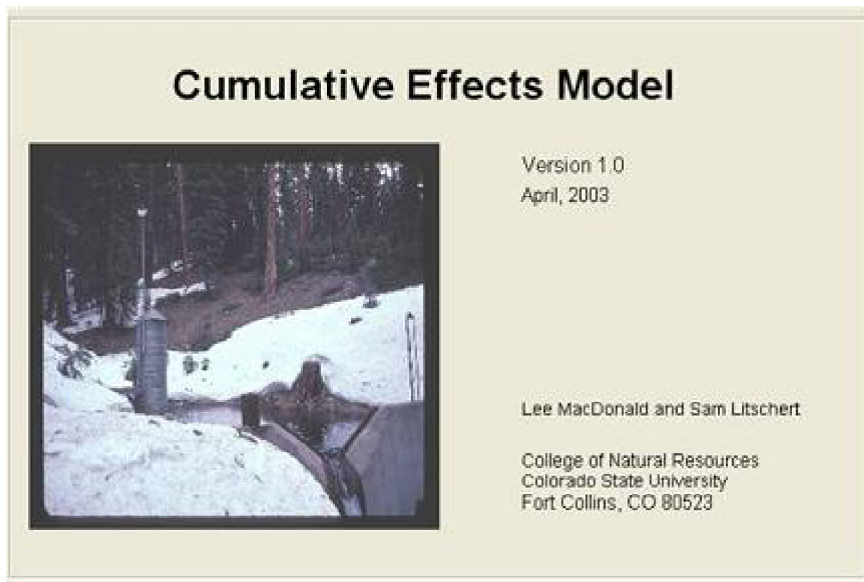


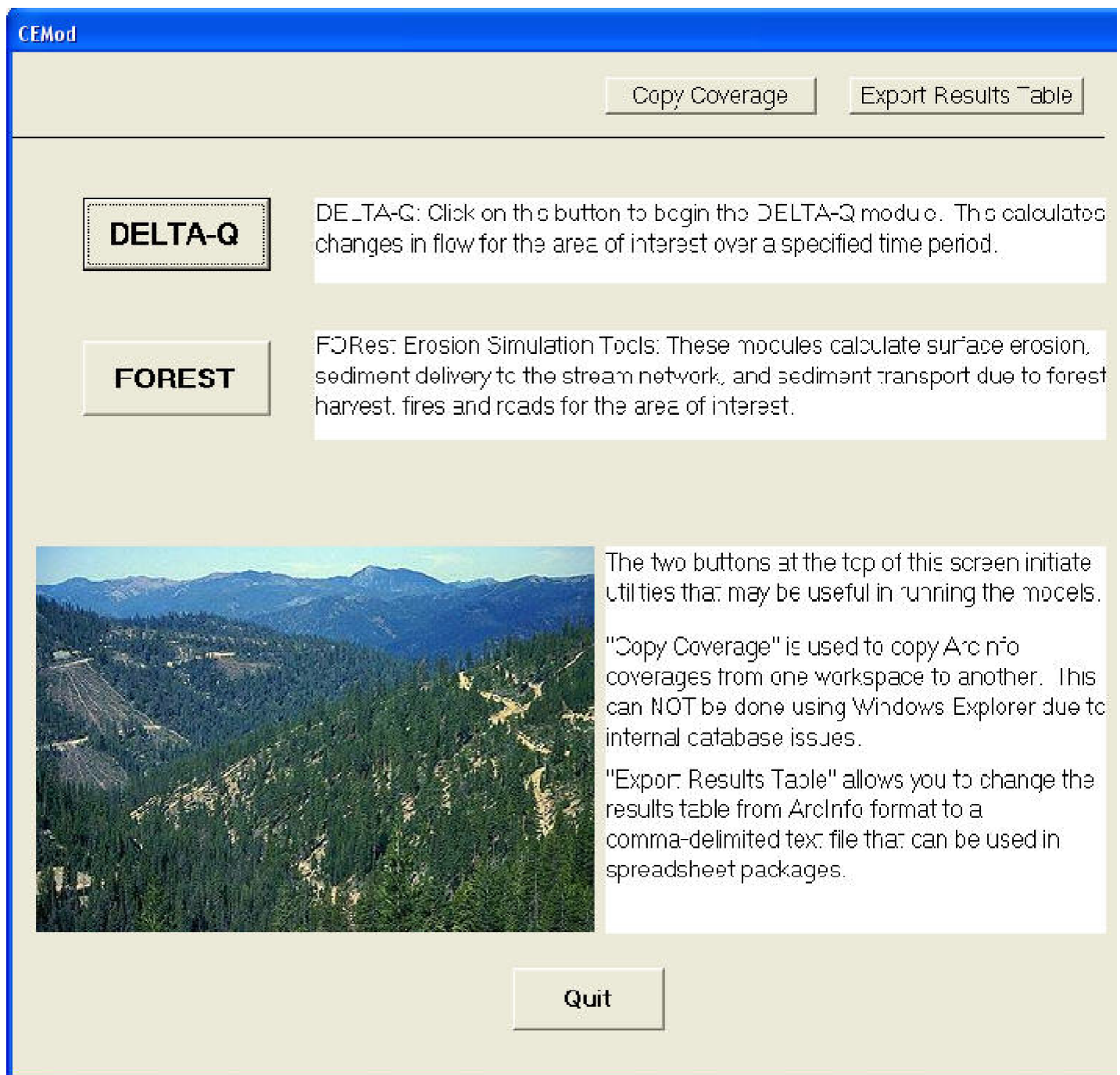
## DELTAQ Instructions for Use:

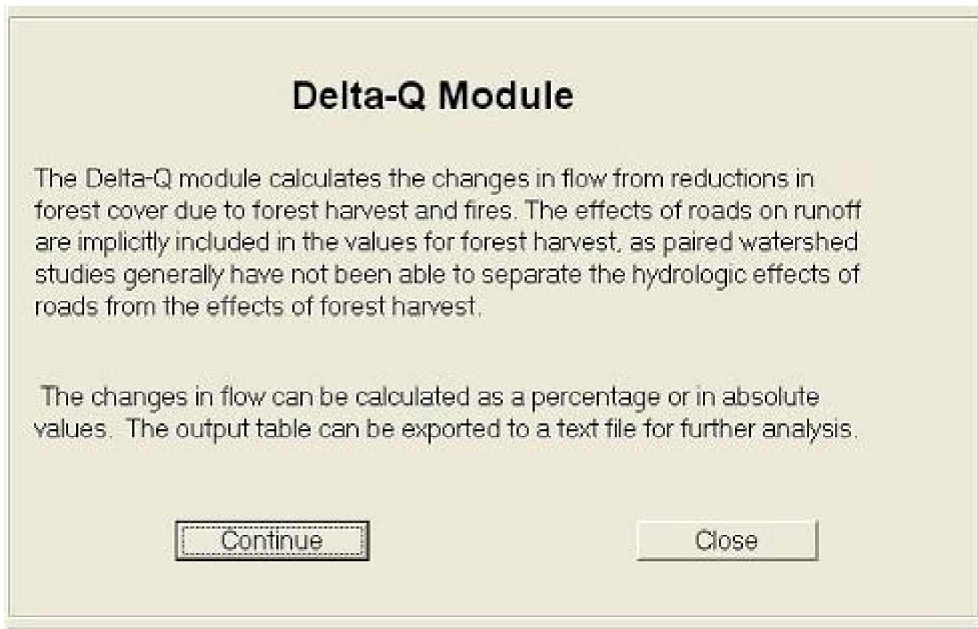
Double Click on the DeltaQ desktop icon, DeltaQ.exe in Windows Explorer or start\programs\DeltaQ.

Click on the opening splash screen to start.

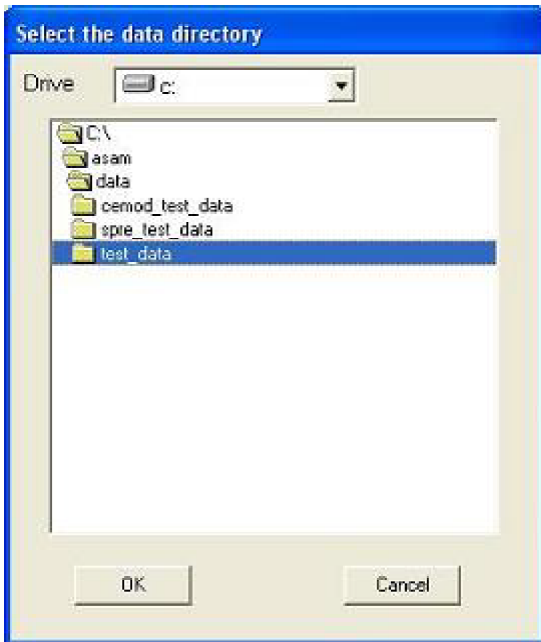


To access the DeltaQ module, click on the "DeltaQ" button from the Cumulative Effects model opening screen. After clicking "Continue" on the opening screen, successive forms appear to guide the user through data identification and data entry. The user can repeat DeltaQ with different activity polygon coverages (e.g., forest harvest, fires, or other land uses) and put the results in the same table in order to sum the effects from all activities (step 12).





1. Select the data directory. Click on this button to open a window that enables the user to choose the drive and directory with spatial data. Use the drop-down box to select a drive and double click on directories to produce the sub-directory tree. Select a directory and click OK. This will close the window and return the user to the initial input form.



Follow the numbered instructions to calculate change in flow (1 of 2).

1. Select the data directory

2. Click below to choose an activity or management coverage.

fires\_test  
forest\_test  
soils  
soils\_ws  
watersheds

3. Click below to choose a field containing the year of the activity. The year field must be in the form yyyy.

GPS\_YES\_NO  
FM\_CHANGE\_  
DISTRICT  
SILVICS\_TY  
FUELS\_TREA  
COMP\_STAND  
GIS\_ACRE  
DISTRICT\_D  
ACRES  
AREA\_A  
ID  
SHED\_NAME  
REACH  
YEARCUTNUM  
S\_PCT

4. Choose a watershed.

5. Choose the level of flow to calculate:

☐ Low flows (1st percentile)  
☐ Median flows (50th percentile)  
☐ High flows (99th percentile)  
☒ Other

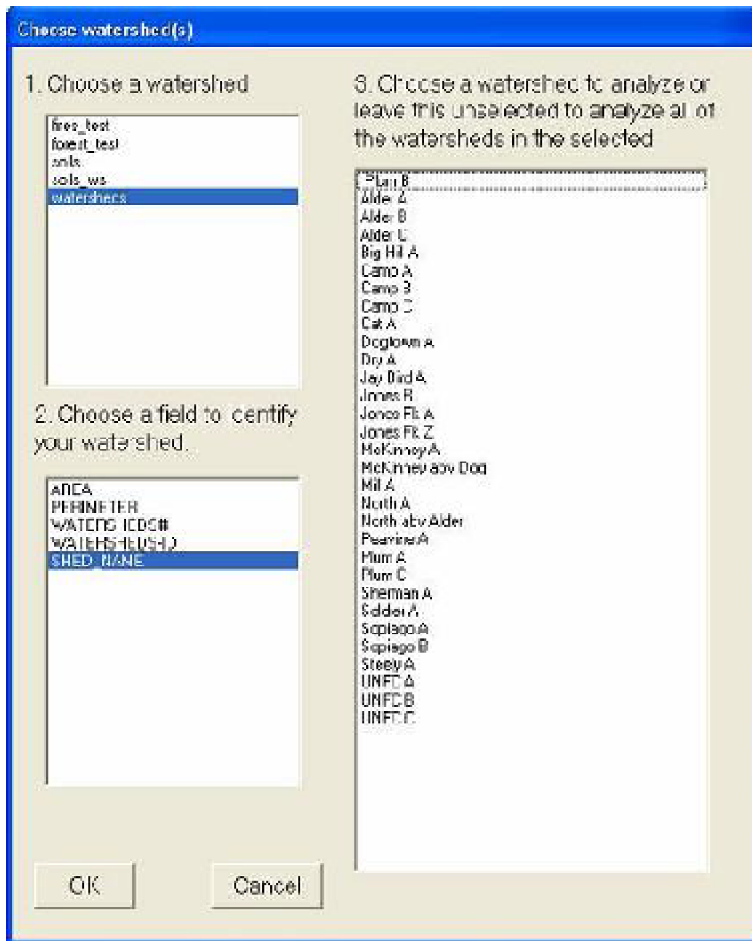
6. Choose the type of calculation. This will bring up a form to select an activity field, and then a form to assign changes in flow and years to hydrologic recovery.

☐ As absolute values  
☐ As percent values

Continue Cancel

2. Select a coverage from the list that appears in the coverage box. The data coverage must contain: (1) areas of forest management treatments, activities, or fires; (2) a numeric field with the year of the treatment or activity; and (3) a field detailing the type of activity. By selecting a data coverage, the list of fields in the coverage will appear in the next box.

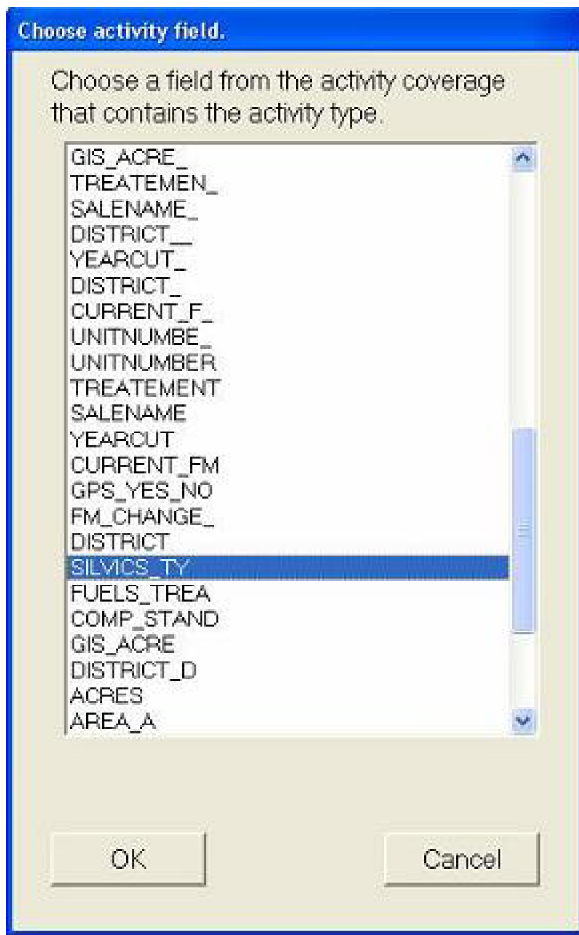
3. Click on the field box to select a field containing the year of the activity. The data contained in the selected field must be in numeric format and contain a four digit year (e.g. 2004).



4. Choose watershed(s). Click on the button to reveal a window containing three boxes.
  - a) The top left box lists the coverages in the data directory. Click on a watershed coverage.
  - b) The lower left box displays the fields available in the selected coverage. Click on a field that contains the names identifying individual watersheds.
  - c) The long box on the right lists the watersheds named in the coverage. Choose the watershed for analysis. If no watershed is selected, Delta-Q will run using all watersheds in the coverage and list the results for each watershed.

Once the activity and watershed coverages are chosen, the program will create a new temporary coverage by clipping the activity coverage to the spatial extent of the watershed. Be patient, as this may take a few minutes depending on the size of your coverage. This ensures that the original coverages are unchanged. The new coverage will be deleted when CEMod ends but a copy of the coverage (named tmp\_act) can be made using the copy utility on the opening screen.

5. Choose the level of flow to calculate. Within the database, the low, median, and high flow options are defined as the 1st, 50th, or 99th percentiles, respectively. "Other" can be used to designate a different flow percentile, but no default or literature values are provided.



6. Choose whether the change in flow values are to be calculated in absolute (cfs mi-2) or percent terms. Choosing one of these options will show the "Choose Activity Field" window. This window lists the fields in the selected activity coverage. The user can choose which field contains information about the type of activity (e.g., fire severity or type of silvicultural activities). Select a field and click on "OK" to show the "Assign change..." window.



## DeltaQ Instructions

**Assign percent change in flow and years to hydrologic recovery.**

Double Click and type values in the empty columns next to each activity to assign a percent change in flow and years to hydrologic recovery. Use 'Enter' to move down a row.

Activity Type	Percent Change in Flow	Years to Hydrologic Recovery
plantation	20	5
unknown	0	0
Caspe Thin	10	5
thinning	10	5
Pre Comm Thin	10	5
THIN&BURN	10	5
caspothin	10	5

The median values for high flow from the paired watershed studies are 12% and 0.19cfs/mi<sup>2</sup>.

Estimated hydrologic recovery period for high flow is 1/3 to 1/2 of rotation age

The "Assign change..." window has two columns that need to be filled for each activity field. The first column is for flow change values and the second column is for the number of years to hydrologic recovery. Click the row next to each activity type to add a value or click 'enter' to move to the next row. Click "OK" when finished. If no values are entered the program assumes that the activity has no effect on runoff.

A note at the bottom of the table informs the user of the median values from 26 paired watershed studies for the chosen flow percentile. Under the "View results..." button, the user can review the flow changes, key site characteristics, and published references for each of the 26 paired-watershed studies.

Note that the percent values are relative to the controls to the paired watershed data, as the Delta-Q module has no means of estimating the baseline flow conditions in the watershed being simulated. To calculate a percent change for your watershed you need to calculate the absolute change and then relate this to the measured or estimated flows on your watershed.

Click on the Continue button to progress to the second input menu.

Follow the numbered instructions to calculate change in flow (2 of 2).

7. Enter the years (yyyy) to model flow

Begin: 1987      End: 1995

8. Enter a name for this simulation. It will be used to name a table to store the results.      results7\_16\_03.tbl

9. If you are calculating the cumulative change from different activity layers, enter the table name where you are storing the cumulative results for the watershed.      accum7\_16\_03.tbl

Calculate      Display Table of Results      Close

7. Enter a four-digit year to begin the analysis. The end year is optional. If the user does not enter an ending year, the beginning year is automatically entered and the flow change is calculated for one year only.

8. Enter a name for the table of results. The table will be reused, in that results from subsequent runs of the program will be appended until the user enters a different table name.

9. Enter a name for the table of accumulated effects. This table will sum the effects of all coverages for each year.

10. Click on "Calculate" when all data values are entered.

11. Click on the display results button when the calculations are finished. The table shows the name of the watershed, the years modeled, area of activity in square miles, change in flow, and the units for this run (either cfs mi-2 or percent). The table is exported to the designated file "table".txt.



**Results Table**

SHED_NAME	Year	Activity Area (mi2)	Change in Flow	Units
'Alder A'	1987	0.003	0.01	'pc'
'Alder A'	1988	0.199	0.54	'pc'
'Alder A'	1989	0.199	0.43	'pc'
'Alder A'	1990	1.034	2.57	'pc'
'Alder A'	1991	1.034	2.01	'pc'
'Alder A'	1992	1.042	1.48	'pc'
'Alder A'	1993	1.124	1.14	'pc'
'Alder A'	1994	0.928	0.65	'pc'
'Alder A'	1995	0.928	0.15	'pc'
'Alder B'	1987	0.043	0.33	'pc'
'Alder B'	1988	0.376	2.83	'pc'
'Alder B'	1989	0.376	2.25	'pc'
'Alder B'	1990	0.376	1.67	'pc'
'Alder B'	1991	0.376	1.09	'pc'
'Alder B'	1992	0.376	0.51	'pc'
'Alder B'	1993	0.333	0.00	'pc'
'Alder C'	1988	0.072	0.54	'pc'
'Alder C'	1989	0.072	0.43	'pc'
'Alder C'	1990	0.072	0.33	'pc'
'Alder C'	1991	0.072	0.22	'pc'
'Alder C'	1992	0.072	0.11	'pc'
'Alder C'	1993	0.072	0.00	'pc'
'Big Hill A'	1988	0.001	0.01	'pc'

results7\_16\_03.tbl was exported to results7\_16\_03.tbl.txt

If no records appear for a certain year, it is because there has been no activity during that year and previous activities have attained hydrologic recovery.

Accumulate Effects

Close

The user can run Delta-Q on several data layers and save all the results to the same table or to different tables depending on the selected table name(s). If Delta-Q is run on several layers for the same years, watersheds, and units, the results can be accumulated to account for overlapping activities.

12. After running DELTA-Q on more than one data layer, the results for the watershed can be accumulated from the results table window and will be displayed in the "Cumulative Effects" window. This table can be exported to text format using the "Export Table" button. All tables are in ArcInfo format. Tables can be exported to comma-delimited text files from the CEMod startup and cumulative results windows.