PRELIMINARY MODELING APPLICATION OF COMMUNITY MODEL CMAQ TO CENTRAL REGION OF THAILAND

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INTRODUCTION

- Air quality modeling (AQM): Useful tool for studying air pollution problems
- Objective: Examine the application potential of CMAQ (CMAS, 2005) for AQM of Thailand
- Scope:
  - Meteorological modeling (MM5) (MM5, 2005)
  - Emissions work (Developed codes + Spreadsheet + GIS)
  - Photochemical-transport modeling (CMAQ)
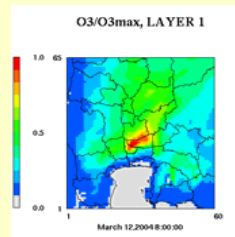 - O3 simulation (simplified) during a short summer period
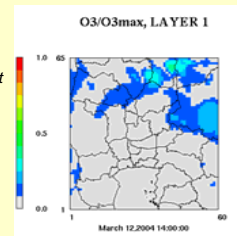

Thailand map and CMAQ domain

IMPLEMENTATION

- 7-day simulation during Mar. 08-14, 2004
- MM5 modeling:
  - A set of archived global analysis data (NCEP, 2005) used to suggest initial and boundary conditions
  - No assimilation performed
- MCIP (CMAS, 2005) processing
- CMAQ simulation (6km gird size)
- Emissions work includes:
  - Consulting literature and databases (see References)
  - Technical developments for preparing and processing emissions
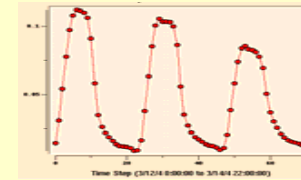
EXAMPLE RESULTS

a) Distribution of O3 at UTC Hr. 800, Day 5

b) Distribution of O3 at UTC Hr. 1400, Day 5

CONCLUSIONS

- Limited resources, leading to several technical simplifications in the study
- Incorporation of more emissions details needed
- CMAQ: Potential model for use in air quality study of Thailand:
  - Open-source model and its ready access without cost
  - Large community of users
  - Continued development and technical support
- Possible utilization of information available from recent literature and databases for AQM of Thailand

c) Time series of domain-wide average O3 level (in ppmV) for final three simulation days

ACKNOWLEDGEMENTS

ADDITIONAL INFORMATION

- Extended abstract
- http://www.prism.gatech.edu/~km110

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