Ray Quay

1. What are the key urban remote sensing/urban modeling and forecasting issues that you represent?

- Development of advanced scenario analysis that utilizes quantitative and qualitative methods to extract key concepts from a large number of scenarios generated by an urban models. These concepts are them used to help policy makers achieve foresight about the future and make decisions on issues of high uncertainty.
- Anticipatory Governance that suggests replacing the traditional problem solving method of predict (using urban models) and plan with a method of foresight (using urban models) and anticipation.
- Visualization of uncertainty within modeling results at spatial and temporal scales.
- Urban model development, I am currently working with a team to revise a regional water budget model (WaterSim) of the central Arizona region.

2. What are the key challenges, missing opportunities, and exciting developments in your theme and region?

Challenges:

- Quantification of uncertainty inherent in a model as opposed to uncertainty defined by known uncertainty about future of social and environmental factors.
- The techniques and tools to visualize multi-dimensional (more than 4) results of urban model output and to visualize the uncertainty in such results is very limited.
- Lack of quantitative tools to do analysis across multiple scenarios (100s), particularly spatial model results.

Exciting Developments:

- Anticipatory Governance that embraces uncertainty rather than trying to reduce it, allowing uncertainty not only to exist in model results, but is needed in order to provide foresight and anticipation.
- Urban Land Institute region Reality Check visioning efforts in various regions of the US.
- Computers are getting faster and hard drives bigger!

3. Why are we not seeing more studies on smaller urban areas?

- Lack of funding either at smaller governmental units or ability to do multiple small studies at larger governmental units.
- Error becomes bigger at smaller scales, modeling of small scale processes is more prone to uncertainty than large scale.

4. What platform/data/access limitations do you currently/frequently encounter?

- Data sets are becoming bigger and moving them around and backing them up becomes difficult. Any data set that is larger than 25GBs has no common platform for easy transportation. To large for blue ray and DVD, network is to slow. Requires a portable drive.
- High Res remote sensing data sets though now widely available in place and time, can get expensive limiting how much place and time you can actually obtain.
- Quality, availability, and standards of formatting and content of transactional data (home-land sales, water use, electrical use, sewer flows, etc) varies widely from one jurisdiction to another and in some case, no historical data is available.

5. How do these limitations affect our ability to monitor, model and forecast urban areas?

- Makes it difficult to translate a project developed at one scale, place and time to another.

6. What do you see as missing in terms of case studies and methods?

- Standard methods for addressing uncertainty within models.
- Standard methods for defining, reporting, and visualizing uncertainty of factors used as input and that are output from urban and resource models.
- See advanced scenario methods from 2. Above.