GPS FUNDAMENTALS

Training on the Pacific Islands Protected Area Portal (PIPAP) and Geographic Information Systems (GIS) for improved protected area planning and management in Vanuatu

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IUCN

GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS)

- Series of 18-30 satellites that transmits time and location data through radio waves to a receiver
 - GPS (USA), GLONASS (Russian), Galileo (EU), Navic (India), BeiDou (China)
- At least 4 satellites required for geolocation
 - 3 possible if at sea level
- Currently, 24 satellites in operation for GPS
- Receiver picks up signal
 - More satellites = less error
 - Garmin units +/- 3 meters
 - Units with high receiver +/- few centimeters













Garmin GPS +/- 3 meters



Time

X

Y

- Error from bounce of trees, other structures, bad angles from satellites
- Star = Actual Location (100, 100)
- Red Circle = uncertainty +/- 3 meters
- Purple X's = GPS recording

Time	x	Y
10:00:14	97.2	99.9

- Error from bounce of trees, other structures, bad angles from satellites
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Time	X	Y
10:00:14	97.2	99.9
10:00:15	100.8	97.4

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Time	x	Y
10:00:14	97.2	99.9
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10:00:16	97.5	98.5

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10:00:19	105.0	105.0

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122	10:00:17	100.3	100.2
and the second	10:00:18	100.0	101.5
	10:00:19	105.0	105.0
	10:00:20	99.0	101.5

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10:00:18	100.0	101.5
10:00:19	105.0	105.0
10:00:20	99.0	101.5
10:00:21	99.5	99.5

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10:00:20	99.0	101.5
10:00:21	99.5	99.5
10:00:22	100.0	99.5

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10:00:21	99.5	99.5
10:00:22	100.0	99.5

HOW DO WE KNOW WHICH OF THESE IS THE CLOSEST?

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WE DON'T KNOW

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Average	101.4	100.3

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Average	101.4	100.3

THE LONGER WE LET THE GPS AVERAGE POINTS, THE MORE POINTS ARE AVERAGED AND THE MORE POINTS WE AVERAGE THE LESS CHANCE OF ERROR!!!!

TODAY'S ASSIGNMENT

- Collect GPS data for the boundaries of a protected area
- Record the GPS Coordinates from first point and then the averaged coordinates
- Log the averaged point as waypoints
- Name the waypoints after your first name
- Enter in the coordinates into a table
- Use Basecamp to export GPX file
- Import GPX file in QGIS
- Add the table coordinates into QGIS and turn them into points
- From the points, we are going to connect the points to draw a polygon
- Make a map of the protected area boundary
- Enter in the metadata for the new polygon shapefile





First We Need to set the Coordinate System

Acquiring Satellites

Click Menu button Then Select Setup Then Enter

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Select Units And Click Enter

GPSmap 60CSx

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Set Coordinate System Position Format: UTM UPS Map Datum: WGS 84 Click Enter

Position Forma UTM UPS Map Datum WGS 84 Distance/Speed Metric Elevation (Vent Meters (m/r	Speed) nin)		
Depth Meters Temperature Celsius Pressure Millibars	RMIN		
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To Collect a Waypoint: Click MARK





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Use the Directional Pad to go to the Name and Click ENTER to change name



Use the Directional Pad to go to the Note and Click ENTER to add notes

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Coordinates WITHOUT Averaging Write the Name of Waypoint And Unaveraged Coordinates down

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GPSmap 62s

Proximity Alarms Track Manager Share Wirelessly Share Wirelessly Waypoint Active Route Sight 'N Go

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For 62s: To Average a Waypoint: Click MENU Use directional pad To find Waypoint Averaging Click ENTER

OUT



Corrections of the constraint of the constraint

When Sample Confidence is 100%, Write down updated coordinates Use directional Pad to select Save MARK Click ENTER To AVERAGE, use directional pad to go to AVG And click ENTR



Wait for measurement count to get to 40 and observe estimated accuracy when at 40 click Save



Coordinates will be updated with averaged coordinates Write down the coordiantes Click OK to save waypoint

GPSmap 60CSx

17-FEB-20 9:10:18PM

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Map

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