- core HOT / SCOPE cruise attributes
  - Lance populates
  - Ken uploads into Seaview for

category	type	HOT units	Notes
biological	prochlorococcus_abundance	x10^5/ml	FCM: HOT; Caron - dilution experiemnts
biological	synechococcus_abundance	x10^5/ml	FCM: HOT; Caron - dilution experiemnts
biological	heterotrophic_bacteria_abundance	x10^5/ml	FCM: HOT; Caron - dilution experiemnts
biological	pico_eukaryote_abundance	x10^5/ml	FCM: HOT ("euk"); Caron - dilution experiemnts
biological	crocosphaera_abundance	x10^1/ml	FCM: Caron - dilution experiments
biological	heterotrophic_nanoplankton_abundance	x10^1/ml	EpiMicro: Caron - dilution experiments
biological	photo_mixo_nanoplankton_abundance	x10^1/ml	EpiMicro: Caron - dilution experiments
biological	diatom_abundance	x10^1/ml	InvMicro: Caron - dilution experiments
biological	dinoflagellate_abundance	x10^1/ml	InvMicro: Caron - dilution experiments
biological	ciliate_abundance	x10^1/ml	InvMicro: Caron - dilution experiments
biological	chlorophyllide_a	ng/l	HPLC
biological	chlorophyll_a	ng/l	HPLC
biological	chlorophyll_b	ng/l	HPLC
biological	chlorophyll_c	ng/l	HPLC
biological	chlorophyll_c4	ng/l	HPLC
biological	fluorometric_chlorophyll_a	ng/l	HPLC
biological	chloropigment_CTD	µg/l	
biological	pp_light	mg C/m^3/d	
biological	pp_dark	mg C/m^3/d	
biological	Adenosine 5' Triphosphate	ng/kg	
biological	bacterial_production_leu_light	pmol leu/l/hr	Church
biological	bacterial_production_leu_dark	pmol leu/l/hr	Church
biological	nfix_rate	nmol/l/d	Church
biological	pp_pro	µmol C/l/d	Church
biological	pp_syn	µmol C/l/d	Church
biological	pp_pico_eukaryote	µmol C/l/d	Church
biological	pp_fractionated_0.2-3	µmol C/l/d	Church
biological	pp_fractionated_>3	µmol C/l/d	Church
biological	pp_0.2PC	µmol C/l/d	Church
biological	pp_filtrate	µmol C/l/d	Church
chemical	19-prime-butanoyloxyfucoxanthin	ng/l	HPLC
chemical	19-prime-hexanoyloxyfucoxanthin	ng/l	HPLC
chemical	carotene-alpha	ng/l	HPLC
chemical	carotene-beta	ng/l	HPLC
chemical	diadinoxanthin	ng/l	HPLC
chemical	divinyl chlorophyll a	ng/l	HPLC
chemical	fucoxanthin	ng/l	HPLC
chemical	lutein	ng/l	HPLC
chemical	monovinyl chlorophyll a	ng/l	HPLC
chemical	peridinin	ng/l	HPLC
chemical	prasinoxanthin	ng/l	HPLC
chemical	violaxanthin	ng/l	HPLC
chemical	zeaxanthin	ng/l	HPLC
chemical	total_phaeopigment	ng/l	HPLC
chemical	nitrate_CTD	µmol/kg	
chemical	salinity_bottle	PSS-78	
chemical	dissolved_oxygen	µmol/kg	
chemical	dissolved_inorganic_carbon	µmol/kg	
chemical	ph	TOT25	
chemical	alkalinity	µeq/kg	
chemical	phosphate	µmol/kg	
chemical	nitrate_and_nitrite	µmol/kg	
chemical	nitrite	nmol/kg	
chemical	silicate	µmol/kg	
chemical	dissolved_organic_phosphorus	µmol/kg	
chemical	dissolved_organic_nitrogen	µmol/kg	
chemical	dissolved_organic_carbon	µmol/kg	
chemical	total_dissolved_nitrogen	µmol/kg	
chemical	total_dissolved_phosphorus	µmol/kg	

theta = °C ITS-90 potential temp
chl = fluor chl-a
chlplus = chl_c
chlb = chl_b
hplc = chl_a
ebact = pico_euk
psi = particle silicate
112 = PP_light
chlda = chlorophyllide_a

chemical	particulate_silica	nmol/kg	
chemical	particulate_carbon	µmol/kg	
chemical	particulate_nitrogen	µmol/kg	
chemical	particulate_phosphorus	nmol/kg	
chemical	d15N_total_particulate_nitrogen	‰ vs air-N	sediment traps
chemical	low_level_nitrogen	nmol/kg	
chemical	low_level_phosphorus	nmol/kg	
chemical	gas_n2o	mol/kg	
chemical	gas_ch4	mol/kg	
environment	light_intensity_exp	µmol quanta/m^2/sec	
environment	light_flux	mol quanta/m^2/d	on deck incident light for full day
environment	growth_medium		
environment	isolation_method		
location	depth_bottom	m	
location	depth_sample	m	
location	latitude	decimal degrees	
location	longitude	decimal degrees	
location	cruise_name		
location	station		
miscellaneous	collection_date	yyyy_mm_dd	
miscellaneous	collection_time	GMT	
miscellaneous	date_of_experiment	yyyy_mm_dd	
miscellaneous	filter_max	µm	
miscellaneous	filter_min	µm	
miscellaneous	filter_type		
miscellaneous	principle_investigator		
miscellaneous	treatment		
miscellaneous	volume_filtered	l	
other	cast_num		
other	rosette_position		
physical environment	pressure	dbars	
physical environment	temperature_potential	ITS-90	
physical environment	temperature_CTD	ITS-90	
physical environment	density_potential	km/m^3	
physical environment	salinity_CTD	PSS-78	
physical environment	dissolved_oxygen_CTD	µmol/kg	
physical environment	experimental_temperature	C	
process	isolation_and_growth_condition		
sequence	sra_bioproject		
sequence	ENA Sample		
sequence	genbank_acc		
sequence	sequencing_chemistry		
sequence	sequencing_method		
sequence	sample_prep_method		
sequence	num_of_reads		
sequence	gene_name		
sequence	standard_type		
sequence	tag_primer		
specimen	taxon_id		

HOT-DOGS

Hawaii Ocean Time-series Data Organization & Graphical System

Select a location ...

Units for Bottle HPLC Pigment Data

	non-integrated	integrated
Pressure	decibars	
Potential Temperature	ITS-90	ITS-90
Potential Density	kg/m^3	kg/m^2
Fluorometric Chlorophyll *a*	µg/l	mg/m^2
Pheopigments	µg/l	mg/m^2
HPLC Chlorophyll c_3	ng/l	$µg/m^2$
HPLC Chlorophyll [c_1+c_2] & Mg 3,8 DVP4A5	ng/l	$µg/m^2$
HPLC Chlorophyll c_1 + c_2 + c_3	ng/l	$µg/m^2$
HPLC Peridinin	ng/l	$µg/m^2$
HPLC 19'-Butanoyloxyfucoxanthin	ng/l	$µg/m^2$
HPLC Fucoxanthin	ng/l	$µg/m^2$
HPLC 19'-Hexanoyloxyfucoxanthin	ng/l	$µg/m^2$
HPLC Prasinoxanthin	ng/l	$µg/m^2$
HPLC Diadinoxanthin	ng/l	$µg/m^2$
HPLC Zeaxanthin	ng/l	$µg/m^2$
HPLC Chlorophyll *b*	ng/l	$µg/m^2$
HPLC chlorophyll *a*	ng/l	$µg/m^2$
HPLC Chlorophyll c_4	ng/l	$µg/m^2$
HPLC α-Carotene	ng/l	$µg/m^2$
HPLC β-Carotene	ng/l	$µg/m^2$
HPLC Carotenes (α+β)	ng/l	$µg/m^2$
HPLC Chlorophyllide *a*	ng/l	$µg/m^2$
HPLC Violaxanthin	ng/l	$µg/m^2$
HPLC Lutein	ng/l	$µg/m^2$
HPLC Monovinyl Chlorophyll *a*	ng/l	$µg/m^2$
HPLC Divinyl Chlorophyll *a*	ng/l	$µg/m^2$

Funding provided by the National Science Foundation (NSF)

Phycoerythrin 5µ fraction	ng/l	µg/m^2
Phycoerythrin 10µ fraction	ng/l	µg/m^2
Heterotrophic Bacteria	# x 10^5/ml	# x 10^{11}/m^2
Prochlorococcus	# x 10^5/ml	# x 10^{11}/m^2
Synechococcus	# x 10^5/ml	# x 10^{11}/m^2
Eukaryotes pico-euk?	# x 10^5/ml	# x 10^{11}/m^2
Adenosine 5'-Triphosphate	ng/kg	µg/m^2
Nitrous Oxide NOx	nmol/kg	µmol/m^2
Primary Production: Light 12	mg C/m^3	mg/m^2/day
Primary Production: Dark 12	mg C/m^3	mg/m^2/day

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HOT-DOGS

Hawaii Ocean Time-series Data Organization & Graphical System

Select a location ...

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Units for Epi-Fluorescence Microscopy Data

	non-integrated	integrated
Depth	meters	
Diatom	µg C/l	mg C/m^2
Prymnesiophytes	µg C/l	mg C/m^2
Autotrophic dinoflagellates	µg C/l	mg C/m^2
Crocosphaera	µg C/l	mg C/m^2
Trichodesmium	µg C/l	mg C/m^2
Other Autotrophs	µg C/l	mg C/m^2
Heterotrophic dinoflagellate	µg C/l	mg C/m^2
Other Heterotrophs	µg C/l	mg C/m^2
Autotroph Biomass by size class	µg C/l	mg C/m^2
Heterotroph Biomass by size class	µg C/l	mg C/m^2

Funding provided by the National Science Foundation (NSF)

Core Measurements at BATS

Parameter	Depth Range (m)	Method/Instrument
	Continuous electronic measurements	
Temperature	0 - 4200	Dual SBE-03f sensors
Conductivity	0 - 4200	Dual SBE04 sensors
Pressure	0 - 4200	SeaBird Digiquartz
Dissolved Oxygen	0 - 4200	SBE43 polarographic membrane sensors
Fluorescence	0 - 4200	Chelsea Instruments
	Discrete Samples	
Salinity	0 - 4200	Guildline Autosal 8400B
Dissolved Oxygen	0 - 4200	Winkler Titration, UV endpoint
Total CO_2	0 - 500	Automated coulometric analysis
Alkalinity	0 - 500	High precision titration
Nitrate, Nitrite	0 - 4200	CFA colorometric using Technicon-2
Phosphate	0 - 4200	CFA colorometric using Technicon-2
Silicate	0 - 4200	CFA colorometric using Technicon-2
Dissolved Organic Carbon	0 - 4200	High temperature catalytic oxidation
Dissolved Organic Nitrogen	0 - 4200	UV oxidation
Particulate Organic Carbon	0 - 1000	High temperature combustion CHN analyzer
Particulate Organic Nitrogen	0 - 1000	High temperature combustion CHN analyzer
Particulate Silicate	0 - 1000	Chemical digestion, colorometric analysis
Phytoplankton Pigments	0 - 250	HPLC
Fluorometric Chlorophyll a	0 - 250	Turner fluorometer
Bacteria Enumeration	0 - 4000	DAPI stained, fluorescence microscopy
	Rate Measurements	
Primary Production	0 - 140	in-situ incubation , 14C uptake
Bacterial activity	0 - 300	Thymidine incorporation
Particle Fluxes	150, 200, 300	Free drifting surface tethered MultiPITs
Mass flux		Gravimetric analysis
Total Carbon flux		Swimmer removal, CHN analysis
Organic carbon flux		Swimmer removal, acidification , CHN
Organic nitrogen flux		Swimmer removal, CHN analysis