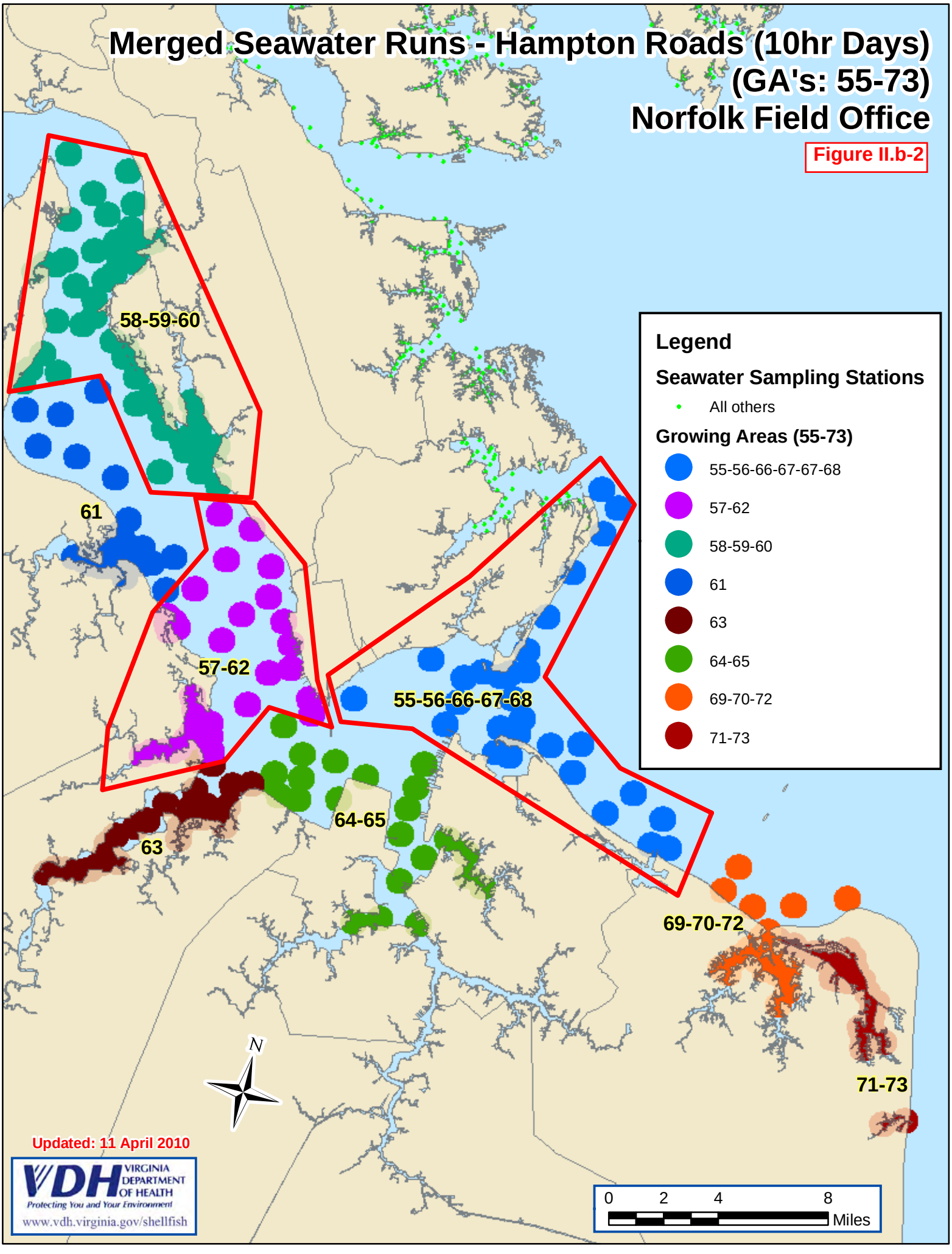
Merged Seawater Runs - Hampton Roads (10hr Days)
(GA's: 55-73)
Norfolk Field Office
Figure II.b-2
58-59-60
61
57-62
55-56-66-67-68
64-65
63
69-70-72
71-73
Legend
Seawater Sampling Stations
All others
Growing Areas (55-73)
55-56-66-67-67-68
57-62
58-59-60
61
63
64-65
69-70-72
71-73
N
0 2 4 8
Miles
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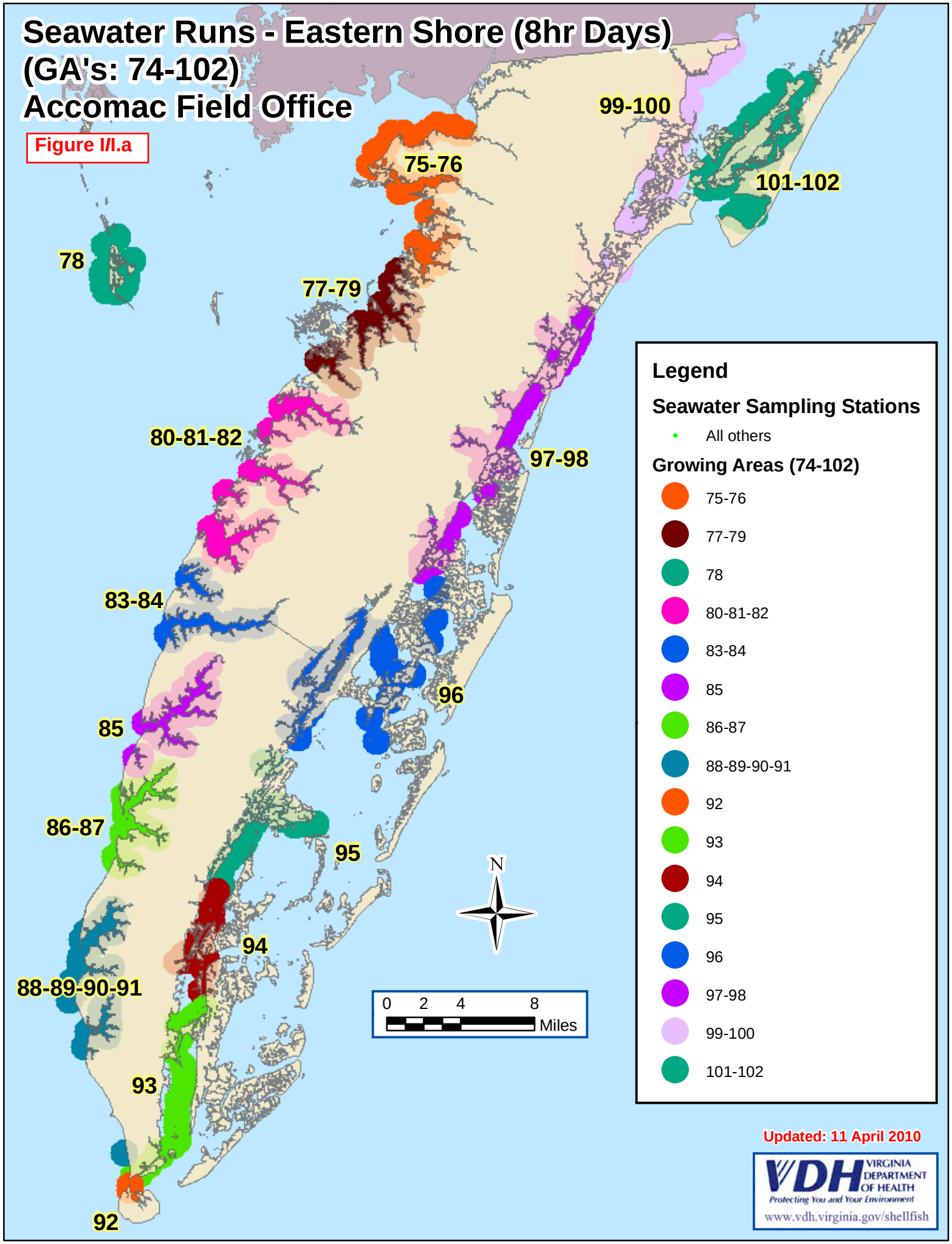
Seawater Runs - Eastern Shore (8hr Days)
(GA's: 74-102)
Accomac Field Office

Figure I/I.a



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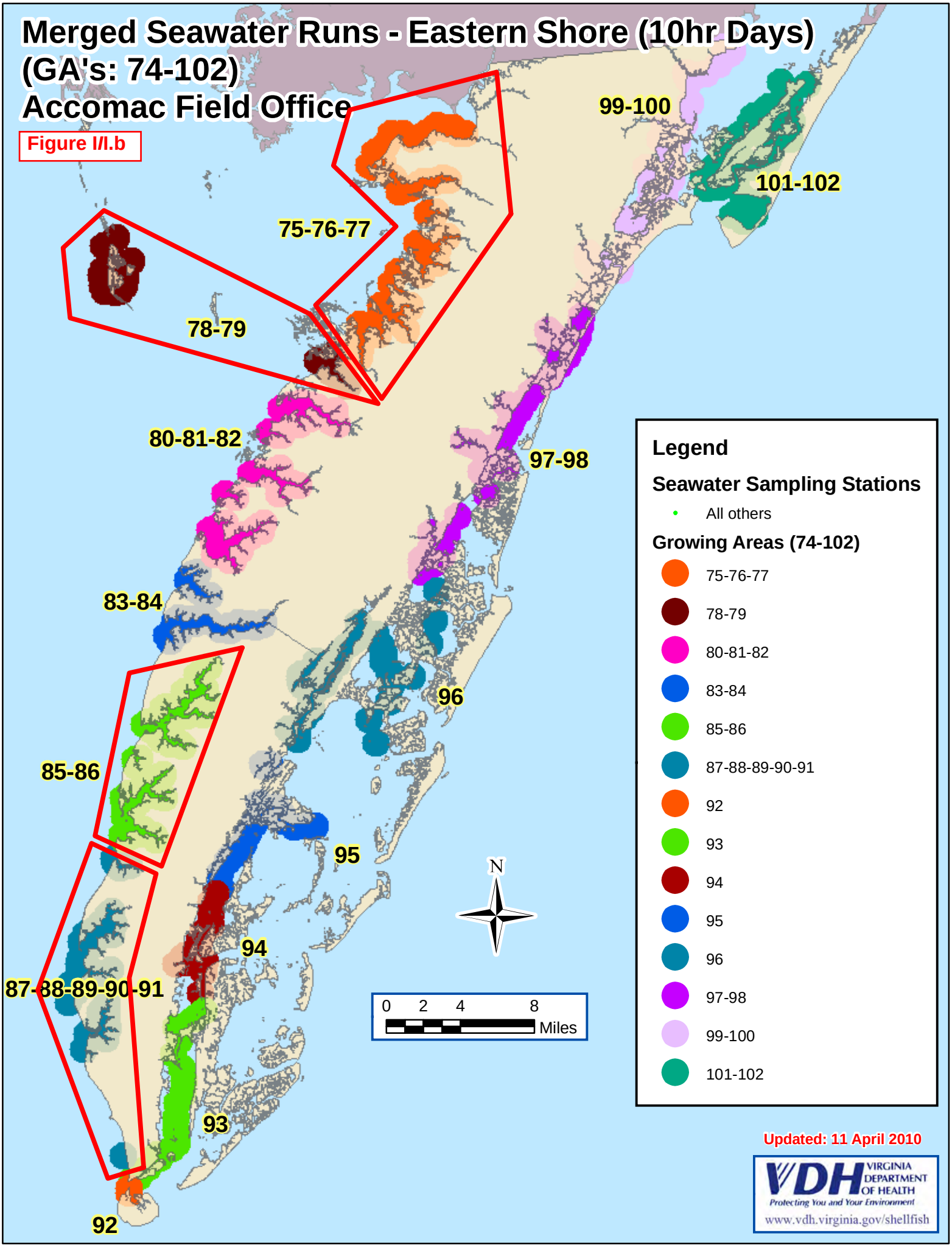
Merged Seawater Runs - Eastern Shore (10hr Days)
(GA's: 74-102)
Accomac Field Office
Figure I/I.b
99-100
101-102
75-76-77
78-79
80-81-82
97-98
83-84
96
85-86
95
94
87-88-89-90-91
93
92
N
0 2 4 8
Miles
Legend
Seawater Sampling Stations
All others
Growing Areas (74-102)
75-76-77
78-79
80-81-82
83-84
85-86
87-88-89-90-91
92
93
94
95
96
97-98
99-100
101-102
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