As I reflect on my career of more than thirty years in the field of cartography, it is difficult to grasp the degree of change technology has brought to the business of mapping and charting and to those who benefit from it. For most of the twentieth century, change came incrementally. The plane-table, used at the time of the first survey of the US coast in 1834, served as a primary instrument in map compilation, until the introduction of film-based aerial photogrammetry in the 1920s. Similarly, film photography underpinned map production, until it was eventually supplanted by new technologies made possible by the digital revolution. It took the advent of the personal computer and the full availability of GPS in the 1990s to accelerate change to the pace we have become accustomed to, with byproducts of the digital revolution in the form of new instruments, sensors, and software being introduced on a continuing basis. Cartography—"as much an art as a science at the start of my career"—has been entirely transformed. To recall the way things were, at least from my perspective, is to understand how far technology has taken us.

In the early 1980s, the process for revising a nautical chart involved enlarging a 9 inch x 9 inch aerial photograph to the scale of a black mylar copy of the chart. The enlarged print was placed behind the mylar copy and changes were carefully made to the back side of the mylar with a knife blade and inked with a red 0.13mm Rapidograph pen. Each cartographer was responsible for maintaining and cleaning his pens.

The analog stereoplotter, which had been in use for many years, was helpful, however, it could still take an hour or more to set up a stereo model based on the angles of the aircraft at the time the photograph was taken. An analog stereoplotter involved the use of punch cards, adjusting of knobs, turning a thumb wheel and pressing a foot pedal to generate and compile a base map sheet. Again, Rapidograph pens were used to trace the plotted information onto a new mylar map sheet, and stick-up type was added by hand to the map sheet. It was art mixed with science. Things changed for the better, in a relative sense, with analytical stereoplotters, which incorporated computer-driven hardware and software, considerably reducing the time to set and reset a stereo model.

Establishing photographic control was also challenging in the era before GPS. It required researching and physically locating survey marks on the ground. In areas where survey marks were not available, such as the Louisiana marshes, a Transit Satellite System receiver was used to provide horizontal control for a photo panel. The introduction of airborne kinematic GPS in the late 1980s and early 1990s brought many welcomed changes to the process of establishing control.

It was in the early 1980s that an effervescent Canadian drew my attention to the notion of an 'electronic' chart which, at the time, seemed implausible to me. Later, with GPS as its driving technology, electronic charting steadily evolved as a tool for navigation, first in conjunction with the paper chart, and eventually as a stand-alone technology for use by the largest class of seagoing vessels. As a one-time navigator who laboured hard to plot a ship position that was usually three minutes old by the time it reached the paper chart, the arrival of the electronic chart was cause for great celebration.

Fast forward to today; the relentless advances in computerisation, miniaturisation, and software technologies have not only changed the way maps and charts are produced, but also the way they are used. New acquisition and image-processing technologies have created opportunities to leverage data once collected and compiled exclusively for the safety of navigation and apply it for wide-ranging purposes. For example, emergency responders are using hand-held devices to download near real-time shoreline and land cover data that can help in disaster recovery planning. Similarly, oil spills are being tracked and monitored with aerial images enhanced by sophisticated data-filtering applications. Moreover, these and other technology-driven applications have changed the way society views maps and charts and, in a broader sense, inspired renewed appreciation for geography as the integrative discipline it has always been. Clearly, change is good!