

# Northwestern Hawaiian Islands Lidar Validation Mission

## Check Point Survey Report



June 2011

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## Background

The U.S. Geological Survey (USGS) contracted with Hawai'i-based Aerial Surveying, Inc. to collect lidar-derived elevation data over the low-lying areas within the northwestern Hawaiian Islands (NWHI) during the summer of 2010. A separate contract issued to Aerial Surveying, Inc. by the National Oceanic and Atmospheric Administration (NOAA) funded the lidar data processing and elevation data product development phases of the project. Lidar data provide high resolution digital elevation models that are used for many applications, including but not limited to sea level rise modeling, habitat assessments, and tsunami inundation modeling. In April 2011, NOAA deployed a survey crew to the NWHI to collect high accuracy point data to validate the 2010 lidar data. The survey crew used survey-grade Global Positioning System (GPS) receivers to collect high accuracy elevation points.

This work was conducted under permit number PMNM-2010-033 as approved by NOAA, the U.S. Fish and Wildlife Service (USFWS), and the State of Hawai'i, and acknowledged by Dr. Charles L. Littnan of NOAA's Pacific Islands Fisheries Science Center.

## Methodology

### Personnel

The field crew was composed of scientists from NOAA's Pacific Services Center (Jamie Carter, Survey Crew Chief) and NOAA's Papahānaumokuākea Marine National Monument (Joey Lecky, Survey Technician). Additional support was provided by several other land-based and ship-based scientists and crew. NOAA's Marine Debris Team and crew from the NOAA Ship Oscar Elton Sette provided transport to and from the islands. NOAA's Monk Seal Team provided ship-based logistical support and on-island escorts at Pearl and Hermes Atoll, Lisianski Island, and Pearl and Hermes Atoll. On-island escorts were provided by US Fish and Wildlife at Midway Atoll, Laysan Island, and French Frigate Shoals. The State of Hawai'i Division of Forestry and Wildlife (DOFAW) provided on-island escorts on at Kure Atoll.

### Survey Sites

Six general areas were surveyed in the NWHI. Within each area, only the most stable islands were surveyed. These islands were determined to be those with persistent ground cover and/or hard substrate. The resulting target areas included the following:

1. Midway Atoll (Sand Island, Spit Island, and Eastern Island)
2. Kure Atoll (Green Island)
3. Pearl and Hermes Atoll (Southeast Island, Grass Island, North Island, and Seal-Kittery Island)
4. Lisianski Island
5. Laysan Island
6. French Frigate Shoals (Tern Island, Trig Island, East Island)

### Field Data Collection

Survey-grade Global Positioning System (GPS) receivers were used to establish robust geodetic networks within each survey area. A dual-frequency L1/L2 Thales Z-Max GPS receiver was used as a base station. It collected data continuously throughout each day of survey activity and was set up on existing geodetic markers when possible. NOAA's National Geodetic Survey (NGS) established a network of 3<sup>rd</sup> order benchmarks in the NWHI during a 2001 research cruise. These marks and older U.S. Navy Hydrographic Office marks were used where they were available.

## NWHI Lidar Validation Mission

Two single-frequency L1 ProMark 3 GPS receivers were used as roving instruments and collected the actual lidar validation points. A minimum of 20 points were surveyed in each island or atoll area to allow for a statistically rigorous analysis of the accuracy of the lidar data. With 20 points, one point is allowed to fail the vertical error threshold established with the lidar contractor without the entire lidar data set being rejected. The locations selected for GPS survey points had to exhibit the following characteristics:

- Flat and bare ground that is at least 4 meters in diameter
- Absence of tall vegetation within 5 meters of the point
- Stable ground (i.e. not impacted by the severe storm of 11 February or the tsunami of 11 March)

The base station receiver was set up on a known geodetic mark each morning of each survey day. After it was secure and running, the team began collecting rover points around the perimeters of the islands and in select interior locations when accompanied by escorts. Each observation, or period of time that the GPS receiver collected data at a single location, lasted the minimum amount of time required to obtain a fixed solution with sub-centimeter horizontal and vertical accuracies. For most points this was between five and fifteen minutes depending on the baseline length to the network base station. A minimum of three photographs were taken of each point from different angles to characterize the ground plane and surrounding obstructions (e.g. towers, buildings, trees, shrubs). For each point, the field crew recorded the point identification, antenna height, observation start and end times, photograph identification numbers, and any other comments regarding the site suitability. All of these data were recorded in field books and later transferred to data sheets and finally to this survey report.

Table 1. Field survey itinerary and associated base stations.

Date	Island/Atoll	Base Station ID	PID
4/8/2011	Midway Atoll	MISE	BBCG31
4/9/2011	Midway Atoll	MISE	BBCG31
4/11/2011	Kure Atoll	KUBA	DE5247
4/12/2011	Kure Atoll	KUBA	DE5247
4/13/2011	Pearl and Hermes Atoll	PHBA	
4/14/2011	Pearl and Hermes Atoll	PHBA	
4/15/2011	Lisianski Island	LIBA	DE5248
4/16/2011	Laysan Island	LABA	DE5231
4/18/2011	French Frigate Shoals	FFBA	

## Data Processing

The raw GPS data were downloaded from the receivers and archived with the field photographs and other notes. The GPS data were then imported into Ashtech's GNSS Solutions software (version 3.60.1) for post-processing and adjustment of the GPS data. The GPS base stations were processed through NGS' online positioning user service (OPUS) to obtain both NAD83 and ITRF00 position solutions. The ITRF ellipsoid heights were used where known heights were not available from NGS datasheets.

## Results

The two-step data processing methodology produced corrected positions for the base station points and adjusted positions for the roving points. The OPUS-derived base station coordinates were entered in GNSS Solutions to fix their positions and allow the roving points to adjust accordingly.

### Base Station Positions

The position for each base station was processed in the North American Datum of 1983 (NAD83) horizontal datum and projected in the appropriate Universal Transverse Mercator (UTM) zone. Each position was also determined in relation to two vertical datums: NAD83/GRS80 and WGS84 (table 2). OPUS was used to generate fixed positions for the base stations. These positions were compared against known geodetic control where it was available. In those cases, the published datasheet positions were processed using NGS' Horizontal Time Dependent Positioning (HTDP) tool to update them with known velocities.

Table 2. Base station positions

<b>Station ID</b>	<b>NAD83/UTM Zone</b>	<b>NAD83/UTM Easting (m)</b>	<b>NAD83/UTM Northing (m)</b>	<b>GRS80 Ellipsoid (m)</b>	<b>WGS84 Ellipsoid (m)</b>
<b>MISE</b>	1	463864.652	3120774.895	3.224	4.211
<b>KUBA</b>	1	373237.095	3141502.655	5.715	6.731
<b>PHBA</b>	1	616609.245	3074364.825	4.894	5.833
<b>LIBA</b>	2	203752.392	2886073.205	8.913	9.784
<b>LABA</b>	2	425911.667	2850913.435	17.182	17.978
<b>FFBA</b>	3	368923.846	2640253.448	18.470	19.070

### Roving Positions

The roving positions were processed in GNSS Solutions using the base station positions shown in table 2. The resulting positions include information about the region, island, latitude, longitude, easting, northing, UTM zone, and ellipsoid heights (GRS80 and WGS84). See table 3 for the full list.

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Table 3. Roving positions

Region	Island	Site_ID	Latitude_NA D83	Longitude_NAD 83	Easting_NAD 83	Northing_NAD 83	UTM_Zo ne	Ellipsoid_Height_GR S80	Ellipsoid_Height_WG S84
Kure Atoll	Green	J031	28.39855	-178.29	373650	3142029	1	5.451	6.467
Kure Atoll	Green	H022	28.39152	-178.293	373353.9	3141254	1	4.995	6.011
Kure Atoll	Green	H036	28.3954	-178.289	373732.3	3141679	1	5.342	6.358
Kure Atoll	Green	H023	28.39155	-178.292	373442.5	3141256	1	5.164	6.18
Kure Atoll	Green	H024	28.39056	-178.294	373230	3141148	1	5.609	6.625
Kure Atoll	Green	H025	28.39379	-178.294	373234	3141506	1	5.708	6.724
Kure Atoll	Green	H026	28.3896	-178.296	373044.5	3141045	1	5.762	6.778
Kure Atoll	Green	H027	28.38915	-178.297	372918	3140996	1	5.918	6.934
Kure Atoll	Green	H028	28.38868	-178.299	372772.8	3140945	1	6.055	7.07
Kure Atoll	Green	H029	28.38828	-178.3	372675.9	3140902	1	6.041	7.057
Kure Atoll	Green	H030	28.38788	-178.301	372545.7	3140859	1	6.19	7.206
Kure Atoll	Green	H031	28.38697	-178.302	372444.4	3140759	1	5.869	6.886
Kure Atoll	Green	H032	28.38724	-178.303	372379.7	3140789	1	6.202	7.218
Kure Atoll	Green	H033	28.39689	-178.292	373443.6	3141848	1	5.172	6.188
Kure Atoll	Green	H034	28.39905	-178.29	373640.8	3142085	1	5.25	6.267
Kure Atoll	Green	H035	28.39846	-178.291	373557.9	3142020	1	4.501	5.517
Kure Atoll	Green	J019	28.39116	-178.292	373465	3141212	1	5.521	6.537
Kure Atoll	Green	J032	28.39813	-178.29	373653.3	3141983	1	5.302	6.318
Kure Atoll	Green	J020	28.39064	-178.293	373322.7	3141157	1	5.694	6.71
Kure Atoll	Green	J033	28.39526	-178.289	373736.7	3141664	1	5.296	6.312
Kure Atoll	Green	J021	28.38998	-178.295	373138.5	3141086	1	5.844	6.86
Kure Atoll	Green	J034	28.39483	-178.291	373481.3	3141619	1	5.325	6.341
Kure Atoll	Green	J022	28.38984	-178.296	373033.4	3141070	1	5.796	6.812
Kure Atoll	Green	J023	28.3894	-178.297	372902.5	3141024	1	5.951	6.967
Kure Atoll	Green	J024	28.38894	-178.299	372767.1	3140974	1	6.095	7.111
Kure Atoll	Green	J025	28.38852	-178.3	372651.8	3140928	1	6.112	7.129
Kure Atoll	Green	J027	28.38815	-178.301	372543.8	3140889	1	6.188	7.203
Kure Atoll	Green	J028	28.38759	-178.303	372377	3140829	1	6.32	7.336

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Region	Island	Site_ID	Latitude_NA D83	Longitude_NAD 83	Easting_NAD 83	Northing_NAD 83	UTM_Zo ne	Ellipsoid_Height_GR S80	Ellipsoid_Height_WG S84
Kure Atoll	Green	J029	28.38747	-178.303	372320.3	3140816	1	4.917	5.936
Kure Atoll	Green	J030	28.39734	-178.292	373448.8	3141898	1	4.015	5.031
Midway Atoll	Sand	J011	28.21191	-177.368	463839.4	3120732	1	3.162	4.149
Midway Atoll	Sand	J010	28.20292	-177.374	463257.1	3119738	1	2.933	3.92
Midway Atoll	Sand	J009	28.19685	-177.394	461306.1	3119072	1	3.658	4.646
Midway Atoll	Sand	J008	28.21417	-177.386	462087.7	3120988	1	3.037	4.025
Midway Atoll	Eastern	J007	28.20788	-177.336	467031.4	3120277	1	3.511	4.498
Midway Atoll	Eastern	J006	28.20976	-177.33	467601.9	3120483	1	3.438	4.424
Midway Atoll	Eastern	J005	28.21027	-177.328	467861.8	3120538	1	4.055	5.041
Midway Atoll	Eastern	J004	28.21163	-177.327	467885.3	3120690	1	4.064	5.05
Midway Atoll	Eastern	J003	28.2131	-177.329	467702.9	3120852	1	3.811	4.797
Midway Atoll	Eastern	J002	28.21053	-177.332	467442.2	3120569	1	3.255	4.242
Midway Atoll	Sand	J001	28.215	-177.362	464497.2	3121072	1	3.726	4.713
Midway Atoll	Sand	H012	28.21215	-177.369	463834.6	3120759	1	3.248	4.235
Midway Atoll	Sand	H011	28.20284	-177.375	463235.5	3119729	1	3.058	4.045
Midway Atoll	Sand	H010	28.1971	-177.394	461295.7	3119099	1	3.625	4.612
Midway Atoll	Sand	H009	28.21051	-177.385	462256.2	3120582	1	3.869	4.856
Midway Atoll	Sand	H008	28.21586	-177.372	463470.5	3121171	1	4.058	5.045
Midway Atoll	Eastern	H007	28.20862	-177.334	467249.1	3120358	1	3.409	4.395
Midway Atoll	Eastern	H006	28.2094	-177.331	467524.6	3120443	1	3.432	4.419
Midway Atoll	Eastern	H005	28.20901	-177.329	467739.2	3120399	1	3.444	4.43
Midway Atoll	Eastern	H004	28.20988	-177.325	468074.7	3120495	1	4.084	5.07
Midway Atoll	Eastern	H003	28.21094	-177.326	468054.7	3120613	1	3.942	4.928
Midway Atoll	Eastern	H002	28.21456	-177.327	467925.2	3121014	1	4.361	5.347
Midway Atoll	Eastern	H001	28.21158	-177.33	467623.1	3120685	1	3.783	4.769
Midway Atoll	Sand	J018	28.21675	-177.369	463784.3	3121269	1	3.82	4.806
Midway Atoll	Sand	J017	28.21576	-177.377	463027.2	3121162	1	4.115	5.102
Midway Atoll	Sand	J016	28.21236	-177.38	462725	3120785	1	9.022	10.009
Midway Atoll	Sand	J015	28.20864	-177.38	462679.5	3120373	1	4.232	5.219

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Region	Island	Site_ID	Latitude_NA D83	Longitude_NAD 83	Easting_NAD 83	Northing_NAD 83	UTM_Zo ne	Ellipsoid_Height_GR S80	Ellipsoid_Height_WG S84
Midway Atoll	Sand	J014	28.20417	-177.384	462291.8	3119880	1	3.234	4.222
Midway Atoll	Sand	J013	28.20917	-177.374	463265.5	3120430	1	3.065	4.052
Midway Atoll	Sand	J012	28.21085	-177.361	464575.9	3120613	1	3.635	4.622
Midway Atoll	Sand	H021	28.21592	-177.37	463687.7	3121177	1	3.91	4.897
Midway Atoll	Sand	H020	28.21594	-177.377	463004.7	3121181	1	4.193	5.18
Midway Atoll	Sand	H017	28.21181	-177.381	462635.1	3120725	1	10.038	11.026
Midway Atoll	Sand	H016	28.20881	-177.38	462721	3120392	1	4.169	5.156
Midway Atoll	Sand	H015	28.2038	-177.384	462306.4	3119838	1	3.887	4.874
Midway Atoll	Sand	H014	28.20913	-177.375	463246.1	3120425	1	3.358	4.345
Midway Atoll	Sand	H013	28.20972	-177.366	464117.4	3120488	1	3.125	4.112
Pearl and Hermes Atoll	Southeast	J045	27.79	-175.817	616583.7	3074502	1	3.756	4.695
Pearl and Hermes Atoll	Southeast	J044	27.79018	-175.817	616504.5	3074521	1	4.047	4.986
Pearl and Hermes Atoll	Southeast	J043	27.78936	-175.817	616515	3074429	1	3.724	4.663
Pearl and Hermes Atoll	Southeast	J042	27.78838	-175.818	616476.3	3074321	1	5.248	6.187
Pearl and Hermes Atoll	Southeast	J041	27.78921	-175.818	616402.6	3074412	1	5.07	6.009
Pearl and Hermes Atoll	Southeast	J040	27.7881	-175.819	616393.3	3074289	1	3.323	4.262
Pearl and Hermes Atoll	Southeast	J039	27.7882	-175.82	616280	3074298	1	3.418	4.357
Pearl and Hermes Atoll	Southeast	J038	27.78964	-175.821	616153.8	3074457	1	4.867	5.806
Pearl and Hermes Atoll	Southeast	J037	27.79069	-175.821	616182.2	3074574	1	4.126	5.064
Pearl and Hermes Atoll	North	J036	27.92625	-175.738	624185.8	3089673	1	4.492	5.43
Pearl and Hermes Atoll	North	J035	27.92573	-175.737	624246.1	3089617	1	4.05	4.987
Pearl and Hermes Atoll	Southeast	H051	27.78888	-175.816	616608.5	3074377	1	5.751	6.69
Pearl and Hermes Atoll	Southeast	H050	27.78881	-175.816	616602.6	3074369	1	4.887	5.826



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Region	Island	Site_ID	Latitude_NA D83	Longitude_NAD 83	Easting_NAD 83	Northing_NAD 83	UTM_Zo ne	Ellipsoid_Height_GR S80	Ellipsoid_Height_WG S84
<b>Pearl and Hermes Atoll</b>	Southeast	H049	27.78833	-175.817	616512.6	3074316	1	5.137	6.076
<b>Pearl and Hermes Atoll</b>	Southeast	H048	27.78874	-175.817	616532	3074362	1	4.591	5.53
<b>Pearl and Hermes Atoll</b>	Southeast	H047	27.78917	-175.817	616591.6	3074410	1	4.232	5.171
<b>Pearl and Hermes Atoll</b>	Southeast	H046	27.78965	-175.816	616680.8	3074463	1	3.799	4.738
<b>Pearl and Hermes Atoll</b>	Southeast	H045	27.78945	-175.815	616721.6	3074442	1	4.486	5.425
<b>Pearl and Hermes Atoll</b>	Southeast	H044	27.7898	-175.815	616768.2	3074481	1	4.118	5.057
<b>Pearl and Hermes Atoll</b>	Southeast	H043	27.79038	-175.816	616660.4	3074544	1	3.969	4.908
<b>Pearl and Hermes Atoll</b>	Southeast	H042	27.79064	-175.817	616580.2	3074572	1	4.151	5.09
<b>Pearl and Hermes Atoll</b>	Southeast	H041	27.79064	-175.817	616581	3074572	1	4.53	5.469
<b>Pearl and Hermes Atoll</b>	Southeast	H040	27.79058	-175.817	616497.3	3074565	1	4.141	5.08
<b>Pearl and Hermes Atoll</b>	Southeast	H039	27.7904	-175.818	616408.1	3074544	1	4.054	4.993
<b>Pearl and Hermes Atoll</b>	North	H038	27.92682	-175.737	624234.1	3089737	1	4.734	5.672
<b>Pearl and Hermes Atoll</b>	North	H037	27.926	-175.737	624298.7	3089646	1	4.13	5.066
<b>Pearl and Hermes Atoll</b>	Grass	H058	27.77378	-175.907	607666.8	3072622	1	4.949	5.89
<b>Pearl and Hermes Atoll</b>	Seal-Kittery	H057	27.76394	-175.945	603957.4	3071499	1	4.688	5.631
<b>Pearl and Hermes Atoll</b>	Seal-Kittery	H056	27.76506	-175.943	604108.6	3071625	1	3.867	4.809
<b>Pearl and Hermes Atoll</b>	Seal-Kittery	H055	27.75988	-175.939	604551.1	3071055	1	3.335	4.274
<b>Pearl and Hermes Atoll</b>	Southeast	H054	27.79001	-175.818	616460.1	3074501	1	3.885	4.825
<b>Pearl and Hermes Atoll</b>	Southeast	H053	27.78891	-175.818	616494.9	3074380	1	4.389	5.328
<b>Pearl and Hermes Atoll</b>	Southeast	H052	27.78885	-175.816	616628.6	3074375	1	4.774	5.713

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Region	Island	Site_ID	Latitude_NA D83	Longitude_NAD 83	Easting_NAD 83	Northing_NAD 83	UTM_Zo ne	Ellipsoid_Height_GR S80	Ellipsoid_Height_WG S84
<b>Pearl and Hermes Atoll</b>	Grass	J052	27.77334	-175.903	608057	3072577	1	3.345	4.286
<b>Pearl and Hermes Atoll</b>	Seal-Kittery	J051	27.76278	-175.943	604189.2	3071372	1	4.164	5.107
<b>Pearl and Hermes Atoll</b>	Seal-Kittery	J050	27.76077	-175.941	604368.2	3071152	1	4.93	5.873
<b>Pearl and Hermes Atoll</b>	Seal-Kittery	J049	27.75995	-175.94	604500.5	3071062	1	3.208	4.147
<b>Pearl and Hermes Atoll</b>	Southeast	J048	27.79052	-175.82	616230.7	3074555	1	4.338	5.277
<b>Pearl and Hermes Atoll</b>	Southeast	J047	27.78974	-175.82	616216.3	3074469	1	3.789	4.728
<b>Pearl and Hermes Atoll</b>	Southeast	J046	27.78892	-175.819	616301	3074379	1	3.353	4.292
<b>Lisianski Island</b>	Lisianski	J063	26.05626	-173.962	203678.6	2885280	2	10.241	11.112
<b>Lisianski Island</b>	Lisianski	J062	26.05626	-173.964	203393.6	2885287	2	10.514	11.385
<b>Lisianski Island</b>	Lisianski	J061	26.05676	-173.966	203222.1	2885346	2	10.238	11.11
<b>Lisianski Island</b>	Lisianski	J060	26.0594	-173.968	203057.5	2885643	2	9.741	10.612
<b>Lisianski Island</b>	Lisianski	J059	26.06185	-173.969	202956	2885917	2	11.758	12.63
<b>Lisianski Island</b>	Lisianski	J058	26.06446	-173.97	202863.7	2886208	2	11.526	12.397
<b>Lisianski Island</b>	Lisianski	J057	26.06759	-173.972	202688.4	2886559	2	10.857	11.728
<b>Lisianski Island</b>	Lisianski	J056	26.07097	-173.971	202801.1	2886931	2	10.885	11.756
<b>Lisianski Island</b>	Lisianski	J055	26.07067	-173.967	203195.9	2886889	2	10.494	11.365
<b>Lisianski Island</b>	Lisianski	J054	26.06855	-173.963	203557.5	2886646	2	9.962	10.833
<b>Lisianski Island</b>	Lisianski	J053	26.06689	-173.962	203655.4	2886459	2	9.595	10.466
<b>Lisianski Island</b>	Lisianski	H068	26.05585	-173.963	203559.8	2885237	2	10.556	11.428
<b>Lisianski Island</b>	Lisianski	H067	26.05649	-173.965	203290.2	2885315	2	9.947	10.818
<b>Lisianski Island</b>	Lisianski	H066	26.05741	-173.967	203129	2885420	2	10.163	11.034
<b>Lisianski Island</b>	Lisianski	H065	26.05901	-173.968	203074.4	2885598	2	9.865	10.737
<b>Lisianski Island</b>	Lisianski	H064	26.06076	-173.969	202984.2	2885795	2	11.226	12.097
<b>Lisianski Island</b>	Lisianski	H063	26.06561	-173.971	202782.5	2886337	2	10.545	11.417
<b>Lisianski Island</b>	Lisianski	H062	26.06943	-173.971	202715.8	2886762	2	10.722	11.593
<b>Lisianski Island</b>	Lisianski	H061	26.07123	-173.969	202965.1	2886956	2	10.988	11.859

NWHI Lidar Validation Mission

Region	Island	Site_ID	Latitude_NA D83	Longitude_NAD 83	Easting_NAD 83	Northing_NAD 83	UTM_Zo ne	Ellipsoid_Height_GR S80	Ellipsoid_Height_WG S84
Lisianski Island	Lisianski	H060	26.06958	-173.964	203437.2	2886763	2	10.488	11.359
Lisianski Island	Lisianski	H059	26.06617	-173.962	203671.4	2886380	2	10.926	11.797
Laysan Island	Laysan	J077	25.77525	-171.735	426332.1	2850999	2	9.841	10.636
Laysan Island	Laysan	J076	25.76872	-171.742	425641.4	2850281	2	15.255	16.051
Laysan Island	Laysan	J075	25.75978	-171.742	425549	2849291	2	11.344	12.138
Laysan Island	Laysan	J074	25.76083	-171.736	426195.8	2849403	2	9.698	10.492
Laysan Island	Laysan	J073	25.75863	-171.738	426007.1	2849161	2	10.648	11.443
Laysan Island	Laysan	J072	25.75814	-171.737	426064.7	2849106	2	10.655	11.452
Laysan Island	Laysan	J071	25.76381	-171.729	426893.1	2849730	2	10.498	11.294
Laysan Island	Laysan	J070	25.77165	-171.727	427117.8	2850597	2	11.311	12.107
Laysan Island	Laysan	J069	25.77467	-171.724	427400.9	2850929	2	14.98	15.776
Laysan Island	Laysan	J068	25.77646	-171.725	427261	2851129	2	14.206	15.002
Laysan Island	Laysan	J067	25.7798	-171.727	427070.9	2851500	2	16.551	17.347
Laysan Island	Laysan	J066	25.77724	-171.733	426510.8	2851219	2	9.498	10.293
Laysan Island	Laysan	J065	25.7783	-171.736	426247.4	2851338	2	14.443	15.239
Laysan Island	Laysan	J064	25.77765	-171.74	425764.4	2851269	2	13.455	14.252
Laysan Island	Laysan	H082	25.77454	-171.738	425987.8	2850923	2	15.448	16.244
Laysan Island	Laysan	H081	25.76888	-171.742	425643.6	2850298	2	15.214	16.01
Laysan Island	Laysan	H080	25.76052	-171.743	425483.6	2849373	2	11.098	11.892
Laysan Island	Laysan	H079	25.76197	-171.736	426200.8	2849530	2	9.439	10.232
Laysan Island	Laysan	H078	25.75997	-171.737	426060.8	2849309	2	10.159	10.954
Laysan Island	Laysan	H077	25.75868	-171.736	426177.6	2849165	2	10.18	10.976
Laysan Island	Laysan	H076	25.76516	-171.729	426944.4	2849879	2	10.596	11.392
Laysan Island	Laysan	H075	25.7695	-171.727	427125.4	2850358	2	11.099	11.896
Laysan Island	Laysan	H074	25.7747	-171.725	427304.4	2850933	2	15.325	16.121
Laysan Island	Laysan	H073	25.7765	-171.726	427170.6	2851133	2	14.113	14.909
Laysan Island	Laysan	H072	25.7804	-171.724	427391.6	2851564	2	10.803	11.599
Laysan Island	Laysan	H071	25.77641	-171.734	426443.5	2851128	2	9.535	10.331
Laysan Island	Laysan	H070	25.77855	-171.735	426304.6	2851365	2	13.846	14.642

NWHI Lidar Validation Mission

Region	Island	Site_ID	Latitude_NA D83	Longitude_NAD 83	Easting_NAD 83	Northing_NAD 83	UTM_Zo ne	Ellipsoid_Height_GR S80	Ellipsoid_Height_WG S84
Laysan Island	Laysan	H069	25.77682	-171.74	425782.9	2851177	2	12.47	13.266
French Frigate Shoals	East	J092	23.78695	-166.21	376768.5	2631164	3	18.471	19.068
French Frigate Shoals	East	J091	23.78758	-166.21	376714.1	2631234	3	18.466	19.062
French Frigate Shoals	Trig	J090	23.8715	-166.242	373526.8	2640555	3	17.865	18.463
French Frigate Shoals	Tern	J089	23.8682	-166.287	368906.8	2640231	3	18.021	18.621
French Frigate Shoals	Tern	J088	23.87054	-166.281	369580.9	2640483	3	18.153	18.753
French Frigate Shoals	Tern	J087	23.87027	-166.282	369475.3	2640454	3	18.086	18.686
French Frigate Shoals	Tern	J086	23.87008	-166.283	369404.4	2640435	3	18.099	18.699
French Frigate Shoals	Tern	J085	23.86977	-166.284	369289.6	2640400	3	17.983	18.582
French Frigate Shoals	Tern	J084	23.86958	-166.285	369205.9	2640381	3	18.052	18.653
French Frigate Shoals	Tern	J083	23.86928	-166.285	369145.3	2640348	3	18.113	18.713
French Frigate Shoals	Tern	J082	23.86916	-166.286	369083.1	2640335	3	18.049	18.649
French Frigate Shoals	Tern	J081	23.86881	-166.287	368985.1	2640297	3	18.066	18.666
French Frigate Shoals	Tern	J080	23.86852	-166.288	368888.8	2640266	3	17.992	18.592
French Frigate Shoals	Tern	J079	23.86828	-166.289	368793.4	2640241	3	18.089	18.689
French Frigate Shoals	Tern	J078	23.86814	-166.289	368746.3	2640226	3	17.953	18.553
French Frigate Shoals	East	H098	23.78624	-166.208	376890.2	2631084	3	18.236	18.833
French Frigate Shoals	East	H097	23.78742	-166.21	376769.9	2631216	3	18.197	18.792
French Frigate Shoals	Trig	H096	23.87168	-166.243	373449.1	2640575	3	17.793	18.392
French Frigate Shoals	Tern	H095	23.86839	-166.287	368919.3	2640252	3	19.617	20.217

NWHI Lidar Validation Mission

Region	Island	Site_ID	Latitude_NA D83	Longitude_NAD 83	Easting_NAD 83	Northing_NAD 83	UTM_Zo ne	Ellipsoid_Height_GR S80	Ellipsoid_Height_WG S84
French Frigate Shoals	Tern	H094	23.86954	-166.283	369347	2640375	3	18.257	18.857
French Frigate Shoals	Tern	H093	23.87079	-166.281	369584.3	2640511	3	18.08	18.68
French Frigate Shoals	Tern	H092	23.87047	-166.282	369479.7	2640477	3	18.087	18.688
French Frigate Shoals	Tern	H091	23.87026	-166.283	369386.7	2640454	3	18.118	18.718
French Frigate Shoals	Tern	H090	23.86999	-166.284	369277.6	2640425	3	18.052	18.652
French Frigate Shoals	Tern	H089	23.8703	-166.285	369195.8	2640460	3	17.994	18.594
French Frigate Shoals	Tern	H088	23.86955	-166.285	369136.7	2640378	3	18.102	18.702
French Frigate Shoals	Tern	H087	23.86932	-166.286	369078.2	2640354	3	18.016	18.616
French Frigate Shoals	Tern	H086	23.86907	-166.287	368979.2	2640327	3	17.997	18.597
French Frigate Shoals	Tern	H085	23.86884	-166.288	368881.7	2640301	3	18.057	18.657
French Frigate Shoals	Tern	H084	23.86858	-166.289	368785	2640274	3	18.091	18.691
French Frigate Shoals	Tern	H083	23.86844	-166.289	368735.5	2640258	3	17.972	18.572

## **Appendix A: Survey Log**

### **Midway Atoll**

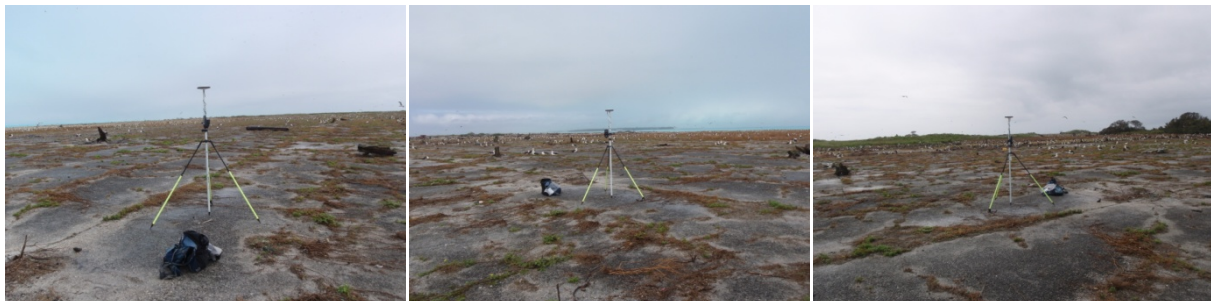
Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: MISE  
Antenna Height (m): 1.407  
Photo IDs: 1,2,3



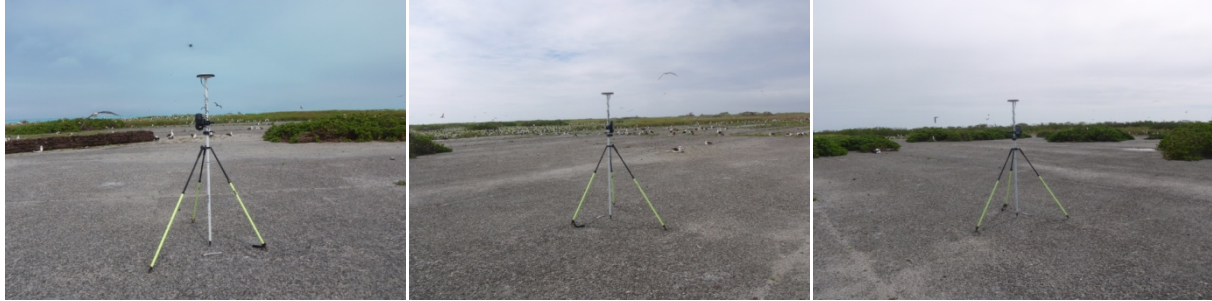
Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: J001  
Antenna Height (m): 2.046  
Photo IDs: 6,7,8



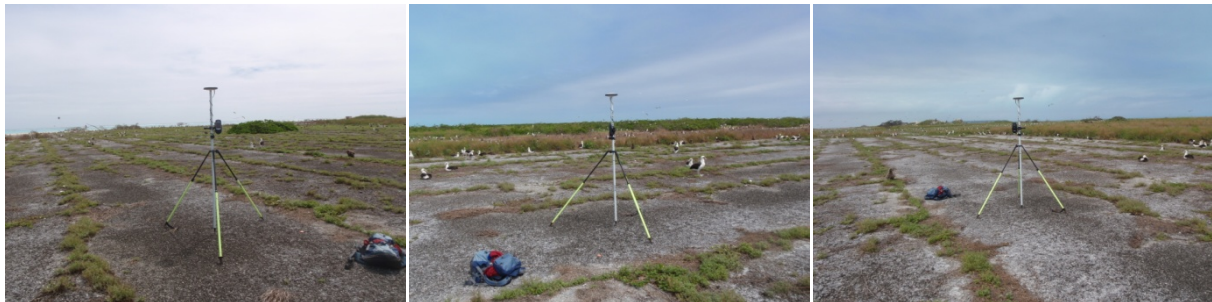
Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H001  
Antenna Height (m): 2.046  
Photo IDs: 9,10,11



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H002  
Antenna Height (m): 2.046  
Photo IDs: 12,13,14



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H003  
Antenna Height (m): 2.046  
Photo IDs: 21,22,23

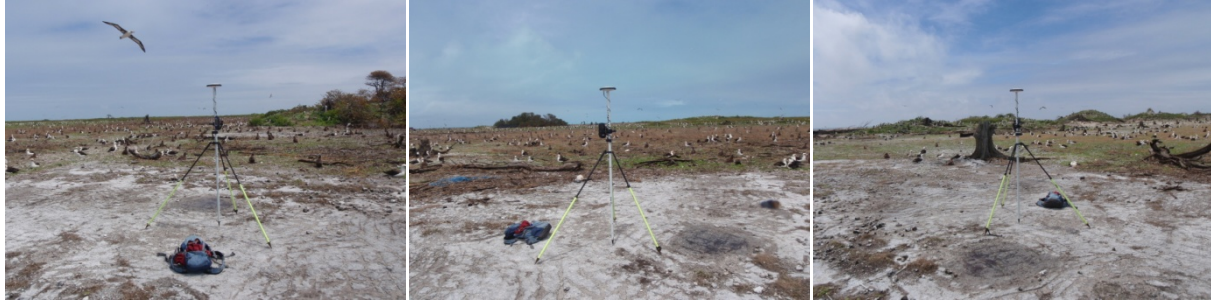


Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H004  
Antenna Height (m): 2.046  
Photo IDs: 24,25,26





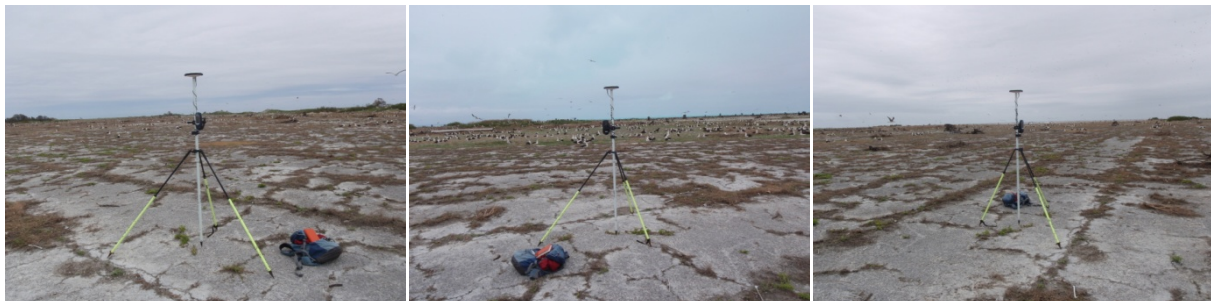
Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H005  
Antenna Height (m): 2.046  
Photo IDs: 29,30,31



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H006  
Antenna Height (m): 2.046  
Photo IDs: 32,33,34



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H007  
Antenna Height (m): 2.046  
Photo IDs: 37,38,39



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H008  
Antenna Height (m): 2.046  
Photo IDs: 43,44,45,46



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H009  
Antenna Height (m): 2.044  
Photo IDs: 47,48,49



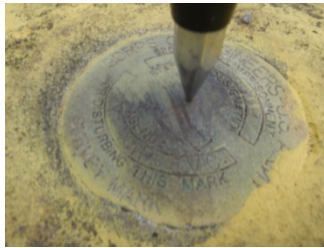
Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H010  
Antenna Height (m): 2.042  
Photo IDs: 50,51,52,53



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H011  
Antenna Height (m): 2.045  
Photo IDs: 54,55,56



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H012  
Antenna Height (m): 2.045  
Photo IDs: 57,58,59,61



Island/Atoll: Midway Atoll  
Date: 4/9/2011  
Station ID: MISE  
Antenna Height (m): 1.426  
Photo IDs: 1,2,3



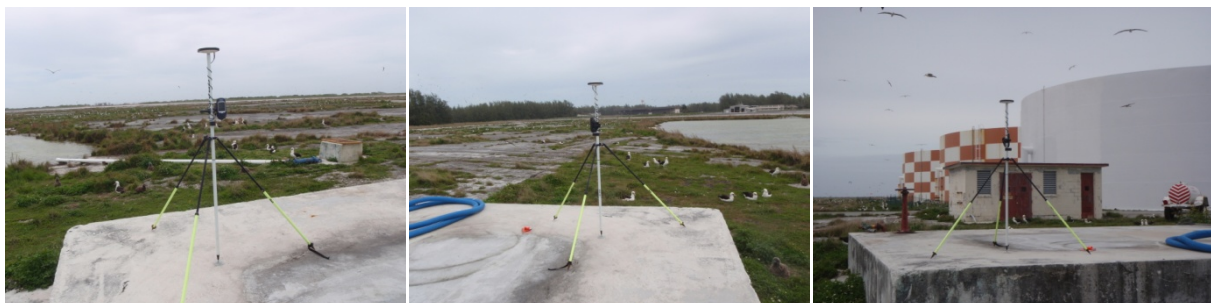
Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H013  
Antenna Height (m): 2.042  
Photo IDs: 62,63,64



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: H014  
Antenna Height (m): 2.041  
Photo IDs: 65,66,67



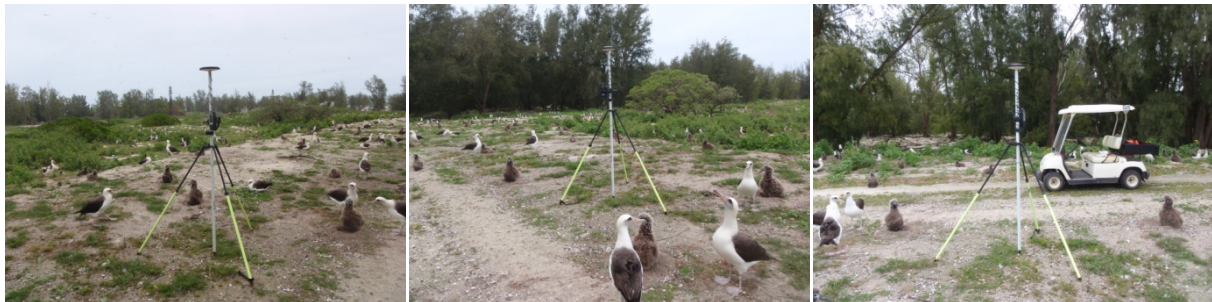
Island/Atoll: Midway Atoll  
Date: 4/9/2011  
Station ID: H015  
Antenna Height (m): 2.047  
Photo IDs: 69,70,71,72  
**PID: DE5245**



Island/Atoll: Midway Atoll  
Date: 4/9/2011  
Station ID: H016  
Antenna Height (m): 2.043  
Photo IDs: 73,74,75



Island/Atoll: Midway Atoll  
Date: 4/9/2011  
Station ID: H017  
Antenna Height (m): 2.014  
Photo IDs: 77,78,79



Island/Atoll: Midway Atoll  
Date: 4/9/2011  
Station ID: H020  
Antenna Height (m): 2.043  
Photo IDs: 81,82,83



Island/Atoll: Midway Atoll  
Date: 4/9/2011  
Station ID: H021  
Antenna Height (m): 2.044  
Photo IDs: 84,85,86



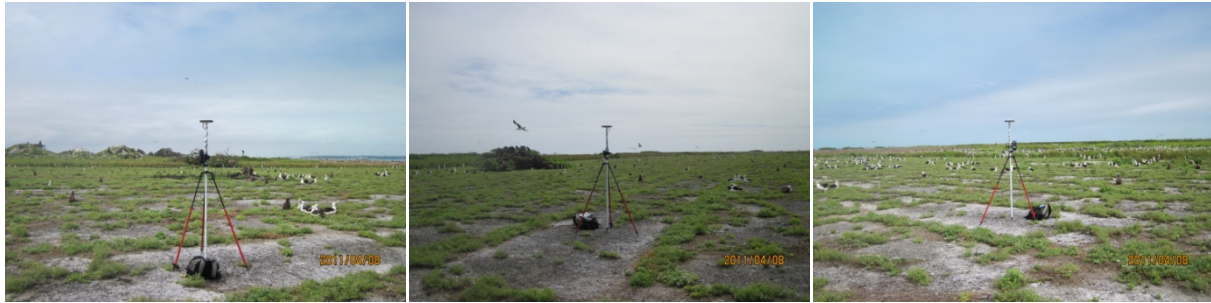
Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: J002  
Antenna Height (m): 2.045  
Photo IDs: 565,566,567



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: J003  
Antenna Height (m): 1.991  
Photo IDs: 569,570,571



Island/Atoll: Midway Atoll  
 Date: 4/8/2011  
 Station ID: J004  
 Antenna Height (m): 2.044  
 Photo IDs: 572,573,574



Island/Atoll: Midway Atoll  
 Date: 4/8/2011  
 Station ID: J005  
 Antenna Height (m): 2.034  
 Photo IDs: 575,576,577

Comment: Part way down south runway from east.



Island/Atoll: Midway Atoll  
 Date: 4/8/2011  
 Station ID: J006  
 Antenna Height (m): 2.044  
 Photo IDs: 578,579,580

Comment: Just south of 2 large bushes/trees in center of island, to west of dunes referenced in J005. On north edge of runway, bag is to the south.



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: J007  
Antenna Height (m): 2.039  
Photo IDs: 581,582,583

Comment: 100 yards past western-most intersection on southern runway. Center of runway a little north of center.



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: J008  
Antenna Height (m): 2.042  
Photo IDs: 584,585,586

Comment: Farthest north yellow "X" on N-S runway.



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: J009  
Antenna Height (m): 2.045  
Photo IDs: 587,588,589

Comment: South corner of yellow chevron at west end of E-W runway.





Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: J010  
Antenna Height (m): 2.047  
Photo IDs: 590,591,592

Comment: Cart path north of bulky dump, 20-30 yards east of Jamie's site.



Island/Atoll: Midway Atoll  
Date: 4/8/2011  
Station ID: J011  
Antenna Height (m): 2.035  
Photo IDs: 593,594,595

Comment: By base station and USGS benchmark and boat launch ramp.



Island/Atoll: Midway Atoll  
Date: 4/9/2011  
Station ID: J012  
Antenna Height (m): 2.017  
Photo IDs: 598,599,600

Comment: Middle of south pier of big harbor.



Island/Atoll: Midway Atoll  
Date: 4/9/2011  
Station ID: J013  
Antenna Height (m): 2.045  
Photo IDs: 601,602,603,604



Island/Atoll: Midway Atoll  
Date: 4/9/2011  
Station ID: J014  
Antenna Height (m): 2.043  
Photo IDs: 605,606,607

Comment: NE of 3 water tanks, inside runway triangle.



Island/Atoll: Midway Atoll  
Date: 4/9/2011  
Station ID: J015  
Antenna Height (m): 2.026  
Photo IDs: 608,609,610

Comment: SW corner of large gray rectangle closest to 3 water tanks.



Island/Atoll: Midway Atoll  
Date: 4/9/2011  
Station ID: J016  
Antenna Height (m): 2.045  
Photo IDs: 611,612,613



Island/Atoll: Midway Atoll  
Date: 4/9/2011  
Station ID: J017  
Antenna Height (m): 2.045  
Photo IDs: 627,628,629

Comment: Road to west of Charlie Barracks.



Island/Atoll: Midway Atoll  
Date: 4/9/2011  
Station ID: J018  
Antenna Height (m): 2.051  
Photo IDs: 634,635,636

Comment: Near base of east pier.

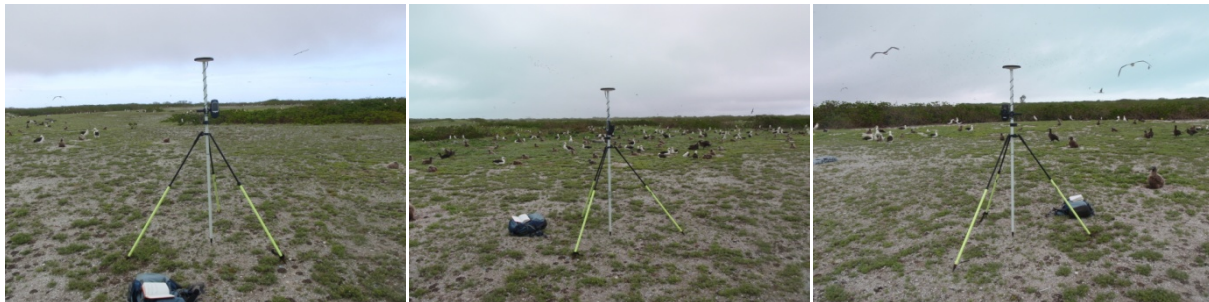


**Kure Atoll**

Island/Atoll: Kure Atoll  
Date: 4/11/2011  
Station ID: KUBA  
Antenna Height (m): 1.424  
Photo IDs: 99,100,101,102  
PID: DE5247



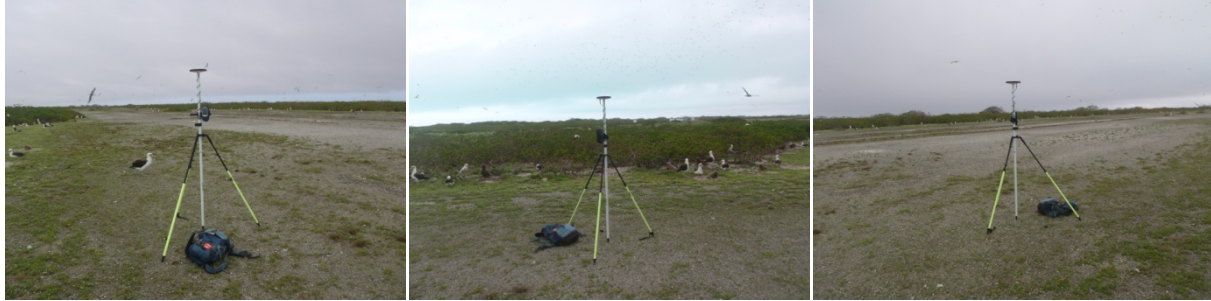
Island/Atoll: Kure Atoll  
Date: 4/11/2011  
Station ID: H022  
Antenna Height (m): 2.038  
Photo IDs: 87,88,89



Island/Atoll: Kure Atoll  
Date: 4/11/2011  
Station ID: H023  
Antenna Height (m): 2.030  
Photo IDs: 90,91,92



Island/Atoll: Kure Atoll  
Date: 4/11/2011  
Station ID: H024  
Antenna Height (m): 2.033  
Photo IDs: 93,94,95



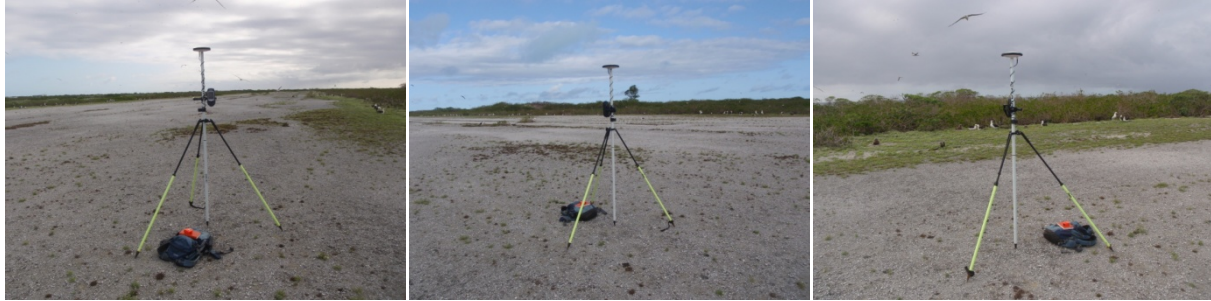
Island/Atoll: Kure Atoll  
Date: 4/11/2011  
Station ID: H025  
Antenna Height (m): 2.044  
Photo IDs: 96,97,98



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: KUBA  
Antenna Height (m): 1.426  
Photo IDs: 99,100,101  
**PID: DE5247**



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: H026  
Antenna Height (m): 2.035  
Photo IDs: 110,111,112



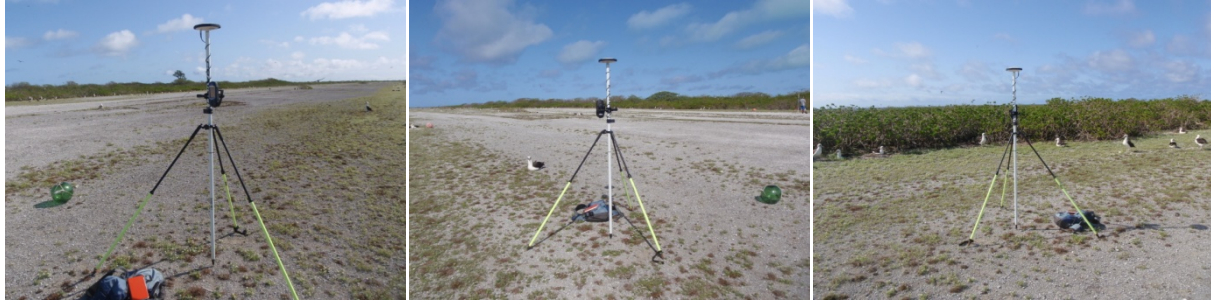
Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: H027  
Antenna Height (m): 2.040  
Photo IDs: 117,118,119



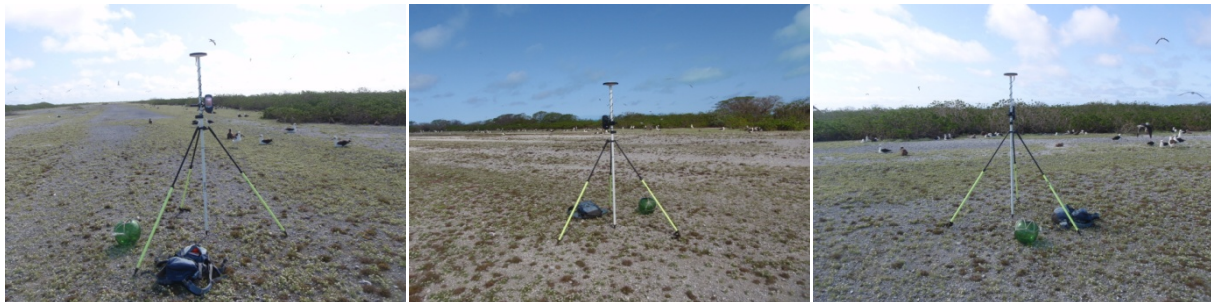
Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: H028  
Antenna Height (m): 2.042  
Photo IDs: 123,124,125



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: H029  
Antenna Height (m): 2.036  
Photo IDs: 126,127,128



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: H030  
Antenna Height (m): 2.032  
Photo IDs: 129,130,131

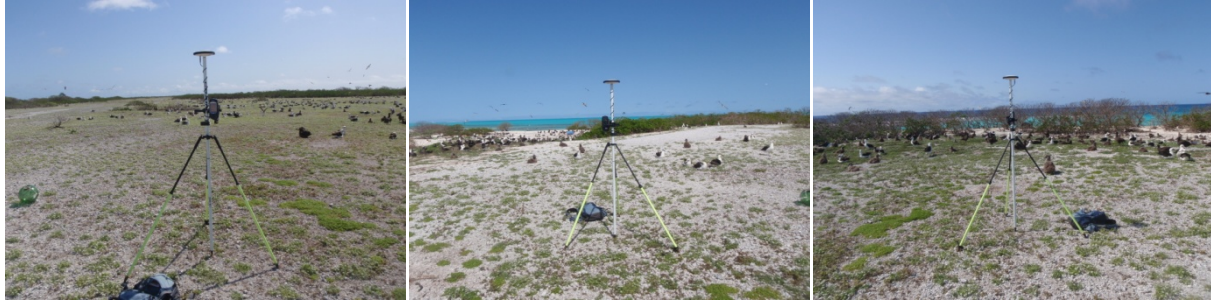


Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: H031  
Antenna Height (m): 2.043  
Photo IDs: 134,135,136





Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: H032  
Antenna Height (m): 2.024  
Photo IDs: 139,140,141



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: H033  
Antenna Height (m): 1.975  
Photo IDs: 144,145,146



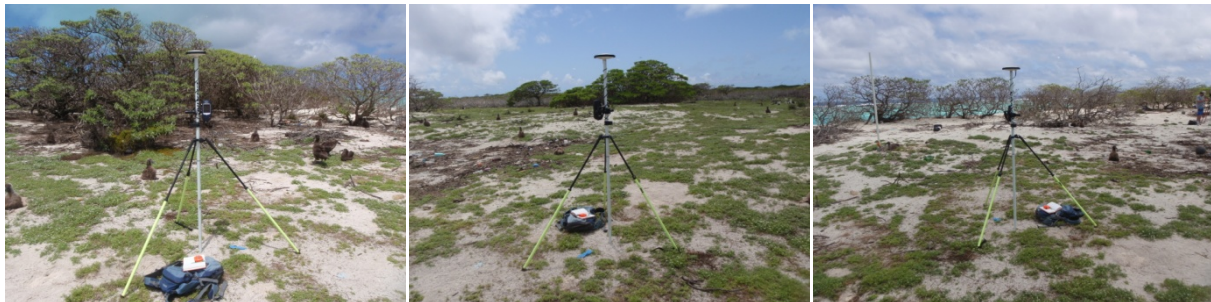
Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: H034  
Antenna Height (m): 1.976  
Photo IDs: 149,150,151



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: H035  
Antenna Height (m): 1.987  
Photo IDs: 152,153,154



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: H036  
Antenna Height (m): 1.956  
Photo IDs: 163,164,165



Island/Atoll: Kure Atoll  
Date: 4/11/2011  
Station ID: J019  
Antenna Height (m): 2.040  
Photo IDs: 643,644,645



Island/Atoll: Kure Atoll  
Date: 4/11/2011  
Station ID: J020  
Antenna Height (m): 2.043  
Photo IDs: 647,648,649



Island/Atoll: Kure Atoll  
Date: 4/11/2011  
Station ID: J021  
Antenna Height (m): 2.035  
Photo IDs: 650,651,652



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: J022  
Antenna Height (m): 2.041  
Photo IDs: 679,680,681



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: J023  
Antenna Height (m): 2.042  
Photo IDs: 684,685,686



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: J024  
Antenna Height (m): 2.043  
Photo IDs: 687,688,689



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: J025  
Antenna Height (m): 2.047  
Photo IDs: 690,691,692



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: J027  
Antenna Height (m): 2.038  
Photo IDs: 693,694,695



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: J028  
Antenna Height (m): 2.039  
Photo IDs: 696,697,698

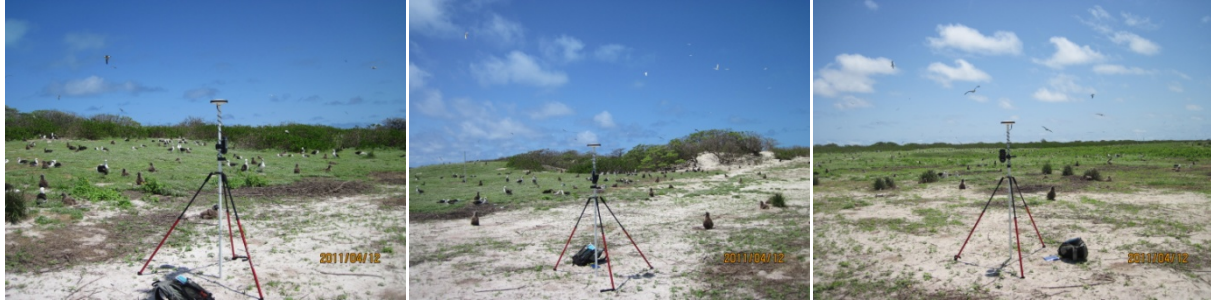


Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: J029  
Antenna Height (m): 2.040  
Photo IDs: 699,700,701



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: J030  
Antenna Height (m): 1.958  
Photo IDs: 702,703,704

Comment: Site known as "Booby Acres" by the local DLNR DOFAW folks.



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: J031  
Antenna Height (m): 1.959  
Photo IDs: 705,706,707



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: J032  
Antenna Height (m): 1.923  
Photo IDs: 708,709,710

Comment: Lots of dead branches on the ground.



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: J033  
Antenna Height (m): 1.973  
Photo IDs: 711,712,713



Island/Atoll: Kure Atoll  
Date: 4/12/2011  
Station ID: J034  
Antenna Height (m): 2.009  
Photo IDs: 714,715,716



**Pearl and Hermes Atoll**



NWHI Lidar Validation

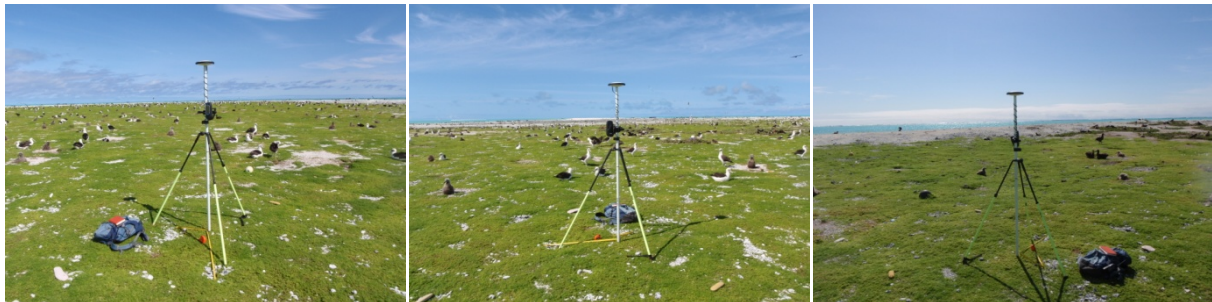
Survey Log

Pearl and Hermes Atoll

Island/Atoll: Pearl and Hermes Atoll  
Date: 4/13/2011  
Station ID: PHBA  
Antenna Height (m): 1.425  
Photo IDs: 186,187,188,189



Island/Atoll: Pearl and Hermes Atoll  
Date: 4/13/2011  
Station ID: H037  
Antenna Height (m): 1.983  
Photo IDs: 208,209,210



Island/Atoll: Pearl and Hermes Atoll  
Date: 4/13/2011  
Station ID: H038  
Antenna Height (m): 1.957  
Photo IDs: 213,214,215



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: H039

Antenna Height (m): 1.977

Photo IDs: 219,220,221



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: H040

Antenna Height (m): 1.980

Photo IDs: 222,223,224



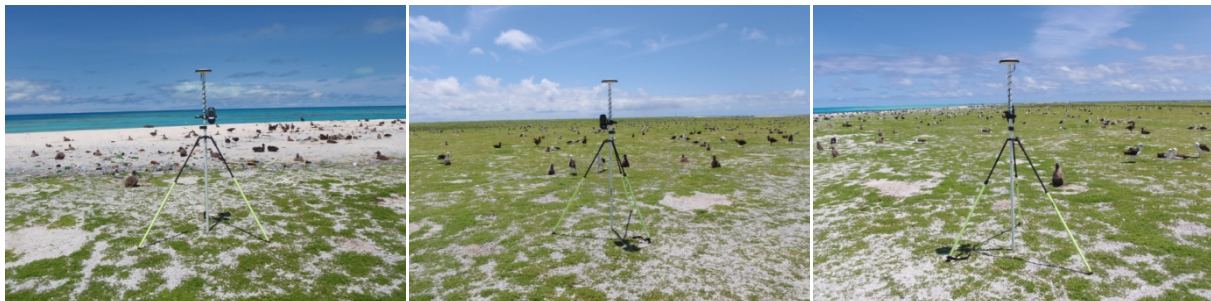
Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: H042

Antenna Height (m): 1.960

Photo IDs: 225,226,227



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: H043

Antenna Height (m): 1.962

Photo IDs: 228,229,230



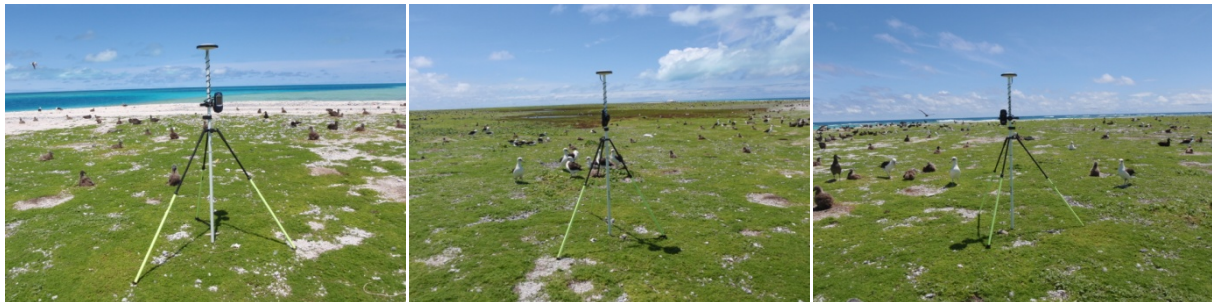
Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: H044

Antenna Height (m): 1.977

Photo IDs: 231,232,233



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: H045

Antenna Height (m): 1.979

Photo IDs: 234,235,236



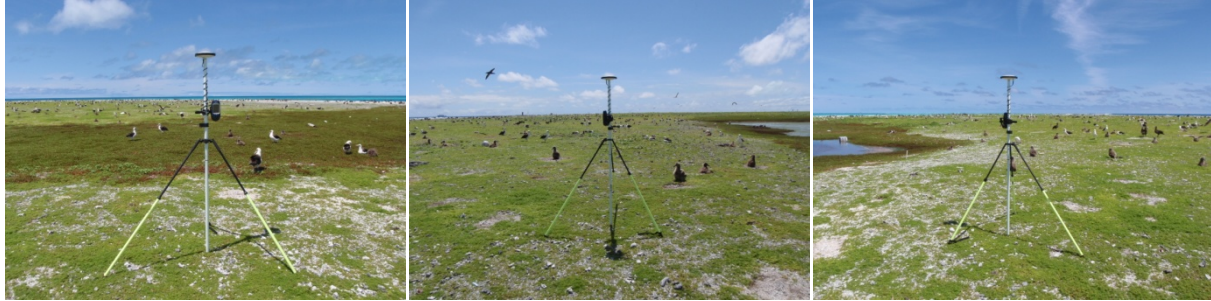
Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: H046

Antenna Height (m): 1.979

Photo IDs: 237,238,239



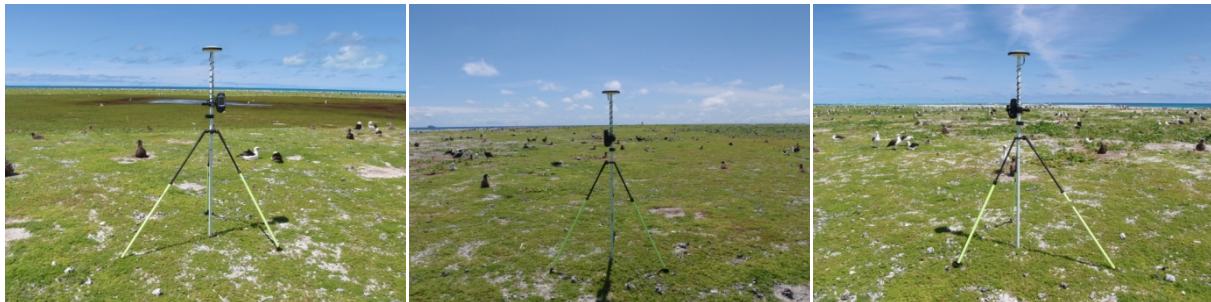
Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: H047

Antenna Height (m): 1.971

Photo IDs: 242,243,244



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: H048

Antenna Height (m): 1.972

Photo IDs: 245,246,247



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: H049

Antenna Height (m): 1.975

Photo IDs: 248,249,250



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: H050

Antenna Height (m): 1.950

Photo IDs: 251,252,253



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: H051

Antenna Height (m): 1.090

Photo IDs: 254,255,256,257,258,259

Comment: Mark named "Pearl Astro"



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: J035

Antenna Height (m): 1.941

Photo IDs: 738,739,740



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: J036

Antenna Height (m): 1.979

Photo IDs: 741,742,743



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: J037

Antenna Height (m): 1.963

Photo IDs: 749,750,751

Comment: Mark named "Pearl Astro"



Island/Atoll: Pearl and Hermes Atoll  
Date: 4/13/2011  
Station ID: J038  
Antenna Height (m): 1.983  
Photo IDs: 752,753,754,755



Island/Atoll: Pearl and Hermes Atoll  
Date: 4/13/2011  
Station ID: J039  
Antenna Height (m): 2.033  
Photo IDs: 756,757,758

Comment: Lava rock shelf on south of island to the east of the small pond.



Island/Atoll: Pearl and Hermes Atoll  
Date: 4/13/2011  
Station ID: J040  
Antenna Height (m): 2.047  
Photo IDs: 764,765,766

Comment: Small lava rock on south tip of west island north of channel.



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: J041

Antenna Height (m): 1.963

Photo IDs: 767,768,769



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: J042

Antenna Height (m): 1.954

Photo IDs: 770,771,772



Island/Atoll: Pearl and Hermes Atoll

Date: 4/13/2011

Station ID: J043

Antenna Height (m): 1.976

Photo IDs: 773,774,775





Island/Atoll: Pearl and Hermes Atoll  
Date: 4/13/2011  
Station ID: J044  
Antenna Height (m): 2.004  
Photo IDs: 776,777,778



Island/Atoll: Pearl and Hermes Atoll  
Date: 4/13/2011  
Station ID: J045  
Antenna Height (m): 2.001  
Photo IDs: 779,780,781

Comment: Interior of west half of island just north of wetland.



Island/Atoll: Pearl and Hermes Atoll  
Date: 4/14/2011  
Station ID: PHBA  
Antenna Height (m): 1.423  
Photo IDs: 186,187,188,189



Island/Atoll: Pearl and Hermes Atoll

Date: 4/14/2011

Station ID: H052

Antenna Height (m): 1.959

Photo IDs: 260,261,262



Island/Atoll: Pearl and Hermes Atoll

Date: 4/14/2011

Station ID: H053

Antenna Height (m): 1.976

Photo IDs: 263,264,265



Island/Atoll: Pearl and Hermes Atoll

Date: 4/14/2011

Station ID: H054

Antenna Height (m): 1.976

Photo IDs: 266,267,268



Island/Atoll: Pearl and Hermes Atoll

Date: 4/14/2011

Station ID: H055

Antenna Height (m): 2.047

Photo IDs: 274,275,276



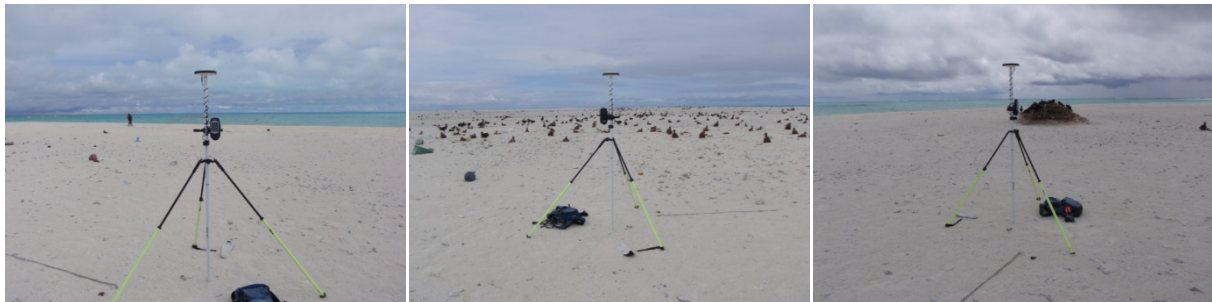
Island/Atoll: Pearl and Hermes Atoll

Date: 4/14/2011

Station ID: H056

Antenna Height (m): 1.938

Photo IDs: 277,278,279



Island/Atoll: Pearl and Hermes Atoll

Date: 4/14/2011

Station ID: H057

Antenna Height (m): 2.042

Photo IDs: 280,281,282



Island/Atoll: Pearl and Hermes Atoll

Date: 4/14/2011

Station ID: H058

Antenna Height (m): 1.978

Photo IDs: 285,286,287



Island/Atoll: Pearl and Hermes Atoll

Date: 4/14/2011

Station ID: J046

Antenna Height (m): 2.032

Photo IDs: 785,786,787



Island/Atoll: Pearl and Hermes Atoll

Date: 4/14/2011

Station ID: J047

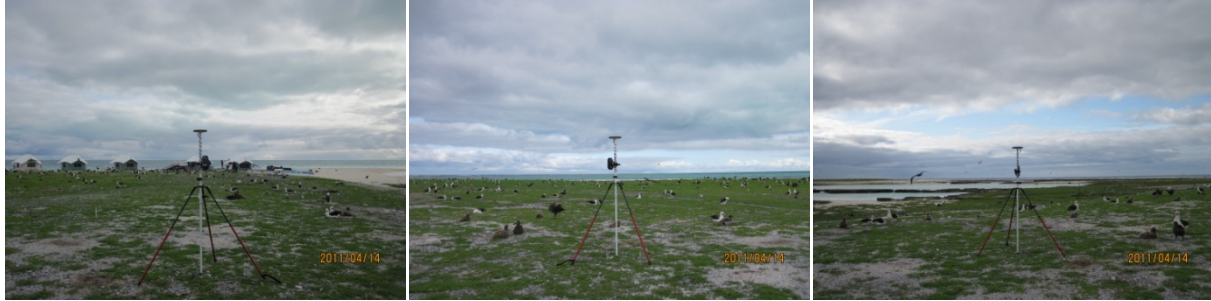
Antenna Height (m): 1.946

Photo IDs: 789,790,791



Island/Atoll: Pearl and Hermes Atoll  
Date: 4/14/2011  
Station ID: J048  
Antenna Height (m): 1.992  
Photo IDs: 792,793,794

Comment: 40 meters south of camp.



Island/Atoll: Pearl and Hermes Atoll  
Date: 4/14/2011  
Station ID: J049  
Antenna Height (m): 2.041  
Photo IDs: 806,807,808

Comment: SE and S of island on rock platform.



Island/Atoll: Pearl and Hermes Atoll  
Date: 4/14/2011  
Station ID: J050  
Antenna Height (m): 1.954  
Photo IDs: 813,814,815



Island/Atoll: Pearl and Hermes Atoll

Date: 4/14/2011

Station ID: J051

Antenna Height (m): 1.925

Photo IDs: 816,817,818



Island/Atoll: Pearl and Hermes Atoll

Comment: Bird Island

Date: 4/14/2011

Station ID: J052

Antenna Height (m): 2.032

Photo IDs: 830,831,832



**Lisianski Island**

Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: LIBA  
Antenna Height (m): 1.427  
Photo IDs: 303,304,305,363  
PID: DE5248



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: H059  
Antenna Height (m): 1.956  
Photo IDs: 307,308,309

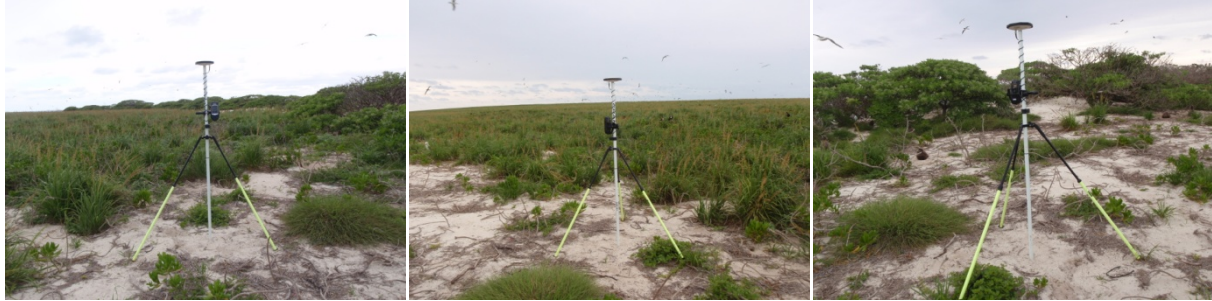


Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: H060  
Antenna Height (m): 1.922  
Photo IDs: 313,314,315





Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: H061  
Antenna Height (m): 1.925  
Photo IDs: 316,317,318



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: H062  
Antenna Height (m): 1.961  
Photo IDs: 322,323,324



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: H063  
Antenna Height (m): 1.941  
Photo IDs: 331,332,333



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: H064  
Antenna Height (m): 1.948  
Photo IDs: 340,341,342



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: H065  
Antenna Height (m): 1.947  
Photo IDs: 343,344,345



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: H066  
Antenna Height (m): 1.948  
Photo IDs: 346,347,348



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: H067  
Antenna Height (m): 1.936  
Photo IDs: 354,355,356



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: H068  
Antenna Height (m): 1.930  
Photo IDs: 357,358,359



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: J053  
Antenna Height (m): 1.903  
Photo IDs: 1067,1068,1069



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: J054  
Antenna Height (m): 1.956  
Photo IDs: 1070,1071,1072



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: J055  
Antenna Height (m): 1.938  
Photo IDs: 1081,1082,1083



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: J056  
Antenna Height (m): 1.935  
Photo IDs: 1086,1087,1088

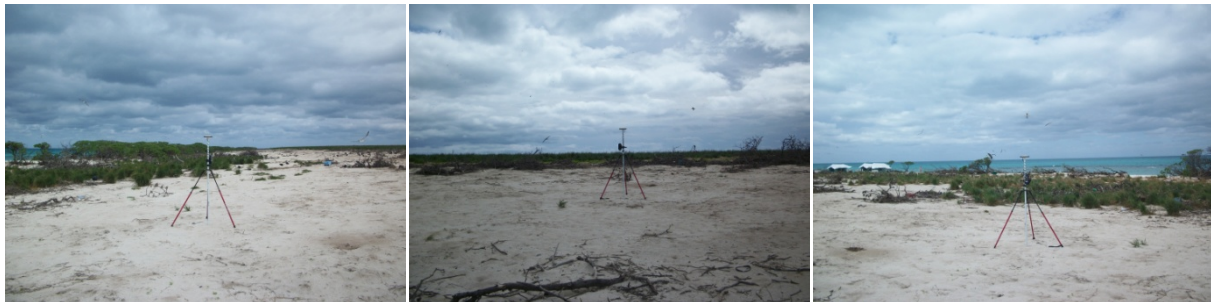


Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: J057  
Antenna Height (m): 1.953  
Photo IDs: 1090,1091,1092



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: J058  
Antenna Height (m): 1.907  
Photo IDs: 1094,1095,1096

Comment: Just north of camp (aka tsunami central).



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: J059  
Antenna Height (m): 1.958  
Photo IDs: 1107,1108,1109



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: J060  
Antenna Height (m): 1.944  
Photo IDs: 854,855,856



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: J061  
Antenna Height (m): 1.904  
Photo IDs: 857,858,859



Island/Atoll: Lisianski  
Date: 4/15/2011  
Station ID: J062  
Antenna Height (m): 1.911  
Photo IDs: 860,861,862



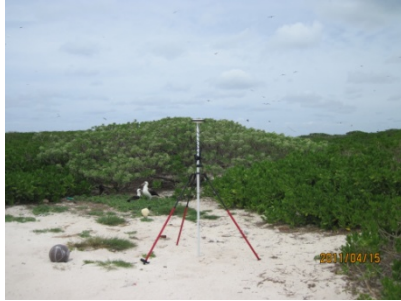
Island/Atoll: Lisianski

Date: 4/15/2011

Station ID: J063

Antenna Height (m): 1.906

Photo IDs: 863,864,865



**Laysan Island**

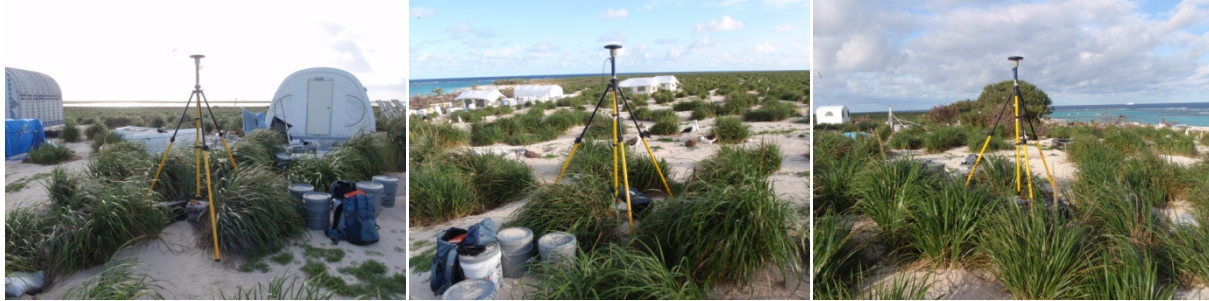


NWHI Lidar Validation

Survey Log

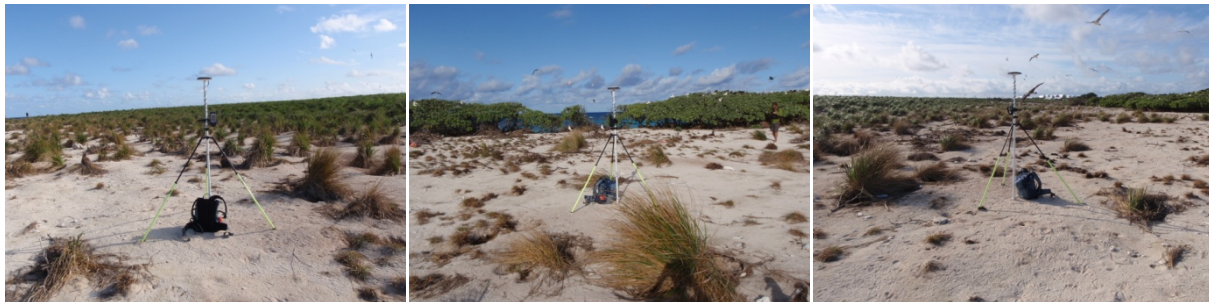
Laysan Island

Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: LABA  
Antenna Height (m): 1.423  
Photo IDs: 364,365,366,367,368  
PID: DE5231



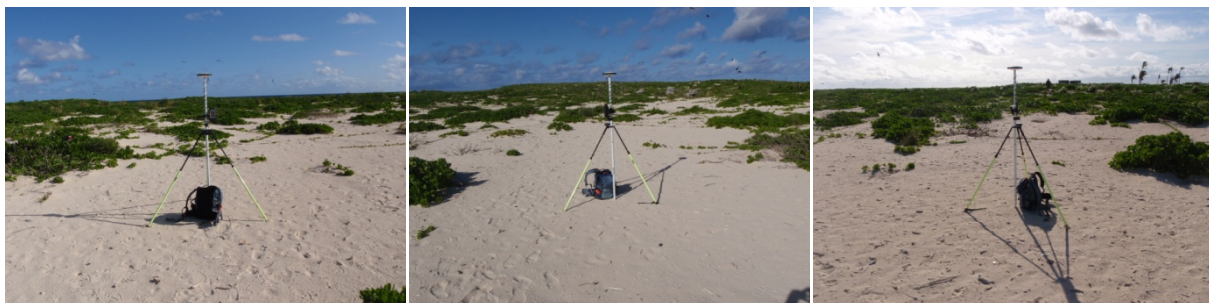
Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H069  
Antenna Height (m): 1.960  
Photo IDs: 369,370,371

Stability: B  
Comment: Lee of coastal stand.



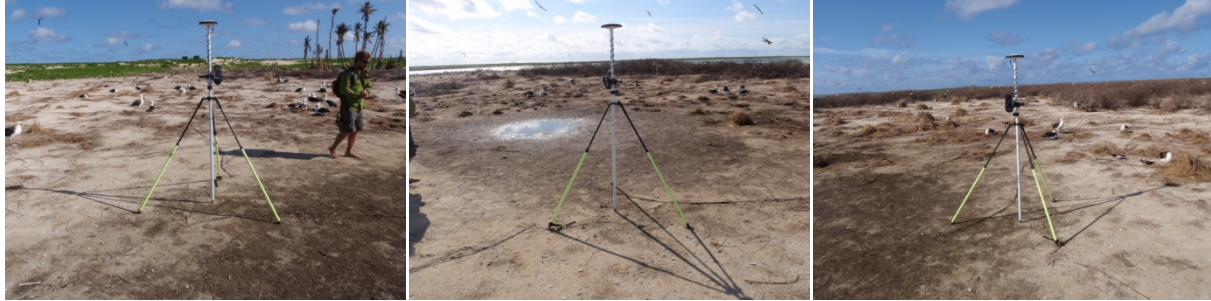
Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H070  
Antenna Height (m): 1.899  
Photo IDs: 372,373,374

Stability: B



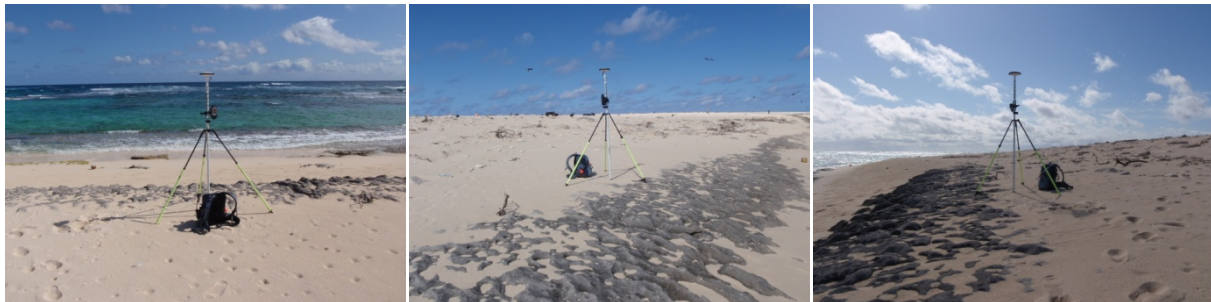
Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H071  
Antenna Height (m): 1.990  
Photo IDs: 382,383,384

Stability: A  
Comment: Lake bed.



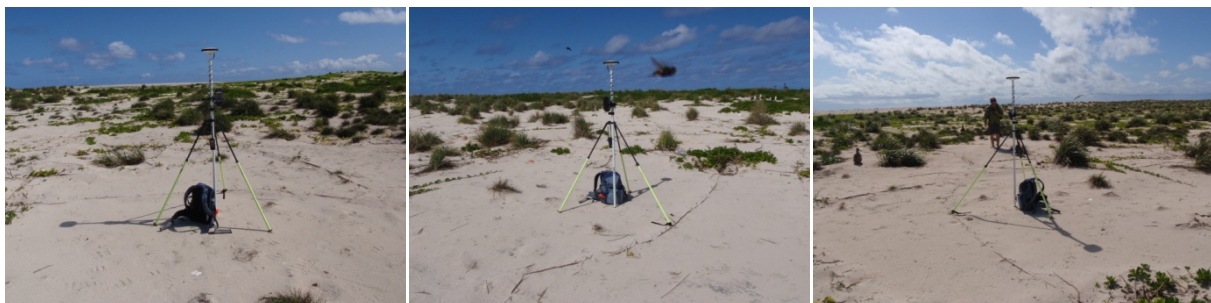
Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H072  
Antenna Height (m): 1.980  
Photo IDs: 385,386,387

Stability: C  
Comment: Coral bench.



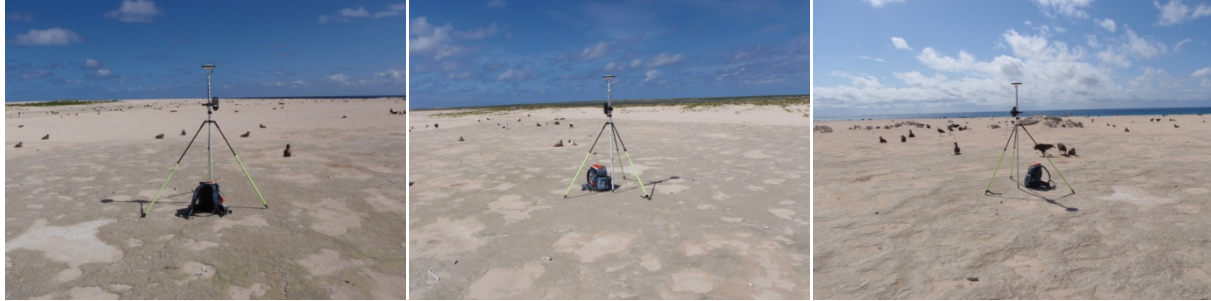
Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H073  
Antenna Height (m): 1.967  
Photo IDs: 388,389,390

Stability: A  
Comment: Guano field.



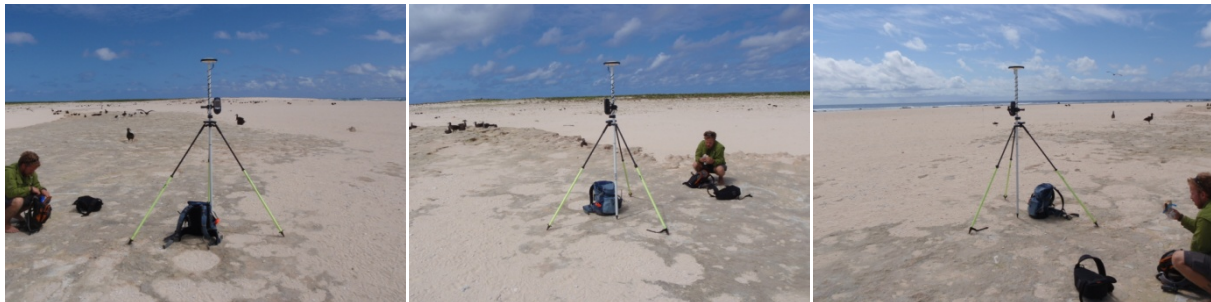
Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H074  
Antenna Height (m): 2.025  
Photo IDs: 391,392,393

Stability: A  
Comment: Guano field.



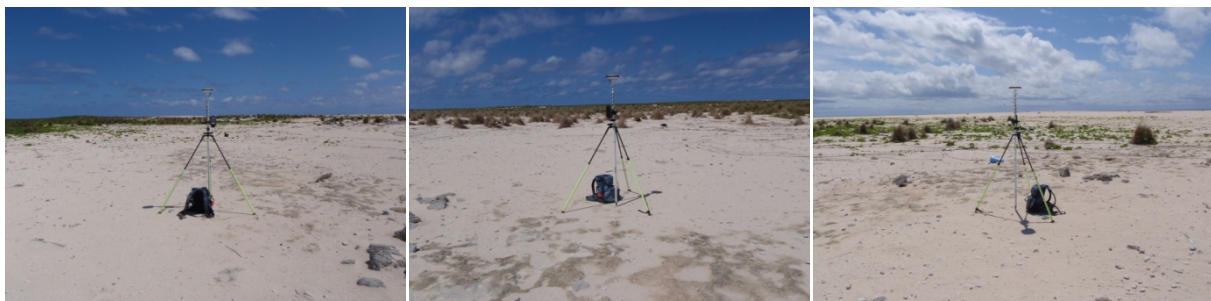
Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H075  
Antenna Height (m): 2.025  
Photo IDs: 394,395,396

Stability: A  
Comment: Guano field.



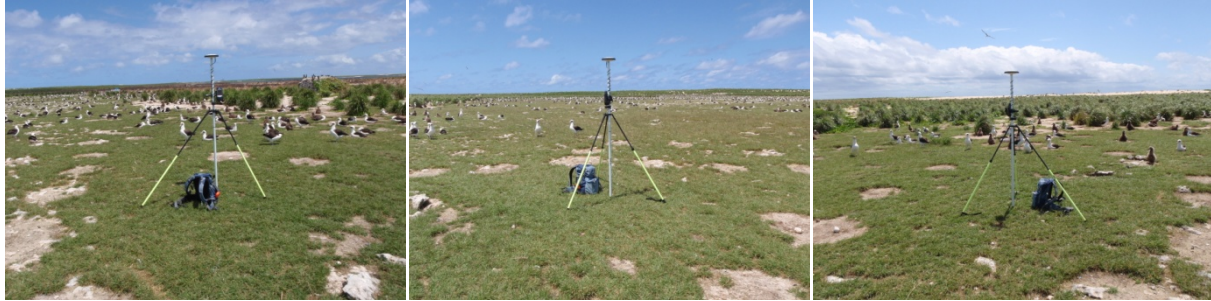
Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H076  
Antenna Height (m): 2.029  
Photo IDs: 397,398,399

Stability: A  
Comment: Guano field.



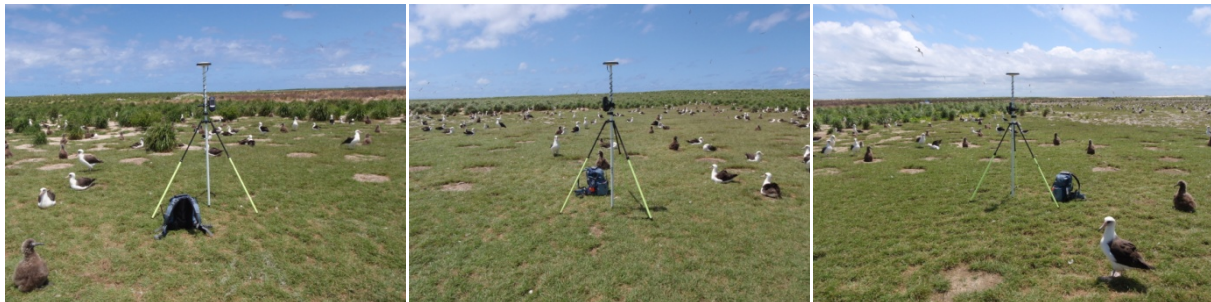
Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H077  
Antenna Height (m): 2.003  
Photo IDs: 406,407,408

Stability: A  
Comment: Hardpan, old guano mine.



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H078  
Antenna Height (m): 2.005  
Photo IDs: 415,416,417

Stability: A  
Comment: Hardpan, old guano mine.



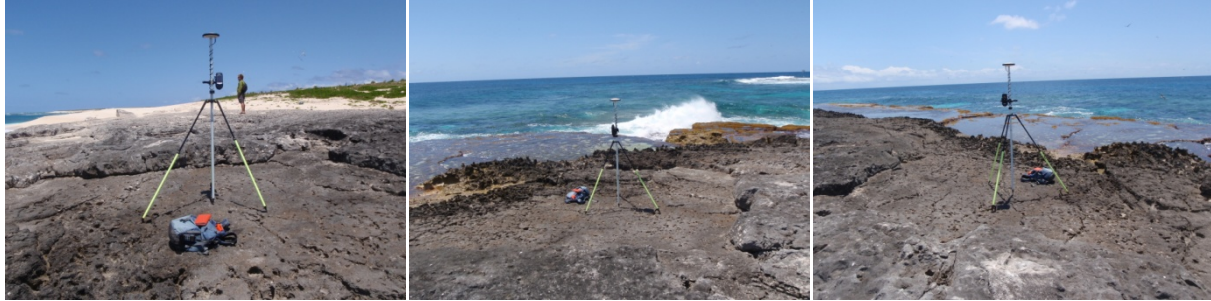
Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H079  
Antenna Height (m): 1.965  
Photo IDs: 423,424,425

Stability: A  
Comment: Lakebed.



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H080  
Antenna Height (m): 2.042  
Photo IDs: 460,461,462

Stability: A  
Comment: Lava bench.



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H081  
Antenna Height (m): 1.980  
Photo IDs: 463,464,465

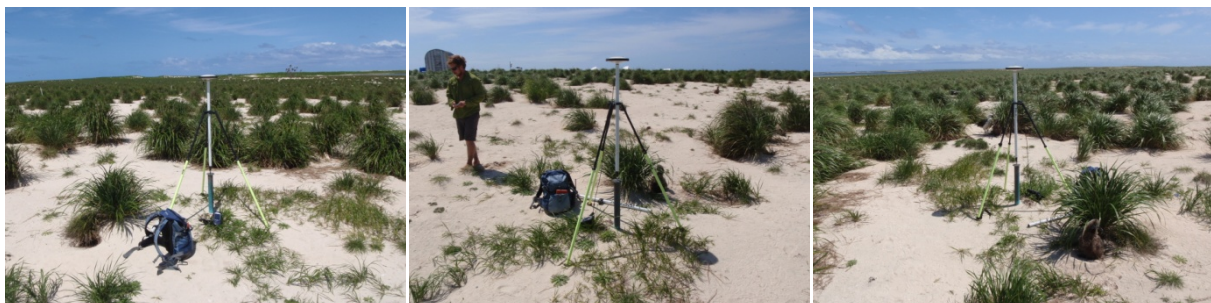
Stability: B  
Comment: Edge of vegetation and burrows.



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: H082  
Antenna Height (m): 1.089  
Photo IDs: 467,468,469,470



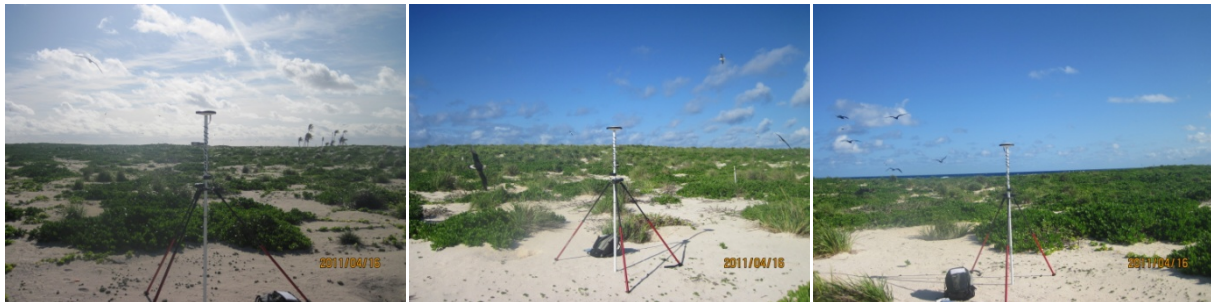
Stability: A  
Comment: OCS benchmark.



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J064  
Antenna Height (m): 1.924  
Photo IDs: 877,878,879



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J065  
Antenna Height (m): 1.933  
Photo IDs: 885,886,887



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J066  
Antenna Height (m): 1.949  
Photo IDs: 893,894,895

Comment: North end of lake in mud flats (very spongy ground).



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J067  
Antenna Height (m): 2.024  
Photo IDs: 896,897,898



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J068  
Antenna Height (m): 1.964  
Photo IDs: 899,900,901



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J069  
Antenna Height (m): 1.981  
Photo IDs: 902,903,904



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J070  
Antenna Height (m): 1.973  
Photo IDs: 905,906,907



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J071  
Antenna Height (m): 1.944  
Photo IDs: 908,909,910



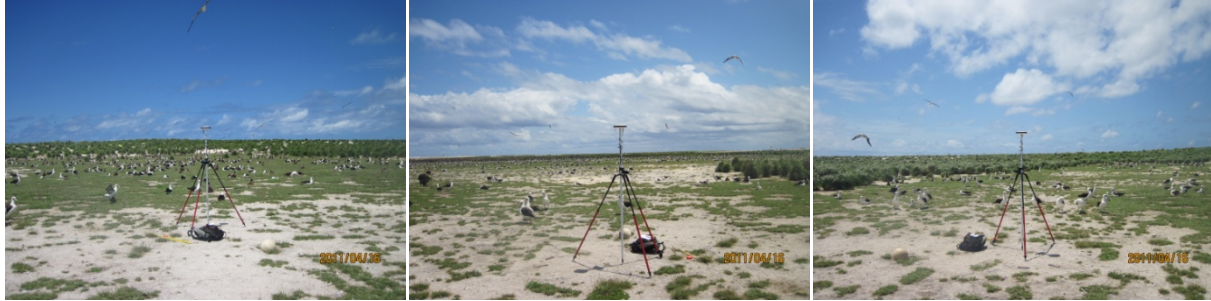
Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J072  
Antenna Height (m): 2.045  
Photo IDs: 912,913,914

Comment: South end of flat "dead pan" area to south of lake.

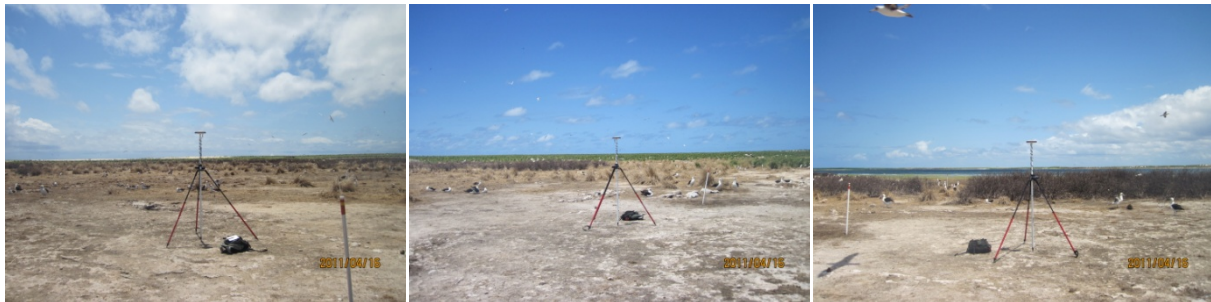




Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J073  
Antenna Height (m): 2.039  
Photo IDs: 915,916,917



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J074  
Antenna Height (m): 2.044  
Photo IDs: 918,919,920



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J075  
Antenna Height (m): 2.030  
Photo IDs: 921,922,923

Comment: Small narrow rock ledge on SW corner of island.



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J076  
Antenna Height (m): 1.973  
Photo IDs: 924,925,926



Island/Atoll: Laysan  
Date: 4/16/2011  
Station ID: J077  
Antenna Height (m): 1.937  
Photo IDs: 929,930,931

Comment: NW side of lake just south of bush patch.

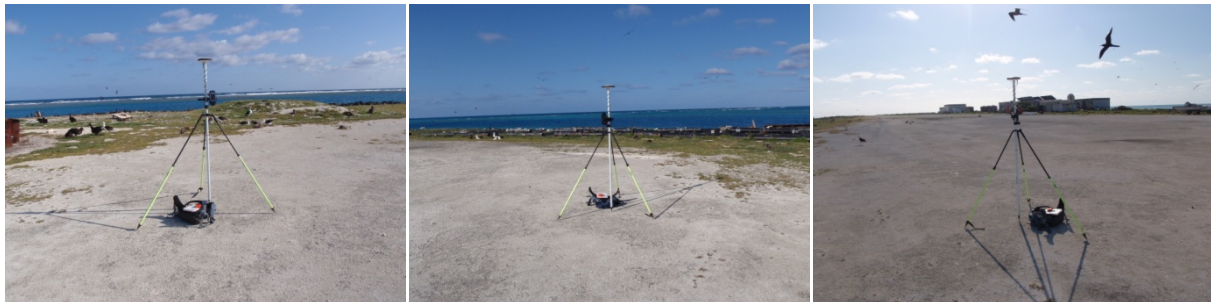


**French Frigate Shoals**

Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: FFBA  
Antenna Height (m): 1.422  
Photo IDs: 473,474,475,476  
Designation: French 2001



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: H083  
Antenna Height (m): 2.040  
Photo IDs: 478,479,480



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: H084  
Antenna Height (m): 2.044  
Photo IDs: 481,482,483



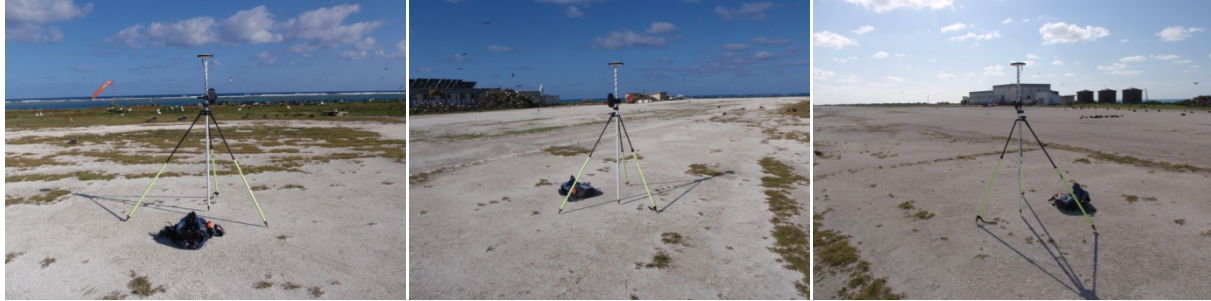
Island/Atoll: French Frigate Shoals

Date: 4/18/2011

Station ID: H085

Antenna Height (m): 2.045

Photo IDs: 484,485,486



Island/Atoll: French Frigate Shoals

Date: 4/18/2011

Station ID: H086

Antenna Height (m): 2.047

Photo IDs: 487,488,489



Island/Atoll: French Frigate Shoals

Date: 4/18/2011

Station ID: H087

Antenna Height (m): 2.043

Photo IDs: 490,491,492



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: H088  
Antenna Height (m): 2.019  
Photo IDs: 493,494,495

Comment: This point was collected for FWS and marks the location of the 500-meter marker on the north side of the runway.



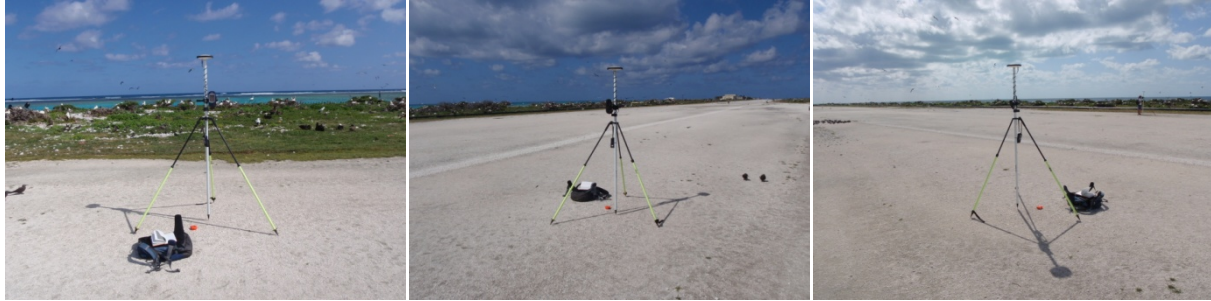
Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: H089  
Antenna Height (m): 2.044  
Photo IDs: 496,497,498



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: H090  
Antenna Height (m): 2.044  
Photo IDs: 499,500,501



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: H091  
Antenna Height (m): 2.043  
Photo IDs: 502,503,504



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: H092  
Antenna Height (m): 2.038  
Photo IDs: 505,506,507



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: H093  
Antenna Height (m): 2.015  
Photo IDs: 508,509,510



NWHI Lidar Validation

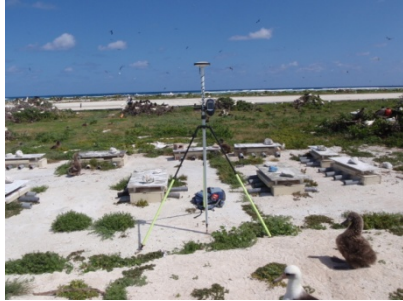
Survey Log

French Frigate Shoals

Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: H094  
Antenna Height (m): 2.045  
Photo IDs: 511,512,513,515

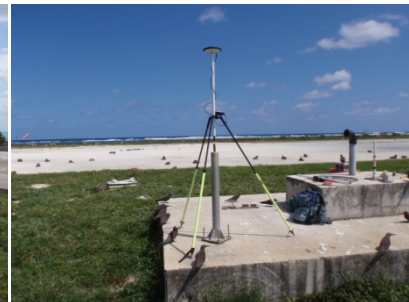


Comment: Collected for FWS (Paula Hartzell) to mark the end of a transect.



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: H095  
Antenna Height (m): 1.090  
Photo IDs: 516,517,518  
PID: DE5426

**DO NOT USE FOR LIDAR AA.**



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: H096  
Antenna Height (m): 1.926  
Photo IDs: 521,522,523





Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: H097  
Antenna Height (m): 2.022  
Photo IDs: 524,525,526



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: H098  
Antenna Height (m): 2.020  
Photo IDs: 527,528,529



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: J078  
Antenna Height (m): 2.037  
Photo IDs: 943,944,945



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: J079  
Antenna Height (m): 2.042  
Photo IDs: 946,947,948



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: J080  
Antenna Height (m): 2.041  
Photo IDs: 949,950,951



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: J081  
Antenna Height (m): 2.039  
Photo IDs: 952,953,954



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: J082  
Antenna Height (m): 2.039  
Photo IDs: 955,956,957



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: J083  
Antenna Height (m): 2.005  
Photo IDs: 958,959,960,961



Comment: This point was collected for FWS and marks the location of the 500-meter marker on the south side of the runway.  
**DO NOT USE IN LIDAR AA.**



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: J084  
Antenna Height (m): 2.039  
Photo IDs: 962,963,964



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: J085  
Antenna Height (m): 2.039  
Photo IDs: 965,966,967



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: J086  
Antenna Height (m): 2.034  
Photo IDs: 968,969,970



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: J087  
Antenna Height (m): 2.044  
Photo IDs: 971,972,973



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: J088  
Antenna Height (m): 2.039  
Photo IDs: 974,975,976



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: J089  
Antenna Height (m): 2.045  
Photo IDs: 977,978,979

Comment: Center of circle on SW side of catchment pad, directly south of base station.



Island/Atoll: French Frigate Shoals  
Date: 4/18/2011  
Station ID: J090  
Antenna Height (m): 1.937  
Photo IDs: 985,986,987



Island/Atoll: French Frigate Shoals

Date: 4/18/2011

Station ID: J091

Antenna Height (m): 1.938

Photo IDs: 1000,1001,1002



Island/Atoll: French Frigate Shoals

Date: 4/18/2011

Station ID: J092

Antenna Height (m): 2.016

Photo IDs: 1009,1010,1011



## **Appendix B: GPS Processing Reports**

Midway Atoll

# Land Survey Overview

GNSS Solutions, Copyright (C) 2010 Ashtech. 6/27/2011 1:30:51 PM  
[www.ashtech.com](http://www.ashtech.com)

Project Name : NWHI\_Midway  
 Spatial Reference System : UTM/NAD83-CORS96/UTM zone 01N WGS84  
 Time Zone : (GMT-10:00) Hawaii  
 Linear Units : Meters

## Coordinate System Summary

### Coordinate system

Name : UTM/NAD83-CORS96/UTM zone 01N WGS84  
 Type : Projected  
 Unit name : Meters  
 Meters per unit : 1  
 Vertical datum : WGS\_84  
 Vertical unit : Meters  
 Meters per unit : 1

### Datum

Name : NAD83-CORS96~1  
 Ellipsoid Name : WGS 84  
 Semi-major Axis : 6378137.000 m  
 Inverse Flattening : 298.257223563  
 DX to WGS84 : -1.0040 m  
 DY to WGS84 : 1.9097 m  
 DZ to WGS84 : 0.5155 m  
 RX to WGS84 : -0.026719 "  
 RY to WGS84 : -0.000342 "  
 RZ to WGS84 : -0.010987 "  
 ppm to WGS84 : 0.001540000000

### Projection

Projection Class : Transverse\_Mercator  
 latitude\_of\_origin : 0° 00' 00.00000"N  
 central\_meridian : 177° 00' 00.00000"W  
 scale\_factor : 0.999600000000  
 false\_easting : 500000.000 m  
 false\_northing : 0.000 m

Control Points : 1  
 Reference Points : 0  
 Logged Points : 37  
 Target Points : 0  
 Intermediate Points : 0



## Control Points

Name	Components	95%		Status	Control
		Error			
MISE	East	463864.652	0.004	FIXED	
	North	3120774.895	0.009	FIXED	
	Ellips height	4.211	0.006	FIXED	

## Logged Points

Name	Components	95%		Status
		Error		
H001	East	467623.099	0.001	Processed (static)
	North	3120684.838	0.001	Processed (static)
	Ellips height	4.769	0.003	Processed (static)
H002	East	467925.213	0.000	Processed (static)
	North	3121014.151	0.000	Processed (static)
	Ellips height	5.347	0.001	Processed (static)
H003	East	468054.726	0.000	Processed (static)
	North	3120612.770	0.000	Processed (static)
	Ellips height	4.928	0.001	Processed (static)
H004	East	468074.650	0.001	Processed (static)
	North	3120494.684	0.000	Processed (static)
	Ellips height	5.070	0.001	Processed (static)
H005	East	467739.183	0.001	Processed (static)
	North	3120399.385	0.001	Processed (static)
	Ellips height	4.430	0.003	Processed (static)
H006	East	467524.649	0.000	Processed (static)
	North	3120443.173	0.000	Processed (static)
	Ellips height	4.419	0.000	Processed (static)
H007	East	467249.077	0.000	Processed (static)
	North	3120358.106	0.000	Processed (static)
	Ellips height	4.395	0.001	Processed (static)
H008	East	463470.534	0.000	Processed (static)
	North	3121170.965	0.000	Processed (static)
	Ellips height	5.045	0.001	Processed (static)
H009	East	462256.176	0.000	Processed (static)
	North	3120582.065	0.000	Processed (static)
	Ellips height	4.856	0.000	Processed (static)
H010	East	461295.686	0.000	Processed (static)
	North	3119099.014	0.000	Processed (static)
	Ellips height	4.612	0.001	Processed (static)
H011	East	463235.484	0.000	Processed (static)
	North	3119729.088	0.000	Processed (static)
	Ellips height	4.045	0.001	Processed (static)
H012	East	463834.552	0.001	Processed (static)
	North	3120758.641	0.001	Processed (static)
	Ellips height	4.235	0.002	Processed (static)
H013	East	464117.449	0.000	Processed (static)
	North	3120488.448	0.000	Processed (static)
	Ellips height	4.112	0.000	Processed (static)

H014	East	463246.053	0.000	Processed (static)
	North	3120425.385	0.000	Processed (static)
	Ellips height	4.345	0.001	Processed (static)
H015	East	462306.424	0.000	Processed (static)
	North	3119837.940	0.000	Processed (static)
	Ellips height	4.874	0.000	Processed (static)
	Description	DE5245		
H016	East	462721.042	0.000	Processed (static)
	North	3120391.938	0.000	Processed (static)
	Ellips height	5.156	0.001	Processed (static)
H017	East	462635.114	0.000	Processed (static)
	North	3120724.819	0.000	Processed (static)
	Ellips height	11.026	0.000	Processed (static)
H020	East	463004.726	0.000	Processed (static)
	North	3121180.952	0.000	Processed (static)
	Ellips height	5.180	0.000	Processed (static)
H021	East	463687.739	0.000	Processed (static)
	North	3121177.217	0.000	Processed (static)
	Ellips height	4.897	0.000	Processed (static)
J001	East	464497.186	0.000	Processed (static)
	North	3121071.829	0.000	Processed (static)
	Ellips height	4.713	0.001	Processed (static)
J002	East	467442.207	0.000	Processed (static)
	North	3120568.660	0.000	Processed (static)
	Ellips height	4.242	0.001	Processed (static)
J003	East	467702.935	0.000	Processed (static)
	North	3120852.342	0.000	Processed (static)
	Ellips height	4.797	0.001	Processed (static)
J004	East	467885.297	0.000	Processed (static)
	North	3120689.697	0.000	Processed (static)
	Ellips height	5.050	0.001	Processed (static)
J005	East	467861.792	0.000	Processed (static)
	North	3120538.333	0.000	Processed (static)
	Ellips height	5.041	0.000	Processed (static)
J006	East	467601.935	0.000	Processed (static)
	North	3120483.279	0.000	Processed (static)
	Ellips height	4.424	0.001	Processed (static)
J007	East	467031.416	0.000	Processed (static)
	North	3120276.744	0.000	Processed (static)
	Ellips height	4.498	0.001	Processed (static)
J008	East	462087.689	0.000	Processed (static)
	North	3120988.065	0.000	Processed (static)
	Ellips height	4.025	0.001	Processed (static)
J009	East	461306.118	0.000	Processed (static)
	North	3119072.009	0.000	Processed (static)
	Ellips height	4.646	0.001	Processed (static)
J010	East	463257.138	0.000	Processed (static)
	North	3119738.156	0.000	Processed (static)
	Ellips height	3.920	0.000	Processed (static)
J011	East	463839.409	0.001	Processed (static)
	North	3120732.133	0.001	Processed (static)
	Ellips height	4.149	0.001	Processed (static)
J012	East	464575.886	0.000	Processed (static)
	North	3120612.734	0.000	Processed (static)

	Ellips height	4.622	0.001	Processed (static)
J013	East	463265.494	0.000	Processed (static)
	North	3120429.768	0.000	Processed (static)
	Ellips height	4.052	0.001	Processed (static)
J014	East	462291.849	0.000	Processed (static)
	North	3119879.541	0.000	Processed (static)
	Ellips height	4.222	0.000	Processed (static)
J015	East	462679.454	0.000	Processed (static)
	North	3120372.946	0.000	Processed (static)
	Ellips height	5.219	0.001	Processed (static)
J016	East	462724.951	0.000	Processed (static)
	North	3120785.346	0.000	Processed (static)
	Ellips height	10.009	0.000	Processed (static)
J017	East	463027.223	0.000	Processed (static)
	North	3121161.526	0.000	Processed (static)
	Ellips height	5.102	0.001	Processed (static)
J018	East	463784.343	0.001	Processed (static)
	North	3121268.580	0.000	Processed (static)
	Ellips height	4.806	0.001	Processed (static)

## Files

Name	Start Time	Sampling	Epochs	Size (Kb)	Type
BMISEA11.098	11/04/08 09:33	5	5716	5242	L1/L2 GPS
BPM01D11.099	11/04/08 17:17	5	66	31	L1 GPS/WAAS
BPM01C11.099	11/04/08 16:55	5	134	67	L1 GPS/WAAS
BPM01B11.099	11/04/08 16:23	5	184	84	L1 GPS/WAAS
BPM01A11.099	11/04/08 15:53	5	156	67	L1 GPS/WAAS
BPM01G11.098	11/04/08 13:59	5	187	97	L1 GPS/WAAS
BPM01F11.098	11/04/08 13:27	5	181	87	L1 GPS/WAAS
BPM01E11.098	11/04/08 12:57	5	207	94	L1 GPS/WAAS
BPM01D11.098	11/04/08 12:29	5	182	95	L1 GPS/WAAS
BPM01C11.098	11/04/08 11:48	5	182	91	L1 GPS/WAAS
BPM01B11.098	11/04/08 11:16	5	183	86	L1 GPS/WAAS
BPM01A11.098	11/04/08 10:09	5	129	50	L1 GPS/WAAS
B1234F11.099	11/04/08 17:16	5	72	34	L1 GPS/WAAS
B1234E11.099	11/04/08 16:54	5	152	76	L1 GPS/WAAS
B1234D11.099	11/04/08 16:21	5	206	96	L1 GPS/WAAS
B1234C11.099	11/04/08 15:47	5	268	117	L1 GPS/WAAS
B1234B11.099	11/04/08 15:18	5	144	57	L1 GPS/WAAS
B1234A11.099	11/04/08 14:06	5	183	88	L1 GPS/WAAS
B1234F11.098	11/04/08 13:42	5	183	83	L1 GPS/WAAS
B1234E11.098	11/04/08 13:17	5	182	85	L1 GPS/WAAS
B1234D11.098	11/04/08 12:49	5	184	90	L1 GPS/WAAS
B1234C11.098	11/04/08 12:28	5	186	97	L1 GPS/WAAS
B1234B11.098	11/04/08 11:53	5	182	93	L1 GPS/WAAS
B1234A11.098	11/04/08 11:27	5	181	76	L1 GPS/WAAS
BMISEA11.099	11/04/09 11:14	5	2577	2481	L1/L2 GPS
BPM01B11.100	11/04/09 14:35	5	96	42	L1 GPS/WAAS
BPM01A11.100	11/04/09 14:09	5	167	72	L1 GPS/WAAS
BPM01I11.099	11/04/09 13:06	5	158	61	L1 GPS/WAAS
BPM01H11.099	11/04/09 12:45	5	122	51	L1 GPS/WAAS
BPM01G11.099	11/04/09 12:23	5	162	68	L1 GPS/WAAS
BPM01F11.099	11/04/09 11:58	5	127	54	L1 GPS/WAAS
BPM01E11.099	11/04/09 11:36	5	123	52	L1 GPS/WAAS
B1234B11.100	11/04/09 14:29	5	182	79	L1 GPS/WAAS
B1234A11.100	11/04/09 14:12	5	126	53	L1 GPS/WAAS
B1234K11.099	11/04/09 13:08	5	120	52	L1 GPS/WAAS
B1234J11.099	11/04/09 12:44	5	124	63	L1 GPS/WAAS
B1234I11.099	11/04/09 12:22	5	172	89	L1 GPS/WAAS

B1234H11.099	11/04/09 11:57	5	120	63	L1 GPS/WAAS
B1234G11.099	11/04/09 11:24	5	303	138	L1 GPS/WAAS

## Occupations

<u>File</u>	<u>Site</u>	<u>Start Time</u>	<u>Time span</u>	<u>Type</u>
	MISE	April 8 2011 09:33:02.00	07:54:08.00	Static
BMISEA11.098	J011	April 8 2011 17:17:00.00	00:05:25.00	Static
BPM01D11.099	J010	April 8 2011 16:55:55.00	00:11:05.00	Static
BPM01C11.099	J009	April 8 2011 16:23:05.00	00:15:15.00	Static
BPM01B11.099	J008	April 8 2011 15:53:20.00	00:12:55.00	Static
BPM01A11.099	J007	April 8 2011 13:59:45.00	00:15:30.00	Static
BPM01G11.098	J006	April 8 2011 13:27:55.00	00:15:00.00	Static
BPM01F11.098	J005	April 8 2011 12:57:05.00	00:17:10.00	Static
BPM01E11.098	J004	April 8 2011 12:29:30.00	00:15:05.00	Static
BPM01D11.098	J003	April 8 2011 11:48:05.00	00:15:05.00	Static
BPM01C11.098	J002	April 8 2011 11:16:15.00	00:15:10.00	Static
BPM01B11.098	J001	April 8 2011 10:09:40.00	00:10:40.00	Static
BPM01A11.098	H012	April 8 2011 17:16:25.00	00:05:55.00	Static
B1234F11.099	H011	April 8 2011 16:54:25.00	00:12:35.00	Static
B1234E11.099	H010	April 8 2011 16:21:15.00	00:17:05.00	Static
B1234D11.099	H009	April 8 2011 15:47:00.00	00:22:15.00	Static
B1234C11.099	H008	April 8 2011 15:18:35.00	00:11:55.00	Static
B1234B11.099	H007	April 8 2011 14:06:05.00	00:15:10.00	Static
B1234A11.099	H006	April 8 2011 13:42:05.00	00:15:10.00	Static
B1234F11.098	H005	April 8 2011 13:17:20.00	00:15:05.00	Static
B1234E11.098	H004	April 8 2011 12:49:50.00	00:15:15.00	Static
B1234D11.098	H003	April 8 2011 12:28:45.00	00:15:25.00	Static
B1234C11.098	H002	April 8 2011 11:53:30.00	00:15:05.00	Static
B1234B11.098	H001	April 8 2011 11:27:30.00	00:15:00.00	Static
B1234A11.098	MISE	April 9 2011 11:14:00.00	03:34:40.00	Static
BMISEA11.099	J018	April 9 2011 14:35:25.00	00:07:55.00	Static
BPM01B11.100	J017	April 9 2011 14:09:20.00	00:13:50.00	Static
BPM01A11.100	J016	April 9 2011 13:06:25.00	00:13:05.00	Static
BPM01I11.099	J015	April 9 2011 12:45:20.00	00:10:05.00	Static
BPM01H11.099	J014	April 9 2011 12:23:35.00	00:13:25.00	Static
BPM01G11.099				

J013	April 9 2011 11:58:25.00	00:10:30.00	Static
BPM01F11.099			
J012	April 9 2011 11:36:25.00	00:10:10.00	Static
BPM01E11.099			
H021	April 9 2011 14:29:55.00	00:15:05.00	Static
B1234B11.100			
H020	April 9 2011 14:12:25.00	00:10:25.00	Static
B1234A11.100			
H017	April 9 2011 13:08:25.00	00:09:55.00	Static
B1234K11.099			
H016	April 9 2011 12:44:20.00	00:10:15.00	Static
B1234J11.099			
H015	April 9 2011 12:22:40.00	00:14:15.00	Static
B1234I11.099			
H014	April 9 2011 11:57:55.00	00:09:55.00	Static
B1234H11.099			
H013	April 9 2011 11:24:30.00	00:25:10.00	Static
B1234G11.099			

## Processes

Reference	Reference File	Rover	Rover File	Mode	Num
MISE	BMISEA11.098	J011	BPM01D11.099	Static	1
MISE	BMISEA11.098	H005	B1234E11.098	Static	2
MISE	BMISEA11.098	H006	B1234F11.098	Static	3
MISE	BMISEA11.098	H007	B1234A11.099	Static	4
MISE	BMISEA11.098	H008	B1234B11.099	Static	5
MISE	BMISEA11.098	H009	B1234C11.099	Static	6
MISE	BMISEA11.098	H010	B1234D11.099	Static	7
MISE	BMISEA11.098	H011	B1234E11.099	Static	8
MISE	BMISEA11.098	H012	B1234F11.099	Static	9
MISE	BMISEA11.098	J006	BPM01F11.098	Static	10
MISE	BMISEA11.098	J002	BPM01B11.098	Static	11
MISE	BMISEA11.098	H004	B1234D11.098	Static	12
MISE	BMISEA11.098	J003	BPM01C11.098	Static	13
MISE	BMISEA11.098	J010	BPM01C11.099	Static	14
MISE	BMISEA11.098	J004	BPM01D11.098	Static	15
MISE	BMISEA11.098	J005	BPM01E11.098	Static	16
MISE	BMISEA11.098	J009	BPM01B11.099	Static	17
MISE	BMISEA11.098	H003	B1234C11.098	Static	18
MISE	BMISEA11.098	J008	BPM01A11.099	Static	19
MISE	BMISEA11.098	J007	BPM01G11.098	Static	20
MISE	BMISEA11.098	J001	BPM01A11.098	Static	21
MISE	BMISEA11.098	H002	B1234B11.098	Static	22
MISE	BMISEA11.098	H001	B1234A11.098	Static	23
MISE	BMISEA11.099	H015	B1234I11.099	Static	24
MISE	BMISEA11.099	H016	B1234J11.099	Static	25
MISE	BMISEA11.099	H017	B1234K11.099	Static	26
MISE	BMISEA11.099	H020	B1234A11.100	Static	27
MISE	BMISEA11.099	H021	B1234B11.100	Static	28
MISE	BMISEA11.099	H014	B1234H11.099	Static	29
MISE	BMISEA11.099	J015	BPM01H11.099	Static	30
MISE	BMISEA11.099	J012	BPM01E11.099	Static	31
MISE	BMISEA11.099	J013	BPM01F11.099	Static	32
MISE	BMISEA11.099	J018	BPM01B11.100	Static	33
MISE	BMISEA11.099	H013	B1234G11.099	Static	34
MISE	BMISEA11.099	J016	BPM01I11.099	Static	35
MISE	BMISEA11.099	J017	BPM01A11.100	Static	36
MISE	BMISEA11.099	J014	BPM01G11.099	Static	37
J006	BPM01F11.098	H005	B1234E11.098	Static	38
H013	B1234G11.099	J012	BPM01E11.099	Static	39
H009	B1234C11.099	J008	BPM01A11.099	Static	40
J005	BPM01E11.098	H004	B1234D11.098	Static	41
H010	B1234D11.099	J009	BPM01B11.099	Static	42
J007	BPM01G11.098	H007	B1234A11.099	Static	43
H003	B1234C11.098	J004	BPM01D11.098	Static	44
J002	BPM01B11.098	H001	B1234A11.098	Static	45

H021	B1234B11.100	J018	BPM01B11.100	Static	46
J003	BPM01C11.098	H002	B1234B11.098	Static	47
H015	B1234I11.099	J014	BPM01G11.099	Static	48
J017	BPM01A11.100	H020	B1234A11.100	Static	49
J016	BPM01I11.099	H017	B1234K11.099	Static	50
H011	B1234E11.099	J010	BPM01C11.099	Static	51
J013	BPM01F11.099	H014	B1234H11.099	Static	52
H016	B1234J11.099	J015	BPM01H11.099	Static	53
H012	B1234F11.099	J011	BPM01D11.099	Static	54

### Processed vectors

Vector Identifier	Vector Length	95% Error		Vector Components	95% Error	SV	PDOP	QA	Solution
MISE - J003	3840.547	0.020	X	218.895	0.008	10	1.8		Fixed
11/04/08 11:48			Y	-3833.504	0.008				
			Z	78.284	0.008				
MISE - J011	49.676	0.002	X	-21.336	0.001	8	2.0		Fixed
11/04/08 17:17			Y	24.169	0.001				
			Z	-37.793	0.000				
MISE - H016	1206.490	0.007	X	-235.767	0.003	9	1.9		Fixed
11/04/09 12:44			Y	1133.250	0.003				
			Z	-340.260	0.003				
MISE - H015	1818.928	0.009	X	-516.673	0.004	9	1.9		Fixed
11/04/09 12:22			Y	1533.865	0.004				
			Z	-829.942	0.004				
MISE - H001	3760.976	0.019	X	135.982	0.008	10	1.7		Fixed
11/04/08 11:27			Y	-3757.873	0.008				
			Z	-69.583	0.007				
MISE - H002	4069.174	0.021	X	305.492	0.009	10	1.8		Fixed
11/04/08 11:53			Y	-4051.628	0.008				
			Z	221.712	0.008				
MISE - J001	699.032	0.005	X	169.791	0.002	8	2.1		Fixed
11/04/08 10:09			Y	-624.735	0.002				
			Z	263.672	0.002				
MISE - J007	3206.942	0.017	X	-84.803	0.007	9	1.7		Fixed
11/04/08 13:59			Y	-3176.730	0.007				
			Z	-430.903	0.007				
MISE - J008	1790.391	0.010	X	16.888	0.004	9	1.8		Fixed
11/04/08 15:53			Y	1780.939	0.004				
			Z	182.951	0.004				
MISE - H003	4194.830	0.021	X	122.495	0.009	11	1.5		Fixed
11/04/08 12:28			Y	-4190.962	0.008				
			Z	-132.009	0.009				
MISE - J009	3074.600	0.016	X	-925.166	0.007	9	1.6		Fixed
11/04/08 16:23			Y	2514.501	0.006				
			Z	-1508.150	0.006				
MISE - J005	4005.681	0.020	X	77.994	0.008	9	1.7		Fixed
11/04/08 12:57			Y	-4000.023	0.008				
			Z	-198.035	0.008				
MISE - H020	951.341	0.006	X	150.250	0.003	9	1.5		Fixed
11/04/09 14:12			Y	869.302	0.002				
			Z	356.073	0.003				
MISE - J010	1202.086	0.007	X	-518.053	0.003	8	2.0		Fixed
11/04/08 16:55			Y	581.421	0.003				

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			Z	-915.742	0.002			
MISE - H021	439.670	0.003	X	181.038	0.001	9	1.6	Fixed
11/04/09 14:29			Y	186.712	0.001			
			Z	354.505	0.001			
MISE - H004	4220.942	0.021	X	67.562	0.009	9	1.8	Fixed
11/04/08 12:49			Y	-4213.798	0.009			
			Z	-235.995	0.008			
MISE - J002	3584.877	0.018	X	72.925	0.008	10	1.6	Fixed
11/04/08 11:16			Y	-3579.973	0.007			
			Z	-172.683	0.007			
MISE - J006	3750.090	0.019	X	40.090	0.008	8	2.4	Fixed
11/04/08 13:27			Y	-3741.700	0.008			
			Z	-247.481	0.008			
MISE - H012	34.222	0.003	X	-9.124	0.001	8	2.0	Fixed
11/04/08 17:16			Y	29.675	0.001			
			Z	-14.398	0.001			
MISE - H011	1220.946	0.007	X	-523.469	0.003	8	2.0	Fixed
11/04/08 16:54			Y	602.829	0.003			
			Z	-923.736	0.003			
MISE - H010	3068.448	0.016	X	-912.878	0.007	9	1.6	Fixed
11/04/08 16:21			Y	2525.594	0.006			
			Z	-1484.387	0.006			
MISE - H009	1620.615	0.009	X	-167.649	0.004	8	1.9	Fixed
11/04/08 15:47			Y	1602.492	0.003			
			Z	-174.087	0.003			
MISE - H008	558.965	0.004	X	167.675	0.002	9	1.7	Fixed
11/04/08 15:18			Y	403.597	0.001			
			Z	348.478	0.002			
MISE - H007	3411.308	0.018	X	-35.883	0.007	8	2.3	Fixed
11/04/08 14:06			Y	-3392.207	0.007			
			Z	-358.699	0.007			
MISE - H006	3676.418	0.018	X	17.455	0.008	9	1.7	Fixed
11/04/08 13:42			Y	-3665.466	0.008			
			Z	-283.025	0.007			
MISE - H005	3894.188	0.020	X	7.043	0.008	9	1.7	Fixed
11/04/08 13:17			Y	-3880.919	0.008			
			Z	-321.110	0.008			
MISE - J004	4023.101	0.020	X	150.595	0.008	11	1.5	Fixed
11/04/08 12:29			Y	-4019.763	0.008			
			Z	-64.538	0.008			
MISE - J016	1140.202	0.006	X	-54.065	0.003	9	1.7	Fixed
11/04/09 13:06			Y	1138.885	0.003			
			Z	8.854	0.002			
MISE - H017	1231.049	0.007	X	-87.786	0.003	9	1.7	Fixed
11/04/09 13:08			Y	1227.116	0.003			
			Z	-44.272	0.002			
MISE - J017	922.727	0.006	X	142.204	0.003	9	1.5	Fixed
11/04/09 14:09			Y	846.345	0.002			
			Z	338.976	0.002			
MISE - H013	382.191	0.002	X	-123.211	0.001	10	1.7	Fixed
11/04/09 11:24			Y	-259.695	0.001			
			Z	-251.889	0.001			
MISE - J018	500.368	0.004	X	228.848	0.002	9	1.6	Fixed

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11/04/09 14:35			Y	92.447	0.002			
			Z	435.259	0.002			
MISE - J013 11/04/09 11:58	691.716	0.005	X	-191.205	0.002	10	2.1	Fixed
			Y	590.180	0.002			
			Z	-305.939	0.002			
MISE - J012 11/04/09 11:36	729.763	0.005	X	-43.223	0.002	9	2.0	Fixed
			Y	-714.732	0.002			
			Z	-140.867	0.002			
MISE - J015 11/04/09 12:45	1251.983	0.007	X	-246.755	0.003	9	1.9	Fixed
			Y	1174.334	0.003			
			Z	-357.088	0.003			
MISE - H014 11/04/09 11:57	710.781	0.005	X	-194.452	0.002	10	1.8	Fixed
			Y	609.486	0.002			
			Z	-309.718	0.002			
MISE - J014 11/04/09 12:23	1810.492	0.010	X	-497.142	0.004	9	1.9	Fixed
			Y	1549.486	0.004			
			Z	-793.616	0.004			
J007 - H007 11/04/08 14:06	232.460	0.002	X	48.920	0.001	7	3.2	Fixed
			Y	-215.478	0.001			
			Z	72.208	0.000			
J006 - H005 11/04/08 13:27	160.920	0.005	X	-33.049	0.002	8	2.5	Fixed
			Y	-139.221	0.001			
			Z	-73.625	0.002			
J005 - H004 11/04/08 12:57	217.371	0.003	X	-10.435	0.002	9	1.8	Fixed
			Y	-213.776	0.001			
			Z	-37.960	0.001			
J003 - H002 11/04/08 11:53	275.043	0.002	X	86.590	0.001	10	1.8	Fixed
			Y	-218.126	0.001			
			Z	143.430	0.001			
J002 - H001 11/04/08 11:27	215.071	0.006	X	63.063	0.003	7	2.3	Fixed
			Y	-177.901	0.002			
			Z	103.101	0.002			
H012 - J011 11/04/08 17:17	26.959	0.002	X	-12.213	0.001	8	2.0	Fixed
			Y	-5.506	0.001			
			Z	-23.395	0.000			
H011 - J010 11/04/08 16:55	23.485	0.001	X	5.415	0.001	8	2.0	Fixed
			Y	-21.409	0.000			
			Z	7.994	0.000			
H010 - J009 11/04/08 16:23	28.961	0.001	X	-12.287	0.001	9	1.6	Fixed
			Y	-11.094	0.000			
			Z	-23.764	0.000			
H009 - J008 11/04/08 15:53	439.742	0.003	X	184.537	0.002	8	1.9	Fixed
			Y	178.446	0.001			
			Z	357.038	0.001			
H003 - J004 11/04/08 12:29	186.148	0.002	X	28.101	0.001	11	1.5	Fixed
			Y	171.199	0.001			
			Z	67.471	0.001			
J017 - H020 11/04/09 14:12	29.735	0.001	X	8.044	0.001	9	1.5	Fixed
			Y	22.958	0.000			
			Z	17.100	0.000			
J016 - H017 11/04/09 13:08	108.371	0.001	X	-33.721	0.001	9	1.7	Fixed
			Y	88.231	0.001			
			Z	-53.125	0.000			



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J013 - H014 11/04/09 11:58	19.939	0.002	X	-3.247	0.001	9	2.2	Fixed
			Y	19.307	0.000			
			Z	-3.778	0.001			
H021 - J018 11/04/09 14:35	133.015	0.002	X	47.809	0.001	9	1.6	Fixed
			Y	-94.267	0.001			
			Z	80.754	0.000			
H016 - J015 11/04/09 12:45	45.737	0.002	X	-10.987	0.001	9	1.9	Fixed
			Y	41.085	0.001			
			Z	-16.828	0.001			
H015 - J014 11/04/09 12:23	44.103	0.001	X	19.530	0.001	9	1.9	Fixed
			Y	15.620	0.000			
			Z	36.327	0.000			
H013 - J012 11/04/09 11:36	475.170	0.003	X	79.991	0.002	9	2.0	Fixed
			Y	-455.041	0.001			
			Z	111.017	0.001			

**Kure Atoll**

**Land Survey Overview**

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Project Name : NWHI\_Kure  
 Spatial Reference System : UTM/NAD83-CORS96/UTM zone 01N WGS84  
 Time Zone : (GMT-11:00) Samoa  
 Linear Units : Meters

**Coordinate System Summary**

Coordinate system

Name : UTM/NAD83-CORS96/UTM zone 01N WGS84  
 Type : Projected  
 Unit name : Meters  
     Meters per unit : 1  
 Vertical datum : WGS\_84  
 Vertical unit : Meters  
     Meters per unit : 1

Datum

Name : NAD83-CORS96~1  
 Ellipsoid Name : WGS 84  
 Semi-major Axis : 6378137.000 m  
 Inverse Flattening : 298.257223563  
 DX to WGS84 : -1.0040 m  
 DY to WGS84 : 1.9097 m  
 DZ to WGS84 : 0.5155 m  
 RX to WGS84 : -0.026719 "  
 RY to WGS84 : -0.000342 "  
 RZ to WGS84 : -0.010987 "  
 ppm to WGS84 : 0.001540000000

Projection

Projection Class : Transverse\_Mercator  
 latitude\_of\_origin : 0° 00' 00.00000"N  
 central\_meridian : 177° 00' 00.00000"W  
 scale\_factor : 0.999600000000  
 false\_easting : 500000.000 m  
 false\_northing : 0.000 m

Control Points : 1  
 Reference Points : 0  
 Logged Points : 30  
 Target Points : 0  
 Intermediate Points : 0

## Control Points

<u>Error</u>	<u>Name</u>	<u>Components</u>	<u>95% Error</u>	<u>Status</u>	<u>Control</u>
	KUBA	East	373237.095	0.018	FIXED
		North	3141502.655	0.006	FIXED
		Ellips height	6.731	0.022	FIXED

## Logged Points

<u>Name</u>	<u>Components</u>	<u>95% Error</u>	<u>Status</u>
H022	East	373353.935	0.001 Processed (static)
	North	3141253.719	0.001 Processed (static)
	Ellips height	6.011	0.002 Processed (static)
H023	East	373442.540	0.001 Processed (static)
	North	3141256.490	0.000 Processed (static)
	Ellips height	6.180	0.001 Processed (static)
H024	East	373229.990	0.001 Processed (static)
	North	3141148.271	0.001 Processed (static)
	Ellips height	6.625	0.001 Processed (static)
H025	East	373234.027	0.001 Processed (static)
	North	3141506.473	0.001 Processed (static)
	Ellips height	6.724	0.001 Processed (static)
H026	East	373044.466	0.000 Processed (static)
	North	3141044.546	0.000 Processed (static)
	Ellips height	6.778	0.001 Processed (static)
H027	East	372918.046	0.000 Processed (static)
	North	3140995.862	0.000 Processed (static)
	Ellips height	6.934	0.001 Processed (static)
	<i>Description</i>	<i>in line b/w dune and tree</i>	
H028	East	372772.760	0.001 Processed (static)
	North	3140944.704	0.001 Processed (static)
	Ellips height	7.070	0.001 Processed (static)
	<i>Description</i>		
H029	East	372675.916	0.000 Processed (static)
	North	3140902.283	0.001 Processed (static)
	Ellips height	7.057	0.001 Processed (static)
H030	East	372545.708	0.000 Processed (static)
	North	3140859.066	0.000 Processed (static)
	Ellips height	7.206	0.001 Processed (static)
H031	East	372444.394	0.001 Processed (static)
	North	3140758.988	0.001 Processed (static)
	Ellips height	6.886	0.001 Processed (static)
H032	East	372379.693	0.000 Processed (static)
	North	3140789.316	0.000 Processed (static)
	Ellips height	7.218	0.000 Processed (static)
H033	East	373443.568	0.001 Processed (static)
	North	3141848.215	0.001 Processed (static)
	Ellips height	6.188	0.003 Processed (static)
H034	East	373640.797	0.001 Processed (static)

	North	3142084.932	0.000	Processed (static)
	Ellips height	6.267	0.001	Processed (static)
	<i>Description</i>	<i>poor location</i>		
H035	East	373557.873	0.001	Processed (static)
	North	3142020.465	0.000	Processed (static)
	Ellips height	5.517	0.001	Processed (static)
H036	East	373732.262	0.001	Processed (static)
	North	3141679.431	0.001	Processed (static)
	Ellips height	6.358	0.001	Processed (static)
J019	East	373464.957	0.001	Processed (static)
	North	3141212.187	0.001	Processed (static)
	Ellips height	6.537	0.001	Processed (static)
J020	East	373322.652	0.001	Processed (static)
	North	3141156.824	0.001	Processed (static)
	Ellips height	6.710	0.001	Processed (static)
J021	East	373138.504	0.001	Processed (static)
	North	3141085.568	0.001	Processed (static)
	Ellips height	6.860	0.002	Processed (static)
J022	East	373033.386	0.000	Processed (static)
	North	3141070.446	0.000	Processed (static)
	Ellips height	6.812	0.001	Processed (static)
J023	East	372902.524	0.000	Processed (static)
	North	3141023.904	0.000	Processed (static)
	Ellips height	6.967	0.001	Processed (static)
J024	East	372767.088	0.000	Processed (static)
	North	3140973.813	0.000	Processed (static)
	Ellips height	7.111	0.001	Processed (static)
J025	East	372651.781	0.000	Processed (static)
	North	3140928.451	0.000	Processed (static)
	Ellips height	7.129	0.001	Processed (static)
J027	East	372543.814	0.000	Processed (static)
	North	3140889.262	0.001	Processed (static)
	Ellips height	7.203	0.001	Processed (static)
J028	East	372377.006	0.000	Processed (static)
	North	3140828.580	0.000	Processed (static)
	Ellips height	7.336	0.001	Processed (static)
J029	East	372320.250	0.000	Processed (static)
	North	3140816.310	0.000	Processed (static)
	Ellips height	5.936	0.001	Processed (static)
J030	East	373448.838	0.001	Processed (static)
	North	3141897.592	0.000	Processed (static)
	Ellips height	5.031	0.001	Processed (static)
J031	East	373649.989	0.000	Processed (static)
	North	3142028.960	0.000	Processed (static)
	Ellips height	6.467	0.001	Processed (static)
J032	East	373653.307	0.001	Processed (static)
	North	3141983.171	0.000	Processed (static)
	Ellips height	6.318	0.001	Processed (static)
J033	East	373736.736	0.001	Processed (static)
	North	3141663.631	0.001	Processed (static)
	Ellips height	6.312	0.002	Processed (static)
J034	East	373481.340	0.001	Processed (static)
	North	3141618.652	0.001	Processed (static)
	Ellips height	6.341	0.002	Processed (static)

## Files

Name	Start Time	Sampling	Epochs	Size (Kb)	Type
BPM01L11.102	11/04/12 12:46	5	149	73	L1 GPS/WAAS
B1234A11.102	11/04/11 15:26	5	61	25	L1 GPS/WAAS
B1234A11.103	11/04/12 13:25	5	75	31	L1 GPS/WAAS
B1234B11.102	11/04/11 15:35	5	62	28	L1 GPS/WAAS
B1234C11.102	11/04/11 15:44	5	66	30	L1 GPS/WAAS
B1234D11.102	11/04/11 15:59	5	92	42	L1 GPS/WAAS
B1234DB11.102	11/04/12 08:55	5	102	45	L1 GPS/WAAS
B1234E11.102	11/04/12 09:08	5	173	78	L1 GPS/WAAS
B1234F11.102	11/04/12 09:27	5	97	44	L1 GPS/WAAS
B1234G11.102	11/04/12 09:39	5	123	61	L1 GPS/WAAS
B1234H11.102	11/04/12 09:53	5	133	65	L1 GPS/WAAS
B1234I11.102	11/04/12 10:08	5	142	69	L1 GPS/WAAS
B1234J11.102	11/04/12 10:23	5	257	126	L1 GPS/WAAS
B1234K11.102	11/04/12 12:13	5	74	33	L1 GPS/WAAS
B1234L11.102	11/04/12 12:44	5	97	46	L1 GPS/WAAS
B1234M11.102	11/04/12 12:56	5	97	44	L1 GPS/WAAS
BKUBAA11.102	11/04/11 15:16	5	666	585	L1/L2 GPS
BKUBAB11.102	11/04/12 08:03	5	4507	4202	L1/L2 GPS
BPM01A11.102	11/04/11 15:29	5	72	32	L1 GPS/WAAS
BPM01A11.103	11/04/12 13:02	5	107	45	L1 GPS/WAAS
BPM01B11.102	11/04/11 15:39	5	69	31	L1 GPS/WAAS
BPM01B11.103	11/04/12 13:27	5	66	28	L1 GPS/WAAS
BPM01C11.102	11/04/11 15:51	5	73	33	L1 GPS/WAAS
BPM01C11.103	11/04/12 14:09	5	69	29	L1 GPS/WAAS
BPM01D11.102	11/04/12 08:56	5	99	45	L1 GPS/WAAS
BPM01E11.102	11/04/12 09:08	5	121	55	L1 GPS/WAAS
BPM01F11.102	11/04/12 09:25	5	124	56	L1 GPS/WAAS
BPM01G11.102	11/04/12 09:40	5	124	62	L1 GPS/WAAS
BPM01H11.102	11/04/12 09:57	5	125	61	L1 GPS/WAAS
BPM01I11.102	11/04/12 10:13	5	140	68	L1 GPS/WAAS
BPM01J11.102	11/04/12 10:29	5	193	96	L1 GPS/WAAS
BPM01K11.102	11/04/12 12:15	5	83	39	L1 GPS/WAAS

## Occupations

File	Site	Start Time	Time span	Type
BPM01L11.102	J031	April 12 2011 12:46:20.00	00:12:20.00	Static
B1234A11.102	H022	April 11 2011 15:26:55.00	00:05:00.00	Static
B1234A11.103	H036	April 12 2011 13:25:55.00	00:06:10.00	Static
B1234B11.102	H023	April 11 2011 15:35:20.00	00:05:05.00	Static
B1234C11.102	H024	April 11 2011 15:44:55.00	00:05:25.00	Static
B1234D11.102	H025	April 11 2011 15:59:55.00	00:07:35.00	Static
B1234DB11.102	H026	April 12 2011 08:55:15.00	00:08:25.00	Static
B1234E11.102	H027	April 12 2011 09:08:50.00	00:14:20.00	Static
B1234F11.102	H028	April 12 2011 09:27:50.00	00:08:00.00	Static
B1234G11.102	H029	April 12 2011 09:39:35.00	00:10:10.00	Static
B1234H11.102	H030	April 12 2011 09:53:35.00	00:11:00.00	Static

H031	April 12 2011 10:08:25.00	00:11:45.00	Static
B1234I11.102			
H032	April 12 2011 10:23:20.00	00:21:20.00	Static
B1234J11.102			
H033	April 12 2011 12:13:35.00	00:06:05.00	Static
B1234K11.102			
H034	April 12 2011 12:44:10.00	00:08:00.00	Static
B1234L11.102			
H035	April 12 2011 12:56:50.00	00:08:00.00	Static
B1234M11.102			
KUBA	April 11 2011 15:16:35.00	00:55:25.00	Static
BKUBAA11.102			
KUBA	April 12 2011 08:03:05.00	06:15:30.00	Static
BKUBAB11.102			
J019	April 11 2011 15:29:55.00	00:05:55.00	Static
BPM01A11.102			
J032	April 12 2011 13:02:35.00	00:08:45.00	Static
BPM01A11.103			
J020	April 11 2011 15:39:40.00	00:05:40.00	Static
BPM01B11.102			
J033	April 12 2011 13:27:05.00	00:05:25.00	Static
BPM01B11.103			
J021	April 11 2011 15:51:15.00	00:06:00.00	Static
BPM01C11.102			
J034	April 12 2011 14:09:10.00	00:05:40.00	Static
BPM01C11.103			
J022	April 12 2011 08:56:05.00	00:08:10.00	Static
BPM01D11.102			
J023	April 12 2011 09:08:45.00	00:10:00.00	Static
BPM01E11.102			
J024	April 12 2011 09:25:15.00	00:10:15.00	Static
BPM01F11.102			
J025	April 12 2011 09:40:00.00	00:10:15.00	Static
BPM01G11.102			
J027	April 12 2011 09:57:30.00	00:10:20.00	Static
BPM01H11.102			
J028	April 12 2011 10:13:15.00	00:11:35.00	Static
BPM01I11.102			
J029	April 12 2011 10:29:55.00	00:16:00.00	Static
BPM01J11.102			
J030	April 12 2011 12:15:30.00	00:06:50.00	Static
BPM01K11.102			

## Processes

Reference	Reference File	Rover	Rover File	Mode	Num
KUBA	BKUBAB11.102	H036	B1234A11.103	Static	1
KUBA	BKUBAB11.102	H026	B1234DB11.102	Static	2
KUBA	BKUBAB11.102	J030	BPM01K11.102	Static	3
KUBA	BKUBAB11.102	H028	B1234F11.102	Static	4
KUBA	BKUBAB11.102	H029	B1234G11.102	Static	5
KUBA	BKUBAB11.102	H030	B1234H11.102	Static	6
KUBA	BKUBAB11.102	H032	B1234J11.102	Static	7
KUBA	BKUBAB11.102	H031	B1234I11.102	Static	8
KUBA	BKUBAB11.102	H035	B1234M11.102	Static	9
KUBA	BKUBAB11.102	J032	BPM01A11.103	Static	10
KUBA	BKUBAB11.102	H027	B1234E11.102	Static	11
KUBA	BKUBAB11.102	H034	B1234L11.102	Static	12
KUBA	BKUBAB11.102	J033	BPM01B11.103	Static	13
KUBA	BKUBAB11.102	J034	BPM01C11.103	Static	14
KUBA	BKUBAB11.102	J022	BPM01D11.102	Static	15
KUBA	BKUBAB11.102	J025	BPM01G11.102	Static	16
KUBA	BKUBAB11.102	J023	BPM01E11.102	Static	17
KUBA	BKUBAB11.102	J031	BPM01L11.102	Static	18
KUBA	BKUBAB11.102	J028	BPM01I11.102	Static	19
KUBA	BKUBAB11.102	J024	BPM01F11.102	Static	20
KUBA	BKUBAB11.102	J027	BPM01H11.102	Static	21

KUBA	BKUBAB11.102	H033	B1234K11.102	Static	22
KUBA	BKUBAB11.102	J029	BPM01J11.102	Static	23
KUBA	BKUBAA11.102	H022	B1234A11.102	Static	24
KUBA	BKUBAA11.102	J021	BPM01C11.102	Static	25
KUBA	BKUBAA11.102	H024	B1234C11.102	Static	26
KUBA	BKUBAA11.102	H023	B1234B11.102	Static	27
KUBA	BKUBAA11.102	J020	BPM01B11.102	Static	28
KUBA	BKUBAA11.102	J019	BPM01A11.102	Static	29
KUBA	BKUBAA11.102	H025	B1234D11.102	Static	30
H032	B1234J11.102	J029	BPM01J11.102	Static	31
J031	BPM01L11.102	H034	B1234L11.102	Static	32
J028	BPM01I11.102	H031	B1234I11.102	Static	33
H027	B1234E11.102	J023	BPM01E11.102	Static	34
H030	B1234H11.102	J027	BPM01H11.102	Static	35
J025	BPM01G11.102	H029	B1234G11.102	Static	36
J024	BPM01F11.102	H028	B1234F11.102	Static	37
H026	B1234DB11.102	J022	BPM01D11.102	Static	38
J030	BPM01K11.102	H033	B1234K11.102	Static	39
H036	B1234A11.103	J033	BPM01B11.103	Static	40

### Processed vectors

Vector Identifier	Vector Length	95% Error		Vector Components	95% Error	SV	PDOP	QA	Solution
J031 - H034 11/04/12 12:46	56.733	0.002	X	26.449	0.001	7	3.3		Fixed
			Y	10.586	0.001				
			Z	49.062	0.000				
H036 - J033 11/04/12 13:27	16.426	0.003	X	-7.311	0.002	8	1.9		Fixed
			Y	-4.865	0.001				
			Z	-13.881	0.001				
H026 - J022 11/04/12 08:56	28.176	0.002	X	11.886	0.001	9	1.7		Fixed
			Y	11.718	0.000				
			Z	22.700	0.001				
H027 - J023 11/04/12 09:08	32.058	0.001	X	12.751	0.001	7	3.6		Fixed
			Y	16.213	0.001				
			Z	24.542	0.000				
H030 - J027 11/04/12 09:57	30.261	0.002	X	14.279	0.001	10	1.5		Fixed
			Y	2.645	0.001				
			Z	26.550	0.001				
H032 - J029 11/04/12 10:29	65.311	0.001	X	11.882	0.001	10	1.8		Fixed
			Y	60.122	0.000				
			Z	22.576	0.000				
KUBA - H029 11/04/12 09:39	821.974	0.006	X	-305.032	0.003	8	2.2		Fixed
			Y	545.971	0.002				
			Z	-533.396	0.002				
KUBA - J022 11/04/12 08:56	477.909	0.004	X	-212.493	0.002	9	1.7		Fixed
			Y	192.860	0.001				
			Z	-382.164	0.001				
KUBA - J034 11/04/12 14:09	270.446	0.004	X	63.975	0.002	8	2.0		Fixed
			Y	-241.237	0.001				
			Z	104.177	0.001				
KUBA - J033 11/04/12 13:27	525.040	0.005	X	94.291	0.002	8	1.9		Fixed
			Y	-495.398	0.002				
			Z	146.144	0.002				
KUBA - H034 11/04/12 12:44	708.678	0.004	X	291.140	0.002	8	1.8		Fixed
			Y	-389.008	0.002				
			Z	515.882	0.001				

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KUBA - H027 11/04/12 09:08	598.979	0.004	X	-252.043	0.002	7	3.5	Fixed
			Y	306.283	0.001			
			Z	-448.822	0.002			
KUBA - J032 11/04/12 13:02	635.840	0.004	X	243.187	0.002	8	1.7	Fixed
			Y	-404.050	0.002			
			Z	426.494	0.001			
KUBA - H035 11/04/12 12:56	609.244	0.004	X	258.277	0.002	8	1.7	Fixed
			Y	-307.709	0.002			
			Z	458.024	0.001			
KUBA - H031 11/04/12 10:08	1087.149	0.006	X	-380.995	0.003	10	1.6	Fixed
			Y	773.829	0.002			
			Z	-661.759	0.003			
KUBA - J025 11/04/12 09:40	820.106	0.005	X	-293.505	0.002	8	2.2	Fixed
			Y	570.746	0.002			
			Z	-510.567	0.002			
KUBA - H030 11/04/12 09:53	944.766	0.006	X	-330.220	0.003	10	1.5	Fixed
			Y	675.042	0.002			
			Z	-572.588	0.002			
KUBA - J027 11/04/12 09:57	925.871	0.006	X	-315.949	0.003	10	1.5	Fixed
			Y	677.686	0.002			
			Z	-546.036	0.002			
KUBA - H028 11/04/12 09:27	726.034	0.005	X	-281.519	0.002	8	2.3	Fixed
			Y	450.224	0.002			
			Z	-495.147	0.001			
KUBA - J030 11/04/12 12:15	448.213	0.004	X	196.516	0.002	8	2.5	Fixed
			Y	-201.770	0.002			
			Z	348.662	0.001			
KUBA - H026 11/04/12 08:55	497.061	0.003	X	-224.375	0.002	9	1.7	Fixed
			Y	181.137	0.001			
			Z	-404.864	0.001			
KUBA - H036 11/04/12 13:25	525.883	0.005	X	101.601	0.002	8	1.9	Fixed
			Y	-490.532	0.002			
			Z	160.025	0.002			
KUBA - H032 11/04/12 10:23	1115.568	0.006	X	-369.133	0.003	10	1.7	Fixed
			Y	839.245	0.002			
			Z	-635.531	0.002			
KUBA - H024 11/04/11 15:44	354.527	0.004	X	-168.502	0.002	8	2.0	Fixed
			Y	-1.718	0.001			
			Z	-311.918	0.002			
KUBA - H025 11/04/11 15:59	4.899	0.002	X	1.713	0.001	7	2.1	Fixed
			Y	3.162	0.001			
			Z	3.327	0.001			
KUBA - J019 11/04/11 15:29	369.253	0.003	X	-129.863	0.002	8	1.7	Fixed
			Y	-234.985	0.001			
			Z	-253.506	0.001			
KUBA - J028 11/04/12 10:13	1092.983	0.006	X	-350.681	0.003	9	1.8	Fixed
			Y	842.906	0.002			
			Z	-600.953	0.002			
KUBA - H023 11/04/11 15:35	320.698	0.003	X	-109.287	0.002	8	1.7	Fixed
			Y	-211.467	0.001			
			Z	-214.908	0.001			
KUBA - J023 11/04/12 09:08	584.192	0.005	X	-239.296	0.002	7	3.6	Fixed
			Y	322.497	0.002			
			Z	-424.280	0.002			



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KUBA - J021 11/04/11 15:51	428.668	0.005	X Y Z	-201.684 88.159 -367.842	0.002 0.001 0.002	7 2.2		Fixed
KUBA - H022 11/04/11 15:26	275.049	0.004	X Y Z	-113.547 -122.966 -218.262	0.002 0.001 0.002	8 1.7		Fixed
KUBA - J029 11/04/12 10:29	1145.516	0.006	X Y Z	-357.261 899.367 -612.953	0.003 0.002 0.002	10 1.8		Fixed
KUBA - H033 11/04/12 12:13	402.629	0.003	X Y Z	171.861 -197.763 305.718	0.002 0.002 0.001	8 2.5		Fixed
KUBA - J024 11/04/12 09:25	707.660	0.004	X Y Z	-267.929 456.620 -469.569	0.002 0.002 0.001	8 2.3		Fixed
KUBA - J031 11/04/12 12:46	669.074	0.005	X Y Z	264.696 -399.596 466.818	0.002 0.002 0.002	7 3.2		Fixed
KUBA - J020 11/04/11 15:39	356.329	0.003	X Y Z	-161.281 -94.128 -303.478	0.002 0.001 0.001	7 2.1		Fixed
J020 - H023 11/04/11 15:39	155.975	0.150	X Y Z	52.563 -117.569 87.995	0.063 0.061 0.059	7 2.1	<b>No</b>	Float
J024 - H028 11/04/12 09:27	29.662	0.002	X Y Z	-13.593 -6.393 -25.578	0.001 0.001 0.000	8 2.3		Fixed
J025 - H029 11/04/12 09:40	35.605	0.002	X Y Z	-11.526 -24.774 -22.829	0.001 0.001 0.001	8 2.2		Fixed
J028 - H031 11/04/12 10:13	96.893	0.003	X Y Z	-30.315 -69.079 -60.806	0.002 0.001 0.001	10 1.6		Fixed
J030 - H033 11/04/12 12:15	49.681	0.005	X Y Z	-24.661 4.008 -42.941	0.002 0.001 0.002	8 2.5		Fixed

**Pearl and Hermes Atoll**

**Land Survey Overview**

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Project Name : NWHI\_Pearl\_Hermes  
 Spatial Reference System : UTM/NAD83-CORS96/UTM zone 01N WGS84  
 Time Zone : (GMT-11:00) Coordinated Universal Time-11  
 Linear Units : Meters

**Coordinate System Summary**

Coordinate system

Name : UTM/NAD83-CORS96/UTM zone 01N WGS84  
 Type : Projected  
 Unit name : Meters  
 Meters per unit : 1  
 Vertical datum : WGS\_84  
 Vertical unit : Meters  
 Meters per unit : 1

Datum

Name : NAD83-CORS96~1  
 Ellipsoid Name : WGS 84  
 Semi-major Axis : 6378137.000 m  
 Inverse Flattening : 298.257223563  
 DX to WGS84 : -1.0040 m  
 DY to WGS84 : 1.9097 m  
 DZ to WGS84 : 0.5155 m  
 RX to WGS84 : -0.026719 "  
 RY to WGS84 : -0.000342 "  
 RZ to WGS84 : -0.010987 "  
 ppm to WGS84 : 0.001540000000

Projection

Projection Class : Transverse\_Mercator  
 latitude\_of\_origin : 0° 00' 00.00000"N  
 central\_meridian : 177° 00' 00.00000"W  
 scale\_factor : 0.999600000000  
 false\_easting : 500000.000 m  
 false\_northing : 0.000 m

Control Points : 1  
 Reference Points : 0  
 Logged Points : 40  
 Target Points : 0  
 Intermediate Points : 0

## Control Points

Name	Components	95%		Status	Control
		Error			
PHBA	East	616609.245	0.028	FIXED	
	North	3074364.825	0.011	FIXED	
	Ellips height	5.833	0.018	FIXED	

## Logged Points

Name	Components	95%		Status
		Error		
H037	East	624298.717	0.000	Processed (static)
	North	3089646.302	0.000	Processed (static)
	Ellips height	5.066	0.000	Processed (static)
H038	East	624234.110	0.000	Processed (static)
	North	3089737.320	0.000	Processed (static)
	Ellips height	5.672	0.000	Processed (static)
H039	East	616408.090	0.001	Processed (static)
	North	3074543.643	0.001	Processed (static)
	Ellips height	4.993	0.002	Processed (static)
H040	East	616497.269	0.001	Processed (static)
	North	3074564.554	0.001	Processed (static)
	Ellips height	5.080	0.002	Processed (static)
H041	East	616581.034	0.062	Processed (static)
	North	3074572.342	0.045	Processed (static)
	Ellips height	5.469	0.073	Processed (static)
H042	East	616580.208	0.001	Processed (static)
	North	3074572.360	0.001	Processed (static)
	Ellips height	5.090	0.001	Processed (static)
H043	East	616660.379	0.001	Processed (static)
	North	3074544.354	0.001	Processed (static)
	Ellips height	4.908	0.001	Processed (static)
H044	East	616768.232	0.001	Processed (static)
	North	3074481.444	0.001	Processed (static)
	Ellips height	5.057	0.001	Processed (static)
H045	East	616721.613	0.001	Processed (static)
	North	3074441.847	0.001	Processed (static)
	Ellips height	5.425	0.001	Processed (static)
H046	East	616680.789	0.001	Processed (static)
	North	3074463.413	0.001	Processed (static)
	Ellips height	4.738	0.002	Processed (static)
H047	East	616591.616	0.002	Processed (static)
	North	3074409.573	0.002	Processed (static)
	Ellips height	5.171	0.004	Processed (static)
H048	East	616531.953	0.001	Processed (static)
	North	3074361.625	0.001	Processed (static)
	Ellips height	5.530	0.003	Processed (static)
H049	East	616512.552	0.001	Processed (static)
	North	3074315.993	0.001	Processed (static)
	Ellips height	6.076	0.002	Processed (static)

H050	East	616602.571	0.001	Processed (static)
	North	3074369.350	0.001	Processed (static)
	Ellips height	5.826	0.002	Processed (static)
H051	East	616608.476	0.001	Processed (static)
	North	3074376.953	0.000	Processed (static)
	Ellips height	6.690	0.001	Processed (static)
	Description	DE5202		
H052	East	616628.550	0.001	Processed (static)
	North	3074374.564	0.001	Processed (static)
	Ellips height	5.713	0.003	Processed (static)
H053	East	616494.918	0.001	Processed (static)
	North	3074379.853	0.001	Processed (static)
	Ellips height	5.328	0.002	Processed (static)
H054	East	616460.122	0.001	Processed (static)
	North	3074500.901	0.001	Processed (static)
	Ellips height	4.825	0.001	Processed (static)
H055	East	604551.103	0.000	Processed (static)
	North	3071054.660	0.000	Processed (static)
	Ellips height	4.274	0.000	Processed (static)
H056	East	604108.591	0.000	Processed (static)
	North	3071624.667	0.000	Processed (static)
	Ellips height	4.809	0.000	Processed (static)
H057	East	603957.422	0.000	Processed (static)
	North	3071499.122	0.000	Processed (static)
	Ellips height	5.631	0.001	Processed (static)
H058	East	607666.791	0.002	Processed (static)
	North	3072621.782	0.002	Processed (static)
	Ellips height	5.890	0.003	Processed (static)
J035	East	624246.051	0.000	Processed (static)
	North	3089616.575	0.000	Processed (static)
	Ellips height	4.987	0.000	Processed (static)
J036	East	624185.795	0.000	Processed (static)
	North	3089673.258	0.000	Processed (static)
	Ellips height	5.430	0.000	Processed (static)
J037	East	616182.161	0.001	Processed (static)
	North	3074574.156	0.001	Processed (static)
	Ellips height	5.064	0.001	Processed (static)
J038	East	616153.781	0.001	Processed (static)
	North	3074457.036	0.001	Processed (static)
	Ellips height	5.806	0.001	Processed (static)
J039	East	616280.020	0.001	Processed (static)
	North	3074298.371	0.001	Processed (static)
	Ellips height	4.357	0.001	Processed (static)
J040	East	616393.313	0.001	Processed (static)
	North	3074288.757	0.001	Processed (static)
	Ellips height	4.262	0.001	Processed (static)
J041	East	616402.551	0.001	Processed (static)
	North	3074412.030	0.001	Processed (static)
	Ellips height	6.009	0.002	Processed (static)
J042	East	616476.295	0.001	Processed (static)
	North	3074320.713	0.001	Processed (static)
	Ellips height	6.187	0.002	Processed (static)
J043	East	616514.985	0.001	Processed (static)
	North	3074429.232	0.000	Processed (static)

	Ellips height	4.663	0.001	Processed (static)
J044	East	616504.526	0.001	Processed (static)
	North	3074520.712	0.001	Processed (static)
	Ellips height	4.986	0.002	Processed (static)
J045	East	616583.714	0.001	Processed (static)
	North	3074501.823	0.001	Processed (static)
	Ellips height	4.695	0.002	Processed (static)
J046	East	616300.965	0.001	Processed (static)
	North	3074378.549	0.000	Processed (static)
	Ellips height	4.292	0.001	Processed (static)
J047	East	616216.293	0.001	Processed (static)
	North	3074469.095	0.001	Processed (static)
	Ellips height	4.728	0.001	Processed (static)
J048	East	616230.700	0.001	Processed (static)
	North	3074555.411	0.001	Processed (static)
	Ellips height	5.277	0.002	Processed (static)
J049	East	604500.481	0.000	Processed (static)
	North	3071061.525	0.000	Processed (static)
	Ellips height	4.147	0.000	Processed (static)
J050	East	604368.193	0.000	Processed (static)
	North	3071151.830	0.000	Processed (static)
	Ellips height	5.873	0.000	Processed (static)
J051	East	604189.247	0.000	Processed (static)
	North	3071372.473	0.000	Processed (static)
	Ellips height	5.107	0.001	Processed (static)
J052	East	608057.039	0.000	Processed (static)
	North	3072576.707	0.000	Processed (static)
	Ellips height	4.286	0.000	Processed (static)

## Files

Name	Start Time	Sampling	Epochs	Size (Kb)	Type
BPHBAA11.103	11/04/13 07:40	5	5243	4890	L1/L2 GPS
BPM01I11.104	11/04/13 14:50	5	61	30	L1 GPS/WAAS
BPM01H11.104	11/04/13 14:39	5	64	29	L1 GPS/WAAS
BPM01G11.104	11/04/13 14:28	5	71	31	L1 GPS/WAAS
BPM01F11.104	11/04/13 14:12	5	62	25	L1 GPS/WAAS
BPM01E11.104	11/04/13 13:58	5	65	27	L1 GPS/WAAS
BPM01D11.104	11/04/13 13:46	5	65	27	L1 GPS/WAAS
BPM01C11.104	11/04/13 13:30	5	83	35	L1 GPS/WAAS
BPM01B11.104	11/04/13 13:14	5	79	33	L1 GPS/WAAS
BPM01A11.104	11/04/13 13:02	5	71	31	L1 GPS/WAAS
BPM01E11.103	11/04/13 10:29	5	365	191	L1 GPS/WAAS
BPM01D11.103	11/04/13 09:48	5	380	185	L1 GPS/WAAS
B1234M11.104	11/04/13 14:50	5	62	31	L1 GPS/WAAS
B1234L11.104	11/04/13 14:36	5	71	35	L1 GPS/WAAS
B1234K11.104	11/04/13 14:26	5	65	28	L1 GPS/WAAS
B1234J11.104	11/04/13 14:18	5	61	25	L1 GPS/WAAS
B1234I11.104	11/04/13 14:10	5	60	25	L1 GPS/WAAS
B1234H11.104	11/04/13 14:00	5	61	26	L1 GPS/WAAS
B1234G11.104	11/04/13 13:52	5	60	25	L1 GPS/WAAS
B1234F11.104	11/04/13 13:43	5	63	26	L1 GPS/WAAS
B1234E11.104	11/04/13 13:33	5	60	25	L1 GPS/WAAS
B1234D11.104	11/04/13 13:24	5	61	26	L1 GPS/WAAS
B1234C11.104	11/04/13 13:20	5	31	13	L1 GPS
B1234B11.104	11/04/13 13:11	5	61	24	L1 GPS/WAAS
B1234A11.104	11/04/13 13:02	5	62	23	L1 GPS/WAAS

B1234C11.103	11/04/13 10:28	5	362	162	L1 GPS/WAAS
B1234B11.103	11/04/13 09:50	5	361	140	L1 GPS/WAAS
BPHBAA11.104	11/04/14 07:42	5	5319	4962	L1/L2 GPS
B1234A11.105	11/04/14 13:34	5	181	80	L1 GPS/WAAS
B1234T11.104	11/04/14 11:48	5	240	109	L1 GPS/WAAS
B1234S11.104	11/04/14 11:17	5	243	126	L1 GPS/WAAS
B1234R11.104	11/04/14 10:39	5	240	126	L1 GPS/WAAS
B1234Q11.104	11/04/14 08:39	5	60	26	L1 GPS/WAAS
B1234P11.104	11/04/14 08:29	5	64	29	L1 GPS/WAAS
B1234O11.104	11/04/14 08:12	5	125	57	L1 GPS/WAAS
B1234N11.104	11/04/14 07:55	5	60	28	L1 GPS/WAAS
BPM01A11.105	11/04/14 13:46	5	188	85	L1 GPS/WAAS
BPM01O11.104	11/04/14 11:51	5	251	116	L1 GPS/WAAS
BPM01N11.104	11/04/14 11:10	5	243	122	L1 GPS/WAAS
BPM01M11.104	11/04/14 10:40	5	264	144	L1 GPS/WAAS
BPM01L11.104	11/04/14 08:32	5	63	31	L1 GPS/WAAS
BPM01K11.104	11/04/14 08:22	5	65	32	L1 GPS/WAAS
BPM01J11.104	11/04/14 08:10	5	77	36	L1 GPS/WAAS

## Occupations

File	Site	Start Time	Time span	Type
	PHBA	April 13 2011 07:40:05.00	07:16:50.00	Static
BPHBAA11.103	J045	April 13 2011 14:50:25.00	00:05:00.00	Static
BPM01I11.104	J044	April 13 2011 14:39:25.00	00:05:15.00	Static
BPM01H11.104	J043	April 13 2011 14:28:00.00	00:05:50.00	Static
BPM01G11.104	J042	April 13 2011 14:12:50.00	00:05:05.00	Static
BPM01F11.104	J041	April 13 2011 13:58:15.00	00:05:20.00	Static
BPM01E11.104	J040	April 13 2011 13:46:50.00	00:05:20.00	Static
BPM01D11.104	J039	April 13 2011 13:30:30.00	00:06:50.00	Static
BPM01C11.104	J038	April 13 2011 13:14:25.00	00:06:30.00	Static
BPM01B11.104	J037	April 13 2011 13:02:30.00	00:05:50.00	Static
BPM01A11.104	J036	April 13 2011 10:29:50.00	00:30:20.00	Static
BPM01E11.103	J035	April 13 2011 09:48:25.00	00:31:30.00	Static
BPM01D11.103	H051	April 13 2011 14:50:10.00	00:05:05.00	Static
B1234M11.104	H050	April 13 2011 14:36:30.00	00:05:50.00	Static
B1234L11.104	H049	April 13 2011 14:26:45.00	00:05:20.00	Static
B1234K11.104	H048	April 13 2011 14:18:35.00	00:05:00.00	Static
B1234J11.104	H047	April 13 2011 14:10:20.00	00:04:55.00	Static
B1234I11.104	H046	April 13 2011 14:00:05.00	00:05:00.00	Static
B1234H11.104	H045	April 13 2011 13:52:40.00	00:04:55.00	Static
B1234G11.104	H044	April 13 2011 13:43:20.00	00:05:10.00	Static
B1234F11.104	H043	April 13 2011 13:33:10.00	00:04:55.00	Static
B1234E11.104	H042	April 13 2011 13:24:40.00	00:05:00.00	Static
B1234D11.104				

H041	April 13 2011 13:20:05.00	00:02:30.00	Static
B1234C11.104			
H040	April 13 2011 13:11:40.00	00:05:00.00	Static
B1234B11.104			
H039	April 13 2011 13:02:25.00	00:05:05.00	Static
B1234A11.104			
H038	April 13 2011 10:28:05.00	00:30:05.00	Static
B1234C11.103			
H037	April 13 2011 09:50:20.00	00:30:00.00	Static
B1234B11.103			
PHBA	April 14 2011 07:42:05.00	07:23:10.00	Static
BPHBAA11.104			
H058	April 14 2011 13:34:15.00	00:15:00.00	Static
B1234A11.105			
H057	April 14 2011 11:48:25.00	00:19:55.00	Static
B1234T11.104			
H056	April 14 2011 11:17:50.00	00:20:10.00	Static
B1234S11.104			
H055	April 14 2011 10:39:25.00	00:19:55.00	Static
B1234R11.104			
H054	April 14 2011 08:39:30.00	00:04:55.00	Static
B1234Q11.104			
H053	April 14 2011 08:29:25.00	00:05:15.00	Static
B1234P11.104			
H051	April 14 2011 08:12:45.00	00:10:25.00	Static
B1234O11.104			
H052	April 14 2011 07:55:00.00	00:04:55.00	Static
B1234N11.104			
J052	April 14 2011 13:46:55.00	00:15:35.00	Static
BPM01A11.105			
J051	April 14 2011 11:51:40.00	00:20:50.00	Static
BPM01O11.104			
J050	April 14 2011 11:10:10.00	00:20:10.00	Static
BPM01N11.104			
J049	April 14 2011 10:40:05.00	00:21:55.00	Static
BPM01M11.104			
J048	April 14 2011 08:32:55.00	00:05:10.00	Static
BPM01L11.104			
J047	April 14 2011 08:22:25.00	00:05:20.00	Static
BPM01K11.104			
J046	April 14 2011 08:10:50.00	00:06:20.00	Static
BPM01J11.104			

## Processes

Reference	Reference File	Rover	Rover File	Mode	Num
PHBA	BPHBAA11.104	H055	B1234R11.104	Static	1
PHBA	BPHBAA11.104	H052	B1234N11.104	Static	2
PHBA	BPHBAA11.104	J047	BPM01K11.104	Static	3
PHBA	BPHBAA11.104	J046	BPM01J11.104	Static	4
PHBA	BPHBAA11.104	J048	BPM01L11.104	Static	5
PHBA	BPHBAA11.104	H051	B1234O11.104	Static	6
PHBA	BPHBAA11.104	H054	B1234Q11.104	Static	7
PHBA	BPHBAA11.104	J052	BPM01A11.105	Static	8
PHBA	BPHBAA11.104	J050	BPM01N11.104	Static	9
PHBA	BPHBAA11.104	H053	B1234P11.104	Static	10
PHBA	BPHBAA11.104	J049	BPM01M11.104	Static	11
PHBA	BPHBAA11.104	H056	B1234S11.104	Static	12
PHBA	BPHBAA11.104	H057	B1234T11.104	Static	13
PHBA	BPHBAA11.104	H058	B1234A11.105	Static	14
PHBA	BPHBAA11.104	J051	BPM01O11.104	Static	15
PHBA	BPHBAA11.103	J038	BPM01B11.104	Static	16
PHBA	BPHBAA11.103	J037	BPM01A11.104	Static	17
PHBA	BPHBAA11.103	J036	BPM01E11.103	Static	18
PHBA	BPHBAA11.103	H042	B1234D11.104	Static	19
PHBA	BPHBAA11.103	H041	B1234C11.104	Static	20
PHBA	BPHBAA11.103	J040	BPM01D11.104	Static	21

PHBA	BPHBAA11.103	J041	BPM01E11.104	Static	22
PHBA	BPHBAA11.103	H040	B1234B11.104	Static	23
PHBA	BPHBAA11.103	J042	BPM01F11.104	Static	24
PHBA	BPHBAA11.103	J043	BPM01G11.104	Static	25
PHBA	BPHBAA11.103	J044	BPM01H11.104	Static	26
PHBA	BPHBAA11.103	J045	BPM01I11.104	Static	27
PHBA	BPHBAA11.103	J039	BPM01C11.104	Static	28
PHBA	BPHBAA11.103	H045	B1234G11.104	Static	29
PHBA	BPHBAA11.103	H037	B1234B11.103	Static	30
PHBA	BPHBAA11.103	H038	B1234C11.103	Static	31
PHBA	BPHBAA11.103	H039	B1234A11.104	Static	32
PHBA	BPHBAA11.103	H043	B1234E11.104	Static	33
PHBA	BPHBAA11.103	J035	BPM01D11.103	Static	34
PHBA	BPHBAA11.103	H044	B1234F11.104	Static	35
PHBA	BPHBAA11.103	H046	B1234H11.104	Static	36
PHBA	BPHBAA11.103	H047	B1234I11.104	Static	37
PHBA	BPHBAA11.103	H048	B1234J11.104	Static	38
PHBA	BPHBAA11.103	H049	B1234K11.104	Static	39
PHBA	BPHBAA11.103	H050	B1234L11.104	Static	40
PHBA	BPHBAA11.103	H051	B1234M11.104	Static	41
H051	B1234O11.104	J046	BPM01J11.104	Static	42
H051	B1234M11.104	J045	BPM01I11.104	Static	43
J035	BPM01D11.103	H037	B1234B11.103	Static	44
J036	BPM01E11.103	H038	B1234C11.103	Static	45
J049	BPM01M11.104	H055	B1234R11.104	Static	46
J051	BPM01O11.104	H057	B1234T11.104	Static	47
H056	B1234S11.104	J050	BPM01N11.104	Static	48
J052	BPM01A11.105	H058	B1234A11.105	Static	49
J039	BPM01C11.104	H043	B1234E11.104	Static	50
J043	BPM01G11.104	H049	B1234K11.104	Static	51
J037	BPM01A11.104	H039	B1234A11.104	Static	52
H050	B1234L11.104	J044	BPM01H11.104	Static	53
J041	BPM01E11.104	H046	B1234H11.104	Static	54
J042	BPM01F11.104	H047	B1234I11.104	Static	55

### Processed vectors

Vector Identifier	Vector Length	95% Error	Vector Components	95% Error	SV	PDOP	QA	Solution	
PHBA - H057 11/04/14 11:48	12975.563	0.063	X	-2189.453	0.026	9	1.7	<b>No</b>	Fixed
			Y	12555.728	0.026				
			Z	-2434.180	0.025				
PHBA - J044 11/04/13 14:39	187.841	0.004	X	66.180	0.002	8	2.0		Fixed
			Y	108.355	0.001				
			Z	138.433	0.001				
PHBA - J043 11/04/13 14:28	114.196	0.003	X	24.576	0.001	9	1.7		Fixed
			Y	95.705	0.001				
			Z	57.247	0.001				
PHBA - J042 11/04/13 14:12	140.110	0.004	X	-29.962	0.002	9	1.7		Fixed
			Y	131.564	0.001				
			Z	-37.734	0.001				
PHBA - H040 11/04/13 13:11	229.031	0.004	X	86.025	0.002	8	1.6		Fixed
			Y	116.659	0.001				
			Z	177.329	0.002				
PHBA - J041 11/04/13 13:58	212.066	0.004	X	7.679	0.002	9	1.8		Fixed
			Y	207.391	0.001				
			Z	43.611	0.001				
PHBA - J040 11/04/13 13:46	228.998	0.003	X	-48.828	0.002	9	1.7		Fixed
			Y	213.713	0.001				
			Z	-66.201	0.000				
PHBA - H041	209.474	0.151	X	95.045	0.062	8	1.7	<b>No</b>	Float



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11/04/13 13:20			Y	33.239	0.061				
			Z	183.687	0.061				
PHBA - H042	209.606	0.003	X	95.331	0.002	8	1.7		Fixed
11/04/13 13:24			Y	34.089	0.001				
			Z	183.534	0.000				
PHBA - J036	17084.540	0.083	X	7669.423	0.034	11	1.8	No	Fixed
11/04/13 10:29			Y	-7185.336	0.034				
			Z	13469.684	0.034				
PHBA - J037	475.738	0.004	X	68.942	0.002	9	1.5		Fixed
11/04/13 13:02			Y	431.326	0.002				
			Z	188.497	0.001				
PHBA - J038	464.813	0.005	X	11.794	0.002	9	1.6		Fixed
11/04/13 13:14			Y	456.738	0.002				
			Z	85.454	0.002				
PHBA - H055	12507.357	0.061	X	-2355.446	0.025	11	1.8	No	Fixed
11/04/14 10:39			Y	11952.472	0.025				
			Z	-2832.715	0.025				
PHBA - H058	9112.976	0.045	X	-1418.613	0.018	9	1.7		Fixed
11/04/14 13:34			Y	8881.189	0.018				
			Z	-1469.136	0.018				
PHBA - H045	136.264	0.003	X	43.931	0.002	8	1.8		Fixed
11/04/13 13:52			Y	-110.220	0.001				
			Z	67.003	0.000				
PHBA - H056	12800.654	0.062	X	-2120.216	0.025	10	1.7	No	Fixed
11/04/14 11:17			Y	12407.969	0.025				
			Z	-2324.591	0.025				
PHBA - J049	12554.385	0.061	X	-2355.518	0.025	11	1.5	No	Fixed
11/04/14 10:40			Y	12003.169	0.025				
			Z	-2826.315	0.025				
PHBA - H053	115.338	0.004	X	-0.384	0.002	9	1.7		Fixed
11/04/14 08:29			Y	114.480	0.001				
			Z	14.036	0.001				
PHBA - J050	12658.858	0.062	X	-2323.854	0.025	11	1.5	No	Fixed
11/04/14 11:10			Y	12137.286	0.025				
			Z	-2744.575	0.025				
PHBA - J052	8739.278	0.043	X	-1411.932	0.018	9	1.7	No	Fixed
11/04/14 13:46			Y	8490.743	0.017				
			Z	-1512.848	0.017				
PHBA - H054	201.926	0.003	X	54.058	0.002	9	1.7		Fixed
11/04/14 08:39			Y	152.189	0.001				
			Z	121.204	0.000				
PHBA - H051	12.170	0.001	X	4.839	0.001	10	1.4		Fixed
11/04/14 08:12			Y	1.025	0.000				
			Z	11.119	0.000				
PHBA - J048	423.915	0.005	X	63.345	0.003	9	1.7		Fixed
11/04/14 08:32			Y	382.420	0.002				
			Z	171.599	0.002				
PHBA - J046	308.677	0.004	X	-13.356	0.002	10	1.4		Fixed
11/04/14 08:10			Y	308.068	0.001				
			Z	14.029	0.001				
PHBA - J047	406.647	0.004	X	22.639	0.002	9	1.6		Fixed
11/04/14 08:22			Y	394.724	0.002				
			Z	95.090	0.001				

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PHBA - H052 11/04/14 07:55	21.628	0.004	X Y Z	5.964 -19.018 8.397	0.003 0.001 0.001	9	2.6		Fixed
PHBA - J051 11/04/14 11:51	12778.581	0.063	X Y Z	-2232.459 12321.304 -2548.278	0.026 0.025 0.025	9	1.7	No	Fixed
PHBA - H047 11/04/13 14:10	48.112	0.004	X Y Z	20.229 18.722 39.434	0.003 0.001 0.001	8	1.8		Fixed
PHBA - J045 11/04/13 14:50	139.393	0.003	X Y Z	63.065 28.894 120.907	0.002 0.001 0.001	9	1.8		Fixed
PHBA - J039 11/04/13 13:30	335.946	0.004	X Y Z	-52.189 326.991 -56.687	0.002 0.001 0.001	9	1.7		Fixed
PHBA - H050 11/04/13 14:36	8.065	0.003	X Y Z	1.657 6.771 4.058	0.002 0.001 0.001	8	2.0		Fixed
PHBA - H048 11/04/13 14:18	77.377	0.005	X Y Z	-6.517 77.067 -2.314	0.003 0.001 0.001	8	1.7		Fixed
PHBA - H051 11/04/13 14:50	12.186	0.002	X Y Z	4.840 1.008 11.138	0.001 0.001 0.001	9	1.8		Fixed
PHBA - H046 11/04/13 14:00	121.844	0.004	X Y Z	51.783 -68.912 86.114	0.002 0.001 0.001	8	1.8		Fixed
PHBA - H044 11/04/13 13:43	197.220	0.003	X Y Z	65.892 -155.748 101.471	0.002 0.001 0.000	8	1.8		Fixed
PHBA - J035 11/04/13 09:48	17060.642	0.083	X Y Z	7647.481 -7246.817 13418.837	0.034 0.034 0.033	10	1.6	No	Fixed
PHBA - H043 11/04/13 13:33	186.716	0.003	X Y Z	87.936 -46.581 157.988	0.002 0.001 0.000	8	1.7		Fixed
PHBA - H039 11/04/13 13:02	269.211	0.005	X Y Z	70.255 205.143 159.546	0.002 0.002 0.002	8	1.6		Fixed
PHBA - H038 11/04/13 10:28	17163.413	0.083	X Y Z	7702.546 -7231.987 13525.971	0.034 0.034 0.034	9	1.9	No	Fixed
PHBA - H037 11/04/13 09:50	17110.853	0.083	X Y Z	7664.976 -7298.644 13444.673	0.034 0.034 0.034	8	1.8	No	Fixed
PHBA - H049 11/04/13 14:26	108.348	0.003	X Y Z	-29.577 95.276 -42.272	0.002 0.001 0.001	8	1.7		Fixed
J043 - H049 11/04/13 14:28	113.300	0.005	X Y Z	-54.156 -0.428 -99.518	0.003 0.001 0.001	8	1.7		Fixed
J042 - H047 11/04/13 14:12	145.623	0.008	X Y Z	50.181 -112.838 77.171	0.005 0.002 0.000	8	1.8		Fixed

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J041 - H046 11/04/13 14:00	283.012	0.005	X Y Z	44.107 -276.304 42.503	0.003 0.002 0.001	8 1.8	Fixed
J039 - H043 11/04/13 13:33	453.074	0.005	X Y Z	140.126 -373.573 214.672	0.003 0.002 0.001	8 1.7	Fixed
J037 - H039 11/04/13 13:02	228.034	0.005	X Y Z	1.314 -226.185 -28.952	0.002 0.001 0.002	8 1.6	Fixed
J036 - H038 11/04/13 10:29	80.256	0.001	X Y Z	33.119 -46.651 56.283	0.000 0.000 0.000	9 1.9	Fixed
J035 - H037 11/04/13 09:50	60.489	0.001	X Y Z	17.500 -51.824 25.826	0.000 0.000 0.000	8 1.8	Fixed
H051 - J046 11/04/14 08:12	307.597	0.003	X Y Z	-18.195 307.044 2.911	0.001 0.001 0.001	10 1.4	Fixed
H051 - J045 11/04/13 14:50	127.346	0.003	X Y Z	58.225 27.886 109.769	0.002 0.001 0.001	9 1.8	Fixed
H050 - J044 11/04/13 14:39	180.386	0.005	X Y Z	64.528 101.583 134.374	0.003 0.002 0.000	8 2.0	Fixed
H056 - J050 11/04/14 11:17	539.560	0.003	X Y Z	-203.642 -270.682 -419.983	0.002 0.001 0.001	10 1.7	Fixed
J052 - H058 11/04/14 13:46	392.947	0.008	X Y Z	-6.689 390.451 43.713	0.004 0.002 0.003	9 1.7	Fixed
J051 - H057 11/04/14 11:51	264.235	0.002	X Y Z	42.999 234.419 114.101	0.001 0.001 0.001	9 1.7	Fixed
J049 - H055 11/04/14 10:40	51.099	0.001	X Y Z	0.076 -50.697 -6.403	0.001 0.000 0.000	11 1.8	Fixed

### Repeat vectors

Repeat Vector		Difference	Length	QA
PHBA - H051	X	0.001	12.186	
	11/04/13 14:50	Y	-0.017	
	11/04/14 08:12	Z	0.019	

**Lisianski Island**

**Land Survey Overview**

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Project Name : NWHI\_Lisianski  
 Spatial Reference System : UTM/NAD83-CORS96/UTM zone 02N  
 Time Zone : (GMT-11:00) Samoa  
 Linear Units : Meters

**Coordinate System Summary**

Coordinate system

**Name :** UTM/NAD83-CORS96/UTM zone 02N  
**Type :** Projected  
**Unit name :** Meters  
**Meters per unit :** 1  
**Vertical datum :** WGS\_84  
**Vertical unit :** Meters  
**Meters per unit :** 1

Datum

**Name :** NAD83-CORS96  
**Ellipsoid Name :** GRS 1980  
**Semi-major Axis :** 6378137.000 m  
**Inverse Flattening :** 298.257222101  
**DX to WGS84 :** -1.0040 m  
**DY to WGS84 :** 1.9097 m  
**DY to WGS84 :** 0.5155 m  
**RX to WGS84 :** -0.026719 "  
**RX to WGS84 :** -0.000342 "  
**RZ to WGS84 :** -0.010987 "  
**ppm to WGS84 :** 0.001540000000

Projection

**Projection Class :** Transverse\_Mercator  
**latitude\_of\_origin** 0° 00' 00.00000"N  
**central\_meridian** 171° 00' 00.00000"W  
**scale\_factor** 0.999600000000  
**false\_easting** 500000.000 m  
**false\_northing** 0.000 m

Control Points : 1  
 Reference Points : 0  
 Logged Points : 21  
 Target Points : 0  
 Intermediate Points : 0

## Control Points

Name	Components	95%		Status	Control
		Error			
LIBA	East	203752.392	0.022	FIXED	
	North	2886073.205	0.041	FIXED	
	Ellips height	9.784	0.025	FIXED	

## Logged Points

Name	Components	95%		Status
		Error		
H059	East	203671.366	0.001	Processed (static)
	North	2886379.601	0.000	Processed (static)
	Ellips height	11.797	0.001	Processed (static)
H060	East	203437.231	0.001	Processed (static)
	North	2886762.551	0.001	Processed (static)
	Ellips height	11.359	0.002	Processed (static)
H061	East	202965.074	0.001	Processed (static)
	North	2886956.279	0.001	Processed (static)
	Ellips height	11.859	0.002	Processed (static)
H062	East	202715.801	0.000	Processed (static)
	North	2886762.043	0.000	Processed (static)
	Ellips height	11.593	0.001	Processed (static)
H063	East	202782.497	0.000	Processed (static)
	North	2886337.317	0.000	Processed (static)
	Ellips height	11.417	0.001	Processed (static)
H064	East	202984.230	0.001	Processed (static)
	North	2885794.518	0.001	Processed (static)
	Ellips height	12.097	0.003	Processed (static)
H065	East	203074.433	0.001	Processed (static)
	North	2885598.497	0.000	Processed (static)
	Ellips height	10.737	0.001	Processed (static)
H066	East	203128.977	0.001	Processed (static)
	North	2885419.780	0.001	Processed (static)
	Ellips height	11.034	0.002	Processed (static)
H067	East	203290.197	0.001	Processed (static)
	North	2885314.874	0.001	Processed (static)
	Ellips height	10.818	0.001	Processed (static)
H068	East	203559.765	0.001	Processed (static)
	North	2885237.426	0.001	Processed (static)
	Ellips height	11.428	0.002	Processed (static)
J053	East	203655.404	0.001	Processed (static)
	North	2886459.341	0.001	Processed (static)
	Ellips height	10.466	0.002	Processed (static)
J054	East	203557.527	0.001	Processed (static)
	North	2886646.091	0.001	Processed (static)
	Ellips height	10.833	0.002	Processed (static)
J055	East	203195.918	0.001	Processed (static)
	North	2886889.453	0.001	Processed (static)
	Ellips height	11.365	0.002	Processed (static)

J056	East	202801.130	0.001	Processed (static)
	North	2886930.948	0.001	Processed (static)
	Ellips height	11.756	0.002	Processed (static)
J057	East	202688.412	0.001	Processed (static)
	North	2886559.156	0.001	Processed (static)
	Ellips height	11.728	0.002	Processed (static)
J058	East	202863.737	0.000	Processed (static)
	North	2886208.313	0.000	Processed (static)
	Ellips height	12.397	0.001	Processed (static)
J059	East	202955.950	0.001	Processed (static)
	North	2885916.607	0.000	Processed (static)
	Ellips height	12.630	0.001	Processed (static)
J060	East	203057.480	0.001	Processed (static)
	North	2885642.619	0.001	Processed (static)
	Ellips height	10.612	0.001	Processed (static)
J061	East	203222.106	0.001	Processed (static)
	North	2885346.378	0.001	Processed (static)
	Ellips height	11.110	0.001	Processed (static)
J062	East	203393.585	0.001	Processed (static)
	North	2885286.740	0.000	Processed (static)
	Ellips height	11.385	0.001	Processed (static)
J063	East	203678.612	0.001	Processed (static)
	North	2885279.772	0.001	Processed (static)
	Ellips height	11.112	0.001	Processed (static)

## Files

Name	Start Time	Sampling	Epochs	Size (Kb)	Type
BLIBAA11.105	11/04/15 08:47	5	3510	3222	L1/L2 GPS
BPM01A11.106	11/04/15 13:01	5	66	32	L1 GPS/WAAS
BPM01K11.105	11/04/15 12:40	5	107	56	L1 GPS/WAAS
BPM01J11.105	11/04/15 12:24	5	100	49	L1 GPS/WAAS
BPM01I11.105	11/04/15 12:07	5	99	47	L1 GPS/WAAS
BPM01H11.105	11/04/15 11:45	5	99	45	L1 GPS/WAAS
BPM01G11.105	11/04/15 10:46	5	129	70	L1 GPS/WAAS
BPM01F11.105	11/04/15 10:22	5	76	39	L1 GPS/WAAS
BPM01E11.105	11/04/15 10:06	5	68	33	L1 GPS/WAAS
BPM01D11.105	11/04/15 09:49	5	73	34	L1 GPS/WAAS
BPM01C11.105	11/04/15 09:29	5	61	29	L1 GPS
BPM01B11.105	11/04/15 09:15	5	80	34	L1 GPS/WAAS
B1234K11.105	11/04/15 12:54	5	79	40	L1 GPS/WAAS
B1234J11.105	11/04/15 12:37	5	92	48	L1 GPS/WAAS
B1234I11.105	11/04/15 12:22	5	99	48	L1 GPS/WAAS
B1234H11.105	11/04/15 12:06	5	104	49	L1 GPS/WAAS
B1234G11.105	11/04/15 11:50	5	96	43	L1 GPS/WAAS
B1234F11.105	11/04/15 10:41	5	146	76	L1 GPS/WAAS
B1234E11.105	11/04/15 10:12	5	129	63	L1 GPS/WAAS
B1234D11.105	11/04/15 09:55	5	61	28	L1 GPS/WAAS
B1234C11.105	11/04/15 09:36	5	66	30	L1 GPS/WAAS
B1234B11.105	11/04/15 09:10	5	65	26	L1 GPS/WAAS

## Occupations

File	Site	Start Time	Time span	Type
	LIBA	April 15 2011 08:47:10.00	04:52:25.00	Static

BLIBAA11.105	J063	April 15 2011 13:01:05.00	00:05:25.00	Static
BPM01A11.106	J062	April 15 2011 12:40:35.00	00:08:50.00	Static
BPM01K11.105	J061	April 15 2011 12:24:40.00	00:08:15.00	Static
BPM01J11.105	J060	April 15 2011 12:07:40.00	00:08:10.00	Static
BPM01I11.105	J059	April 15 2011 11:45:05.00	00:08:10.00	Static
BPM01H11.105	J058	April 15 2011 10:46:00.00	00:10:40.00	Static
BPM01G11.105	J057	April 15 2011 10:22:50.00	00:06:15.00	Static
BPM01F11.105	J056	April 15 2011 10:06:45.00	00:05:35.00	Static
BPM01E11.105	J055	April 15 2011 09:49:50.00	00:06:00.00	Static
BPM01D11.105	J054	April 15 2011 09:29:55.00	00:05:00.00	Static
BPM01C11.105	J053	April 15 2011 09:15:20.00	00:06:30.00	Static
BPM01B11.105	H068	April 15 2011 12:54:15.00	00:06:30.00	Static
B1234K11.105	H067	April 15 2011 12:37:40.00	00:07:35.00	Static
B1234J11.105	H066	April 15 2011 12:22:00.00	00:08:10.00	Static
B1234I11.105	H065	April 15 2011 12:06:55.00	00:08:35.00	Static
B1234H11.105	H064	April 15 2011 11:50:00.00	00:07:55.00	Static
B1234G11.105	H063	April 15 2011 10:41:30.00	00:12:05.00	Static
B1234F11.105	H062	April 15 2011 10:12:30.00	00:10:40.00	Static
B1234E11.105	H061	April 15 2011 09:55:10.00	00:05:00.00	Static
B1234D11.105	H060	April 15 2011 09:36:40.00	00:05:25.00	Static
B1234C11.105	H059	April 15 2011 09:10:25.00	00:05:20.00	Static
B1234B11.105				

## Processes

Reference	Reference File	Rover	Rover File	Mode	Num
LIBA	BLIBAA11.105	H067	B1234J11.105	Static	1
LIBA	BLIBAA11.105	H060	B1234C11.105	Static	2
LIBA	BLIBAA11.105	J059	BPM01H11.105	Static	3
LIBA	BLIBAA11.105	J061	BPM01J11.105	Static	4
LIBA	BLIBAA11.105	J058	BPM01G11.105	Static	5
LIBA	BLIBAA11.105	J057	BPM01F11.105	Static	6
LIBA	BLIBAA11.105	J056	BPM01E11.105	Static	7
LIBA	BLIBAA11.105	J055	BPM01D11.105	Static	8
LIBA	BLIBAA11.105	J062	BPM01K11.105	Static	9
LIBA	BLIBAA11.105	J054	BPM01C11.105	Static	10
LIBA	BLIBAA11.105	J063	BPM01A11.106	Static	11
LIBA	BLIBAA11.105	H059	B1234B11.105	Static	12
LIBA	BLIBAA11.105	H068	B1234K11.105	Static	13
LIBA	BLIBAA11.105	J060	BPM01I11.105	Static	14
LIBA	BLIBAA11.105	H063	B1234F11.105	Static	15
LIBA	BLIBAA11.105	H066	B1234I11.105	Static	16
LIBA	BLIBAA11.105	H061	B1234D11.105	Static	17
LIBA	BLIBAA11.105	H065	B1234H11.105	Static	18
LIBA	BLIBAA11.105	H064	B1234G11.105	Static	19
LIBA	BLIBAA11.105	H062	B1234E11.105	Static	20

LIBA	BLIBAA11.105	J053	BPM01B11.105	Static	21
H063	B1234F11.105	J058	BPM01G11.105	Static	22
J062	BPM01K11.105	H067	B1234J11.105	Static	23
H065	B1234H11.105	J060	BPM01I11.105	Static	24
J061	BPM01J11.105	H066	B1234I11.105	Static	25
J059	BPM01H11.105	H064	B1234G11.105	Static	26

### Processed vectors

Vector Identifier	Vector Length	95% Error		Vector Components	95% Error	SV	PDOP	QA	Solution
LIBA - J060 11/04/15 12:07	816.941	0.006	X	-267.556	0.003	8	2.4		Fixed
			Y	659.995	0.002				
			Z	-400.266	0.003				
LIBA - H060 11/04/15 09:36	757.457	0.007	X	261.645	0.003	9	1.7		Fixed
			Y	360.042	0.002				
			Z	612.906	0.003				
LIBA - J059 11/04/15 11:45	811.141	0.006	X	-162.092	0.003	9	1.7		Fixed
			Y	779.408	0.002				
			Z	-155.557	0.002				
LIBA - J061 11/04/15 12:24	899.097	0.007	X	-377.660	0.003	8	2.2		Fixed
			Y	476.197	0.002				
			Z	-662.560	0.003				
LIBA - J058 11/04/15 10:46	898.255	0.005	X	-45.842	0.002	11	1.8		Fixed
			Y	891.006	0.002				
			Z	104.249	0.002				
LIBA - J057 11/04/15 10:22	1168.901	0.008	X	86.936	0.004	9	2.2		Fixed
			Y	1089.201	0.003				
			Z	415.227	0.003				
LIBA - J056 11/04/15 10:06	1279.992	0.009	X	261.300	0.004	9	2.0		Fixed
			Y	1002.898	0.003				
			Z	751.196	0.003				
LIBA - J055 11/04/15 09:49	987.214	0.007	X	289.001	0.003	9	1.7		Fixed
			Y	608.265	0.003				
			Z	721.861	0.003				
LIBA - J062 11/04/15 12:40	863.859	0.005	X	-384.077	0.002	9	1.5		Fixed
			Y	301.883	0.002				
			Z	-712.463	0.002				
LIBA - J054 11/04/15 09:29	604.708	0.005	X	225.379	0.003	8	2.2		Fixed
			Y	232.692	0.002				
			Z	510.618	0.001				
LIBA - J063 11/04/15 13:01	796.314	0.006	X	-354.080	0.003	8	1.8		Fixed
			Y	18.550	0.002				
			Z	-713.021	0.002				
LIBA - H067 11/04/15 12:37	887.476	0.007	X	-383.240	0.003	9	1.5		Fixed
			Y	406.478	0.002				
			Z	-689.576	0.003				
LIBA - H068 11/04/15 12:54	857.106	0.007	X	-386.409	0.003	8	1.7		Fixed
			Y	133.560	0.002				
			Z	-753.313	0.003				
LIBA - H063 11/04/15 10:41	1004.525	0.006	X	1.706	0.003	11	1.8		Fixed
			Y	980.599	0.002				
			Z	217.931	0.002				
LIBA - H066	902.495	0.006	X	-356.439	0.003	8	2.2		Fixed



NWHI Lidar Validation

GPS Processing Report

Lisianski Island

11/04/15 12:22			Y	573.678	0.002			
			Z	-598.618	0.002			
LIBA - H061 11/04/15 09:55	1182.276	0.009	X	291.047	0.004	9	1.8	Fixed
			Y	841.921	0.003			
			Z	777.328	0.003			
LIBA - H065 11/04/15 12:06	827.067	0.006	X	-284.870	0.003	8	2.4	Fixed
			Y	640.125	0.002			
			Z	-439.464	0.002			
LIBA - H064 11/04/15 11:50	816.595	0.006	X	-211.369	0.003	9	1.7	Fixed
			Y	742.994	0.002			
			Z	-264.782	0.002			
LIBA - H062 11/04/15 10:12	1243.744	0.007	X	178.298	0.003	9	2.1	Fixed
			Y	1075.984	0.003			
			Z	597.802	0.003			
LIBA - J053 11/04/15 09:15	397.859	0.005	X	155.878	0.003	7	3.3	Fixed
			Y	122.745	0.001			
			Z	344.859	0.002			
LIBA - H059 11/04/15 09:10	316.719	0.003	X	121.904	0.001	8	2.2	Fixed
			Y	101.294	0.001			
			Z	274.208	0.001			
J062 - H067 11/04/15 12:40	107.076	0.003	X	0.831	0.002	9	1.5	Fixed
			Y	104.597	0.001			
			Z	22.890	0.000			
J061 - H066 11/04/15 12:24	118.496	0.004	X	21.221	0.002	9	1.7	Fixed
			Y	97.480	0.001			
			Z	63.943	0.002			
J059 - H064 11/04/15 11:50	125.236	0.006	X	-49.273	0.003	9	1.7	Fixed
			Y	-36.411	0.002			
			Z	-109.227	0.002			
H065 - J060 11/04/15 12:07	47.234	0.003	X	17.315	0.001	8	2.4	Fixed
			Y	19.870	0.001			
			Z	39.197	0.001			
H063 - J058 11/04/15 10:46	152.352	0.002	X	-47.549	0.001	11	1.8	Fixed
			Y	-89.592	0.001			
			Z	-113.681	0.000			

Laysan Island

# Land Survey Overview

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[www.ashtech.com](http://www.ashtech.com)

Project Name : NWHI\_Laysan  
 Spatial Reference System : UTM/NAD83-CORS96/UTM zone 02N WGS84  
 Time Zone : (GMT-11:00) Samoa  
 Linear Units : Meters

## Coordinate System Summary

### Coordinate system

Name : UTM/NAD83-CORS96/UTM zone 02N WGS84  
 Type : Projected  
 Unit name : Meters  
     Meters per unit : 1  
 Vertical datum : WGS\_84  
 Vertical unit : Meters  
     Meters per unit : 1

### Datum

Name : NAD83-CORS96  
 Ellipsoid Name : GRS 1980  
 Semi-major Axis : 6378137.000 m  
 Inverse Flattening : 298.257222101  
 DX to WGS84 : -1.0040 m  
 DY to WGS84 : 1.9097 m  
 DZ to WGS84 : 0.5155 m  
 RX to WGS84 : -0.026719 "  
 RY to WGS84 : -0.000342 "  
 RZ to WGS84 : -0.010987 "  
 ppm to WGS84 : 0.001540000000

### Projection

Projection Class : Transverse\_Mercator  
 latitude\_of\_origin : 0° 00' 00.00000"N  
 central\_meridian : 171° 00' 00.00000"W  
 scale\_factor : 0.999600000000  
 false\_easting : 500000.000 m  
 false\_northing : 0.000 m

Control Points : 1  
 Reference Points : 0  
 Logged Points : 28  
 Target Points : 0  
 Intermediate Points : 0

## Control Points

Name	Components	95%		Status	Control
		Error			
LABA	East	425911.667	0.006	FIXED	
	North	2850913.435	0.006	FIXED	
	Ellips height	17.978	0.005	FIXED	

## Logged Points

Name	Components	95%		Status
		Error		
H069	East	425782.884	0.001	Processed (static)
	North	2851177.204	0.001	Processed (static)
	Ellips height	13.266	0.001	Processed (static)
H070	East	426304.572	0.001	Processed (static)
	North	2851365.368	0.000	Processed (static)
	Ellips height	14.642	0.001	Processed (static)
H071	East	426443.536	0.001	Processed (static)
	North	2851127.536	0.001	Processed (static)
	Ellips height	10.331	0.002	Processed (static)
H072	East	427391.621	0.001	Processed (static)
	North	2851564.274	0.001	Processed (static)
	Ellips height	11.599	0.002	Processed (static)
H073	East	427170.599	0.001	Processed (static)
	North	2851133.379	0.001	Processed (static)
	Ellips height	14.909	0.002	Processed (static)
H074	East	427304.357	0.001	Processed (static)
	North	2850933.489	0.001	Processed (static)
	Ellips height	16.121	0.001	Processed (static)
H075	East	427125.404	0.000	Processed (static)
	North	2850358.431	0.000	Processed (static)
	Ellips height	11.896	0.001	Processed (static)
H076	East	426944.391	0.001	Processed (static)
	North	2849878.886	0.001	Processed (static)
	Ellips height	11.392	0.003	Processed (static)
H077	East	426177.592	0.001	Processed (static)
	North	2849165.380	0.000	Processed (static)
	Ellips height	10.976	0.001	Processed (static)
H078	East	426060.774	0.000	Processed (static)
	North	2849309.497	0.000	Processed (static)
	Ellips height	10.954	0.001	Processed (static)
H079	East	426200.819	0.001	Processed (static)
	North	2849529.767	0.000	Processed (static)
	Ellips height	10.232	0.001	Processed (static)
H080	East	425483.613	0.001	Processed (static)
	North	2849372.956	0.001	Processed (static)
	Ellips height	11.892	0.003	Processed (static)
H081	East	425643.550	0.001	Processed (static)
	North	2850298.092	0.001	Processed (static)
	Ellips height	16.010	0.002	Processed (static)

H082	East	425987.750	0.000	Processed (static)
	North	2850923.171	0.000	Processed (static)
	Ellips height	16.244	0.001	Processed (static)
J064	East	425764.390	0.001	Processed (static)
	North	2851269.191	0.001	Processed (static)
	Ellips height	14.252	0.002	Processed (static)
J065	East	426247.359	0.001	Processed (static)
	North	2851337.656	0.001	Processed (static)
	Ellips height	15.239	0.002	Processed (static)
J066	East	426510.837	0.001	Processed (static)
	North	2851219.072	0.001	Processed (static)
	Ellips height	10.293	0.002	Processed (static)
J067	East	427070.857	0.000	Processed (static)
	North	2851499.866	0.000	Processed (static)
	Ellips height	17.347	0.001	Processed (static)
J068	East	427260.973	0.001	Processed (static)
	North	2851128.506	0.001	Processed (static)
	Ellips height	15.002	0.002	Processed (static)
J069	East	427400.945	0.001	Processed (static)
	North	2850929.496	0.001	Processed (static)
	Ellips height	15.776	0.002	Processed (static)
J070	East	427117.753	0.001	Processed (static)
	North	2850597.311	0.001	Processed (static)
	Ellips height	12.107	0.002	Processed (static)
J071	East	426893.056	0.001	Processed (static)
	North	2849729.840	0.001	Processed (static)
	Ellips height	11.294	0.001	Processed (static)
J072	East	426064.698	0.001	Processed (static)
	North	2849106.306	0.000	Processed (static)
	Ellips height	11.452	0.001	Processed (static)
J073	East	426007.130	0.000	Processed (static)
	North	2849160.534	0.000	Processed (static)
	Ellips height	11.443	0.001	Processed (static)
J074	East	426195.769	0.000	Processed (static)
	North	2849403.139	0.000	Processed (static)
	Ellips height	10.492	0.001	Processed (static)
J075	East	425549.046	0.000	Processed (static)
	North	2849290.787	0.000	Processed (static)
	Ellips height	12.138	0.001	Processed (static)
J076	East	425641.358	0.001	Processed (static)
	North	2850280.991	0.001	Processed (static)
	Ellips height	16.051	0.001	Processed (static)
J077	East	426332.064	0.002	Processed (static)
	North	2850999.496	0.001	Processed (static)
	Ellips height	10.636	0.003	Processed (static)

## Files

Name	Start Time	Sampling	Epochs	Size (Kb)	Type
BLABAA11.106	11/04/16 07:34	5	4985	4701	L1/L2 GPS
BPM01B11.107	11/04/16 14:16	5	78	33	L1 GPS/WAAS
BPM01A11.107	11/04/16 13:23	5	75	31	L1 GPS/WAAS

BPM01M11.106	11/04/16 12:43	5	163	74	L1 GPS/WAAS
BPM01L11.106	11/04/16 12:02	5	125	55	L1 GPS/WAAS
BPM01K11.106	11/04/16 11:41	5	112	54	L1 GPS/WAAS
BPM01J11.106	11/04/16 11:26	5	102	53	L1 GPS/WAAS
BPM01I11.106	11/04/16 10:48	5	73	40	L1 GPS/WAAS
BPM01H11.106	11/04/16 10:17	5	67	32	L1 GPS/WAAS
BPM01G11.106	11/04/16 09:53	5	69	34	L1 GPS/WAAS
BPM01F11.106	11/04/16 09:38	5	81	37	L1 GPS/WAAS
BPM01E11.106	11/04/16 09:14	5	86	39	L1 GPS/WAAS
BPM01D11.106	11/04/16 08:43	5	66	30	L1 GPS/WAAS
BPM01C11.106	11/04/16 08:21	5	62	28	L1 GPS/WAAS
BPM01B11.106	11/04/16 07:59	5	64	26	L1 GPS/WAAS
B1234B11.107	11/04/16 14:09	5	121	55	L1 GPS/WAAS
B1234A11.107	11/04/16 13:22	5	62	28	L1 GPS/WAAS
B1234L11.106	11/04/16 12:52	5	115	57	L1 GPS/WAAS
B1234K11.106	11/04/16 12:03	5	98	43	L1 GPS/WAAS
B1234J11.106	11/04/16 11:40	5	153	72	L1 GPS/WAAS
B1234I11.106	11/04/16 11:27	5	97	51	L1 GPS/WAAS
B1234H11.106	11/04/16 10:45	5	64	34	L1 GPS/WAAS
B1234G11.106	11/04/16 10:18	5	145	75	L1 GPS/WAAS
B1234F11.106	11/04/16 09:53	5	77	37	L1 GPS/WAAS
B1234E11.106	11/04/16 09:39	5	64	29	L1 GPS/WAAS
B1234D11.106	11/04/16 09:19	5	79	38	L1 GPS/WAAS
B1234C11.106	11/04/16 08:43	5	70	32	L1 GPS/WAAS
B1234B11.106	11/04/16 08:20	5	104	45	L1 GPS/WAAS
B1234A11.106	11/04/16 07:58	5	75	33	L1 GPS/WAAS

## Occupations

File	Site	Start Time	Time span	Type
	LABA	April 16 2011 07:34:05.00	06:55:20.00	Static
BLABAA11.106	J077	April 16 2011 14:16:15.00	00:06:25.00	Static
BPM01B11.107	J076	April 16 2011 13:23:45.00	00:06:10.00	Static
BPM01A11.107	J075	April 16 2011 12:43:25.00	00:13:30.00	Static
BPM01M11.106	J074	April 16 2011 12:02:10.00	00:10:20.00	Static
BPM01L11.106	J073	April 16 2011 11:41:10.00	00:09:15.00	Static
BPM01K11.106	J072	April 16 2011 11:26:50.00	00:08:25.00	Static
BPM01J11.106	J071	April 16 2011 10:48:35.00	00:06:00.00	Static
BPM01I11.106	J070	April 16 2011 10:17:00.00	00:05:30.00	Static
BPM01H11.106	J069	April 16 2011 09:53:55.00	00:05:40.00	Static
BPM01G11.106	J068	April 16 2011 09:38:20.00	00:06:40.00	Static
BPM01F11.106	J067	April 16 2011 09:14:35.00	00:07:05.00	Static
BPM01E11.106	J066	April 16 2011 08:43:40.00	00:05:25.00	Static
BPM01D11.106	J065	April 16 2011 08:21:20.00	00:05:05.00	Static
BPM01C11.106	J064	April 16 2011 07:59:40.00	00:05:15.00	Static
BPM01B11.106	H082	April 16 2011 14:09:00.00	00:10:00.00	Static
B1234B11.107	H081	April 16 2011 13:22:40.00	00:05:05.00	Static
B1234A11.107	H080	April 16 2011 12:52:50.00	00:09:30.00	Static
B1234L11.106				

B1234K11.106	H079	April 16 2011 12:03:40.00	00:08:05.00	Static
B1234J11.106	H078	April 16 2011 11:40:45.00	00:12:40.00	Static
B1234I11.106	H077	April 16 2011 11:27:55.00	00:08:00.00	Static
B1234H11.106	H076	April 16 2011 10:45:45.00	00:05:15.00	Static
B1234G11.106	H075	April 16 2011 10:18:40.00	00:12:00.00	Static
B1234F11.106	H074	April 16 2011 09:53:30.00	00:06:20.00	Static
B1234E11.106	H073	April 16 2011 09:39:10.00	00:05:15.00	Static
B1234D11.106	H072	April 16 2011 09:19:45.00	00:06:30.00	Static
B1234C11.106	H071	April 16 2011 08:43:50.00	00:05:45.00	Static
B1234B11.106	H070	April 16 2011 08:20:30.00	00:08:35.00	Static
B1234A11.106	H069	April 16 2011 07:58:45.00	00:06:10.00	Static

## Processes

Reference	Reference File	Rover	Rover File	Mode	Num
LABA	BLABAA11.106	J072	BPM01J11.106	Static	1
LABA	BLABAA11.106	H082	B1234B11.107	Static	2
LABA	BLABAA11.106	J064	BPM01B11.106	Static	3
LABA	BLABAA11.106	J065	BPM01C11.106	Static	4
LABA	BLABAA11.106	J066	BPM01D11.106	Static	5
LABA	BLABAA11.106	J067	BPM01E11.106	Static	6
LABA	BLABAA11.106	J068	BPM01F11.106	Static	7
LABA	BLABAA11.106	J069	BPM01G11.106	Static	8
LABA	BLABAA11.106	H081	B1234A11.107	Static	9
LABA	BLABAA11.106	J071	BPM01I11.106	Static	10
LABA	BLABAA11.106	J073	BPM01K11.106	Static	11
LABA	BLABAA11.106	J074	BPM01L11.106	Static	12
LABA	BLABAA11.106	H076	B1234H11.106	Static	13
LABA	BLABAA11.106	J075	BPM01M11.106	Static	14
LABA	BLABAA11.106	J076	BPM01A11.107	Static	15
LABA	BLABAA11.106	J077	BPM01B11.107	Static	16
LABA	BLABAA11.106	H074	B1234F11.106	Static	17
LABA	BLABAA11.106	H075	B1234G11.106	Static	18
LABA	BLABAA11.106	J070	BPM01H11.106	Static	19
LABA	BLABAA11.106	H073	B1234E11.106	Static	20
LABA	BLABAA11.106	H070	B1234B11.106	Static	21
LABA	BLABAA11.106	H080	B1234L11.106	Static	22
LABA	BLABAA11.106	H069	B1234A11.106	Static	23
LABA	BLABAA11.106	H079	B1234K11.106	Static	24
LABA	BLABAA11.106	H071	B1234C11.106	Static	25
LABA	BLABAA11.106	H072	B1234D11.106	Static	26
LABA	BLABAA11.106	H078	B1234J11.106	Static	27
LABA	BLABAA11.106	H077	B1234I11.106	Static	28
J075	BPM01M11.106	H080	B1234L11.106	Static	29
H078	B1234J11.106	J073	BPM01K11.106	Static	30
H075	B1234G11.106	J070	BPM01H11.106	Static	31
J074	BPM01L11.106	H079	B1234K11.106	Static	32
H082	B1234B11.107	J077	BPM01B11.107	Static	33
H070	B1234B11.106	J065	BPM01C11.106	Static	34
J072	BPM01J11.106	H077	B1234I11.106	Static	35
J068	BPM01F11.106	H073	B1234E11.106	Static	36
H074	B1234F11.106	J069	BPM01G11.106	Static	37
J076	BPM01A11.107	H081	B1234A11.107	Static	38
H069	B1234A11.106	J064	BPM01B11.106	Static	39
J071	BPM01I11.106	H076	B1234H11.106	Static	40
H071	B1234C11.106	J066	BPM01D11.106	Static	41

### Processed vectors

Vector Identifier	Vector Length	95% Error		Vector Components	95% Error	SV	PDOP	QA	Solution
LABA - H081 11/04/16 13:22	671.447	0.005	X	-301.778	0.003	9	1.7		Fixed
			Y	223.712	0.002				
			Z	-556.528	0.001				
LABA - H075 11/04/16 10:18	1335.073	0.007	X	-55.531	0.003	10	1.8		Fixed
			Y	-1238.063	0.003				
			Z	-496.522	0.003				
LABA - H074 11/04/16 09:53	1393.303	0.009	X	213.940	0.004	9	1.8		Fixed
			Y	-1376.567	0.003				
			Z	24.226	0.003				
LABA - J077 11/04/16 14:16	429.321	0.004	X	104.967	0.002	8	1.8		Fixed
			Y	-409.212	0.002				
			Z	76.447	0.001				
LABA - J076 11/04/16 13:23	688.021	0.005	X	-309.482	0.003	8	1.9		Fixed
			Y	224.712	0.002				
			Z	-571.925	0.001				
LABA - J075 11/04/16 12:43	1663.238	0.009	X	-744.765	0.004	8	1.7		Fixed
			Y	249.211	0.004				
			Z	-1466.145	0.004				
LABA - H076 11/04/16 10:45	1462.284	0.010	X	-287.541	0.005	11	1.8		Fixed
			Y	-1091.492	0.004				
			Z	-929.646	0.004				
LABA - J074 11/04/16 12:02	1537.317	0.009	X	-600.539	0.004	8	2.4		Fixed
			Y	-382.924	0.003				
			Z	-1362.375	0.004				
LABA - H073 11/04/16 09:39	1278.433	0.009	X	281.334	0.004	9	1.7		Fixed
			Y	-1230.445	0.003				
			Z	203.095	0.004				
LABA - J071 11/04/16 10:48	1538.068	0.009	X	-358.985	0.004	11	1.8		Fixed
			Y	-1050.825	0.004				
			Z	-1064.213	0.003				
LABA - H070 11/04/16 08:20	599.057	0.005	X	254.591	0.002	9	1.6		Fixed
			Y	-357.625	0.002				
			Z	407.624	0.002				
LABA - J069 11/04/16 09:53	1489.867	0.010	X	226.668	0.004	9	1.8		Fixed
			Y	-1472.374	0.004				
			Z	20.958	0.004				
LABA - J068 11/04/16 09:38	1366.802	0.009	X	292.382	0.004	9	1.7		Fixed
			Y	-1320.220	0.003				
			Z	199.195	0.004				
LABA - J067 11/04/16 09:14	1299.522	0.008	X	422.049	0.004	8	2.2		Fixed
			Y	-1107.117	0.003				
			Z	533.782	0.003				
LABA - J066 11/04/16 08:43	672.890	0.005	X	225.762	0.003	9	1.6		Fixed
			Y	-571.134	0.002				
			Z	274.988	0.001				
LABA - J065 11/04/16 08:21	541.162	0.006	X	233.785	0.003	9	1.6		Fixed
			Y	-302.971	0.002				
			Z	382.634	0.002				

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LABA - J064 11/04/16 07:59	385.183	0.004	X Y Z	134.657 170.436 318.096	0.002 0.002 0.001	9 1.6	Fixed
LABA - H082 11/04/16 14:09	76.749	0.001	X Y Z	16.848 -74.404 8.400	0.001 0.001 0.000	9 1.6	Fixed
LABA - J072 11/04/16 11:26	1814.215	0.010	X Y Z	-748.019 -273.531 -1630.038	0.004 0.004 0.004	9 1.8	Fixed
LABA - J073 11/04/16 11:41	1756.098	0.009	X Y Z	-733.142 -212.875 -1581.476	0.004 0.004 0.003	9 1.7	Fixed
LABA - H080 11/04/16 12:52	1599.392	0.009	X Y Z	-718.820 319.583 -1392.559	0.004 0.004 0.004	8 1.7	Fixed
LABA - H069 11/04/16 07:58	293.665	0.003	X Y Z	98.712 146.003 234.900	0.002 0.001 0.001	9 1.6	Fixed
LABA - H079 11/04/16 12:03	1414.051	0.008	X Y Z	-545.191 -379.274 -1248.383	0.003 0.003 0.003	8 2.4	Fixed
LABA - H071 11/04/16 08:43	573.588	0.006	X Y Z	176.556 -510.769 192.212	0.003 0.002 0.002	9 1.6	Fixed
LABA - H072 11/04/16 09:19	1617.298	0.011	X Y Z	501.786 -1419.405 590.890	0.005 0.004 0.004	7 3.1	Fixed
LABA - H078 11/04/16 11:40	1611.408	0.009	X Y Z	-660.897 -255.764 -1447.217	0.004 0.004 0.004	9 1.7	Fixed
LABA - H077 11/04/16 11:27	1768.771	0.010	X Y Z	-705.726 -381.169 -1576.456	0.004 0.004 0.003	9 1.8	Fixed
LABA - J070 11/04/16 10:17	1247.257	0.008	X Y Z	45.784 -1214.264 -281.278	0.004 0.003 0.002	10 1.8	Fixed
J076 - H081 11/04/16 13:23	17.247	0.004	X Y Z	7.703 -1.000 15.399	0.002 0.001 0.002	8 2.0	Fixed
J075 - H080 11/04/16 12:52	105.074	0.006	X Y Z	25.946 70.373 73.587	0.003 0.001 0.002	7 2.8	Fixed
J074 - H079 11/04/16 12:03	126.771	0.002	X Y Z	55.349 3.650 113.992	0.001 0.001 0.000	8 2.4	Fixed
J072 - H077 11/04/16 11:27	127.459	0.003	X Y Z	42.292 -107.639 53.583	0.001 0.001 0.001	9 1.8	Fixed
J071 - H076 11/04/16 10:48	157.692	0.006	X Y Z	71.437 -40.672 134.571	0.004 0.002 0.000	11 1.8	Fixed
J068 - H073 11/04/16 09:39	90.536	0.004	X Y	-11.048 89.775	0.002 0.001	9 1.7	Fixed



NWHI Lidar Validation

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Laysan Island

Station ID	Station Name	Station Elevation	Station Accuracy	X	Y	Z	Station Accuracy	Station Accuracy	Station Accuracy	Station Accuracy	
H082 - J077	11/04/16 14:16	352.835	0.007	X 88.122	Y -334.808	Z 68.048	0.004	0.002	0.003	8 1.8	Fixed
H078 - J073	11/04/16 11:41	158.381	0.003	X -72.243	Y 42.890	Z -134.261	0.001	0.001	0.001	9 1.7	Fixed
H075 - J070	11/04/16 10:18	239.083	0.005	X 101.312	Y 23.797	Z 215.244	0.003	0.001	0.002	10 1.8	Fixed
H074 - J069	11/04/16 09:53	96.704	0.003	X 12.727	Y -95.807	Z -3.268	0.002	0.001	0.001	9 1.8	Fixed
H071 - J066	11/04/16 08:43	113.653	0.004	X 49.206	Y -60.365	Z 82.776	0.002	0.001	0.001	9 1.6	Fixed
H070 - J065	11/04/16 08:21	63.595	0.003	X -20.805	Y 54.654	Z -24.990	0.002	0.001	0.001	9 1.6	Fixed
H069 - J064	11/04/16 07:59	93.864	0.004	X 35.945	Y 24.434	Z 83.195	0.002	0.001	0.001	9 1.6	Fixed

## French Frigate Shoals

# Land Survey Overview

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[www.ashtech.com](http://www.ashtech.com)

Project Name : NWHI\_FFS  
 Spatial Reference System : UTM/NAD83-CORS96/UTM zone 03N WGS84~1  
 Time Zone : (GMT-11:00) Samoa  
 Linear Units : Meters

## Coordinate System Summary

### Coordinate system

<b>Name :</b>	UTM/NAD83-CORS96/UTM zone 03N WGS84~1
<b>Type :</b>	Projected
<b>Unit name :</b>	Meters
<b>Meters per unit :</b>	1
<b>Vertical datum :</b>	WGS_84
<b>Vertical unit :</b>	Meters
<b>Meters per unit :</b>	1

### Datum

<b>Name :</b>	NAD83-CORS96~1
<b>Ellipsoid Name :</b>	WGS 84
<b>Semi-major Axis :</b>	6378137.000 m
<b>Inverse Flattening :</b>	298.257223563
<b>DX to WGS84 :</b>	-1.0040 m
<b>DY to WGS84 :</b>	1.9097 m
<b>DY to WGS84 :</b>	0.5155 m
<b>RX to WGS84 :</b>	-0.026719 "
<b>RY to WGS84 :</b>	-0.000342 "
<b>RZ to WGS84 :</b>	-0.010987 "
<b>ppm to WGS84 :</b>	0.001540000000

### Projection

<b>Projection Class :</b>	Transverse_Mercator
<b>latitude_of_origin</b>	0° 00' 00.00000"N
<b>central_meridian</b>	165° 00' 00.00000"W
<b>scale_factor</b>	0.999600000000
<b>false_easting</b>	500000.000 m
<b>false_northing</b>	0.000 m

Control Points	:	1
Reference Points	:	0
Logged Points	:	31
Target Points	:	0
Intermediate Points	:	0

## Control Points

Name	Components	95%		Status	Control
		Error			
FFBA	East	368923.835	0.008	FIXED	
	North	2640253.431	0.019	FIXED	
	Ellips height	19.070	0.019	FIXED	
	Description	French 2001			

## Logged Points

Name	Components	95%		Status
		Error		
H083	East	368735.541	0.001	Processed (static)
	North	2640258.232	0.000	Processed (static)
	Ellips height	18.572	0.001	Processed (static)
H084	East	368785.032	0.001	Processed (static)
	North	2640274.119	0.001	Processed (static)
	Ellips height	18.691	0.001	Processed (static)
H085	East	368881.678	0.001	Processed (static)
	North	2640301.227	0.001	Processed (static)
	Ellips height	18.657	0.002	Processed (static)
H086	East	368979.241	0.001	Processed (static)
	North	2640326.699	0.001	Processed (static)
	Ellips height	18.597	0.002	Processed (static)
H087	East	369078.169	0.001	Processed (static)
	North	2640353.530	0.000	Processed (static)
	Ellips height	18.616	0.001	Processed (static)
H088	East	369136.656	0.002	Processed (static)
	North	2640377.894	0.001	Processed (static)
	Ellips height	18.702	0.002	Processed (static)
	Description	FWS 500m-N mark		
H089	East	369195.823	0.001	Processed (static)
	North	2640460.083	0.001	Processed (static)
	Ellips height	18.594	0.002	Processed (static)
H090	East	369277.648	0.001	Processed (static)
	North	2640425.438	0.000	Processed (static)
	Ellips height	18.652	0.001	Processed (static)
H091	East	369386.713	0.001	Processed (static)
	North	2640454.476	0.001	Processed (static)
	Ellips height	18.718	0.002	Processed (static)
H092	East	369479.713	0.001	Processed (static)
	North	2640476.937	0.001	Processed (static)
	Ellips height	18.688	0.002	Processed (static)
H093	East	369584.267	0.001	Processed (static)
	North	2640511.352	0.001	Processed (static)
	Ellips height	18.680	0.003	Processed (static)
H094	East	369347.015	0.001	Processed (static)
	North	2640374.590	0.001	Processed (static)
	Ellips height	18.857	0.002	Processed (static)
	Description	FWS transect origin		
H095	East	368919.296	0.001	Processed (static)
	North	2640252.046	0.001	Processed (static)

	Ellips height	20.217	0.002	Processed (static)
H096	East	373449.093	0.001	Processed (static)
	North	2640575.357	0.001	Processed (static)
	Ellips height	18.392	0.001	Processed (static)
H097	East	376769.874	0.000	Processed (static)
	North	2631215.713	0.000	Processed (static)
	Ellips height	18.792	0.000	Processed (static)
H098	East	376890.242	0.000	Processed (static)
	North	2631083.912	0.000	Processed (static)
	Ellips height	18.833	0.000	Processed (static)
J078	East	368746.304	0.001	Processed (static)
	North	2640225.894	0.001	Processed (static)
	Ellips height	18.553	0.001	Processed (static)
J079	East	368793.391	0.001	Processed (static)
	North	2640240.930	0.001	Processed (static)
	Ellips height	18.689	0.002	Processed (static)
J080	East	368888.834	0.001	Processed (static)
	North	2640265.847	0.001	Processed (static)
	Ellips height	18.592	0.001	Processed (static)
J081	East	368985.126	0.001	Processed (static)
	North	2640296.991	0.001	Processed (static)
	Ellips height	18.666	0.001	Processed (static)
J082	East	369083.098	0.001	Processed (static)
	North	2640335.327	0.000	Processed (static)
	Ellips height	18.649	0.001	Processed (static)
J083	East	369145.304	0.001	Processed (static)
	North	2640348.161	0.000	Processed (static)
	Ellips height	18.713	0.001	Processed (static)
	Description	FWS 500m-S mark		
J084	East	369205.879	0.001	Processed (static)
	North	2640380.840	0.001	Processed (static)
	Ellips height	18.653	0.002	Processed (static)
J085	East	369289.565	0.001	Processed (static)
	North	2640400.426	0.000	Processed (static)
	Ellips height	18.582	0.001	Processed (static)
J086	East	369404.365	0.001	Processed (static)
	North	2640434.728	0.001	Processed (static)
	Ellips height	18.699	0.002	Processed (static)
J087	East	369475.326	0.001	Processed (static)
	North	2640454.308	0.000	Processed (static)
	Ellips height	18.686	0.001	Processed (static)
J088	East	369580.899	0.000	Processed (static)
	North	2640483.202	0.000	Processed (static)
	Ellips height	18.753	0.001	Processed (static)
J089	East	368906.837	0.001	Processed (static)
	North	2640230.515	0.001	Processed (static)
	Ellips height	18.621	0.002	Processed (static)
J090	East	373526.774	0.000	Processed (static)
	North	2640554.820	0.000	Processed (static)
	Ellips height	18.463	0.001	Processed (static)
J091	East	376714.113	0.000	Processed (static)
	North	2631233.674	0.000	Processed (static)
	Ellips height	19.062	0.000	Processed (static)

J092	East	376768.514	0.000	Processed (static)
	North	2631164.045	0.000	Processed (static)
	Ellips height	19.068	0.000	Processed (static)

## Files

Name	Start Time	Sampling	Epochs	Size (Kb)	Type
BFFBAA11.108	11/04/18 07:37	5	5140	4830	L1/L2 GPS
BPM01A11.109	11/04/18 13:28	5	278	115	L1 GPS/WAAS
BPM01N11.108	11/04/18 12:54	5	262	125	L1 GPS/WAAS
BPM01M11.108	11/04/18 11:48	5	168	79	L1 GPS/WAAS
BPM01L11.108	11/04/18 09:56	5	71	32	L1 GPS/WAAS
BPM01K11.108	11/04/18 09:32	5	101	48	L1 GPS/WAAS
BPM01J11.108	11/04/18 09:20	5	88	43	L1 GPS/WAAS
BPM01I11.108	11/04/18 09:08	5	102	46	L1 GPS/WAAS
BPM01H11.108	11/04/18 08:57	5	82	37	L1 GPS/WAAS
BPM01G11.108	11/04/18 08:48	5	62	28	L1 GPS/WAAS
BPM01F11.108	11/04/18 08:40	5	63	29	L1 GPS/WAAS
BPM01E11.108	11/04/18 08:29	5	67	30	L1 GPS/WAAS
BPM01D11.108	11/04/18 08:21	5	60	27	L1 GPS/WAAS
BPM01C11.108	11/04/18 08:13	5	60	27	L1 GPS/WAAS
BPM01B11.108	11/04/18 08:05	5	60	27	L1 GPS/WAAS
BPM01A11.108	11/04/18 07:58	5	60	27	L1 GPS/WAAS
B1234A11.109	11/04/18 13:29	5	224	101	L1 GPS/WAAS
B1234O11.108	11/04/18 12:59	5	261	124	L1 GPS/WAAS
B1234N11.108	11/04/18 11:54	5	142	62	L1 GPS/WAAS
B1234M11.108	11/04/18 10:00	5	60	29	L1 GPS/WAAS
B1234L11.108	11/04/18 09:44	5	69	31	L1 GPS/WAAS
B1234K11.108	11/04/18 09:30	5	73	36	L1 GPS/WAAS
B1234J11.108	11/04/18 09:19	5	86	42	L1 GPS/WAAS
B1234I11.108	11/04/18 09:08	5	94	42	L1 GPS/WAAS
B1234H11.108	11/04/18 08:57	5	84	38	L1 GPS/WAAS
B1234G11.108	11/04/18 08:48	5	62	28	L1 GPS/WAAS
B1234F11.108	11/04/18 08:38	5	62	28	L1 GPS/WAAS
B1234E11.108	11/04/18 08:29	5	75	34	L1 GPS/WAAS
B1234D11.108	11/04/18 08:20	5	61	28	L1 GPS/WAAS
B1234C11.108	11/04/18 08:12	5	60	27	L1 GPS/WAAS
B1234B11.108	11/04/18 08:04	5	61	28	L1 GPS/WAAS
B1234A11.108	11/04/18 07:56	5	60	26	L1 GPS/WAAS

## Occupations

File	Site	Start Time	Time span	Type
BFFBAA11.108	FFBA	April 18 2011 07:37:35.00	07:08:15.00	Static
BPM01A11.109	J092	April 18 2011 13:28:25.00	00:23:05.00	Static
BPM01N11.108	J091	April 18 2011 12:54:45.00	00:21:45.00	Static
BPM01M11.108	J090	April 18 2011 11:48:30.00	00:13:55.00	Static
BPM01L11.108	J089	April 18 2011 09:56:30.00	00:05:50.00	Static
BPM01K11.108	J088	April 18 2011 09:32:40.00	00:08:20.00	Static
BPM01J11.108	J087	April 18 2011 09:20:30.00	00:07:15.00	Static
BPM01I11.108	J086	April 18 2011 09:08:25.00	00:08:25.00	Static
BPM01H11.108	J085	April 18 2011 08:57:25.00	00:06:45.00	Static
	J084	April 18 2011 08:48:25.00	00:05:05.00	Static

BPM01G11.108	J083	April 18 2011 08:40:50.00	00:05:10.00	Static
BPM01F11.108	J082	April 18 2011 08:29:35.00	00:05:30.00	Static
BPM01E11.108	J081	April 18 2011 08:21:15.00	00:04:55.00	Static
BPM01D11.108	J080	April 18 2011 08:13:45.00	00:04:55.00	Static
BPM01C11.108	J079	April 18 2011 08:05:45.00	00:04:55.00	Static
BPM01B11.108	J078	April 18 2011 07:58:30.00	00:04:55.00	Static
BPM01A11.108	H098	April 18 2011 13:29:50.00	00:18:35.00	Static
B1234A11.109	H097	April 18 2011 12:59:05.00	00:21:40.00	Static
B1234O11.108	H096	April 18 2011 11:54:35.00	00:11:45.00	Static
B1234N11.108	H095	April 18 2011 10:00:50.00	00:04:55.00	Static
B1234M11.108	H094	April 18 2011 09:44:45.00	00:05:40.00	Static
B1234L11.108	H093	April 18 2011 09:30:25.00	00:06:00.00	Static
B1234K11.108	H092	April 18 2011 09:19:25.00	00:07:05.00	Static
B1234J11.108	H091	April 18 2011 09:08:55.00	00:07:45.00	Static
B1234I11.108	H090	April 18 2011 08:57:30.00	00:06:55.00	Static
B1234H11.108	H089	April 18 2011 08:48:05.00	00:05:05.00	Static
B1234G11.108	H088	April 18 2011 08:38:15.00	00:05:05.00	Static
B1234F11.108	H087	April 18 2011 08:29:05.00	00:06:10.00	Static
B1234E11.108	H086	April 18 2011 08:20:40.00	00:05:00.00	Static
B1234D11.108	H085	April 18 2011 08:12:30.00	00:04:55.00	Static
B1234C11.108	H084	April 18 2011 08:04:25.00	00:05:00.00	Static
B1234B11.108	H083	April 18 2011 07:56:35.00	00:04:55.00	Static
B1234A11.108				

## Processes

Reference	Reference File	Rover	Rover File	Mode	Num
FFBA	BFFBAA11.108	H090	B1234H11.108	Static	1
FFBA	BFFBAA11.108	J082	BPM01E11.108	Static	2
FFBA	BFFBAA11.108	J083	BPM01F11.108	Static	3
FFBA	BFFBAA11.108	J088	BPM01K11.108	Static	4
FFBA	BFFBAA11.108	J079	BPM01B11.108	Static	5
FFBA	BFFBAA11.108	J078	BPM01A11.108	Static	6
FFBA	BFFBAA11.108	J084	BPM01G11.108	Static	7
FFBA	BFFBAA11.108	H098	B1234A11.109	Static	8
FFBA	BFFBAA11.108	H097	B1234O11.108	Static	9
FFBA	BFFBAA11.108	J085	BPM01H11.108	Static	10
FFBA	BFFBAA11.108	H096	B1234N11.108	Static	11
FFBA	BFFBAA11.108	J086	BPM01I11.108	Static	12
FFBA	BFFBAA11.108	H095	B1234M11.108	Static	13
FFBA	BFFBAA11.108	J081	BPM01D11.108	Static	14
FFBA	BFFBAA11.108	H094	B1234L11.108	Static	15
FFBA	BFFBAA11.108	H086	B1234D11.108	Static	16
FFBA	BFFBAA11.108	H083	B1234A11.108	Static	17
FFBA	BFFBAA11.108	J092	BPM01A11.109	Static	18
FFBA	BFFBAA11.108	H084	B1234B11.108	Static	19

FFBA	BFFBAA11.108	H092	B1234J11.108	Static	20
FFBA	BFFBAA11.108	H085	B1234C11.108	Static	21
FFBA	BFFBAA11.108	J087	BPM01J11.108	Static	22
FFBA	BFFBAA11.108	J091	BPM01N11.108	Static	23
FFBA	BFFBAA11.108	J080	BPM01C11.108	Static	24
FFBA	BFFBAA11.108	H091	B1234I11.108	Static	25
FFBA	BFFBAA11.108	H087	B1234E11.108	Static	26
FFBA	BFFBAA11.108	J090	BPM01M11.108	Static	27
FFBA	BFFBAA11.108	H088	B1234F11.108	Static	28
FFBA	BFFBAA11.108	J089	BPM01L11.108	Static	29
FFBA	BFFBAA11.108	H089	B1234G11.108	Static	30
FFBA	BFFBAA11.108	H093	B1234K11.108	Static	31
J092	BPM01A11.109	H098	B1234A11.109	Static	32
J091	BPM01N11.108	H097	B1234O11.108	Static	33
J090	BPM01M11.108	H096	B1234N11.108	Static	34
J086	BPM01I11.108	H091	B1234I11.108	Static	35
J088	BPM01K11.108	H093	B1234K11.108	Static	36
J087	BPM01J11.108	H092	B1234J11.108	Static	37
H090	B1234H11.108	H085	BPM01H11.108	Static	38
H087	B1234E11.108	J082	BPM01E11.108	Static	39
J083	BPM01F11.108	H088	B1234F11.108	Static	40
J084	BPM01G11.108	H089	B1234G11.108	Static	41
H084	B1234B11.108	J079	BPM01B11.108	Static	42
H086	B1234D11.108	J081	BPM01D11.108	Static	43
J080	BPM01C11.108	H085	B1234C11.108	Static	44
J078	BPM01A11.108	H083	B1234A11.108	Static	45

### Processed vectors

Vector Identifier	Vector Length	95% Error		Vector Components	95% Error	SV	PDOP	QA	Solution
FFBA - H096 11/04/18 11:54	4537.591	0.023	X	1216.982	0.010	8	2.4		Fixed
			Y	-4358.788	0.009				
			Z	331.150	0.010				
FFBA - H085 11/04/18 08:12	63.744	0.003	X	8.909	0.001	9	1.6		Fixed
			Y	46.021	0.001				
			Z	43.197	0.000				
FFBA - H092 11/04/18 09:19	599.244	0.006	X	221.538	0.003	8	2.0		Fixed
			Y	-516.123	0.002				
			Z	208.879	0.002				
FFBA - H084 11/04/18 08:04	140.364	0.003	X	-24.978	0.002	9	1.6		Fixed
			Y	136.996	0.001				
			Z	17.613	0.000				
FFBA - J092 11/04/18 13:28	12008.933	0.059	X	-1656.111	0.024	8	2.0	No	Fixed
			Y	-8565.198	0.024				
			Z	-8252.826	0.024				
FFBA - H083 11/04/18 07:56	188.391	0.004	X	-42.995	0.002	9	1.6		Fixed
			Y	183.400	0.002				
			Z	2.624	0.000				
FFBA - H086 11/04/18 08:20	91.878	0.003	X	42.404	0.002	9	1.6		Fixed
			Y	-46.007	0.001				
			Z	67.281	0.001				
FFBA - H094 11/04/18 09:44	440.267	0.005	X	149.421	0.003	9	1.8		Fixed
			Y	-398.067	0.002				
			Z	114.241	0.002				
FFBA - J081 11/04/18 08:21	75.209	0.003	X	32.141	0.002	9	1.6		Fixed
			Y	-54.848	0.001				
			Z	40.187	0.001				
FFBA - H090	393.484	0.003	X	152.788	0.002	8	2.2		Fixed

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11/04/18 08:57			Y	-325.357	0.001				
			Z	160.089	0.001				
FFBA - J086 11/04/18 09:08	513.691	0.005	X	186.882	0.002	8	2.2		Fixed
			Y	-447.405	0.002				
			Z	169.655	0.002				
FFBA - J080 11/04/18 08:13	37.148	0.003	X	-3.144	0.001	9	1.6		Fixed
			Y	35.382	0.001				
			Z	10.872	0.000				
FFBA - J085 11/04/18 08:57	394.240	0.003	X	145.938	0.002	8	2.2		Fixed
			Y	-339.530	0.001				
			Z	137.283	0.001				
FFBA - H097 11/04/18 12:59	11970.750	0.058	X	-1635.393	0.024	8	1.9	No	Fixed
			Y	-8561.064	0.024				
			Z	-8205.639	0.023				
FFBA - H098 11/04/18 13:29	12149.222	0.060	X	-1657.698	0.024	9	1.7	No	Fixed
			Y	-8691.651	0.024				
			Z	-8325.313	0.024				
FFBA - J084 11/04/18 08:48	309.546	0.005	X	118.073	0.002	9	1.6		Fixed
			Y	-260.359	0.001				
			Z	118.704	0.002				
FFBA - J078 11/04/18 07:58	179.689	0.003	X	-53.031	0.002	9	1.6		Fixed
			Y	169.569	0.001				
			Z	-26.872	0.000				
FFBA - J079 11/04/18 08:05	131.067	0.004	X	-35.940	0.002	9	1.6		Fixed
			Y	125.405	0.001				
			Z	-12.674	0.001				
FFBA - J088 11/04/18 09:32	696.214	0.005	X	248.289	0.003	9	1.7		Fixed
			Y	-613.708	0.002				
			Z	215.474	0.002				
FFBA - J083 11/04/18 08:40	240.925	0.003	X	90.661	0.002	9	1.6		Fixed
			Y	-204.992	0.001				
			Z	88.337	0.000				
FFBA - J082 11/04/18 08:29	179.121	0.003	X	70.727	0.002	9	1.6		Fixed
			Y	-145.936	0.001				
			Z	76.057	0.000				
FFBA - H095 11/04/18 10:00	4.883	0.003	X	-2.653	0.002	9	2.1		Fixed
			Y	4.012	0.001				
			Z	-0.840	0.000				
FFBA - J087 11/04/18 09:20	587.049	0.004	X	211.633	0.002	8	2.0		Fixed
			Y	-514.237	0.002				
			Z	188.145	0.001				
FFBA - H091 11/04/18 09:08	504.751	0.004	X	190.340	0.002	8	2.2		Fixed
			Y	-428.204	0.002				
			Z	187.578	0.001				
FFBA - H087 11/04/18 08:29	183.989	0.003	X	76.688	0.001	9	1.6		Fixed
			Y	-139.236	0.001				
			Z	92.651	0.000				
FFBA - J090 11/04/18 11:48	4613.709	0.024	X	1227.633	0.010	8	2.4		Fixed
			Y	-4436.355	0.009				
			Z	313.020	0.010				
FFBA - H088 11/04/18 08:38	246.591	0.003	X	100.214	0.002	9	1.6		Fixed
			Y	-193.479	0.001				
			Z	115.456	0.000				



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FFBA - J089 11/04/18 09:56	28.541	0.003	X Y Z	-12.652 14.198 -21.283	0.002 0.001 0.001	9 2.0	Fixed
FFBA - H089 11/04/18 08:48	341.654	0.004	X Y Z	146.691 -242.282 191.073	0.002 0.002 0.001	9 1.6	Fixed
FFBA - H093 11/04/18 09:30	709.143	0.005	X Y Z	260.162 -614.012 241.222	0.003 0.002 0.001	9 1.7	Fixed
FFBA - J091 11/04/18 12:54	11920.659	0.058	X Y Z	-1642.118 -8505.128 -8189.528	0.024 0.024 0.023	9 1.6	<b>No</b> Fixed
J092 - H098 11/04/18 13:29	145.768	0.001	X Y Z	-1.594 -126.457 -72.486	0.001 0.001 0.000	8 2.0	Fixed
J091 - H097 11/04/18 12:59	58.595	0.001	X Y Z	6.719 -55.934 -16.111	0.001 0.000 0.000	8 1.9	Fixed
J090 - H096 11/04/18 11:54	80.366	0.003	X Y Z	-10.650 77.567 18.130	0.001 0.001 0.001	8 2.4	Fixed
J088 - H093 11/04/18 09:32	28.356	0.005	X Y Z	11.884 -0.304 25.743	0.003 0.001 0.001	9 1.7	Fixed
J087 - H092 11/04/18 09:20	23.055	0.004	X Y Z	9.904 -1.887 20.734	0.002 0.001 0.001	8 2.0	Fixed
J086 - H091 11/04/18 09:08	26.493	0.003	X Y Z	3.456 19.201 17.923	0.002 0.001 0.001	8 2.2	Fixed
J084 - H089 11/04/18 08:48	79.894	0.004	X Y Z	28.618 18.077 72.369	0.002 0.001 0.002	9 1.6	Fixed
J083 - H088 11/04/18 08:40	30.971	0.005	X Y Z	9.555 11.513 27.117	0.003 0.002 0.000	9 1.6	Fixed
J080 - H085 11/04/18 08:13	36.103	0.003	X Y Z	12.054 10.640 32.325	0.002 0.001 0.000	9 1.6	Fixed
J078 - H083 11/04/18 07:58	34.088	0.002	X Y Z	10.038 13.832 29.494	0.001 0.001 0.000	9 1.6	Fixed
H090 - J085 11/04/18 08:57	27.711	0.002	X Y Z	-6.850 -14.174 -22.806	0.001 0.001 0.000	8 2.2	Fixed
H087 - J082 11/04/18 08:29	18.862	0.002	X Y Z	-5.961 -6.700 -16.594	0.001 0.001 0.000	9 1.6	Fixed
H086 - J081 11/04/18 08:21	30.292	0.003	X Y Z	-10.261 -8.841 -27.095	0.002 0.001 0.000	9 1.6	Fixed
H084 - J079 11/04/18 08:05	34.231	0.004	X Y Z	-10.963 -11.592 -30.286	0.002 0.002 0.000	9 1.6	Fixed