

**Jinny Nathans:** This is Jinny Nathans, AMS archivist, and I am talking to Todd Glickman, former editor of the Glossary Second Edition, at the annual meeting, January 8th, 2019 in Phoenix, Arizona. Todd, let's talk about public-private partnerships and the origins of that.

**Todd Glickman:** I'd be delighted to do so, thanks for having me. It's widely recognized that the private sector meteorology got a big boost right after World War II when meteorologists no longer had the US government to support, those both in the government and those who were outside of the government. And there was also the recognition of the need of providing weather-related services to commerce, and consulting was a very big part of that for quite a long time, much less so in terms of businesses, companies that were focused on providing weather services. There had been a few, AccuWeather was one of the early ones, there were a number of private weather forecasting firms such as Weather Services Corporation in Bedford, Massachusetts, which I started working for as a radio broadcaster in the late 1970s. They'd been around for a number of decades at that time as well. But these companies were typically providing forecasting and consulting services to help others use weather information in their operations, whether it be agriculture, utilities, transportation, so forth and so on. During the latter part of the 1970s, the ability to use computers, mainframe computers, such as the PDP-8, PDP-11, PDP-10 to process weather information and transform it into value-added products started to take off.

A number of individuals at about the same time had the idea that it would be a great business opportunity to take raw weather information, turn it into value-added products, and market those products to various industries. And those products would help others do forecasting, would help others support weather related operations, as opposed to just providing the end results.

The one that I'm most familiar with is WSI Corporation, which was founded essentially as a spinoff from Weather Services Corporation in 1979, and I was one of the first employees of the company, having just graduated from MIT. The mission of that company was to take National Weather Service raw information, textual information from what back in those days was known as Service A, Service C, the Rawork[sp?], and also analog radar data, and process it into information that could be used by other meteorologists to derive their services, to give them just what they needed to do their jobs. There were a couple of other companies that were starting to do the same thing, AccuWeather was, Kavouras, Ocean Routes, perhaps Alden Corporation, mostly based in the United States.

One of the important requirements of being able to do this was to get at the raw information, what we would then call the high-speed weather feeds, even though they weren't very high-speed by today's standards by any means, from the National Weather Service. There were some in the government and others who thought that the data belonged to the government and should be sold to the private sector at fair market value, because the private sector was then going to be itself making a profit with those data. There were others who thought, and it turns out fortunately, and rightfully so, that those data were already in the public domain and that it would be in the best interest of the government to make those data available freely and easily for the incremental cost of making them available. There were number of individuals in the National Weather Service and NOAA who supported that idea, Bob Carnahan who was a director of external relations in the National Weather Service of followed by a gentleman named Ed Gross, Dick Hallgren, who at the time was the director the National Weather Service subsequently he

became the Executive Director of the American Meteorological Society, and others worked with their colleagues in the National Weather Service, NOAA, Department of Commerce and with us in the private sector to figure out how to do that. Roughly 1980 time frame, the government came up with the concept called the Family of Services. The Family of Services was a set of then high-speed data feeds that took almost all the raw alphanumeric weather information from the National Weather Service and made it available to the private sector for a relatively small licensing fee, as well as the incremental cost of making those data available, essentially to support what it cost the National Weather Service to do that. There was some computing power, some communications cost, some personal cost and so on, but it turns out that those costs which were shared amongst the private sector were relatively small enough that it made for a viable business opportunity, and so WSI and its competitors in the field at the time were able to start in that business.

Not long thereafter, in the early 1980s, John Coleman came up with the idea of the Weather Channel, a national television network that would provide weather information forecast over cable, and he chose WSI Corporation to be its data provider for the majority of the products: alphanumeric, later on radar data as well as satellite data. The Weather Channel and WSI worked closely with the National Weather Service and NESDIS, the other part of NOAA, the satellite service, to figure out how to make those data available. Because communications were not as advanced as they are today it was a combination of dial-up circuits, dedicated circuits, some very early satellite transmission capabilities, but in the end, the system worked and it matured very quickly in the '80s as communications technology improved, the power of computing increased, the size and cost of computing decreased, and there was more ability for the private sector to take advantage of those data, turn it into value-added products, and market it to others in the industry.

I think that period from the late '70s through perhaps the middle '80s was a pivotal time period in the development of the private sector, because it allowed for a brand-new generation of companies to develop. It also provided for a set of employment opportunities for those not only in meteorology but in data processing, in marketing, in product development, in documentation, in editing everything that goes around building businesses, and so an entire ecosystem developed in the private sector to allow that to happen.

**JN:** Also, the electronic delivery of information.

**TG:** Exactly, in the very early days we walked around with computer terminals that were perhaps the size of a large briefcase...

**JN:** Beehives.

**TG:** Yup, and you could plug a telephone handset into it, long before cellular, and communicate data at 300 or 1200 bot, but very quickly some of the communications companies developed packet switching and we used two services called Telnet and Timenet which allowed people anywhere in the country, and this may sound like this is just a novel idea, to dial a local phone number to collect the data, and not have to dial long distance, because long-distance could cost a dollar a minute back then, calling from California to Washington or from New York to Alabama.

Even using 800 numbers, toll-free numbers were not really toll-free because the owner of the toll-free number was paying perhaps dimes or \$0.20 a minute to utilize those lines, and those costs moved up very quickly, so using packet switching and later satellite delivery really transformed the way that those data were communicated.

**JN:** It's fascinating to hear this from this particular slant in terms of delivering meteorological information, because this is right at the time when I was going to library school, and we used acoustic couplers, but it was the beginning of selling information, turning phonebooks into electronic information and selling that data, and also the beginnings of database vendors, which, Dialogue was started at Lockheed to transfer that type of information, so it's fascinating to hear about it from this direction.

**TG:** Most of those early days were focused on text data, alphanumerics. But of course there was a crying need for graphics, and I recall that in probably 1983 or '84 a company in Boston, The Analytic Sciences Corporation, TASC, which was founded by Art Gelb and Harry Silverman, had been toying around with collecting digital GOES data, satellite received and putting it up on very early personal computer. Because WSI was just down the road from them, we were a natural partner. We developed a joint partnership to collect those data, and the very first time we demonstrated that was to an audience at NASA Goddard, we brought an Apple II computer and we were able to show two what at the time were high-resolution, by today standards very low resolution GOES-E satellite images, they were called Image A and Image B, and if you toggled them back-and-forth you created what we called a loop and very quickly we used the technology at WSI and TASC to collect the GOES data, work with manufacturers of graphic systems both inside the weather industry, such as Weather Central and others, also those outside the industry like Tektronix to create display devices which could put those images on television.

WBZ television in Boston was the first to put a digital GOES satellite image on TV. I have a hard copy that image hanging at home right now, so the latter part of the '80s and into the '90s, two things happened was to revolutionize the way that graphics, especially color satellite imagery was put on television, and used otherwise, and then also take advantage of the National Weather Service's new program NEXRAD, the Next Generation of Radar System that is NEXRAD, collect those data through NIDS, the NEXRAD Information Dissemination System, and again turn those into value-added products that could be used by the greater community.

**JN:** I'm just going to ask you one more quick question, was most of this innovation in and around Boston? Was that the hub for getting these things going, because you said PDP-8, 9, 10, and that's Digital, so very local.

**TG:** Right, Digital Equipment Corporation. I think there were a number of places where it was happening. Of course our company was based in the greater Boston area with great help from the folks at the National Weather Service. They were clearly our partners in this, there was a growing interest in seeing the National Weather Service, NESDIS, NOAA data out there in the world and making a difference to support the mission of the National Weather Service and NOAA in general. So big credit goes to them in the Washington area, the Weather Channel was in Atlanta, they were part of the impetus to make this happen, and there were other companies around the country that were doing this, AccuWeather in Pennsylvania, Kevouras in

Minneapolis, Ocean Routes was in California as I recall, so it truly was I think a number of places around the country. And we were also seen by others in the world meteorological community at the WMO, in Japan and other countries, as being at the forefront of doing this and I recall being invited to WMO and to Japan, to the British Met Office in Britain to talk about what we were doing. But it was a very transformative period and I think it really created a great base for what has been such a vibrant private sector meteorology today.

**JN:** Thank you. That was really fascinating to get picture of those early days. Thank you.