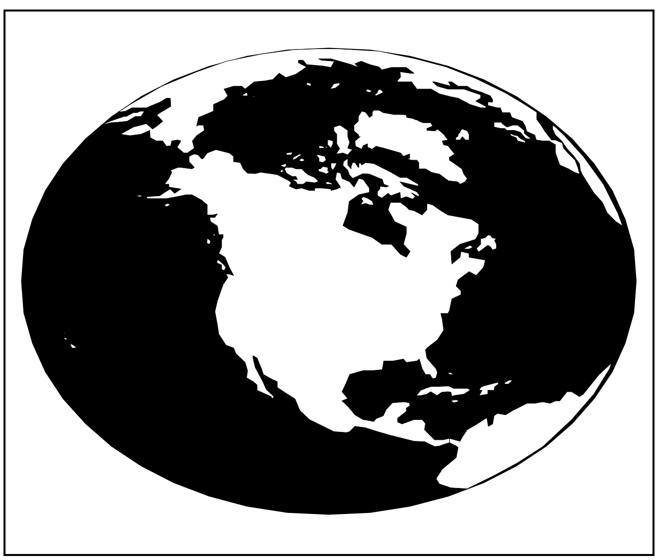
A Quarterly Report

AGNPS Newsletter

Spring 1994

It's done! The AGNPS Bullpen is happy to announce the long-awaited release of AGNPS Upgrade version 4.02. As you will see later in this newsletter, the technology of version 4.02 is far superior to that of earlier versions of AGNPS. At the same time, the look and feel of the AGNPS program has been kept very similar to that of version 3.65. Therefore, the upgrade will be easy to become familiar with. If you are interested in receiving a copy of AGNPS version 4.02, please fill out the request form in the last page of this newsletter and send or fax it to us. Please be sure to answer *each* of the questions about your computer system in the request form since the new version is quite machine specific due to memory configuration. We are very excited about this version; thank you to everyone who has waited so patiently while we were ironing out the rough edges.

AGNPS Version 4.02



AGNPS version 4.02 came about as the need for new technology from AGNPS users increased along with computing size, power, and platform types. The improvements will increase the model efficiency and speed as well as allow use of extended (EMS) and expanded (XMS) memory to break the 1900 cell barrier of previous AGNPS versions! Here is a list containing some of the major changes with version 4.02:

- The addition of a triangular hydrograph to calculate flow rates.
- The option of using the SCS TR55 method of peak flow calculation.
- The ability to decay nutrients during channel flows and in impoundments.
- Channel scouring by particle size.
- Soil information entry.
- Addition of pesticide routines.
- Source accounting of pollutants.
- More precise data entry for values of infiltration rates, manning's, etc..
- An extended/expanded memory manager which allows as many as 32,000 cells (depending on machine capabilities).

Another change that you will notice is in our AGNPS request form. We are now asking for information about your computer. The reason for this is to make AGNPS as efficient as possible.

The AGNPS (Agricultural NonPoint Source) computer model was developed by the Agricultural Research Service (ARS) in cooperation with the Minnesota Pollution Control Agency (MPCA) and the Soil Conservation Service (SCS). The model was developed to analyze and provide estimates of runoff water quality from agricultural watersheds, simulating runoff, sediment and nutrient transport.

We have four different versions of the program, and once we know your machine's configuration, we will send you the AGNPS version best suited for your machine. If you change machines in the future, let us know if you need a different AGNPS version. We are also sending out copies of the AGNPS version 4.02 User's Guide on diskette. It will cut down on our shipping costs if you can print out the manual from your own system. The manuals will come in two versions: MicroSoft Word DOS version 5.0 and Word Perfect 5.2 for Windows. The reason for using WP 5.2 for Windows is because this particular version is portable to both Word Perfect 5.1 and Word Perfect 6.0 for DOS. If your system is able to print from any of these formats, we encourage you to indicate so on the AGNPS request form.

Now that version 4.02 will be distributed, we will also begin a gradual shift of customer support away from version 3.65. This means that if a user is having trouble with AGNPS version 3.65 or earlier, we suggest they request a copy of version 4.02. We would like you to stay current with the available technology rather than call with questions about an outdated version of the program.

Please also note that we have successfully compiled a UNIX version of the 4.02 model. There is no user-interface with the UNIX version, but many UNIX users will be using some type of GIS/AGNPS conversion program for this. We have not done any work directly with GIS in the bullpen outside of helping define data file formats. We have compiled a short list of persons who have worked on the AGNPS/GIS link. This list will be added to the AGNPS 4.02 packets when we send them out. If you are interested in the UNIX version of the model, please contact us by way of the internet address listed later in this newsletter.

Other AGNPS Developments

As the Single Event upgrade neared completion, attention moved away from the Annualized (Continuous Simulation) version of AGNPS. Now that we are releasing version 4.02, attention will once again focus on Annualized AGNPS. The technology in this model will be updated to match that of the new single event version. Due to the size and complexity of a continuous AGNPS simulation, we began running into limitations of the current design. For this reason, it has been decided to redesign the continuous simulation model. The design process is reaching the analysis phase and we hope to begin programming by mid May. We will concentrate primarily on the continuous model this summer. Once the model portion is completed, we will build appropriate user interfaces to fit. We have received several excellent suggestions for the input interface including a graphical input. Currently we are considering this in our design and are leaning towards X-Windows in the UNIX environment and MicroSoft Windows for the PC version. Any suggestions or comments are welcome.

Relating to the Annualized version of AGNPS, we have rewritten the winter simulation model. This model simulates snow, frost and thaw depths for each segment of a slope. Just a couple of the improvements include an hourly time increment, as well as multiple frost layers (up to 2 complete frost layers). This model will be implemented into Annualized AGNPS and a fortran version has been programmed into WEPP (Water Erosion Prediction Project). We have also created a standalone winter simulation program which we are currently validating and documenting. The standalone version will require a weather input file (Cligen format) and a land information data file. If you are interested in helping with verification of this model, or receiving a copy of it, please contact Dr. Young or John Witte.

We have received several requests for a reference list of articles related to the AGNPS program. The lab has compiled a short list of known references and this list is available if you are interested. Request it when you send in the order form that came with this newsletter. Currently, we have 17 known references. This is an on-going list and if you know of any references that we have overlooked we would be glad to add them.

Personnel

Some of you may have heard rumors about the personnel changes which have taken place in the Bullpen. Dr. Young officially retired in early January of this year. However, things haven't changed much as Dr. Young is working at the lab as a collaborator on the AGNPS project. He may be contacted the same as before. About the same time as Dr. Young's retirement, Basil Meyer accepted a position as a programmer/analyst for a private company. We miss him around the Bullpen and wish Basil the best of luck. Currently we have 2 full-time programmers working in the Bullpen. Mike Koehler has been working extensively with the new AGNPS version 4.02 model, pesticide database, and source accounting. John Witte has been working on the user interfaces, winter routines, and Annualized AGNPS design. Jim Eklund has recently joined the Bullpen team by helping with support and documentation.

Training

In our last few newsletters, we have mentioned the possibilities of putting together an AGNPS/GIS training session. Several of you responded favorably to such an idea. We are still hoping to have such a session available. However, due to the uncertainty of USDA funds, it has been postponed indefinitely. We still want to hear any comments/suggestions that you may have. When we get a better idea of the budget situation we will let you know via the AGNPS newsletter.

Internet/BBS Status

We have both good and bad news regarding the current status of our internet connection. The good news is that all of the required hardware has been purchased and installed. The bad news is that, due to a jurisdictional problem between the University of Minnesota and a private company, our physical connection has been put on an indefinite hold. We have been listening for good news from the University for several months now and have heard nothing definite. We had hoped to send version 4.02 and documentation out through the net, but we have decided to limit this method to the Unix model distribution. So as far as communications go, we will continue to send and receive our Email through our USDA_ARS@CAA.MRS.UMN.EDU account. Please note that this is a general account for the entire soil lab. Therefore, please add something to the message description explaining that the messages refers to AGNPS.

Because of the problems just mentioned, we moved the AGNPS Bulletin Board over to the SUN Workstation. Now, when you dial up our modem line (612-589-2854), you will login directly to the Sun in the Bullpen via 14.4 Kbaud modem. We have set up an account for dial-in users. The username of this account is "agnps" and the password for this account is "agnps402". We have already set this account up to keep the latest AGNPS version in it along with up to date documentation. This account is an experimental one. If we start running into security problems the password may be changed without advance notice. We will let you know how everything is working in our next newsletter.

Hot Topics

If you decided to build a new house, what steps would you take? Would you buy an empty lot, a bunch of wood, and start nailing boards together until it looks the way you want? Of course not! You would probably start by researching locations, considering expenses, find an architect you like, I could go on and on. All of these things can be described as the design "process". Overlooking the design process when building a home sounds ridiculous, you couldn't possibly do a good job just "throwing a house together". The same is true for software. For years, computer programs have been written to solve specialized problems. As computers become larger and faster, so do the problems that we try to solve with them. Unfortunatly, rather than trying to design a new solution which takes advantage of the available computer technology, we modify the old solution to produce reasonable results for the new problem. It is a little like attaching a garage to the picture window in your living room because the hole was already in the wall. These methods appear to be effective--you do indeed have an attached garage now. Unfortunatly, if you look at the old house as the original problem, you will see that it is no longer working the way you intended because you can't see out of the living room window!

But wait, it gets worse! Imagine trying to make further additions or changes without any design. Eventually, your house will fall down and you will have to start over. Hopefully, the second time you will consider a better design!

The steps taken in designing a software project are described as *Software Engineering* (referred to as "SE"). There are several different methodologies regarding SE techniques, each with different claims. When it comes right down to it, they all are basically the same. It is important to analyze the entire problem, make plans for future enhancements, and find out what is really needed from the end user. After all, once the program is completed the user is the one who will have to live with the end result. Following these steps may take some discipline from a documentation standpoint along with some added time. However, the benefits of this method far outweigh the cost when you consider an ongoing product.

What does this have to do with AGNPS? Alot. The more information we can receive from our users (called *requirements*), the better job we can do designing AGNPS software. We need to hear your comments, corrections and improvement ideas about your current version of AGNPS. It is important that you explain your thoughts carefully in the space provided on the Request Form (*lower RH corner*). Be critical! We won't know if you don't like something unless you tell us. Some suggestions include:

- user interface changes
- model additions
- new utilities
- want an AGNPS video game?

The requirements we receive from our users will be the first step of many to delivering better quality software to you in less time.

Summer Plans

We are looking forward to the busy summer ahead of us. We anticipate a heavy customer support load with the release of the new version of AGNPS. As mentioned earlier, we will be working on the Continuous Simulation AGNPS model throughout the summer. We are also planning to design in all of the SCS calculation methods, a rangeland component, a groundwater component, and an urban component as well. With the SCS calculations already coded and validated on a single event basis and completion of the winter simulation, we are anticipating the beta testing to begin this fall. We have a list of persons interested in participating in this testing. For those who have not contacted us but are interested in testing, please indicate so on the comment section of the AGNPS request form.

Acknowledgements

The AGNPS Newsletter is a cooperative effort supported by various agencies, including the USDA Soil Conservation Service (SCS), the Minnesota Pollution Control Agency (MPCA), the Legislative Commission on Minnesota Resources (LCMR) and the Environmental Protection Agency (EPA). The editors of this edition of the newsletter are John Witte, Mike Koehler and Jim Eklund. The intent of this newsletter is to inform non-AGNPS users of the AGNPS program and to keep current users of AGNPS abreast of current developments and facilitate use of the model.