

# AFS – Computer User’s Section, Volume XIX, Number I



# AFSCUS

Summer 2006

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**\*\*CUS Annual Meeting in Lake Placid has been scheduled for Monday, Sept. 11, 2006 from 1-3 PM\*\***



# President's Byte

I was participating in a cross-divisional meeting at my agency recently. The purpose of the meeting was to create a team that would work together to develop standards for field data collection, from what tools to use, how to collect the data, and the eventual storage of the data in an enterprise data system. It seemed like a simple process to me, but other members of the work group didn't necessarily share my perspective. The reason for the differences in philosophy? Bottom line: data.

Data. That's what scientists collect so they can run analyses and make decisions regarding how to conserve natural resources. It is so important that the Computer User Section will hold National Fisheries Database Summit II in Salt Lake City this fall just to share experience and plan for the future concerning the vast amount of fish and habitat data that we collect every day. In a preparation meeting for the Summit, the steering committee spent a considerable amount of time identifying the important data issues that will be addressed at the Summit. I had the same feeling in the steering committee meeting that I had in my agency meeting: you can get any group together and talk about data and you will notice a broad array of opinions about it. I have tried to figure out why this is for a long time and it seems to come down to two things: where you are in data development or what your job function is. I'll explain using Fred's Really Simplistic Approach to Data Management (FRSADM) and illustrate what I've been through that makes me look at databases the way I do.

Data is what we gather when we sample a population. If we sample the population and collect the same data elements in a standardized way two or more times, then we have the ability to create a database. The key word in that last statement is standardized, which brings us to the first rule of FRSADM: standardized procedures are required to capture data that will be inserted into a normalized database. The battle to standardize or not could last forever. Ultimately, though, scientists want to be able to detect some change in a population over time, either good or bad. Equipped with long-term databases that were collected in a consistent fashion, we have the greatest opportunity to identify those changes. As a freshwater fisheries database manager for the Texas Parks and Wildlife Department (TPWD), I am fortunate to be part of an organization that has had a

standardized sampling procedures manual since the late 1970s. My marine counterparts in Texas have had a standardized sampling program even longer than that. That shifts the emphasis from creating brand new procedures to continually evaluating the efficiency and effectiveness of our procedures while utilizing the latest technology to be more efficient and decrease errors.

Once data is collected in a standardized manner, the second rule of FRSADM kicks in: data should be entered into a spreadsheet or database. I know, I know, you're thinking this is a no-brainer. I can show you offices with full file cabinets and empty hard drives (except for pictures of the Hurricane Katrina Heineken guy). There is no reason not to enter the sample data into a software package on the computer. For the most part, it doesn't matter which software package you use. The software available these days has many import and export options, so combining data sets is relatively straightforward. It is very hard to combine a data set that isn't electronic, though! If data is electronic, sharing is inevitable. When data is shared, the recipient needs to understand how the data is collected and what each field of information is. This information is typically called metadata, and since you have worked through the process of creating a set of standardized procedures, much of this information is already spelled out, and you are moving along in the metadata creation process. Prior to my arrival at TPWD, the primary data used by fishery managers was already in an electronic format. Sure, it was spread across different offices within the state. It resided on a mainframe, in dBase tables, in Lotus 1-2-3 spreadsheets, and in SAS data sets, but biologists were able to share the data on floppy disks. Even newly-collected data found its way into a master statewide database.

If you have satisfied FRSADM rules 1 and 2, the natural progression to rule 3 of FRSADM is to develop a centralized, relational database system (RDMS) that contains all of the related, normalized tables for the geographic extent for which that standardization exists. This step minimizes multiple versions of the same data, including the stand-alone spreadsheet of data that only exists on the computer of the local biologist. It requires systems (Microsoft Access, Microsoft SQL Server, and Oracle are the most widely used) robust enough to accommodate

years of standardized sampling data over a large geographic area. Using data normalization techniques and relating similar data with key fields, all of an organization's data is now combined into an information system. In the 1990s, the TPWD Inland Fisheries Division began migrating its master statewide databases from Paradox, Microsoft Access, and SAS data sets to Microsoft SQL Server. We have been able to minimize the redundancy of separate data systems, the data is available in one convenient location, and the data can be sliced and diced into whatever is required to answer specific questions.

Aaaah, Step 4. In my opinion, this is where you want to be. You have your standardized, normalized data residing in a RDMS. The logical next step is to make that data, that your organization spent a lot of money to collect, available to other scientists, preferably on the Internet. As a database manager, the day the staff of my organization can go get their own data online without having to give me a call is utopia. When the data is accessible in this manner, other resource managers can then potentially combine it with their data for basin or region-wide analyses. Examples of online fisheries data available at a regional scale include PACFISH and MARIS, from which the contributing organizations, as well as other organizations, have benefited. This is essentially the concept that is going to be addressed at the National Fisheries Database Summit II. The participants will spend 2.5 days discussing the benefits and the problems associated with the "All the Data, All the Time" approach.

My fisheries division is on Step 4. Our staff (around 250 people) enters, verifies, and reports their standardized and administrative data using their web browser. The staff had previously been accustomed to accessing all of their data right off their hard drives. They had to make that conceptual shift to go to the server for everything, and after years they are still working to make it a habit. The data can be accessed by all Parks and Wildlife employees. We currently do not share the data on the Internet with anglers or scientists outside our agency because our IT department is still looking into technical/legal/cost issues (they have been looking into it a long time...does that sound familiar?). I'm not too worried about getting our data on the Internet because IT will complete their study some day, and our data will be ready because we are on Step 4!

Okay, so what does Fred's Really Simplistic Approach to Data Management have to do with the different perspectives that I saw in my meetings? I think the different perspectives are based on what FRSADM Step the person or organization is on. People can't even understand what an enterprise database is when they don't even have standardized sampling procedures. Organizations aren't worried about making data available on the Internet when data is only located in paper files or Excel spreadsheets on district biologist computers. In the case of my particular agency meeting, there were division representatives that had no standard procedures, division representatives that had no interest in data sharing, and IT representatives who were sure that everything had to end up in tightly-controlled Oracle databases. I just sat there and asked if everyone could just get along! At the Summit steering committee meeting, I was able to see the perspective of federal employees responsible for aggregating data from across the country. Their concerns included lack of data, no standardization, and no central clearinghouses for accessing the data that exists. Data ties all of these people together, and a lot of communication, coordination, standardization, and money are required to satisfy the needs at all levels. Hopefully, Summit II will be a valuable step in the direction of addressing a few of those needs.

The key to me is that each database manager needs to identify which Step he or she is on and focus on the next step and not expect to have world-class information systems overnight. When I attended National Fisheries Database Summit I in 1998, the information system that I was responsible for was at Step 2. I met representatives of organizations that were at Steps 3 or 4, saw examples of their systems, and received lots of tips from lessons learned. I went back to my state energized with the knowledge that my information systems could get to the next level and the data could be used by scientists other than district biologists managing a particular sportfish species. The final lesson that I would like to leave you with is that this whole process is a slow evolution. There will be roadblocks and disappointments and at times progress will be so slow you won't know you're making any. Then one day you'll wake up, data will be flowing like it should be, and you'll be at the next Fisheries Database Summit relating all of your experiences with your peers!

## **ESRI ArcGIS 9.x Demonstrations (Flash and Windows Media files)**

Provided by Fred Janssen

[ArcView Desktop GIS for Mapping, Data Integration and Analysis](#)

<http://www.esri.com/flashmedia/arcview06.swf>

Topics covered:

Advanced spatial analysis

Extensive data use and management tools

Ready-to-use data

**\*ArcMap Navigation**

Topics covered:

Integrating and navigating data layers

Finding and identifying features

Hyperlink capabilities

**\*ArcMap Symbology**

Topics covered:

Data symbology and classification options

**\*ArcMap Shortcuts and Productivity Tools**

Topics covered:

Using keyboard shortcuts to increase productivity

The advantages of the Pause Drawing option

**\*Integrating a Variety of Local Data in a Map**

Topics covered:

Integrating data from different sources that use different formats

Integrating raster data as an attribute

Taking advantage of hyperlink capabilities

**\*Integrating Web Data in a Map**

Topics covered:

Using interoperability tools to integrate Web-based and local data

Accessing data and map services through portal sites and ArcWeb Services

**\*Flash and Windows Media files for these topics will be made available on the website.**

## **Garmin raster utilities: Free GPS utilities for loading large amounts of data into Garmin background maps**

### **GPSMapEdit 1.0, update 28.1**

<http://www.geopainting.com/en/>

Freeware that enables you to create a new map and to display or modify an already-compiled map. TPWD biologists use this software to export ESRI ArcView shapefiles to Garmin .img files for use as background maps in GPS (requires the cGPSmapper compiler).

### **cGPSmapper Windows 0089a**

<http://cgpsmapper.com/en/main.htm>

This software works with GPSMapEdit to export ESRI shapefiles to Garmin .img files which can be downloaded to Garmin GPS receivers.

## **Garmin IMG to GPS Uploader Front-End for SendMap 2.6**

<http://homepage.ntlworld.com/mdipol/img2gps/>

IMG2GPS is a Windows GUI for the SendMap / Sendmap20 DOS application by gps\_mapper. It will transfer any Map file (.img format) to your Garmin GPS. It will work for encrypted Garmin as well as home-made map files.

### **GPS TrackMaker 13.0.163**

<http://www.gpstm.com/index.php>

Creates, edits and deletes Tracklogs, Routes and Waypoints, the data can be stored in TXT, GTM and other formats, calculates length, instantaneous and average speeds in tracklogs, makes possible to insert several scanned map images in the background, recognizes PCX5, Waypoint+, MapInfo®, ArcView®, and other formats, Real Time Navigation function, option to choose name, style and color of Tracklogs.

## **Waypoints and Coordinates**

Provided by Mike Porter

### **GPS software and information**

The best website for an introduction to GPS units is [gpsinformation.net](http://gpsinformation.net). The site includes information on battery drain ([gpsinformation.net/main/bat-5.txt](http://gpsinformation.net/main/bat-5.txt)), tutorials, links to third-party software and assorted topics.

GPS TrackMaker ([www.gpstm.com/](http://www.gpstm.com/)) is a program compatible with more than 160 GPS models (including Garmin, Magellan, Lowrance, Eagle, MRL, Brunton and others). It has functionality for creating your own maps and programming commands in various languages. It currently supports English, Spanish, Portuguese, Czech, Dutch, Finnish, French, German, Hungarian, Italian, Russian, and Turkish. They provide support for translating the 1500 lines into other languages using a spreadsheet. The free version of GPS TrackMaker provides a quick and reliable program for downloading waypoints from a GPS unit. The professional version will import and export to ArcView, Excel, and AutoCAD.

OziExplorer ([www.ozexplorer](http://www.ozexplorer)) has another program with a free version that converts downloaded GPS points from most GPS units into shape files. The simple georeferencing tool can download GPS points directly to scanned maps (.bmp).

## **Geographic Information Systems**

See the [American Fisheries Society 136th Annual](#)

[Meeting](#) website for the [Basic GIS Techniques for Fisheries Biologists](#) and [Introduction to the Great Lakes GIS Project](#) workshops along with other Continuing Education opportunities.

The United Nations Environment Programme ([maps.grida.no/](http://maps.grida.no/)) is a collection of global and regional data with an interactive interface. You can customize your own map or learn about specific environmental features.

NOAA/NESDIS has a new online curriculum (grades 4-6) on remote sensing and coral reefs: [coralreefwatch.noaa.gov/satellite/education/reef\\_remote\\_sensing.html](http://coralreefwatch.noaa.gov/satellite/education/reef_remote_sensing.html)

### Virtual Terrain Project (VTP)

(<http://www.vterrain.org/index.html>) VTP fosters the creation of tools for easily constructing any part of the real world in interactive, 3D digital form through the convergence of CAD, GIS, visual simulation, surveying and remote sensing. The project gathers information and supports a set of software tools. The tools and their source code are [freely shared](#) to help accelerate the adoption and development of the necessary technologies. The project includes compilations of elevation data, ground imagery and data sources.

MAP2PDF and GeoPDF are software products by Carahsoft Technology Corp ([www.carahsoft.com/webcasts/TerraGo/05-18-06/TerraGo05-18-06.html](http://www.carahsoft.com/webcasts/TerraGo/05-18-06/TerraGo05-18-06.html)) for creating maps to share with users who do not have or use GIS software. MAP2PDF leverages the popular Adobe® Acrobat document formatting standard to provide a portable mapping format known as a GeoPDF. Utilizing MAP2PDF, agencies are able to create and publish layered, georegistered maps. GeoPDF is the industry's first georegistered mapping format to leverage the Adobe Acrobat portable document format. With the popularity of Adobe Reader, GIS professionals can utilize GeoPDFs to share geospatial data.

## Visualization Software

Provided by Mike Porter

The National Center for Atmospheric Research (NCAR) has a number of visualization tools;

([www.vets.ucar.edu/software/index.shtml](http://www.vets.ucar.edu/software/index.shtml)). The NCAR Command Language (NCL) is a free interpreted language designed specifically for

scientific data processing and visualization. NCL has robust file input and output.

The Visualization ToolKit (VTK) ([www.vtk.org](http://www.vtk.org)) is an open source, freely available software system for 3D computer graphics, image processing, and visualization. VTK supports a wide variety of visualization algorithms including scalar, vector, tensor, texture, and volumetric methods; and advanced modeling techniques such as implicit modeling, polygon reduction, mesh smoothing, cutting, contouring, and Delaunay triangulation. In addition, dozens of imaging algorithms have been directly integrated to allow the user to mix 2D imaging / 3D graphics algorithms and data. VTK has been installed and tested on Unix-based platform, PCs (Windows 98/ME/NT/2000/XP), and Mac OSX Jaguar or later.

OpenDX ([www.opendx.org](http://www.opendx.org)) is the open source software version of [IBM's Visualization Data Explorer](#) Product. The open source version is Data Explorer with a clean set of code that can be compiled on a multitude of platforms. OpenDX is a full-featured software package for the visualization of scientific, engineering and analytical data with a standard interface environment.

MayaVi ([mayavi.sourceforge.net](http://mayavi.sourceforge.net)) is a free, easy to use scientific data visualization software written in [Python](#). It uses the [Visualization Toolkit \(VTK\)](#) noted above for the graphics. It should run on any platform with both Python and VTK installed (Unix, Linux, Mac OSX, Windows).

### Society for Conservation GIS and SCB announce concurrent meetings

The ninth annual international conference of the Society for Conservation GIS (Geographic Information Systems) will be held 24–28 June 2006 in San Jose, California, USA, concurrent with SCB's 20th annual meeting. The two societies share the goal of creating an international community of conservation professionals and GIS practitioners to build conservation capacity and promote geospatial technologies at local, regional, and global levels. The two conferences share the common theme of *Conservation Without Borders*, with the four major threads of local-level and regional-level conservation, marine and freshwater conservation, 21st century conservation, and transboundary conservation.

**The May newsletter is available for the Organization of Fish and Wildlife Information Managers (OFWIM).**

It has been posted on the OFWIM website at:

<http://www.ofwim.org/docs/2006/OFWIMMayNews2006.pdf>

Featured in this issue:

- New contests!
- Second call for papers for the 2006 Annual Meeting
- National Fisheries Data Summit announcement
- An article by Falk Huettmann: Software Certification in the Profession of Wildlife Biology and Conservation Management
- Second announcement of the 2006 OFWIM Student Scholarships
- Request for raffle donations for the annual meeting

Also available on the website:

- Second call for papers and NEW abstract deadline (July 21, 2006)

<http://www.ofwim.org/meetings/2006/SecondCallOFWIM2006.pdf>

- OFWIM 2006 meeting details

<http://www.ofwim.org/docs/2006/OFWIM2006MeetingDetails.pdf>

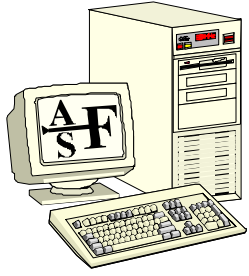
- Format for abstracts for paper and poster submission

<http://www.ofwim.org/docs/2006/OFWIMPaperAbstractsFormat2006.pdf>

- OFWIM 2006 Registration Form

<http://www.ofwim.org/docs/2006/OFWIMFinalRegForm2006.pdf>

\*\*\*Note: CUS member Mike Prager reports that the NOAA Beaufort Laboratory Web site is being restructured. For that reason, his Web page is temporarily unavailable. Anyone wishing reprints or software, including his ASPIC production-model program or REPAST reference-point calculator, should contact Mike by email at [Mike.Prager@noaa.gov](mailto:Mike.Prager@noaa.gov). Until the Web site is functioning again, Mike will send software on CD-ROM upon request.



## American Fisheries Society Computer User Section

### NATIONAL FISHERIES DATA SUMMIT

*Focusing on Applications to the National Fish Habitat Initiative*

**When:** October 31 – November 2, 2006      **Where:** Salt Lake City, UT

**Who Should Attend:** Professionals who are responsible for the management, integration, and distribution of fisheries and related data for natural resources agencies and organizations – marine and freshwater.

**Purpose:** The National Fish Habitat Initiative (NFHI) is a nationwide effort to address common problems that afflict the condition of fish habitat throughout the United States. Measuring the condition of habitat and its impact on fish populations across wide geographic areas will require greater use of shared information across agencies. The widely acclaimed *1998 Freshwater Fisheries Database Summit* established groundwork that assisted agencies in developing information systems. The 2006 Summit will build upon that work and focus attention on cutting edge issues that impact our ability to share information more effectively.

**Why Should You Attend:** This event will provide a focused forum in which you can interact with your counterparts and peers from across the nation on issues that directly impact your job and your profession. The results of this Summit will directly impact the progress of the nationwide NFHI. Come and be a part of it!

#### **Sponsored by:**

American Fisheries Society Computer User Section  
Sport Fish Restoration Program/Multistate Conservation Grant Program  
U.S. Geological Survey National Biological Information Infrastructure  
U.S. Fish and Wildlife Service Division of Fish & Wildlife Management Assistance  
U.S. Fish and Wildlife Service Division of Federal Assistance  
Organization of Fish and Wildlife Information Managers  
National Oceanographic and Atmospheric Administration-Fisheries  
Association of Fish and Wildlife Agencies  
*For more information, visit [www.fisheries.org/cus](http://www.fisheries.org/cus)*

## DATA SUMMIT SPECIFICS

**GOAL:** Participants will review the National Fish Habitat assessment process and determine the availability of indicator data at national, landscape, and local scales. The Summit results will expect to:

- Outline the availability of data necessary to fulfill the needs of the NFHI data system
- Identify specific sources of the data to meet the needs of the NFHI data systems
- Outline mechanisms and processes for assembling and transferring needed data, including:
  - Defining data and information to be included
  - Identifying key data transfer standards
  - Assessing key web services for integration
  - Addressing scaling issues for initial development
  - Identifying mechanisms to integrate regional joint partnership information systems

**BENEFITS OF PARTICIPATION:** We know that your time is valuable and schedules are tight, so the Summit will be designed not only to benefit the NFHI but also to offer professional advancement for participants, including:

- Helping to shape the implementation of this national initiative, which has been endorsed by state fish and wildlife agency directors, federal agencies, and leading nongovernmental organizations
- Interacting with and learning from colleagues facing similar information management challenges as you
- Providing opportunities to demonstrate your information system and gain hands-on experience with systems used by other agencies