

REVIEW

Chapter 5 - Environmental Impacts of Plant Operation
(Specifically 5.3 and 5.5)

of

Draft Environmental Statement

NEP 1 & 2

NUREG-0529

May 1979

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5.3 Performance of Heat Dissipation System

5.3.1.2.3 Far-Field (p.5-4 applicant); 5.3.2.2 Far-Field (p.5-11 staff)

The far-field model used by the NRC Staff is more appropriate to far-field prediction than the applicant's, because it at least permits heat transfer in the onshore direction (sect. 5.3.1.2.3 p. 5-4), however neither model considers the effects of wind on the trajectory of the heated surface layer. Additionally wind effects do not enter the discussions on near-field (5.3.1.2.1 and 5.3.2.1) or intermediate field (5.3.1.2.2).

Wind effects have been shown to be a significant driving force, especially for the surface layer, and therefore cannot be ignored in the evaluation of impacts of the thermal plume and its chemical components on the shore and coastal ponds of the south coast of R.I.

Recent studies in nearshore Block Island Sound (RIDEM-URI 1979) have shown that the trajectory of surface drifters released within 1 1/2 miles of shore along the south coast is heavily dependent on tidal currents at, and soon after, release and wind speed and direction. These studies are particularly relevant to conditions in the late spring and summer seasons, and are discussed in some detail in the following paragraphs.

During the period May-September, 1978, surface drifters were released regularly at eight (8) sites (see figure) in Block Island Sound by University of Rhode Island (URI) and R. I. Department of Environmental Management (RIDEM) personnel. Releases were made on fifteen (15) dates, on approximately a weekly basis. Each release totaled 200 drifters, twenty-five at each of the eight stations. Drifter returns were quite high overall. Of the 3000 surface drifters released during the fifteen week period, 1475 were returned for an overall return rate of 49%.

The surface drifter used in this study was a five-inch long transparent plastic bottle with screw cap. Within the bottle a pre-stamped and addressed waterproof fluorescent orange card was inserted and the bottle filled with freshwater. The water-

filled bottle was positively buoyant and in seawater floated on its side such that it was completely submerged, with only the edge of the screw cap being exposed to the atmosphere. Thus the direct influence of the wind on bottle movement was minimal, rather it moved with the surface layer, or the top three inches of water which in turn was driven by the wind and tide.

The results of the program showed that drifters released at the nearshore stations, especially stations #1, 3, 4 and 8 came ashore so rapidly that the release sites were inadequate for measuring long term surface drift along the south coast of Rhode Island. Station #3 was in 30 feet of water off Charlestown at the approximate location of the intake structures, and station #4 was one mile further offshore. The URI report warned that "It was found that release sites close to shore yielded information that was strongly biased by very short term tidal currents and wind. Without looking closely at time-of-retrieval of the drifters, implications about nearshore drift might be erroneously made." Tabular data from the URI survey for Station #3 are included as an appendix to this critique.

In addition to this drifter work for the lobster larvae project, drifters and remote sensing (infra-red) data were used in the URI coastal ponds project (S. Nixon personal communication). These data indicate that ebbing tidal currents carry material from Quonochontaug Pond breachway easterly over the proposed site of the intake structures.

In view of these data it seems apparent that the present analysis (NUREG-0529) and concomitant evaluation of impacts, of the interaction of the intake structures with coastal pond effluents, and the interaction of the thermal plume with the shoreline and breachways is inadequate. Modeling efforts must include the effects of wind on the thermal plume and must incorporate the presence of the effluent from the nearby coastal ponds.

5.5 Nonradiological Impacts of Ecological Systems

5.5.2.2 Entrainment (p. 5-46 to 48)

Interesting analytical work was carried out by the NRC Staff in estimating the impact of lobster larvae entrainment on the commercial fishery of the state. In their conclusion (p. 5-48 top) they stated that entrainment is not expected to be significant because by their calculations only 0.5% and 0.04% of the 1976 and 1977 Rhode Island landings respectively are considered to be affected. Additional information on the lobster resource in the region is available and must be considered by the applicant and NRC staff in evaluating the impacts of the heat dissipation system on this valuable resource.

Comparing "equivalent adults," derived from larval concentrations with lobster landings at Rhode Island ports (p. 5-48) dilutes the significance of the nearshore larval concentrations. Rhode Island lobster landings are predominantly from areas offshore of Rhode Island and Block Island Sound. According to the U.S. Department of Interior's Final Supplement to Environmental Statement for OCS Sale #42 (p. 114) 78% of the 1975 landings and 76% of the 1976 landings came from the Georges Bank area. The larvae especially the high concentrations of fourth stage found in Rhode Island and Block Island Sounds, do not, in all probability contribute to the adult offshore population, rather they are the source of recruitment to the inshore stock. Therefore, the entrainment of fourth stage larvae should be evaluated as it impacts the inshore fishery, both commercial and recreational, not the total fishery as estimated from total landings data.

There are indications that the spatial distribution of fourth stage lobster larvae is significantly affected by wind speed and direction (RIDEM-URI 1979). Surface drifter returns and computer modeling which were integral parts of the URI lobster larvae sampling program, indicate that wind speed and direction during the few days prior to sampling can provide insight into the concentrations found. cursory inspection of the applicant's 1977 and 1976 data on lobster larvae tends to corroborate these observations. Prevailing winds, during the time of the year that fourth stage larvae are present, are southwesterly driving the surface water of Block Island Sound somewhat onshore and towards the northeast. However the passage of frontal systems can pro-

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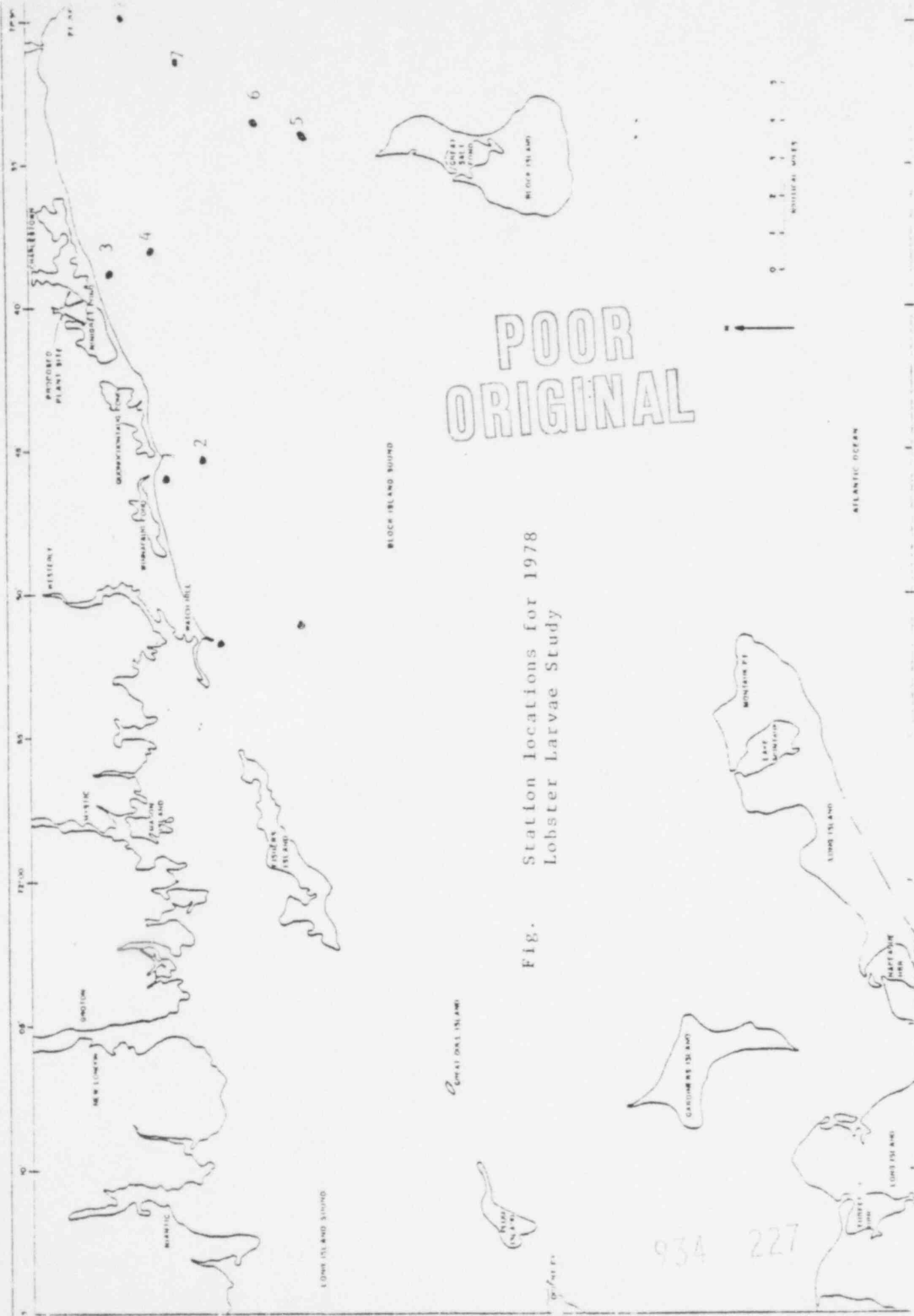
duce wind drifts that drive larvae out of the Long Island Sound, Narragansett and Buzzards Bay into Block Island and Rhode Island Sound, thence to be advected towards the south coast when prevailing winds return.

Conclusions:

Consideration must be given to the effect of wind on the trajectory of the thermal plume. Surface drifters and computer modeling which include wind, indicate fairly rapid movement of surface water towards shore during summer months.

Regarding the intake system, wind must also be considered in assessing the entrainment of lobster larvae. Additional work regarding the high concentrations of fourth stage larvae, as shown in the 1976 and 1978 data, must be accomplished. If it is found that the present location of the intake system intercepts the wind driven migratory route of late stage lobster larvae towards Narragansett and Buzzards Bays then relocation of the intakes must be considered. Additionally the interaction of coastal pond effluent with the intake system must be addressed. As stated previously the ebbing effluent from Quonochontong Pond appears to pass through the area of the intakes, as shown by breachway drifter release and infrared photography.

Because of the omissions stated above Section 5.3 and 5.5 of the NRC draft environmental statement (NUREG - 0529) is inadequate in its present form.



SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown (30 - foot depth contour) -

Number Released in each case = 25 drifters

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
19 May 1978	1. Carpenters Beach	5/20 5:29 am
	2. Deep Hole Fishing Area	5/20 6:15 am
	3. Deep Hole Fishing Area	5/20 10:00 am
	4. Deep Hole Fishing Area	5/20 10:00 am
	5. Carpenters Beach Reef	5/20 11:00 am
	6. Moonstone Beach	5/20 11:00 am
	7. Deep Hole Fishing Area	5/20 11:30 am
	8. Deep Hole Fishing Area	5/20 11:30 am
	9. Deep Hole Fishing Area	5/20 11:30 am
	10. Deep Hole Fishing Area	5/20 11:30 am
	11. Carpenters Beach	5/20 11:30 am
	12. Carpenters Beach	5/20 11:30 am
	13. Reef at Carpenters Beach	5/20 12:10 pm
	14. Big Hole Reef Matunuck	5/20 12:15 pm
	15. Reef at Carpenters Beach	5/20 12:30 pm
	16. Deep Hole Matunuck	5/21 6:00 am

Summary: 16 returned; 64% return rate; most 3-5 miles to East

SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown (30 - foot depth contour) -

Number Released in each case = 25 drifters

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
23 May 1978	1. Charlestown Breach - east side	5/24 10:30 am
	2. Charlestown Breach - east side	5/24 10:30 am
	3. Charlestown Breach - east side	5/24 10:30 am
	4. Charlestown Breach - west side	5/24 10:30 am
	5. Charlestown Breach - east side	5/24 10:30 am
	6. Charlestown Breach - 1000 ft east	5/24 1:00 pm
	7. Charlestown Breach - 250 y east	5/24 3:10 pm
	8. Charlestown Breach	5/24 7:30 pm
	9. Charlestown Breach - east side	5/24 8:00 pm
	10. Charlestown Breach - east side	5/24 8:00 pm
	11. Charlestown Breach - east side	5/24 8:30 pm
	12. Charlestown Breach - east side	5/25 5:00 am
	13. Charlestown Breach - Ninigret Conservation Area	5/25 6:00 am
	14. Charlestown Breach - 500 y east	5/25 9:00 am
	15. Charlestown Breach - 400 y east	5/25 9:00 am
	16. Charlestown Breach - 600 y east	5/25 9:00 am
	17. Charlestown Breach - 500 ft east	5/25 9:30 am
	18. West Hampton, LI	6/3 2:15 pm

Summary: 18 returned; 72% return rate; most onshore

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SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown (30 - foot depth contour) -

Number Released in each case = 25 drifters

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
1 June 1978	1. Charlestown, East Beach - Blue Shutters	6/2 8:05 am
	2. Charlestown, East Beach - Blue Shutters	6/2 8:05 am
	3. Charlestown, East Beach - Blue Shutters	6/2 8:05 am
	4. Charlestown, East Beach - Blue Shutters	6/2 1:30 pm
	5. Weekapaug Point	6/10 3:00 am

Summary: 5 returned; 25% return rate; onshore

SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown 930 - foot depth contour) -

Number Released in each case = 25 drifters

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
6 June 1978	1. Charlestown Breachway - west side	6/6 4:00 pm
	2. Charlestown Breachway - west side	6/6 4:00 pm
	3. Charlestown Breachway - west side	6/6 4:00 pm
	4. Charlestown Breachway - west side	6/6 4:00 pm
	5. Charlestown Breachway - west side	6/6 4:00 pm
	6. Charlestown Breachway - west side	6/6 4:00 pm
	7. Charlestown Breachway - west side	6/6 4:00 pm
	8. Charlestown Breachway - west side	6/6 4:00 pm
	9. Charlestown Breachway - west side	6/6 4:00 pm
	10. Charlestown Breachway - west side	6/6 4:00 pm
	11. Charlestown Breachway - west side	6/6 4:00 pm
	12. Charlestown Breachway - west side	6/6 4:00 pm
	13. Charlestown Breachway - 200 y west	6/7 1:00 pm
	14. Charlestown Beach - 1/2 mi West of cable	6/7 2:45 pm
	15. Charlestown Beach - 1/2 mi West of cable	6/7 2:45 pm
	16. Charlestown Breachway - 1000 y east	6/9 4:50 pm
	17. Charlestown Breachway - in channel	6/11 3:00 pm
	18. Tockwotten Cove Road dock - Ninigret Pond	6/21 5:00 pm
	19. N.E. Ocean House Marine - Charlestown Pond	7/2 2:30 pm
	20. Charlestown Breachway	7/7 7:30 am

Summary: 20 returned; 80% return rate; most onshore

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SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown (30 - foot depth contour) -

Number Released in each case = 25 drifters

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
20 June 1978	1. Deep Hole, Matunuck	6/22 7:00 am
	2. Galilee Beach Club - $\frac{1}{4}$ mile east	6/22 7:45 am
	3. Galilee Beach Club, Galilee, RI	6/22 7:45 am
	4. Carpenters Bar - $\frac{1}{2}$ mile south	6/23 12:30 pm
	5. Between Matunuck & E. Matunuck	6/23 8:45 pm
	6. E. Matunuck State Beach	6/23
	7. Galilee Breakwater driftwood cottage	6/24 1:00 pm
	8. Galilee Bridge to Great Island	6/24 3:00 pm
	9. Falmouth, MA - W. Fal-Buzz. Bay	7/29 2:00 pm
	10. Jones Beach - west end 2 Beach	8/7 11:00 am

Summary: 10 returned; 40% return rate; most to East

SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown (30 - foot depth contour) -

Number Released in each case = 25 drifters

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
27 June 1978	1. Ninigret Cons. Area - Charlestown	6/27 4:25 pm
	2. Ninigret Cons. Area - Charlestown	6/27 4:27 pm
	3. East Beach, Charlestown	6/27 4:30 pm
	4. East Beach, Charlestown	6/27 4:30 pm
	5. East Beach, Charlestown	6/27 4:30 pm
	6. East Beach, Charlestown	6/27 4:30 pm
	7. East Beach, Charlestown	6/27 4:30 pm
	8. East Beach, Charlestown	6/27 4:30 pm
	9. East Beach, Charlestown	6/27 4:30 pm
	10. East Beach, Charlestown	6/27 4:30 pm
	11. East Beach, Charlestown	6/27 4:30 pm
	12. East Beach, Charlestown	6/27 4:30 pm

Summary: 12 returned; 48% return rate; most onshore

SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown (30 - foot depth contour) -

Number Released in each case = 25 drifters

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
5 July 1978	1. Weekapaug Beach - 200 y west of ent.	7/6 10:40 am
	2. Weekapaug Beach - 40 y west Noyes Neck Road	7/6 11:10 am
	3. East Beach - 100 y south of Blue Shutters	7/6? 11:10 am
	4. Weekapaug Beach - old Inn ruins	7/6 11:15 am
	5. Weekapaug Beach - 200 y west of ent.	7/6 11:30 am
	6. Weekapaug Beach - 200 y west of ent.	7/6 11:30 am
	7. Weekapaug Beach - Noyes Neck Road power station	7/6 11:30 am
	8. Weekapaug Beach - Noyes Neck Road power station	7/6 11:30 am
	9. Weekapaug Beach - Noyes Neck Road power station	7/6 11:40 am
	10. Weekapaug Beach - 200 y west of ent.	7/6 12:00 noon
	11. Weekapaug Beach - 200 y west of ent.	7/6 12:00 noon
	12. Quonochontaug Beach, near breach	7/6 2:30 pm
	13. 5 miles east of Misquamicut (Quonnie Breach	7/6 2:30 pm
	14. Weekapaug Beach - 100 y south of breach	7/6 5:00 pm
	15. Weekapaug Beach - 1 mile north of breach	7/7 8:30 am
	16. Weekapaug Beach - 1 mile north of breach	7/7 10:30 am
	17. Weekapaug Beach - 100 y south of breach	7/7 4:00 pm
	18. Weekapaug Beach	7/8 2:15 pm
	19. 4 miles east of Misquamicut	7/8 2:30 pm
	20. Green Hill Beach	7/9 6:25 am

Summary: 20 returned; 84% return rate; most to West

SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown (30 - foot depth contour) -

Number Released in each case = 25 drifters

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
12 July 1978	1. Charlestown Breach - 1 mile east 1 mile offshore	7/13 9:00 am
	2. Charlestown Beach - 200 ft east of public	7/13 3:00 -
	3. Charlestown Beach - 1 mile south in surf	7/13 3:00 pm
	4. Charlestown Beach - 1½ mile south	7/13 3:30 pm
	5. West Beach	7/13 3:45 pm
	6. Charlestown, Ninigret refuge ½ to breach	7/13 5:30 pm
	7. Charlestown, Ninigret Beach 1 mile east parking lot	7/13 6:00 pm
	8. Charlestown, Ninigret Beach 1 mile east parking lot	7/13 6:00 pm
	9. Charlestown, Ninigret Beach 1 mile east parking lot	7/13 6:00 pm
	10. Charlestown, Ninigret Beach 1 mile east parking lot	7/13 6:00 pm
	11. Charlestown, Ninigret Beach 1 mile east parking lot	7/13 6:00 pm
	12. Charlestown East Beach near CG	7/13 7:30 pm
	13. Green Hill Beach ½ mile south of cable	7/13 8:05
	14. Green Hill Point 200 m west	7/14 10:00 am
	15. Quonochontaug Breach	7/14 12:00 noon

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<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
16.	Charlestown Beach	7/14 6:00 pm
17.	—	7/19 12:30 pm
18.	East Beach	7/19 1:30 pm
19.	Charlestown Breach - east beach side	8/6 3:30 pm
20.	Charlestown, Ninigret Pond opposite met. tower	8/9 11:30 am
21.	East side Ft. Neck Pond	8/12 11:30 am

Summary: 21 returned; 86% return rate; most onshore

934 236

SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown (30 - foot depth contour) -

Number Released in each case = 25 drifters

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
21 July 1978	1. Deep Hole, Matunuck - 800 y west	7/23 7:50 am
	2. Matunuck Beach - 100 y E of Carpenters	7/23 9:30
	3. Matunuck Point - 1½ miles offshore	7/23 10:30 am
	4. Moonstone Beach - 10 ft offshore	7/23 11:00 am
	5. Carpenters Beach - lifeguard stand	7/23 11:00 am
	6. Moonstone Beach - 200 y E of road	7/23 1:00 pm
	7. Moonstone Beach - 200 y E town beach	7/23 4:00 pm
	8. East Beach - sunrise acres assoc.	7/24 1:05 pm
	9. Carpenters Beach Matunuck	7/25 10:30 am
	10. Quonochontaug, E & W beaches	7/27 3:00 pm
	11. Taunton River	7/28 2:45 am ?

Summary: 11 returned; 44% return rate; most to East

934 237

SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown (30 - foot depth contour) -

Number Released in each case = 25 drifters

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
28 July 1978	1. Misquamicut near Andrea hotel	7/31 7:00 pm
	2. Misquamicut - 1 mile west of breach	7/31 7:10 - 7:20 pm
	3. Misquamicut - 1 mile west of breach	7/31 7:10 - 7:20 pm
	4. Misquamicut - 1 mile west of breach	7/31 7:10 - 7:20 pm
	5. Misquamicut - 1 mile west of breach	7/31 7:10 - 7:20 pm
	6. Misquamicut - 1 mile west of breach	7/31 7:10 - 7:20 pm
	7. Misquamicut State Beach	7/31 7:30 pm
	8. Misquamicut State Beach	7/31 7:30 pm
	9. Misquamicut - across from Sisco's	7/31 7:40 pm
	10. Watch Hill - 250 y E of lighthouse	7/31 9:00 pm
	11. Watch Hill - 400 y E of lighthouse	7/31 9:00 pm
	12. Watch Hill - 400 y E of lighthouse	7/31 9:00 pm
	13. Watch Hill - 1/2 mile east of Ocean House	8/1 6:45 am
	14. Watch Hill - 1/2 mile east of Ocean House	8/1 6:45 am
	15. Watch Hill - 1/4 mile of lighthouse	8/1 7:00 am
	16. Misquamicut State Beach	8/1 7:15 am
	17. Watch Hill - Ocean House & Norman Hall	8/1 8:00 am
	18. Watch Hill - Ocean House & Norman Hall	8/1 8:00 am
	19. Watch Hill - near lighthouse	8/1 10:00 am
	20. Misquamicut - near Blue Sands	8/1 8:00 pm

Summary: 20 returned; 80% return rate; most to West

934 238

SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown - (30 - foot depth contour) -

Number Released in each case = 25 drifters

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
1 August 1978	1. Watch Hill - 1 mile from lighthouse	8/1 2:00 pm
	2. Misquamicut State Beach & Watch Hill	8/3 11:00
	3. Misquamicut State Beach & Watch Hill	8/3 11:00
	4. Misquamicut State Beach & Watch Hill	8/3 11:00
	5. Misquamicut State Beach	8/3 11:50 pm
	6. Misquamicut - 200 y West Atl. Ave.	8/3 12:30 pm
	7. Misquamicut - 500 y West Atl. Ave	8/3 12:45 pm
	8. Misquamicut - 1000 y West Atl. Ave.	8/3 1:30 pm
	9. Misquamicut State Beach	8/3 1:55 -
	10. Misquamicut State Beach	8/3 2:00 pm
	11. Misquamicut State Beach	8/3 2:00 pm
	12. Misquamicut	8/3 2:08 pm
	13. Misquamicut State Beach	8/3 2:08 pm
	14. Misquamicut State Beach	8/3 2:08 pm
	15. Misquamicut State Beach	8/3 4:00 pm
	16. Misquamicut State Beach	8/3 4:30 pm
	17. Misquamicut State Beach - Ferris Wheel	8/3 5:30 pm
	18. Misquamicut State Beach - Andrea Hotel 1½ miles west	8/5 11:00 am
	19. Misquamicut Beach Atl. Ave	8/6 -

Summary: 19 returned; 76% return rate; most to West

934 239

SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown - (30 - foot depth contour) -

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
11 August 1978	1. Charlestown Breachway - $\frac{1}{2}$ mile W. 500 y offshore	8/11 12:30 pm
	2. Charlestown East Beach State Park	8/11 4:14 pm
	3. Charlestown Ninigret Cons. Area	8/11 4:25 pm
	4. Charlestown Ninigret Cons. Area	8/11 4:25 pm
	5. Charlestown East Beach-150 y E. parking	8/11 4:30 pm
	6. Ninigret Cons. Area - Charlestown	8/11 4:35 pm
	7. Charlestown East Beach blue shutters	8/11 4:35 pm
	8. Charlestown East Beach blue shutters	8/11 4:35 pm
	9. Charlestown East Beach blue shutters	8/11 4:35 pm
	10. Charlestown East Beach- 160 y E. parking	8/11 4:45 pm
	11. Charlestown East Beach - parking lot	8/11 5:00 pm
	12. Charlestown East Beach	8/11 5:00 pm
	13. Charlestown East Beach	8/11 5:15 pm
	14. Charlestown East Beach	8/11 5:30 pm
	15. Watch Hill $1\frac{1}{2}$ mile E. lighthouse	8/12 4:15 pm
	16. Charlestown East Beach	8/12 4:30 pm
	17. Charlestown East Beach blue shutters	8/12 4:50 pm
	18. Charlestown East Beach blue shutters	8/12 4:55 pm
	19. Watch Hill $\frac{1}{2}$ mile E. of Ocean House	8/12 5:45 pm

Summary: 19 returned; 78% return rate; most onshore

934 240

SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown - (30 foot depth contour) -

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
15 August 1978	1. Charlestown Breach & Town Beach	8/15 3:00 pm
	2. Charlestown Beach - cottage #31	8/15 4:00 pm
	3. Charlestown Beach - 1000 W. parking lot	8/15 4:10 pm
	4. Charlestown Beach - 1200 ft. W. parking lot	8/15 4:15 pm
	5. Charlestown Beach - halfway to breach	8/15 5:00 pm
	6. Charlestown Beach - E. of breachway	8/15 5:00 pm
	7. Charlestown Beach - S. public beach	8/15 5:00 pm
	8. Charlestown Beach - 1/3 Mi. W. public beach	8/15 5:00 pm
	9. Charlestown Beach	8/15 -
	10. Charlestown Beach - state bathhouse	8/16 6:15 am
	11. Charlestown Beach - near lifeguard	8/16 7:30 am
	12. Green Hill Beach	8/16 9:15 am
	13. Green Hill Beach	8/16 9:20 am
	14. Charlestown Beach - 1/2 Mi. E publ. beach	8/16 11:00 am
	15. Charlestown Beach - East Beach	8/17 10:00 -

Summary: 15 returned; 60% return rate; most onshore

934 241

SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown - (30 - foot depth contour) -

Number Released in each case = 25 drifters

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
22 August 1978	1. Block Island - Great Salt Pond Jetty in water	8/27 10:30 am
	2. Block Island - Great Salt Pond Jetty in water	8/27 11:15 am
	3. Block Island - Great Salt Pond Jetty in water	8/27 11:40 am
	4. Weekapaug - Fenway Bench	8/28 4:00 pm
	5. Weekapaug - Fenway Bench	8/28 4:30 pm
	6. Misquamicut State Beach - 150 y West	8/28 7:30 pm
	7. Deep Hole Fishing - Matunuck	8/29 6:30 am
	8. Quonochontaug - 300 y bait shop	8/29 8:30 am
	9. Matunuck - 50 ft offshore	8/29 3:00 pm
	10. Block Island - 1/2 mi. S north light	9/3 -
	11. Block Island - New Harbor & No. Point	9/13 2:00 pm

Summary: 11 returned; 44% return rate; most offshore

934 242

SURFACE DRIFTER RETURN DATA

- for Station #3 - Nearshore Charlestown - (30 - foot depth contour) -

Number Released in each case = 25 drifters

<u>DATE OF RELEASE</u>	<u>WHERE FOUND</u>	<u>WHEN FOUND</u>
1 September 1978	1. Quonochontaug - 2½ mi. S. (210°T)	9/2 11:45
	2. Charlestown East Beach	9/3 1:00 pm
	3. Charlestown East Beach	9/3 3:30 pm
	4. Charlestown - Ninigret Cons. Area	9/3 4:00 pm
	5. Matunuck - Green Hill - ½ way	9/3 4:00 pm
	6. Charlestown East Beach - 1 mi. W. breach	9/3 5:00 pm
	7. Charlestown East Beach - 1 mi. W. breach	9/3 5:00 pm
	8. Charlestown East Beach	9/3 5:10 pm
	9. Charlestown - 1 mile W. of breach	9/3 5:15 pm
	10. Charlestown Ninigret Cons. Area	9/3 7:00 pm
	11. Block Island - ½ way Salt Pond - North Light	9/7 3:10 pm
	12. Montauk	9/11 6:30 -
	13. South Hampton, Long Island	9/15 12:30 pm

Summary: 13 returned; 52% return rate; most onshore