

# PyLith Modeling Tutorial

## Meshing Strategies

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# Meshing Complex Geometry

## Steps in creating a mesh

- Determine geometric features needed
  - Fault geometry
  - Topography
  - Sharp structural boundaries
  - Magma sources with complex geometry
- Create spline curve (2D) or NURBS surface (3D) in CUBIT/Trelis
- If using surface in several models export it for future use
- Use surfaces within CUBIT/Trelis to webcut volumes
- Choose discretization according to type of problem

# Example problems

## 3-D meshing of nonplanar geometry and variable discretization

- Three-dimensional subduction zone example using NURBS surfaces

[examples/meshing/surface\\_nurbs/subduction](#)

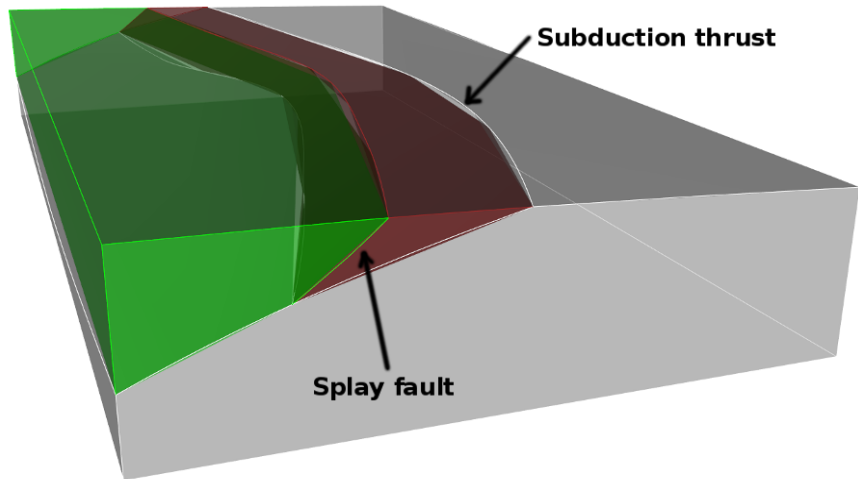
- Subduction interface geometry
  - Splay fault geometry
  - Topography/bathymetry
- How to use CUBIT's sizing function to vary discretization size

[examples/meshing/cubit\\_cellsize](#)

These examples have been verified to work with CUBIT 15.1 and Trelis 16.0.2.

# 3-D Subduction Zone

Mesh with subduction thrust, splay fault, and topo/bathymetry



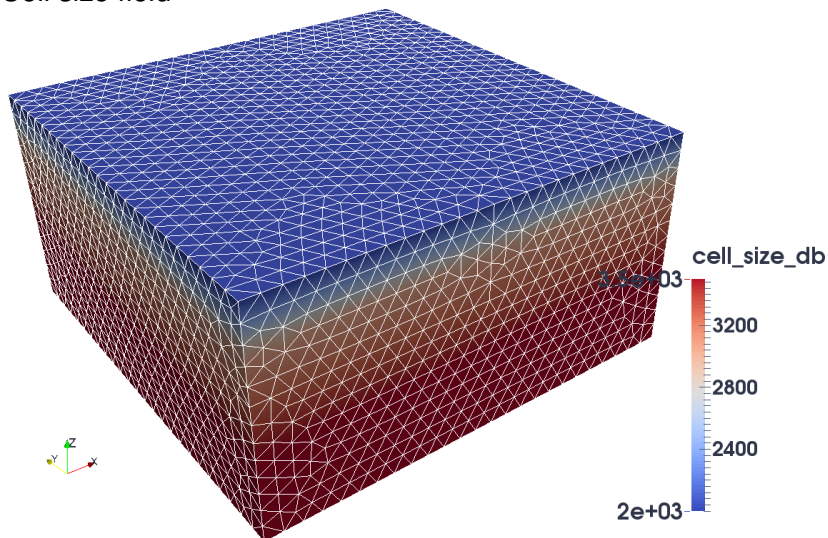
Meshing

3-D Subduction

# Using user-defined fields to control mesh size

Example 1: Use a spatial database to control cell size

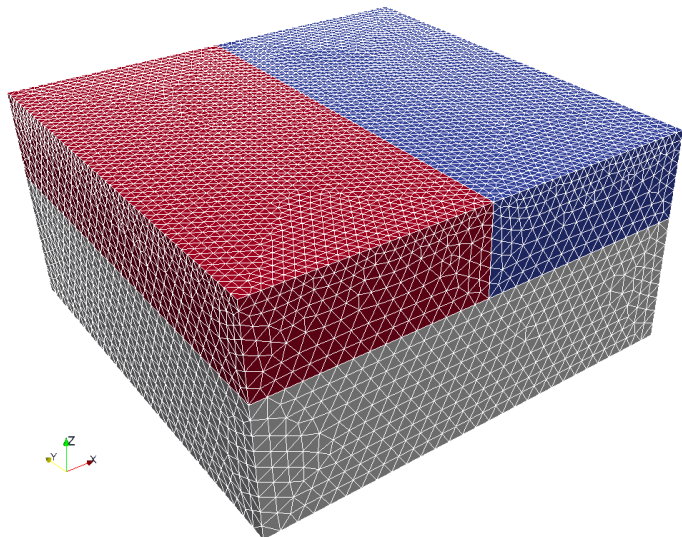
Cell size field



# Using user-defined fields to control mesh size

Example 1: Use a spatial database to control cell size

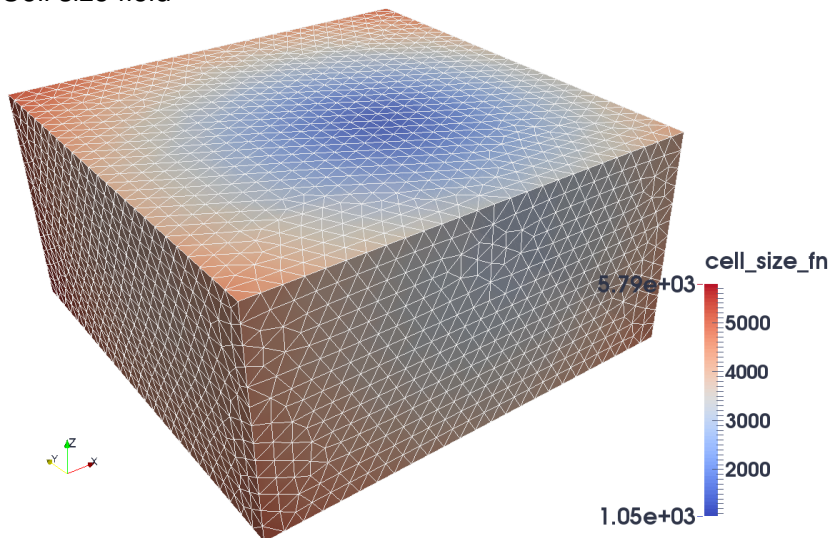
Resulting mesh



# Using user-defined fields to control mesh size

Example 2: Use an analytical function to control cell size

Cell size field



# Using user-defined fields to control mesh size

Example 2: Use an analytical function to control cell size

Resulting mesh

