

Dear Sir,

I read with interest the article **ELLIPSOIDAL HEIGHTS: THE FUTURE OF VERTICAL GEODETIC CONTROL** by G. Steinberg and H. Papo published in the GPS Forum of your February issue. I am not sure that I have fully understood all the ideas contained in the paper, apart from the authors' understandable transfixation on GPS as the answer to all fair maidens' prayers, but I have certainly tried. I confess to being particularly intrigued by something called *orthometric islands* - islands, where remnants of common sense survive? Imagine my surprise when discovering that the *orthometric islands* were "synonymous to chart datums" described in a report (which I co-authored) cited in the paper. What's going on?

Seriously now: I am not sure what is it that the authors try to advocate. Do they want height users to switch to *ellipsoidal heights* - I prefer the term *geodetic heights* as the term ellipsoidal heights, introduced to geodesy by our space brethren, implies the non sequitur (by analogy with the standard terminology of geoidal heights) "heights of the ellipsoid above the ellipsoid" - in their everyday practice? Are they trying to tell us that a piece of a shoreline with heights varying from -48.38 to -51.12 metres is perfectly all right to an engineer trying to come up with a plan for new port facilities in his area of interest? Are the authors playing with the idea that an aqueduct can be adequately designed using heights which have no bearing on physical reality and which, consequently, cannot tell the designer which way is *up* and which way is *down*? (Yes, I know that even orthometric heights may not be a good enough instrument to use under these circumstances! Contrary to the authors' belief, even orthometric heights are **not** "physically meaningful".) Do the authors feel that it is preferable to cater to GPS

operators by adopting a system of heights that is a bit more directly connected to the 3-dimensional Cartesian coordinate differences that come out of the GPS machinery, rather than to the public, lay or technical, whose idea of heights is invariably related to *mean sea level* ? I suspect that the authors have more sense than advising the national agencies to issue the numbers (heights) in the geodetic system, i.e., as geodetic heights.

As the authors cite our report for the Canadian Hydrographic Service, they may have hopefully thought of the approach we have recommended in the report? Our idea was to use *geodetic heights* for **storing** heights in a data base. We never envisaged disseminating these heights to users. As a matter of fact we have explicitly warned against such practice as being potentially dangerous: the wrong kind of heights in the hands of the uninitiated can be very easily misinterpreted. *Orthometric heights* can be obtained from *geodetic heights* very simply by subtracting the *geoidal heights* evaluated from an available geoid model; the same goes for height differences. It is thus a simple matter to supply the technical and lay public with orthometric heights (height differences) using 1) the stored geodetic heights, and 2) the most accurate available geoid model. This scheme would allow the national (and other) agencies to store the allegedly most accurate information, the geodetic heights, in an unadulterated form while offering to the user the most accurate orthometric heights at any given time. Clearly, this scheme does not preclude the GPS height providers to obtain also the geodetic heights in their area of interest, if they so desire.

Our scheme is not a big deal for either geodesists or for the height users. It is a matter of implementation for the agencies that deal with the storage and

dissemination of height data. Is this what the authors had in mind when writing about “orthometric islands”? I hope it is, but I sure did not get it from the paper.

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