

Land Use Land Cover Change Scenarios and Projections From the Perspective of the Department of Defense

Dr. John A. Hall
ODUSD(I&E)/Science and Technology Directorate

Workshop on U.S. Land Use/Land Cover Scenarios
and Projections

June 25, 2014



SERDP
DOD • EPA • DOE



ESTCP

Information Sources

Cyrena Eitler, Compatible Use Program Lead & Program Manager
Office of Economic Adjustment, ODUSD(I&E)

Interest: Community assistance associated with the
effects of Base Realignment and Closure (BRAC) and
Joint

Land Use Planning to ensure compatible development

Kristen Thomasgard, Program Director, Readiness and
Environmental Protection Integration (REPI) Program,
ODUSD(I&E)/Basing Directorate

Interest: Off-installation solutions for resolving
environmental compliance issues

Dr. James Westervelt, USACE, Engineer Research and
Development Center, Construction Engineer Research
Laboratory

Interest: “Past” BRAC forecast planning for the US Army

Uses: Past/Future

- Joint Land Use Study planning processes
 - ❑ Guide compatible civilian development within designated footprints that may impact military operations
 - ❑ Potentially enable shared assumptions for climate change vulnerability assessments, preparedness, and adaptive responses

- Base Realignment and Closure/Force realignment
 - ❑ Provide community assistance to adjust to previous rounds of BRAC
 - ❑ Prepare for future rounds of BRAC if and when they are Congressionally authorized

- Sentinel Landscapes
 - ❑ Rural landscapes that support working lands, conservation and national defense together
 - ❑ Can help to relieve external development pressures that can inhibit military uses of land, water, and air spaces
 - ❑ Subject of a Memorandum of Understanding between DoD, DOI, and USDA

Temporal/Spatial Scales

- Past:
 - Temporal: Snapshot or ~5 years
 - Spatial: Immediate surrounding area (to installations and ranges; under air space) and county-level

- Future:
 - Temporal: < 20 years (prediction), 20 to 50 years, and 50+ years (scenarios)
 - Spatial: landscape/regional scales (Sentinel landscapes); adaptable grid predictions/scenarios of “growth” that correspond to development (land use) changes (community assistance and BRAC planning; Sentinel landscapes)

Drivers of Change

- Water availability/dynamic probabilities of drought (and flood)
- Urban development near maneuver areas and live fire ranges
- Land conversion of farmland/forest land and undeveloped habitat/ecosystems
- Land conversion that increases vulnerability to climate change

Currently Have Availability

- Predicted population growth trends (including population density and land use) at whatever scales it is available
 - ❑ Likely inconsistent across geographic domains
 - ❑ May not explicitly provide desired output variables
 - ❑ Of short time horizon

Like to Have Available

- Working definition: Accessible tools/data to assist DoD and Defense communities in understanding predicted (< 20 years) and plausible (scenarios 20+ years and out) population growth trends and their associated effects on land conversion and use for geographic areas (perhaps via an adaptable grid approach) surrounding installations and ranges and underlying training air space to guide compatible civilian development, foster Sentinel landscapes and their effectiveness, and increase resilience to and reduce the vulnerability to the potential effects of climate change

Output Variables

- County-level (now) and adaptable grid (future?) estimates of population growth and land-use change
- Large rural landscapes spatially explicit risk of development
- Rural landscape values with respect to value of working lands to rural economies, conservation, and military mission protection

All of the above in the context of those areas surrounding military installations and ranges and underlying training flight routes

Workshop Outcomes

- **Short-term:** Identify best practices for County-level predictions and scenarios of population growth and associated changes in land conversion and use
- **Long-term:** Identify path forward to develop an adaptive grid approach for providing relevant population growth and land conversion/use predictions/scenarios at the “right” spatial scale