



# **RHODE ISLAND DEPARTMENT OF HEALTH BEACH PROGRAM**

## **2009 Season Report**



Newport Bridge, Newport, RI <http://asergeev.com/pictures/archives/compress/2004/425/12.htm>

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\* Due to the size of this appendix it is attached as a separate document

## **Executive Summary**

The Rhode Island Department of Health (HEALTH) is responsible for the licensing and regulation of bathing beach facilities in the State of Rhode Island. This includes both fresh and saltwater beaches. Funding for the beach Program is provided by the United States Environmental Protection Agency (USEPA). These funds support primary Beach Program activities which include: sanitary surveys, development and implementation of a risk-based monitoring plan, and bacteriological testing at marine beaches. Currently, the USEPA does not provide funds to monitor freshwater bathing beaches. Freshwater beach managers are responsible for sampling and following HEALTH approved regulations.

From May through September 2009, approximately 1,770 samples were collected from all 68 monitored saltwater bathing beaches. All samples were analyzed for Enterococci as required in the Federal Beaches Environmental Assessment and Coastal Health (BEACH) Act.

The 2009 bathing season saw a significant increase in beach closures and closure days from the 2008 season. Whereas 40 beach closure events resulted in the 124 beach closure days recorded for 2008, 79 closure events resulted in the 181 beach closure days recorded for 2009. The total volume of rainfall was significantly higher during the summer of 2009 (May 25 through September 7) than the summer of 2008. Total rainfall increased from 9.64 inches in 2008 to 17.24 inches in 2009. Significant rainfall instances (> 0.50 inches in a 24-hour period) greatly increased in 2009, with 6 instances in 2008 and 13 instances in 2009.

## 1.0 Program Standards

### *Mission*

The mission of the Rhode Island Department of Health's (HEALTH) Beach Program is to protect the public from illness associated with swimming in contaminated bathing waters. The Beach Program achieves this goal by licensing recreational bathing beaches throughout the state under the authority of the General Laws of Rhode Island (Appendix A). We further this mission by assisting beach owners and managers with finding and eliminating sources of contamination.

### *History*

HEALTH began monitoring beaches in the summer of 1995. Prior to 1995, the Rhode Island Department of Environmental Management (RIDEM) was responsible for monitoring beaches. All facilities monitored under this program are licensed as Recreational Facilities by HEALTH.

A "bathing beach" is defined by HEALTH as a natural area or tract of land that is used in connection with swimming and/or bathing in any waters of the state provided:

- a) It is open to the public by permit and/or payment of a fee; or
- b) It is maintained as a private club or association requiring membership fees or dues; or
- c) It is maintained with or without charge for the recreation of groups of ten (10) or more children.

Licensing requires facilities to have electrical service; refuse storage and disposal; sewage disposal facilities; adequate toilets, showers, or lavatories with hot and cold running water; a drinkable water supply; and the water adjacent to a bathing beach must meet bacteriological standards.

In 1999, development of a comprehensive beach-monitoring program began under a USEPA Environmental Monitoring for Public Access and Community Tracking (EMPACT) Grant titled Bacterial Water Quality Monitoring at Upper Narragansett Bay Bathing Beaches. This grant enabled HEALTH to establish a public notification system including a website, telephone hotline, and beach flagging system. HEALTH also evaluated conditions in Upper Narragansett Bay, which has long been impacted by urban runoff, point source discharges, and combined sewer overflows (CSOs).

The EMPACT Program provided HEALTH with the resources to sample 23 stations in the Upper Narragansett Bay in wet and dry weather. The conclusion of this study determined that additional sampling was needed at the licensed Upper Bay beaches to adequately protect the public. Also, the areas north of Conimicut Point in Warwick and Nayatt Point in Barrington were deemed unsuitable for licensing.

In 2000, Congress enacted the Beaches Environmental Assessment and Coastal Health (BEACH) Act, an amendment to the Federal Water Pollution Control Act (a.k.a. The Clean Water Act). This act authorizes USEPA to distribute grants to eligible states and Indian tribes to reduce the risk of disease and illness in the nation's bathing waters. State objectives under this program were published by the USEPA in June 2002. The National Beach Guidance and Required Performance Criteria for Grants document outlines several requirements of the BEACH Act which include: a

tiered categorization of beaches according to risk, identification and mitigation of pollution sources, a risk communication plan, and specific beach monitoring information<sup>1</sup>.

Since 2000 the USEPA has provided HEALTH with over \$1 million in beach grants to manage Rhode Island's Beach Program. These grants have provided HEALTH the resources to vastly improve the Beach Program and to develop a broad base of knowledge regarding Rhode Island's monitored beaches.

### ***Program Staff***

The Beach Program consists of two full time employees, a Beach Program Coordinator and a Beach Program Assistant. The Beach Program is designated under the Office of Food Protection. As a result the Chief of the Office of Food Protection and Chief Environmental Health Food Specialist provide additional oversight and coordination.

Three interns are hired during the summer months to conduct sampling efforts. Two interns are designated as beach water samplers. The samplers collect samples daily at beaches determined by the Beach Program Coordinator and/or Beach Program Assistant. After samples have been collected and submitted to the laboratory the samplers come into the office to enter in their daily observations from the beaches. One intern is stationed in the laboratory and handles all necessary set-up/prep of sample containers and analysis equipment.

To aid in the 2009 Sand Sampling Project, the Beach Program hired three additional interns. Two interns were assigned to the Sanitary Microbiological section of the laboratory, and one was designated to collect beach sand samples at the ten study beaches.

### ***Funding***

During the 2009 beach season, EPA provided HEALTH with \$209,650 for the Beach Program. These funds support primary activities which include: sanitary surveys to identify risk and potential sources of fecal contamination at beaches; development and implementation of a risk-based monitoring plan; and bacteriological testing at saltwater beaches.

### ***Standards***

RIDEM and USEPA set Rhode Island's water quality standard, which states: saltwater bathing waters must not exceed a single sample standard of 104 Enterococci per 100 milliliters (mL) of water.

### ***Performance Criteria***

EPA has developed nine performance criteria for the implementation of monitoring, assessment, and notification programs. To be eligible for a grant to implement a monitoring and notification program, the state, tribal, or local government's program must be consistent with these performance criteria. The performance criteria also apply to federal agency programs and programs directly implemented by EPA. These performance criteria are based on and incorporate other requirements of the sections of the BEACH Act<sup>3</sup>.

### **Risk-Based Beach Evaluation and Classification Plan (Criterion 1)**

To evaluate and classify risk at Rhode Island's licensed facilities the Beach Program identified coastal recreational waters and bathing beaches throughout the state. Beach evaluations, sanitary surveys and water quality evaluations were conducted to determine risk.

### **Tiered Monitoring Plan (Criterion 2)**

To develop a tiered monitoring plan HEALTH identified the following factors: period and extent of use, frequency of monitoring needed, location of monitoring, methods to be used, and assessment procedures for short term increases in pathogen indicators.

### **Monitoring Report Submission (Criterion 3)**

HEALTH submits all beach monitoring data to EPA. Currently, HEALTH submits information annually through EPA's Central Data Exchange (CDX). To collect and submit this information HEALTH employs a web-based data manager (Garrison Enterprises).

### **Methods and Assessment Procedures (Criterion 4)**

To assess levels of pathogen indicators, HEALTH will use the IDEXX Enterolert™ method to enumerate Enterococci. Enterolert™ provides HEALTH a range of Enterococci from <10 to >24,192 MPN/100ml.

### **Public Notification and Risk Communication Plan (Criterion 5)**

HEALTH's public notification plan includes: an official beach sign program, 24-hour telephone hotline, publicly accessible website, and daily media releases. The purpose of this plan is to quickly notify the public of potential risk associated with swimming in contaminated bathing waters.

### **Measures to Notify EPA and Local Governments/Beach Managers (Criterion 6)**

EPA will be notified of all beach closures and openings through HEALTH's web-based management system. Every time a beach is opened and/or closed a press release will be emailed to the EPA Region 1 contact. Furthermore, EPA will receive an end of season report containing all violations and closures.

Beach managers will be notified immediately by telephone once a decision to close the facility has been made. The beach manager/operator will inform facility staff and bathers and post closure notification signs. Beach managers and local governments will receive an emailed press release as part of the closure notice distribution.

### **Measures to Notify the Public (Criterion 7)**

HEALTH utilizes several methods to notify the public of beach closures including: a 24-hour telephone hotline, daily updated website, closure sign system at all licensed beaches and a standard format press release.

### **Notification Report Data Submission Plan (Criterion 8)**

The BEACH Program requires HEALTH to submit all beach notification data to EPA. Currently, HEALTH submits information annually through EPA's Central Data Exchange (CDX). To collect and submit this information HEALTH employs a web-based data manager (Garrison Enterprises)

### **Public Evaluation of Program (Criterion 9)**

During the development of the Beach Program HEALTH conducted two public comment periods. First EPA, DEM and all licensed beach managers were given the opportunity to evaluate the sanitary survey procedures. Comments were used to better classify risk at licensed bathing beaches in Rhode Island. Second, the public was given an opportunity to comment on monitoring and public notification plans. Notices were sent out to all licensed beaches. An online notification was given for an informal public hearing to be held at HEALTH. Following the hearing, the public were given additional time to comment electronically or in writing.

During the 2008 beach season a marketing intern from the Bryant College of Business assisted HEALTH in a program evaluation. The evaluation assisted the Beach Program to more efficiently serve the needs of the public and provide a higher level of customer satisfaction and service to beach owners. Extensive research was used to track program performance in providing effective monitoring information and helpful support throughout the summer season.

## **2.0 Flagship Beaches**

USEPA defines flagship beaches as high-use beaches selected for targeted attention. Beaches were designated based on three criteria: a history of closures; extended periods of poor water quality; and service to a diverse socioeconomic user group. During the 2002 season, Goddard Park in Warwick, Warren Town Beach in Warren, and King Park Swim Area in Newport were designated as Rhode Island's Flagship Beaches. As a result of the closure of King Park Swim Area in 2004 by the City of Newport, Scarborough State Beach in Narragansett was designated as a flagship beach.

During the summer of 2003, the environmental health of Narragansett Bay was questioned. Rhode Island experienced the highest number of beach closures in recorded history and Greenwich Bay experienced the worst fish kill in the last fifty years. In response to these events, Governor Donald Carcieri formed the Governor's Narragansett Bay and Watershed Planning Commission to coordinate and plan for the environmental and economic health of the Bay. Ten study panels were formed with experts from state and federal government, academia, non-governmental organizations, private firms, and the public.

In March of 2004, the Commission issued a report detailing recommendations to improve the health of Narragansett Bay. On July 22, 2004, Governor Donald Carcieri responded to the report, charging HEALTH, DEM and the Department of Transportation (DOT) with developing an improvement strategy for the ten priority beaches. In December 2004, HEALTH, DEM and DOT issued *Joint Improvement Strategy for 10 Priority Beaches*, a document outlining the steps to be taken to identify and eliminate sources of contamination.

### ***Greenwich Bay***

Beaches located in the City of Warwick accounted for the largest percentage of closures by town over the last several years. From 2008 to 2009, closures in Warwick decreased from 73 to 58 closure days as rainfall increased from 9.64 inches to 17.24 inches. The decrease in closure days may be attributed to the increased stormwater holding capacity of the State Tunnel Project. With decreased contaminated discharge, water quality in upper Narragansett Bay has improved.

In 2009 the City of Warwick continued their efforts with connecting homes in Greenwich Bay to municipal sewer systems. Over six thousand connections have been made since the beginning of the project. These connections are also attributed to the decrease in beach closures.

### ***Easton's and Atlantic Beach Club***

In 2009 the City of Newport again granted money to a local Aquidneck Island volunteer organization, Clean Ocean Access (COA), to continue sampling Easton's Beach during the off-season when surfers utilize the beach area. This study is unique since HEALTH does not sample any of Rhode Island's beaches during the off-season (with the exception of short-term special studies). The City of Newport agreed to pay for sample analysis from January through December and COA agreed to provide all necessary manpower.

In the summer of 2009 Easton's Beach began using a seaweed harvester to remove excess seaweed from the waterline. Removal has resulted in reduced beaches closures and improved the aesthetic value of the facility.

Atlantic Beach Club worked with the Coastal Resource Management Council (CRMC) and a local waste management company to remove seaweed as necessary during the beach season. This contract will continue throughout the 2010 beach season as well.

## **3.0 2009 Data Summary**

### ***Sample Results***

The number of samples collected by HEALTH has increased from 281 in 1995 to 1770 in 2009. Beach Owners and Managers and non-profit groups under Beach Program guidance collected additional saltwater samples. The number of facilities tested has increased from 82 in 1997 to 118 in 2009, 68 of which are saltwater beaches.

### ***Closures***

During the 2009 beach season there were 79 recorded closure events totaling 181 closure days. This represents a 45.97% increase in closure days from the 2008 bathing season (there were 40 closure events totaling 124 closure days). Detailed information regarding beach closures can be found in Appendix G - *2009 Coastal Beaches Action Summary*. Total rainfall increased drastically from 2008 to 2009, from 9.64 inches to 17.24 inches. Also, significant rainfall events increased greatly from 6 in 2008 to 13 inches in 2009. Beginning in the summer of 2009 the Beach Program began tracking all meteorological data including tidal and lunar cycles at eleven major weather stations throughout the state (Appendix H – *Meteorological Conditions*). This data was used to track precipitation, air/water temperatures and wind direction/speed.



Table 1 contains data regarding closure days for each beach and suspected sources of contamination.

**Table 1. 2009 Saltwater Beach Closures**

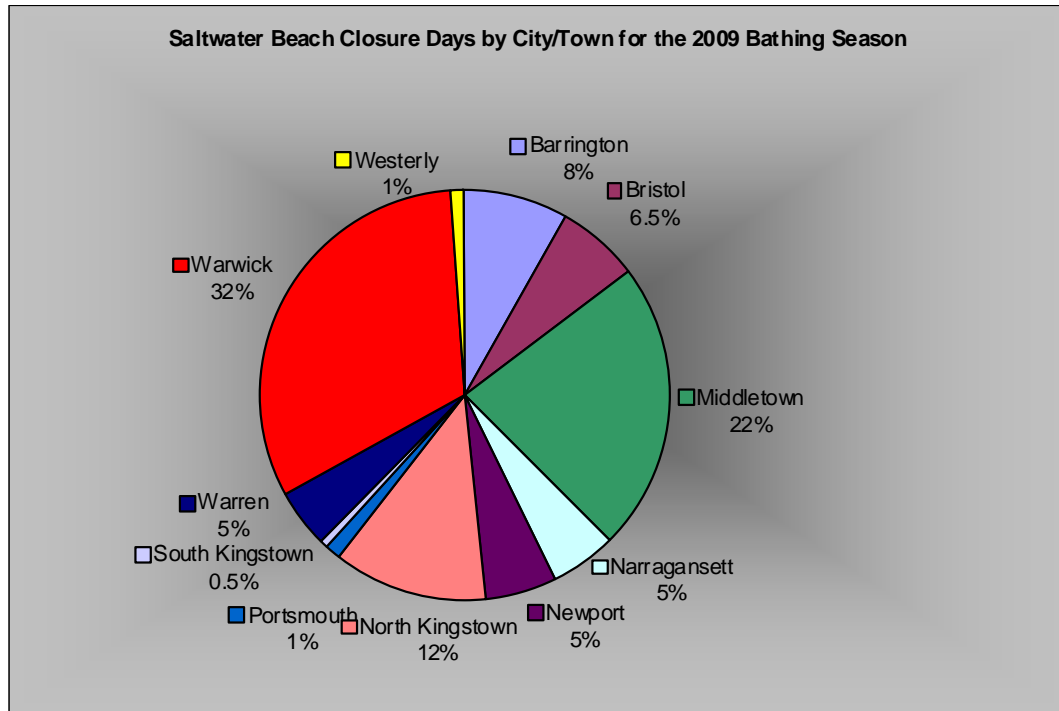
Beach Name	Days Closed	Problems
Atlantic Beach Club	18	Stormwater, Pump station, Newport CSO
Barrington Town Beach	15	Run-off, Providence CSO
Bristol Town Beach	12	Run-off, Wildlife, Providence CSO
Camp Fuller – YMCA Beach	1	Run-off, Wildlife
Camp Grosvenor	10	Run-off, Wildlife
City Park	12	Run-off, Boats, Wildlife
Conimicut Point	19	Providence CSO, Wildlife, Run-off
Easton’s Beach	3	Stormwater, Pump station, Newport CSO
Fort Adams	6	Run-off, Wildlife
Goddard Park	10	Run-off, Boats, Wildlife
Misquamicut Club	1	Sewage Discharge
North Kingstown Town Beach	8	Stormwater Run-off
Oakland Beach	17	Run-off, Wildlife
Peabody’s Beach	11	Stormwater Run-off, Boats, Wildlife
Plum Beach Club	1	Stormwater Run-off
Sandy Point Beach	2	Stormwater Run-off
Saunderstown Yacht Club Beach	3	Stormwater Run-off
Scarborough State Beach – North	5	Stormwater Run-off
Scarborough State Beach – South	5	Stormwater Run-off
Third Beach	11	Run-off, Boats
Warren Town Beach	9	Sewer Issues, Stormwater Run-off, Boats
Watch Hill Carousel Beach	1	Sewage Discharge
Total:	<b>181</b>	

The following table and charts document the percentage of closures attributed to each town. Note: all saltwater closure days occurred within eleven of Rhode Island's coastal towns.

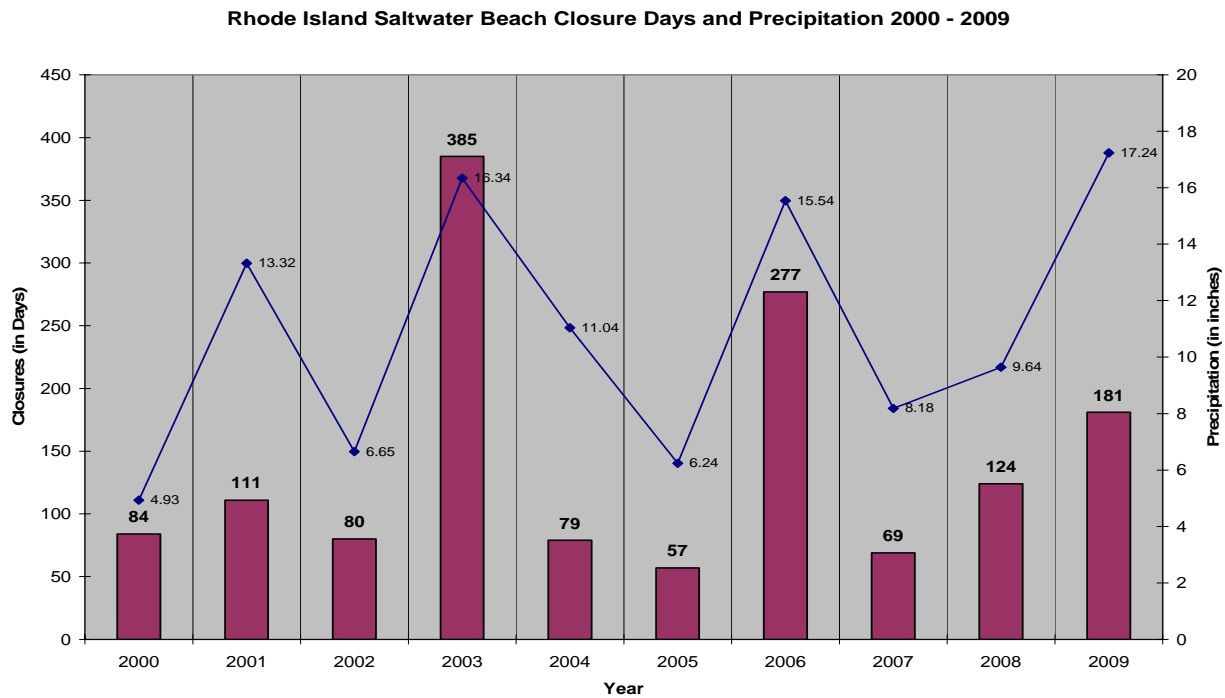
**Table 2. Percentage of Saltwater Beach Closure Days By Town for the 2009 Bathing Season**

<b>Percentage of Total Saltwater Closure Days</b>	<b>City/Town</b>	<b>Number of Closure Days</b>	<b>Facilities Closed</b>
5.0	Warren	9	Warren Town Beach
32.0	Warwick	58	City Park Beach, Conimicut Point Beach, Goddard State Park Beach, Oakland Beach
22.0	Middletown	40	Atlantic Beach Club Beach, Peabody's Beach, Third Beach
12.0	North Kingstown	22	Camp Grosvenor, North Kingstown Town Beach, Plum Beach Club, Saunderstown Yacht Club
8.0	Barrington	15	Barrington Town Beach
6.5	Bristol	12	Bristol Town Beach
6.0	Narragansett	10	Scarborough State Beach North, Scarborough State Beach South
6.0	Newport	10	Easton's Beach, Fort Adams
1.0	Portsmouth	2	Sandy Point Beach
1.0	Westerly	2	Misquamicut Club, Watch Hill Carousel Beach
0.5	South Kingstown	1	Camp Fuller – YMCA Beach
<b>100</b>		<b>181</b>	

**Chart A. Saltwater Beach Closure Days By Town for the 2009 Bathing Season**



**Chart B. Rhode Island Saltwater Beach Closure Days and Precipitation 2000-2009**



**Locational Data**

In summer and fall of 2009 EPA requested that Rhode Island review and correct locational data points for all monitored beaches. Using a web-based application the program found discrepancies at numerous beaches and resolved them. Having accurate locational data provides the EPA and the Beach Program with more precise beach extents. This allows for improved monitoring and notification.

**Geometric Mean**

A single outlier can drastically skew the arithmetic mean of a beach data set. The geometric mean is used to reduce the impact of significant outliers when averaging a large data set. The geometric mean is calculated by multiplying all data points and taking the  $n$ th root of the product, where  $n$  is the number of data points. The Beach Program uses geometric means as another metric to measure beach health.

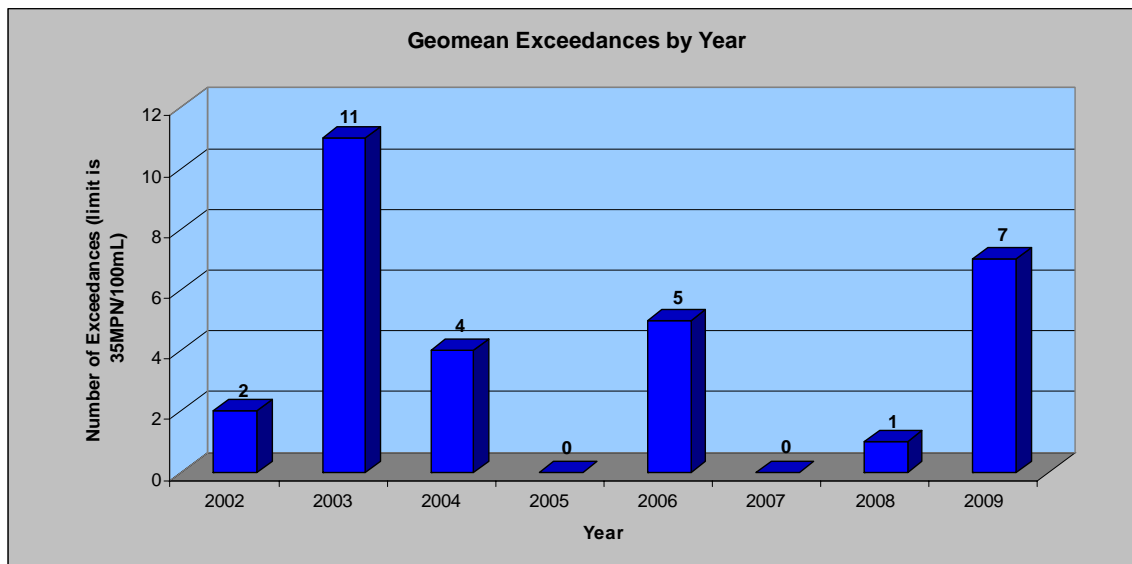
**Table 3. Geometric Mean of Enterococci Bacteria in Rhode Island**

<b>Geometric Mean of Enterococci Bacteria in RI (Safe limit = 35 MPN/100ml)</b>								
<b>Beach</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Alfies	17.32	10.00	13.55	13.26	10.00	10.00	10.00	12.65
Andrea Hotel	14.58	10.00	11.67	14.14	10.00	12.23	10.00	21.68
Atlantic Beach Casino	10.00	19.49	11.22	10.00	10.00	10.00	10.00	12.08
Atlantic Beach Club	27.02	87.89	48.40	33.69	76.94	29.23	32.44	55.53
Atlantic Beach Park	10.00	10.00	10.00	11.93	11.70	10.00	10.00	14.92
Atlantic Pizza & Grill	20.25	10.00	11.22	10.00	10.00	10.00	10.00	12.23
Ballards Inn	n/a	11.89	10.00	n/a	20.28	10.00	24.28	10.00
Barrington Town Beach	13.06	59.03	16.45	16.53	26.82	17.01	17.67	23.21
Blue Shutters Beach	11.75	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Bonnet Shores Beach	12.01	13.19	15.42	10.37	19.82	12.58	14.09	19.97
Briggs Beach	10.00	14.31	15.15	10.00	12.66	10.00	11.34	12.28
Bristol Town Beach	45.12	30.31	15.29	20.21	42.86	15.13	19.35	29.76
Camp Grosvenor	22.29	25.14	29.43	20.64	20.44	18.13	51.18	25.64
Camp St. Dorothy	44.40	18.70	20.11	16.98	30.94	14.02	11.08	40.15
C. Roger Wheeler Beach	16.77	12.00	14.98	10.85	15.38	13.77	10.00	12.14
Charlestown Breachway	13.01	12.46	10.00	10.00	10.00	10.00	10.00	14.12
Charlestown Town Beach	12.66	28.89	11.18	10.97	10.00	10.00	10.00	12.30
City Park Beach	17.81	70.25	17.90	28.02	28.04	22.31	20.43	15.53
Conimicut Point Beach	27.93	74.71	22.16	30.27	46.84	20.58	28.64	27.69
Dunes Club	17.69	14.67	11.50	10.35	10.56	10.69	14.78	15.64
Dunes Park	10.00	10.00	16.62	10.00	10.00	10.00	10.00	10.00
East Beach	10.72	26.04	10.63	10.00	10.00	10.00	10.00	10.00
East Matunuck Beach	10.00	10.00	11.16	10.00	10.00	10.80	11.22	10.00
Easton's Beach	19.57	30.61	50.29	20.08	n/a	26.97	34.18	27.18

Fogland Beach	15.52	11.93	14.85	10.71	16.68	10.59	11.53	16.35
Fort Adams State Park	19.62	22.65	18.44	14.00	20.45	12.56	13.03	18.39
Fred Benson Town Beach	n/a	10.00	10.00	10.00	34.79	10.00	10.00	10.00
Galilee Beach Club Assoc.	12.08	19.78	11.49	10.00	10.00	10.00	10.00	13.91
Goddard Park	15.85	33.18	14.96	20.18	19.87	16.69	17.28	36.91
Gooseberry Beach	29.01	16.92	13.00	10.34	13.61	10.44	10.59	13.91
Goosewing Beach	10.00	10.00	14.28	12.54	10.00	10.63	10.00	12.42
Grinell's Beach	24.78	11.22	13.87	13.70	14.70	10.00	10.92	16.99
Hazard's Beach	12.46	13.59	19.33	10.99	12.56	14.75	16.30	16.58
Jim's Trailer Park	10.00	10.00	10.80	10.00	10.00	11.89	13.26	10.00
Mackerel Cove Beach	12.60	36.25	16.92	13.14	18.19	11.48	23.31	12.26
Matunuck Town Beach	10.91	11.22	10.71	11.22	21.29	10.00	19.02	14.37
Misquamicut Club	10.00	58.78	12.20	19.11	15.01	10.00	10.00	10.00
Misquamicut Fire District Beaches	12.08	10.00	11.13	10.00	10.00	10.00	10.55	11.82
Misquamicut State Beach	10.47	11.78	12.32	10.81	10.77	11.27	11.37	13.20
Narragansett Town Beach	11.45	12.78	10.48	10.18	14.28	10.49	11.21	15.62
North Kingstown Town Beach	15.23	28.78	21.05	13.15	16.18	23.69	12.95	24.64
Oakland Beach	17.07	41.46	24.75	27.42	26.78	20.52	20.79	21.12
Ocean House	11.89	10.00	10.00	11.22	10.00	n/a	10.00	13.01
Paddy's Beach	10.00	10.00	10.00	10.00	10.00	12.98	10.00	11.22
Peabody's Beach	n/a	43.45	24.71	11.97	23.17	10.80	18.61	28.61
Pleasant View Inn	n/a	10.00	10.00	10.00	10.00	10.00	10.00	17.69
Plum Beach Club	12.46	11.22	13.46	12.97	24.23	16.83	11.49	41.68
Roy Carpenter's Beach	20.98	11.89	11.22	10.00	11.79	31.56	10.00	10.72
Sachuest Beach	12.60	10.00	13.21	10.90	13.11	10.95	12.10	17.47
Salty Brine Beach	15.23	24.49	11.93	10.00	13.16	18.24	17.43	18.88
Sam's Beach	17.32	10.00	10.00	10.80	10.00	11.49	13.80	14.45
Sandy Point Beach	10.00	11.22	13.43	14.69	14.54	10.44	12.82	35.54
Sandy Shore Motel	10.00	10.00	13.55	10.00	10.00	10.00	10.00	19.22
Saunderstown Yacht Club	n/a	51.86	37.22	12.88	35.67	14.12	14.80	36.97
Scarborough State Beach North	14.36	16.54	23.00	15.33	18.17	22.87	15.69	17.99
Scarborough State Beach South	19.71	19.40	23.49	16.63	22.11	20.60	12.96	19.52
Seaside Beach Club	10.00	10.00	20.08	10.00	10.00	10.00	12.66	12.54
South Shore Beach	10.00	16.49	15.15	10.00	10.00	10.88	10.59	19.88
Spouting Rock Beach Assoc.	13.16	60.30	39.83	11.04	20.77	10.00	14.74	27.17
Surf Hotel	n/a	10.00	n/a	n/a	14.14	25.25	14.14	10.00
Third Beach	n/a	n/a	16.59	16.35	26.25	15.84	17.49	35.51
Warren Town Beach	23.38	68.30	11.59	24.08	40.85	25.12	17.27	21.96
Warren's Point Beach Club	10.00	19.89	10.91	10.55	10.00	11.22	14.90	11.70
Weekapaug Fire District Beaches	n/a	n/a	13.01	10.00	10.00	10.00	10.56	10.71
Westerly Town Beach New	10.00	10.00	10.00	10.00	12.60	10.00	14.70	16.35
Westerly Town Beach Old	10.00	22.15	12.65	10.00	10.00	10.00	12.25	15.00
Willow Dell Beach Club	n/a	10.00	15.13	10.00	16.04	10.72	12.53	11.22

The following chart depicts the number of beaches exceeding the 35 MPN/100mL standard per year.

**Chart C. Geomean Exceedances by Year**



## 6.0 2009 Projects

### *Sand Study*

Sand sample collection took place at 10 of Rhode Island's highest risk beaches that exhibit unsafe fecal bacteria levels. In addition, two beaches that do not experience elevated bacteria levels in the water were used as control sites. The twelve collection sites incorporated varying wave intensities including low (upper Bay beaches), medium (Warwick beaches) and high (open ocean beaches).

A Daily Beach Survey was completed by the samplers at each of the twelve facilities. Environmental conditions that were not collected in the Daily Survey were collected through [www.weatherunderground.com](http://www.weatherunderground.com). These conditions include precipitation, wind direction and speed, currents, tidal and lunar cycles and air temperature.

Analysis of samples for Enterococci used the 24-hour Enterolert test. Testing took place at the Rhode Island Department of Health State Laboratory. Analysis followed Standard Operating Procedures for the Enterolert Method. Dry weight analysis was conducted on sand samples at the HEALTH laboratory. Analysis for dry weight followed Standard Operating Procedures.

Sample results were emailed to the Project Manager at [amie.parris@health.ri.gov](mailto:amie.parris@health.ri.gov), the Project Assistant at [sean.mccormick@health.ri.gov](mailto:sean.mccormick@health.ri.gov) and Dr. Ernest Julian, Chief for Office of Food Protection at [ernest.julian@health.ri.gov](mailto:ernest.julian@health.ri.gov), upon completion of lab analysis.

With this information, the Beach Program hopes to make more health conscious and proactive decisions when closing beach facilities and to evaluate the current closure methods already in

place. The Program will attempt to answer the following question: Is there is a need to implement more stringent policies when closing a beach to swimming based on sand sample data?

Program Staff collected 338 sand samples from August 11 through September 3, 2009. Sample results ranged from <0.28 MPN/gram through >968.43 MPN/gram of sand. The lowest sample result was taken from the dry sand of Barrington Town Beach (high risk facility) and the highest sample was taken from the wet sand of Galilee Beach Club (control beach). Based on this observation no direct correlation can be made between bacterial contamination in sand and water.

Beach Sand does not have a federally approved standard. Sampling and investigation of fecal bacteria in beach sand is new field of study and therefore cannot be used as a method to measure pollutants. Beach Sand data is collected for research purposes with the intent to one day be used as an additional environmental health factor regarding coastal beaches.

Note: Further project details can be found in the Quality Assurance Project Plan (QAPP) for the Beaches Environmental Assessment and Coastal Health Grant: *Investigating Potential Fecal Bacteria in Rhode Island Beach Sand and Its Effect on Beach Closures* (Appendix F\*).

### ***Bristol Town Beach Improvements***

There are four major projects currently in place at Colt State Park (Bristol Town Beach), one of which has been completed.

First, the completed project consists of six catch basins constructed between the beach and the surrounding park area. These bioswales have been placed along the edge where the *fragmides* meet the water. Rain from the parking lot and park area enters the bioswales before entering the beach. The rainwater is filtered mechanically in the catch basins, and then further filtered by the vegetation in the bioswales. The bioswales also significantly slow down the flow of rainwater to prevent surges of storm water that may carry bacteria and other contamination.

The second project concerns the 36" storm drainpipe that drains approximately 30 feet from the beach facility. This pipe is to be "daylighted" – a large transect (about 400 yards) will be cut open, exposing the water to the sun and outside environment. This open-air section will be a winding stream designed to slow the water flow down. Footbridges will allow for the public to enjoy the new stream while providing valuable access points to travel throughout the park. Around the stream, specialized plants have been chosen that will absorb the water through their root systems, creating a stream that releases cleaner water into Narragansett Bay.

Third, the Town of Bristol has taken a \$1,000,000 loan to remove the parking lot at Bristol Town Beach and replace it with an ecofriendly green parking lot with bioretention swales and specialized vegetation to further absorb and filter storm water.

Finally, the sewage treatment pipe closest to the beach is receiving a major renovation. Underground storage tanks are to be added, which will store water during periods of high-volume rain. When the intense rain has finished, the water will be released at greatly reduced rates, allowing for proper filtration and cleansing of the water.

### ***Barrington Town Beach Source Identification***

HEALTH met with Barrington to discuss recent elevated bacteria levels at the town beach. A full beach survey was conducted including sampling of the bathing water and a nearby storm water

pipe. Sample results from the pipe showed high levels of bacteria and will need to be investigated further in the upcoming beach season.

### ***Middletown Investigation and Survey***

During the 2009 bathing season Middletown saw an increase in high bacteria levels at Third Beach and Peabody's Beach. As a result the Beach Program met with the Middletown Department of Recreation, owners of Peabody's Beach and the Norman Bird Sanctuary. An investigation was conducted at the beaches and along the Maidford River, including a nearby horse farm and vineyards. To further investigate, the town hired a private consulting firm to examine these possible sources of contamination, which will begin in 2010. A detailed map depicting the survey location and sampling points can be found in Appendix I - *Maidford River Survey Map*.

### ***Governor's Bay Day 2009***

In July 2009, the Beach Program participated in the Governor's Bay Day. The purpose of Bay Day is to promote public awareness of the state's beaches. The Beach Program managed a table at Colt State Park to provide information on the Program and educate the public on what they can do to minimize beach closures. Educational materials included an interactive storm-water model that demonstrates how pollutants can be mobilized from urban, suburban, and rural areas into fresh and saltwater environments. Additional educational materials included beach health brochures, informational coloring pages for children, Bristol Town Beach improvements map, sample beach closure sign, a tablet computer displaying the Beach Program website and Program staff to assist patrons with questions.

### ***URI Watershed Watch***

In July of 2009, the Beach Program spoke about beach water quality and sampling efforts on the News Channel 10 URI Watershed Watch Report. A small segment on the news was dedicated to demonstrating how samples are collected at the beach and discussing beach water quality. Both the Beach Program Coordinator and Beach Program Assistant attended the recording of the segment at Oakland Beach in Warwick, RI.

## **5.0 Future Activities**

### ***Monitoring and Data Collection***

Beach interns will conduct sampling at coastal beaches from Memorial Day through Labor Day. Approximately 2,000 samples will be collected, submitted, and analyzed for Enterococci bacteria during the summer season.

### ***Public Notification***

The Beach Program will distribute press releases to beach owners, local governments and RI media. The Program will update the 24-hour telephone hotline on daily basis and produce Public Service Announcements to promote the Beach Program and Public Health.



### ***Source Tracking***

The Beach Program will work with sister agencies and local governments to find and eliminate sources of contamination at Rhode Island beaches. Program staff will coordinate meetings to drive change and lend support to others working for similar causes.

### ***Data Submission***

The Program Coordinator will prepare data for submission to EPA's Storet Warehouse and WQX/CDX Database. S/he will submit data files for the 2011 beach season to EPA Region 1.

### ***Sanitary Surveys***

The Beach Program will conduct sanitary surveys and full beach evaluations at all 68 licensed saltwater bathing beaches. Collected data will include locational data points, daily user populations, unidentified sources of contamination (including discharge pipes), bird populations, nearby farms etc.

### ***Data Merge***

Program Staff will continue work with Garrison Enterprises to upgrade the Beach Program website. Improvements include posting beach evaluation surveys and rain data. The Program would also like to incorporate updated GIS maps to the site to replace the outdated maps. A few beaches in Rhode Island provide live feed cameras to their beaches. We would like to link those beaches to the Beach Program website in order to provide the public with the best, up-to-date information.

### ***Wet Weather Sampling***

The Beach Program will continue to collect wet weather data at Rhode Island's ten priority beaches. This effort will be increased by collecting weekend samples. Work will include: sample collection, data entry and results analysis. Program staff will open communication with other agencies and towns who are conducting similar testing.

### ***Pre-emptive Closure Evaluations***

Based on the successful protocols utilized at Easton's Beach and Scarborough State Beach, the Program will develop further closure evaluations for the remaining Governor's Priority Beaches. This will be accomplished by correcting all data, analyzing closure rates and rate of clean-up and documenting significant rain events.

### ***Urban Beach Initiative***

Program Staff will investigate various unlicensed public access points, for example Gaspee Point in Cranston, RI. This study will include: water quality sampling, property surveys and stakeholder meetings. EPA will assist HEALTH by providing dive team specialists to survey underwater conditions. The goal of this project is restore access/use to communities that have currently impaired beaches.

### ***Education and Outreach***

The Program would like to begin an Education and Outreach Initiative that will utilize written media and interpersonal communication to increase awareness regarding healthy beach practices. The initiative's primary audience will include children and young adults. Potential activities include: Governor's Bay Day, Rhode State Lifeguard training, youth camp presentations and distribution of informational media.

### ***Environmental Stewardship***

The Beach Program will provide beach owners and managers information on environmentally friendly improvements at their facilities. Projects such as porous pavement, rain gardens, buffer planting and pipe day lighting can be used to used to improve beach and water quality.

### ***Predictive Modeling***

During the 2009 season, HEALTH utilized predictive measures at Scarborough State Beach and Easton's Beach, which tend to have high closure rates. Since sampling has increased steadily over the past several years, more data is available to create models. Currently, the processing time for a sample result is 24 hours. HEALTH's goal is to use past data to create a system that will dictate appropriate closing/opening measures in a timely manner to ensure better public health.

HEALTH is currently in the process of reviewing all data in the beach database to ensure the quality of reported results. Upon completion of the data evaluation, HEALTH plans to assess rainfall and sample data for beaches with chronic closures to look for trends that may help in the development of closure protocols.

## **Works Cited**

1. NOAA Northeast Environmental Climate Data. <http://www.erh.noaa.gov/box/dailystns.shtml>
2. United States Environmental Protection Agency. Beaches Assessment and Coastal Health Act of 2000. 33 U.S.C. 1362 sections 104, 303, 406, 502, and 518(e)  
<http://www.epa.gov/waterscience/beaches/rules/act.html>
3. USEPA National Beach Guidance and Required Performance Criteria for Grants. June 2002.  
[http://www.epa.gov/waterscience/beaches/grants/guidance/Accessible\\_pdf/all.pdf](http://www.epa.gov/waterscience/beaches/grants/guidance/Accessible_pdf/all.pdf)

### **Appendix A**

#### Rules and Regulations for Licensing of Recreational Facilities

# **RULES AND REGULATIONS FOR LICENSING OF RECREATIONAL FACILITIES**

[R23-21-RF]

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

DEPARTMENT OF HEALTH

May 1980

***AS AMENDED***

June 1983

**January 2002 (re-filing in accordance with  
the provisions of section 42-35-4.1 of the  
Rhode Island General Laws, as amended)**

These amended rules and regulations are promulgated pursuant to the authority conferred under sections 23-1-5, 23-1-17 and 23-21-4 of the General Laws of Rhode Island of 1956, as amended, and are established for the purpose of defining the minimal standards for recreational facilities consistent with statutory provisions.

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## **PART A DEFINITIONS AND ADMINISTRATION**

### **Section 1.0 DEFINITIONS**

Wherever used in these rules and regulations the following terms shall be construed as follows:

- 1.1 "Adequate" shall mean that which is needed to accomplish the intended purpose in keeping with good public health practice.
- 1.2 "Amusement Place" shall mean any tract of land together with the structures located thereon, the principle use of which is to provide a "midway" of amusement, or animal or vehicle racing for public amusement or recreation.
- 1.3 "Bathing" shall mean swimming and the related activities connected thereto.
- 1.4 "Bathing Beach" shall mean any natural area or tract of land which is used in connection with swimming and/or bathing in any waters of the state provided:
  - (a) It is open to the public by permit and/or payment of a fee; or
  - (b) It is maintained as a private club or association requiring membership fee or dues; or
  - (c) It is maintained with or without charge for the recreation of groups of ten (10) or more children.
- 1.5 "Department" shall mean Rhode Island Department of Health.
- 1.6 "Director" shall mean the Director of the Rhode Island Department of Health or his duly authorized agents.
- 1.7 "Drainage Unit" shall mean a pit filled with crushed stone for soil absorption of potable water overflow at drinking facilities or watering stations.
- 1.8 "Family Camp" shall mean any place maintained to accommodate tents, mobile camping units, trailers, recreation vehicles, etc., in which separate sites are provided or made available for individuals, families or other groups of similar size. Service buildings may or may not be provided.
  - (a) "Primitive Family Camp" shall mean a place provided to accommodate camping with or without tents and/or shelters. Such places are usually NOT accessible to automobiles and/or recreation vehicles. A primitive family camp is a site at which basic needs for camp operation such as buildings, water supply systems, toilets, lavatories, showers and cooking facilities are NOT usually provided.
  - (b) "Caravan, Safari, Rally" shall mean an affiliated group of recreational vehicles assembled for a short term camping experience.
- 1.9 "Family Campsite" shall mean a portion of land in a camping area for the placement of a recreational vehicle and/or tent for the exclusive use of its occupants.
- 1.10 "Garbage" shall mean the putrescible animal and vegetable wastes that result from the handling, preparation and consumption of food.



- 1.11 "Hotel, Motel, Motor Court, Inn, Tourist Cabins" shall mean any building or group of buildings with six or more rooms, or accommodations for more than eight individuals, used for temporary occupancy for lodging or sleeping and further provided they are served by a private or non-community water supply or individual sewage disposal system.
- 1.12 "Mobile Home" shall mean a prefabricated, one-family dwelling unit, to which temporary wheels can be attached for transportation to a permanent location or foundation. Mobile homes are excluded from the provisions of these regulations.
- 1.13 "Operator" shall refer to any person who:
- (a) Alone or jointly or severally with others owns an establishment covered in these regulations; or
  - (b) Has care, charge or control of an establishment as agent or lessee of the owner or as an independent contractor.
- 1.14 "Person" will be held to mean any individual, firm, co-partnership, association or private or municipal corporation.
- 1.15 "Plastic Waste Insert" shall mean any liner which consists of a non-dissolvable material used as a convenience for the collection and disposal of refuse and human waste; e.g., liners for portable "Jonny" camp units, can liners, etc.
- 1.16 "Potable Water" shall mean water free from impurities present in amounts sufficient to cause disease or harmful physiological effects and conforming in its bacteriological, radiological and chemical quality to the requirement of the Rhode Island Department of Health Public Drinking Water Regulations.
- 1.17 "Primitive or Outpost Youth/Adult Camp" shall mean a camp or other site at which the basic needs such as places of abode, water supply systems and permanent toilet and cooking facilities are not usually provided.
- 1.18 "Recreation Facility" shall mean to include but not be limited to hotels, motels, motor courts or inns, tourist cabins establishments, camping areas, amusement places, bathing beaches, mobile recreational vehicle facilities and parks.
- 1.19 "Recreational Vehicle" shall mean a vehicle which may or may not be motor propelled, that is used primarily for recreation purposes on land. It includes motor homes, travel trailers, "pop-top" trailers, fold-out trailers, vans and other similar vehicles primarily designed for camping or overnight occupancy.
- (a) "Dependent Recreational Vehicle" shall mean a vehicle which has no permanent toilet, lavatory and shower facilities and is dependent upon a service building for toilet, lavatory and shower facilities.
  - (b) "Independent or Self-Contained Recreational Vehicle" shall mean a vehicle which can operate independent of connections to sewer, water and electric systems. It may contain a water-flushed toilet, lavatory, bath, shower and kitchen sink, all of which are connected to water storage and sewage holding tanks located within the vehicle.

- 1.20 "Refuse" shall mean all putrescible and non-putrescible solid wastes including garbage, rubbish, ashes and biological wastes.
- 1.21 "Rubbish" shall mean all non-putrescible solid wastes consisting of both combustible and non-combustible materials such as paper, tin cans, glass bottles, bedding, rags, crockery, metals, etc.
- 1.22 "Sanitary Station (Dump Station)" shall mean a facility used for receiving and disposing of wastes from various types of holding tanks.
- 1.23 "Sanitary Sewage" shall mean any human or animal excremental liquid or substance including the discharge of water closets, laundry tubs, washing machines, sinks, dishwashers and the contents of septic tanks, cesspools or privies. Waste water from dishwashing procedures, handwashing, bathing and shower facilities will be considered sewage.
- 1.24 "Service Building" shall mean a structure housing toilets, lavatories, showers and such other facilities as may be required.
- 1.25 "Shall or Must" shall be used to state mandatory requirements.
- 1.26 "Should or May" shall be used to state recommended or advisory procedures or equipment.
- 1.27 "Travel Trailer" shall mean a vehicular, portable structure built on a chassis with permanent wheels for the purpose of towing from place to place as a temporary residence for travel, recreation or vacation use.
- 1.28 "Watering Station" shall mean a centralized potable water supply outlet.
- 1.29 "Youth/Adult Camp" shall mean any camp, primitive or outpost camp, or residential camp which conducts a program for 10 or more campers.
- (a) "Day Camp" - A camp operated for less than 24 hours in any one day not including day care centers as defined in section 23-28.1-5 of the General Laws. Day campers will be limited to two overnight programs per week.
- (b) "Residential Camp" shall mean a camp which provides overnight facilities.

## Section 2.0 ADMINISTRATION

- 2.1 ISSUANCE AND EXPIRATION OF LICENSE - No person shall maintain within this state any recreation facility or use as defined in Section 1.0 until such person shall have obtained a license therefore from the department in accordance with the requirements of section 2 of Chapter 23-21 of the General Laws of Rhode Island of 1956, as amended. Licenses are not transferable. All licenses must be prominently displayed at the licensed location.
- 2.2 LICENSE APPLICATION - The initial application for a license must be on forms provided. A detailed plan drawn to scale showing the entire site, location and layout of buildings, recreational vehicle sites, complete details of water supplies, pumps and service including well logs, sewage and refuse disposal units, bathing areas and all available unit sites must be approved by the Director prior to any construction and before any license can be issued. Plans and construction must comply with

all applicable existing laws and regulations. Additions or alterations subsequent to the submission of such will be made only with the approval of the Director.

- 2.3 **SUSPENSION OR REVOCATION OF LICENSE** - The Director may suspend or revoke any license for violation of the provisions of Chapter 23-21 of the Rhode Island General Laws or these regulations. The provisions of section 3 of Chapter 23-21 shall apply.
- 2.4 **VARIANCES** - In the event of special situations or unusual conditions, the Director may grant variances to these regulations. Requests for variances will be submitted in writing and detail to the licensing authority.
- 2.5 **RETROACTIVITY** - Recreational facilities licensed by the Department prior to 10 June 1980, the effective date of these rules and regulations, may be deemed acceptable with respect to said design and construction if they are capable of being maintained in a sanitary condition that protects the public health.
- 2.6 **PENALTY FOR VIOLATIONS** - Any person who violates the foregoing regulations shall be subject to the provisions of section 8 of Chapter 23-21 of the General Laws of Rhode Island of 1956, as amended, entitled Licensing of Recreational Facilities.
- 2.7 **SEVERABILITY** - If any provision of these regulations or the application thereof to any facility or circumstance shall be held invalid, such invalidity shall not affect the provisions or application of the regulations which can be given effect, and to this end the provisions of the regulations are declared to be severable.

## **PART B GENERAL REQUIREMENTS**

### **Section 3.0 ANIMALS AND PETS**

- (a) No owner or person in charge of a dog, cat or other pet animal shall permit it to run at large or to commit any nuisance within the limits of any recreational facility under these regulations. Any kennels, pens or other areas provided for such pets shall be maintained in a sanitary condition at all times.
- (b) The applicable provisions of Title 4, entitled Animal Health of the General Laws of Rhode Island of 1956, as amended, shall apply where applicable.
- (c) Horses and other farm animals must be stabled at least five hundred (500) feet away from living quarters, dining halls and kitchens in order to minimize odor and nuisance problems. Temporary shelters, corrals, tie rails or hitching posts shall not be located within two hundred (200) feet of any dining hall or other place where food is prepared, cooked or served. Stables must have cleanable floors properly drained and maintained. Drainage from stables and temporary quarters shall not contaminate any spring, stream, lake or other water drainage. All manure must be removed, stored or disposed of in a manner that prevents insect breeding.

### **Section 4.0 REPORTING OF COMMUNICABLE DISEASE**

- 4.1 Cases of communicable disease designated as "reportable diseases" by the Director of Health shall be reported promptly to the Rhode Island Department of Health in accordance with the "Regulations

Pertaining to Reporting of Communicable Disease" of the Rhode Island Department of Health.

- (a) When infectious diseases present a potential hazard or occur in epidemic form in campers, these shall be reported to the Rhode Island Department of Health, even if not designated as "reportable diseases".

#### Section 5.0 CURTAILMENT OF UTILITIES OR SERVICES

- 5.1 No person shall cause the water, or sewage disposal, service facility or equipment which is required to be made available under these minimum standards to be shut off or removed except for such temporary period as may be necessary during actual repairs or alterations or during temporary emergencies when curtailment of service is approved by the Director.

#### Section 6.0 ELECTRICAL DISTRIBUTION SYSTEM

- 6.1 Electrical wiring system provided shall consist of approved fixtures, equipment and appurtenances installed and maintained in accordance with the State Building Code.

#### Section 7.0 FOOD SERVICE

- 7.1 All food operations will comply with the requirements of Chapters 23-1, 21-27 and 21-31 of the General Laws of 1956, as amended, and the regulations adopted thereunder.

#### Section 8.0 LAUNDRY FACILITIES

- (a) If laundry facilities are provided in a recreational facility, there must be a separate room or building set aside for the use of washing machines and this use confined to the inhabitants of that recreational facility;
- (b) All laundry rooms will have floors that are impervious to water, easily cleaned and sloped to floor drains connected to the sewerage disposal system. The floors will be maintained in a sanitary condition at all times. Walls and partitions in laundries will be constructed of easily cleanable and impervious material;
- (c) Laundries will have 40 foot candles of lighting and be properly ventilated.

#### Section 9.0 PEST CONTROL

- (a) Grounds, buildings, parking areas, and structures must be maintained reasonably free of insect and rodent infestation and harborages;
- (b) Extermination methods and other measures to control pests must conform with requirements of the Department of Environmental Management where applicable or as approved by the Director.

#### Section 10.0 REFUSE STORAGE AND DISPOSAL

- (a) The operator shall provide an adequate storage area and maintain, in a clean and sanitary condition, as many receptacles for the storage of garbage and rubbish as are necessary to contain the accumulation between collections. Garbage and rubbish should be disposed of at

least twice weekly;

- (b) Garbage must be stored in fly-tight, water-tight, rodent-proof receptacles of metal or other durable material and properly covered;
- (c) The storage, collection and disposal of refuse must be so conducted as to create no health hazards, rodent harborage, insect breeding areas, accident or fire hazards or air pollution;
- (d) When garbage and rubbish is to be disposed of on the grounds, disposal must be approved by the Director of Environmental Management and shall be in accordance with Chapter 46, Title 23.

#### Section 11.0 SEPTIC TANK CLEANERS

11.1 Any establishment under these regulations that has apparatus for the removal of septage or sanitary sewage must comply with the provisions of Chapter 23-49, Rhode Island General Laws of 1956, as amended.

#### Section 12.0 SEWAGE DISPOSAL FACILITIES

- (a) Sewage must be disposed of in accordance with rules and regulations adopted under the authority of section 42-17.1-2(L), (M) and (R) of the Public Laws of 1978, Chapter 131, section 6;
- (b) Primitive or outpost camps will utilize methods approved by the Director.

#### Section 13.0 SWIMMING POOLS AND BATHING BEACHES

- (a) Where a swimming pool is provided, it will be constructed and operated in accordance with Chapter 23-22 of the General Laws of 1956, as amended, and all state regulations applicable;
- (b) Bathing beach water must meet bacteriological and safety standards as determined by the department, or the Department of Environmental Management.

#### Section 14.0 TOILETS, LAVATORIES AND SHOWERS

- (a) Each recreational facility will provide the number of toilets, showers or lavatories or fraction thereof as cited in Tables HIV of the appendix, and such facilities will be maintained clean, sanitary, well-lighted and in good repair;
- (b) Handwashing facilities will be adjacent to toilet facilities and urinals;
- (c) Potable hot and cold running water will be provided at all showers and lavatories unless a variance has been granted;
- (d) Approved hand cleaner and approved hand drying facilities will be provided at all lavatories unless a variance has been granted;
- (e) Proper ventilation will be provided;
- (f) 40 foot candles of light will be provided unless otherwise exempted;

- (g) Duckboards will not be used in showers.

## **Section 15.0 WATER SUPPLY**

- (a) The operator of all recreational facilities will supply potable water, under pressure, adequate for the needs of such facility. The water supply must be obtained from a source approved in writing by the Department and so distributed as to be readily available. If there is more than one well serving the recreational facility, each well must be visually, readily identifiable by name, number, color or some other means on or about the well;
- (b) The operator shall install and maintain all pipes and pumps delivering potable water in accordance with the State Building Code;
- (c) There must be no physical connection between any pipe carrying water from a potable water source and any pipe carrying water from any other source without written approval of the Director;
- (d) Drinking fountains shall be of a design meeting the following general criteria based on the National Plumbing Code, 1955 revision and installed in accordance with the State Building Code:
  - (1) The fountain shall be constructed of an impervious material and have an easily cleanable bowl and other surfaces;
  - (2) The jet of water must be at an angle preventing water from falling back into the orifice;
  - (3) The end of the nozzle must be protected by guards preventing the person using the fountain from contacting the nozzle;
  - (4) The nozzle must discharge above the edge of the bowl so an air gap is provided to prevent a possible cross-connection;
  - (5) Proper drainage must be provided to carry off water promptly.

## **PART C SPECIAL REQUIREMENTS**

### **SUBSECTION I**

## **Section 16.0 YOUTH/ADULT CAMPS**

- 16.1 Toilets, Urinals and Privies - (1) Non-water carried sewage disposal systems such as pit privies, latrines and urinals may not be less than 100 feet from a kitchen or food service area; (2) Residential camps shall provide handwashing and shower facilities and will meet the minimum requirements as cited in Table II; (3) Sleeping areas shall not be more than 200 feet from a toilet or urinal nor less than 50 feet from any non-water carried toilets and/or urinals.
- 16.2 Handwashing and Showers, Etc. - (1) Handwashing and shower facilities shall be supplied with sufficient warm and cold running water; (2) Showers or bathtubs, when provided, must be in the living quarters or in a centrally located structure; (3) Handwashing facilities, shower stalls, bathtub areas and dressing compartments must be maintained in a clean and sanitary condition; (4) Day camps are not required to provide shower facilities; however, they must meet the requirements cited

in Table III; (5) Primitive or outpost camps are exempt from handwashing and shower facility requirements, as shown in Tables II and III.

- 16.3 Primitive (Outpost) Requirements - Basic standards of sanitation relative to waste and sewage disposal, water supply, lavatory, bathing facilities and food sanitation apply to all primitive camping including but not limited to the following: (1) Counselors must be trained in the basic principles of food protection and sanitation and a list of trained personnel certified by the director of camping for the particular organization shall be available; (2) Each individual shall have available approved clean, fresh water for lavatory needs; (3) Warm water and adequate facilities shall be available for handwashing; (4) Adequate facilities shall be provided for approved methods of sanitizing eating and drinking utensils; (5) slit trenches or "cat hole" disposal of human excreta or other recognized methods of sewage disposal must be provided.

## **SUBSECTION II**

### **Section 17.0 FAMILY CAMPS**

- 17.1 Waste Disposal - (1) One recreational vehicle sanitary station (dump station) with a foot-operated seal cover, or equivalent, providing sanitary closure of the sewer pipe inlet when not in use shall be provided for each 150 family campsites; (2) When potable water is supplied to an individual campsite, an approved means of sewage collection and/or disposal must be provided.
- 17.2 Potable Water Supply - A potable watering station must be provided for supplying recreational vehicle storage tanks. All necessary procedures must be taken to assure the safety of the water supply. A watering station must be at least fifty (50) feet away from a sanitary station. A sign at least two (2) feet by two (2) feet must be posted at each potable water station stating, in proportional lettering, "POTABLE WATER. NOT TO BE USED FOR FLUSHING WASTE TANKS".
- 17.3 Service Building - A central service building containing all necessary toilet and other required plumbing facilities must be provided for all recreational vehicle parking areas, except those reserved exclusively for independent recreational vehicles. Service buildings shall be located convenient to the parking spaces, but in no case more than five hundred (500) feet away. (See Table IV for required plumbing facilities.)
- 17.4 Primitive Camps - Basic standards of sanitation relative to waste and sewage disposal apply. Campers are responsible for using safe water for drinking and culinary purposes.
- 17.5 A Camping Caravan - Safari - Rally may be accommodated in an area maintained and licensed as a recreational facility provided adequate facilities are present to accommodate the types of recreational vehicles or tents involved. A camping caravan - safari - rally may be held on land not maintained as a recreational facility if prior approval is obtained from the Department of Health. Approved, adequate facilities must be readily available for good personal hygienic and public health protection. Approvals are limited to a three (3) day period.

## APPENDIX

### PLUMBING FIXTURE REQUIREMENTS

**Table I**

#### Motels, Hotels, Cabins, Amusement Places, Bathing Beaches

Facility	Toilets	Urinals	Handwashing Facilities	Bathtubs or Showers
Motels, Hotels, Cabins, etc	1*	-	1*	1*
Amusement Places and Bathing Beaches	1/500 Male 1/500 Female	1/500 Male	1/500 Male 1/500 Female	-

\*Per dwelling unit

**Table II**

#### Youth - Residential Camps

Number Served	Boys		Girls	Boys or Girls	
	Toilets	Urinals	Toilets	Handwashing Facilities	Bathtubs or Showers
1-10	1	-	1	1	1
11-18	1	1	2	2	2
19-33	2	1	2	3	2
34-48	2	2	3	3	3
49-63	3	2	4	4	4
64-79	3	3	5	4	5
80-95	4	3	6	5	6



**Table III****Youth - Day Camps**

<b>Facilities</b>	<b>Boys</b>	<b>Girls</b>
Toilets*	1/60	1/35
Urinals*	1/60	-
Handwashing*	1/33	1/33

\*Per number of individuals served

**Table IV****Family Camps**

<b>Number of Sites</b>	<b>Toilets</b>		<b>Urinals</b>	<b>Handwashing Facilities</b>		<b>Showers</b>		<b>Other (a)</b>
	<b>Men</b>	<b>Women</b>	<b>Men</b>	<b>Men</b>	<b>Women</b>	<b>Men</b>	<b>Women</b>	
1-30	2	2	1	2	2	1	1	1
31-45	2	2	1	3	3	1	1	1
46-60	2	3	2	3	3	2	2	1
61-80	3	4	2	4	4	2	2	1
81-100	3	4	2	4	4	3	3	1
100+ (b)								

- (a) A flushing toilet (without seat) shall be provided, at each service building, for disposal of liquid wastes unless a sanitary station is conveniently accessible.
- (b) For recreational vehicle areas having more than 100 sites there shall be provided 1 additional toilet and lavatory, for each sex, for each additional 30 sites; 1 additional shower, for each sex, for each additional 40 sites; and 1 additional men's urinal for each additional 100 sites.

**Appendix B**

Sanitary Survey Form



## **Rhode Island Department of Health Beach Monitoring Program**



**BEACH NAME:**

**DATE OF SURVEY:**

**Beach Contact Information**

**Narrative**

**Beach Monitoring Activities**

**Closure History (Last 5-years)**



## Rhode Island Department of Health Beach Monitoring Program



**BEACH NAME:**

**DATE SURVEY COMPLETED:**

Is beach area marked (i.e. roped off, etc.)? Describe.	
Lat/Long of ends of beach area (N/S or E/W boundaries)	
Length of swimming area	
Lat/Long of Sample Stations	
Length of entire beach	
Location of storm water run-off points? Describe and/or get lat/long	
Comments	



## Rhode Island Department of Health Beach Monitoring Program



**BEACH NAME:**  
**COMPLETED:**

**DATE**

**SURVEY**

### Beach History and Known Sources of Contamination:

Does the Beach meet its use classification?	YES/NO (if no, high risk)						
303d Listed?	YES/NO (add 1 point per impairment)						
Confirmed Illness Reports?	YES/NO (if yes, add 5 points)						
Closed during the 2006 Bathing Season?	1-5days 1 Point	6-10days 2 Points	11-15days 3 Points	16-20days 4 Points	21-25days 5 Points	26-30days 6 Points	
Closed during the 2005 Bathing Season?	1-5days 1 Point	6-10days 2 Points	16-20days 4 Points	21-25days 5 Points	26-30days 6 Points	31-35days 7 Points	
Is the beach located in an UA or DPA?	YES/NO (if yes, add 10 points)						
Number of PS Discharges within a 5 mile radius?	(1 point per discharge)						
Is the area subject to CSO's or SSO's?	YES/NO (if yes, add 25 points)						
Is the area subject to Agricultural run-off?	YES/NO						
The nearest POTW is _____miles away?	0-1 mile 15 points	1-2 miles 10 points	2-3 miles 5 points	3-4 miles 3 points	4-5 miles 1 point		
Number of POTW's within 5 miles?	(1 point per POTW)						
Level of Private Septic Systems?	High 10 points		Medium 5 points		Low 1 point		
Is there a TMDL in progress?	YES/NO (if yes, subtract 5 points)						
Ave. # of times the single sample standard was violated?	(1 point per exceedance)						
How important is this beach to the local economy?	High 10 points		Medium 5 points		Low 1 point		
Number of Marine Pump-Outs within 5 miles?	(Subtract 1 point per facility)						

### Field Survey:

Sanitary facilities located at Beach?	YES/NO (if no, add 5 points)			
Number of Marinas to likely have an effect on the beach?	(1 point per marina)			
Level of boat traffic?	High 10 points	Medium 5 points	Low 1 point	
Wild animals present on/near beach?	YES/NO (if yes, add 5 points)			

Domestic animals on/near beach?	YES/NO (if yes, add 5 points)					
Approx. # of Birds on a typical 100ft. section of beach?	(.25 points per bird)					
Ave. # of users during peak beach season?	1-500 5 points	501-1500 10 points	1500-5000 15 points	5001-10000 20 points	>10001 25 points	
Ave # of off-peak users (primary contact)?	1-25 1 point		26-50 5 points		>50 10 points	
Density of susceptible population?	0-33% 5 points		34-67% 10 points		68-100% 15 points	
Visible stormwater run-off?	YES/NO (if yes, 5 points per occurrence)					
Pipes at/adjacent to beach?	YES/NO (if yes, pipe <12"-1 point, >12"-2 points)					
Presence of floatable debris?	YES/NO (if yes, add 5 points)					
Presence of scum/oil sheen?	YES/NO (if yes, add 5 points)					

General Information:

Length of beach			
Location of pipes?			
Location of sampling points?			
Location of stormwater run-off points?			
Distance to stream/river?			
Wrack present?	YES/NO	Width:	Do they rake? YES/NO

Grand Total:	
--------------	--

**Comments:**

**Appendix C**

Daily Survey Form

## **Bathing Beach Survey**

Name of Beach: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Water Temp: \_\_\_\_\_

### Weather Conditions:

Sunny & Clear \_\_\_\_\_ Cloudy & Overcast \_\_\_\_\_ Rainy \_\_\_\_\_ Foggy \_\_\_\_\_ Windy \_\_\_\_\_

### Tidal Conditions:

Slow \_\_\_\_\_ Moderate \_\_\_\_\_ High \_\_\_\_\_ High Tide \_\_\_\_\_ Low Tide \_\_\_\_\_

### Activity on Beach:

Approx.# of People \_\_\_\_\_ Adults \_\_\_\_\_ Children \_\_\_\_\_

Swimming \_\_\_\_\_ Sunbathing \_\_\_\_\_ Fishing \_\_\_\_\_ Boating \_\_\_\_\_ Walking \_\_\_\_\_ Other \_\_\_\_\_

### Conditions of the Beach:

Overall Appearance \_\_\_\_\_ Debris on Beach \_\_\_\_\_ Debris in Water \_\_\_\_\_

Vegetation in Water: 1      2      3      4      5  
                         <25%   25%   50%   75%   100% Cover in 1 meter quadrat

Vegetation on Shore: 1      2      3      4      5  
                         <25%   25%   50%   75%   100% Cover in 1 meter quadrat

Width of Wrack on shore (in meters) \_\_\_\_\_

Visible sewage or sewage odor \_\_\_\_\_

### Conditions of Water:

Clear \_\_\_\_\_ Cloudy & Murky \_\_\_\_\_ Oily Film \_\_\_\_\_

### Sources of Pollution:

Waterfowl Approx.#-Seagulls \_\_\_\_\_ Ducks \_\_\_\_\_ Geese \_\_\_\_\_ Swans \_\_\_\_\_

Approx. # of Boats \_\_\_\_\_

### Wind and Weather Conditions:

### Additional Comments:



**Appendix D**

Homepage for HEALTH's Beach Monitoring Program

Rhode Island Department of Health - Beach Monitoring - Windows Internet Explorer

http://www.ribeaches.org/

Rhode Island Department of Health - Beach Monitoring

RI.gov

R.I. Government Agencies | Privacy Policy | Search RI.gov:  Go

Rhode Island Department of Health

David R. Gifford, MD, MPH, Director  
Donald L. Carcieri, Governor

HOME | HEALTH TOPICS | NEWS | DATA | PROGRAMS | PUBLICATIONS | SITE MAP

Beach Monitoring Home | News and Publications | Closures and Advisories | Water Quality Information | Fact Sheets for Beach Goers | Illness Complaint Form | Related Links | RIBeach Watch Login | Content Syndication | Beach Owners and Managers

**Beach Water Quality Monitoring**

The purpose of the Rhode Island Department of Health Beach Monitoring Program is to provide real-time water quality and safety information concerning all 126 monitored bathing facilities. Through effective management of these beaches, the Department of Health can minimize public health risks associated with swimming in contaminated waters.

For information regarding Recent Beach Closures and/or Openings please see the "RECENT BEACH CLOSURES" section in the right-hand menu. Alternatively you can use the "SEARCH BEACH RESULTS" feature on the right-hand menu to search for a specific beach by beach name or by town to see a full water quality monitoring history for that beach.

- Recent Closures and Advisories
- Recent Press Releases
- Fact Sheets for Beach Goers

If you have any questions, comments or suggestions for the Beach Monitoring Program website, please contact us at: [ribeaches@health.ri.gov](mailto:ribeaches@health.ri.gov)

Today is March 26 2010  
Today's weather and ozone forecast

**SEARCH BEACH RESULTS**

Any Beach

Select a Beach or Select a Town

Any Town

Search  Click Search

**BEACH SEARCH TIPS**

Select a Beach or Town to search. When complete you will be presented with an alphabetical list of all beaches that match your search criteria.

**RECENT PRESS RELEASES**

No Recent Press Releases Available.

More ...

**RECENT BEACH CLOSURES**

No Recent Beach Closures Available.

More ...

Beach Monitoring Program  
3 Capital Hill Room 203  
Providence, RI 02908-5097  
(401)222-7727 or (401)222-2751  
Amie Parris - Beach Coordinator  
[amie.parris@health.ri.gov](mailto:amie.parris@health.ri.gov)

For questions or comments on the Beach Monitoring Program site, please e-mail [RIBeaches@health.ri.gov](mailto:RIBeaches@health.ri.gov)

Rhode Island Department of Health • 3 Capitol Hill • Providence RI 02908  
Voice: 401-222-2231 • Fax: 401-222-6548 • TTY: 711 • Contact Us  
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**Appendix E**

Rhode Island Beach Closure Days 2000 to 2009

***Rhode Island Department of Health Beach Monitoring Program******Closure Evaluation Spreadsheet***

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<b>Number of Monitored Freshwater Beaches</b>	51	51	49	51	47	50	53	49	50	50
<b>Number of Monitored Saltwater Beaches</b>	31	31	70	72	71	69	69	69	74	68
<b>Total Number of Monitored Beaches</b>	82	82	119	123	118	119	122	118	124	118
<b>Sample Count*</b> (RIDOH - EPA Funded Sampling Only)	515	976	1,779	2,567	2,701	3,211	2,769	1,718	1,655	1,770
<b>Rainfall Total</b> (Memorial Day - labor Day)	4.93	13.32	6.65	16.34	11.04	6.24	15.54	8.18	9.64	17.24
<b>Significant Rain Events</b> (>0.5" in 24-hr)	4	7	6	12	9	4	7	6	6	13
<b>Total Sewage Discharge Volume (Million Gallons)</b>	No Data	215.42	719.34	994.83	998.43	1024.5	854.77	579.03	955.1	207.79
<b>Closure Events</b>	13	26	27	67	41	30	91	43	52	89
<b>Closure Days</b>	103	148	103	459	122	65	351	96	164	230

\* Sample count estimates do not include approximately 1,000 samples submitted by Beach Operators on an annual basis, which are reviewed by RIDOH.

For up to the minute information, visit us online at [www.health.ri.gov](http://www.health.ri.gov) or via our hotline at 401-222-2751.

## Appendix F

## Appendix G

2009 Coastal Beaches Action Summary						
Town/City	Beach Name	Action Type	Action Start Date	Action End Date	Action Duration	Source
Middletown	Atlantic Beach Club	closure	6/10/2009	6/14/2009	4	Storm
Middletown	Atlantic Beach Club	closure	7/22/2009	7/23/2009	1	Storm
Middletown	Atlantic Beach Club	closure	7/24/2009	7/25/2009	1	Storm
Middletown	Atlantic Beach Club	closure	7/31/2009	8/1/2009	1	Storm
Middletown	Atlantic Beach Club	closure	8/12/2009	8/13/2009	1	Heavy Seaweed
Middletown	Atlantic Beach Club	closure	8/14/2009	8/15/2009	1	Heavy seaweed
Middletown	Atlantic Beach Club	closure	8/18/2009	8/25/2009	7	Off-shore tropical storm, Heavy seaweed
Middletown	Atlantic Beach Club	closure	8/29/2009	8/31/2009	2	Storm
Barrington	Barrington Town Beach	closure	7/2/2009	7/8/2009	6	Storm
Barrington	Barrington Town Beach	closure	7/23/2009	7/25/2009	2	Storm
Barrington	Barrington Town Beach	closure	8/20/2009	8/25/2009	5	Off-shore tropical storm
Barrington	Barrington Town Beach	closure	8/29/2009	8/31/2009	2	Storm
Bristol	Bristol Town Beach	closure	6/23/2009	6/25/2009	2	Unknown
Bristol	Bristol Town Beach	closure	7/2/2009	7/4/2009	2	Storm
Bristol	Bristol Town Beach	closure	7/24/2009	7/25/2009	1	Storm
Bristol	Bristol Town Beach	closure	8/20/2009	8/25/2009	5	Off-shore tropical storm
Bristol	Bristol Town Beach	closure	8/29/2009	8/31/2009	2	Storm
South Kingstown	Camp Fuller - YMCA Beach	closure	7/2/2009	7/3/2009	1	Storm
North Kingstown	Camp Grosvenor	closure	7/9/2009	7/14/2009	5	Storm
North Kingstown	Camp Grosvenor	closure	7/22/2009	7/23/2009	1	Storm
North Kingstown	Camp Grosvenor	closure	7/24/2009	7/28/2009	4	Storm
Warwick	City Park Beach	closure	7/2/2009	7/7/2009	5	Storm
Warwick	City Park Beach	closure	7/9/2009	7/10/2009	1	Storm
Warwick	City Park Beach	closure	7/24/2009	7/28/2009	4	Storm
Warwick	City Park Beach	closure	8/29/2009	8/31/2009	2	Storm
Warwick	Conimicut Point Beach	closure	6/30/2009	7/7/2009	8	Unknown (6/30), Storm (7/1-7/7)
Warwick	Conimicut Point Beach	closure	7/9/2009	7/10/2009	1	Storm
Warwick	Conimicut Point Beach	closure	7/24/2009	7/28/2009	4	Storm
Warwick	Conimicut Point Beach	closure	8/21/2009	8/25/2009	4	Off-shore tropical storm
Warwick	Conimicut Point Beach	closure	8/29/2009	8/31/2009	2	Storm
Newport	Easton's Beach	closure	7/24/2009	7/25/2009	1	Storm
Newport	Easton's Beach	closure	8/29/2009	8/31/2009	2	Storm
Newport	Fort Adams State Park	closure	6/24/2009	6/25/2009	1	Unknown
Newport	Fort Adams State Park	closure	7/10/2009	7/11/2009	2	Storm
Newport	Fort Adams State Park	closure	7/22/2009	7/23/2009	1	Storm
Newport	Fort Adams State Park	closure	7/24/2009	7/25/2009	1	Storm
Newport	Fort Adams State Park	closure	8/29/2009	8/31/2009	2	Storm
Warwick	Goddard Memorial State Park	closure	6/23/2009	6/26/2009	3	Unknown
Warwick	Goddard Memorial State Park	closure	7/2/2009	7/4/2009	2	Storm
Warwick	Goddard Memorial State Park	closure	7/24/2009	7/26/2009	2	Storm
Warwick	Goddard Memorial State Park	closure	8/20/2009	8/21/2009	1	Off-shore tropical storm
Warwick	Goddard Memorial State Park	closure	8/29/2009	8/31/2009	2	Storm
Westerly	Misquamicut Club	closure	7/2/2009	7/3/2009	1	Sewage discharge in area
North Kingstown	North Kingstown Town Beach	closure	6/25/2009	6/26/2009	1	Unknown
North Kingstown	North Kingstown Town Beach	closure	7/2/2009	7/4/2009	2	Storm
North Kingstown	North Kingstown Town Beach	closure	7/9/2009	7/11/2009	2	Storm
North Kingstown	North Kingstown Town Beach	closure	7/24/2009	7/25/2009	1	Storm
North Kingstown	North Kingstown Town Beach	closure	8/29/2009	8/31/2009	2	Storm
Warwick	Oakland Beach	closure	7/2/2009	7/7/2009	5	Storm
Warwick	Oakland Beach	closure	7/23/2009	7/28/2009	5	Storm
Warwick	Oakland Beach	closure	7/31/2009	8/1/2009	1	Storm
Warwick	Oakland Beach	closure	8/21/2009	8/25/2009	4	Off-shore tropical storm
Warwick	Oakland Beach	closure	8/29/2009	8/31/2009	2	Storm

Middletown	Peabody's Beach	closure	7/2/2009	7/7/2009	5	Storm
Middletown	Peabody's Beach	closure	7/9/2009	7/11/2009	2	Storm
Middletown	Peabody's Beach	closure	7/24/2009	7/26/2009	2	Storm
Middletown	Peabody's Beach	closure	8/29/2009	8/31/2009	2	Storm
North Kingstown	Plum Beach Club	closure	7/28/2009	7/29/2009	1	Unknown
Portsmouth	Sandy Point Beach	closure	7/2/2009	7/4/2009	2	Storm
Saunderstown	Saunderstown Yacht Club	closure	8/21/2009	8/24/2009	3	Off-shore tropical storm
Narragansett	Scarborough State Beach North	closure	7/2/2009	7/3/2009	1	Storm
Narragansett	Scarborough State Beach North	closure	7/22/2009	7/23/2009	1	Storm
Narragansett	Scarborough State Beach North	closure	7/24/2009	7/25/2009	1	Storm
Narragansett	Scarborough State Beach North	closure	8/29/2009	8/31/2009	2	Storm
Narragansett	Scarborough State Beach South	closure	7/2/2009	7/3/2009	1	Storm
Narragansett	Scarborough State Beach South	closure	7/22/2009	7/23/2009	1	Storm
Narragansett	Scarborough State Beach South	closure	7/24/2009	7/25/2009	1	Storm
Narragansett	Scarborough State Beach South	closure	8/29/2009	8/31/2009	2	Storm
Middletown	Third Beach	closure	7/3/2009	7/4/2009	1	Storm
Middletown	Third Beach	closure	7/9/2009	7/11/2009	2	Storm
Middletown	Third Beach	closure	7/24/2009	7/26/2009	2	Storm
Middletown	Third Beach	closure	7/31/2009	8/1/2009	1	Unknown
Middletown	Third Beach	closure	8/13/2009	8/14/2009	1	Unknown
Middletown	Third Beach	closure	8/29/2009	8/31/2009	2	Storm
Middletown	Third Beach	closure	9/1/2009	9/3/2009	2	Unknown
Warren	Warren Town Beach	closure	7/2/2009	7/4/2009	2	Storm
Warren	Warren Town Beach	closure	7/8/2009	7/10/2009	2	Storm
Warren	Warren Town Beach	closure	7/23/2009	7/26/2009	3	Storm
Warren	Warren Town Beach	closure	8/29/2009	8/31/2009	2	Storm
Westerly	Watch Hill Carousel Beach	closure	7/3/2009	7/4/2009	1	Sewage discharge in area



## Appendix H

Date	Meteorological Condition	Tiverton	Little Compton	Bristol	Johnston	Coventry	Cumberland	Narragansett	Newport	North Kingstown	Warwick	Westerly - Watch Hill
5/25/2009	Precipitation (in)	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.7	4.3	0.7	2.8	0.6	3.9	2.2	6.1	1.4	9.0	0.1
	Wind Direction	WNW	SW	ESE	NNW	N	NNW	WNW	W	SSW	NW	SW
	Mean Air Temp (F)	65.2	67	65.5	67.7	66.4	67.9	66.6	62.7	68.4	67	62
	Mean Water Temp (F)	58	58	62	57	57	57	54	57	56	60	57
	Tide - AM low	2:48	3:02	2:49	n/a	n/a	n/a	3:00	2:49	2:43	2:52	4:05
	Tide - PM low	2:22	2:36	2:23	n/a	n/a	n/a	2:34	2:23	2:17	2:26	3:39
	Tide - AM high	9:03	8:54	9:17	n/a	n/a	n/a	8:52	9:04	9:07	9:17	9:45
	Tide - PM high	9:23	9:15	9:37	n/a	n/a	n/a	9:13	9:24	9:27	9:37	10:05
	Lunar cycle	Waning gibbous	Waning gibbous	Waning gibbous	Waning gibbous	Waning gibbous	Waning gibbous	Waning gibbous	Waning gibbous	Waning gibbous	Waning gibbous	Waning gibbous
5/26/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	2.5	4.7	1.4	2.8	0.9	5.4	2.0	9.7	2.8	9.0	8.8
	Wind Direction	SSE	ESE	NE	ESE	SE	ESE	E	ESE	ESE	ESE	ESE
	Mean Air Temp (F)	52.7	55.6	54.3	54.5	54.8	56	54.5	53.7	57.2	55	53.4
	Mean Water Temp (F)	58	58	62	57	57	57	54	57	57	60	57
	Tide - AM low	3:39	3:53	3:40	n/a	n/a	n/a	3:51	3:40	3:34	3:43	4:56
	Tide - PM low	3:14	3:28	3:15	n/a	n/a	n/a	3:26	3:15	3:09	3:18	4:31
	Tide - AM high	9:55	9:47	10:09	n/a	n/a	n/a	9:45	9:56	9:59	10:09	10:37
	Tide - PM high	10:16	10:08	10:30	n/a	n/a	n/a	10:06	10:17	10:20	10:30	10:58
	Lunar cycle	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter
5/27/2009	Precipitation (in)	0.21	0.00	0.24	0.00	0.13	0.31	0.01	0.00	0.00	0.10	0.00
	Wind Speed (mph)	2.2	3.4	0.1	2.0	0.4	3.0	0.8	5.0	1.2	6.0	5.8
	Wind Direction	SSE	E	NE	ENE	ESE	ESE	E	ESE	E	E	E
	Mean Air Temp (F)	51.2	55.1	53.1	51.6	52.5	51.3	54.1	53.6	56.1	53	53.9
	Mean Water Temp (F)	58	58	62	57	57	57	55	57	57	60	57
	Tide - AM low	4:30	4:44	4:31	n/a	n/a	n/a	4:42	4:31	4:25	4:34	5:47
	Tide - Pm low	4:07	4:21	4:08	n/a	n/a	n/a	4:19	4:08	4:02	4:11	5:24
	Tide - AM high	10:50	10:42	11:04	n/a	n/a	n/a	10:40	10:51	10:54	11:04	11:32
	Tide - PM high	11:12	11:04	11:26	n/a	n/a	n/a	11:02	11:13	11:16	11:26	11:54
	Lunar cycle	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter	Last quarter
5/28/2009	Precipitation (in)	0.00	0.00	0.02	0.00	0.00	0.04	0.00	0.00	0.00	0.01	0.00
	Wind Speed (mph)	1.0	4.8	1.8	3.0	0.6	6.2	2.4	9.6	2.7	11.0	7.0
	Wind Direction	SE	N	NNE	NNE	N	NE	NNE	NE	ENE	NE	NE
	Mean Air Temp (F)	52.1	55.5	53.2	50.3	53.3	50.3	54.8	53.7	57.2	54	54.7
	Mean Water Temp (F)	58	58	62	57	57	57	55	58	57	61	57
	Tide - AM low	5:22	5:36	5:23	n/a	n/a	n/a	5:34	5:23	5:17	5:26	6:39
	Tide - PM low	5:04	5:18	5:05	n/a	n/a	n/a	5:16	5:05	4:59	5:08	6:21
	Tide - AM high	11:47	11:39	n/a	n/a	n/a	n/a	11:37	11:48	11:51	n/a	n/a
	Tide - PM high	n/a	12:01	12:01	n/a	n/a	n/a	11:59	n/a	n/a	12:01	12:29
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
5/29/2009	Precipitation (in)	0.22	0.24	0.21	0.00	0.22	0.14	0.29	0.00	0.20	0.17	0.05
	Wind Speed (mph)	0.6	4.6	0.2	1.6	0.1	0.6	0.4	4.5	0.5	4.0	3.2
	Wind Direction	S	SSE	NNW	NE	NE	SE	NNE	NNE	E	E	ESE
	Mean Air Temp (F)	56.2	58.3	56.3	56.4	57.2	57.2	55.8	55	60.4	58	56.5
	Mean Water Temp (F)	58	58	62	57	57	57	56	58	58	61	57
	Tide - AM low	6:10	6:25	6:10	n/a	n/a	n/a	6:23	6:11	6:03	6:12	7:26
	Tide - PM low	5:52	6:07	5:52	n/a	n/a	n/a	6:05	5:53	3:46	5:54	7:13
	Tide - AM high	12:34	12:28	12:43	n/a	n/a	n/a	12:26	12:35	12:39	12:42	1:04
	Tide - PM high	12:55	12:47	12:58	n/a	n/a	n/a	12:45	12:56	12:52	12:58	1:18
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
5/30/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.34
	Wind Speed (mph)	1.8	4.5	0.5	2.5	0.6	2.7	2.3	6.8	0.9	7.0	6.0
	Wind Direction	NW	SSW	WSW	NW	NW	WNW	W	SW	WSW	W	WSW
	Mean Air Temp (F)	64.4	64.6	65.5	66.8	66.4	66.7	65.1	60.9	68.4	69	63.7
	Mean Water Temp (F)	58	58	62	57	58	58	56	58	58	61	57
	Tide - AM low	6:58	7:13	6:58	n/a	n/a	n/a	7:11	6:59	6:49	7:01	8:14
	Tide - PM low	6:39	6:56	6:40	n/a	n/a	n/a	6:54	6:40	4:32	6:42	8:02
	Tide - AM high	1:21	1:16	1:31	n/a	n/a	n/a	1:14	1:22	1:27	1:30	12:52

	Tide - PM high	1:42	1:35	1:46	n/a	n/a	n/a	1:33	1:43	1:39	1:46	1:06
	Lunar cycle	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon
5/31/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
	Wind Speed (mph)	2.9	5.5	1.2	6.0	1.7	6.3	1.9	5.2	2.2	10.0	3.5
	Wind Direction	SSW	SW	SSE	SW	S	SSW	SW	SW	SW	WSW	SSW
	Mean Air Temp (F)	62.1	62.4	62	60.7	63.3	65.4	61.3	59.3	65.9	64	58.9
	Mean Water Temp (F)	58	58	62	58	58	58	57	58	58	61	58
	Tide - AM low	7:46	8:03	7:46	n/a	n/a	n/a	8:01	7:47	7:37	6:49	9:03
	Tide - PM low	7:27	7:45	7:28	n/a	n/a	n/a	7:43	7:28	5:20	7:32	8:49
	Tide - AM high	2:08	2:04	2:19	n/a	n/a	n/a	2:02	2:09	12:14	2:18	1:41
	Tide - PM high	2:34	2:23	2:34	n/a	n/a	n/a	2:21	2:35	12:26	2:34	1:54
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
6/1/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	3.4	7.9	1.6	3.8	1.3	5.1	4.2	13.0	2.5	10.0	10.8
	Wind Direction	WNW	SW	SSW	WSW	SSW	WSW	W	WSW	SW	WSW	SW
	Mean Air Temp (F)	52.9	56	54.8	56	54.9	57.6	54.2	53.4	56.1	57	57.7
	Mean Water Temp (F)	58	58	62	58	58	58	57	58	58	61	58
	Tide - AM low	9:28	9:42	9:29	n/a	n/a	n/a	9:40	9:29	9:23	9:32	10:45
	Tide - PM low	10:25	10:39	10:26	n/a	n/a	n/a	10:37	10:26	10:20	10:29	11:42
	Tide - AM high	3:04	2:55	3:17	n/a	n/a	n/a	2:53	3:04	3:07	3:17	3:45
	Tide - PM high	3:40	3:31	3:53	n/a	n/a	n/a	3:29	3:40	3:43	3:53	4:21
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
6/2/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.8	5.4	0.3	2.5	0.5	1.8	1.9	0.5	1.3	7.0	5.4
	Wind Direction	W	SSW	S	N	S	WSW	WSW	SW	SW	WSW	SW
	Mean Air Temp (F)	60.9	61.6	61.6	58.8	62.4	65.6	62.1	58.9	64.5	67	62.5
	Mean Water Temp (F)	58	58	62	58	58	58	57	58	58	61	58
	Tide - AM low	10:10	10:24	10:11	n/a	n/a	n/a	10:22	10:11	10:05	10:14	11:27
	Tide - PM low	10:17	11:31	11:18	n/a	n/a	n/a	11:29	11:18	11:12	11:21	n/a
	Tide - AM high	4:04	3:55	4:17	n/a	n/a	n/a	3:53	4:04	4:07	4:17	4:45
	Tide - PM high	4:39	4:30	4:52	n/a	n/a	n/a	4:28	4:39	4:42	4:52	5:20
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
6/3/2009	Precipitation (in)	0.01	0.00	0.01	0.00	0.02	0.14	0.03	0.00	0.00	0.01	0.00
	Wind Speed (mph)	1.3	3.6	0.5	2.4	0.2	0.3	1.4	1.0	0.9	6.0	5.1
	Wind Direction	WNW	W	N	N	NNE	SE	NNW	NNW	NE	n/a	NW
	Mean Air Temp (F)	61.3	63	62.2	59.9	60.3	55	62.3	59	64.5	65	62.7
	Mean Water Temp (F)	58	58	62	59	59	59	57	60	59	61	59
	Tide - AM low	10:45	10:59	10:45	n/a	n/a	n/a	10:57	10:46	10:40	10:49	12:34
	Tide - PM low	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	11:55	n/a	12:02
	Tide - AM high	5:04	4:55	5:17	n/a	n/a	n/a	4:53	5:04	5:07	5:17	5:45
	Tide - PM high	5:35	5:26	5:48	n/a	n/a	n/a	5:24	5:35	5:38	5:48	6:16
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
6/4/2009	Precipitation (in)	0.27	0.35	0.31	0.00	0.27	0.14	0.29	0.00	0.31	0.20	0.00
	Wind Speed (mph)	1.2	2.8	0.2	2.1	0.4	1.7	0.7	7.0	3.1	6.0	3.6
	Wind Direction	WSW	SSW	SSE	SW	SSE	S	SSE	SW	S	SSW	S
	Mean Air Temp (F)	57.7	61.9	58.7	61.4	59.9	62.4	58.1	55.1	63	62	58.9
	Mean Water Temp (F)	58	58	62	59	59	59	57	60	59	61	59
	Tide - AM low	12:00	12:14	12:01	n/a	n/a	n/a	12:12	12:01	11:13	12:04	1:17
	Tide - PM low	11:18*	11:32*	11:19*	n/a	n/a	n/a	11:30*	11:19*	n/a	11:22*	12:35
	Tide - AM high	5:59	5:50	6:12	n/a	n/a	n/a	5:48	5:59	6:02	6:12	6:40
	Tide - PM high	6:26	6:17	6:39	n/a	n/a	n/a	6:15	6:26	6:29	6:39	7:07
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
6/5/2009	Precipitation (in)	0.70	0.67	0.66	0.15	0.57	0.16	0.58	0.58	0.75	0.53	0.13
	Wind Speed (mph)	1.5	3.1	0.6	2.0	0.3	2.1	0.9	2.4	1.3	6.0	5.2
	Wind Direction	SE	NE	NNE	ENE	E	ESE	NNE	NE	E	E	NE
	Mean Air Temp (F)	54.9	58.3	57	56	55.4	57.9	56.3	55.8	58.9	58	55.1
	Mean Water Temp (F)	58	58	62	60	60	60	57	60	59	61	59
	Tide - AM low	12:38	12:52	12:39	n/a	n/a	n/a	12:50	12:39	12:33	12:42	1:55
	Tide - PM low	11:55*	12:09	11:56*	n/a	n/a	n/a	12:07	11:56*	11:50*	11:59*	1:12
	Tide - AM high	6:49	6:40	7:02	n/a	n/a	n/a	6:38	6:49	6:52	7:02	7:30

	Tide - PM high	7:13	7:04	7:26	n/a	n/a	n/a	7:02	7:13	7:16	7:26	7:54
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
6/6/2009	Precipitation (in)	0.10	0.08	0.08	0.14	0.02	0.03	0.07	0.08	0.12	0.00	0.71
	Wind Speed (mph)	1.9	6.4	1.3	3.1	1.2	4.0	3.0	5.6	2.1	9.0	7.7
	Wind Direction	WSW	WNW	ENE	WNW	SSE	ESE	NNW	NNE	SSW	NNE	S
	Mean Air Temp (F)	57.8	61	58.4	60.9	59.8	61.4	58.2	57.5	62.3	62	57.6
	Mean Water Temp (F)	58	58	62	60	60	60	57	60	59	61	59
	Tide - AM low	1:12	1:26	1:13	n/a	n/a	n/a	1:24	1:13	1:07	1:16	2:29
	Tide - PM low	12:34	12:48	12:35	n/a	n/a	n/a	12:46	12:35	12:29	12:38	1:51
	Tide - AM high	7:34	7:25	7:47	n/a	n/a	n/a	7:23	7:34	7:37	7:47	8:15
	Tide - PM high	7:56	7:47	8:09	n/a	n/a	n/a	7:45	7:56	7:59	8:09	8:37
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
6/7/2009	Precipitation (in)	0.00	0.00	0.00	0.02	0.00	0.03	0.01	0.00	0.00	0.00	0.00
	Wind Speed (mph)	2.3	4.8	0.4	3.0	0.7	2.2	3.1	3.6	1.5	8.0	5.4
	Wind Direction	WNW	SW	S	W	SSW	WNW	W	SW	WSW	W	SW
	Mean Air Temp (F)	6.4	65.7	66.6	69	58.5	68.1	66.5	65.7	70.3	70	65.8
	Mean Water Temp (F)	58	58	62	61	61	61	58	60	59	61	59
	Tide - AM low	1:48	2:02	1:49	n/a	n/a	n/a	2:00	1:49	1:43	1:52	3:05
	Tide - PM low	1:16	1:30	1:17	n/a	n/a	n/a	1:28	1:17	1:11	1:20	2:33
	Tide - AM high	8:16	8:07	8:29	n/a	n/a	n/a	8:05	8:16	8:19	8:29	8:57
	Tide - PM high	8:37	8:28	8:50	n/a	n/a	n/a	8:26	8:37	8:40	8:50	9:18
	Lunar cycle	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon
6/8/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.7	3.1	0.5	1.7	0.6	2.8	0.6	1.1	1.6	7.0	3.7
	Wind Direction	SSE	SE	ENE	SSE	SE	E	ESE	SE	ESE	ENE	E
	Mean Air Temp (F)	63.7	65.4	64.4	62.3	64.7	65.8	62.6	56.5	65.1	68	62.9
	Mean Water Temp (F)	59	59	62	61	61	61	59	60	61	61	59
	Tide - AM low	2:25	2:39	2:26	n/a	n/a	n/a	2:37	2:26	2:20	2:29	3:42
	Tide - PM low	2:00	2:14	2:01	n/a	n/a	n/a	2:12	2:01	1:55	2:04	3:17
	Tide - AM high	8:57	8:48	9:10	n/a	n/a	n/a	8:46	8:57	9:00	9:10	9:38
	Tide - PM high	9:16	9:07	9:29	n/a	n/a	n/a	9:05	9:16	9:19	9:29	9:57
	Lunar cycle	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon
6/9/2009	Precipitation (in)	0.34	0.28	0.38	0.20	0.47	0.27	0.47	0.30	0.55	0.32	0.16
	Wind Speed (mph)	3.1	3.7	0.1	0.3	0.3	3.2	0.6	1.8	1.1	0.4	5.4
	Wind Direction	SSE	ESE	ESE	NNW	ESE	ESE	E	ESE	E	E	ENE
	Mean Air Temp (F)	55.7	58.1	56.8	56.6	55.3	57.2	56.6	55.9	58.6	56.4	55.9
	Mean Water Temp (F)	59	59	62	61	61	61	59	60	61	62	59
	Tide - AM low	3:03	3:17	3:04	n/a	n/a	n/a	3:15	3:04	2:58	3:07	4:20
	Tide - PM low	2:44	2:58	2:45	n/a	n/a	n/a	2:56	2:45	2:39	2:48	4:01
	Tide - AM high	9:37	9:28	9:50	n/a	n/a	n/a	9:26	9:37	9:40	9:50	10:18
	Tide - PM high	9:55	9:46	10:08	n/a	n/a	n/a	9:44	9:55	9:58	10:08	10:36
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
6/10/2009	Precipitation (in)	0.12	0.04	0.07	0.09	0.10	0.02	0.02	0.03	0.08	0.02	0.51
	Wind Speed (mph)	0.5	2.0	0.4	0.4	0.1	2.8	0.6	2.8	0.3	6.0	4.7
	Wind Direction	E	N	N	NNW	ENE	NNE	N	NNE	ENE	n/a	NE
	Mean Air Temp (F)	58.6	61.3	59.1	58.3	58.4	57.4	59.8	59.3	60.8	60	61.1
	Mean Water Temp (F)	60	60	62	61	61	61	60	60	61	62	59
	Tide - AM low	3:41	3:55	3:42	n/a	n/a	n/a	3:53	3:42	3:36	3:35	4:58
	Tide - PM low	3:28	3:42	3:29	n/a	n/a	n/a	3:40	3:29	3:23	3:32	4:45
	Tide - AM high	10:18	10:09	10:31	n/a	n/a	n/a	10:07	10:18	10:21	10:31	10:59
	Tide - PM high	10:33	10:24	10:46	n/a	n/a	n/a	10:22	10:33	10:36	10:46	11:14
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
6/11/2009	Precipitation (in)	0.02	0.04	0.03	0.04	0.11	0.14	0.01	0.00	0.00	0.03	0.00
	Wind Speed (mph)	1.4	3.1	0.6	0.7	0.3	3.0	0.8	2.4	1.5	7.0	6.2
	Wind Direction	SE	NE	NNE	N	ESE	ENE	NNE	NE	E	ENE	ENE
	Mean Air Temp (F)	59	61.8	60.5	60.5	60.1	59.3	59.8	59.8	63.3	61	59.5
	Mean Water Temp (F)	60	60	62	62	62	62	60	60	61	63	59
	Tide - AM low	4:19	4:33	4:20	n/a	n/a	n/a	4:31	4:20	4:14	4:23	5:36
	Tide - PM low	4:11	4:25	4:12	n/a	n/a	n/a	4:23	4:12	4:06	4:15	5:28
	Tide - AM high	11:00	10:51	11:13	n/a	n/a	n/a	10:49	11:00	11:03	11:13	11:41
	Tide - PM high	11:12	11:03	11:25	n/a	n/a	n/a	11:01	11:12	11:15	11:25	11:53
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous

6/12/2009	Precipitation (in)	0.33	0.47	0.35	0.40	0.57	0.54	0.53	0.37	0.35	0.39	0.57
	Wind Speed (mph)	2.1	5.0	0.5	0.3	0.8	1.6	1.7	2.9	1.3	6.0	5.2
	Wind Direction	SSW	S	SSE	W	S	SW	WSW	S	SW	SSW	SSW
	Mean Air Temp (F)	65.9	66	65.9	65.3	66.1	64.8	65.3	64.7	69.8	68	65.8
	Mean Water Temp (F)	60	60	62	62	62	62	60	61	61	63	59
	Tide - AM low	4:56	5:10	4:57	n/a	n/a	n/a	5:08	4:57	4:51	5:00	6:13
	Tide - PM low	4:54	5:08	4:55	n/a	n/a	n/a	5:06	4:55	4:49	4:58	6:11
	Tide - AM high	11:42	11:33	11:55	n/a	n/a	n/a	11:31	11:42	11:45	11:55	n/a
	Tide - PM high	11:52	11:43	n/a	n/a	n/a	n/a	11:41	11:52	11:55	n/a	12:23
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
6/13/2009	Precipitation (in)	0.01	0.00	0.00	0.01	0.00	0.00	0.04	0.03	0.00	0.00	0.00
	Wind Speed (mph)	1.4	2.7	0.6	0.5	0.5	3.4	0.7	2.0	1.5	7.0	4.1
	Wind Direction	SSE	SSE	E	W	SE	ESE	ESE	ENE	SE	ESE	SE
	Mean Air Temp (F)	65.5	67.2	65.8	67.4	65.5	67.8	64.8	64.2	68.1	70	64.4
	Mean Water Temp (F)	60	60	62	62	62	62	60	61	62	64	59
	Tide - AM low	5:34	5:48	5:35	n/a	n/a	n/a	5:46	5:35	5:29	5:38	6:51
	Tide - PM low	5:40	5:54	5:41	n/a	n/a	n/a	5:52	5:41	5:35	5:44	6:57
	Tide - AM high	n/a	n/a	12:05	n/a	n/a	n/a	n/a	n/a	n/a	12:05	12:33
	Tide - PM high	12:24	12:15	12:37	n/a	n/a	n/a	12:13	12:24	12:27	12:37	1:05
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
6/14/2009	Precipitation (in)	0.23	0.08	0.25	0.79	0.41	0.81	0.14	0.13	0.26	0.44	0.12
	Wind Speed (mph)	1.7	2.9	0.5	0.4	0.4	2.9	0.8	1.7	0.2	6.0	5.9
	Wind Direction	SE	E	NNE	W	SE	ESE	ENE	ENE	E	ESE	E
	Mean Air Temp (F)	59.7	63	61	61.6	60.6	61.2	60.9	59.7	62.1	62	61.1
	Mean Water Temp (F)	61	61	62	62	62	62	60	61	63	64	61
	Tide - AM low	6:14	6:28	6:15	n/a	n/a	n/a	6:26	6:15	6:09	6:18	7:31
	Tide - PM low	6:32	6:46	6:33	n/a	n/a	n/a	6:44	6:33	6:27	6:36	7:49
	Tide - AM high	12:34	12:25	12:47	n/a	n/a	n/a	12:23	12:34	12:37	12:47	1:15
	Tide - PM high	1:06	12:57	1:19	n/a	n/a	n/a	12:55	1:06	1:09	1:19	1:47
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
6/15/2009	Precipitation (in)	0.00	0.00	0.00	0.13	0.09	0.03	0.00	0.00	0.28	0.02	0.21
	Wind Speed (mph)	1.2	2.6	0.4	0.5	0.5	3.6	0.4	1.4	0.6	6.0	5.0
	Wind Direction	SE	E	NE	NW	ESE	E	ESE	E	ESE	E	ESE
	Mean Air Temp (F)	58.7	62.1	60.4	60	58.9	60.3	60	58.7	61	61	58.7
	Mean Water Temp (F)	61	61	62	62	62	62	61	61	63	64	61
	Tide - AM low	6:59	7:13	7:00	n/a	n/a	n/a	7:11	7:00	6:54	7:03	8:16
	Tide - PM low	7:36	7:50	7:37	n/a	n/a	n/a	7:48	7:37	7:31	7:40	8:53
	Tide - AM high	1:19	1:10	1:32	n/a	n/a	n/a	1:08	1:19	1:22	1:32	2:00
	Tide - PM high	1:51	1:42	2:04	n/a	n/a	n/a	1:40	1:50	1:54	2:04	2:32
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
6/16/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
	Wind Speed (mph)	0.7	3.0	0.9	1.0	0.4	4.5	0.9	2.9	2.2	7.0	4.5
	Wind Direction	E	NNE	NNE	N	NNE	ENE	NNE	NNE	E	Ne	E
	Mean Air Temp (F)	58	61.9	65.2	59.1	58.5	59	58.9	58.9	61.2	61	58.3
	Mean Water Temp (F)	61	61	63	63	63	63	61	61	64	64	61
	Tide - AM low	7:51	8:05	7:52	n/a	n/a	n/a	8:03	7:52	7:46	7:55	9:08
	Tide - PM low	8:52	9:06	8:53	n/a	n/a	n/a	9:04	8:53	8:47	8:56	10:09
	Tide - AM high	2:08	1:59	2:21	n/a	n/a	n/a	1:57	2:08	2:11	2:21	2:49
	Tide - PM high	2:39	2:30	2:52	n/a	n/a	n/a	2:28	2:39	2:42	2:52	3:20
	Lunar cycle	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter
6/17/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.4	3.4	0.3	0.8	1.2	3.4	0.7	1.4	1.4	6.0	4.1
	Wind Direction	SW	SSW	S	W	SSE	S	SE	SSE	SSW	S	SSE
	Mean Air Temp (F)	58.6	61.7	62	59.2	57.3	61.5	59	58.9	60	60	57.4
	Mean Water Temp (F)	61	61	63	63	63	63	61	62	64	64	61
	Tide - AM low	8:46	9:00	8:47	n/a	n/a	n/a	8:58	8:47	8:41	8:50	10:03
	Tide - PM low	10:01	10:15	10:02	n/a	n/a	n/a	10:13	10:02	9:56	10:05	11:18
	Tide - AM high	3:02	2:53	3:15	n/a	n/a	n/a	2:51	3:02	3:05	3:15	3:43
	Tide - PM high	3:32	3:23	3:45	n/a	n/a	n/a	3:21	3:32	3:35	3:45	4:13
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
6/18/2009	Precipitation (in)	0.38	0.31	0.23	0.58	0.64	0.79	0.54	0.39	0.12	0.52	0.04
	Wind Speed (mph)	6.6	6.5	1.6	0.3	1.4	5.1	1.4	5.1	1.7	8.0	6.0

	Wind Direction	SSE	SE	SSE	WNW	SE	SSE	ESE	SE	S	SSE	ESE
	Mean Air Temp (F)	60.8	62.3	61.9	59.4	58	58.9	61.2	60.7	60.8	60	59.7
	Mean Water Temp (F)	61	61	63	63	63	63	61	62	65	64	61
	Tide - AM low	9:41	9:55	9:42	n/a	n/a	n/a	9:53	9:42	9:36	9:45	10:58
	Tide - PM low	10:59	11:13	11:00	n/a	n/a	n/a	11:11	11:00	10:54	11:03	n/a
	Tide - AM high	4:02	3:53	4:15	n/a	n/a	n/a	3:51	4:02	4:05	4:15	4:43
	Tide - PM high	4:31	4:22	4:44	n/a	n/a	n/a	4:20	4:31	4:34	4:44	5:12
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
6/19/2009	Precipitation (in)	0.94	0.63	0.46	0.42	0.49	0.57	0.43	0.14	0.46	0.59	0.60
	Wind Speed (mph)	4.9	5.5	1.1	0.2	0.9	4.6	1.0	3.2	1.2	7.0	6.0
	Wind Direction	SSE	SSE	SSE	NNE	SE	SSE	SSE	SE	SSW	SSE	S
	Mean Air Temp (F)	66.5	67.1	66.3	66.5	67.3	66.7	66.3	65.1	71.1	69	66.3
	Mean Water Temp (F)	62	62	63	64	64	64	62	62	65	64	62
	Tide - AM low	10:33	10:47	10:34	n/a	n/a	n/a	10:45	10:34	10:28	10:37	12:16
	Tide - PM low	11:53	n/a	11:54	n/a	n/a	n/a	n/a	11:54	11:48	11:57	11:50*
	Tide - AM high	5:04	4:55	5:17	n/a	n/a	n/a	4:53	5:04	5:07	5:17	5:45
	Tide - PM high	5:31	5:22	5:44	n/a	n/a	n/a	5:20	5:31	5:34	5:44	6:12
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
6/20/2009	Precipitation (in)	0.01	0.00	0.00	0.01	0.00	0.03	0.00	0.01	0.08	0.00	0.01
	Wind Speed (mph)	1.4	2.7	0.3	0.3	0.6	1.9	0.4	1.6	1.1	6.0	4.0
	Wind Direction	SSE	S	SSE	WNW	SSE	SSE	SSE	ESE	SSW	SSE	SE
	Mean Air Temp (F)	64.6	66.5	65	68	66.6	68.8	63.7	64.2	68.5	67	63.8
	Mean Water Temp (F)	62	62	63	65	65	65	62	62	66	65	62
	Tide - AM low	11:25	12:07	11:26	n/a	n/a	n/a	12:05	11:26	11:20	11:29	1:10
	Tide - PM low	n/a	11:39*	n/a	n/a	n/a	n/a	11:37*	n/a	n/a	n/a	12:42
	Tide - AM high	6:04	5:55	6:17	n/a	n/a	n/a	5:53	6:04	6:07	6:17	6:45
	Tide - PM high	6:29	6:20	6:42	n/a	n/a	n/a	6:18	6:29	6:32	6:42	7:10
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
6/21/2009	Precipitation (in)	0.02	0.04	0.03	0.02	0.01	0.20	0.14	0.04	0.04	0.02	0.10
	Wind Speed (mph)	1.6	7.9	3.7	2.8	1.6	9.9	4.1	10.3	4.1	16	10.4
	Wind Direction	N	N	NNE	NNE	N	NNE	N	NNE	NNE	NNE	NNE
	Mean Air Temp (F)	61.8	63.7	62.7	63.4	63.5	63.1	63.5	62.6	66.8	66	65.3
	Mean Water Temp (F)	62	62	64	65	65	65	62	62	66	65	62
	Tide - AM low	12:48	1:02	12:49	n/a	n/a	n/a	1:00	12:49	12:43	12:52	2:05
	Tide - PM low	12:18	12:32	12:19	n/a	n/a	n/a	12:30	12:19	12:13	12:22	1:35
	Tide - AM high	7:00	6:51	7:13	n/a	n/a	n/a	6:49	7:00	7:03	7:13	7:41
	Tide - PM high	7:24	7:15	7:37	n/a	n/a	n/a	7:13	7:24	7:27	7:37	8:05
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
6/22/2009	Precipitation (in)	0.31	0.08	0.27	0.18	0.11	0.14	0.03	0.15	0.12	0.19	0.00
	Wind Speed (mph)	2.9	11.5	3.7	2.2	0.3	1.8	6.8	13.3	3.3	14.0	13.5
	Wind Direction	N	NNW	NNE	NE	ESE	N	N	NNE	N	n/a	N
	Mean Air Temp (F)	60.6	61.9	61.5	62.3	62.5	61.8	62.9	61.3	65.1	62	64.6
	Mean Water Temp (F)	63	63	64	66	66	65	62	62	66	65	62
	Tide - AM low	1:43	1:57	1:44	n/a	n/a	n/a	1:55	1:44	1:38	1:47	3:00
	Tide - PM low	1:13	1:27	1:14	n/a	n/a	n/a	1:25	1:14	1:08	1:17	2:30
	Tide - AM high	7:54	7:45	8:07	n/a	n/a	n/a	7:43	7:54	7:57	8:07	8:35
	Tide - PM high	8:17	8:08	8:30	n/a	n/a	n/a	8:06	8:17	8:20	8:30	8:58
	Lunar cycle	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon
6/23/2009	Precipitation (in)	0.06	0.12	0.03	0.00	0.01	0.03	0.00	0.02	0.07	0.04	0.00
	Wind Speed (mph)	1.9	9.1	2.4	1.6	1.3	8.8	4.2	9.9	0.4	12.0	10.0
	Wind Direction	N	N	NNE	NE	N	N	N	NNE	NE	n/a	N
	Mean Air Temp (F)	62.1	63.4	63	63.9	63.7	63.8	63.9	62.6	66.3	66	66.3
	Mean Water Temp (F)	63	63	64	66	66	65	62	62	66	65	62
	Tide - AM low	2:37	2:51	2:38	n/a	n/a	n/a	2:49	2:38	2:32	2:41	3:54
	Tide - PM low	2:09	2:23	2:10	n/a	n/a	n/a	2:21	2:10	2:04	2:13	3:26
	Tide - AM high	8:47	8:38	9:00	n/a	n/a	n/a	8:36	8:47	8:50	9:00	9:28
	Tide - PM high	9:10	9:01	9:23	n/a	n/a	n/a	8:59	9:10	9:13	9:23	9:51
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent

6/24/2009	Precipitation (in)	0.04	0.00	0.02	0.03	0.00	0.09	0.05	0.03	0.00	0.01	0.00
	Wind Speed (mph)	0.4	1.9	0.7	1.1	0.2	6.5	0.9	2.5	0.6	8.0	4.0
	Wind Direction	N	N	NNE	NE	NNW	NNE	NNW	NNE	NNE	NNE	ENE
	Mean Air Temp (F)	61.7	63.5	62.5	62.8	63.3	62.7	62.3	61.3	66.1	63	64
	Mean Water Temp (F)	63	63	64	67	67	65	62	62	66	66	63
	Tide - AM low	3:29	3:43	3:30	n/a	n/a	n/a	3:41	3:30	3:24	3:33	4:46
	Tide - PM low	3:06	3:20	3:07	n/a	n/a	n/a	3:18	3:07	3:01	3:10	4:23
	Tide - AM high	9:40	9:31	9:53	n/a	n/a	n/a	9:29	9:40	9:43	9:53	10:21
	Tide - PM high	10:03	9:54	10:16	n/a	n/a	n/a	9:52	10:03	10:06	10:16	10:44
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
6/25/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.02	0.00	0.00	0.00
	Wind Speed (mph)	0.7	3.3	0.2	0.2	0.6	1.3	0.6	1.3	2.5	3.0	2.9
	Wind Direction	SW	SW	SSE	SSE	S	SE	WSW	SW	S	n/a	SSW
	Mean Air Temp (F)	64.6	66.6	65.3	69.2	69.3	67.6	64.7	64.4	63.8	67	64.9
	Mean Water Temp (F)	63	63	64	67	67	66	62	63	67	66	63
	Tide - AM low	4:17	4:31	4:18	n/a	n/a	n/a	4:29	4:18	4:12	4:21	5:34
	Tide - PM low	4:02	4:16	4:03	n/a	n/a	n/a	4:14	4:03	3:57	4:06	5:19
	Tide - AM high	10:35	10:26	10:48	n/a	n/a	n/a	10:24	10:35	10:38	10:48	11:16
	Tide - PM high	10:57	10:48	11:13	n/a	n/a	n/a	10:46	10:57	11:00	11:10	11:38
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
6/26/2009	Precipitation (in)	0.20	0.28	0.02	0.05	0.12	0.06	0.06	0.01	0.05	0.05	0.09
	Wind Speed (mph)	1.9	4.6	0.5	0.6	0.6	2.1	2.2	2.7	1.4	7.0	0.1
	Wind Direction	SW	SSW	S	SW	S	SW	W	SW	WSW	SW	SW
	Mean Air Temp (F)	66.7	67.8	67.5	71.3	69.2	72.5	67.6	66.2	69.1	71	67
	Mean Water Temp (F)	63	63	64	68	68	66	62	64	67	66	63
	Tide - AM low	5:03	5:17	5:04	n/a	n/a	n/a	5:15	5:04	4:58	5:07	6:20
	Tide - PM low	4:59	5:13	5:00	n/a	n/a	n/a	5:11	5:00	4:54	5:03	6:16
	Tide - AM high	11:30	11:21	11:43	n/a	n/a	n/a	11:19	11:30	11:33	11:43	n/a
	Tide - PM high	11:51	11:42	n/a	n/a	n/a	n/a	11:40	11:51	11:54	n/a	12:11
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
6/27/2009	Precipitation (in)	0.00	0.00	0.00	0.00	1.23	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.7	2.9	0.3	0.4	0.4	2.7	2.1	1.6	1.2	7.0	3.2
	Wind Direction	WSW	SSW	S	WNW	SE	ENE	WNW	SSW	SSW	SSW	S
	Mean Air Temp (F)	68.9	69.4	68.7	71.4	68.2	70.7	65.7	65.8	70.1	71	66.4
	Mean Water Temp (F)	64	64	64	68	68	67	63	64	67	66	64
	Tide - AM low	5:49	6:03	5:50	n/a	n/a	n/a	6:01	5:50	5:44	5:53	7:06
	Tide - PM low	5:59	6:13	6:00	n/a	n/a	n/a	6:11	6:00	5:54	6:03	7:16
	Tide - AM high	n/a	n/a	12:04	n/a	n/a	n/a	n/a	n/a	n/a	12:04	12:32
	Tide - PM high	12:25	12:16	12:38	n/a	n/a	n/a	12:14	12:25	12:28	12:38	1:06
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
6/28/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	0.7	4.6	1.2	0.8	0.4	5.0	1.8	4.8	1.8	9.0	5.4
	Wind Direction	N	NNW	NE	NNE	N	N	NNW	N	NE	NNE	N
	Mean Air Temp (F)	64.5	66.5	65.5	65.8	65.4	65.5	66.5	65.2	66.4	67	66.9
	Mean Water Temp (F)	64	64	66	68	68	68	63	64	68	67	64
	Tide - AM low	6:36	6:50	6:37	n/a	n/a	n/a	6:48	6:37	6:31	6:40	7:53
	Tide - PM low	7:13	7:27	7:14	n/a	n/a	n/a	7:25	7:14	7:08	7:17	8:30
	Tide - AM high	12:46	12:37	12:59	n/a	n/a	n/a	12:35	12:46	12:49	12:59	1:27
	Tide - PM high	1:20	1:11	1:33	n/a	n/a	n/a	1:09	1:20	1:23	1:33	2:01
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
6/29/2009	Precipitation (in)	0.35	0.20	0.28	0.20	0.01	0.21	0.00	0.14	0.20	0.17	0.00
	Wind Speed (mph)	1.5	4.3	0.5	0.1	0.5	2.9	1.3	1.5	1.6	6.0	5.0
	Wind Direction	SSW	SSW	SSE	NE	SSE	SSE	WSW	S	SSW	S	SW
	Mean Air Temp (F)	66.1	68.9	67.5	69.8	68.8	69.7	68.9	66.6	74.1	70	69.2
	Mean Water Temp (F)	64	64	66	69	69	68	63	64	68	67	64
	Tide - AM low	7:28	7:42	7:29	n/a	n/a	n/a	7:40	7:29	7:23	7:32	8:45
	Tide - PM low	8:47	9:01	8:48	n/a	n/a	n/a	8:59	8:48	8:42	8:51	10:04
	Tide - AM high	1:40	1:31	1:53	n/a	n/a	n/a	1:29	1:40	1:43	1:53	2:21
	Tide - PM high	2:15	2:06	2:28	n/a	n/a	n/a	2:04	2:15	2:18	2:28	2:56

	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
6/30/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.09	0.00
	Wind Speed (mph)	1.8	3.4	0.7	0.3	1.1	4.2	0.1	2.0	3.0	7.0	7.1
	Wind Direction	SSE	ESE	SE	NNE	SE	E	NNE	ESE	ESE	E	SE
	Mean Air Temp (F)	68.5	70	69.8	69.5	70	67.8	63.5	67.1	74.5	71	66.4
	Mean Water Temp (F)	64	64	66	69	69	69	64	65	69	67	65
	Tide - AM low	8:23	8:37	8:24	n/a	n/a	n/a	8:35	8:24	8:18	8:27	9:40
	Tide - PM low	10:02	10:16	10:03	n/a	n/a	n/a	10:14	10:03	9:57	10:06	11:19
	Tide - AM high	2:36	2:27	2:49	n/a	n/a	n/a	2:25	2:36	2:39	2:49	3:17
	Tide - PM high	3:12	3:03	3:25	n/a	n/a	n/a	3:01	3:12	3:15	3:25	3:53
	Lunar cycle	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter
7/1/2009	Precipitation (in)	1.16	3.15	1.11	1.54	2.22	0.82	1.77	2.03	2.44	1.92	4.27
	Wind Speed (mph)	3.1	4.2	0.4	0.2	0.2	2	1.1	3.1	0.6	6	6
	Wind Direction	SE	SE	ENE	NNW	SE	NE	NNW	ESE	E	E	ESE
	Mean Air Temp (F)	66.1	67.8	66.3	64.8	64.9	63.4	65	65.5	67.9	67	66
	Mean Water Temp (F)	64	64	66	70	70	69	64	65	69	67	65
	Tide - AM low	9:15	9:29	9:16	n/a	n/a	n/a	9:27	9:16	9:10	9:19	10:32
	Tide - PM low	10:57	11:11	10:58	n/a	n/a	n/a	11:09	10:58	10:52	11:01	n/a
	Tide - AM high	3:33	3:24	3:46	n/a	n/a	n/a	3:22	3:33	3:36	3:46	4:14
	Tide - PM high	4:11	4:02	4:24	n/a	n/a	n/a	4:00	4:11	4:14	4:24	4:52
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
7/2/2009	Precipitation (in)	0.78	0.31	0.99	0.83	1.44	1.08	0.43	0.33	0.00	1.14	0.00
	Wind Speed (mph)	2.1	3.3	0.5	0.3	0.3	3.1	0.4	1.5	1.1	7	1.5
	Wind Direction	SE	SE	NE	NNW	SE	N	NNE	ESE	E	E	SSE
0	Mean Air Temp (F)	65.8	67.7	65.8	65.1	65.7	63.7	62.9	65.9	65.6	67	66.8
	Mean Water Temp (F)	64	64	66	71	71	70	65	65	69	67	65
	Tide - AM low	10:02	10:16	10:03	n/a	n/a	n/a	10:14	10:03	9:57	10:06	12:14
	Tide - PM low	11:42	11:56	11:43	n/a	n/a	n/a	11:54	11:43	11:37	11:46	11:19*
	Tide - AM high	4:34	4:25	4:47	n/a	n/a	n/a	4:23	4:34	4:37	4:47	5:15
	Tide - PM high	5:10	5:01	5:23	n/a	n/a	n/a	4:59	5:10	5:13	5:23	5:51
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
7/3/2009	Precipitation (in)	0.19	0.08	0.23	0.24	0.01	0.01	0.00	0.00	0.00	1.18	0.18
	Wind Speed (mph)	1.3	3.1	0.2	0.1	0.2	1.4	7	1.6	1.3	6	4.2
	Wind Direction	SW	SSW	SSE	W	SSE	SSE	SSW	S	SSE	S	S
	Mean Air Temp (F)	68.2	70.7	68.2	68.2	69.3	67.7	70	68.1	72.7	69	69.2
	Mean Water Temp (F)	64	64	67	71	71	70	65	65	69	67	65
	Tide - AM low	10:45	10:59	10:46	n/a	n/a	n/a	10:57	10:46	10:40	10:49	12:59
	Tide - PM low	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12:02
	Tide - AM high	5:32	5:23	5:45	n/a	n/a	n/a	5:21	5:32	5:35	5:45	6:13
	Tide - PM high	6:05	5:56	6:18	n/a	n/a	n/a	5:54	6:05	6:08	6:18	6:46
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
7/4/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	3.5	3.5	1.6	0.9	0.9	4.5	1.3	5.4	0.1	11	8.2
	Wind Direction	NW	WSW	WSW	WSW	WNW	W	W	W	W	WNW	WSW
	Mean Air Temp (F)	69.7	71	71	70.5	68.2	69	68.5	69.7	62.9	70	72.2
	Mean Water Temp (F)	64	64	67	71	71	71	65	65	69	67	65
	Tide - AM low	12:20	12:34	12:21	n/a	n/a	n/a	12:32	12:21	12:15	12:24	1:37
	Tide - PM low	11:28*	11:42*	11:29*	n/a	n/a	n/a	11:40*	11:29*	11:23*	11:32*	12:45
	Tide - AM high	6:25	6:16	6:38	n/a	n/a	n/a	6:14	6:25	6:28	6:38	7:06
	Tide - PM high	6:54	6:45	7:07	n/a	n/a	n/a	6:43	6:54	6:57	7:07	7:35
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
7/5/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	3	4	1.2	0.7	0.7	4.1	10.8	5.7	1.5	11	6.5
	Wind Direction	NW	WSW	WSW	WSW	NW	WNW	WNW	W	W	W	WSW
	Mean Air Temp (F)	67.1	69.3	69	69.1	66.6	66.8	69.6	67.1	67.8	68	67.7
	Mean Water Temp (F)	64	64	67	72	72	71	66	65	69	67	65
	Tide - AM low	12:55	1:09	12:56	n/a	n/a	n/a	1:07	12:56	12:50	12:59	2:12
	Tide - PM low	12:12	12:26	12:13	n/a	n/a	n/a	12:24	12:13	12:07	12:16	1:29
	Tide - AM high	7:12	7:03	7:25	n/a	n/a	n/a	7:01	7:12	7:15	7:25	7:53
	Tide - PM high	7:37	7:28	7:50	n/a	n/a	n/a	7:26	7:37	7:40	7:50	8:18
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous



7/6/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.4	3.1	0.2	0.3	0.3	1.7	3	1.4	1.4	6	3.8
	Wind Direction	WSW	SSW	SSE	WSW	SSE	S	S	SW	SSW	SSW	S
	Mean Air Temp (F)	69.3	70.2	69.8	72	67.4	70.1	65.2	67.8	70.6	69	67.8
	Mean Water Temp (F)	64	64	67	72	72	72	66	65	69	67	65
	Tide - AM low	1:31	1:45	1:32	n/a	n/a	n/a	1:43	1:32	1:26	1:35	2:48
	Tide - PM low	12:57	1:11	12:58	n/a	n/a	n/a	1:09	12:58	12:52	1:01	2:14
	Tide - AM high	7:55	7:46	8:08	n/a	n/a	n/a	7:44	7:55	7:58	8:08	8:36
	Tide - PM high	8:17	8:08	8:30	n/a	n/a	n/a	8:06	8:17	8:20	8:30	8:58
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
7/7/2009	Precipitation (in)	0.64	1.34	0.07	0.35	0.81	0.86	1.26	1.01	0.83	0.69	0.38
	Wind Speed (mph)	3.1	3.5	0.1	0.2	0.4	4	0.7	1.9	0.9	7	6.4
	Wind Direction	SSE	SE	SE	W	SE	SSE	SE	SE	S	S	SE
	Mean Air Temp (F)	63.4	65.8	60.8	63.7	61.5	63.6	64.2	63.5	66.1	65	65.1
	Mean Water Temp (F)	64	64	68	73	73	72	66	65	69	67	65
	Tide - AM low	2:08	2:22	2:09	n/a	n/a	n/a	2:20	2:09	2:03	2:12	3:25
	Tide - PM low	1:44	1:58	1:45	n/a	n/a	n/a	1:56	1:45	1:39	1:48	3:01
	Tide - AM high	8:35	8:26	8:48	n/a	n/a	n/a	8:24	8:35	8:38	8:48	9:16
	Tide - PM high	8:55	8:46	9:08	n/a	n/a	n/a	8:44	8:55	8:58	9:08	9:36
	Lunar cycle	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon
7/8/2009	Precipitation (in)	0.23	0.79	0.10	0.19	0.44	0.31	0.29	1.03	0.20	0.24	0.88
	Wind Speed (mph)	2.1	3.2	0.6	0.7	0.5	4.8	1.1	3.2	1.1	8	6.8
	Wind Direction	SE	E	N	NNE	N	NE	NE	ENE	E	NE	E
	Mean Air Temp (F)	60.2	67.2	65.1	63.8	64.8	63.5	65.4	64.1	67.5	68	66.9
	Mean Water Temp (F)	64	64	69	73	73	73	67	65	69	68	65
	Tide - AM low	2:45	2:59	2:46	n/a	n/a	n/a	2:57	2:46	2:40	2:49	4:02
	Tide - PM low	2:29	2:43	2:30	n/a	n/a	n/a	2:41	2:30	2:24	2:33	3:46
	Tide - AM high	9:13	9:04	9:26	n/a	n/a	n/a	9:02	9:13	9:16	9:26	9:54
	Tide - PM high	9:30	9:21	9:43	n/a	n/a	n/a	9:19	9:30	9:33	9:43	10:11
	Lunar cycle	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon
7/9/2009	Precipitation (in)	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.2	3.7	1.5	1.0	0.4	4.8	1.1	4.1	1.8	8.0	4.8
	Wind Direction	E	NNE	NNE	NE	NNW	NE	NNE	NNE	ENE	NE	E
	Mean Air Temp (F)	61.4	64.8	63.6	61.7	61.6	60.8	62.9	62	63.5	63	63.1
	Mean Water Temp (F)	65	64	70	74	74	73	67	65	69	68	65
	Tide - AM low	3:21	3:35	3:22	n/a	n/a	n/a	3:33	3:22	3:16	3:25	4:38
	Tide - PM low	3:13	3:27	3:14	n/a	n/a	n/a	3:25	3:14	3:08	3:17	4:30
	Tide - AM high	9:52	9:43	10:05	n/a	n/a	n/a	9:41	9:52	9:55	10:05	10:33
	Tide - PM high	10:06	9:57	10:19	n/a	n/a	n/a	9:55	10:06	10:09	10:19	10:47
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
7/10/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.0	2.9	0.2	0.3	0.4	2.7	0.5	1.4	1.3	5.0	1.7
	Wind Direction	S	S	ENE	NNE	SE	ESE	SSE	ESE	SSE	S	NNE
	Mean Air Temp (F)	62.5	65.8	64.4	64.8	61.8	64.6	63	61.5	62.9	63	56.8
	Mean Water Temp (F)	65	64	707	74	74	73	67	65	69	69	65
	Tide - AM low	3:55	4:09	3:56	n/a	n/a	n/a	4:07	3:56	3:50	3:59	5:12
	Tide - PM low	3:54	4:08	3:55	n/a	n/a	n/a	4:06	3:55	3:49	3:58	5:11
	Tide - AM high	10:30	10:21	10:43	n/a	n/a	n/a	10:19	10:30	10:33	10:43	11:11
	Tide - PM high	10:42	10:33	10:55	n/a	n/a	n/a	10:31	10:42	10:45	10:55	11:23
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
7/11/2009	Precipitation (in)	0.12	0.00	0.02	0.02	0.15	0.28	0.03	0.03	0.04	0.15	0.02
	Wind Speed (mph)	2.7	5.3	1.2	1.0	1.3	5.9	1.9	2.5	2.7	10.0	6.8
	Wind Direction	S	S	SSE	WSW	SSE	S	S	S	SW	SSW	S
	Mean Air Temp (F)	63.5	64.6	64.3	68.1	62.7	66.6	63.9	61.7	66	63	63.9
	Mean Water Temp (F)	66	64	71	74	74	73	68	65	69	69	65
	Tide - AM low	4:27	4:41	4:28	n/a	n/a	n/a	4:39	4:28	4:22	4:31	5:44
	Tide - PM low	4:33	4:47	4:34	n/a	n/a	n/a	4:45	4:34	4:28	4:37	5:50
	Tide - AM high	11:08	10:59	11:21	n/a	n/a	n/a	10:57	11:08	11:11	11:21	11:49
	Tide - PM high	11:21	11:12	11:34	n/a	n/a	n/a	11:10	11:21	11:24	11:34	n/a
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
7/12/2009	Precipitation (in)	0.29	0.16	0.24	0.25	0.08	0.54	0.06	0.08	0.04	0.06	0.08
	Wind Speed (mph)	2.2	6.7	0.5	0.6	0.7	3.0	2.7	3.5	2.4	8.0	6.9
	Wind Direction	SW	SSW	SSE	WSW	S	WSW	WSW	SSW	SW	SW	SW

	Mean Air Temp (F)	67.6	69.3	68.7	70.7	68.7	68.7	68.6	67.1	70.3	71	68.3
	Mean Water Temp (F)	67	65	71	74	74	73	68	65	69	70	65
	Tide - AM low	4:59	5:13	5:00	n/a	n/a	n/a	5:11	5:00	4:54	5:03	6:16
	Tide - PM low	5:13	5:27	5:14	n/a	n/a	n/a	5:25	5:14	5:08	5:17	6:30
	Tide - AM high	11:48	11:39	n/a	n/a	n/a	n/a	11:37	11:48	11:51	n/a	12:02
	Tide - PM high	n/a	11:53	12:01	n/a	n/a	n/a	11:51	n/a	n/a	12:01	12:29
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
7/13/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	2.4	4.4	0.7	0.9	0.6	2.3	4.8	4.1	1.8	10.0	7.2
	Wind Direction	WNW	SW	WSW	WSW	SSW	W	W	WSW	WSW	W	WSW
	Mean Air Temp (F)	65.8	67.6	68	68.4	64.5	65.4	66.9	65.8	66.8	68	66.9
	Mean Water Temp (F)	67	66	72	75	75	73	68	65	69	70	65
	Tide - AM low	5:33	5:47	5:34	n/a	n/a	n/a	5:45	5:34	5:28	5:37	6:50
	Tide - PM low	5:57	6:11	5:58	n/a	n/a	n/a	6:09	5:58	5:52	6:01	7:14
	Tide - AM high	12:02	n/a	12:15	n/a	n/a	n/a	n/a	12:02	12:05	12:15	12:43
	Tide - PM high	12:29	12:20	12:42	n/a	n/a	n/a	12:18	12:29	12:32	12:42	1:10
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
7/14/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.7	3.5	0.4	0.4	0.3	2.2	2.8	2.8	1.0	8.0	4.1
	Wind Direction	NW	SW	WSW	WSW	NW	WNW	W	WNW	W	WNW	W
	Mean Air Temp (F)	67	69.1	68.6	68	64.1	65.9	67.2	67.4	68	67	65.5
	Mean Water Temp (F)	67	66	72	75	75	74	68	65	69	71	65
	Tide - AM low	6:12	6:26	6:13	n/a	n/a	n/a	6:24	6:13	6:07	6:16	7:29
	Tide - PM low	6:50	7:04	6:51	n/a	n/a	n/a	7:02	6:51	6:45	6:54	8:07
	Tide - AM high	12:47	12:38	1:00	n/a	n/a	n/a	12:36	12:47	12:50	1:00	1:28
	Tide - PM high	1:13	1:04	1:26	n/a	n/a	n/a	1:02	1:13	1:16	1:26	1:54
	Lunar cycle	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter
7/15/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	2.5	4.2	0.5	0.8	0.5	2.6	4.3	4.5	1.8	9.0	14.0
	Wind Direction	WNW	SW	WSW	SW	WSW	W	WNW	WSW	WSW	W	SSW
	Mean Air Temp (F)	67.8	69	69.4	70.2	66.8	67.8	68.1	67	68.4	69	68.1
	Mean Water Temp (F)	68	66	73	76	76	74	68	65	69	71	66
	Tide - AM low	6:59	7:13	7:00	n/a	n/a	n/a	7:11	7:00	6:54	7:03	8:16
	Tide - PM low	8:01	8:15	8:02	n/a	n/a	n/a	8:13	8:02	7:56	8:05	9:18
	Tide - AM high	1:35	1:26	1:48	n/a	n/a	n/a	1:24	1:35	1:38	1:48	2:16
	Tide - PM high	2:02	1:53	2:15	n/a	n/a	n/a	1:51	2:02	2:05	2:15	2:43
	Lunar cycle	Waning Crescent	Waning Crescoent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
7/16/2009	Precipitation (in)	0.03	0.00	0.02	0.04	0.05	0.01	0.04	0.02	0.00	0.00	0.00
	Wind Speed (mph)	3.0	6.2	1.2	1.8	1.8	5.1	2.6	4.7	3.0	9.0	6.2
	Wind Direction	SSW	SSW	SSE	WSW	S	SSW	SSW	SSW	SW	SSW	SSW
	Mean Air Temp (F)	69.3	70.3	69.7	71.9	69.1	72.2	69.8	69.3	72.2	72	68.6
	Mean Water Temp (F)	68	67	73	76	76	74	68	67	70	71	66
	Tide - AM low	7:56	8:10	7:57	n/a	n/a	n/a	8:08	7:57	7:51	8:00	9:13
	Tide - PM low	9:24	9:38	9:25	n/a	n/a	n/a	9:36	9:25	9:19	9:28	10:41
	Tide - AM high	2:29	2:20	2:42	n/a	n/a	n/a	2:18	2:29	2:32	2:42	3:10
	Tide - PM high	2:58	2:49	3:11	n/a	n/a	n/a	2:47	2:58	3:01	3:11	3:39
	Lunar cycle	Waning Crescent	Waning Crescoent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
7/17/2009	Precipitation (in)	0.13	0.00	0.00	0.01	0.00	0.07	0.00	0.10	0.00	0.03	0.02
	Wind Speed (mph)	1.5	0.2	0.1	0.2	0.5	2.5	0.6	1.3	1.0	5.0	9.0
	Wind Direction	S	SW	NNE	WSW	SSE	S	SSW	SSE	S	SSE	SSE
	Mean Air Temp (F)	73.4	73.7	66.1	76.6	74.4	75.9	72.5	71.9	75.9	75	72.6
	Mean Water Temp (F)	68	67	73	76	76	74	68	68	70	71	67
	Tide - AM low	8:59	9:13	9:00	n/a	n/a	n/a	9:11	9:00	8:54	9:03	10:16
	Tide - PM low	10:36	10:50	10:37	n/a	n/a	n/a	10:48	10:37	10:31	10:40	11:53
	Tide - AM high	3:30	3:21	3:43	n/a	n/a	n/a	3:19	3:30	3:33	3:43	4:11
	Tide - PM high	4:01	3:52	4:14	n/a	n/a	n/a	3:50	4:01	4:04	4:14	4:42
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
7/18/2009	Precipitation (in)	0.33	0.51	0.81	0.00	0.40	0.17	0.34	0.30	0.55	0.88	0.54
	Wind Speed (mph)	2.2	5.2	0.7	0.3	0.4	3.0	1.2	3.1	1.8	7.0	6.8
	Wind Direction	S	SSW	SSE	WSW	SSE	WSW	SW	SSW	SW	S	SW

	Mean Air Temp (F)	74.3	74.4	74.3	72	74.1	75	74.7	73	77.3	77	74.4
	Mean Water Temp (F)	68	67	74	76	76	747	68	68	70	71	67
	Tide - AM low	10:02	10:16	10:03	n/a	n/a	n/a	10:14	10:03	9:57	10:06	11:19
	Tide - PM low	11:38	11:52	11:39	n/a	n/a	n/a	11:50	11:39	11:33	11:42	n/a
	Tide - AM high	4:36	4:27	4:49	n/a	n/a	n/a	4:25	4:36	4:39	4:49	5:17
	Tide - PM high	5:07	4:58	5:20	n/a	n/a	n/a	4:56	5:07	5:10	5:20	5:48
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
7/19/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.9	4.5	1.0	0.7	0.4	2.2	3.1	3.0	1.4	6.0	4.4
	Wind Direction	W	SW	S	WSW	S	W	W	SW	SW	n/a	SW
	Mean Air Temp (F)	70.6	72.4	71.3	73.1	69.2	71.5	71.4	69.4	71.4	72	70.9
	Mean Water Temp (F)	68	68	74	76	76	75	69	69	70	71	67
	Tide - AM low	11:03	11:17	11:04	n/a	n/a	n/a	11:15	11:04	10:58	11:07	12:55
	Tide - PM low	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12:20
	Tide - AM high	5:41	5:32	5:54	n/a	n/a	n/a	5:30	5:41	5:44	5:54	6:22
	Tide - PM high	6:11	6:02	6:24	n/a	n/a	n/a	6:00	6:11	6:14	6:24	6:52
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
7/20/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.3	1.9	0.2	0.1	0.3	2.4	0.2	0.7	0.7	4.0	3.9
	Wind Direction	SSE	SSE	SSE	N	SE	SE	W	SE	SE	S	SE
	Mean Air Temp (F)	70.1	71.1	70.6	71.8	69.1	71.9	69.3	68.7	71.2	71	69.7
	Mean Water Temp (F)	68	68	75	76	76	75	69	69	71	71	67
	Tide - AM low	12:34	12:48	12:35	n/a	n/a	n/a	12:46	12:35	12:29	12:38	1:51
	Tide - PM low	12:02	12:16	12:03	n/a	n/a	n/a	12:14	12:03	11:57*	12:06	1:19
	Tide - AM high	6:41	6:32	6:54	n/a	n/a	n/a	6:30	6:41	6:44	6:54	7:22
	Tide - PM high	7:08	6:59	7:21	n/a	n/a	n/a	6:57	7:08	7:11	7:21	7:49
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
7/21/2009	Precipitation (in)	0.44	1.10	0.83	0.58	1.39	0.95	1.03	0.80	1.30	0.96	1.09
	Wind Speed (mph)	0.4	0.3	0.8	0.3	0.1	2.7	0.3	2.3	0.3	0.7	5.0
	Wind Direction	E	ESE	NNE	NNE	NW	NNE	NNE	NE	NNE	n/a	n/a
	Mean Air Temp (F)	66	69.9	66.7	65	64.3	64.4	66.9	66.7	68.7	66	68
	Mean Water Temp (F)	69	68	75	76	76	75	69	69	71	71	67
	Tide - AM low	1:29	1:43	1:30	n/a	n/a	n/a	1:41	1:30	1:24	1:33	2:46
	Tide - PM low	1:01	1:15	1:02	n/a	n/a	n/a	1:13	1:02	0:56	1:05	2:18
	Tide - AM high	7:37	7:28	7:50	n/a	n/a	n/a	7:26	7:37	7:40	7:50	8:18
	Tide - PM high	8:02	7:53	8:15	n/a	n/a	n/a	7:51	8:02	8:05	8:15	8:43
	Lunar cycle	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon
7/22/2009	Precipitation (in)	0.01	0.12	0.00	0.07	0.00	0.04	0.00	0.00	0.20	0.00	0.00
	Wind Speed (mph)	1.4	5.1	0.3	0.3	0.3	0.7	1.4	1.4	0.6	4.0	2.3
	Wind Direction	SW	SW	S	WNW	SSW	WNW	WSW	SSW	SSW	WSW	SSW
	Mean Air Temp (F)	71.6	73.2	71.3	72.1	70.7	69.3	72.1	7.2	74.6	73	69.6
	Mean Water Temp (F)	69	68	75	76	76	75	70	70	71	71	67
	Tide - AM low	2:20	2:34	2:21	n/a	n/a	n/a	2:32	2:21	2:15	2:24	3:37
	Tide - PM low	2:00	2:14	2:01	n/a	n/a	n/a	2:12	2:01	1:55	2:04	3:17
	Tide - AM high	8:30	8:21	8:43	n/a	n/a	n/a	8:19	8:30	8:33	8:43	9:11
	Tide - PM high	8:54	8:45	9:07	n/a	n/a	n/a	8:43	8:54	8:57	9:07	9:35
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
7/23/2009	Precipitation (in)	0.94	0.87	1.04	0.13	1.19	0.58	1.11	0.78	1.54	1.48	0.00
	Wind Speed (mph)	2.0	2.8	0.3	1.3	0.8	5.0	0.4	2.0	2.7	7.0	4.6
	Wind Direction	ESE	E	NE	NNE	SE	ENE	E	E	E	ENE	ESE
	Mean Air Temp (F)	68.6	69.7	69.6	68.1	67	67.2	67.3	68.1	67.7	71	67.8
	Mean Water Temp (F)	69	69	76	76	76	75	70	70	71	71	67
	Tide - AM low	3:07	3:21	3:08	n/a	n/a	n/a	3:19	3:08	3:02	3:11	4:24
	Tide - PM low	2:57	3:11	2:58	n/a	n/a	n/a	3:09	2:58	2:52	3:01	4:14
	Tide - AM high	9:22	9:13	9:35	n/a	n/a	n/a	9:11	9:22	9:25	9:35	10:03
	Tide - PM high	9:45	9:36	9:58	n/a	n/a	n/a	9:34	9:45	9:48	9:58	10:26
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
7/24/2009	Precipitation (in)	0.79	1.26	0.92	1.85	2.17	2.49	1.41	1.17	2.28	1.08	3.15

	Wind Speed (mph)	3.8	5.7	7.2	1.7	1.4	10.2	4.7	6.5	2.7	12	9.8
	Wind Direction	NNE	N	NW	NE	N	N	NW	N	NNW	NNE	NW
	Mean Air Temp (F)	66.3	69.4	68.7	66.9	66.8	65.8	68.5	67.4	70	70	69.5
	Mean Water Temp (F)	70	69	76	76	76	75	70	70	72	71	67
	Tide - AM low	3:50	4:04	3:51	n/a	n/a	n/a	4:02	3:51	3:45	3:54	5:07
	Tide - PM low	3:52	4:06	3:53	n/a	n/a	n/a	4:04	3:53	3:47	3:56	5:09
	Tide - AM high	10:14	10:05	10:37	n/a	n/a	n/a	10:03	10:14	10:17	10:27	10:55
	Tide - PM high	10:36	10:27	10:49	n/a	n/a	n/a	10:25	10:36	10:39	10:49	11:17
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
7/25/2009	Precipitation (in)	0.07	0.00	0.09	0.17	0.08	0.02	0.10	0.08	0.04	0.07	0.00
	Wind Speed (mph)	2.3	5.4	0.3	0.7	0.4	3.2	1.6	2.3	1.8	8.0	4.7
	Wind Direction	SW	SSW	SSE	WSW	SSW	SW	WSW	SSW	SW	SSW	S
	Mean Air Temp (F)	70.5	72.1	70.4	73.3	71.4	71.9	71.4	70.1	74	73	68.3
	Mean Water Temp (F)	70	69	76	76	76	75	70	70	72	71	68
	Tide - AM low	4:30	4:44	4:31	n/a	n/a	n/a	4:42	4:31	4:25	4:34	5:47
	Tide - PM low	4:45	4:59	4:46	n/a	n/a	n/a	4:57	4:46	4:40	4:39	6:02
	Tide - AM high	11:07	10:58	11:20	n/a	n/a	n/a	10:56	11:07	11:10	11:20	11:48
	Tide - PM high	11:28	11:19	11:41	n/a	n/a	n/a	11:17	11:28	11:31	11:41	n/a
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
7/26/2009	Precipitation (in)	0.19	0.04	0.16	0.10	0.52	0.04	0.15	0.14	0.16	0.08	0.00
	Wind Speed (mph)	3.1	6.7	0.5	1.1	1.6	7.6	1.9	3.2	3.2	10.0	6.8
	Wind Direction	S	S	SSE	WSW	SSE	S	S	S	SW	S	SSE
	Mean Air Temp (F)	72.1	72.3	72.1	75.6	73.7	75.9	72.5	71.7	76.9	77	69
	Mean Water Temp (F)	70	70	77	76	76	75	70	70	72	71	69
	Tide - AM low	5:09	5:23	5:10	n/a	n/a	n/a	5:21	5:10	5:04	5:13	6:26
	Tide - PM low	5:38	5:52	5:39	n/a	n/a	n/a	5:50	5:39	5:33	5:42	6:55
	Tide - AM high	11:59	11:50	n/a	n/a	n/a	n/a	11:48	11:59	n/a	n/a	12:09
	Tide - PM high	n/a	n/a	12:12	n/a	n/a	n/a	n/a	n/a	12:02	12:12	12:40
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
7/27/2009	Precipitation (in)	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
	Wind Speed (mph)	3.1	7.4	0.7	1.2	1.2	5.9	2.9	5.2	3.4	7.0	8.6
	Wind Direction	SSW	SSW	SSE	WSW	SSE	SW	WSW	SSW	SW	SSW	SSW
	Mean Air Temp (F)	73.4	74.1	72.9	77.3	75.1	77.7	73.3	72.5	77.8	78	73.3
	Mean Water Temp (F)	70	70	77	76	76	76	71	71	72	72	69
	Tide - AM low	5:48	6:02	5:49	n/a	n/a	n/a	6:00	5:49	5:43	5:52	7:05
	Tide - PM low	6:36	6:50	6:37	n/a	n/a	n/a	6:48	6:37	6:31	6:40	7:53
	Tide - AM high	12:20	12:11	12:33	n/a	n/a	n/a	12:09	12:20	12:23	12:33	1:

7/30/2009	Precipitation (in)	0.05	0.24	0.00	0.08	0.34	0.79	0.04	0.06	0.00	0.03	0.01
	Wind Speed (mph)	2.1	6.7	0.5	0.6	0.6	3.0	3.5	4.6	2.4	8.0	8.2
	Wind Direction	SSW	SSW	SSW	WSW	SSE	SW	W	SSW	SW	SW	SW
	Mean Air Temp (F)	76.2	75.6	77.4	77.6	75.7	76.3	76.9	75.1	79.6	80	76.1
	Mean Water Temp (F)	71	70	77	77	77	77	72	71	73	73	70
	Tide - AM low	8:18	8:32	8:19	n/a	n/a	n/a	8:30	8:19	8:13	8:22	9:35
	Tide - PM low	10:33	10:47	10:34	n/a	n/a	n/a	10:45	10:34	10:28	10:37	11:50
	Tide - AM high	3:01	2:52	3:14	n/a	n/a	n/a	2:50	3:01	3:04	3:14	3:42
	Tide - PM high	3:41	3:32	3:54	n/a	n/a	n/a	3:30	3:41	3:44	3:54	4:22
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
7/31/2009	Precipitation (in)	0.00	0.43	0.06	0.31	0.66	0.60	0.05	0.13	0.12	0.51	0.03
	Wind Speed (mph)	2.6	5.3	0.9	0.6	1.2	4.5	1.9	2.8	2.3	7.0	6.0
	Wind Direction	SSW	SSW	S	WSW	SSE	SSW	S	S	SW	SW	SSW
	Mean Air Temp (F)	73.1	72.6	72.8	72.5	70.9	71.8	72.1	70.9	74.9	73	70.8
	Mean Water Temp (F)	71	70	77	77	77	77	72	71	73	73	70
	Tide - AM low	9:22	9:36	9:23	n/a	n/a	n/a	9:34	9:23	9:17	9:26	10:39
	Tide - PM low	11:21	11:35	11:22	n/a	n/a	n/a	11:33	11:22	11:16	11:25	n/a
	Tide - AM high	4:02	3:53	4:15	n/a	n/a	n/a	3:51	4:02	4:05	4:15	4:43
	Tide - PM high	4:44	4:35	4:57	n/a	n/a	n/a	4:33	4:44	4:47	4:57	5:25
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
8/1/2009	Precipitation (in)	0.05	0.04	0.01	0.35	0.00	0.00	0.01	0.00	0.00	0.00	0.25
	Wind Speed (mph)	2.1	2.9	0.2	0.2	0.3	1.8	1.4	1.6	1.0	5.0	3.3
	Wind Direction	WSW	SW	S	WSW	SSE	WSW	W	WSW	S	WSW	SSW
	Mean Air Temp (F)	76.2	73.6	72.7	74.2	72.7	73.8	72.6	70.8	74	75	72.5
	Mean Water Temp (F)	71	70	77	77	77	77	72	71	73	73	70
	Tide - AM low	10:19	10:33	10:20	n/a	n/a	n/a	10:31	10:20	10:14	10:23	12:38
	Tide - PM low	11:59	n/a	n/a	n/a	n/a	n/a	n/a	n/a	11:54	n/a	11:36*
	Tide - AM high	5:04	4:55	5:17	n/a	n/a	n/a	4:53	5:04	5:07	5:17	5:45
	Tide - PM high	5:43	5:34	5:56	n/a	n/a	n/a	5:32	5:43	5:46	5:56	6:24
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
8/2/2009	Precipitation (in)	0.24	0.04	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
	Wind Speed (mph)	2.7	5.1	0.4	0.3	0.7	4.6	0.8	2.7	1.7	8.0	5.6
	Wind Direction	S	SSE	SSE	W	SSE	S	SE	SSE	SSW	S	SSE
	Mean Air Temp (F)	72.3	72.8	72	71.9	71	72.4	71.4	71.3	74.6	71	71.2
	Mean Water Temp (F)	71	70	77	77	77	77	72	71	73	73	71
	Tide - AM low	11:11	12:13	12:00	n/a	n/a	n/a	12:11	12:00	11:06	12:03	1:16
	Tide - PM low	n/a	11:25	11:12*	n/a	n/a	n/a	11:23*	11:12*	n/a	11:15*	12:28
	Tide - AM high	6:01	5:52	6:14	n/a	n/a	n/a	5:50	6:01	6:04	6:14	6:42
	Tide - PM high	6:34	6:25	6:47	n/a	n/a	n/a	6:23	6:34	6:37	6:47	7:15
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
8/3/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.4	4.3	0.1	0.2	0.1	1.1	1.1	1.3	1.4	5.0	3.2
	Wind Direction	W	SW	SW	W	SSW	W	W	S	SSW	SSW	SSW
	Mean Air Temp (F)	74.5	76	75.1	76.7	73.5	74.9	75.3	73	76.8	75	74.9
	Mean Water Temp (F)	71	71	77	77	77	77	72	71	73	73	71
	Tide - AM low	12:34	12:48	12:35	n/a	n/a	n/a	12:46	12:35	12:29	12:38	1:51
	Tide - PM low	11:59*	12:13	12:00	n/a	n/a	n/a	12:11	12:00	11:54*	12:03	1:16
	Tide - AM high	6:49	6:40	7:02	n/a	n/a	n/a	6:38	6:49	6:52	7:02	7:30
	Tide - PM high	7:17	7:08	7:30	n/a	n/a	n/a	7:06	7:17	7:20	7:30	7:58
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
8/4/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.7	4.9	0.2	0.7	0.7	3.3	1.1	2.9	1.7	7.0	4.0
	Wind Direction	SSW	SSW	SSE	WSW	SSE	SW	SSW	SW	SW	SSW	S
	Mean Air Temp (F)	73.4	75.4	73.9	74.2	73	73.6	73.9	73	75.7	75	73.4
	Mean Water Temp (F)	71	71	77	77	77	77	72	71	73	73	71
	Tide - AM low	1:08	1:22	1:09	n/a	n/a	n/a	1:20	1:09	1:03	1:12	2:25
	Tide - PM low	12:46	1:00	12:47	n/a	n/a	n/a	12:58	12:47	12:41	12:50	2:03
	Tide - AM high	7:31	7:22	7:44	n/a	n/a	n/a	7:20	7:31	7:34	7:44	8:12
	Tide - PM high	7:54	7:45	8:07	n/a	n/a	n/a	7:43	7:54	7:57	8:07	8:35
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
8/5/2009	Precipitation (in)	0.03	0.00	0.12	0.33	0.33	0.16	0.00	0.00	0.00	0.31	0.00
	Wind Speed (mph)	2.6	6.9	0.5	1.0	0.9	2.7	2.1	4.9	2.9	9.0	7.5
	Wind Direction	SSW	SSW	S	WSW	S	WSW	WSW	SSW	SW	SW	SW

	Mean Air Temp (F)	76	75.6	75.7	77.1	76.9	75.2	75.6	74.7	80.2	78	77.7
	Mean Water Temp (F)	71	71	77	77	77	77	72	71	74	73	71
	Tide - AM low	1:43	1:57	1:44	n/a	n/a	n/a	1:55	1:44	1:38	1:47	3:00
	Tide - PM low	1:32	1:46	1:33	n/a	n/a	n/a	1:44	1:33	1:27	1:36	2:49
	Tide - AM high	8:10	8:01	8:23	n/a	n/a	n/a	7:59	8:10	8:13	8:23	8:51
	Tide - PM high	8:29	8:20	8:42	n/a	n/a	n/a	8:18	8:29	8:32	8:42	9:10
	Lunar cycle	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon
8/6/2009	Precipitation (in)	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.1	3.7	0.2	0.1	0.1	2.7	0.8	2.1	0.6	5.0	4.6
	Wind Direction	SE	W	E	WNW	SE	SSW	WNW	NNW	S	WSW	NW
	Mean Air Temp (F)	69.6	71.2	69.9	69.3	67.2	69.4	70.2	69.4	71.1	71	68.9
	Mean Water Temp (F)	71	71	77	77	77	77	72	71	74	73	71
	Tide - AM low	2:18	2:32	2:19	n/a	n/a	n/a	2:30	2:19	2:13	2:22	3:35
	Tide - PM low	2:15	2:29	2:16	n/a	n/a	n/a	2:27	2:16	2:10	2:19	3:32
	Tide - AM high	8:46	8:37	8:59	n/a	n/a	n/a	8:35	8:46	8:49	8:59	9:27
	Tide - PM high	9:03	8:54	9:16	n/a	n/a	n/a	8:52	9:03	9:06	9:16	9:44
	Lunar cycle	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon
8/7/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	2.2	2.5	1.2	0.2	0.7	2.8	6.2	4.1	1.3	9.0	4.9
	Wind Direction	NNW	NN W	WNW	SW	N	NW	WNW	NW	NW	NW	NW
	Mean Air Temp (F)	69.5	72.5	72.2	69.6	67.6	67.6	70.1	70.1	69.2	70	68.8
	Mean Water Temp (F)	71	71	77	77	77	77	72	71	74	74	72
	Tide - AM low	2:51	3:05	2:52	n/a	n/a	n/a	3:03	2:52	2:46	2:55	4:08
	Tide - PM low	2:56	3:10	2:57	n/a	n/a	n/a	3:08	2:57	2:51	3:00	4:13
	Tide - AM high	9:21	9:12	9:34	n/a	n/a	n/a	9:10	9:21	9:24	9:34	10:02
	Tide - PM high	9:37	9:28	9:50	n/a	n/a	n/a	9:26	9:37	9:40	9:50	10:18
	Lunar cycle	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon	Full Moon
8/8/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.6	2.7	0.1	0.1	0.3	1.8	1.5	2.6	0.7	7.0	4.3
	Wind Direction	NNW	NW	W	WN W	NNW	NW	WNW	N	NW	NW	WNW
	Mean Air Temp (F)	65.6	68.3	67.3	65.5	63.5	65.3	66.6	66.9	65.1	67	66.5
	Mean Water Temp (F)	71	71	77	77	77	77	72	72	74	74	72
	Tide - AM low	3:23	3:37	3:24	n/a	n/a	n/a	3:35	3:24	3:18	3:27	4:40
	Tide - PM low	3:34	3:48	3:35	n/a	n/a	n/a	3:46	3:35	3:29	3:38	4:51
	Tide - AM high	9:56	9:47	10:09	n/a	n/a	n/a	9:45	9:56	9:59	10:09	10:37
	Tide - PM high	10:12	10:08	10:25	n/a	n/a	n/a	10:06	10:12	10:15	10:25	10:53
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
8/9/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	2.8	4.5	0.2	0.3	0.3	4.4	0.6	2.4	1.0	7.0	5.0
	Wind Direction	SSE	SSE	SSE	W	SE	S	SE	SSE	S	S	SE
	Mean Air Temp (F)	66	68	67.6	65.8	63.6	65.1	67.1	67.5	67.8	65	66.4
	Mean Water Temp (F)	71	71	77	77	77	77	72	72	74	74	72
	Tide - AM low	3:53	4:07	3:54	n/a	n/a	n/a	4:05	3:54	3:48	3:57	5:10
	Tide - PM low	4:10	4:24	4:11	n/a	n/a	n/a	4:22	4:11	4:05	4:14	5:27
	Tide - AM high	10:33	10:24	10:46	n/a	n/a	n/a	10:22	10:33	10:36	10:46	11:14
	Tide - PM high	10:51	10:42	11:04	n/a	n/a	n/a	10:40	10:51	10:54	11:04	11:32
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
8/10/2009	Precipitation (in)	0.02	0.12	0.02	0.02	0.13	0.00	0.03	0.00	0.00	0.01	0.08
	Wind Speed (mph)	1.9	4.4	0.2	0.3	0.3	2.5	2.2	1.9	1.1	6.0	3.4
	Wind Direction	WNW	SSW	W	WSW	N	WNW	W	SW	SW	SW	WSW
	Mean Air Temp (F)	78.3	76.9	78.8	79.4	77.9	77.9	77.9	76.8	79.9	79	74.9
	Mean Water Temp (F)	71	71	77	77	77	77	72	72	74	74	72
	Tide - AM low	4:24	4:38	4:25	n/a	n/a	n/a	4:36	4:25	4:19	4:28	5:41
	Tide - PM low	4:47	5:01	4:48	n/a	n/a	n/a	4:59	4:48	4:42	4:51	6:04
	Tide - AM high	11:12	11:03	11:25	n/a	n/a	n/a	11:01	11:12	11:15	11:25	11:53
	Tide - PM high	11:33	11:24	11:46	n/a	n/a	n/a	11:22	11:33	11:36	11:46	n/a
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
8/11/2009	Precipitation (in)	0.01	0.00	0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.49	0.00
	Wind Speed (mph)	1.2	2.3	0.2	0.2	0.3	3.5	1.1	1.7	0.7	5.0	4.1
	Wind Direction	NE	N	WNW	NW	N	ENE	WNW	N	NE	N	WNW
	Mean Air Temp (F)	77.6	78.8	78.4	79.5	79.8	78.7	77.9	77.5	79.5	79	79.2
	Mean Water Temp (F)	71	71	77	77	77	77	73	72	75	74	72
	Tide - AM low	4:56	5:10	4:57	n/a	n/a	n/a	5:08	4:57	4:51	5:00	6:13

	Tide - PM low	5:27	5:41	5:28	n/a	n/a	n/a	5:39	5:28	5:22	5:31	6:44
	Tide - AM high	11:55	11:46	n/a	n/a	n/a	n/a	11:44	11:55	11:58	n/a	12:14
	Tide - PM high	n/a	n/a	12:08	n/a	n/a	n/a	n/a	n/a	n/a	12:08	12:36
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
8/12/2009	Precipitation (in)	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Wind Speed (mph)	0.4	2.7	0.8	0.6	0.2	4.9	0.3	2.5	1.3	8.0	2.8
	Wind Direction	ESE	NNE	NNE	N	E	ENE	ENE	NE	ENE	NE	NNE
	Mean Air Temp (F)	69.3	71.7	70.2	69.8	70.1	69.7	70.6	70	71	71	70.3
	Mean Water Temp (F)	71	71	77	77	77	77	73	72	75	74	72
	Tide - AM low	5:34	5:48	5:35	n/a	n/a	n/a	5:46	5:35	5:29	5:38	6:51
	Tide - PM low	6:17	6:31	6:18	n/a	n/a	n/a	6:29	6:18	6:12	6:21	7:34
	Tide - AM high	12:20	12:11	12:33	n/a	n/a	n/a	12:09	12:20	12:23	12:33	1:01
	Tide - PM high	12:42	12:33	12:55	n/a	n/a	n/a	12:31	12:42	12:45	12:55	1:23
	Lunar cycle	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous	Waning Gibbous
8/13/2009	Precipitation (in)	0.39	0.63	0.23	0.06	0.11	0.11	0.24	0.34	0.35	0.20	0.10
	Wind Speed (mph)	0.6	4.1	1.1	1.2	0.2	4.9	0.8	4.6	1.2	9.0	5.0
	Wind Direction	E	N	NNE	NNE	N	NE	N	NNE	ENE	NNE	NE
	Mean Air Temp (F)	66.8	68	67.1	66.3	66.2	66.7	67.3	66.3	68.5	66	68
	Mean Water Temp (F)	72	72	77	77	77	77	73	72	75	74	72
	Tide - AM low	6:21	6:35	6:22	n/a	n/a	n/a	6:33	6:22	6:16	6:25	7:38
	Tide - PM low	7:24	7:38	7:25	n/a	n/a	n/a	7:36	7:25	7:19	7:28	8:41
	Tide - AM high	1:10	1:01	1:23	n/a	n/a	n/a	12:59	1:10	1:13	1:23	1:51
	Tide - PM high	1:35	1:26	1:48	n/a	n/a	n/a	1:24	1:35	1:38	1:48	2:16
	Lunar cycle	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter
8/14/2009	Precipitation (in)	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.0	4.3	0.1	0.1	0.2	2.4	0.6	1.9	1.5	4.0	4.8
	Wind Direction	W	SW	SSE	NE	SSE	WNW	SSE	ENE	S	S	SSW
	Mean Air Temp (F)	68.7	69.9	68.6	71.4	69.6	71.3	69	67.9	70	69	74.6
	Mean Water Temp (F)	72	72	77	77	77	77	73	72	75	74	72
	Tide - AM low	7:19	7:33	7:20	n/a	n/a	n/a	7:31	7:20	7:14	7:23	8:36
	Tide - PM low	9:02	9:16	9:03	n/a	n/a	n/a	9:14	9:03	8:57	9:06	10:19
	Tide - AM high	2:06	1:57	2:19	n/a	n/a	n/a	1:55	2:06	2:09	2:19	2:47
	Tide - PM high	2:34	2:25	2:47	n/a	n/a	n/a	2:23	2:34	2:37	2:47	3:15
	Lunar cycle	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter	Last Quarter
8/15/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
	Wind Speed (mph)	1.5	5.8	0.1	0.3	0.3	1.7	2.1	2.4	1.7	5.0	4.9
	Wind Direction	SW	SSW	S	WNW	SSW	WNW	W	SSW	SW	SSW	SW
	Mean Air Temp (F)	72.2	74.3	73.8	77.1	75	75.9	74.3	72.7	76.4	77	73.5
	Mean Water Temp (F)	72	72	77	77	77	77	73	72	75	74	72
	Tide - AM low	8:29	8:43	8:30	n/a	n/a	n/a	8:41	8:30	8:24	8:33	9:46
	Tide - PM low	10:30	10:44	10:31	n/a	n/a	n/a	10:42	10:31	10:25	10:34	11:47
	Tide - AM high	3:09	3:00	3:22	n/a	n/a	n/a	2:58	3:09	3:12	3:22	3:50
	Tide - PM high	3:41	3:32	3:54	n/a	n/a	n/a	3:30	3:41	3:44	3:54	4:22
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
8/16/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.7	5.5	0.1	0.4	0.2	1.6	1.6	2.0	1.9	6.0	4.3
	Wind Direction	SW	SW	SSE	WSW	S	WSW	W	SSW	SW	S	SW
	Mean Air Temp (F)	75.2	75.1	75.3	79	76.3	76.4	75.2	74.4	78.1	78	74.6
	Mean Water Temp (F)	72	72	72	77	77	77	73	72	75	74	72
	Tide - AM low	9:43	9:57	9:44	n/a	n/a	n/a	9:55	9:44	9:38	9:47	11:00
	Tide - PM low	11:30	11:44	11:31	n/a	n/a	n/a	11:42	11:31	11:25	11:34	n/a
	Tide - AM high	4:17	4:08	4:30	n/a	n/a	n/a	4:06	4:17	4:20	4:30	4:58
	Tide - PM high	4:50	4:41	5:03	n/a	n/a	n/a	4:39	4:50	4:53	5:03	5:31
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
8/17/2009	Precipitation (in)	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.5	6.3	0.2	0.4	0.2	1.0	1.6	1.8	1.3	6.0	3.7
	Wind Direction	SSW	SSW	SSE	WSW	SSE	W	W	SSW	SW	S	SSW
	Mean Air Temp (F)	75.4	75.3	75.3	80.4	78.1	79.9	76.1	74.3	79.2	79	75.6
	Mean Water Temp (F)	73	73	75	77	77	77	73	73	75	74	73
	Tide - AM low	10:52	11:06	10:53	n/a	n/a	n/a	11:04	10:53	10:47	10:56	12:47
	Tide - PM low	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12:09

	Tide - AM high	5:24	5:15	5:37	n/a	n/a	n/a	5:13	5:24	5:27	5:37	6:05
	Tide - PM high	5:55	5:46	6:08	n/a	n/a	n/a	5:44	5:55	5:58	6:08	6:36
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
8/18/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.01
	Wind Speed (mph)	1.6	5.3	0.1	1.0	0.6	3.8	2.0	3.0	1.9	8.0	5.1
	Wind Direction	WSW	SSW	SSE	WSW	S	W	W	SSW	SW	SW	SW
	Mean Air Temp (F)	77.5	75.9	77.4	80.9	77.7	79.4	78.8	75.7	78.9	82	76.5
	Mean Water Temp (F)	73	73	73	77	77	77	71	73	75	74	72
	Tide - AM low	12:21	12:35	12:22	n/a	n/a	n/a	12:33	12:22	12:16	12:25	1:38
	Tide - PM low	11:54*	12:08	11:55*	n/a	n/a	n/a	12:06	11:55*	11:49*	11:58*	1:11
	Tide - AM high	6:25	6:16	6:38	n/a	n/a	n/a	6:14	6:25	6:28	6:38	7:06
	Tide - PM high	6:53	6:44	7:06	n/a	n/a	n/a	6:42	6:53	6:56	7:06	7:34
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
8/19/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.8	5.5	0.2	0.4	0.3	1.6	2.0	2.6	1.7	7.0	6.0
	Wind Direction	WSW	SSW	SSE	WSW	SSW	WNW	WSW	SW	SW	SW	SW
	Mean Air Temp (F)	77.3	77	77.5	80.7	78.6	78.8	79.3	76.3	80.1	82	77.5
	Mean Water Temp (F)	73	73	75	78	78	78	72	71	76	77	72
	Tide - AM low	1:08	1:22	1:09	n/a	n/a	n/a	1:20	1:09	1:03	1:12	2:25
	Tide - PM low	12:54	1:08	12:55	n/a	n/a	n/a	1:06	12:55	12:49	12:58	2:11
	Tide - AM high	7:20	7:11	7:33	n/a	n/a	n/a	7:09	7:20	7L23	7:33	8:01
	Tide - PM high	7:45	7:36	7:58	n/a	n/a	n/a	7:34	7:45	7:48	7:58	8:26
	Lunar cycle	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent	Waning Crescent
8/20/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.8	4.0	0.3	0.6	0.8	3.1	2.0	1.2	1.8	7.0	7.0
	Wind Direction	S	S	SSE	WSW	SSE	SW	WSW	S	SW	S	S
	Mean Air Temp (F)	76.2	76.8	76.5	79.1	77.3	78	79.3	75.1	79.5	70	78.1
	Mean Water Temp (F)	73	73	75	78	78	78	72	71	76	77	72
	Tide - AM low	1:53	2:07	1:54	n/a	n/a	n/a	2:05	1:54	1:48	1:57	3:10
	Tide - PM low	1:51	2:05	1:52	n/a	n/a	n/a	2:03	1:52	1:46	1:55	3:08
	Tide - AM high	8:11	8:02	8:24	n/a	n/a	n/a	8:00	8:11	8:14	8:24	8:52
	Tide - PM high	8:35	8:26	8:48	n/a	n/a	n/a	8:24	8:35	8:38	8:48	9:16
	Lunar cycle	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon
8/21/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	3.1	7.1	0.6	1.5	2.1	8.6	2.0	4.1	3.5	11.0	9.3
	Wind Direction	S	S	SSE	WSW	SSE	SW	WSW	S	SW	S	SSW
	Mean Air Temp (F)	76.1	77.6	76.3	81.1	79.8	81	79.3	76.4	81.1	82	77.5
	Mean Water Temp (F)	73	73	75	78	78	78	72	72	76	77	72
	Tide - AM low	2:34	2:48	2:35	n/a	n/a	n/a	2:46	2:35	2:29	2:38	3:51
	Tide - PM low	2:45	2:59	2:46	n/a	n/a	n/a	2:57	2:46	2:40	2:49	4:02
	Tide - AM high	9:01	8:52	9:14	n/a	n/a	n/a	8:50	9:01	9:04	9:14	9:42
	Tide - PM high	9:24	9:15	9:37	n/a	n/a	n/a	9:13	9:24	9:27	9:37	10:05
	Lunar cycle	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon	New Moon
8/22/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.03	0.00	0.02	0.00
	Wind Speed (mph)	3.1	6.4	0.7	0.8	1.4	6.7	1.6	3.9	2.9	10.0	8.0
	Wind Direction	SSE	SSE	SE	W	SSE	S	WSW	SSE	SSW	S	SSE
	Mean Air Temp (F)	76.5	78.2	77.9	80.7	79	80.4	78.2	76.5	80.9	81	77.1
	Mean Water Temp (F)	73	73	75	78	78	78	72	72	76	77	72
	Tide - AM low	3:14	3:28	3:15	n/a	n/a	n/a	3:26	3:15	3:09	3:18	4:31
	Tide - PM low	3:35	3:49	3:36	n/a	n/a	n/a	3:47	3:36	3:30	3:39	4:52
	Tide - AM high	9:50	9:41	10:03	n/a	n/a	n/a	9:39	9:50	9:53	10:03	10:31
	Tide - PM high	10:12	10:03	10:25	n/a	n/a	n/a	10:01	10:12	10:15	10:25	10:53
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
8/23/2009	Precipitation (in)	0.44	0.24	0.29	0.14	0.06	0.34	0.00	0.45	0.00	0.05	0.00
	Wind Speed (mph)	2.1	6.0	0.5	0.5	0.6	4.0	2.2	3.8	1.7	8.0	6.3
	Wind Direction	W	WSW	SSE	WSW	S	NW	WNW	NW	SW	NW	W
	Mean Air Temp (F)	74.8	77.5	76.2	78.6	77.5	77.4	77.8	76.2	79.9	82	77.6
	Mean Water Temp (F)	73	73	75	78	78	78	71	72	76	77	72
	Tide - AM low	3:51	4:05	3:52	n/a	n/a	n/a	4:03	3:52	3:46	3:55	5:08



	Tide - PM low	4:22	4:36	4:23	n/a	n/a	n/a	4:34	4:23	4:17	4:26	5:39
	Tide - AM high	10:40	10:31	10:53	n/a	n/a	n/a	10:29	10:40	10:43	10:53	11:21
	Tide - PM high	11:01	10:52	11:14	n/a	n/a	n/a	10:50	11:01	11:04	11:14	11:42
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
8/24/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.2	3.5	0.2	0.2	0.2	1.8	1.1	1.6	0.7	6.0	3.9
	Wind Direction	WNW	SW	WSW	WSW	NNW	NW	W	W	WSW	WNW	WNW
	Mean Air Temp (F)	74.5	77	76.3	76	74.5	74.7	75.5	74.5	77.4	79	75.2
	Mean Water Temp (F)	73	73	75	78	78	78	72	72	76	77	72
	Tide - AM low	4:27	4:41	4:28	n/a	n/a	n/a	4:39	4:28	4:22	4:31	5:44
	Tide - PM low	5:07	5:21	5:08	n/a	n/a	n/a	5:19	5:08	5:02	5:11	6:24
	Tide - AM high	11:30	11:21	11:43	n/a	n/a	n/a	11:19	11:30	11:33	11:43	n/a
	Tide - PM high	11:51	11:42	n/a	n/a	n/a	n/a	11:40	11:51	11:54	n/a	12:11
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
8/25/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.0	4.1	0.2	0.4	0.4	4.1	1.0	2.5	1.6	7.0	0.3
	Wind Direction	S	SW	SSE	WSW	SE	WSW	WSW	ENE	SSE	S	NNE
	Mean Air Temp (F)	70.7	73.6	72.1	74	72.4	74.9	72.6	71.5	73.1	75	67.6
	Mean Water Temp (F)	73	73	75	78	78	78	72	72	76	77	72
	Tide - AM low	5:04	5:18	5:05	n/a	n/a	n/a	5:16	5:05	4:59	5:08	6:21
	Tide - PM low	5:54	6:08	5:55	n/a	n/a	n/a	6:06	5:55	5:49	5:58	7:11
	Tide - AM high	n/a	n/a	12:04	n/a	n/a	n/a	n/a	n/a	n/a	12:04	12:32
	Tide - PM high	12:21	12:12	12:34	n/a	n/a	n/a	12:10	12:21	12:24	12:34	1:02
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
8/26/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.00	0.00	0.00
	Wind Speed (mph)	3.0	6.5	0.3	1.1	0.5	4.2	2.9	3.9	1.3	10.0	8.2
	Wind Direction	WNW	SW	WSW	WSW	WSW	WNW	W	SW	WNW	WSW	WSW
	Mean Air Temp (F)	75.4	76.4	77.7	77.2	75	75.1	76.4	75.3	76.9	79	77.9
	Mean Water Temp (F)	73	73	75	78	78	78	72	72	76	77	72
	Tide - AM low	5:44	5:58	5:45	n/a	n/a	n/a	5:56	5:45	5:39	5:48	7:01
	Tide - PM low	6:51	7:05	6:52	n/a	n/a	n/a	7:03	6:52	6:46	6:55	8:08
	Tide - AM high	12:42	12:33	12:55	n/a	n/a	n/a	12:31	12:42	12:45	12:55	1:23
	Tide - PM high	1:14	1:05	1:27	n/a	n/a	n/a	1:03	1:14	1:17	1:27	1:55
	Lunar cycle	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent	Waxing Crescent
8/27/2009	Precipitation (in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.5	4.5	0.3	0.3	0.2	3.6	1.2	4.2	1.1	7.0	4.5
	Wind Direction	NNW	NW	NNW	WSW	NNE	NNW	NNW	N	NE	NE	NNW
	Mean Air Temp (F)	66.2	70.4	68.4	67.5	66.2	66.5	67.9	67.7	67	69	68.9
	Mean Water Temp (F)	73	73	75	78	78	78	72	72	76	77	72
	Tide - AM low	6:30	6:44	6:31	n/a	n/a	n/a	6:42	6:31	6:25	6:34	7:47
	Tide - PM low	8:26	8:40	8:27	n/a	n/a	n/a	8:38	8:27	8:21	8:30	9:43
	Tide - AM high	1:34	1:25	1:47	n/a	n/a	n/a	1:23	1:34	1:37	1:47	2:15
	Tide - PM high	12:09	2:00	2:22	n/a	n/a	n/a	1:58	2:09	2:12	2:22	2:50
	Lunar cycle	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter
8/28/2009	Precipitation (in)	0.01	0.12	0.05	0.11	0.34	0.26	0.16	0.07	0.20	0.28	0.43
	Wind Speed (mph)	1.7	0.3	0.1	0.1	0.1	4.2	0.5	1.6	1.0	7.0	4.3
	Wind Direction	SE	E	E	NW	ESE	SSE	E	E	E	E	ENE
	Mean Air Temp (F)	63.1	67.9	65.3	64.3	62.5	64.9	65.2	64.7	65.2	70	65
	Mean Water Temp (F)	73	73	75	78	78	78	72	72	76	75	72
	Tide - AM low	7:29	7:43	7:30	n/a	n/a	n/a	7:41	7:30	7:24	7:33	8:46
	Tide - PM low	10:01	10:15	10:02	n/a	n/a	n/a	10:13	10:02	9:56	10:05	11:18
	Tide - AM high	2:29	2:20	2:42	n/a	n/a	n/a	2:18	2:29	2:32	2:43	3:10
	Tide - PM high	3:09	3:00	3:22	n/a	n/a	n/a	2:58	3:09	3:12	3:22	3:50
	Lunar cycle	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter	First Quarter
8/29/2009	Precipitation (in)	1.94	3.46	1.63	1.48	1.53	1.73	1.31	2.41	1.65	1.44	1.45
	Wind Speed (mph)	4.5	7.2	0.8	9.0	0.4	8.4	3.0	5.8	1.4	10.0	8.7
	Wind Direction	ESE	NE	N	NE	NNE	N	NNW	NE	N	N	ENE
	Mean Air Temp (F)	61.5	65.8	64	59.5	60.1	58.3	65	64	64.4	62	64.3
	Mean Water Temp (F)	73	73	78	78	78	78	72	72	76	72	72

	Tide - AM low	8:45	8:59	8:46	n/a	n/a	n/a	8:57	8:46	8:40	8:49	10:02
	Tide - PM low	10:52	11:06	10:53	n/a	n/a	n/a	11:04	10:53	10:47	10:56	n/a
	Tide - AM high	3:29	3:20	3:42	n/a	n/a	n/a	3:18	3:29	3:32	3:42	4:10
	Tide - PM high	4:14	4:05	4:27	n/a	n/a	n/a	4:03	4:14	4:17	4:27	4:55
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
8/30/2009	Precipitation (in)	0.00	0.00	0.00	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	0.8	2.2	0.1	0.1	0.2	2.0	0.6	0.9	1.0	5.0	0.0
	Wind Direction	SSE	SW	SSE	NE	SSE	SSW	WNW	SW	S	S	NE
	Mean Air Temp (F)	64.4	66.3	64.8	65.3	64.5	64.8	64.8	64.7	67.5	66	65
	Mean Water Temp (F)	71	71	75	78	78	78	72	72	76	72	72
	Tide - AM low	10:02	10:16	10:03	n/a	n/a	n/a	10:14	10:03	9:57	10:06	12:09
	Tide - PM low	11:29	11:43	11:30	n/a	n/a	n/a	11:41	11:30	11:24	11:33	11:19*
	Tide - AM high	4:34	4:25	4:47	n/a	n/a	n/a	4:23	4:34	4:37	4:47	5:15
	Tide - PM high	5:16	5:07	5:29	n/a	n/a	n/a	5:05	5:16	5:19	5:29	5:57
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
8/31/2009	Precipitation (in)	0.01	0.00	0.01	0.09	0.00	0.00	0.00	0.01	0.00	0.00	0.00
	Wind Speed (mph)	1.7	2.9	0.3	0.1	0.4	3.3	2.1	2.7	0.7	6.0	5.3
	Wind Direction	NNW	NW	WNW	NE	N	NNW	WNW	NNW	WNW	NW	NW
	Mean Air Temp (F)	65.8	68.2	67.3	65.1	63.6	64	66	65.9	66.5	66	69.5
	Mean Water Temp (F)	70	70	71	74	75	73	70	70	72	72	70
	Tide - AM low	11:01	11:15	11:02	n/a	n/a	n/a	11:13	11:02	10:56	11:05	12:46
	Tide - PM low	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	11:57	n/a	12:18
	Tide - AM high	5:33	5:24	5:46	n/a	n/a	n/a	5:22	5:33	5:36	5:46	6:14
	Tide - PM high	6:07	5:58	6:20	n/a	n/a	n/a	5:56	6:07	6:10	6:20	6:48
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
9/1/2009	Precipitation (in)	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wind Speed (mph)	0.6	1.8	0.3	0.2	0.1	2.9	0.8	2.9	1.4	6.0	3.2
	Wind Direction	NE	E	N	NE	ESE	N	N	NNE	E	NNE	E
	Mean Air Temp (F)	61.9	64.2	62.3	61.8	59.5	60.6	62.2	60.8	60.7	64	61.4
	Mean Water Temp (F)	69	69	70	72	71	70	68	68	70	71	68
	Tide - AM low	12:02	12:16	12:03	n/a	n/a	n/a	12:14	12:03	11:44	12:06	1:19
	Tide - PM low	11:49	12:03	11:50*	n/a	n/a	n/a	12:01	11:50*	n/a	11:53*	1:06
	Tide - AM high	6:22	6:13	6:35	n/a	n/a	n/a	6:11	6:22	6:25	6:35	7:03
	Tide - PM high	6:49	6:40	7:02	n/a	n/a	n/a	6:38	6:49	6:52	7:02	7:30
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
9/2/2009	Precipitation (in)	0.00	0.00	0.00	0.06	0.00	0.24	0.01	0.00	0.00	0.00	0.00
	Wind Speed (mph)	1.0	2.3	0.0	0.2	0.3	2.2	0.4	1.0	1.0	5.5	1.7
	Wind Direction	S	SSE	SSE	NE	SE	SSW	SE	SE	SE	SSW	SE
	Mean Air Temp (F)	62.5	64.6	62.7	62.3	60.4	63.4	62.3	61.2	61	64	58.3
	Mean Water Temp (F)	69	69	70	72	72	70	68	68	70	70	67
	Tide - AM low	12:35	12:49	12:36	n/a	n/a	n/a	12:47	12:36	12:30	12:39	1:52
	Tide - PM low	12:34	12:48	12:35	n/a	n/a	n/a	12:46	12:35	12:29	12:38	1:51
	Tide - AM high	7:03	6:54	7:16	n/a	n/a	n/a	6:52	7:03	7:06	7:16	7:44
	Tide - PM high	7:25	7:16	7:38	n/a	n/a	n/a	7:14	7:25	7:28	7:38	8:06
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
9/3/2009	Precipitation (in)	0.00	0.00	0.00	0.07	0.11	0.00	0.01	0.00	0.00	0.00	0.00
	Wind Speed (mph)	0.6	1.6	0.0	0.1	0.2	1.2	0.2	0.7	0.6	3.0	0.6
	Wind Direction	SSE	SSE	SSE	SSE	SSE	SSW	ESE	SE	SSE	SSW	SE
	Mean Air Temp (F)	62	63.8	63.1	65.1	61	63.8	61.2	61.1	60.8	64	56.9
	Mean Water Temp (F)	69	68	70	72	72	70	67	67	70	70	67
	Tide - AM low	1:09	1:23	1:10	n/a	n/a	n/a	1:21	1:10	1:04	1:13	2:26
	Tide - PM low	1:17	1:31	1:18	n/a	n/a	n/a	1:29	1:18	1:12	1:21	2:34
	Tide - AM high	7:39	7:30	7:52	n/a	n/a	n/a	7:28	7:39	7:42	7:52	8:20
	Tide - PM high	7:58	7:49	8:11	n/a	n/a	n/a	7:47	7:58	8:01	8:11	8:39
	Lunar cycle	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous	Waxing Gibbous
9/4/2009	Precipitation (in)	0.00	0.00	0.00	0.09	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Wind Speed (mph)	0.4	2.0	0.6	0.6	0.2	3.2	0.3	1.8	1.1	5.0	4.5
	Wind Direction	ESE	NNE	NNE	NE	N	ENE	NE	NE	ENE	NNE	E
	Mean Air Temp (F)	66.3	66.8	67.8	66.1	64	66.4	65.6	64.9	64.1	67	73.1
	Mean Water Temp (F)	69	68	70	72	72	70	67	67	69	70	67
	Tide - AM low	1:42	1:56	1:43	n/a	n/a	n/a	1:54	1:43	1:37	1:46	2:59
	Tide - PM low	1:57	2:11	1:58	n/a	n/a	n/a	2:09	1:58	1:52	2:01	3:14
	Tide - AM high	8:14	8:05	8:27	n/a	n/a	n/a	8:03	8:14	8:17	8:27	8:55

[illegible]

## Appendix I



