

Parameter	Sample fraction	Unit	Field/lab	Value type	Sample preparation	Sample transport
Alkalinity	Total	μeq^{-1}	Laboratory	Field	Whole water sample	Cool to 4°C, transport to lab for titration
Chlorophyll a	Filtered	mg^{-1}	Laboratory	Field	Vacuum filter through GFF	Freeze, transport to lab for extraction
Dissolved nitrogen as nitrate plus nitrite	Dissolved	$\mu\text{M NO}_{3+2}$	Laboratory	Field	Filtration through 0.4 micron membrane filter	Cool to 4°C, transport to lab for analysis
Dissolved nitrogen as ammonia	Dissolved	$\mu\text{M NH}_4$	Laboratory	Field	Filtration through 0.4 micron membrane filter	Cool to 4°C, transport to lab for analysis
Dissolved phosphorus as orthophosphate	Dissolved	$\mu\text{M PO}_4$	Laboratory	Field	Filtration through 0.4 micron membrane filter	Cool to 4°C, transport to lab for analysis
Total nitrogen as nitrate	Total	$\mu\text{M NO}_3$	Laboratory	Field	Addition of oxidation reagent, pressure cooked at 15 psi for 45 min	Cool to ambient, transport to lab for analysis
Total phosphorus as orthophosphate	Total	$\mu\text{M PO}_4$	Laboratory	Field	Addition of oxidation reagent, pressure cooked at 15 psi for 45 min	Cool to ambient, transport to lab for analysis
Conductivity	Hydrolab		Field	Field	Field measurement	None
Temperature	Hydrolab	°C	Field	Field	Field measurement	None
Dissolved oxygen	Hydrolab	mg L^{-1} and percent	Field	Field	Field measurement	None

		saturation by weight				
pH	Hydrolab	pH units	Field	Field	Field measurement	None
Fecal coliform	Total	Colonies/100 mL	Laboratory	Field	Whole water sample	Cool to 4°C, transport to lab for analysis

Parameter	analytical method	equipment model	quantification limits	detection limits	Technician	Reference
Alkalinity	Potentiometric titration	Altex 3500 pH meter	N/A	10 μeq^{-1} as CaCO_3	Jennifer Beeman; Kelly Chapman	APHA 1992
Chlorophyll a	Acetone extraction; spectrophotometric measurement at 750 and 664 nm	Spectronic 21	N/A	N/A	Kelly Chapman	Lorenzen 1966
Dissolved nitrogen as nitrate plus nitrite	Colorimetric determination	Lachat QuickChem AE	0.05 – 5.0 μM	1 μM	Krista Lee, Janet Cote, Brad Peck	American Public Health Association 1992; Lachat Instruments 1993, 1994
Dissolved nitrogen as ammonia	Colorimetric determination	Lachat QuickChem AE	0.07 – 3.57 μM	1 μM	Krista Lee, Janet Cote, Brad Peck	American Public Health Association 1992; Lachat Instruments 1993, 1994
Dissolved phosphorus as orthophosphate	Colorimetric determination	Lachat QuickChem AE	0.03 – 2.0 μM	1 μM	Krista Lee, Janet Cote, Brad Peck	American Public Health Association 1992; Lachat Instruments 1993, 1994
Total nitrogen as nitrate	Colorimetric determination	Lachat QuickChem	1.0 - 100 μM	1 μM	Krista Lee, Janet Cote,	Valderrama 1981

		AE			Brad Peck	
Total phosphorus as orthophosphate	Colorimetric determination	Lachat QuickChem AE	1.0 - 10 µM	1 µM	Krista Lee, Janet Cote, Brad Peck	Valderrama 1981
Conductivity (Specific)	Hydrolab	Hydrolab MiniSonde				Hydrolab 1997
Temperature	Hydrolab	Hydrolab MiniSonde				Hydrolab 1997
Dissolved oxygen	Hydrolab	Hydrolab MiniSonde				Hydrolab 1997
pH	Hydrolab	Hydrolab MiniSonde				Hydrolab 1997

Field Methods: A Hydrolab that was calibrated according to manufacturers methods before each sample trip collected dissolved oxygen, pH, temperature, conductivity and turbidity. Water levels were established and monitored using the Hydrolab depth recorder.

Laboratory methods: All laboratory analyses were performed at the Cape Cod National Seashore laboratory.

Alkalinity: Measurement was by potentiometric titration using a bromcresol indicator (American Public Health Association 1992).

Chlorophyll a: The water samples were filtered through a Whatman GFF filter. The filter was ground up and extracted with acetone. Then chlorophyll levels in the acetone extract were measured on a spectrophotometer (Lorenzen 1966).

Dissolved nutrients: Dissolved inorganic nutrients (nitrate, nitrite, ammonia, and phosphate) were determined colorimetrically on a Lachat autoanalyzer (American Public Health Association 1992; Lachat Instruments 1993, 1994).

Total nitrogen and phosphorus: Total nitrogen and phosphorus were determined simultaneously by potassium persulfate digestions followed by colorimetric analysis on the Lachat autoanalyzer (Valderrama 1981).

References Cited

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