

Cyberinfrastructure for the Atmospheric Sciences in the 21st Century

September 2003

The following is a draft outline of the report being prepared by the Ad-Hoc Committee on Cyberinfrastructure for Research and Development in the Atmospheric Sciences (CyRDAS; sponsored by the National Science Foundation) for release in early 2004. The charge to the committee as well as background information for this report may be found at www.cyrdas.org along with an open letter to the atmospheric sciences community inviting input and comment on this vital topic.

The report of the CyRDAS Committee is, at this time, composed primarily of the outline that follows. During the month of October 2003, the Committee hopes to obtain the broadest possible input from the atmospheric sciences community through a series of regional focus group meetings, an input form on the web site and email. Members of the atmospheric sciences community with an interest in the shape that cyberinfrastructure takes in the future are strongly encouraged to review the draft outline, as well as the background documents and the list of questions posted at www.cyrdas.org, to determine (1) what aspects of the issues that are mentioned there are of critical importance to them, and (2) what important issues have been omitted from the outline. The CyRDAS Committee aims to develop a comprehensive report that can serve as a first step towards developing a process to plan for cyberinfrastructure investments in the coming decade.

We look forward to your thoughtful input on this important question.

The CyRDAS Committee

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EXECUTIVE SUMMARY

1. INTRODUCTION
2. BACKGROUND
 - 2.1. Cyberinfrastructure – ideas, tools and people
 - 2.2. Scientific challenges and opportunities
 - 2.2.1. Questions arising in computational modeling and data analysis
 - 2.2.2. Challenges for the coming decade
 - 2.3. Educational requirements
 - 2.4. Related reports' recommendations applied to atmospheric science
 - 2.5. Frustrations with CI: barriers to progress in atmospheric sciences
3. ISSUES
 - 3.1. Data
 - 3.1.1. Volume
 - 3.1.2. Complexity (format, structure, etc.)
 - 3.1.3. Management
 - 3.1.4. Acquisition and instrumentation
 - 3.2. Knowledge
 - 3.2.1. Metadata
 - 3.2.2. Semantic web and controlled vocabulary
 - 3.2.3. Knowledge discovery and data mining
 - 3.3. Software engineering - modeling frameworks
 - 3.4. Computational and data systems
 - 3.4.1. Commodity processors
 - 3.4.2. Architectures
 - 3.4.3. Embedded systems
 - 3.4.4. Industry directions
 - 3.5. Computation
 - 3.6. Community models
 - 3.7. Human resources
 - 3.7.1. Personnel
 - 3.7.2. Partnerships
 - 3.7.3. Outreach
 - 3.8. Education
 - 3.8.1. Getting data and CI services into classrooms
 - 3.8.2. How to enable CI-aware (IT & computational science) workforce
 - 3.8.3. Bringing domain experts and CI experts together in appropriate venue
 - 3.8.4. Filling the skills continuum between expert users and novices
 - 3.9. Intellectual property
 - 3.10. Integrating scientific information systems and geographic information systems
 - 3.11. Access and availability
 - 3.11.1. Ease of use
 - 3.11.2. Reliability
 - 3.11.3. Standardization
 - 3.11.4. Security
 - 3.12. Intra-agency coordination
 - 3.13. Interagency coordination
4. CONCLUSIONS AND RECOMMENDATIONS
5. APPENDICES