Utah Division of Air Quality:
Air Quality Research Roadmap (AiR^2) 2018 Results

PM2.5 CHEMISTRY AND PRECURSOR GASES

- Improved understanding of PM2.5 and ozone formation – chemistry
- Chemistry – better inform inventory, better mechanisms
- Need to balance the inventory with measurement – ammonia, diesel emissions, tampering with vehicles, source attribution
- Radical sources and impacts

PM2.5 SOURCE CONTRIBUTIONS

- Source contribution to PM2.5 and ozone – sources

EMISSIONS SOURCES AND THEIR IMPACT ON OZONE FORMATION

- Speciated VOCs
- Background ozone – better accounting for these concentrations, regional issue, impact on meeting federal standards

AIR EXCHANGE PROCESSES AND POLLUTANTS TRANSPORT

- Wintertime meteorology – better understanding
- Transport – how to better understand
- Transport and chemistry from the GSL
- Better understand meteorology

AIR QUALITY MODELING AND EMISSIONS INVENTORY IMPROVEMENTS

- Better characterization of emission sources
- Inventory improvements – regional differences
- Inventory – long term inventory at spot locations, blend more in-depth inventories with this
- Bridge gap of inventory with modeling
- Better models – inventory source apportionment, model of human exposure, historical exposure
- Quantifying Uncertainty – inventory and models
- Better modeling – centrally available model , historical, multiple components
- Need for traffic related emissions –better emission policies, planning for roads
- Modeling – impact of individual control strategies, atmospheric chemistry occurring
- Importance of emissions inventory
- Improve met and photochemical simulations
- Better understanding of the role of radicals and snow chemistry

URBAN AIR POLLUTANTS AND THEIR EFFECT ON HUMAN HEALTH

- Translate sensor data into impacts on health
- Ambient exposure assessment – at home exposure should be better characterized
- PM2.5 health effects- acute exposure
- Emphasis on susceptible populations
- Outdoor vs. indoor exposure
- Air pollution exposure impact on childhood development
- Better quality granular data for health studies – machine learning, distinction between emissions and exposure
- More significant urban impacts

INTERSECTION OF AIR QUALITY AND HUMAN BEHAVIOR

- Human behavior and social science – behavior change
- Inland port – need input to policy makers, assessments for large development projects
- Align what we do locally with what is wanted at federal level
- Economic impacts of poor air quality
- Long term economic impacts of air quality
- Air quality impact on human behavior – how are people changing their behavior based on forecast of air quality
- Public involvement, outreach and education
- Immediate air quality relief program – change behaviors when events are happening
- Better messaging – more effective ways to communicate
- Communication – better job about communicating science to public and health professionals
- State policies better targeted to individual behavior
- Social economic dimension of poor air quality impacts and solutions
- Research dissemination among scientist to public

INSTRUMENTATION AND METHODS

- Need for understanding how to have monitoring network with more granular data
- Better mapping of exposure
- Emerging technologies – satellite etc.
- Increased granularity of data – better spatial but esp. temporal resolution
- Citizen science measurements – better understanding of uncertainty, strategically deploy low cost sensors
- Increase spatial coverage of measurements and observations

EXCEPTIONAL EVENTS AND THEIR IMPACT ON AIR QUALITY

- Wildfires – transport and chemistry
- Better characterize exceptional events – wildfires, wind and dust
- Dust emissions and transport – increased drought impact of dry lake beds and dust
- Flagging exceptional events in real time
- Better info about wildfires

OTHER[i]

- Find an expert – who to reach out to in each field
- Central data repository – uniform data format
- Climate change – impact on air quality

[i] These topics and ideas may not fit with the finalized list of FY2020 Goals and Priorities; however, they are useful topics and ideas for UDAQ to consider.