

# C-Nav GcGPS

Globally Corrected GPS

Distributed by C & C Technologies

- Globally corrected GPS is a technique used to improve the accuracy and stability of the Global Positioning System (GPS).
- The technique was developed by the Jet Propulsion Laboratory for NASA due to the requirement for decimeter accuracy in outer space.
- To accomplish this, a totally new concept of DGPS had to be developed.

# Conventional DGPS

- Conventional DGPS relies on the concept that positional errors recorded in one location is same for all locations within a local area.
- A reference station computes orbit and clock corrections and those corrections are broadcast to the user.
- .Accuracy is degraded as you travel farther away from the reference station.

# Globally Corrected GPS

- Starts with a global network of reference sites strategically positioned around the world. Each site is equipped with high-quality dual-frequency GPS receivers
- Each reference site tracks the entire constellation of GPS satellites in view and sends raw GPS data to two independent network processing hubs (NPH) real-time
- NPHs receive the raw data then calculate orbit and clock correctors for every healthy satellite in the constellation.
- Corrections are broadcast over the INMARSAT communication satellites resulting in a differential correction message valid anywhere in the world.

# System Components

- Receiver: high-quality, dual frequency with dual freq. smoothing to allow refraction-corrected measurements.
- Antenna: tri-band able to receive L1 & L2 GPS frequencies and the Inmarsat L-band frequencies (1525-1565MHz)
- These two items are combined in a single unit about the size of an inflated basketball with a control unit that is mounted as far as 400 ft away via RS232

# Installation

- Mounted antenna on mast.
- Ran one cable down to bridge.
- Mounted control panel.
- Connected serial output to navigation computer
- All told, about 2 hrs we were ready to turn the unit on.







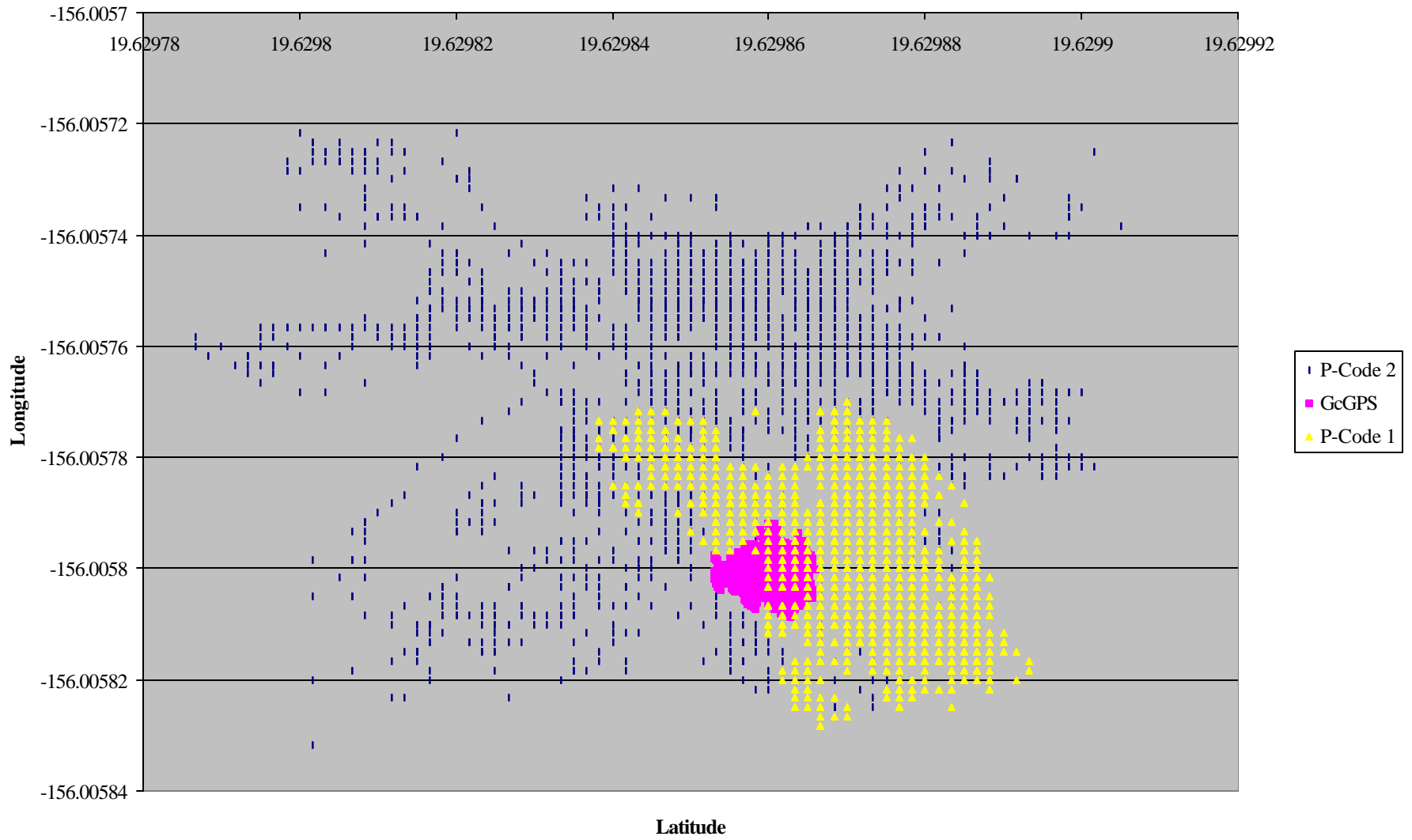


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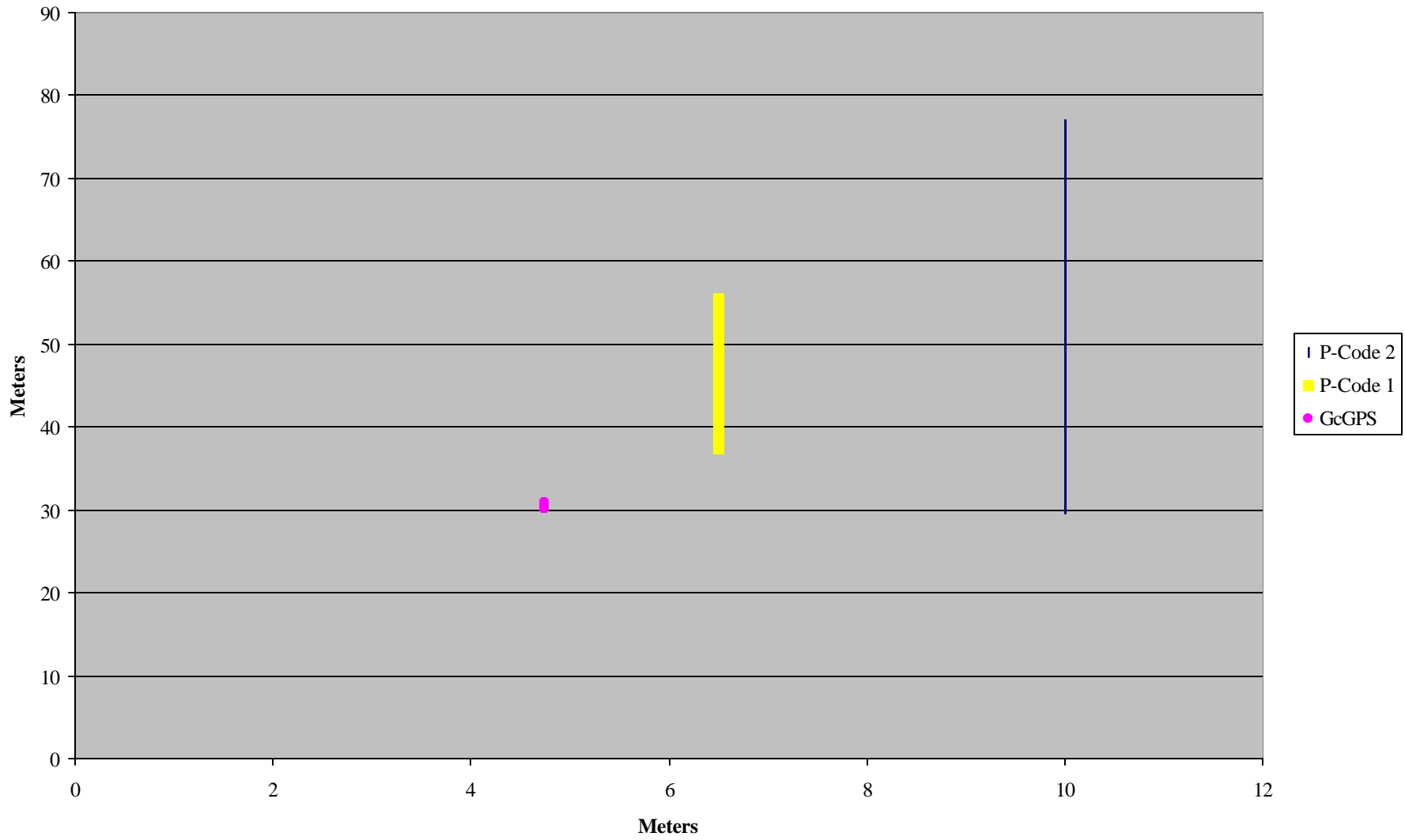




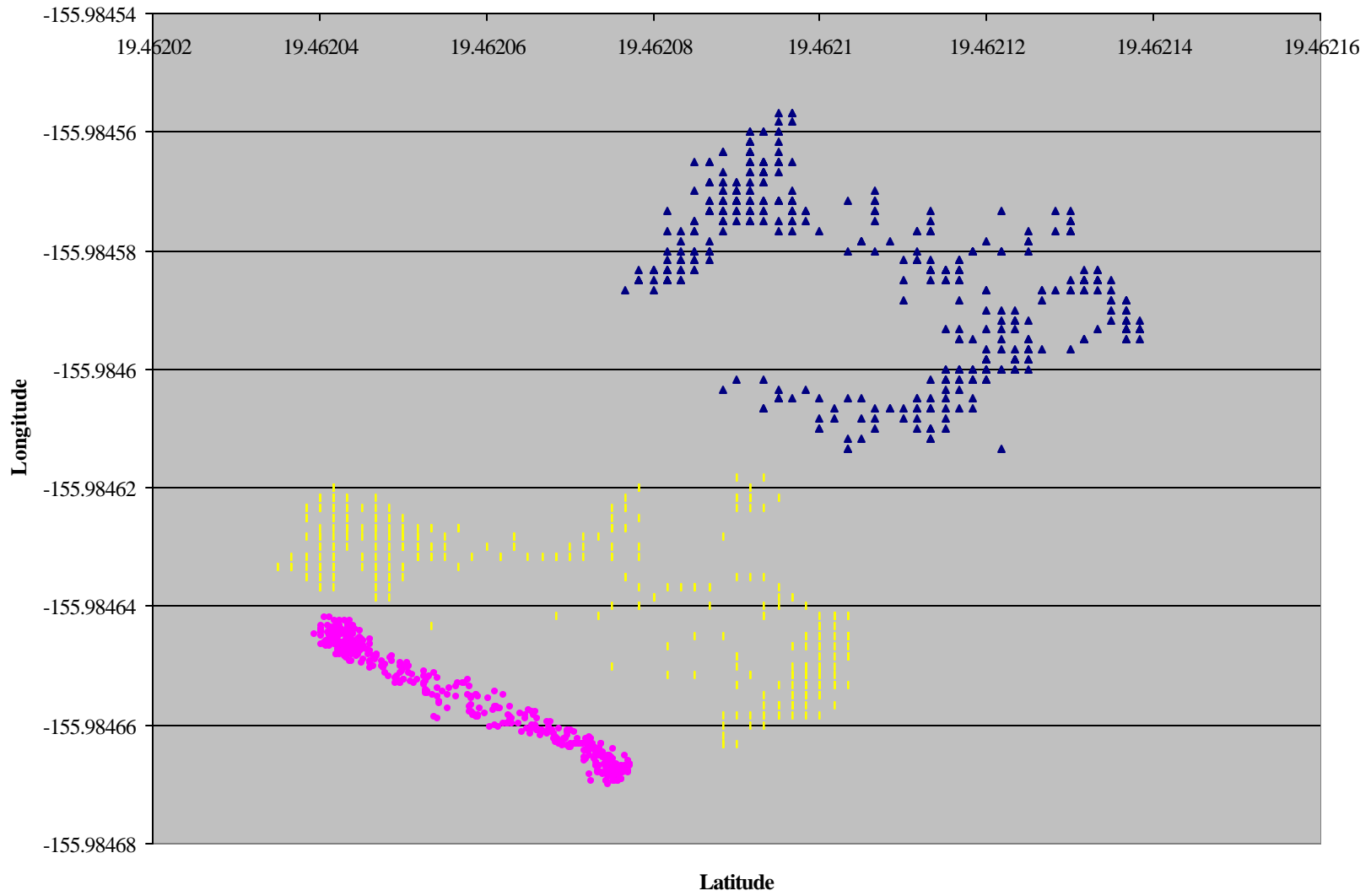
# GPS Comparison



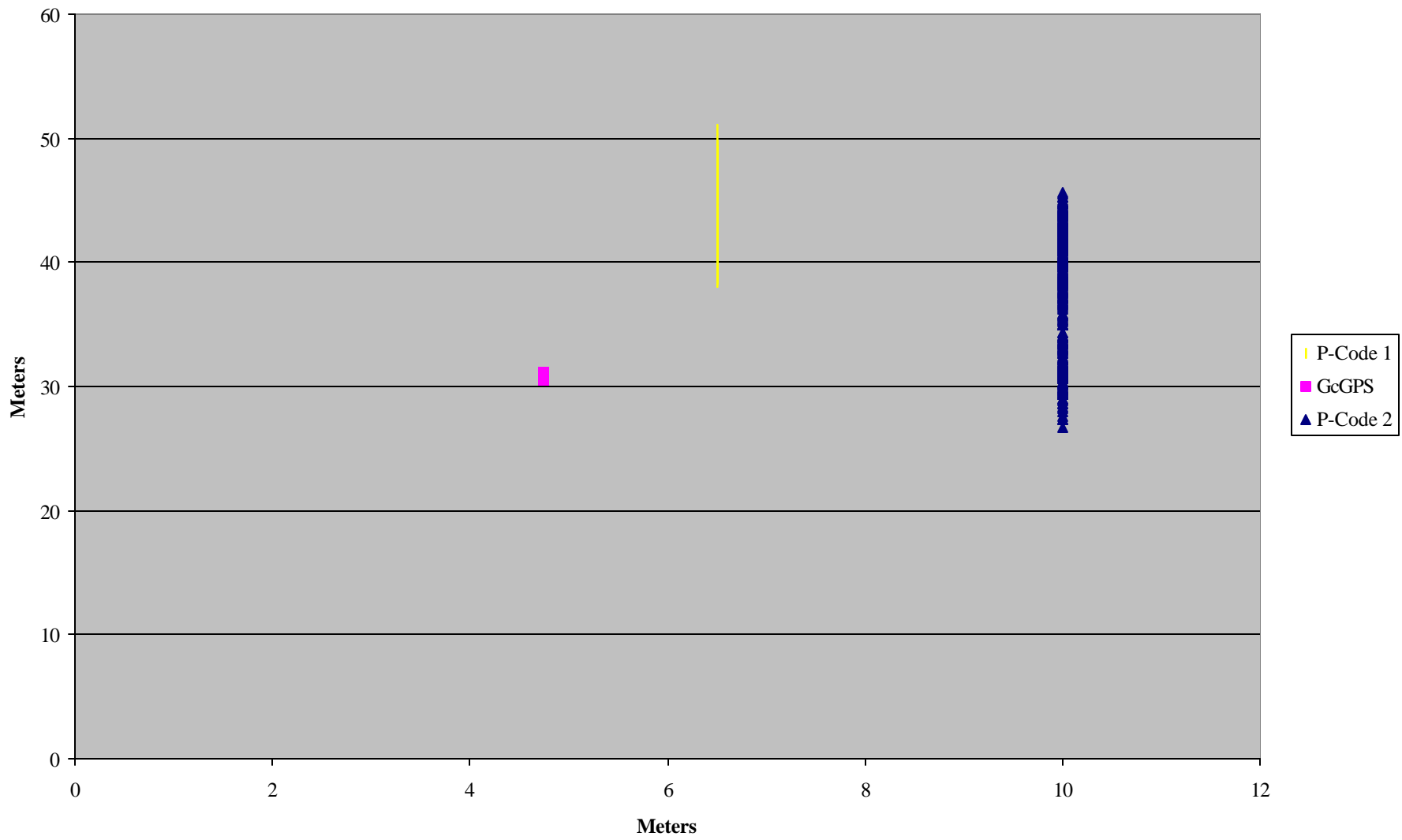
### GPS Altitude Comparison



# GPS Comparison



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# Comments

## Globally Corrected GPS use on R/V Thompson TN-151

I started using the GC-GPS positions into our DSL navigation system when we left San Diego. The GGA string is standard and our nav system had no problems with the string.

I noticed improvements in two areas: DPing and surveying transponders.

Dynamic positioning from the DSL van was much better because there was no jumping around as satellites dropped in or dropped out. The HDOP ceased to be a concern. Medea has not been pulled out of position due to GPS drift.

GC-GPS was used to survey three transponders. The results were very good with an rms error less than half what I expected on all three surveys (.24 .23 .29).

Plotted 1 second fixes for 36 hours at the Honolulu dock. All fixes were in a 1 meter circle. The ship moved a little with the tide.

The consistency of the GC-GPS positions improves layback calculations for towed vehicles when operating outside of acoustic navigation nets.

Tom Crook

# From the Captain

during our brief port stop at kailua-kona roads we kept the vessel in dp rather than anchor due to the short time frame. the ship had never held position so quietly in such a tight radius. we changed heading to match the changing current and i never heard any motor ramp up or saw the position more than 1 meter off in either the x or y axis. i feel the c-nav gps is worth keeping.

glenn



# For More Information

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