The Community Geodetic Model (CGM): *Discussion Questions*

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Session 1: Target Applications for CGM

- *Given these presentations, what should our (revised?) list of target applications be?*
  - spatially variable slip rates and strain rates
  - non-tectonic time-varying signals
  - tracking and modeling transient deformation
  - constraining lithospheric rheology
  - studying fault loading processes and crustal stress
- *What level of spatio-temporal resolution is needed? Need it be uniform?*
- *What level of precision?*

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Session 2: GPS and older geodetic data

- *What are the major noise sources?*
- *To what extent can they be mitigated and what is the best approach?*
- *How good is our spatial/temporal coverage?*
- *What additional sources of GPS data might be available in the future (e.g., new CGPS sites)?*
- *Should the CGM incorporate pre-GPS data? What is the best strategy for doing so?*

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Session 3: InSAR Data

- *How good is our spatial/temporal coverage?*
- *What can we do with what we have?*
- *What characteristics of InSAR data are needed to do a good job of recovering things at the few mm/yr scale?*
- *To what extent can we mitigate the major noise sources?*
- *What opportunities might new missions present?*

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Session 4: How to bring the datasets together

- *What would a combined "data product" look like? (E.g., what basic and derived quantities do we want to provide?)*
- *How independent are GPS and InSAR-derived observations of crustal motion?*
- *How will uncertainties be quantified?*
- *What are the strengths and weaknesses of a combined solution?*
- *What methodological advances to data analysis/combination would help?*
- *What sort of testing, validation, or comparisons will be needed?*
- *Are multiple model branches necessary?*
- *What metadata must be provided with the CGM?*

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Session 5: Development of milestones and a prioritized task list; distribution of tasks

- *What are the basic building blocks that must be completed first?*
- *Who is already conducting work that contributes to this?*
- *How to encourage additional participation (e.g., through RFP)?*
- *How do we keep the CGM up-to-date in the out-years?*
- *Are there web-based tools that could help streamline model development, testing, utilization?*
- *Revisit and revamp the milestones (in light of this discussion and funding delays)*

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SCEC4 CGM Milestones

YEAR 1 (2012-2013)

Obtain input from the SCEC community via a workshop in order to define the conceptual and geographic scope of the CGM, including the time-independent and time-dependent model components, the data to be assimilated into the model, and the type and spatial/temporal distribution of model output.

YEAR 2 (2013-2014)

Start generating a unified GPS time series dataset for secular and transient deformation and compiling LOS velocity maps from available SAR catalogues. Establish strategy for estimating secular rate as well as temporally-variable signals (e.g., seasonal, postseismic). Assess the feasibility and the potential benefits of incorporating additional datasets (e.g., strainmeter, LiDAR) into CGM. Specify the CGM output needed for input to the CSM, transient detection, and WGCEP activities and begin providing preliminary datasets as available.

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YEAR 3 (2014-2015)

Integrate InSAR and GPS in order to formulate a uniform resolution model for secular surface velocities and associated uncertainties. Revise or refine the technical specifications of the CGM based on results obtained in years 1 and 2 and input from the Geodetic Transient Detection TAG and the CSM and WGCEP groups. Define the framework and infrastructure for maintaining CGM. Identify and test algorithms for time-dependent InSAR data analysis.

YEAR 4 (2015-2016)

Use SAR data catalogues from previous and current SAR missions to generate LOS displacement time series over southern California, and conduct comparisons between InSAR and GPS time series results.

YEAR 5 (2016-2017)

Develop a full-scale version of the CGM that integrates data types and includes both time-independent and time-dependent components. Provide outputs from the CGM that can be used as input to the CSM, transient detectors, and time-dependent earthquake forecasting.