Panel 3. RESAMPLING AND REMAPPING PROCEDURES

"Discussion should take into consideration effects on correction, calibration data, and validation efforts. Discussion should also include ideas for better characterization of the MODIS bands based on utilizing information from the 'bowtie' effect, and how the bowtie effect affects level 2 processing."

Panelists: Alan Strahler, Moderator; Steve Ungar, John Barker, Dorothy Hall, Al Fleig, Ian Barton, Frank Hoge, Mike King, Dave Diner (or designate).

Goals and Objectives
- * Review bowtie effect and implications for MODIS production lines
- * Examine resampling issues

Policy Issues/Follow-ons
- * Do we need a standard for resampling MODIS products at various levels?
- * Are there community research issues? If so, how do we resolve them?

Discussion Outline:

I. Bowtie Effect
- * Review of bowtie effect
- * Interdetector calibration via the bowtie
  - -- Select pixels along scan where detectors in different rows see same FOV via bowtie overlap, compare
- * Will topography influence the bowtie effect?
- * Does latitude matter? (E.g., TM scan gaps)
- * Pixel-by-pixel processing of 1B to Level 2 will include redundant work because of bowtie overlap
  - -- Is it unavoidable? Does it matter?

II. Resampling -- Heritage
- * EDC Phone Comments (Dan Steinwand)
  - -- Nearest neighbor (NN), bilinear (BL), cubic convolution (CC), damped 16-pt sinc (sinx/x) (D16S), restoration kernels, all available
  - -- CC used in registering to control pts
  - -- Users seem to want NN, but may not be well informed
- * CCRS Phone Comments (Burt Guindon)
  - -- Resampling done by Geocomp (operational system) by MDA
  - -- Uses 1-D damped 16-pt sinc with 3 passes

III. MODIS Resampling to Level 3 Grid
- * When to resample for multitemporal algorithm?
  - -- Choice 1: Algorithm can work with binned (unresampled) 2G data
    - ++ Level 2 ==> 2G (binned to grid) ==> 3 (resampled) ==> map projected (resampled again)
    - ++ Requires only resampling output of algorithm
  - -- Choice 2: Algorithm works with resampled Level 3 data
    - ++ Level 2 ==> 3 (gridded and resampled) ==> map projected (resampled twice)

++ Requires resampling ALL input data
* How to resample, Level 2 to Level 3
-- 3 input grids (this scan, previous, next), 1 output grid
-- D16S or CC best?
* How to resample, Level 2G to Level 3
-- Anything but NN is very awkward
-- Others require attaching geolocation data to observations

IV. Resampling from Level 3 Grid
* Resampling for map projections from Level 3 Grid
-- D16S for continuously-varying products (e.g., VI)
-- NN for categorical-type products (e.g., Land Cover)
* Regridding for other grids
-- E.g., from fine equal-area grid (ISSCP) to coarse equal-angle grid
-- What type of resampling to use? Or is this the user's problem?
* Are these DAAC issues?

V. Implications for validation
* Pixel-to-ground-point validation
-- What error is induced by resampling? Is it important?
* Instrument-to-instrument comparisons
-- How are these affected by resampling and registration error?