Agricultural Research Service Air Quality Research Activities Update

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National Program Leader

Agricultural Air Quality Task Force Meeting
May 10, 2007

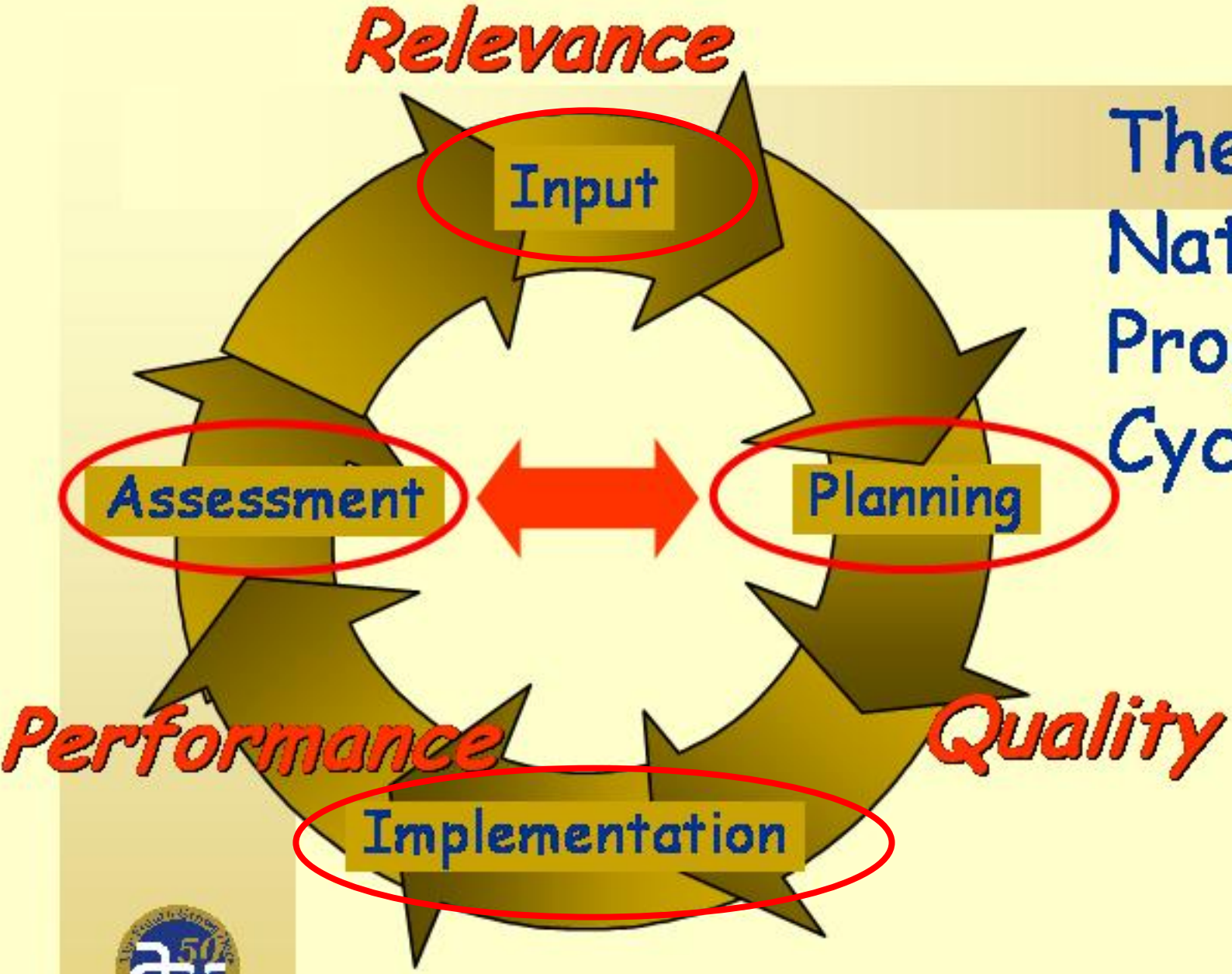
Program Components

- Particulate Emissions
- Ammonia and Ammonium Emissions
- Malodorous Compounds
- Ozone Impacts
- Pesticides and Other Synthetic Organic Compounds

Program Activities

- 4th USDA Greenhouse Gas Conference
- Customer workshop, Lubbock, TX
- Accomplishment Report Data Call
  - Air Quality Program
  - Global Change Program
  - New Report Format

The ARS National Program Cycle



Recent Activities

- Beltsville, MD Project redirected to 100% Air Quality Research (4 SYs)
- Pullman, WA SY Air Quality research time increased to 80%
- Kimberly, ID SY Vacancy includes air quality as a significant component

Dairy Air Quality Experiment
May 2007

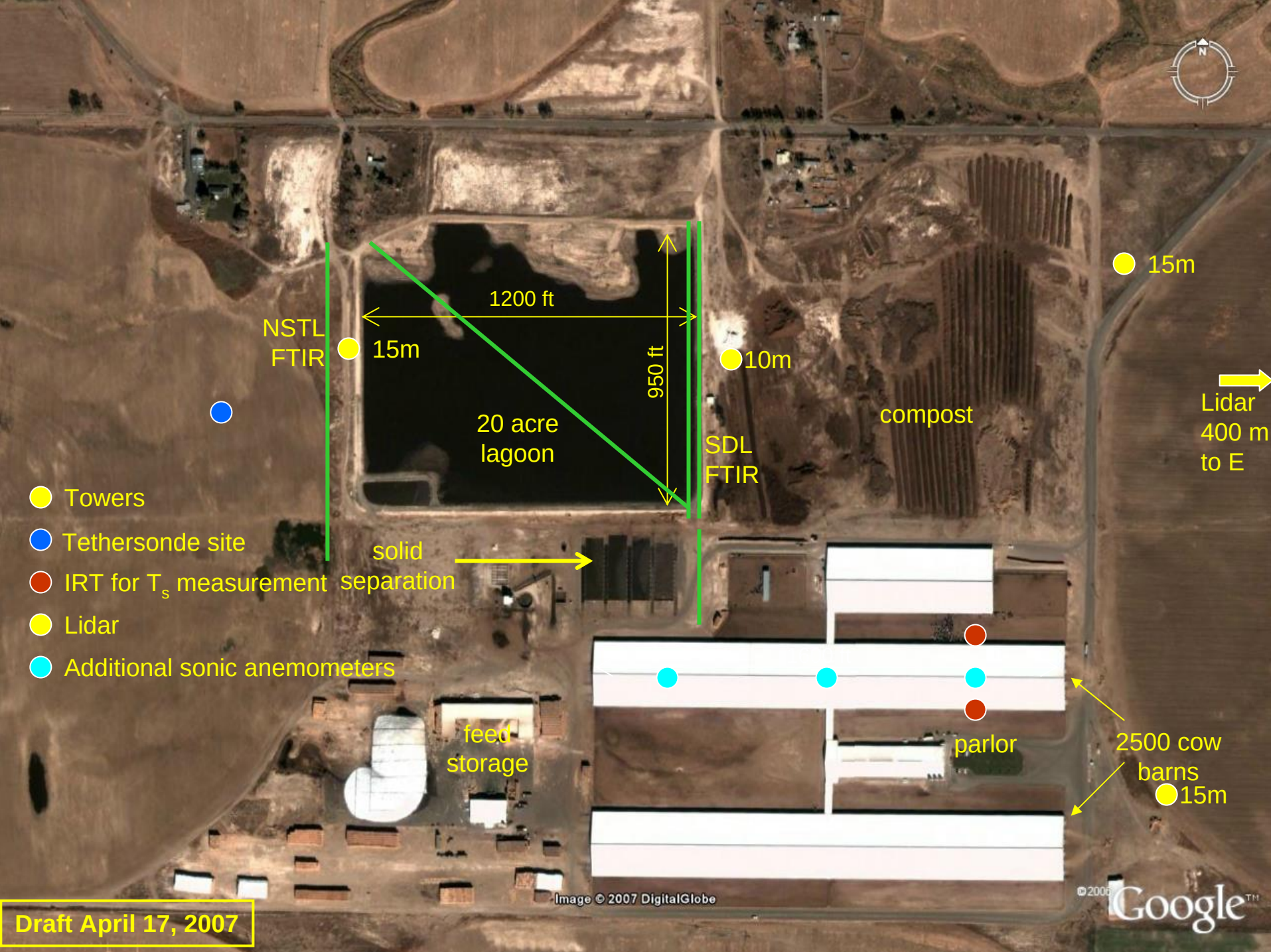
- Kimberly, ID dairy
- ARS National Soil Tilth Lab, Ames, IA
- ARS Northwest Irrigation and Soils Lab, Kimberly, ID
- Space Dynamics Lab, Logan, UT
- University of Idaho, Moscow, ID

Dairy Air Quality Experiment Objectives

- Evaluate LIDAR for emission and transport of particulate plumes from dairy sources
- Assess interaction of gas and PM movement for fate & transport studies
- Assess impact of atmospheric stability and wind shear stress on plume dispersion characteristics
- Assess off-site movement of PM and gases with micrometeorological and LIDAR measurements

Dairy Air Quality Experiment Outcomes

- Basic data on plume dynamics emitted from different locations within a dairy operation throughout a day
- Relationships between management operations and plume dynamics (particulate, dispersion, emission).
- Simultaneous data on characteristics of gas dispersion within a section of the plume with micrometeorological observations.
- Understanding of how spatial/temporal variation of the turbulence field within a dairy operation footprint affects plume dynamics (emission, dispersion, transport).
- Definition of unique micrometeorological signatures within patterns of observed particulate and gaseous plumes for transferability to other agricultural operations and systems.


1200 ft
950 ft
NSTL
FTIR
15m
10m
15m
20 acre
lagoon
SDL
FTIR
compost
Lidar
400 m
to E
Towers
Tethersonde site
IRT for T_s measurement
Lidar
Additional sonic anemometers
solid
separation
feed
storage
parlor
2500 cow
barns
15m
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Dust Abatement Device