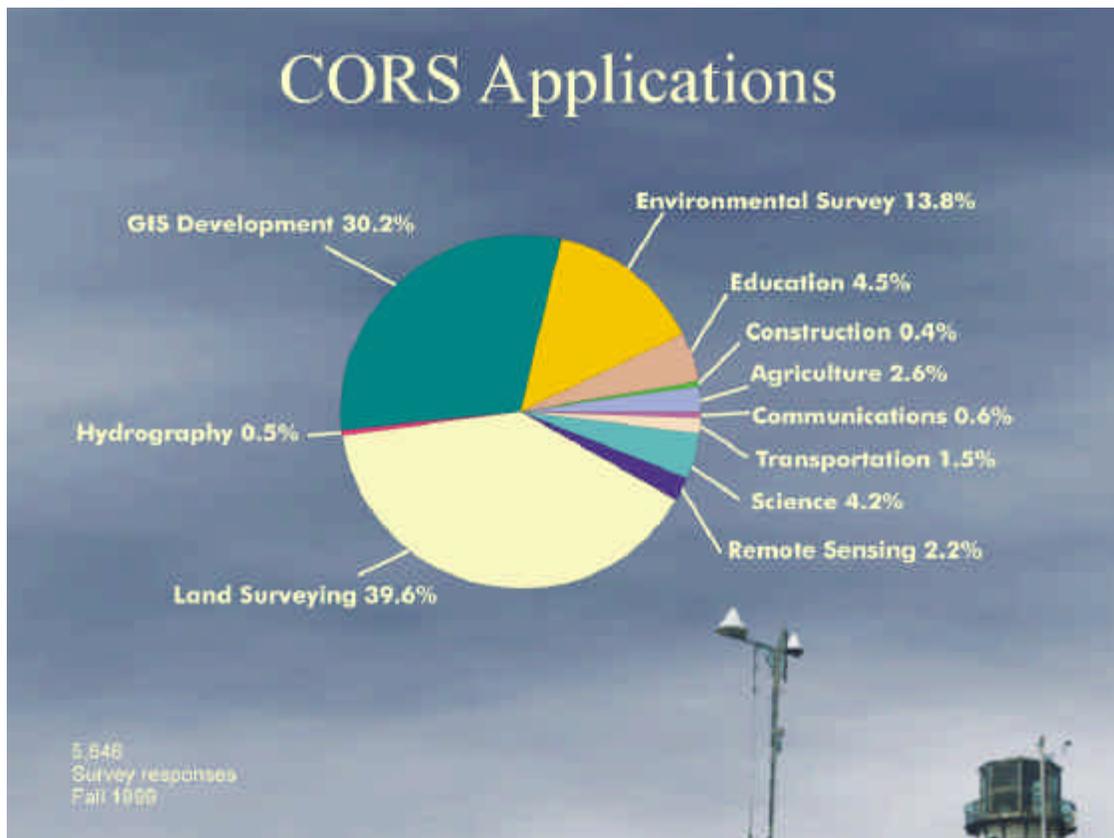




The National Geodetic Survey CORS User Forum



SESSION RESULTS

April 19, 2002

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Executive Summary

Purpose

The National Geodetic Survey (NGS), an Office of NOAA's National Ocean Service, hosted a one day CORS (Continuously Operating Reference Stations) User Forum on Friday, April 19, 2002 in Silver Spring, MD. The Forum focused on how Federal, State and local government agencies, in partnership with international and other public organizations, private industry and academia, can foster coordination among the growing number of CORS subnetworks.

Format/Process

Approximately 95 members of the CORS community participated in the Forum, 61 of which represented some institution other than NGS.

The morning session consisted of seven Information Briefings and a question/answer session with the panel of speakers. These briefings provided overviews of (1) the National and Cooperative CORS Program, (2-4) the CORS Programs in three States: California, North Carolina, and Michigan, (5) the International CORS Program, (6) CORS contributions to weather forecasting, and (7) a view of CORS in the future. PowerPoint slides of the morning presentations may be viewed and/or downloaded at

<http://www.ngs.noaa.gov/CORS/information5> .

This web address also contains PowerPoint slides for an educational presentation, "Introduction to CORS," which has been presented on several occasions throughout the United States.

The afternoon session was focused on gathering user input on the roles and responsibilities of the various players in the coordination of the CORS networks. Specifically, participants were asked to offer their views on the roles of the Federal government, state/local governments, academia, professional organizations, non-profit organizations and private industry. Various tables focused on different aspects of CORS coordination including:

- ~ Applications/outreach/technology transfer
- ~ Data formats/data access
- ~ Reference station operation/Cooperative CORS
- ~ Technical innovations
- ~ Coordinates, orbits and models for accurate positioning

The interactive session was professionally facilitated. Tables of approximately 6-8 users collaborated on the responses to the various roles of members of the CORS community in overall coordination. NGS representatives served as table facilitators. Participants were asked to identify their top 3 roles for each part of CORS coordination in their reports to the entire group.

Common Themes in Roles

This reports provides the documentation of each table's priorities as well as their complete brainstorm listings. The following summary provides highlights of the common themes that emerged for each of the various roles and responsibilities envisioned for each part of the CORS community.

Federal Government

There was overwhelming agreement on the Federal role in the CORS network. All tables referenced the role of providing standards, specifications, and guidelines. Multiple tables offered the role coordinator, facilitator, and communicator particularly across agencies. Furthermore, the Federal government is viewed as responsible for data management and dissemination. The last common theme that emerged was the role of education, outreach, and marketing.

State/Local Governments

Funding of sites was a significant common theme offered for the state and local governments. Furthermore, responsibility for densifying the network by operating/maintaining additional sites emerged as a state/local role. Inter/intra state and federal coordination and information flow was offered by multiple tables as a priority for the states and localities. Finally, the role of outreach, education and training also was highlighted as a key state/local role.

Academia and Non-Profit Organizations

Recurring themes for academia and non-profit organizations included performing research and development, as well as fostering innovative applications. Another common role offered was education and training.

Professional Organizations

Common messages regarding roles for this sector of the community included lobbying to meet user needs. Also, a role in marketing and outreach for the Network was offered by multiple tables.

Private Industry - GPS Vendors

There was a high level of agreement on the roles of the GPS vendors. Participants offered hardware/software development, testing, and training as priorities. Furthermore, research and development, as well as encouraging new CORS applications, were offered in the broader sense as roles for the GPS vendors.

Private Industry - GPS Users

Participants envision the private user sector as the provider of user feedback on CORS products and services. Finally, the private sector is viewed as a potential source for operating/maintaining a subset of CORS sites.

Targets for Coordination

The commonalities and potential overlap of various roles and responsibilities in the CORS system, highlights the need for the strategic coordination among CORS users in the following areas:

- Education, outreach, marketing
- Research and Development
- Site Operation
- Cross level communications and coordination

In an environment of scarce resources, it is crucial that roles and responsibilities in support of effective CORS coordination be well defined and orchestrated toward the same strategic vision. It is recommended that follow on coordination

and planning efforts take place to specifically address those responsibilities of clear potential overlap and/or conflict.

Evaluations

Thirty two evaluation forms were submitted. The rating scale was 1-5 on level of satisfaction (5=highly satisfied). The attendees were 93% satisfied with the overall conference offering ratings of 4 or 5. The morning briefings received a 97% highly satisfied rating of 4 or 5. The interactive session in the afternoon had 81% ratings of a 4 or 5 and 19% with a rating of 3.

Suggestions for next year included providing more time for questions and answers in the morning and expanding the invitation list to include state officials of various agencies. Furthermore, there were several suggestions relating to using the interactive time to more meaningfully engage and involve NGS in the collaborative process.

Information Briefings

- The National & Cooperative CORS Program
Richard Snay, NOAA's National Geodetic Survey
- The California CORS Program
Yehuda Bock, California Spatial Reference Center
- The North Carolina CORS Program
Gary Thompson, North Carolina Geodetic Survey
- The Michigan Spatial Reference Network
Brian Dollman-Jersey, Michigan Dept. of Transportation
- The International CORS Program: Resources for Precise Positioning
Ruth Neilan, International GPS Service
- CORS Contributions to Weather Forecasting
Seth Gutman, NOAA's Forecast Systems Laboratory
- A View of CORS in the Future
Gerald Mader, NOAA's National Geodetic Survey

PowerPoint slides of these briefings presentations may be viewed and/or downloaded at the web address:

<http://www.ngs.noaa.gov/CORS/information5>

Table Products

Common Themes Across Tables

Federal Government

- Standards, specifications and guidelines
- Cross agency coordinator/facilitator/communications
- Education, outreach, marketing
- Data management/dissemination

State/Local Government

- Funding sites
- Network densification/site operation
- Outreach, education, marketing
- Inter/intra state coordination/information flow

Academia and Non-Profit Organizations

- R&D
- Education and training
- Foster innovative applications

Professional Organizations

- Lobbying
- Outreach and education

Private Industry - GPS Vendors

- Hardware/software development
- R & D
- Education and training
- Encourage new applications

Private Industry - GPS Users

- Provide user feedback on CORS products and services
- Operate subset of CORS sites

Table 1: Applications/Outreach/Technology Transfer

FEDERAL GOVERNMENT

Top 3

1. Feds establish reference frame (datum) – global/holistic view of technology – guidance, standards, “big picture”.
2. Expand education, outreach to reduce disconnect with end-users. Broaden use of system through education.
3. NGS should develop approved guidelines/specifications for surveys using CORS.

Brainstorm

1. Feds develop guidelines for CORS construction/how to. (1 vote)
2. Feds establish reference frame (datum) – global/holistic view of technology – guidance, standards (“big picture”). (4 votes)
3. Assist/advise on installation/setup. (1 vote)
4. Simplified Fed Radio Nav Plan – consolidate information on DGPS/WAAS/LAAS – one stop shopping for information on GPS resources. (2 votes)
5. Expand education/outreach to reduce disconnect with end-users. Broaden use of system through education. (3 votes)
6. How do people find out about CORS? Network exists, but not widely publicized.
7. Assistance in selling the new technology of CORS to management.
8. NGS should develop approved guidelines/specifications for surveys using CORS. (3 votes)
9. NGS to establish forums and e-forums to inform/train users (pass information). (2 votes)
10. Local community can get involved setting up a CORS – initiate the process, secure grant funding.
11. Establish quasi – advisor in all states lacking NGS Advisor – information exchange. (5 votes)
12. Satellite uplinks to aid in outreach/education.
13. User’s group for individual CORS.

STATE AND LOCAL GOVERNMENTS

Top 3

1. Densify beyond national network.
2. Facilitate linkage of information from Federal to end-user.
3. What level of service from CORS? Real-time kinematics, weather sensing.

Brainstorm

1. Develop a user's manual.
2. Own and operate additional CORS beyond Federal level stations. (2 votes)
3. Densify beyond national network. (4 votes)
4. = Fed # 10. (2 votes)
5. Facilitate linkage of information from Federal to end user. (3 votes)
6. Promote coordination within GIS community. (3 votes)
7. What level of service from CORS? Real time kinematics, weather sensing... (4 votes)

ACADEMIA/NON-PROFIT ORGANIZATION

Top 3

1. Education/training
2. Long-term fundamental research
3. Continuing education

Brainstorm

1. Education/training (6 votes)
2. Workforce development. (2 votes)
3. Community form/outreach.
4. Long term fundamental research. (5 votes)
5. Continuing education. (5 votes)

PRIVATE INDUSTRY

Top 3

1. Develop equipment and train people to use it.
2. Work closely with state professional organizations to develop guidelines for professional standards and licensing.
3. Make it easier to use the CORS network – equipment, software, etc. Provide support.

Brainstorm

1. Develop equipment and train people to use it. (5 votes)
2. Develop end-user software. (2 votes)
3. Install user-end infrastructure.
4. Understand linkages to Federal resources.
5. Provide (define) requirements to support end-user applications.
6. Adequate training and staff/facilities by private sector organizations. (1 vote)
7. Private industry can or could establish infrastructure.
8. Work closely with state professional organizations to develop guidelines for professional standards and licensing. (6 votes)
9. Make it easier to use the CORS network – equipment, software, etc. provide support. (3 votes)

Table 2: **Data Formats/Information Access**

FEDERAL GOVERNMENT

Top 3

1. Adherence to standards/quality
2. Lateral communicating and coordinating with other agencies
3. Disseminate data

Brainstorm

1. Definition of standards
2. Aggressive feedback request system. (2 votes)
3. Coordinating
4. Adherence to standards/quality. (4 votes)
5. Means to share data
6. Lateral communicating and coordinating with other agencies. (4 votes)
7. Final decision maker
8. Disseminate data. (4 votes)
9. Quality control

STATE AND LOCAL GOVERNMENTS

Top 3

1. Share with neighboring states and Federal government
2. Major responsibility for collection and distribution
3. Conform to the standards

Brainstorm

1. Share with neighbor states and Fed. (3 votes)
2. Major responsibility for collection and distribution. (3 votes)
3. Conform to the standards. (4 votes)
4. Disseminate data.
5. Determine needs. (2 votes)

ACADEMIA, PROFESSIONAL ORGANIZATIONS, NON-PROFIT ORGANIZATION

Top 3

1. Develop and define data formats
2. Global awareness of trends
3. Improving quality

Brainstorm

1. Promote professional ethics.
2. Improving quality. (2 votes)
3. Education (community). (1 vote)
4. Develop and define data formats. (4 votes)
5. Global awareness of trends. (3 votes)
6. Training (1 vote)

7. Determine needs.

PRIVATE INDUSTRY

Top 3

1. Provide products in defined formats
2. Provision of tools to community
3. Providing input

Brainstorm

1. Providing input. (3 votes)
2. Requirements of community. (1 vote)
3. Provision of tools to community. (4 votes)
4. Provide products in defined formats. (4 votes)
5. Determine needs.

Tables 4, 5 & 6: Reference Station Operation/Cooperative CORS

FEDERAL GOVERNMENT

Table 4

Top 3

1. Coordination of CORS
2. Standards
3. Quality control

Brainstorm

1. Coordination of CORS (5 votes)
2. Technical support
3. Standards (4 votes)
4. Quality control (4 votes)
5. Deadline data for standard implementation
6. Site availability information (1 vote)
7. Data archive (1 vote)
8. Education of end-users (2 votes)
9. Leaders in innovation (1 vote)
10. Ensure integrity of data (not just coordinates) (1 vote)
11. Funding (2 votes)
12. Coordinate...coordinate processing (1 vote)
13. Train the trainers (local)
14. Represent CORS community internationally
15. International cooperation (1 vote)
16. Standards enforcement (3 votes)

Table 5

Top 3

1. Coordination
2. Setting standards
3. Research and development

Brainstorm

1. Coordination (5 votes)
2. Setting standards (4 votes)
3. Technology transfer (1 vote)
4. Getting the word out – publication/outreach (1 vote)
~ Public education
5. Providing fund avenues
6. Quality control
7. Ensuring data is good; overseeing data from multiple sources (1 vote)
8. Research and development (4 votes)
9. Distribution of sites station spacing
10. Processing Cooperative CORS as frequent as National CORS. (1 vote)

11. Advisory role for site installation – equipment configuration, design (2 votes)
12. Homogeneous data base and consistent reference system
13. Archiving data (1 vote)
14. Program to help small surveying firms to get involved with technology
15. Fostering partnerships
16. FGCS testing of receivers and antennas (2 votes)
17. Communications standards for data transmission
18. Include Cooperative CORS sites in OPUS solutions (2 votes)

Table 6

Top 3

1. Establish standardization and guidelines
2. Data management and dissemination (distribution), archival and retrieval
3. Metadata, management, NSRS

Brainstorm

1. Establish standardization and guidelines. (6 votes)
2. Advice and consultation. (1 vote)
3. Coordination – list of contacts.
4. Check data integrity.
5. Data management and dissemination (distribution), archival and retrieval. (5 votes)
6. Money – support. (1 vote)
7. Encourage, manage research. (2 votes)
8. Coordinate location, avoid duplication.
9. Education and training workshops. (1 vote)
10. Metadata, management, NSRS. (5 votes)

STATE AND LOCAL GOVERNMENTS

Table 4

Top 3

1. Public relations/education/advertisement
2. Inter/intra state coordination
3. Easy data access – one stop shopping

Brainstorm

1. Statewide implementation
2. Easy data access – one stop shopping (4 votes)
3. Provide coordination within the state
4. Maintenance/infrastructure (3 votes)
5. Redundant data accessibility
6. Requirements for use of data
7. Mandate use of data/coordinates for certain projects or all (3 votes)
8. Public relations/education/advertisement (4 votes)
9. Coordinate locations with neighboring states
10. Provide RTK Broadcast (3 votes)
11. Stay current with improving technology. (1 vote)
12. Quality control. (1 vote)

13. Ongoing funding. (3 votes)
14. Inter/intra state coordination. (4 votes)

Table 5

Top 3

1. Funding
2. Outreach
3. Densification

Brainstorm

1. Funding (7 votes)
2. Dissemination of data
3. Densification (5 votes)
4. Local coordination (1 vote)
5. Maintenance/operation of sites (1 vote)
6. Research and development
7. Outreach/education (7 votes)
8. Local website
9. Quality control
10. Identification of needs (1 vote)
11. Archiving of data
12. Technology transfer
13. Real-time broadcasting of correctors
14. Liability identification – legal impacts to public (1 vote)
15. Legislative issues – requires use of datums (1 vote)

Table 6

Top 3

1. Fund sites, money
2. Coordinate, establish and operate a CORS site
3. Local data management

Brainstorm

1. Fund sites, money. (6 votes)
2. Provide manpower and resources.
3. Determine site locations and setup site. (3 votes)
4. Charge users for GPS data RTK. (1 vote)
5. Equipment maintenance. (2 votes)
6. Collect data, run the site. (1 vote)
7. Coordination/cooperation with the state-wide CORS net – establish and operate. (3 votes)
8. Infrastructure (3 votes)
9. QA/QC
10. Local data management – onsite. (4 votes)
11. Maintain higher data rates.
12. Provide real-time data. (1 vote)

ACADEMIA, PROFESSIONAL ORGANIZATIONS, NON-PROFIT ORGANIZATION

Table 4

Top 3

1. Lobbying
2. Professionally teach current technology
3. Research, develop and publish

Brainstorm

1. Lobbying (5 votes)
2. Professionally teach current technology. (5 votes)
3. Promotion/public relations.
4. Research, develop and publish. (7 votes)
5. Develop workshops/seminars in use of technology. (1 vote)
6. Hotline for questions and technical support (e.g., web, live person).
7. Require knowledge of licensure for professional surveyors. (1 vote)
8. Recognition and acceptance of the program. (2 votes)
9. Grants writing. (1 vote)
10. Clarification of scope of surveying practice. (3 votes)
11. Promote professional ethics. (2 votes)
12. Cooperate with people who develop standards. (2 votes)
13. Publications

Table 5

Top 3

1. Research and development (Academia, Non-Profit)
2. Outreach (PO, Academia, Non-Profit)
3. Lobbying efforts (PO, Non-Profit)

Brainstorm

1. Research and development. (7 votes)
2. Outreach – publications and training. (7 votes)
3. Coordination collecting data
4. Lobbying effort. (6 votes)
5. Development of guidelines (e.g., IGS monument). (1 vote)
6. Pursuit of grants. (2 votes)
7. Identification of technology improvements. (1 vote)
8. Testing
9. Promoting use of technology (1 vote)
10. Densification (4 votes)
11. Sharing of technology (1 vote)
12. Partnering (2 votes)
13. Protecting bandwidth (GPS vs. LEO)

Table 6

Top 3

1. Education, training
2. Funding and infrastructure
3. Benchmark ties

Brainstorm

1. Education training (5 votes)
2. Encourage use of GPS CORS (1 vote)
3. Assist with establishment of site (1 vote)
4. Funding and infrastructure (4 votes)
5. Benchmark ties (4 votes)
6. Research and development (3 votes)

PRIVATE INDUSTRY

Table 4

Top 3

1. Educate buyers (vendors)
2. Research and development (vendors)
3. Provide feedback to sites they use (users)

Brainstorm

1. Use the system - users. (2 votes)
2. Educate buyers - vendor. (5 votes)
3. University support – vendors.
4. Partnerships – users/vendors. (2 votes)
5. Research and development – vendors. (4 votes)
6. Ensure employees training is up-to-date – vendors. (1 vote)
7. Cooperate with people who develop standards – vendors. (2 votes)
8. Provide feedback to Cooperative CORS sites they use – users. (4 votes)
9. Lobby – users and vendors. (3 votes)
10. Vendors timely technical support. (3 votes)
11. Add funding. (1 vote)

Table 5

Top Items

1. Research and development
2. Affordable equipment
3. Lobbying
4. Densification

Brainstorm

1. Research and development – advance technology. (6 votes)
2. Communicating needs
3. Affordable equipment. (4 votes)
4. Lobbying (4 votes)
5. Outreach
6. Standardization not proprietary. (1 vote)
7. Cooperation (1 vote)
8. Testing

Table 6

Top 3

1. Provide manpower, assist with site establishment.
2. Feedback to operators.
3. Research and development.

Brainstorm

1. Provide academia with equipment. (3 votes)
2. Research and development. (3 votes)
3. Feedback to operators. (3 votes)
4. Provide support to Federal, state and local governments. (2 votes)
5. Assist with site establishment. (3 votes)
6. Provide manpower. (4 votes)

Table 7: Technical Innovations

FEDERAL GOVERNMENT

Top Items

1. Standards (international and national) – open GPS standards.
2. Communication and coordination – foster use of innovative systems to communication and coordination.
3. Provide infrastructure that is fundamental for enhancing the CORS.
4. Innovation workshop – conduct ½ or whole day workshop on ideas that is innovative.

Brainstorm

1. Set standards. (5 votes)
2. Encourage and promote technical innovation.
3. 2 hertz data or higher. (1 vote)
4. Apply IT innovations to support data delivery and management.
5. Innovative ways for communications and education.
6. Better communication and coordination among Federal agencies. (5 votes)
7. Provide fundamental infrastructure that other agencies can use. (2 votes)
8. Continue innovation in CORS station hardware.
9. Expand CORS where there is existing control and information. (1 vote)
10. Federal government/NGS should take an active role in dynamic positioning. (1 vote)

STATE AND LOCAL GOVERNMENTS

Top 3

1. Telecommunications – ensuring systems are maintained and modern.
2. Innovate ways for communication and education – user community.
3. Be responsive to special uses/projects.

Brainstorm

1. Prepare for new signals
2. Telecommunications (7 votes)
3. Real-time CORs products. (1 vote)
4. Innovate ways for communication and education. (5 votes)
5. Support new technology, models, etc. – iono, tropo, orbit, geoid. (1 vote)
6. Improve getting signals, innovations, and information to the users – communications technology. (3 votes)
7. Be responsive to special uses/projects. (4 votes)
8. Hold an “innovations workshops”
9. Represents the National interests in the global arena

ACADEMIA, NON-PROFIT ORGANIZATION

Top 3

1. R&D – new technologies, models, etc. (ionospheric, tropospheric, geoid)
2. Innovate ways for communication and education.
3. Responsive to special uses/projects.

Brainstorm

1. Prepare for new signals
2. Telecommunications
3. Real-time CORS products
4. Innovate ways for communication and education. (1 vote)
5. Support new technology, models, etc. – iono, tropo, orbit, geoid. (7 votes)
6. Improve getting signals, innovations, and information to the users – communications technology. (4 votes)
7. Be responsive to special uses/projects. (5 votes)
8. Hold “innovations workshops”. (2 votes)
9. Represents the National interests in the global arena

PROFESSIONAL ORGANIZATIONS

Top Items

1. Telecommunications
2. Real-time CORS products
3. Communication and education
4. Communication technology
5. Innovations workshop

Brainstorm

1. Prepare for new signals. (1 vote)
2. Telecommunications (2 votes)
3. Real-time CORs products. (2 votes)
4. Innovate ways for communication and education. (2 votes)
5. Support new technology, models, etc. – iono, tropo, orbit, geoid. (1 vote)
6. Improve getting signals, innovations, and information to the users – communications technology. (2 votes)
7. Be responsive to special uses/projects. (1 vote)
8. Hold “innovations workshops”. (2 votes)
9. Represents the National interests in the global arena. (1 vote)

PRIVATE INDUSTRY (MANUFACTURERS)

Top 3

1. Create user-friendly software and hardware.
2. Telecommunications – prepare for new signals.
3. Support use of new technology, models, etc.

Brainstorm

1. Prepare for new signals. (4 votes)
2. Telecommunications (3 votes)
3. Real-time CORS products
4. Innovate ways for communication and education. (1 vote)
5. Support new technology, models, etc. – iono, tropo, orbit, geoid. (3 votes)
6. Improve getting signals, innovations, and information to the users – communications technology. (2 votes)
7. Be responsive to special uses/projects. (2 votes)
8. Hold “innovations workshops”.
9. Represents the National interests in the global arena.
10. Create user friendly hardware and software for professional/non-professional users. (5 votes)
11. Open GPS standards. (1 vote)

Table 8: Coordinates, Orbits and Models for Accurate Positioning

FEDERAL GOVERNMENT

Top 3

1. More timely approval of coordinates for HARN and other campaign surveys.
2. NGS must maintain the CORS coordinates at highest possible accuracy. (~1 cm)
3. Provide and maintain data in conjunction with other agencies.

Brainstorm

1. More timely approval of coordinates for HARN and other campaign surveys.
2. NGS must maintain the CORS coordinates at highest possible accuracy. (~1 cm)
3. Global oversight of coordinates and data
4. Provide and maintain data in conjunction with other agencies
5. Keep record of previous coordinates (when coordinates are revised)
6. International cooperation with data assessment
7. Timely maintenance of all coordinates, including all past superceded coordinates
8. Federal government maintains one consistent orbit
~ Orbits come from Federal government
9. Provider of guidelines for use of all GPS data

STATE AND LOCAL GOVERNMENTS

Top Items

1. Densification of Federal network to meet local needs
2. Provide the relationship between local-based coordinates and CORS coordinates
3. Adaptation of GPS data to local needs in reference to local environmental differences
4. User education

Brainstorm

1. Densification of Federal network to meet local needs. (2 votes)
2. Provide the relationship between local based coordinates and CORS coordinates. (3 votes)
3. Adaptation of GPS data to local needs in reference to local environmental differences. (2 votes)
4. Partner with NGS for maintenance of and providing data – like partnership with CSRC.
5. User education. (2 votes)

ACADEMIA, PROFESSIONAL ORGANIZATIONS, NON-PROFIT ORGANIZATION

Top 3

1. Partner with NGS for maintenance of and providing data – like partnership with CSRC.
2. Interface between scientific interests and surveying interests.
3. Generation of new scientific ideas and models and education of new manpower for implementation of these new models and innovations.

Brainstorm

1. Partner with NGS for maintenance of and providing data – like partnership with CSRC. (3 votes)
2. Interface between scientific interests and surveying interests. (4 votes)
3. Generation of new scientific ideas and models and education of new manpower for implementation of these new models and innovations. (2 votes)
4. Professional organizations should educate users on coordinate systems. (1 vote)

PRIVATE INDUSTRY

Top Items

1. Help in re-observation of HARN and local surveys when required.
2. Provide user feedback to Federal, state and academia.
3. Relating boundary monumentation to national coordinate system (CORS).
4. Aggressiveness and timely implementation of changes and new data – stay current.

Brainstorm

1. Help in re-observation of HARN and local surveys when required. (3 votes)
2. Relating boundary monumentation to national coordinate system (CORS). (2 votes)
3. Aggressiveness and timely implementation of changes and new data – stay current. (2 votes)
4. Provide user feedback to federal, state and academia. (3 votes)

Summary of Session Evaluations

The National Geodetic Survey CORS User Forum April 19, 2002

No. of Submissions: (32)

1. CORS Informative Briefings (AM Session)

1 Highly Dissatisfied	2	3 (1)	4 (15)	5 (16) Highly Satisfied
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Why? Comments:

1. Comprehensive coverage east to west activities.
2. Well rounded – hit the mark. Would like to see more.
3. Seems that individuals from FHWA, FAA, ACOE should have attended. Were they invited?
4. Need more Q&A time.
5. High quality presentations – very informative.
6. Some very interesting and timely information that will help move us toward some of our goals.
7. All speakers were very well versed on their presentations, and all presentations were interesting.
8. Very informative.
9. Overall, quite good; good format.
10. Outlines and brief information is very good.
11. Provide a few breakout sessions for individual questions and answers.
12. Well presented and informative.
13. Presentations were very good, the themes were right on target.
14. Put the presentation on the homepage before the workshop starts.
15. Nice diversity of topics.
16. Speculation of the future particularly valuable.
17. Great overview of current and future directions.
- 18-32. No comments.

2. Interactive Users' Assessment (PM Session)

1 Highly Dissatisfied	2	3 (6)	4 (17)	5 (9) Highly Satisfied
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Why? Comments:

1. Informative, well supported technically.
2. I was hoping for more "how to", not so much general what NGS wants.
3. Many good ideas. Seems a lot of ideas overlapped. Nobody discussed how to fund the recommendation at Federal, state, county level, etc.
4. What did NGS do with last year's results? We need a report of action taken.
5. It is interesting to see such common themes from throughout the user community.
6. Issues and roles were somewhat overlapping/repetitive.
7. Very useful discussion.
8. Round table discussions were good. Everyone was able to contribute.
9. Need more one-on-one discussions. Shorter morning.
10. Interactive session is good.
11. Lots of good discussions.
12. The mixture on the table must be better (professional surveyors, companies, etc.).
13. Good forum – look forward to new topics and challenges to discuss.
14. A lot crammed into the time.
15. As a vendor, I was hoping to find out more about CORS and CORS users' requirements of us.
- 16-32. No comments.

3. Overall Forum Rating

1 Highly Dissatisfied	2	3 (1)	3.5 (1)	4 (16)	5 (14) Highly Satisfied
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Why? Comments:

1. I'd like to see more.
2. Highly satisfied. Many good ideas and a lot of interaction. I am interested in receiving a list of participants with e-mail addresses.
3. Always a pleasure.
4. Continue to have these forums.
5. Great!
6. Good
7. Great
8. Well done – again.
9. Very worthwhile day. Thanks!
10. Excellent! I definitely plan on attending next year.
- 11-32. No comments.

4. Suggestions for Future Forums:

1. Personally invite the Directors/Commissioners of State DOTs, Environmental Department and Chief Information Officers. Send out invitations to AASHTO, place more articles in public works, CE news, reach outside of geodesist/surveyor groups. American City & County; FHWA Public Works.
2. Let's do some "real" work – like figure out antenna ht/nance/offsets. Need standardization/agreement between IGS, NGS, manufacturers, etc.
3. AM Presentation and issue or specific PM workshop (e.g., Innovation Improvement of CORS)
4. The existing format seems to work very well.
5. Include a more varied group of users, such as the construction or engineering groups.
6. More detailed.
7. CORS basics and GPS basics session.
8. I heard a suggestion to invite primary leaders from state governments (i.e., Sec of Trans or upper level management). I think this would be a good idea. It could be coordinated through State Survey Office Managers.
9. More opportunity to provide feedback to CORS team at NGS.
10. Lots of suggestions via the user's assessment.
11. Work on issues collaboratively.
- 12-32. No comments.

Additional Comments:

- There is so much innovation and change going on with this technology, that keeping up is extremely difficult. This sort of activity only helps.
- Only 4 participants at Data Formats/Information Access (Table 2). One participant encouraged Fed's aggressive request for input, not just at CORS Forum.
- Group wants NGS to know that in the broad sense, academia and professional organizations must promote professional ethics - later realized it didn't apply to data formats focus.
- On web page, encourage users to provide feedback about CORS through email.
- Don't like the RINEX format - claim many people don't like RINEX, that it's outdated. Would prefer that if there is a Trimble at a site (e.g., that give them the native dat file rather than RINEX).

Forum Participants

Marc Cheves - Professional Surveyor magazine
John Nall, Jr. - City of Denton, Texas
Indrajith Wijayratne - Michigan Tech University
Yehuda Bock - California Spatial Reference Center
Gary Thompson - North Carolina Geodetic Survey
Ruth Neilan - Jet Propulsion Lab
Matt Higgins - Dept of Natural Resources and Mines (Australia)
Victoria W Gorska - FAA-NACO
Anthony Rocco - FAA-NACO
Michael Parsons - U.S. Coast Guard
William Strange - NOAA (Retired)
William Barker - Eastern States Engineering
Larry Hothem - US Geological Survey
Peter Ramm - Land Victoria, Australia
Gordon Garrard - Geodetic Survey Division, NRCan, Canada
John Bean - Central Connecticut State Univ
Seth Gutman - NOAA Forecast Systems Lab
Tim McCann - Seiler Instrument
Matt Shellenberger - American Electric Power
Emerson Bornman - Keystone Precision Instruments
James Stowell - Leica Geosystems
John Hamilton - Terrasurv
Dan Martin - Vermont AOT/Geodetic Survey
Steven Briggs - Trimble
Ken Bays - US BLM
Michael Londe - BLM
Jerry Vetter - JHU/APL
Charles Harpster - PA Department of Transportation
L. Bradley Foltz - PA Department of Transportation
Tom Mochty - Woolpert
Nat Phillips - Kucera International
Louis Marchuk - New Jersey Dept of Transportation
Carl Livingood - GeoSpatial Innovations, Inc.
Rajendra Pandejee - Penndot
Stephen Dunlop - PennDot Dist 6
Louis Burrell - PennDot Dist 6
Stephen Roden - NY State DOT
Cecilia Whitaker - MWD/CSRC
Kim Lochhead - Geodetic Survey Canada
Randall Barton - Oklahoma Dept. of Transportation
Andrew Semenchuk - Michigan D.O.T
Brian Dollman-Jersey - Michigan D.O.T
Eric Orndorff - STV, Inc.
John Rand - Old Dominion University
Erik Soderstrom - Leica Geosystems Inc.
Beverly Sutphin - Florida Dept. of Transportation
Peter Lazio - Sidney B. Bowne & Son
Richard Leu - Iowa DOT
Fred Czepiga - NJDOT, Geodetic Survey
John Knapp - NJDOT, Geodetic Survey
Paul Lee - PENNDOT

Thomas Schorb - Land survey office, Karlsruhe, Germany
Lisa Lascevia - Hagertown Community College
Carey Noll - NASA GSFC
Douglas Scott - Geomatics Canada

Mark Eckl - National Geodetic Survey - DE Advisor
Ronnie Taylor - National Geodetic Survey - FL Advisor
Ronald Ramsey - National Geodetic Survey - MI Advisor
Curt Smith - National Geodetic Survey - OR Advisor
Donald Mulcare - National Geodetic Survey - MD Advisor
Warren Payton - National Geodetic Survey - NJ Advisor

Richard Snay - National Geodetic Survey
Gerry Mader - National Geodetic Survey
Deborah Tyler - National Geodetic Survey
Robert Safford - National Geodetic Survey
David Doyle - National Geodetic Survey
Dennis Milbert - National Geodetic Survey
Donald Haw - National Geodetic Survey
Gordon Adams - National Geodetic Survey
Hong Chen - NGS (RSIS Contractor)
Ying Jin - NGS (RSIS Contractor)
Michelle Van - National Geodetic Survey
Renee Shields - National Geodetic Survey
Steve Hilla - National Geodetic Survey
Tomás Soler - National Geodetic Survey
Nancy Doyle - National Geodetic Survey
Steve Frakes - National Geodetic Survey
Joe Evjen - National Geodetic Survey
Dru Smith - National Geodetic Survey
Knute Berstis - National Geodetic Survey
Vasanthi Kammula - National Geodetic Survey
Mike Cline - National Geodetic Survey
Julie Prusky - National Geodetic Survey
Charlie Schwarz - National Geodetic Survey
Miranda Chin - National Geodetic Survey
Rick Yorczyk - National Geodetic Survey
Cliff Middleton - National Geodetic Survey
Jeff Olsen - National Geodetic Survey
Craig Larrimore - National Geodetic Survey
Mary Oleson - National Geodetic Survey
Dennis Hoar - National Geodetic Survey
Ed Timmerman - National Geodetic Survey
Dale Pursell - National Geodetic Survey
Bill Dillinger - National Geodetic Survey
Rick Foote - National Geodetic Survey