

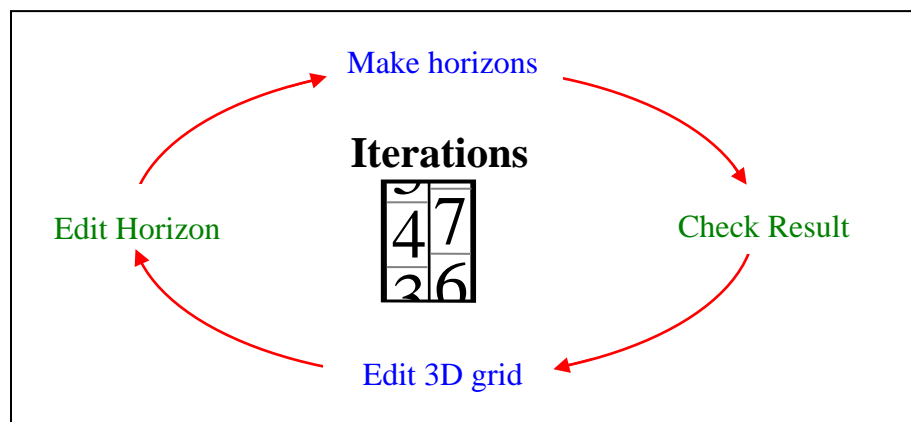
Petrel TIPS&TRICKS from SCM

Knowledge Worth Sharing

Increase Your Editing Speed

Experienced computer users are always looking for a faster way to do what they do. Petrel Mappers and Modelers are the same, they are always looking for a way to build that grid or property model faster. Here is a typical example: You are smoothly and quickly building a model and come to a particularly messy set of fault-horizon intersections you can't fix by any means other than using the *Edit 3D Grid* process. You edit and lock some nodes, then you rerun *Make horizons*, then you look at the result, then you do it again and again and again. You have to keep bouncing back and forth between *Make horizons* and *Edit 3D grid* which requires several clicks and feels like a complete waste of time each time you reopen the same process. Well, it is a waste of time. You don't have to bounce back and forth between the two. You can stay in the editor and still update your horizons with the *Make Horizons* process.

Figure: Edit iterations can soak up hours of time and anything that speeds cycle time for an edit is good.



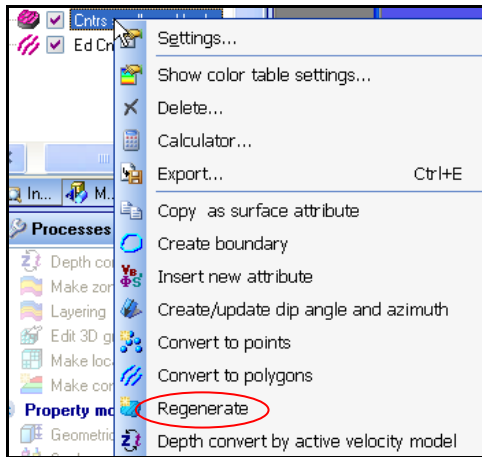
This TIPS&TRICKS article outlines a simple approach that allows you to stay in an editor while updating your 3D Grid. The approach can literally cut one or two minutes off each editing cycle, dramatically reduce your frustration levels and decrease the number of mouse movements. Anyone who has:

- Cycled between *Edit 3D grid* and *Make horizons*,
- Cycled between editing Fault-horizon lines and *Make horizons*, or
- Cycled between fine tuning Fault models, *Pillar gridding*, and *Make horizons*,

will find this technique a welcomed release from those repetitive visits to multiple Settings dialogs and windows. The philosophy is the same as that used in Petrel to rebuild a 2D grid without having to open the *Make/edit surface* process (see SCM TIPS&TRICKS, Contour Gridding, Page 9). Once a 2D grid has been built using the *Make/Edit Surface* process, the input data (e.g., contours) can be edited and then the 2D grid rebuilt without having to go to the *Make/edit surface* process. This is done by right-clicking on the grid's name and selecting *Regenerate*. This re-executes the *Make/edit surface* process using the same inputs and parameters used to run it the first time. You can then stay in the editor, map window, 3D window, or wherever you are and see the changes.

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Figure: The Regenerate tool is used to rebuild a 2D Grid using the *Make/edit surface* process without actually having to go to the *Make/edit surface* process.



Reduce Edit Cycle Time

This method, for reducing edit cycle time, uses a Workflow to execute the non-editing processes while you stay in the editor and in the edit window. All you have to do is insert, into the workflow, the steps that need to be re-executed after each edit. You then make the edits and then run the workflow. The changes are made to the 3D grid (or any object that is being rebuilt) and they appear in the window you are editing in. This approach avoids having to exit the editor, execute the rebuild steps, and then re-enter the editor to do more editing.

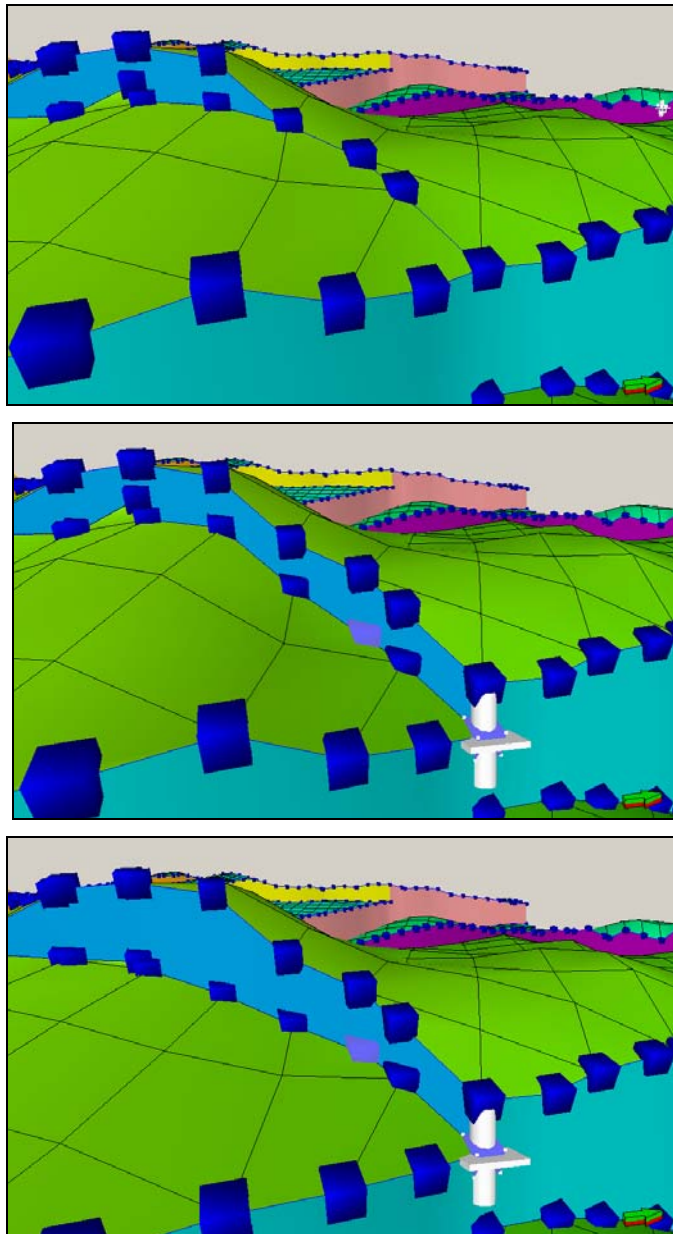
We will use two examples to show how the method works. The first involves editing a horizon using the *Edit 3D grid* process and then rerunning the *Make horizons* process. The second involves tuning the Fault model and then rerunning the *Pillar gridding* and *Make horizons* processes.

Edit 3D Grid → Make Horizon

In this example, we have built a fault model, run *Pillar gridding*, and run *Make horizons*. We are now using the *Edit 3D grid* process to clean displacement problems along the faults. The process of editing involves moving an edit point and then locking that point. Once edit points are locked, they turn a lighter color and will remain locked during the *Make horizons* process. This means that the edit points act as “dummy” points that are used during the blank and re-extension of the horizon up to the fault when the *Make horizons* process is rerun. After making several edits and before moving to another area (to make other edits), we want to rerun *Make horizons* to see if the edits have had the desired effect. This edit and rerun *Make horizons* cycle is repeated dozens and sometimes 100s of times.



Figure: Example using the *Edit 3D grid* process to alter the position of a horizon. View showing the horizon before editing (top), horizon after editing (center) and the updated horizon using that edit and the execution of the workflow (bottom). Note that the edited points that are locked turn a lighter color.



Before starting the *Edit 3D grid* work, insert a *New workflow*. Make sure the 3D Grid you are editing is active (bold) and then click on the *Auto generate workflow* button (bottom right of workflow) and select *Repeat all calculations on the active 3D Grid*. This might look something like the figure below. Delete everything that has been added except the *With 3D grid* line and the *Make horizons* line. Now make the edits and when you are ready to rerun the *Make horizons* process to see the impact of the edits, simply click the *Run* button on the workflow. This will execute the *Make horizons* process without having to actually open the process. The effect of your edits will appear in the window and you can make further edits if they are needed or move to a new area.

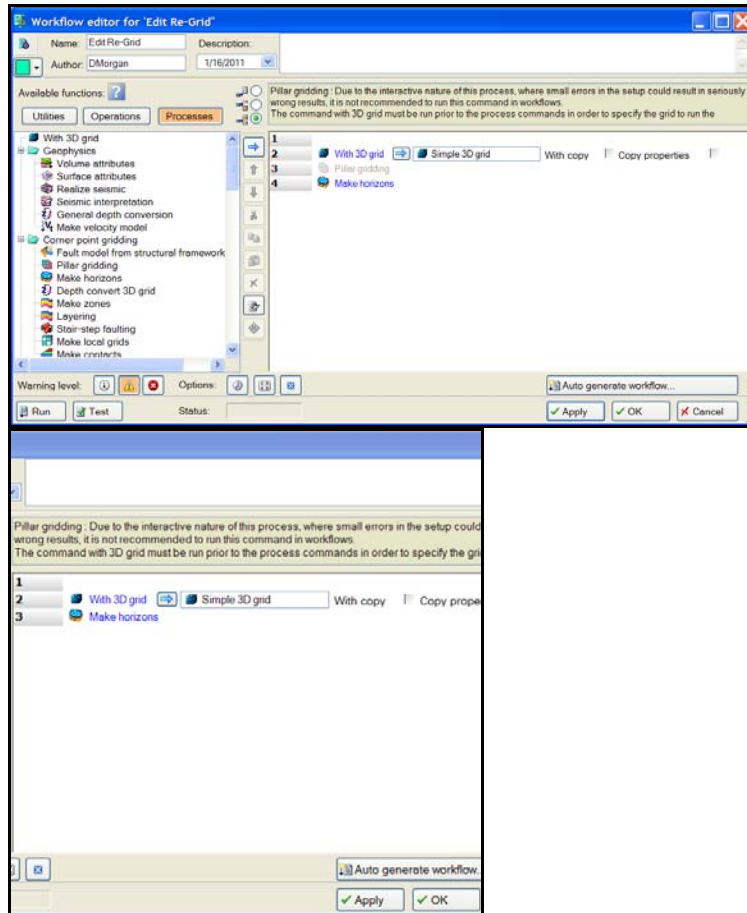
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Figure: Workflow with all steps from the *Repeat all calculations* button (left) and with only the two lines required to update the horizon with the edits (right). Note, this is early in the project and only the Pillar gridding step had to be removed (it could have been set inactive).



Fault Modeling → Pillar Gridding and Make Horizon

In this example, we have built a fault model, run *Pillar gridding*, and run *Make horizons*. While checking the horizons, we note that the fault models and the input horizon interpretations (seismic interpretation) do not match. Many of the fault models must be shifted slightly sideways to accurately go through the fault gap in the seismic interpretation. This tuning of the faults is done in the *Fault Modeling* process. After the tuning, *Pillar gridding* and *Make horizons* must be rerun and the results checked. Normally this rerunning would require opening *Pillar gridding*, going to a 2D Window, running *Pillar gridding*, and then opening *Make horizons* and running that process. Since the fault edits are minor and, if *Pillar gridding* were run without looking at the results they would likely be OK, these steps can be run from a workflow.

Figure: 3D view from the east showing a horizon with fault faces filled demonstrating a problem, the down thrown structure is “crawling” up the fault face (left) and another view from above and slightly west showing the seismic data (red lines) with the fault model incorrectly positioned relative to the fault gap (right).

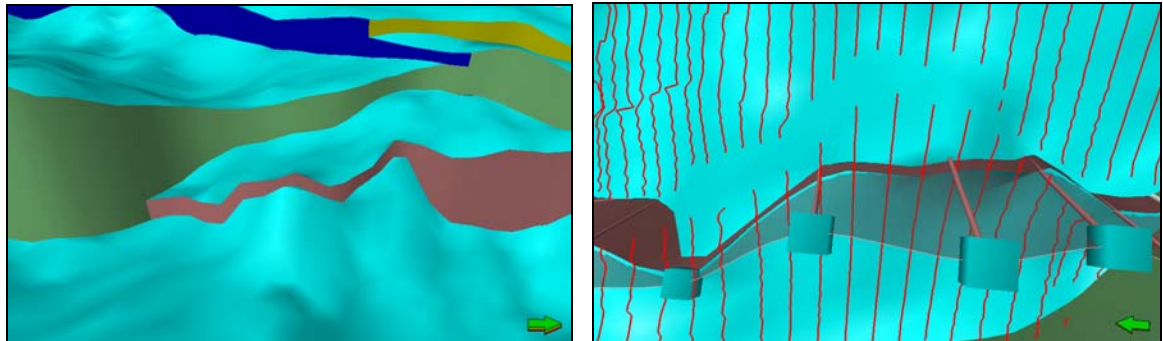


Figure: Workflow with the three lines required to rebuild the pillar grid and horizon (left) and the Petrel Explorer (right) with the *Fault modeling* process highlighted and active at the same time the workflow is run to execute *Pillar gridding* and *Make horizons*.

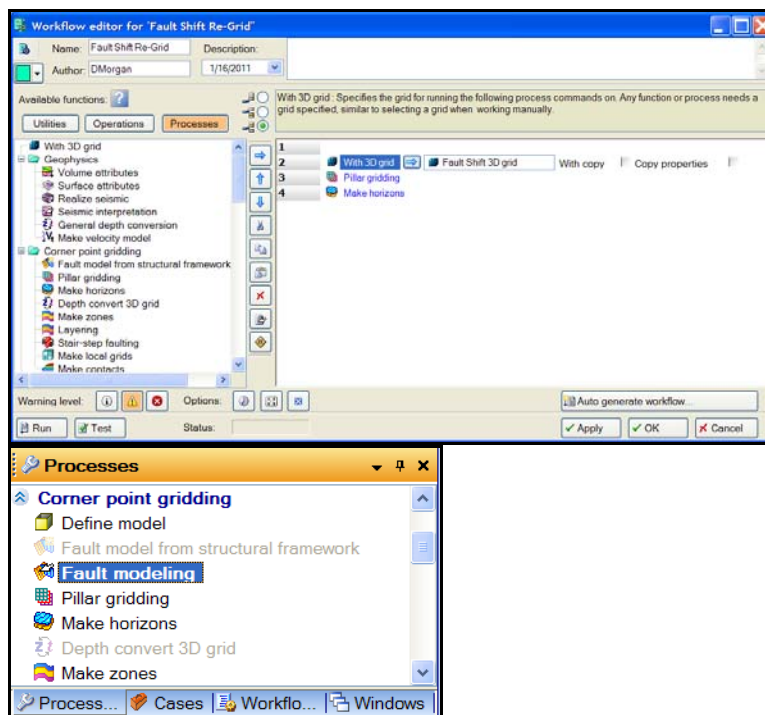


Figure: 3D views showing the edited fault model before running the workflow (left) and after running the workflow (right). Note that we did not get out of the *Fault modeling* process to run the workflow.

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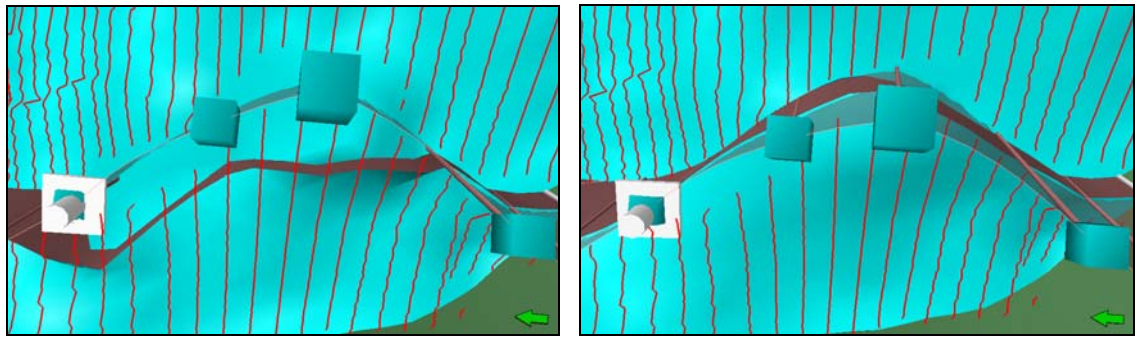


Figure: 3D views before (left) and after (right) editing the fault model, rebuilding the pillar grid, and inserting horizons. The view is ready to be moved to another area for another fix.

