

Chapter 13

Contents of the Compact Disc

CONOP9 Programs for Solving the Stratigraphic Correlation and Seriation Problems as Constrained Optimization

PETER M. SADLER, WILLIAM G. KEMPLE, and MARILYN A. KOOSER

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1. INSTALLATION

The CONOP9 programs have been compiled using Compaq Visual Fortran to run on Windows 9x, XP, and NT platforms. They have also been run successfully on Macintosh platforms with a PC Emulator. At least a 486 processor and 64Mb of RAM is required.

The programs will not run satisfactorily from the CD. Copy all the files from the distribution disks into the same (preferably empty) folder on a hard disk. Retain the folder hierarchy from the CD. During its trial runs, the CONOP9.EXE program will read files that have been copied, edit some of them, and write many additional files to the same folder; do not attempt this

PETER M. SADLER • Department of Earth Sciences, University of California, Riverside, California 92521, WILLIAM G. KEMPLE • Naval Postgraduate School, Monterey, California, 93943, MARILYN A. KOOSER • Department of Earth Sciences, University of California, Riverside, California 92521.

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with a nearly-full disk of any kind or a read-only disk. The distribution disks do not modify any of your system files, do not add the programs to your program listing, and do not create shortcut icons on the desk top. You may wish to do this for yourself in Windows.

On a machine with enough drive space, it is usually most convenient to give every data set its own subdirectory with its own copies of CONOP9.EXE, CONOP9.CFG etc. This avoids many editing chores in CONOP9.CFG and the need to name the output files differently for every data set. In this way it is also possible to run several data sets at the same time. The CD folders are already set up in this fashion.

The files will probably copy with a "read-only" attribute, inherited from the CD. You can check for this in Windows Explorer with the DETAILS view, if the attributes column has been activated in the Properties of the View. 'R' is read-only; we need Archive files ('A') in order to run the program. Convert the attributes of all the copied files from Read-Only to Archive. Highlight all the copied files in Windows Explorer (Shift - Down-Arrow). Right-click the mouse and open the Properties window from the menu that appears. In the properties window, cancel the Read-Only check box; activate the Archive check box. In Windows 2000 and XP you may be able open the Properties window by right-clicking the whole folder.

The main program, CONOP9.EXE, should run successfully as-is. Double click a copy of CONOP9.EXE in the directory listing of one of the sample folders – Riley or Mohawk. It will run a sample data set supplied on the distribution disks. During the run there should be an "animated range chart" on screen. When the message bar changes from "Running . ." to "Input pending ", strike the return key to advance. A menu of graphical output options will be inserted in the Windows menu bar; use it to view various aspects of the solution and to log out.

The program will have written many output files to the subdirectory. They have been named in accordance with parameter settings in CONOP9.CFG. (It is unlikely that these files will all fit onto a floppy disk.) In addition, you may have used the Windows menu bar to SAVE the graphical output screens as bitmap files.

There are several options on this disk for reading about the operation of CONOP9. The CONOP9.CFG file, which supplies the run-time parameters each time CONOP9 runs, includes extensive editing and operating instructions. It should be readable with any text editor. GUIDE9.PDF and REFERENCE 9.PDF contain the developer's documentation; they may be opened in Acrobat Reader. The EXCEL_USERS and NOVICE folders contain advice from a user.

2. FILES AND FOLDERS

MAIN Folder:

- README.txt - Generic installation notes covering several distribution formats; readable from CD with any text editor.
- README.pdf - These notes.
- GUIDE.pdf - Users' guide and tutor for the CONOP9 family of programs, written by the developer (Sadler); open with Adobe Acrobat.
- REFERENCE9.pdf - Developer's Reference Manual for the full CONOP9 command syntax (Sadler); open with Adobe Acrobat Reader
- CONOP9.exe - The primary Windows 9x application (Sadler) that solves correlation and seriation problems. In every run, it reads the primary configuration file (conop9.cfg) which directs it to the input files and establishes how the problem is to be solved.
- CONOP9_CFG.TXT - An example of the primary configuration file (conop9.cfg) with all the user-editable run-time parameters and editing instructions. Functional versions are loaded in the folders with sample data.
- Novice_Syntax.txt - A beginner's summary of the command syntax from conop9.cfg, which discriminates those lines which must be edited correctly for any data set from those which should be left alone by novices.
- Quick_Syntax.txt - A summary command syntax from conop9.cfg.
- CONTROL9.exe - A supporting Windows 9x application (Sadler) that examines input files. It performs analyses of the input data that do not require solving the problem. It reads conop9.cfg to find the input files.
- CONSORT9.exe - A supporting Windows 9x application (Sadler) that performs some formatting of input files. It reads conop9.cfg to find the input files. It can format unsorted input files and edit the weighting values in input files.

EXCEL USERS Folder:

- Suggestions for preparing input files and some output graphics written (Kooser) for users of Excel.

NOVICE Folder:

- A guide to starting CONOP9 from scratch, written (Kooser) for those who prefer not to work through the full Users' Guide and Reference Manual.

RILEY Folder:

- A classic, well-behaved data set used by Shaw and Guex to illustrate graphic correlation and unitary associations respectively. It is described at length as a learning exercise in GUIDE.DOC. The data include 7 sections and 62 taxa (mostly trilobites) from the Cambrian Riley Formation of Texas. All the input files and the configuration files are

ready-to-run; just click on CONOP9.EXE, after copying the folder to a hard disk and removing any read-only attributes. Two additional sub-folders illustrate the use and behaviour of new event types implemented in CONOP9 version 6.1.

- RILEY124: data from same basic 62-taxon sample set, but split into 124 unpaired events; i.e., the FADs and LADs are entered without cross association.
- RILEY9: data from same basic 62-taxon sample set, but augmented with a small number of (hypothetical) mid-range events and unpaired range-end events.

MOHAWK Folder:

- An example of a data set for which it is unusually difficult to find the optimum solution. It is based on 6 sections from the mid-Ordovician of the Mohawk Valley with 21 graptolite genera, 5 volcanic marker beds, and 2 fictitious radiometric dates (added to illustrate how such dates would be used, without influencing the optimal solution). As described in the Users' Guide as the second tutorial example, these data have been the subject of two different published interpretations. All the input files and the configuration files are ready-to-run; just click on CONOP9.EXE, after copying the folder to a hard disk and removing any read-only attributes.

DOS Folder:

- SIMANA.for - Fixed-form Fortran source code for the original DOS version of the program (Kemple and Sadler). It was compiled with the Microsoft Fortran Compiler (to simana.exe) and illustrates how the simulated annealing heuristic and the range adjustments were implemented in their simplest (and slowest) forms. This code does not include any of the advanced event-types, objective function options, graphical analysis, or code optimizations of the later versions. Also in the folder are a font file (modern.fon) and the classic Riley data set with 7 sections and 62 taxa (siman.dat).

3. DISCLAIMER

The developer writes these programs for his own research needs and intellectual development. They are made available "as-is" as a professional courtesy to fellow researchers who wish to examine his solutions or try new applications. The programs are distributed free of charge, but without any legal implication that they will be accurate, correct, or suitable to any particular instance of the stratigraphic correlation and seriation problems. Neither the developer, nor the authors, nor the publisher assume any legal

responsibility or liability for the consequences of decisions that are based upon the output of the programs, whether these result from the internal algorithms or the settings of parameters that must be adjusted by the user to suit each application.

The Users' Guide and Reference Manual are updated, as time permits, but always lag somewhat behind experiences that emerge from the continually on-going augmentation, testing, and correcting of the programs. The author makes no representation that any component of the program has been subject to systematic beta-testing on a par with commercial software. While users should not expect anything approaching full technical support, the developer will attempt to respond to requests for help and welcomes both suggestions for improvement and notification of errors. Where results are found suitable for scientific publication, the author requests the courtesy of citation in those publications.