Options for an Enhanced Reporting Tool
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Not too long ago, Duane approached me with an idea for enhancing the report capabilities of the StreamNet system. This enhancement would essentially produce all or parts of the Monitoring Reports. The reports would be completely formatted with title pages, page headers and footers, graphs, maps, etc. in a way that they could be printed as a finished report. The report facility would also let users determine how to group data and to include multiple data types in a single report (the current system allows only one data type to be displayed at a time). Also, multiple selections for species, locations, etc. could also be made (the current system allows only one of each criteria type to be selected).

The following is a list of ways that this could be accomplished:

Implement through the StreamNet web interface.
An additional facility would be added to the current web interface to provide the new reports and would probably be independent of the existing report facility. The query interface could be implemented as a single page or it could step the user through the process of building the report.

Implementation issues:
- The presentation of the report will be the tricky part. HTML 3.2 does not provide enough tags to support the full formatting of pages. Options are:
    - Cascading Style Sheets (CSS) may solve this problem, but not all browsers support this. I am also not sure at this time if CSS provides enough format options.
    - Documents could be produced in a PDF format. Many web users already have the Acrobat PDF reader and it is free to users who don't—they just have to download and install it (users that don't have it, however, usually gripe that they have to download it). PDF would provide a way to fully format a report. We would need to get the documentation on the PDF format or get a utility that could generate PDF files through a program.
    - Documents could also be generated in Rich Text Format (RTF) format. Most word processors can load and print RTF files. The free Microsoft Word viewer can also be used to view and print downloaded RTF files, much like Acrobat. Also, anyone who uses Internet Explorer and Word can load the document directly into the browser and even modify it there.
- The interface could be made more user friendly if Java and JavaScript could be used. This would limit its use to browsers that support these (both Netscape and IE provide support). Use of Java on Windows 3.1 is still not practical. If we need to maintain support for Windows 3.1 for the enhanced reports, Java could not be used.
- Would make use of the StreamNet database at PSMFC (MS SQL Server).

Implement through a Windows based front-end on CD ROM.
This would be an application similar to the current StreamNet DS except that it would be designed specifically for the enhanced reports. A CD ROM would provide an archived source of data that could be used and referenced by others and could accompany the actual report, if not replace it.

Implementation issues:
- Could make full use of the Windows interface.
- Could be implemented with a variety of tools: C++, Delphi, Visual Basic, MS Access, etc.
- Full control over formatting could be easily accomplished with existing Windows based tools.
- Would require porting a subset of the StreamNet database to CD ROM.
- Would require MapObject licenses for each CD ROM (if live map building where provided).

Implement through a platform independent front-end on CD ROM.
This would be an application similar to the current StreamNet DS except that it would be designed specifically for the enhanced reports. However, this could also be run on any platform (Windows, Mac, Unix). The purpose of going this route would be to provide the enhanced report capabilities on both the web and on a CD ROM while reusing much of the code.

Implementation issues:
- Would need to be implemented using Java and JDBC.
- Less use of Windows features, but would reuse code developed for the web interface.
- The printing capabilities in Java are not too good at this point.
- There are lots of third party Java component and JavaBean providers out there that could be a source for report formatting, graph building, and even map building (no MapObjects necessary).

Pros and Cons
- Web interface
  - Pros
    - It could use the StreamNet database (located in the MS SQL Server).
    - It would be accessible to anyone on the Net.
  - Cons
    - Would have to generate the RTF or PDF files in a program which would take more time to develop than using a tool with a report generator like MS Access.
    - Would require users to use IE or download the appropriate views for Navigator.
- Windows interface
  - Pros
    - Less time to develop the application by using report generation tools.
    - Could make full use of Windows features.
  - Cons
    - Would require duplicating a subset of the StreamNet database on CD ROM
    - Potential for installation problems on various machines.
    - Only accessible through CD ROM distribution.
- Platform independent interface
  - Pros
    - Could run on both the web site and stand-alone CD ROM.
  - Cons
    - Would require Windows 95, Windows NT 3.51 or later to run the application for both the stand-alone and web versions.
    - Would require duplicating a subset of the StreamNet on CD ROM.

Implementation Time
Without further analysis, I won't make an estimate as to how much time it would take to implement any of these options, but I could probably say that in order from shortest development time to longest development time would be: Windows only, web only, platform-independent.