"Crow's Nest" Observations

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I am using the term "Crow's Nest" metaphorically because it helps conveys a message. Several points are:

1. I am relying on the Wikipedia explanation of the term – some things on the internet are useful.
2. I have never used or occupied a real crow's nest.
3. You could say it permits me to "call it as I see it" while acknowledging imperfect insight.

According to Wikipedia, "A crow's nest is a structure in the upper part of the mast of a ship or a structure that is used as a lookout point." The entry goes on to claim, "Since the crow's nest is a point away from the ship's center of mass, rotational movement of the ship is amplified and could lead to severe seasickness, even in accustomed sailors. Therefore, being sent to the crow's nest was also considered punishment." I have not yet figured out how the punishment part supports my analogy.

Many readers are aware of the perspective that I bring to these Benchmark articles. If you are not, I've been a licensed surveyor since 1974 and a licensed engineer since 1979. I have a fierce loyalty to both professions (the overlap is significant) and consider geometry, computations, computers, and GPS as my hobby. I've enjoyed teaching surveying in a college classroom for more than 25 years and am indebted to many students for prodding my curiosity. Even though I retired in 2010, I'm still in the learning mode and enjoy sharing application insights. Is this a sales pitch for the 2nd Edition of my book? Well, yes.

When referring to the crow's nest analogy, I'll admit that part of my perspective was formed during my participation on a high-voltage powerline construction project in the mid-1970s.

http://www.globalcogo.com/CU-Map.pdf

I was part of a much larger team but, I was also the licensed project surveyor in Minnesota and North Dakota. As such, I was responsible for technical issues and for supervising crews for the duration. The surveying portion of the project was completed in August 1978. From there, I went to graduate school at Purdue University.

Landowner resistance was a challenging part of the powerline project. I learned some valuable lessons about the essential role of the surveying profession. Without belaboring the point, I was expected to contribute as a responsible professional in administrative issues while upholding the integrity of the technical activities of the crews I supervised. As an example of the challenges involved, the project garnered coverage in the February 1978 issue of Time magazine.

http://www.globalcogo.com/CU-TimeMag.pdf

I was the surveyor in charge and what the Time article does not say is that approximately half of the entire force of Minnesota State Police was assigned to our project for about 3 months. Supervising 3-4 survey crews in various locations on the project was tough but coordinating logistics with state troopers and telling them what needed to be done will age anyone prematurely. Casper and Wellstone wrote a 300-page book, "Powerline," not sympathetic to surveyors, describing that project from the political and sociological perspectives. Find the book with a Google search. Yes, teaching is much more fun than being a "hockey puck" between farmers and state troopers. But, the word from the crow's nest is that surveyors

are essential in many aspects of development and that surveyors often find themselves on the front lines representing values of "the system" irrespective of personal convictions.

Since retiring, my crow's nest perspective continues to evolve. Given my hobbies and evolution of 3-D concepts for geospatial data during my teaching career, I can't help but continue to promote the role of the surveyor in the digital revolution. The sheer number of people who use spatial data is staggering. Most people acquire a traditional view of spatial data from the "flat-Earth" perspective. That is laudable for the masses, but surveyors are the measuring, mapping, and cadastral professionals and we have the opportunity (even obligation) to be leaders in responsible efficient use of 3-D digital geospatial data. If, heaven forbid, "traditional surveying" dies, the 3-D geospatial "phoenix" will flourish and provide many opportunities for gainful careers! Yes, I am enormously encouraged by rejuvenation of the NMSU Surveying Program.

A relevant example - the American Society of Civil Engineers (ASCE) develops a report card on the status of infrastructure in the United States covering areas such as energy, transportation, water, and others. The ASCE report card does not cover the "spatial data infrastructure." A separate report card on the U.S. National Spatial Data Infrastructure was developed by the Coalition of Geospatial Organizations (COGO) and published in February 2015. COGO consists of twelve different geospatial organizations representing approximately 170,000 professionals nationwide and reviews policies related to generation and use of geospatial data. No policy statement or recommendation is published by COGO without unanimous concurrence of all member organizations.

ASCE Report Card 2017: https://www.infrastructurereportcard.org/
COGO Report Card 2015: (see www.globalcogo.com/A500.pdf for access to 2015 report card.)

The ASCE report card is issued every four years, the last one being in 2017. The COGO report card on the National Spatial Data Infrastructure was published in 2015 and a second update report card is being prepared for publication in 2019. As a member of ASCE and as an ardent supporter of the initial COGO report card, I've had the opportunity to review and offer editorial comment on a draft of the 2nd COGO report card. The update contains over 100 pages, is quite comprehensive, and contains a lot of excellent information. Since spatial and geospatial data are fundamental to nearly every phase of surveying, it behooves all surveying professionals to pay close attention to that report card when it becomes available.

Another issue visible from the crow's nest concerns ambiguity in the definition of horizontal distance.

http://www.globalcogo.com/HD-Options.pdf

The article really has little to offer those who operate successfully under flat-Earth assumptions – that would generally include transit/tape surveying. However, the advent of electronic distance measuring instruments (EDMI) enabled the surveyor to push the limit of flat-Earth assumptions when "long" distances were part of the survey. Even with EDMI many surveyors continued to operate successfully under flat-Earth assumptions. But, when working with GPS survey data, the limit of flat-Earth assumptions needs to be understood and addressed. GPS surveying and using the global spatial data model (GSDM) makes it possible to obtain ridiculous results "at the push of a button."

The article explores the limit of flat-Earth assumptions when defining horizontal distance and provides a chart, Figure 6, showing that the right-triangle component of a slope distance (flat-Earth) can be safely used (within about 1:50,000) for distances less than 2 km and a vertical angle of about 4 degrees or less. The chart includes distances up to 5 km and vertical angles up to 12 degrees.