

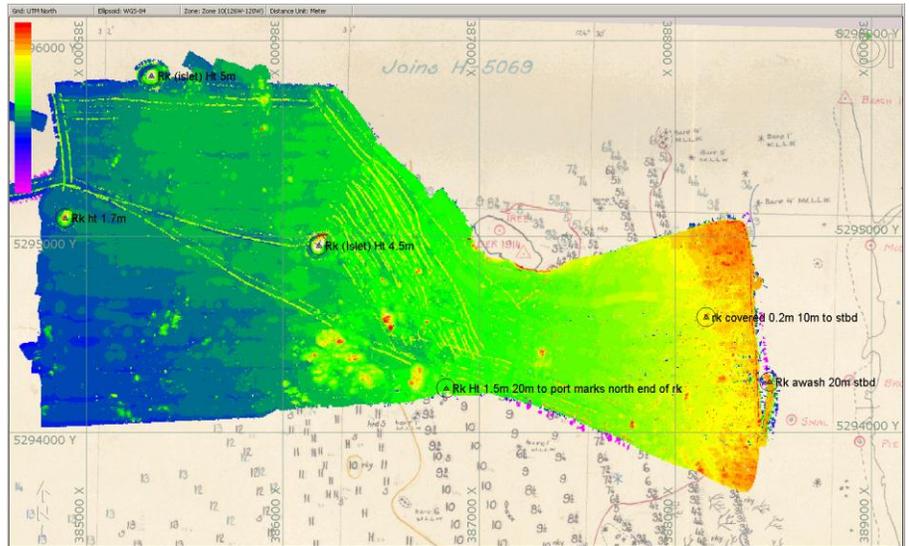
# Mosquito Creek Investigation

## Feature Report

The following 6 rocks/islets/reefs were positioned using HYPACK. The following image shows the raw positions of the items in relation to the survey area.

Heights were corrected to MLLW based on preliminary tides from La Push tide gauge and zone correctors of -6 minutes for time and a range corrector of 0.99.

In the case of item 4, 5, and 6 the final positions were computed using the NGS software "Forward". The position was derived from the position of the survey vessel, an estimated distance, and azimuth, computations attached.



- 1) Rock, Ht 2.2m , 47°47'56.025"N 124°32'13.776"W

A rock with a height of 1.7m was observed at 18:49:40 01/17/2013 GMT. A survey line was run encircling the rock at approximately 30m distance off the rock. A HYPACK target was taken at the center of the circle and the following picture taken.



- 2) Islet, Ht 5.6m, 47°48'19.763"N 124°31'53.433"W

An Islet with a height of 5m was observed at 19:41:39 01/17/2013 GMT. A survey line was run encircling the rock at approximately 30 m distance off the rock. A HYPACK target was taken at the center of the circle and the following picture taken.



- 3) Islet, Ht 5.4m , 47°47'52.311"N 124°31'11.591"W

An Islet with a height of 4.5m was observed at 20:43:33 01/17/2013 GMT. A survey line was run encircling the rock at approximately 30 m distance off the rock. A HYPACK target was taken at the center of the circle and the following picture taken.



- 4) Rock, Ht 1.4m , 47°47'31.193"N 124°29'19.556"W

A rock awash was observed at 21:51:35 01/17/2013 GMT. The rock was 20m to starboard (east) while running a survey line in a northerly direction and the following picture was taken. The position was derived from the position of the survey vessel and an estimated



- 5) Reef, HT 2.2, 47°47'28.450"N 124°30'39.619"W

The north end of a reef oriented in a NE-SW direction and a height of 1.5m was observed at 18:11:42 01/18/2013 GMT. The reef was 20m to port (south) while running a survey line in a westerly direction and the following picture was taken.



- 6) Rock, Ht 1.1m , 47°47'41.728"N 124°29'36.383"W

A rock covered approximately 0.2m was observed at 23:01:42 01/18/2013 GMT. The rock was 10m to starboard (north) while running a survey line in a westerly direction. No picture was taken.

## NGS FORWARD COMPUTATIONS

Item 4

Ellipsoid : GRS80 / WGS84 (NAD83)

Equatorial axis,  $a = 6378137.0000$

Polar axis,  $b = 6356752.3141$

Inverse flattening,  $1/f = 298.25722210088$

First Station : R/V TATOOSH

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LAT = 47 47 31.19300 North

LON = 124 29 20.51700 West

Second Station : Item 4 - Rock

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LAT = 47 47 31.19300 North

LON = 124 29 19.55604 West

Forward azimuth    FAZ = 90 0 0.0000 From North

Back azimuth        BAZ = 270 0 0.7118 From North

Ellipsoidal distance    S =    20.0000 m

ITEM 5

Ellipsoid : GRS80 / WGS84 (NAD83)

Equatorial axis,  $a = 6378137.0000$

Polar axis,  $b = 6356752.3141$

Inverse flattening,  $1/f = 298.25722210088$

First Station : R/V TATOOSH

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LAT = 47 47 29.09800 North

LON = 124 30 39.61900 West

Second Station : Item 5 - Reef

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LAT = 47 47 28.45044 North

LON = 124 30 39.61900 West

Forward azimuth    FAZ = 180 0 0.0000 From North

Back azimuth        BAZ = 0 0 0.0000 From North

Ellipsoidal distance    S =    20.0000 m

ITEM 6

Ellipsoid : GRS80 / WGS84 (NAD83)

Equatorial axis,  $a = 6378137.0000$

Polar axis,  $b = 6356752.3141$

Inverse flattening,  $1/f = 298.25722210088$

First Station : R/V TATOOSH

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LAT = 47 47 41.72800 North

LON = 124 29 36.38300 West

Second Station : Item 6 - Rock

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LAT = 47 47 42.05178 North

LON = 124 29 36.38300 West

Forward azimuth    FAZ = 0 0 0.0000 From North

Back azimuth        BAZ = 180 0 0.0000 From North

Ellipsoidal distance    S =    10.0000 m