



QA/QC of Aleutian Buoy and Airport Observation Data

Background Document

prepared

by

Uwe Gramann, P.Met.
Mountain Weather Services
Smithers, BC

October 2012

Airport Data Comments:

- Dataset includes hourly auto station reports as well as off-hour specials (whenever a ‘significant’ change of weather occurs - which is highly irregular). As a result some days (usually with worse weather) will have more observations than others (usually with better days).
- Sky conditions that indicate only one cloud amount descriptor (“FEW”, “SCT”, “BKN” or “OVC”) were not erased, but no ceiling was assigned.
- All missing data is blank (no special label for missing data was used).
- Extracted ceiling data added is in feet AGL. Missing data is left blank and unlimited ceilings (up to 12000 feet) are labeled “9999”.

Buoy Data Comments

- All missing data are blank (no special label for missing data was used).
- Records are riddled with irregularly missing parameters (did not throw out the whole record since at least a few parameters are always available).
- No buoy visibility was observed.
- No buoy “tide” was observed.

Airports

State	Name	ICAO	IATA	SYNOP	LAT	LON	ELEV
AK	COLD BAY	PACD	CDB	70316	55 12N	162 43W	30
AK	ADAK NAS	PADK	ADK	70454	51 53 N	176 39W	4
AK	DUTCH HARBOR	PADU	DUT	70489	53 54N	166 32W	4



Figure 1 http://en.wikipedia.org/wiki/Cold_Bay_Airport



Figure 2 http://en.wikipedia.org/wiki/Adak_Airport



Figure 3 http://en.wikipedia.org/wiki/Unalaska_Airport

Buoys

46070



http://www.ndbc.noaa.gov/station_page.php?station=46070

<http://www.ndbc.noaa.gov/data/climatic/46070.txt>

Owned and maintained by National Data Buoy Center

6-meter NOMAD buoy

ARES payload

55.083 N 175.270 E (55°5'0" N 175°16'12" E)

Site elevation: sea level

Air temp height: 4 m above site elevation

Anemometer height: 5 m above site elevation

Barometer elevation: sea level

Sea temp depth: 1 m below site elevation

Water depth: 3804 m

Watch circle radius: 3351 yards

46072



http://www.ndbc.noaa.gov/station_page.php?station=46072

<http://www.ndbc.noaa.gov/data/climatic/46072.txt>

Owned and maintained by National Data Buoy Center

6-meter NOMAD buoy

ARES 4.4 payload

51.663 N 172.162 W (51°39'46" N 172°9'43" W)

Site elevation: sea level

Air temp height: 4 m above site elevation

Anemometer height: 5 m above site elevation

Barometer elevation: sea level

Sea temp depth: 1 m below site elevation

Water depth: 3292 m

Watch circle radius: 3551 yards

46073



http://www.ndbc.noaa.gov/station_page.php?station=46073

<http://www.ndbc.noaa.gov/data/climatic/46073.txt>

Owned and maintained by National Data Buoy Center

12-meter discus buoy

MARS payload

55.011 N 171.981 W (55°0'40" N 171°58'50" W)

Site elevation: sea level

Air temp height: 10 m above site elevation

Anemometer height: 10 m above site elevation

Barometer elevation: sea level

Sea temp depth: 1 m below site elevation

Water depth: 3474.7 m

Watch circle radius: 3130 yards

46075



http://www.ndbc.noaa.gov/station_page.php?station=46075

<http://www.ndbc.noaa.gov/data/climatic/46075.txt>

Owned and maintained by National Data Buoy Center

6-meter NOMAD buoy

ARES payload

53.911 N 160.806 W (53°54'39" N 160°48'21" W)

Site elevation: sea level

Air temp height: 4 m above site elevation

Anemometer height: 5 m above site elevation

Barometer elevation: sea level

Sea temp depth: 1 m below site elevation

Water depth: 2487 m

Watch circle radius: 2529 yards

Other Sources of info

Buoy Data: <http://www.ndbc.noaa.gov/>

Airport Data: Obtained by Nuka Research and Planning Group.

Sunshine Hours: <http://archive.nrc-cnrc.gc.ca/eng/services/hia/sunrise-sunset/angle-calculator.html>

Buoy Parameters

(see also: <http://www.ndbc.noaa.gov/measdes.shtml>)

ID	Unique Record Identifier (not always chronological)
BuoyID	WMO identifier
UTC	Time stamp in UTC
WDIR	Wind direction (the direction the wind is coming from in degrees clockwise from true N) during the same period used for WSPD
WSPD	Wind speed (m/s) averaged over an eight-minute period.
GST	Peak 5 second gust speed (m/s) measured during the eight-minute period.
WVHT	Significant wave height (meters) is calculated as the average of the highest one-third of all of the wave heights during the 20-minute sampling period
DPD	Dominant wave period (seconds) is the period with the maximum wave energy
APD	Average wave period (seconds) of all waves during the 20-minute period
ATMP	Air temperature (Celsius)
WTMP	Sea surface temperature (Celsius)
PRES	Sea level pressure (hPa). For C-MAN sites and Great Lakes buoys, the recorded pressure is reduced to sea level using the method described in <i>NWS Technical Procedures Bulletin 291 (11/14/80)</i> .
DEWP	Dewpoint temperature taken at the same height as the air temperature measurement in degrees Celsius.

Airport Parameters

(see also: <http://cdo.ncdc.noaa.gov/qclcd/qclcddocumentation.pdf>)

ID	Unique Record Identifier (not always chronological)
Airport	Airport Name
UTC	Time stamp in UTC
ObsType	Type of observation (Navy aviation Metar, NWS climate etc.)
RecordType	Record Type (Auto station etc.)
SkyCondition	Aviation cloud observations; some records only display a three



	letter word (e.g. "OVC" which should be considered suspect)
Ceiling	Aviation ceiling extracted from Sky Condition. Unlimited if "9999".
Visibility	Visibility In Statute Miles (SM)
WeatherType	Obstruction to vision/weather types.
DryBulbCelsius	Air Temperature (Degrees C)
DewPointCelsius	Dew Point Temperature (Degrees C)
WindDirection	Wind Direction (Tens Of Degrees From True North)
WindSpeed Kt	Wind Speed (Knots/Nautical Miles Per Hour)
StationPressure	Station Pressure (Hectopascal/Millibar)
SeaLevelPressure	Sea Level Pressure (Hectopascal/Millibar)

Conversions Used

1 m/s	1.942615 knots
1 m	3.281 feet
1 km/h	0.539956 knots
1 km	0.539956 nm
1 km/h	0.2778 m/s
1 m/s	3.6 km/h
	1.15155
1 kt	mile/hour
1 inch	25.4 mm
1 in hg	33.8639 hPa

Time Zones

Dutch Harbour	UTC -9
Adak	UTC -10
Cold Bay	UTC -9
46070	UTC -10
46072	UTC -10
46073	UTC -10
46075	UTC -9



Flags

- RS5 Wind speed range extreme/suspect
- CS6 Consistency between gust and mean wind extreme/suspect
- RS9 Wave height range suspect
- RS11 Dominant wave period range suspect/extreme
- RS13 Average wave period range suspect/extreme
- CS15 Dew point depression range suspect/extreme
- RS17 Pressure range suspect/extreme
- RS19 Air temperature range suspect/extreme
- RS21 Water temperature range suspect/extreme
- RS23 Dew point range suspect/extreme
- RS24 Visibility range suspect/extreme
- CS27 Consistency between sea level pressure and wind speed suspect/extreme
- CS29 Consistency between visibility and dew point depression suspect/extreme



Mountain Weather Services

PO 4341 3967 Broadway Ave Smithers BC V0J 2N0

T: 250.877.0001

Ranges used for flagging suspect, extreme and rejected values:

	January				February				March				April				May				June			
	Extreme/Suspect		Reject		Extreme/Suspect		Reject		Extreme/Suspect		Reject		Extreme/Suspect		Reject		Extreme/Suspect		Reject		Extreme/Suspect		Reject	
	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
DEWP	-18	7	-28	17	-18	6	-28	16	-18	6	-28	16	-14	7	-24	17	-13	8	-23	18	-11	10	-21	20
ATMP	-8	7	-18	17	-8	6	-18	16	-8	6	-18	16	-4	7	-14	17	-3	8	-13	18	-1	10	-11	20
WTMP	1	6	0	9	1	6	0	9	1	6	0	9	1	6	0	9	2	9	0	12	3	12	0	15
PRES	965	1045	950	1050	965	1045	950	1050	965	1045	950	1050	975	1045	950	1050	980	1045	950	1050	990	1045	950	1050
WSPD																								
m/s	0	25	0	35	0	25	0	35	0	23	0	33	0	20	0	30	0	17	0	27	0	15	0	25
WVHT	0	12	0	17	0	11	0	16	0	10	0	15	0	9	0	14	0	7	0	12	0	5	0	10
DPD	0	18	0	23	0	18	0	23	0	18	0	23	0	18	0	23	0	18	0	23	0	18	0	23
APD	0	13	0	18	0	13	0	18	0	12	0	17	0	11	0	16	0	10	0	15	0	10	0	15

	July				August				September				October				November				December			
	Extreme/Suspect		Reject		Extreme/Suspect		Reject		Extreme/Suspect		Reject		Extreme/Suspect		Reject		Extreme/Suspect		Reject		Extreme/Suspect		Reject	
	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
DEWP	-6	13	-16	23	-5	16	-15	26	-5	14	-15	24	-11	12	-21	22	-14	10	-24	20	-17	8	-27	18
ATMP	4	13	-6	23	5	16	-5	26	5	14	-5	24	-1	12	-11	22	-4	10	-14	20	-7	8	-17	18
WTMP	6	15	0	18	6	16	0	19	6	14	0	17	5	11	0	14	3	10	0	13	1	8	0	11
PRES	995	1045	950	1050	985	1045	950	1050	980	1045	950	1050	975	1045	950	1050	970	1045	950	1050	965	1045	950	1050
WSPD																								
m/s	0	15	0	25	0	20	0	30	0	20	0	30	0	23	0	33	0	25	0	35	0	25	0	35
WVHT	0	5	0	10	0	5	0	10	0	8	0	13	0	9	0	14	0	10	0	15	0	11	0	16
DPD	0	18	0	23	0	18	0	23	0	18	0	23	0	18	0	23	0	18	0	23	0	18	0	23
APD	0	10	0	15	0	10	0	15	0	11	0	16	0	12	0	17	0	12	0	17	0	13	0	18

Monthly Data Availability

(Note: Not ALL records contain ALL parameters)





