

Rosette Bottle Data (nutrients and chlorophyll) from 31 cruises on the R/V Wecoma, R/V Atlantis, and R/V New Horizon in the Northeast Pacific from 1997-2004 as part of the U.S. GLOBEC program (NEP project)

Website: <https://www.bco-dmo.org/dataset/2456>

Version: 2007-04-05

Version Date: 2012-06-12

Project

» [U.S. GLOBEC Northeast Pacific](#) (NEP)

Program

» [U.S. GLOBal ocean ECosystems dynamics](#) (U.S. GLOBEC)

Contributors	Affiliation	Role
Wheeler, Patricia	Oregon State University (OSU-CEOAS)	Principal Investigator
Allison, Dicky	Woods Hole Oceanographic Institution (WHOI)	BCO-DMO Data Manager

Table of Contents

- [Dataset Description](#)
 - [Methods & Sampling](#)
 - [Data Processing Description](#)
- [Data Files](#)
- [Parameters](#)
- [Instruments](#)
- [Deployments](#)
- [Project Information](#)
- [Program Information](#)
- [Funding](#)

Dataset Description

Data are from Niskin bottle sampling on cruises in 1997 to 2004. For corresponding CTD data see files on the [US GLOBEC data system](#). Data are final; see the 1997-2004 Nutrient/Chlorophyll Data Report (below) for details. Data are organised by year, cruise, transect, and station. Station numbers are included for reference to other cruise data.

Metadata revised: June 12, 2012

Methods & Sampling

The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu). Data are from Niskin bottle sampling on cruises in 1997 to 2004. Complete information on sample collection and analyses is available in the [Data Report](#) (PDF)

Data Processing Description

Complete analyses information is available in the [Data Report](#) (PDF).

The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.

BCO-DMO corrected the 2004 Wecoma cruise ID from 'W0409' to 'W0408D'; the data report was updated in June 2012 to reflect this change.

[[table of contents](#) | [back to top](#)]

Data Files

File
nuts_chl.csv (Comma Separated Values (.csv), 631.89 KB) MD5:0c2b4dc27911a711dde79bd2af77cb32
Primary data file for dataset ID 2456

[[table of contents](#) | [back to top](#)]

Parameters

Parameter	Description	Units
year	Year of data collected	4 digit number
cruiseid	Cruise Identifier	alphanumeric string
transect	Two or three character transect abbreviation	Letters
station	Station number	1 - 2 digit number
station_std	Standard station identifier	Alphanumeric string
month_gmt	GMT month data collected	1 - 2 digit number
day_gmt	GMT day data collected	1 - 2 digit number
time_gmt	Time data collected	4 digit number
lat	Latitude, north is positive	Decimal degrees
lon	Longitude, east is positive	Decimal degrees
press	Pressure	dbar
temp	Water temperature	Degrees centigrade
sal	Salinity	psu
PO4	PO4	micromoles/liter
NH4	NH4	micromoles/liter
SiO2	SiO2	micromoles/liter
NO3_NO2	NO3 plus NO2	micromoles/liter
NO2	NO2	micromoles/liter
NO3	NO3	micromoles/liter
chl_a	Chlorophyll	micrograms/liter

[[table of contents](#) | [back to top](#)]

Instruments

Dataset-specific Instrument Name	Niskin Bottle
Generic Instrument Name	Niskin bottle
Dataset-specific Description	Niskin bottle cast used to collect water samples for pigment, nutrient, plankton, etc. analysis
Generic Instrument Description	A Niskin bottle (a next generation water sampler based on the Nansen bottle) is a cylindrical, non-metallic water collection device with stoppers at both ends. The bottles can be attached individually on a hydrowire or deployed in 12, 24, or 36 bottle Rosette systems mounted on a frame and combined with a CTD. Niskin bottles are used to collect discrete water samples for a range of measurements including pigments, nutrients, plankton, etc.

[[table of contents](#) | [back to top](#)]

Deployments

W9709B

Website	https://www.bco-dmo.org/deployment/57621
Platform	R/V Wecoma
Start Date	1997-09-19
End Date	1997-09-20
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W9711C

Website	https://www.bco-dmo.org/deployment/57622
Platform	R/V Wecoma
Start Date	1997-11-15
End Date	1997-11-22
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W9801B

Website	https://www.bco-dmo.org/deployment/57623
Platform	R/V Wecoma
Start Date	1998-01-30
End Date	1998-02-02
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W9804A

Website	https://www.bco-dmo.org/deployment/57624
Platform	R/V Wecoma
Start Date	1998-04-04
End Date	1998-04-10
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W9808A

Website	https://www.bco-dmo.org/deployment/57625
Platform	R/V Wecoma
Start Date	1998-08-06
End Date	1998-08-14
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W9809A

Website	https://www.bco-dmo.org/deployment/57626
Platform	R/V Wecoma
Start Date	1998-09-24
End Date	1998-09-26
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W9811A

Website	https://www.bco-dmo.org/deployment/57627
Platform	R/V Wecoma
Start Date	1998-11-16
End Date	1998-11-20
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W9902A

Website	https://www.bco-dmo.org/deployment/57628
Platform	R/V Wecoma
Start Date	1999-02-17
End Date	1999-02-18
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W9904B

Website	https://www.bco-dmo.org/deployment/57629
Platform	R/V Wecoma
Start Date	1999-04-19
End Date	1999-04-22
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W9907A

Website	https://www.bco-dmo.org/deployment/57630
Platform	R/V Wecoma
Start Date	1999-07-03
End Date	1999-07-09
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W9909C

Website	https://www.bco-dmo.org/deployment/57631
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/sep99cr.pdf
Start Date	1999-09-22
End Date	1999-09-27
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W9911A

Website	https://www.bco-dmo.org/deployment/57632
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/nov99cr.pdf
Start Date	1999-11-03
End Date	1999-11-05
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0002A

Website	https://www.bco-dmo.org/deployment/57596
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/feb00cr.pdf
Start Date	2000-02-01
End Date	2000-02-03
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0004B

Website	https://www.bco-dmo.org/deployment/57597
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/apr00cr.pdf
Start Date	2000-04-11
End Date	2000-04-17
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0007A

Website	https://www.bco-dmo.org/deployment/57599
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/jul00cr.pdf
Start Date	2000-07-07
End Date	2000-07-13
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0009A

Website	https://www.bco-dmo.org/deployment/57601
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/sep00cr.pdf
Start Date	2000-09-07
End Date	2000-09-12
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0101C

Website	https://www.bco-dmo.org/deployment/57602
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/jan01cr.pdf
Start Date	2001-01-27
End Date	2001-01-29
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0103B

Website	https://www.bco-dmo.org/deployment/57603
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/mar01cr.pdf
Start Date	2001-03-20
End Date	2001-03-24
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0107A

Website	https://www.bco-dmo.org/deployment/57604
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/jul01cr.pdf
Start Date	2001-07-06
End Date	2001-07-09
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0109A

Website	https://www.bco-dmo.org/deployment/57605
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/sep01cr.pdf
Start Date	2001-09-04
End Date	2001-09-10
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0111B

Website	https://www.bco-dmo.org/deployment/57606
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/nov01cr.pdf
Start Date	2001-11-27
End Date	2001-11-29
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0202A

Website	https://www.bco-dmo.org/deployment/57607
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/feb02cr.pdf
Start Date	2002-02-19
End Date	2002-02-21
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0204A

Website	https://www.bco-dmo.org/deployment/57608
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/apr02cr.pdf
Start Date	2002-04-04
End Date	2002-04-10
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0207A

Website	https://www.bco-dmo.org/deployment/57610
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/jul02cr.pdf
Start Date	2002-07-09
End Date	2002-07-15
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

AT7-21

Website	https://www.bco-dmo.org/deployment/57490
Platform	R/V Atlantis
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/sep02cr.pdf
Start Date	2002-09-27
End Date	2002-10-03
Description	<p>funded by NSF OCE-0000733 UNOLS schedule link The original data from this cruise are available from the NSF R2R data catalog.</p> <p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0212A

Website	https://www.bco-dmo.org/deployment/57611
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/dec02cr.pdf
Start Date	2002-12-03
End Date	2002-12-05
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0302A

Website	https://www.bco-dmo.org/deployment/57612
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/feb03cr.pdf
Start Date	2003-02-14
End Date	2003-02-16
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0304A

Website	https://www.bco-dmo.org/deployment/57613
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/apr03cr.pdf
Start Date	2003-04-01
End Date	2003-04-06
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

NH0307A

Website	https://www.bco-dmo.org/deployment/57560
Platform	R/V New Horizon
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/jul03cr.pdf
Start Date	2003-07-02
End Date	2003-07-08
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0309B

Website	https://www.bco-dmo.org/deployment/57617
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/sep03cr.pdf
Start Date	2003-09-26
End Date	2003-10-01
Description	<p>Methods & Sampling The LTOP Nutrient & chlorophyll data were collected by Pat Wheeler (pwheeler@coas.oregonstate.edu) Data are from Niskin bottle sampling on cruises in 1997 to 2004.</p> <p>Processing Description The nuts_chl_lev0 datafile: nuts_chl.dat file was created with clean_revise_wheeler_nut_chl2.pl v0.5.</p>

W0408D

Website	https://www.bco-dmo.org/deployment/57618
Platform	R/V Wecoma
Report	http://globec.whoi.edu/nep/reports/ccs_cruises/aug04cr.pdf
Start Date	2004-08-30
End Date	2004-09-03

[[table of contents](#) | [back to top](#)]

Project Information

U.S. GLOBEC Northeast Pacific (NEP)

Website: <http://nepglobec.bco-dmo.org>

Coverage: Northeast Pacific Ocean, Gulf of Alaska

Program in a Nutshell

Goal: To understand the effects of climate variability and climate change on the distribution, abundance and production of marine animals (including commercially important living marine resources) in the eastern North Pacific. To embody this understanding in diagnostic and prognostic ecosystem models, capable of capturing the ecosystem response to major climatic fluctuations.

Approach: To study the effects of past and present climate variability on the population ecology and population dynamics of marine biota and living marine resources, and to use this information as a proxy for how the ecosystems of the eastern North Pacific may respond to future global climate change. The strong temporal variability in the physical and biological signals of the NEP will be used to examine the biophysical mechanisms through which zooplankton and salmon populations respond to physical forcing and biological interactions in the coastal regions of the two gyres. Annual and interannual variability will be studied directly through **long-term observations** and detailed **process studies**; variability at longer time scales will be examined through **retrospective analysis** of directly measured and proxy data. Coupled **biophysical models** of the ecosystems of these regions will be developed and tested using the process studies and data collected from the long-term observation programs, then further tested and improved by hindcasting selected retrospective data series.

[[table of contents](#) | [back to top](#)]

Program Information

U.S. GLOBAL ocean ECosystems dynamics (U.S. GLOBEC)

Website: <http://www.usglobec.org/>

Coverage: Global

U.S. GLOBEC (GLOBAL ocean ECosystems dynamics) is a research program organized by oceanographers and fisheries scientists to address the question of how global climate change may affect the abundance and production of animals in the sea.

The U.S. GLOBEC Program currently had major research efforts underway in the Georges Bank / Northwest Atlantic Region, and the Northeast Pacific (with components in the California Current and in the Coastal Gulf of Alaska). U.S. GLOBEC was a major contributor to International GLOBEC efforts in the Southern Ocean and Western Antarctic Peninsula (WAP).

[[table of contents](#) | [back to top](#)]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0000733
NSF Division of Ocean Sciences (NSF OCE)	OCE-9732386
National Oceanic and Atmospheric Administration (NOAA)	NA67RJ0151 (NEP)
National Oceanic and Atmospheric Administration (NOAA)	NA86OP0589 (NEP)

[[table of contents](#) | [back to top](#)]