**The History of the NCDC Storm Events Database…**

Back in 1997 or 1998, a National Climatic Data Center (NCDC) employee, Richard (Dick) Cram, was doing some research with National Weather Service’s (NWS) WSR-88D Doppler Radar images while in the Product Development Branch. The NCDC had recently begun receiving “Storm Data” from the NWS in a database format called Borland Paradox (Originally V3.5, then 5.0 and eventually 7.0). The database software was used to collect Storm Data reports from the 123 NWS offices in order to produce the Storm Data Publication, which began in 1959, as well as to populate the Storm Data archive TD3910 (Later DSI-3910). Dick wanted to be able to view radar images of severe weather and then be able to compare the images with the actual damage caused by the storm. He started a team of employees that consisted of database and web application professionals, Ron Ray, Helen Frederick and Steve Fleming, to assist in the creation of the Storm Events Database, a web application capable of querying a database, to be placed online for the everyday user. All forms of digital data were collected and added to the database, which include(d)(s), the Pearson-Fujita Tornado Tape a text file of all tornadoes from 1950-1992, Storm Data in WordPerfect V5.0 format from 1993 – 1995 and Storm Data database in Paradox format beginning January 1996. These data were all ported into a database used by NCDC at the time, Microsoft FoxPro (later Visual FoxPro 6.0). The web application was written in win-cgi scripts calling the VFP database, went online in 1998, and was one of the most popular web pages at NCDC for many years.

Years passed and the Storm Events database popularity soared. Used by many business sectors such as insurance, litigation, hazard mitigation, the requests for higher quality higher spatial resolution increased. In 2000, Storm Data went through an upgrade and the event types were limited to the officially accepted event types were added to a drop-down box in the software and the free-text event type was removed. From 1996-2000, there were over 950 unique event types logged. As you know, this severely limited the online database functionality (more on this later). In October 2006, the NWS switched from Paradox to Windows SQL Server 2003 for their StormDat program, which allowed each NWS Office to enter Storm Data in a web form directly at the NWS Headquarters in Silver Spring, MD. The NWS requested that NCDC specify which fields they required to produce the Storm Data Publication and the Storm Events Database. Once these fields were identified, which ended up being all of them, the NWS provided raw csv files to NCDC, which were loaded into NCDC’s Oracle database. NCDC used these data and created a data file format the was used by the existing Storm Events Database software (Visual FoxPro and win-cgi scripts on a Windows. This continued for many more years as the database popularity grew. Many users wanted the entire database and NCDC obliged, making it available on DVD-ROMs in dBASE4, Paradox 7.0, Visual FoxPro 6.0 and Microsoft Access formats.

In 2012, the NCDC was informed that the Windows 2000 server and Visual FoxPro were no longer NOAA approved hardware or software so development began on a replacement system. We started with the latest, cleanest available data 10/2006 – current, and used the data loaded in Oracle to produce a new web application Storm Events Database V2.0, using the Java programming language. Secondly, we exported the raw Paradox tables into Oracle, Jan 2001 – Sep 2006 first as the event types were constrained by the drop-down event type list. These data had different field structures, data types and precision. Older data had character values in date fields that had to be normalized across the database. The latitude and longitude in older data were degrees, minutes where the new data were decimal degrees. Work began on the 1996-2000 data, which required extensive normalization of the event type fields, from 950 unique event types down to the accepted 49 from the NWS Directive 10-1605. Systematic programs were developed to fix those it could automatically, and manual edits were made to split records that contained multiple event types in the record. Once this was completed, the 1993-1995 data was analyzed and it was determined that the non-county based data (NWS Forecast Zone based data) would be excluded as there were no defined dates or times or locations for many of the events. The data from 1950-1992 were mostly imported from csv files maintained by the Storm Prediction Center (SPC) formerly the National Severe Storms Forecasting Center (NSSFC). There were a fairly easy dataset as they were all Tornadoes (1950-1992) and Thunderstorm Winds / Hail (1955-1992). The Software went through a major upgrade in May 2014 and is what you see being utilized today. Many enhancements were made to the original, including multiple select on state, county and event types, the addition of images of the original Storm Data Publication entry and multiple others.