

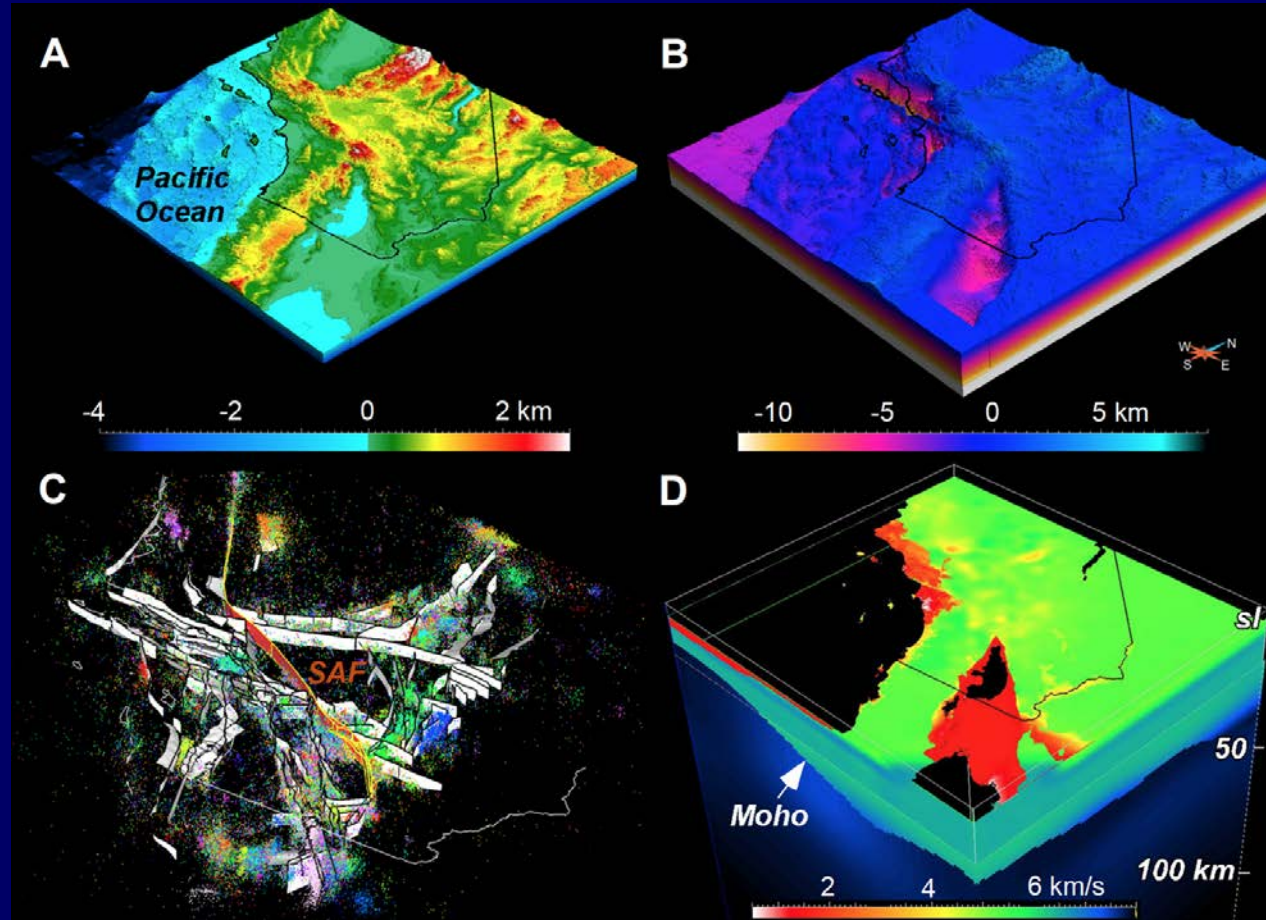
Developing and Distributing USR Community Models

Andreas Plesch

Workshop on Establishing a Geologic Framework in
Southern California, Ponomo, 6/7/-6/8/2016

USR 3D Community Models

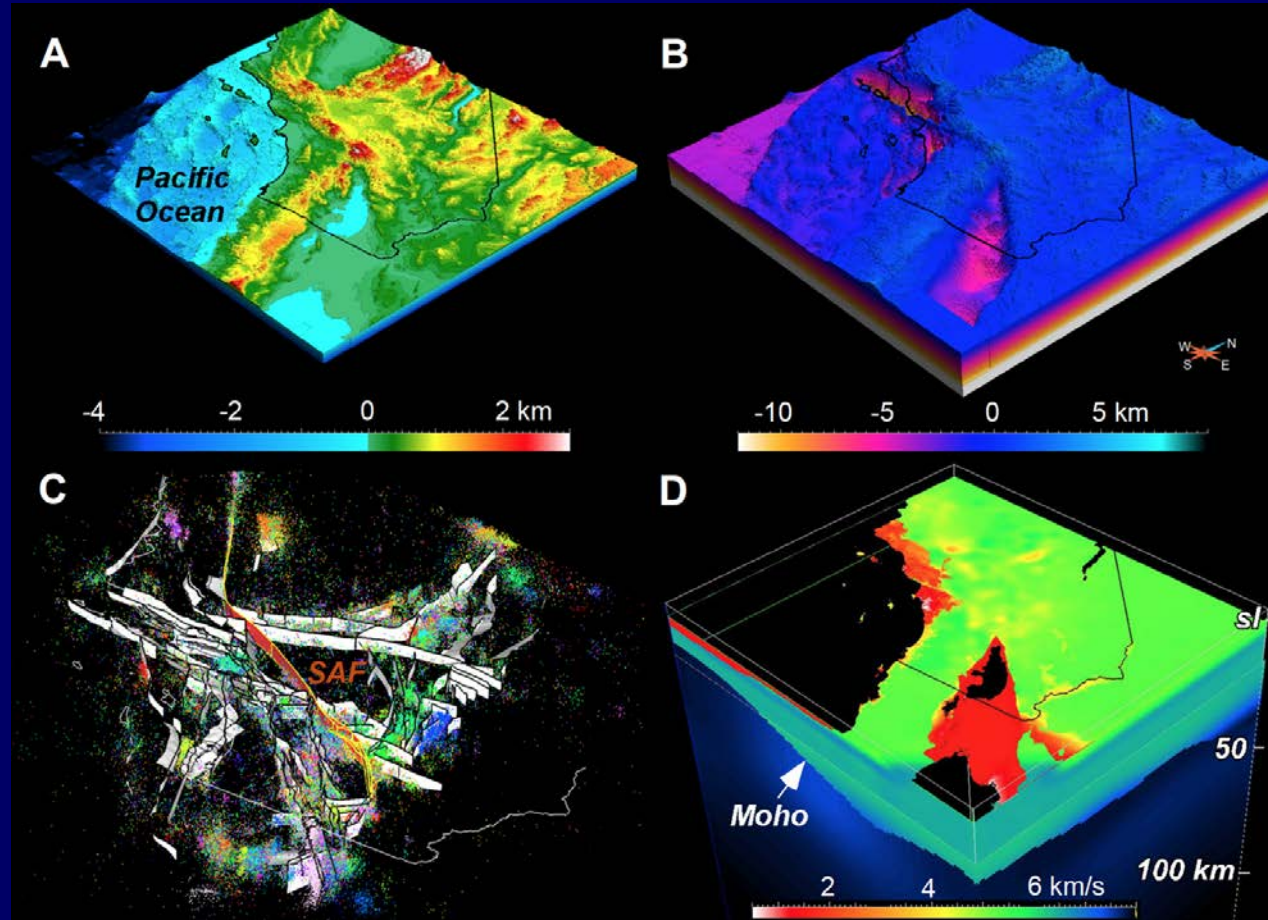
- ❑ Community Fault Model:
 - ❑ >160 active faults in seismogenic crust
- ❑ Community Velocity Model:
 - ❑ Stacked high resolution Vp model with explicit interfaces



SCEC4 Unified Structural Representation (Shaw et al., 2015)

Key Concepts

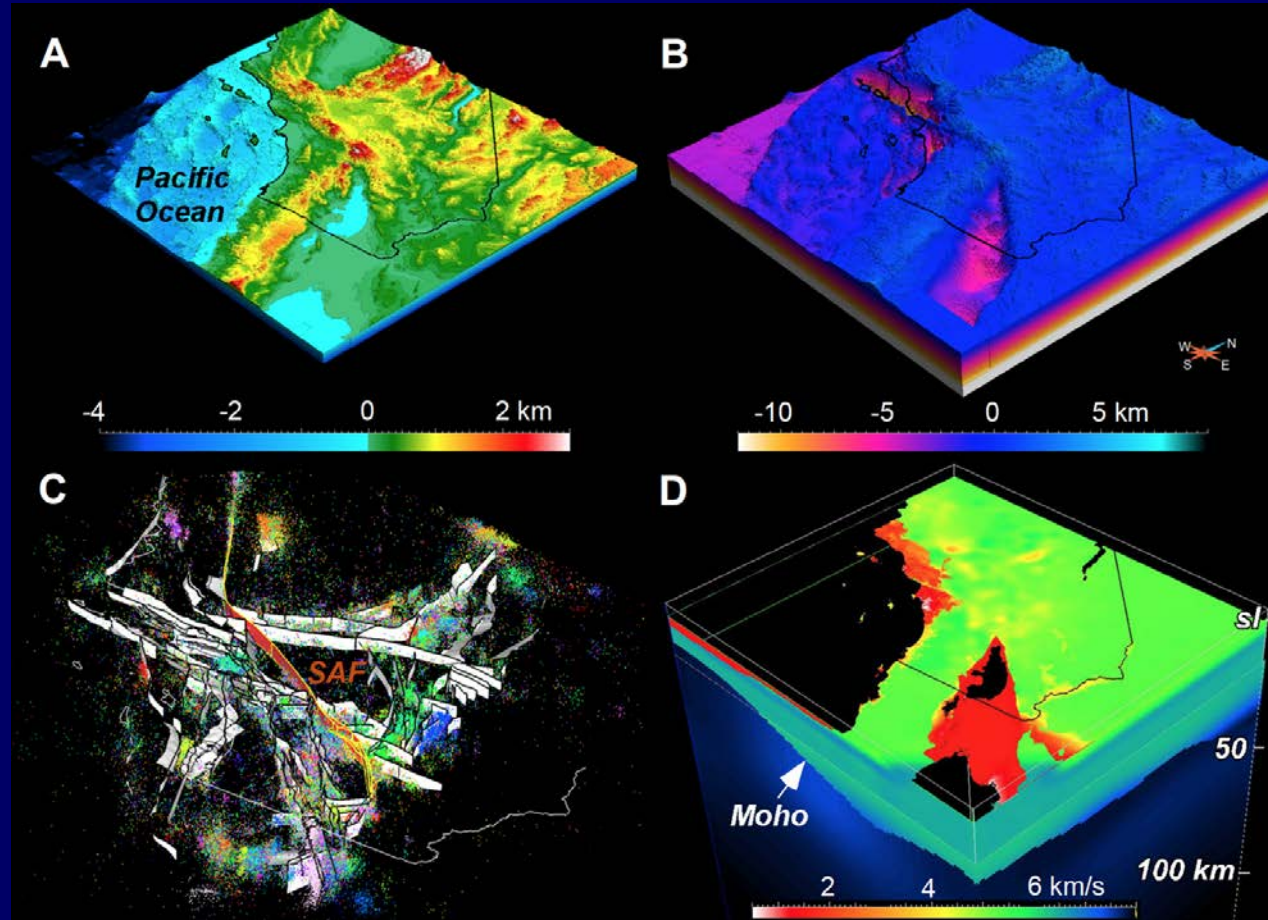
- ❑ Consistency across models
- ❑ Multiple types of representation
- ❑ Alternative representations of the same feature
- ❑ Easy access
- ❑ Versioned releases
- ❑ Established target: boundaries, depth, resolution



SCEC4 Unified Structural Representation (Shaw et al., 2015)

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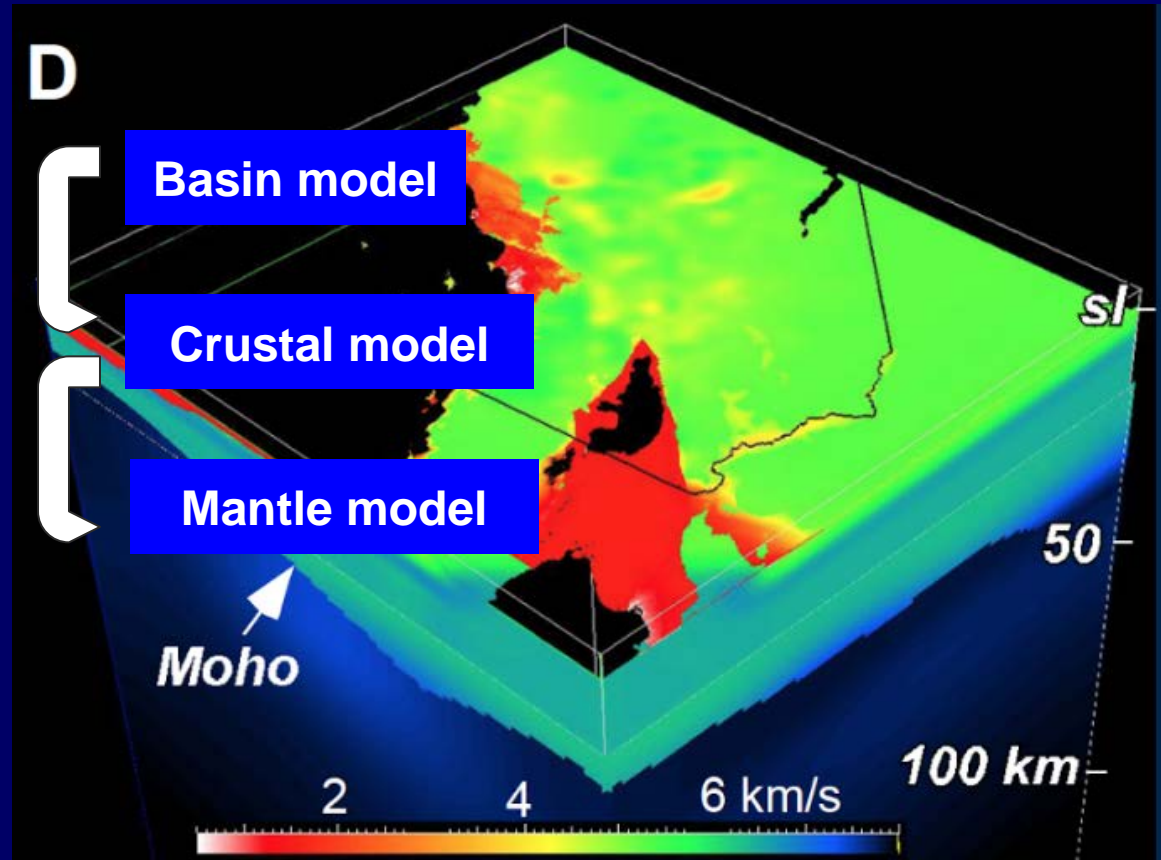
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Model consistency

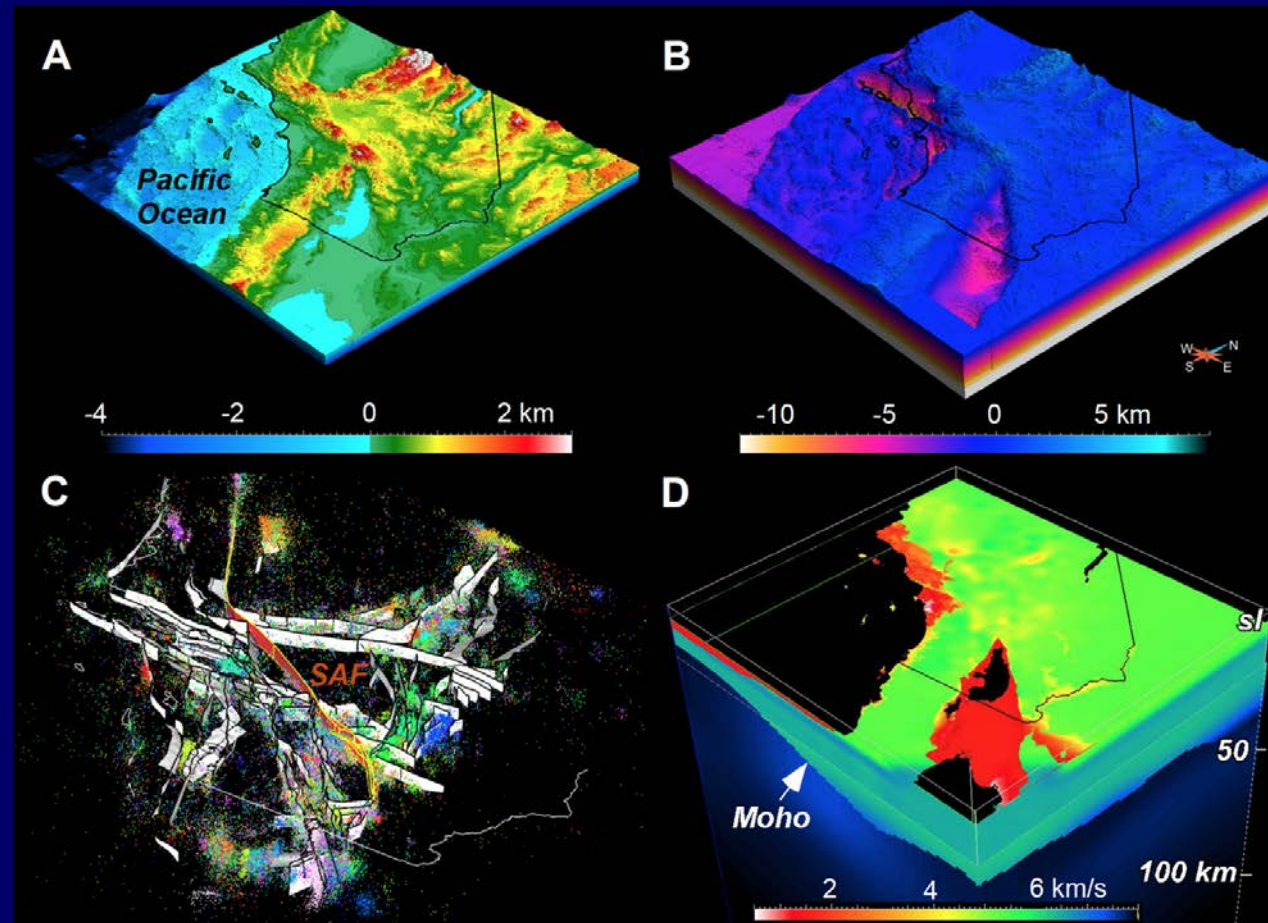
- ❑ CVMH embeds a **basin model** in a **crustal model** in an upper **mantle model**
- ❑ Deeper levels were constructed using shallower levels as input to ensure consistency
- ❑ Major interfaces are offset at CFM faults



CVM-H 15.11

Key Concepts

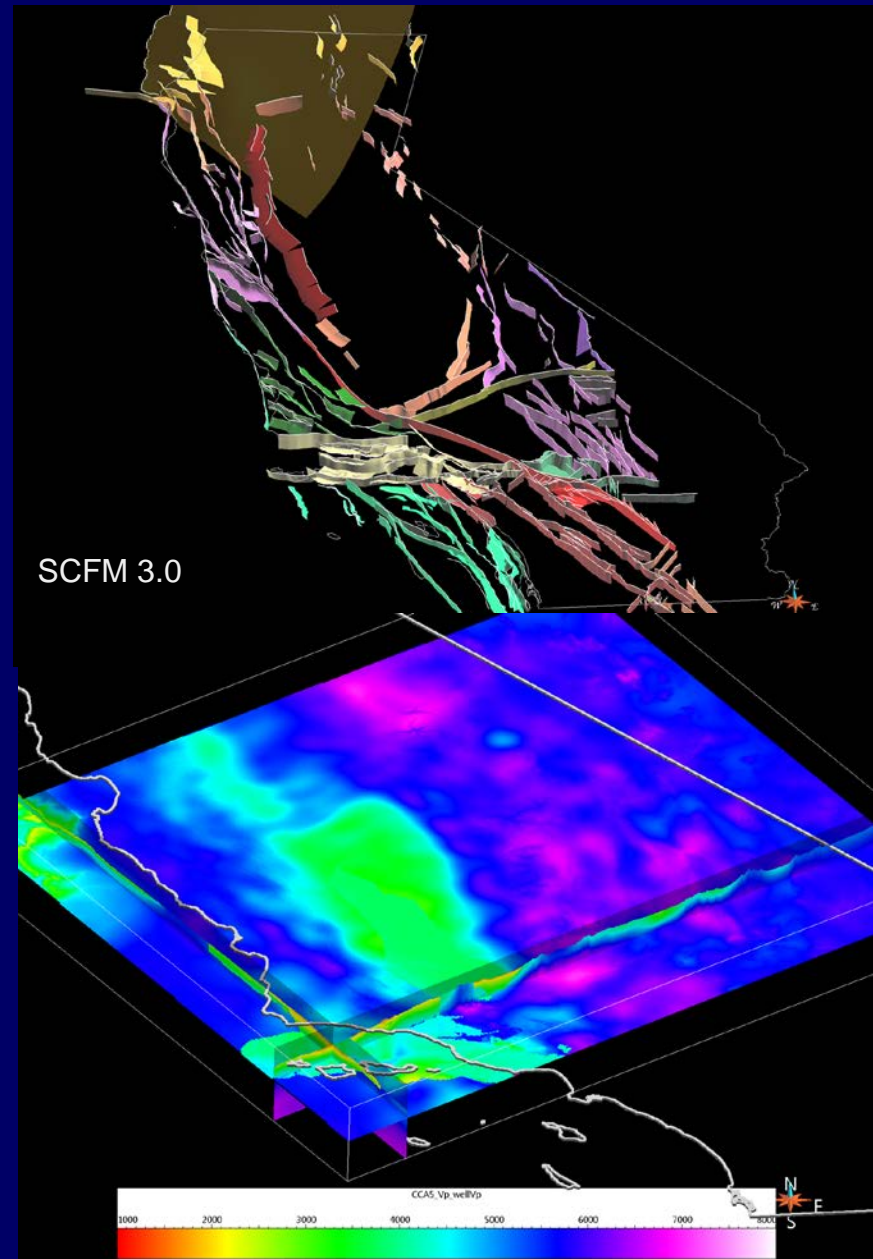
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Feature Representations

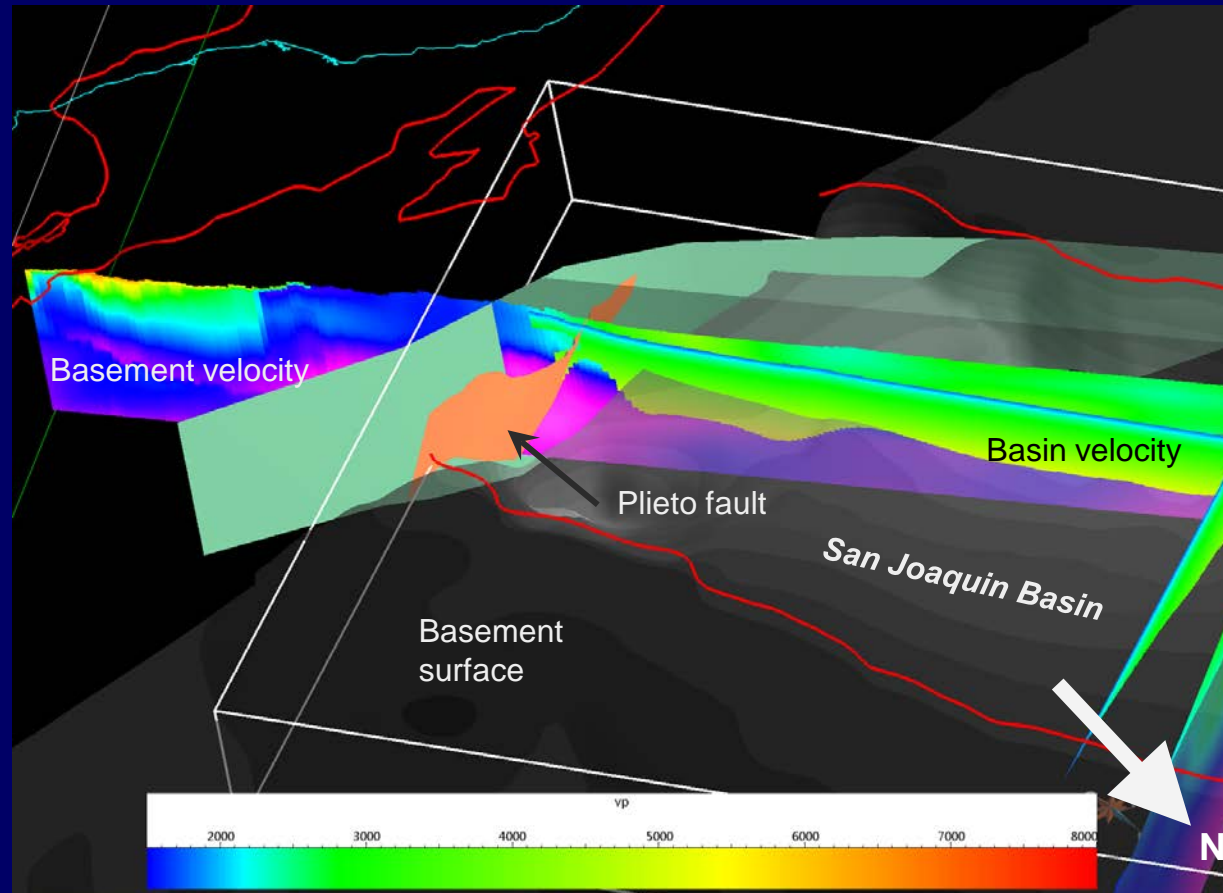
- Faults, layers, interfaces: **surfaces**
- Wave velocity, other geophysical fields, rock properties: **grids**
- Geologic bodies: **volumes**, contours
- Dependant properties: **rule** based representation, functional form

CCA05, 5th iteration



Feature Representations

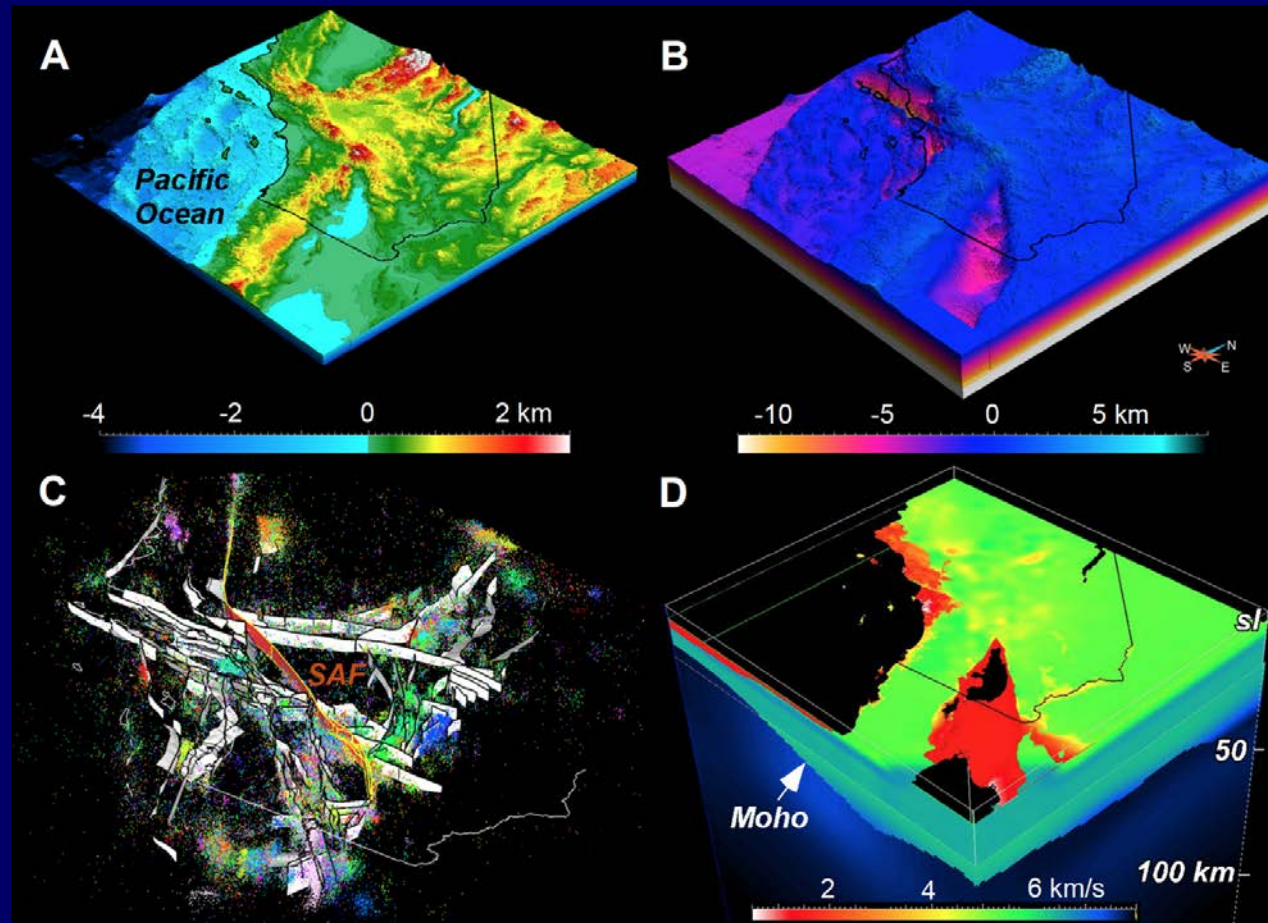
- Object based and grid based representations work together for a full description
- Requires attention to cross-compatibility



CCSP 0.9

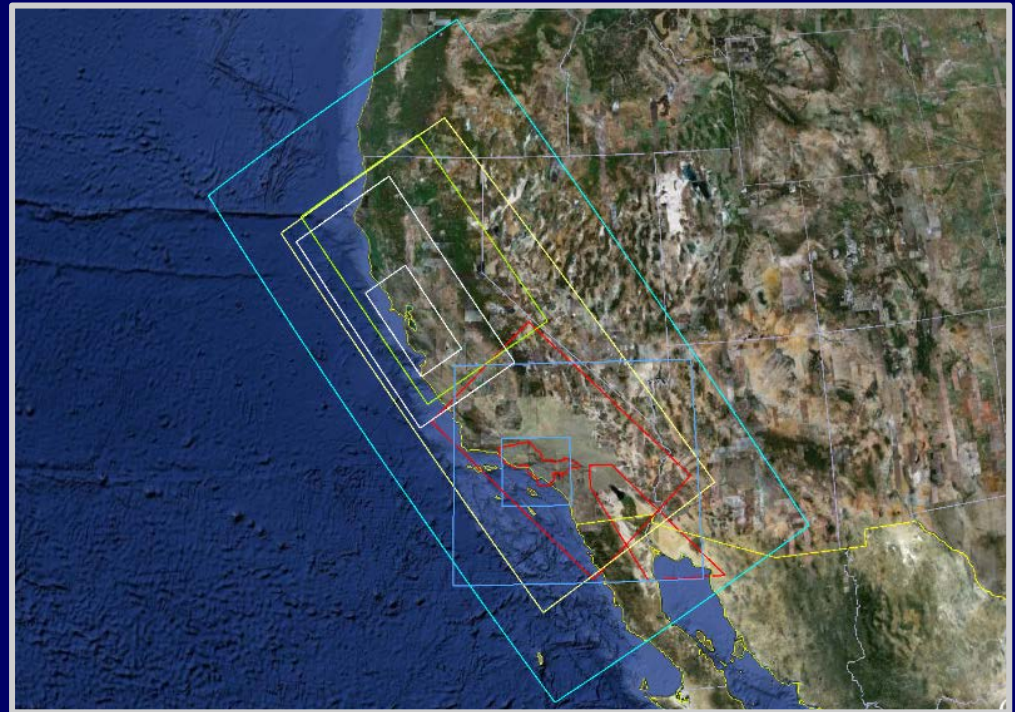
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SCEC UCVM Framework (Small, Maechling, Gill and others)

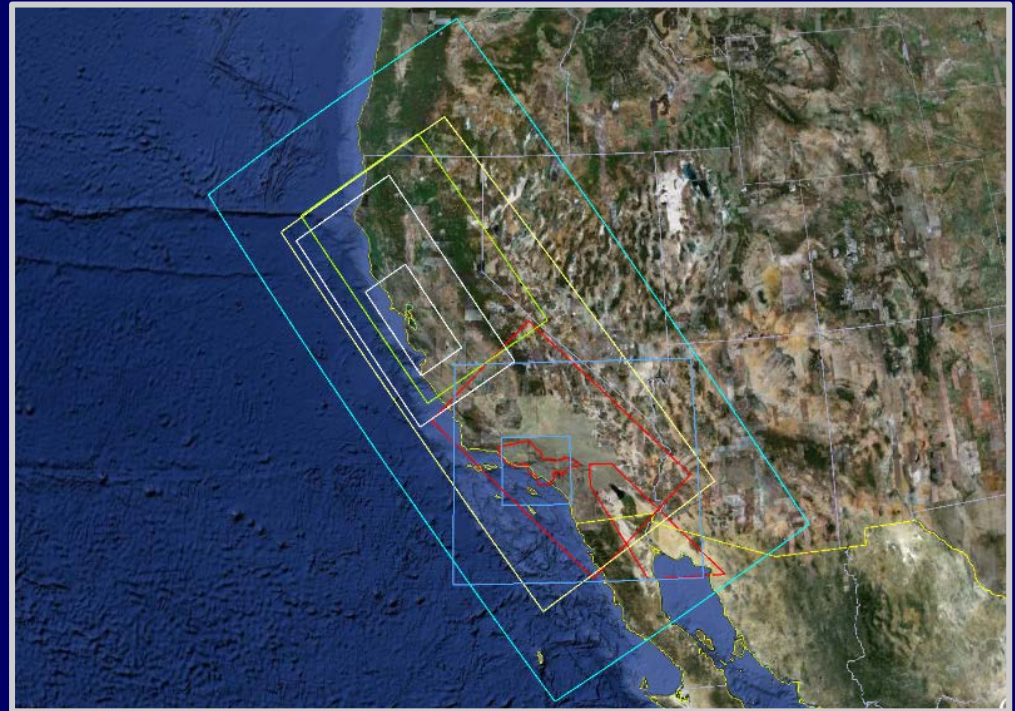
- Provides a uniform query interface to several California velocity models. Models may be queried by (lon,lat,depth) or (lon,lat,elev).
- Contains both a Linux command line query tool and C programming interface
- Easily combine two or more regional velocity models together into one meta-model. Models are tiled in specified order.
- Provides access to several additional statewide datasets
- Proven. Well understood by Community.



UCVM model support (Scecpedia)

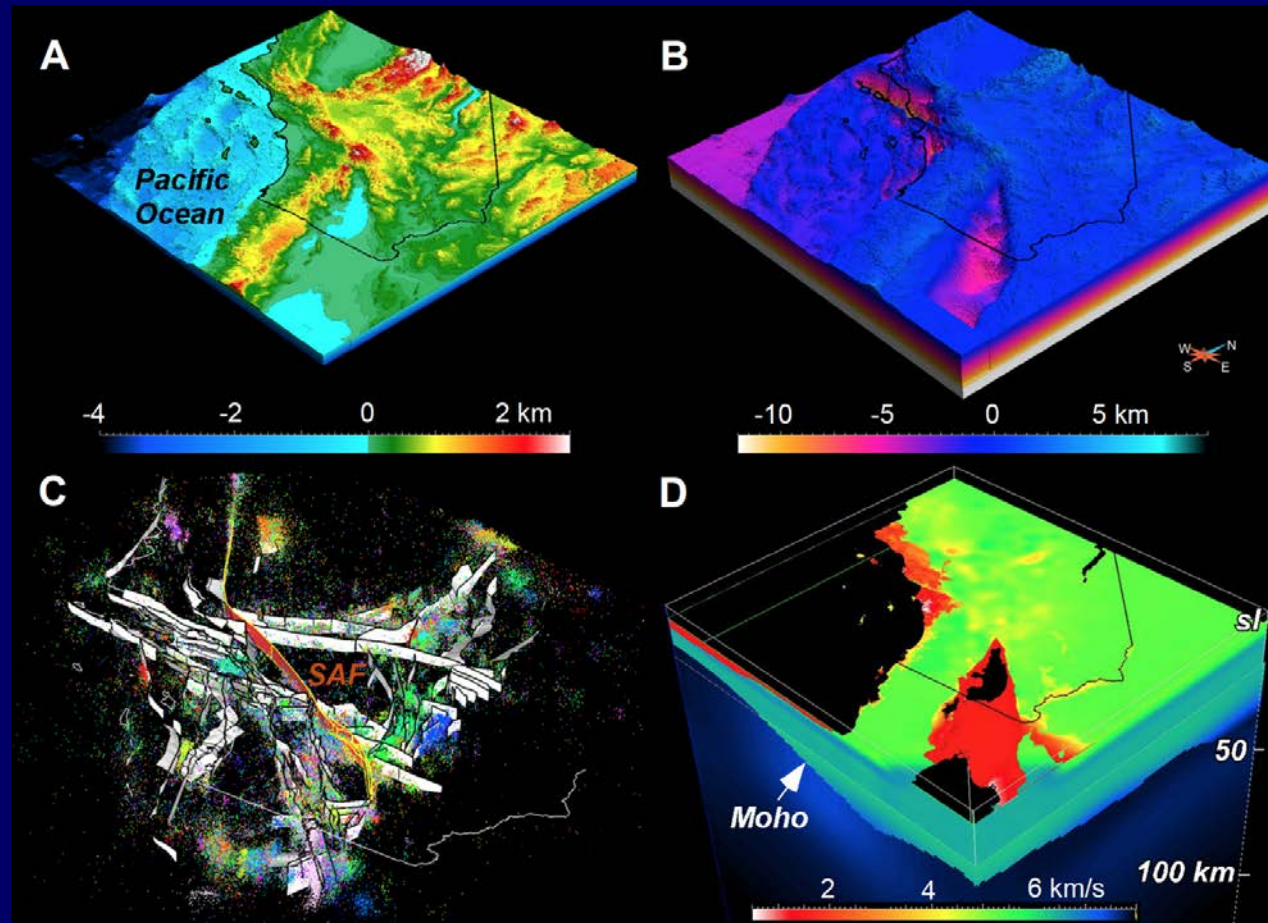
SCEC UCVM Framework (Small, Maechling, Gill and others)

- UCVM is a modular framework
- Could be enhanced to support other models
- What functionality would be needed ?
- Query surfaces ?
- Storage and retrieval of hierarchies of geologic units/features ?



Key Concepts

- ❑ Consistency across models
- ❑ Multiple types of representation
- ❑ **Alternative representations of the same feature**
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Alternatives

- ❑ Allow for multiple representation of the same feature
- ❑ Requires ranking
- ❑ Demand for single best/preferred model

