Appendix III-b6. Responses to question #14 of the questionnaire.

14. Present up to 3 key atmospheric sciences questions that NARSTO should focus on for the next decade.

Responder Comment(s)
Number

Q # 5 1. = Ecosystem Effects; 2. = Finding Mutually Beneficial AQ Management and Climate Change Policies; 3. = Monitoring Networks

Q # 7 1. = What is the role of nitrogen compounds in air pollution?; 2. = Has acid rain been addressed?; 3. = Can US/Canada/Mexico take a unifying approach to visibility?

Q # 8 1. = hemispheric transport; 2. = toxic chemicals; 3. = nanomaterials

Q # 9 1. = To what degree are commonly measured air pollutants surrogates for other pollutants/sources; 2. = How much do we actually know about the interactions of climate change and air pollution

Q # 11 1. = Asessment of climate change potential for emerging substance such as NF3; 2. = Atmospheric Pathwatys for air toxics in North America; 3. = Re-Emission of Stockholm Substances into North American Atmosphere.

Q # 13 1. = Air Quality Model Performance Evaluation; 2. = State of Science of Climate Models; 3. = State of Science of Regional Climate Models.

Q # 14 1. = HAPs; 2. = Model evaluation; 3. = International consistency in standards.

Q # 15 1. = Efectos del cambio climÃ¡tico en la calidad del aire; 2. = Control de contaminaciÃ³n por ozono (control de sus precursores); 3. = Control de contaminaciÃ³n por partÃ-culas 1. Climate change effect in the Air Quality. 2. Air pollution control fo rozone (precursors) 3. Air pollution control for particles.

Q # 16 1. = charactarizing carbon sources in context of climate change and PM air quality; 2. = improving and linking aerosol processes in both air quality and climate models ; 3. = ongoing improvements to emission inventories including validation

Q # 18 1. = Climate/Air Quality Interface; 2. = Intercontinental Transport ; 3. = Reactive Nitrogen

Q # 19 1. = How can we better integrate and apply our assessment tools across multiple spatial scales?; 2. = How can we more rapidly update emissions factor and activity data as these rapidly change?

Q # 22 1. = Climate Change and Air Quality interaction; 2. = Next generation adaptation of multi-pollutant, accountability, and risk based air quality management tools; 3. = Air Quality/Health Impacts of new biofuels

Q # 23 1. = Trans-Global Atlantic and Pacific transport, deposition and impact; 2. = Ongoing work to standardize international models and monitoringnmethods as well as securing/ensuring that key world canary sites are maintained and linked to satellite data acquisition and interpretation; 3. = Support and promote atmospheric issues intergration. Energy, extraction, transport, transformation and oxidation is the foundation of our standard of living. These activities are the source of adverse anthropogenic air quality issues. As well as their overall environmental impact is substantial. They cannot be treated effectively and economically in isolation.

Q # 24 1. = How will boundary layer atmospheric chemistry be affected by energy policies addressing climate change?; 2. = What are the key near source, near roadway atmopsheric transformations that should be incorporated at a sub grid scale level within larger framework of current regional air quality model systems.; 3. = How can oour observation programs be better levergaged and aligned to address the multiple sptial scale, multiple pollutant and multiple media environmental challenges

Q # 25 1. = What have been the air quality impacts of ozone and fine particle pollution control measures in the eastern US since 1990, and what are the most important sources of the remaining problems?; 2. = What are the impacts of trans-boundary transport on North American air qualtiy, and what improvements in data or analytical tools would be most important in improving our understanding of these impacts?; 3. = What can be done to improve the estimates of ammonia emissions in North America and to better assess the effect of those emissions on air quality?

Q # 26 1. = climate change and air quality; 2. = public policies and air quality; 3. = capacity buiding in Mexico

Q # 27 1. = Provide help to Mexico on virtually an AQ problem you can think of.

Q # 28 1. = Making air quality models relevant to changing climate; 2. = supporting appropriate climate change and air quality policies with strong science

Q # 29 1. = Climate change affect of green house gases on the atmosphere; 2. = air quality modelling for policy development; 3. = technology transfer of atmospheric knowledge.

Q # 30 1. = intercontinental transport; 2. = NAAQS attainability/background-threshold issues; 3. = exposure assessment

Q # 31 1. = Continued attention to fine particulate matter; 2. = More work on integration of science into policy

Q # 32 1. = Air quality management and climate change - linkages and opportunities for co-benefits.

Q # 33 1. = The intersection of air quality and climate - several dimensions - 1) How climate strategies will/could affect air quality; 2. = 2) How air strategies affect climate and how climate change will affect air quality; 3. = International transport of air pollutants

Q # 34 1. = Determine the airborne particles toxicology considering both composition and gravimetric parameters; 2. = Discuss the results obtainded by passive monitors, and select other parameters related with toxics; 3. = Carbon and nitrogen cycle are affected by air pollution and Climate change, we need determine some structure and functional indicators

Q # 35 1. = Multi pollutant management; 2. = Climate Change adaptation modelling.

Q # 37 1. = global change effect on air quality; 2. = new fuels impact on iar quality

Q # 38 1. = Linkages between climate change and air quality; 2. = Air Toxics

Q # 39 1. = Impact of environmental pollution on human health and the ecosystem, 2. = Standardize the emission inventory, 3. = Create a fund to support projects of research by involving the three countries.

Q # 40 1. = estimates of present and future transport of polltion across national boundaries; 2. = evaluation of the costs and benefits of a NARSTO-wide emissions trading program for CO2, other regional pollutants

Q # 41 1. = Characterization of mobile emissions; 2. = long-range trasnport of pollutants; 3. = Secondary organic aerosol formation

Q # 43 1. = International transport of particulate matter; 2. = International transport of ozone and ozone precursors.

Q # 44 1. = Transcontinental transport of pollutants; 2. = Interactions between climate change and air quality.

Q # 45 1. = Urban/local scale atmospheric processes - meteorology, chemistry and physics and links to human exposure.; 2. = Accomplishment of significant improvements in emissions information across sectors, including small emitters and based upon measurements that evaluate emissions and improve emission factor models. Must be capable of projecting emission changes that arise from GHG reduction strategies.; 3. = Development of new environmental monitoring concepts, pertaining to the atmosphere and the ecological and human resources that are impacted, that better track progress and true sustainability.

Q # 46 1. = How will various emission control strategies affect attainment of the new 1-hour ozone standard?; 2. = Which ozone control strategies will synergistically reduce (or at least not increase) PM formation?; 3. = Why are average ozone levels regionally increasing, while peak ozone levels in urban areas are decreasing?

Q # 47 1. = Climate-air quality interactions for ozone and PM; 2. = Climate and Mercury interactions as well as climate-ecological impcats interactions; 3. = Long-range transport into and out of North America Continent

Q # 48 1. = climate - air quality interactions; 2. = multipollutant strategies.

Q # 50 1. = Inter-regional transport; 2. = Observational methodology for atmospheric aerosols [particulate and gas phases] that provide fundamentally correct information. This would enable interchangeable applications for concerns about health, visibility and radiative balance.

Q # 51 1. = impacts of aerosols on climate; 2. = impacts of air pollution on ecosystem; 3. = integrated assessment of air quality and climate change co-benefits

Q # 52 1. = Urban air pollution (O3, toxics, PM) and human exposures; 2. = Atmospheric chemical mechanisms - how do they compare? are they adequate to address current problems?

Q # 54 1. = Climate change science and policy assessment including mitigation and adaptation strategies; 2. = Emissions changes with emerging energy technology and policy; 3. = Sustainability of renewable fuels, life-cycle considerations, muliti-pollutant atmospheric and deposition considerations.