Establishment of a Community Modeling and Analysis Support Mechanism

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CMAS: A Community Modeling Support and Analysis System

- Models-3/CMAQ and Community Support Needs
- Establishment of the CMAS
- CMAS Objectives and Advantages
- CMAS Organization
- CMAS Model Review and Approval
- Plans for Initiation of Services

Models-3/CMAQ and Community Support Needs

- Models-3/CMAQ (Community Multiscale Air Quality) modeling system designed to be a community based model
- Open source, modular code with unified chemistry (one-atmosphere approach) intended to encourage collaborative development and linking of modules for meteorology, air emissions, air chemistry and transport, hydrology and ultimately, health effects

Models-3/CMAQ and Community Support Needs (2)

- **Early recognition that Models-3/CMAQ updating and maintenance was too great for one entity**
- **Models-3/CMAQ community modeling workshop (1997) concluded community modeling needs:**
  - **Representation by all sectors of the community**
  - **Provision of user support**
  - **Well-documented, tested open code**
  - **Review and testing procedure for improvements**
  - **A means to share user ideas and data**
  - **Inclusion of user-requested applications and research**

Establishment of CMAS

- **Mechanism: Cooperative Research Grant to MCNC Environmental Modeling Center**
  - **Began October 9, 2001 for four years**
  - **Plan to be self-sustaining (independent of grant) within four years**
  - **Membership based organization**
  - **Will provide model software and basic support free to the modeling community for Models-3/CMAQ, SMOKE emission model and MIMS multimedia modeling framework**
  - **EPA (and others) will provide model improvements to CMAS for distribution**

CMAS Objectives

- **Outreach to the modeling community (information transfer and collaboration) by means of:**
  - **Website and list servers**
  - **Conferences, seminars and workshops**
  - **Technical working groups**
  - **Input from the External Advisory Committee**
  - **Printed and electronic materials**
  - **Collaboration with professional groups**
  - **Technical Reports**
  - **Newsletters**
  - **Site visits**

CMAS Objectives (2)

- **Growth of the user community – encouragement of both regulatory and science model development groups**
- **Provision of clearing house functions**
  - **Sharing of air quality modeling-related data sets (without replication of existing capabilities)**
  - **Release of Models-3/CMAQ, SMOKE, and MIMS improvements and corrections after 2002**
  - **On-line bug tracking system**

CMAS Objectives (3)

- **Education center for modeling community**
  - **User support via web pages, e-mail lists and help desk for Models-3/CMAQ, SMOKE emission model and MIMS framework**
  - **Training for users including modeling applications, data preparation, building of model components, and evaluation of model configurations**
- **Maximize results by leveraging the contributions of multiple partners**
  - **Model science and computational content from many contributors**
  - **Enhanced support and training services made possible by spreading costs over multiple members**
  - **Consistent thorough testing of new modeling components**

CMAS Objectives (4)

- **Provision of computer and science skills**
  - **Advanced tools to build models, develop data sets and analyze modeling results**
  - **Model products, data sets and support at no cost**
  - **Limited additional services may require fees**

CMAS Advantages

- **More and faster advancement of air quality modeling because of multiple contributors of new science and model code**
- **Provision of common reference points for comparison of model code and data sets**
- **Ease of access to through model support**
- **Cost efficiency created by pooling of resources of multiple members**
- **Reduced costs per member organization for a given modeling improvement**

CMAS Organization

- **Counseled by External Advisory Committee (EAC)**
  - **Composed of 18 representatives of modelers from the States, Regional Planning Organizations, EPA, Industry, Academia, Consultants, and includes non-United States members**
  - **Defines community modeling needs and priorities for CMAS**
  - **Sets research and development priorities**
  - **Staggered two-year terms, with some rotation each six months**
  - **Currently creating bylaws and protocols for model testing and acceptance**

CMAS Organization (2)

Current EAC Membership

Mark Evangelista (EPA/OAQPS)
Darrell Winner (EPA/OEI)
Pete Breitenbach (Texas TRNCC)
Shiela Holman (NC DEHNR)
Alan Hansen (EPRI)
Daewon Byun (Univ. of Houston)
Christian Seigneur (AER Consultants)
John Vimont (WRAP)
Weimin Jiang (NRC- Canada)

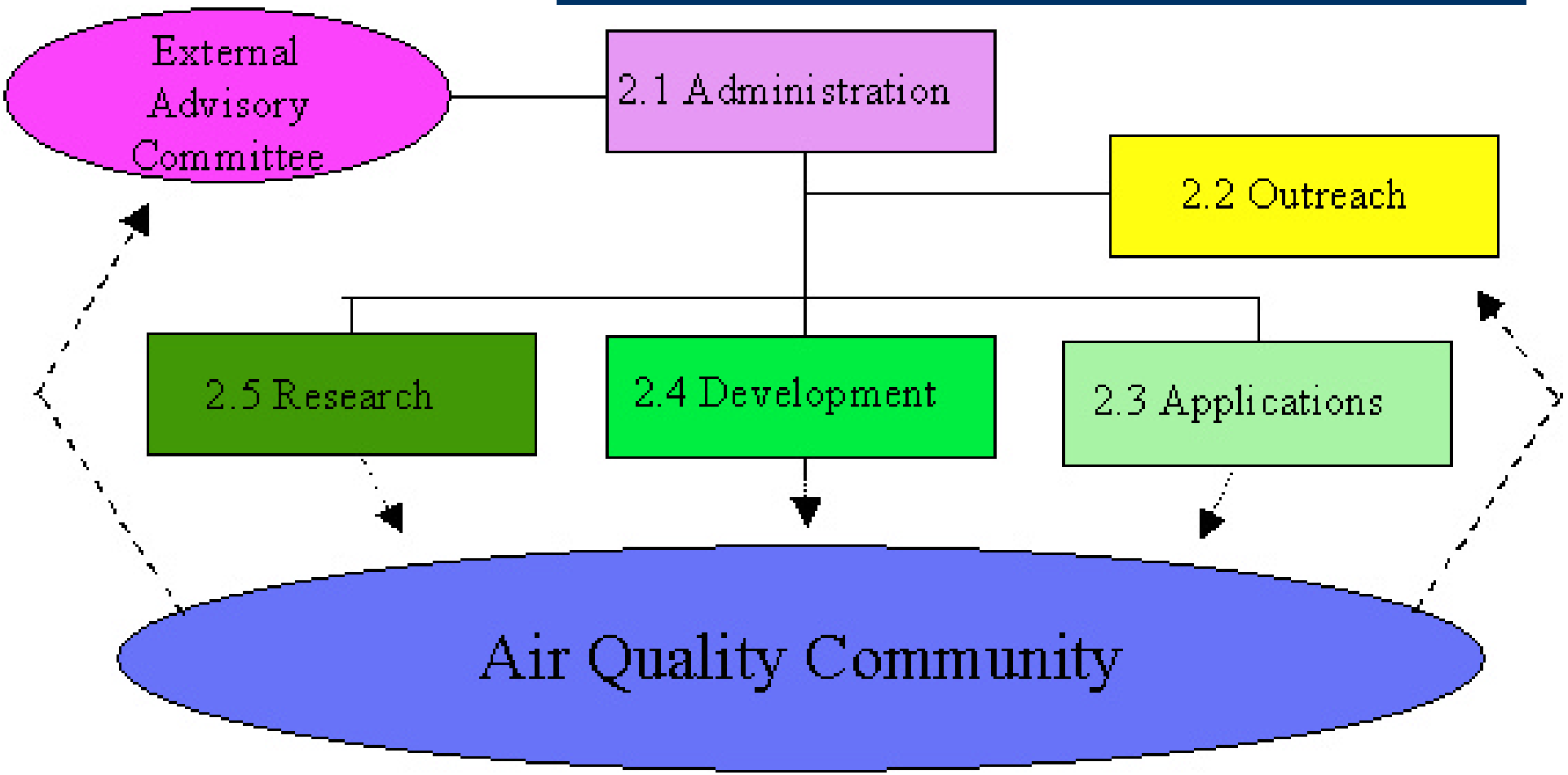
Kenneth Schere (EPA/ORD)
Alan Cimorelli (EPA/Region3)
Kaduwela Ajith (CARB)
David Chock (Ford Motor Co.)
Harvey Jeffries (Univ. of NC)
Ralph Morris (Environ Inc.)
Michael Koerber (LADCO)
Richard Derwent (UK)
Neil Wheeler (Sonoma Technology)

CMAS Organization (3)

Five Functional Areas

- **CMAS Director (Administration) – Mr. Robert Imhoff**
- **Outreach Coordinator (Mr. Robert Imhoff and Dr. Adel Hanna**
- **Research Coordinator (Dr. Rohit Mathur)**
- **Software Development Coordinator (Ms. Alison Eyth)**
- **Applications Support Coordinator (Mr. Zachiarah Adelman**

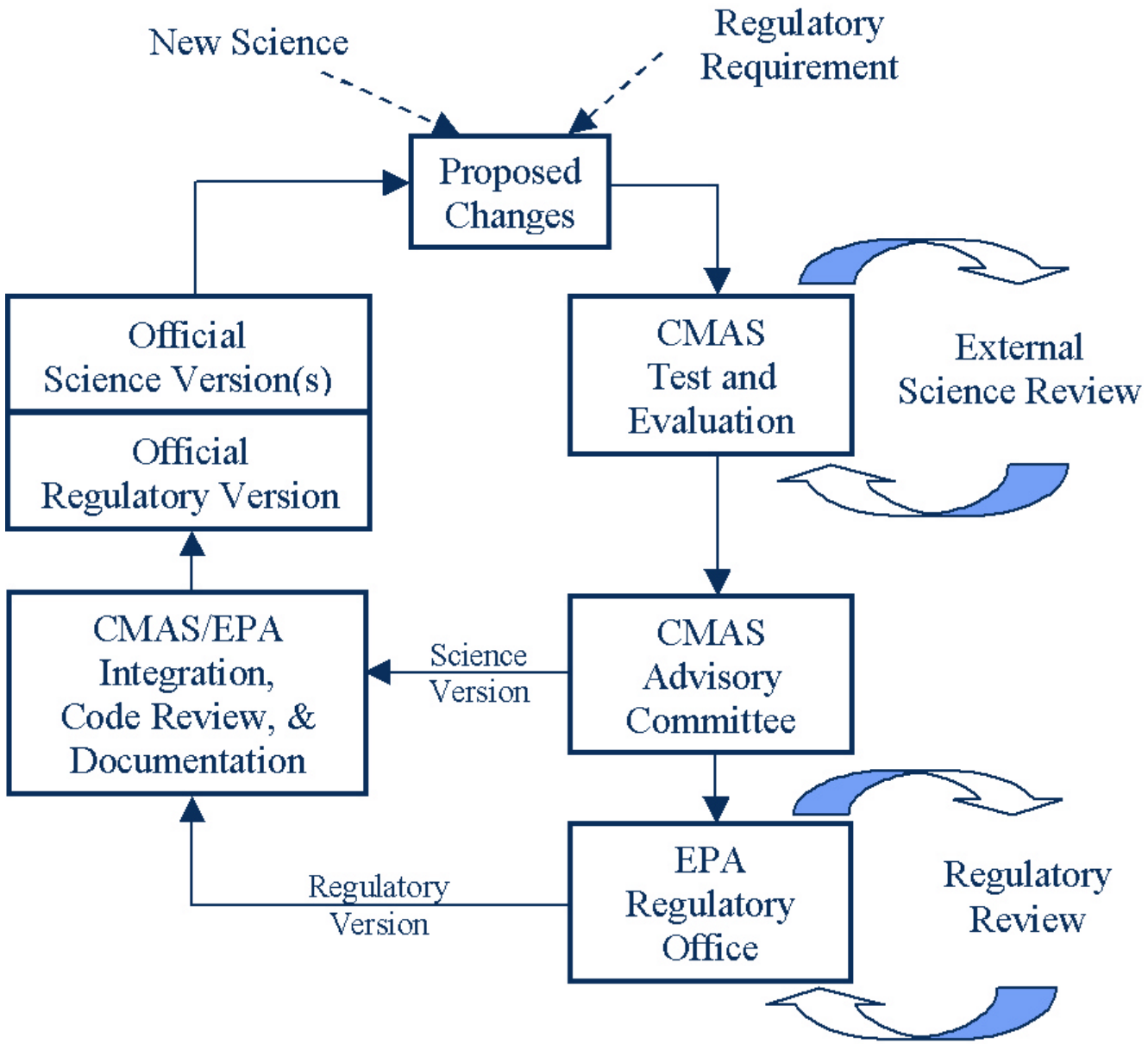
The Relationship of CMAS Functional Areas



Model Review and Approval

- **Process for model review, testing, and approval for release is being drafted for EAC review**
- **Multiple versions of Models-3/CMAQ for different purposes likely**
- **EPA will retain approval for model configurations acceptable for regulatory use**

CMAS Software Development and Implementation



Initiation of CMAS Services

- **First year (2002)**
  - **Establishment of structure and operating procedures**
  - **Planning of membership provisions**
  - **Implementation of Model support (summer)**
- **Second year (2003)**
  - **Begin periodic releases of Models-3/CMAQ updates and documentation**
  - **Begin provision of training for Models-3/CMAQ, SMOKE, and the MIMS framework**
- **Third year (2004) and beyond**
  - **Begin research and applications as resources allow**

Information Sources

- **CMAS (site under development)**
  - **www.emc.mcnc.org/cmas/**
- **Models-3/CMAQ (currently)**
  - **www.epa.gov/asmdnerl/models3/**
- **MIMS**
  - **www.epa.gov/asmdnerl/mims/**
- **SMOKE**
  - **www.emc.mcnc.org/products/smoke/**

Conclusion

CMAS is an organized cost-effective, collaborative means by which to maximize improvements to Models-3/CMAQ and related modeling software, the result being greater than the sum of individual contributions.