YEAR 3 – Interim Evaluation Report for Kaskaskia College
GST Advantage Project
Centralia, IL
NSF ATE DUE# 1304531

December, 2015

Funding Start Date: September 1, 2013

Principal Project Investigator: Mike Rudibaugh
Co-Principal Project Investigator: Bruce Fink

Elaine L. Craft, SCATE Inc. Evaluator

Introduction

As the project progresses into the third year of implementation, a number of changes are noted. It became clear by the mid-point of this three-year project that the goals were overly ambitious for a Small Grant for Institutions New to ATE. The challenges faced have been exacerbated by the rural location of the college and the departure of the original Principal Investigator during the first year of the project. The new PI is adjunct faculty for Kaskaskia College and is a full-time faculty member for a GST program at another college within the state. The new PI inherited goals and deliverables for this project that have proven unreasonable for a small grant in this rural environment where the college does not have a permanent, full-time faculty member in the discipline. During summer 2015, the evaluation team for this project advised the Principal Investigator (PI) to contact NSF to request permission to revise the scope of work for the project. Reflections of the evaluator (Appendix A) outlined the reasons for this recommendation. Communication with NSF and events that transpired thereafter resulted in both a change in NSF Program Officer for the project and the submission of a formal request for a change in scope by the PI (Appendix B). This request has been granted and thus the project will focus on GST-enabled technicians across multiple programs of study at both community college and high school levels but not on creating a GST associate degree program.

Project Summary

The initial goal of the Geospatial Technology (GST) Advantage project was to prepare GST technicians and GST-enabled graduates for opportunities with southern Illinois businesses, industries and government entities. The goal is now to focus on GST-enabled graduates and creating a stronger pipeline of students into entry-level GST course offerings in preparation for growing the program over time. GST is a growing area of study that provides the skills needed for success in an ever expanding array of occupations. The curriculum being pilot-tested in the project is furthering the knowledge and understanding of geospatial technology within the GST community as well as in broader fields. This is leading to an educational approach that can be adopted by other institutions nationwide and one that provides pathways for inclusion of GST into STEM disciplines.

Project Goals and Deliverables (original)

Goal 1: Geospatial Technology (GST) certificate and associate degree programs that align with the industry-validated Geospatial Technology Competency Model (GTMC) will be established that utilize, pilot test, and evaluate a curriculum designed by the National Geo Tech Center. Associated deliverables: 1) GST certificate and associate degree programs established, 2) curriculum pilot-tested and evaluated. *Modified to include only the GST certific*ate.

Goal 2: GST field internship opportunities with local employers will be provided to students, ten in year one, twelve in project year two, and fifteen in project year three. Associated deliverable: Thirty-seven student field internship opportunities with employers will be provided.

Goal 3: GST will be incorporated into twenty STEM classes during the project period through twelve workshops and professional development opportunities provided to Kaskaskia College faculty and K-12 teachers.   Associated deliverables: 1) Twenty STEM classes will have GST incorporated into their curriculum, 2) Twelve workshop and professional development opportunities will be provided to postsecondary, secondary and primary faculty members. *Modified part (2) to include engagement of secondary faculty members in Geospatial Advantage workshops with a goal of building interest and assessing readiness among secondary schools to offer GST for dual credit.*

Goal 4: The GST Advantage initiative will share the diverse and extensive resources available through GST in a series of thirteen outreach sessions during the project period that target students and teachers as well as the leaders of businesses, industries and communities. Associated deliverable: 235 participants will take part in planned outreach sessions.

Goal 5: The Kaskaskia Regional GST Advisory Board, comprised of entities utilizing GST, will meet two times each year during Year 1 of the project period to provide guidance and to support the development, execution and evaluation of the project. Associated deliverable: Sixteen Advisory Board members will participate in guiding and supporting project components and activities.

Evaluation Activities
September 29-October 2, 2015 the evaluator visited Kaskaskia College. The site visit included meetings with the project team and administrators, including the college's new President, and faculty. Another highlight of the visit was participating in an evening meeting of the project's Advisory Board (APPENDIX C). At the PI's request, the evaluator provided an overview of the NSF ATE Program for Advisory Board members designed to help stimulate increased support for NSF-funded activities at the college designed to produce a GST-enabled workforce in the area. Visits with two faculty members in programs benefiting from the infusion of GST modules included include a preview of the GST mapping module that the PI has developed for use in the criminal justice program. Faculty are clearly excited about integrating basic GST mapping capability into their programs of study, and doing so will likely result in a rapid expansion of student interest in this technology and its applications. The Criminal Justice program has one of the largest student enrollments at the college.

Discussions with the project team covered successes and challenges to date and the potential for revising some of the original project goals and deliverables going forward. The project was encouraged to apply for a no-cost extension near the end of year 3 to enable more work to be accomplished over the life of the grant. The extra time will help make up for time that was lost when the original PI unexpectedly retired for health reasons during the first year of the project.

The major summer activity, the Power of Imagery Geospatial Technology Workshop, was held July 31, 2015. Thirty-two (32) organizations were represented at the event (list of organizations provided as APPENDIX D). The program featured Dr. Vince DiNoto, PI/Director of the National ATE Geotech Center and representatives from the American Society for Photogrammetry and Remote Sensing (ASPRS), ESRI (geospatial technology software company), and local industries who use geospatial technology. The event attracted a diverse audience, and 33 completed the evaluation survey at the end. Survey results indicate that 97% (32/33) participants rated the conference good or excellent (16 choosing each answer). Importantly, survey results indicate that the objectives of the event were achieved: 21 participants learned for the first time about the GST program at Kaskaskia College, 94% (31/33) indicted that the conference helped broaden their knowledge about Geospatial Technology and utilization of remote sensing applications. In addition, 60% (21/33) plan to implement something they learned at the conference, 67% (22/33) indicated they plan on increasing uses of data and application of remote sensing in their business or organization. Individual sessions were also highly rated, with only one farm topic (Future of Farm) had fewer than 76% rating of excellent or good.

Looking ahead, 18 of 28 respondents indicated "yes" (12) or "maybe"(6) to a question about supporting the Kaskaskia College GST program by enrolling employees in courses (5), hosting interns (9), donating equipment (1), or marketing the program (8). Respondents could select more than one type of help. Also for future planning, 22 comments were made regarding how to improve the conference, 19 of which are actionable. Survey results are included as APPENDIX E and participant comments are included as APPENDIX F.

Evaluation strategies for the project will continue for unchanged goals and will be amended for Goals 1 and 3 should the PI's request for a change in scope be granted by the Program Officer. College personnel changes have resulted in a new personnel being engaged for data tracking regarding student enrollment in geospatial technology classes. These data will be included in the annual evaluation report next summer. The PI is encouraged to continue keeping records on student internship opportunities as well as student placements. Also the excellent work being done to infuse geospatial modules in other programs should continue as well as outreach efforts to high schools, the community, and industry partners to continue raising awareness of the technology and the options for taking courses at Kaskaskia College necessary for gaining skills and knowledge in the workplace. Capturing data related to this list of these activities should be a priority in 2016.

APPENDIX A
Excerpt from
YEAR 2 – Annual Evaluation Report for Kaskaskia College
GST Advantage Project
Centralia, IL
NSF ATE DUE# 1304531

June 30, 2015

Evaluation Reflections

As year 2 of this 3-year project comes to a close, it has become evident to both project personnel and the external evaluation team that the goals for this project were overly ambitious. Project goals frame a vision for the future of geospatial education for the region toward which this project can make a significant contribution, but it will not be possible to fully accomplish the goals. This project, funded as a "Small Grant for Institutions New to ATE," is providing valuable insights and lessons about the challenges of initiating new advanced technology programs in a relatively small institution in a rural area of mid-America.

The goals of the project call for creating a robust, comprehensive, regional program of geospatial technology education for rural southern Illinois that extends to numerous high schools through dual credit options (with associated faculty development), creates an associate degree in the discipline at Kaskaskia College, and establishes an articulated pathway to a university baccalaureate degree in geospatial technology. At the onset of the project, Kaskaskia College offered no geospatial technology courses and employed no faculty with academic credentials and skills to teach in the discipline. Geospatial technology courses have been taught by a well-qualified faculty member recruited as adjunct faculty from another two-year college in Illinois, Dr. Mike Rudibaugh. The initial Principal Investigator for the project, a mathematician, retired unexpectedly due to health issues several months into the project, and Dr. Rudibaugh is now serving as PI for the project. Dr. Rudibaugh brings experience from his own college's successful geospatial technology program as well as previous grant experience such as serving as a Co-PI on the National GeoTech ATE Center. He is providing exemplary guidance and expertise to move the project forward as well as providing instruction in the discipline. Dr. Rudibaugh receives very high ratings from students.

Kaskaskia College faces challenges with all three levels of education making up the vision for preparing a geospatial workforce for southern Illinois: high school, community college, and university. A major barrier to high school engagement is that the grant does not have the resources necessary to engage the high school teachers as planned. While the teachers have participated in initial "awareness" sessions, moving to the next level of engagement requires more teacher time and faculty development. Faced with implementing Illinois state standards and other "unfunded mandates" in the postsecondary environment, high schools are interested but unable to finance teacher involvement to work toward the development and implementation of dual credit courses. Work on this component of the vision will take time and money beyond the capability of this small project.

At the community college level, to create an associate degree program requires minimum levels of ongoing enrollment and job demand. Awareness about geospatial technology career options is growing in the Kaskaskia service area, but it is a slow process and course enrollment in the introductory GIS course is still small. Other successful geospatial technology programs across the ATE Program have found that it takes substantial enrollment and multiple sections of the introductory GIS course to sustain a major in the discipline. Some who study geospatial technology only need enough knowledge and skill to integrate GIS into other occupations ranging from precision agriculture to oil and gas exploration to emergency first responders and law enforcement. Others need more in-depth knowledge to pursue careers as geospatial technology technicians, analysts, or programmers. In southern Illinois at this time, there is far more demand for the geospatial technology-savvy technician than a GIS specialist. Industry

demand for these skills exceeds the number of students being prepared. This is perhaps most evident in the project data that show more requests for students to fill paid internship positions than there are students available to be placed. The project, therefore, is looking at certificate options and tiered internships to engage students and meet industry demand. In time, and with sufficient growth in enrollment, the college should be able to justify hiring full-time faculty and offering an associate degree program in geospatial technology. This will not be possible within the time frame of this grant.

At the university level, partner institutions are eager to partner with Kaskaskia College on articulation and pathway development, but only after the associate degree program is in place.

For these reasons, and based on project data, near-term efforts should increasingly be focused on producing geospatial technology-savvy graduates and certificate completers, growing the internship program, and infusing GIS across the curriculum. These are components of the initial vision that hold the greatest promise of impact by project end. The project team has been highly engaged in evaluation activities and has consistently provided requested data that have enabled these "lessons learned" to be documented and used for guiding future work. College administrators are supportive, and it is likely that the vision can be realized over time, building on the educator and industry network and partnerships that are being established and fostered by this project.

The evaluation team is recommending that the project team discuss these lessons learned with the project's NSF Program Officer and request that project goals be amended to reduce the scope of the project to enable the project team to focus year 3 work on components of the project that will achieve measurable outcomes and position the college to continue work toward achieving the larger vision for the region.

Program Officer Teles,

This letter serves to formally notify the National Science Foundation ATE on a reformed scope of work for the GST Advantage Project (DUE# 1304531). These suggested modifications relate to a series of lessons learned, institutional challenges to implement specific goals, and recommendations from our external evaluator, Elaine Craft, stated in our Year 2 – Annual Evaluation Report.

As suggested in our Year 2 – Annual Evaluation Report, this project has been somewhat overly ambitious with projecting results within the five stated goals within the life cycle of this grant. Specifically, we see a couple of goals with specific modifications to the projected outcomes that need to be addressed and formally proposed. The following goals and objectives are being specifically targeted for approval with a reformed scope of work:

- Goal 1: Geospatial Technology (GST) certificate and associate program that aligns with the industry validated Geospatial Technology Model (GTCM);
- Goal 3: Six high school teachers will be identified, approved, and trained to teach GSTE101 for college credit at the high school level.

Proposed Scope of Work

Goal 1 - Throughout the life cycle of the grant, the grant team has learned that a variety of challenges will make the development of a full-blown AAS in Geospatial Technology almost impossible within the life cycle of the grant. These assessments are based on having no full-time faculty to lead the program and a reoccurring theme of low program visibility on campus to stabilize student enrollments with the first class, Mapping Your Digital World (GSTE101), at Kaskaskia College.

- Reformed Scope of Work Proposal – Evidence from the Kaskaskia GST Advisory Board and academic programs on campus that could potentially leverage GST suggest that a smaller credential is needed more currently at the institution. This evidence led the development of a GIS Mini-Certificate, which is a two course sequence, that focuses on introducing concepts in GIS with the Mapping Your Digital World (GSTE101) and following up this class with a GIS Work Experience Class (GSTE199). This two course sequence appears to suggest in Kaskaskia's rural market for more demand with GIS users with basic or core skills sets to be applied in specific industries leveraging geospatial technology like information technology, law enforcement, and life science (conservation and forestry). Many employers and academic programs are looking to integrate geospatial technology, however, the need for professional geospatial technicians with degrees is currently not in demand. The GST Mini-Certificate has been approved by the Kaskaskia College Curriculum Committee and is now moved to the Illinois Community College Board for approval. Both Kaskaskia College's Law Enforcement and Information Technology Programs are adding the GST Mini-Certificate as options or requirements to student programs at the institution. The grant team, in theory, feels these changes will assist to stabilize enrollments with the first class and ultimately lead more students to pursue completion of formal certificates and ultimately degrees in geospatial technology in the future. Increasing enrollments within GIS Mini Certificate and existing GST Certificate will provide more justification for investing in a full-time faculty to lead a degree program in the future.

Goal 3 – Six High School Teachers will be identified, approved, and trained to teach GSTE 101, Mapping your Digital World, as a dual credit course.

- Formal interviews and meetings with regional superintendents indicates little to no support exists to formally release K-12 faculty to offer geospatial technology courses. Issues related to faculty loads, state or national standards for curriculum, and other related issues make K-12 administrators very unlikely to release or

reassign K-12 faculty to offer geospatial technology courses at this time. Evidence does indicate, however, that both high school teachers and administrators are increasingly becoming interested with formal integration exercises of geospatial technology into existing STEM courses as baby steps to better understand the teaching benefits to students using geospatial technology. Using this feedback the grant team has developed a series of workshops teaching high school faculty how to integrate GST into a variety of academic subjects. These online modules, which are accessed through the grant website, have no technical limitations relating to cost, software or data installs that often present barriers to GST implementation in K-12 environments. These resources and modules can be identified at the following url: http://www.kcgst.com/InstructorResources.htm

Action Plan and Metrics

1. Goal 1 - We plan to offer the GSTE 101 courses, Mapping Your Digital World, two times in the Spring of 2016 and at least once in the Fall of 2016. The grant team expects and projects higher enrollments with this first class leveraging our new GIS Mini Certificate and new cross disciplinary relationships with information technology, life science, and law enforcement programs. We hope and project to see enrollments in these sections to reach a viable 10-15 students/section.

2. Goal 3 – We plan to formally track with surveys and follow-up meetings with high school faculty attending Kaskaskia College – Geospatial Advantage Workshops. Using this survey data we hope to measure and track to what extent, if any, we are observing formal integration (i.e., modified course syllabus introducing GST) of geospatial technology into related STEM fields in k-12 education in our region. Using this data will assist to track which schools, if any, are ready to move forward with faculty and administrative support to propose a full blown credentialing program to offer K-12 educators the option to offer dual credit courses in geospatial technology.

In summary, we are asking for formal support of these proposed changes with our scope of work on this project, Dr. Teles. We are planning to apply for a no-cost extension to help us reach these goals and to capture more data on the grant's outcomes to meet our projected goals. The Kaskaskia College Grant Team feels these proposed scope of work changes better reflect the current status, achievable results, and outcomes this project can produce at this time. We look forward to any questions, concerns, or comments you might have relating to this proposal. Please feel free to contact me if you need a follow-up conference call to clarify any points made with this request.

Regards,

Mike Rudibaugh, Ph.D., PI Geospatial Advantage NSF-ATE Project, Kaskaskia College

Board Members Present: Philip Mitchell, Mike Rudibaugh, James Patrick, Brent Taylor, Greg Brunner, Patty Brough, Gary Mueller, Gerald Forbeck, Kyle Heimann, Dustin Stine, Janes Deily, Michael Kimberly, Dr. Greg Labyak and Art Borum

Guests: Elaine Craft

The meeting began with dinner at 5:30 and Art Borum opened the meeting at 5:45 with introductions. Borum gave everyone an update on the new Mini-Certificate that includes the two courses, GSTE 101 "Mapping Your Digital World" and GSTE 199 "Work Experience". He went on to explain how important it is to help students understand the many different applications of Geospatial Technology, and when they do the work experience class, generally they can be placed with a business where they have an interest similar to their main discipline. Dr. Rudibaugh talked about the "Tiered Internship" approach and how statistics have shown it helps the program grow. The Mini-Certificate has been approved by KC's Curriculum Council and is being sent to the Illinois Community College Board in January 2016 for anticipated state approval in spring 2016.

Dr. Rudibaugh went over the summer work experience program we had as a result of the completion of the spring class and how we were able to place three students with businesses for the summer and the success of that program. He talked about what the students did for the companies they worked with and how both students and employers benefitted. This was a paid work experience and the students earned from $10.00 to $12.50 per hour for 180 hours.

Borum went over the success of the industry outreach program that occurred on July 31st at KC's Trenton Center. There were 58 people registered for the event from all over the Midwest. The speakers included representatives from The National GeoTech Center, the American Society for Photogrammetry and Remote Sensing, ESRI, Ameren, and CropCopter. Surveys were distributed before they left and 33 filled them out. Of the 33 surveys, 32 rated the conference as Good or Excellent and only 4 said their organization or business would not be willing to help KC's GST Program. Thirty one said the conference helped broaden their knowledge about GST and remote sensing applications. Overall we considered the day very successful.

Elaine Craft, the President of SCATE, Inc. the organization that is our external evaluator for our National Science Foundation (NSF) Advanced Technological Education (ATE) grant was present at our meeting and talked about the importance of the Advisory Board to the program. She began by explaining the emerging field of Geospatial Technology and how and why the NSF formed the grant program and how this program targets advanced technology and the certificates and associates degrees at two year colleges are very powerful for the advancement of this technology. She talked about the value of the advisory board to provide up to date industry information and to guide the program by being involved and showing the real needs in our rural area. She went on to say the labor that a company hires is as important as any supplier of materials and she suggested the board look at Kaskaskia College as a valuable supplier. She talked about how as we move forward there will be other grant opportunities for KC and how important and valuable a letter of support from the board members can be in the application process.

Brent Taylor asked where the program is housed within the college's departments and we explained it is a standalone department and the GSTE 101 intro class has been approved as an Area D Elective, so it can fit with most disciplines and not in one department.

Dr. Rudibaugh said we would develop a white paper on what our enterprise software covers in case there are other plug-ins or applications the area businesses may need in addition to what we now offer.

Dr. Labyak asked the board if we could take our students to actual work sites so they can observe actual uses and needs for geospatial technology.

Gerald Forbeck suggested we focus much of the training on functionality because ESRI doesn't dominate some industries such as Agriculture.

Dustin Stine asked the question "How many students really know what GST is?" and that is our focus for the future to promote better the intro program as an elective and for the faculty to help let their students know how important it could be in their specific discipline.

The meeting was adjourned at 7:45 pm.

APPENDIX D

Companies represented at 2015 "The Power of Imagery" Conference

City of Greenville Public Administration

City of Greenville Economic Development

City of Marshall Illinois

Clinton County GIS Coordinator

Clin-Wash Ag, Inc.

Eastern Illinois University

EJ Water Coop

ESRI

Gonzalez Corporation

HMG Engineers

Illinois Commerce Commission

Illinois Dept. of Transportation

Illinois State Water Survey

Jersey Community High School

JULIE, Inc.

Kaskaskia College

Lake Land College

Macon County Supervisor of Assessments

Monsanto

National Geospatial Agency

Piatt County Zoning

Round Table Design

Self-Employed Grain Farmer

South Central Illinois Growth Alliance

South Central Illinois Regional Planning

Southwestern Illinois Planning Agency

Spatial Connections, Inc.

Spoon River College

Surdex

University of Illinois

U.S. Army Corp of Engineers

Vertical GEO

Overall how would you rate Conference?

Excellent	Good	Fair	Poor	Very Poor
16	16	1		

Rate each of the Sessions:

	Excellent	Good	Fair	Poor	Very Poor	N/A
GeoTech Center	6	19	4			4
Overview	3	26	2			
Up Down & All Around	9	21	1			1
Ameren	7	21	2			
Data management	S	22	1	1		
Future of Farm	6	7	6			1
CropCopter	20	9	1			2

Statements about the Conference:

	Excellent	Good	Fair	Poor	Very Poor	N/A
Enough time was devoted	7	24	1	1		
Enough time was devoted	8	21	4			
Conference was a good pace	12	20	2			
Would recommend conference to others	12	17	2			1
Stay in contact and share information	11	12	6	2		1

Did the conference help broaden your knowledge about GST and utilization of remote sensing applications?

Yes	No	Don't Know
31	1	1

Do you plan to implement anything you learned at the conference?

Yes	No	Don't Know
21	5	7

Do you plan on increasing uses of data and application of remote sensing for your business or organization?

Yes	No	Maybe	Don't Know
22	3	4	3

Do you plan on hiring staff in the future to help with your management, applications and utilization of GST?

Yes	No	Maybe	Don't Know
9	11	6	4

If yes, please write timeline of when you expect to hire?

Within 6 Months	Within 1 year	Within 2 years	Don't Know
4	3	3	8

Were you aware of Kaskaskia College's GST Program?

Yes	No	
13	21	

Do you see a role for the expansion of GST training/courses in higher education leveraging applications of remote sensing?

Yes	No	Maybe	Don't Know
31		2	

If yes, please list the educational or technical program areas that you think should be integrating or leveraging more concepts and skills within GST and remote sensing data.

General Education	Utilities	Agriculture	Law Enforcement	Conservation or Environmental Science	Geology Geography	Surveying
18	21	26	17	22	17	20

Would your organization or business be willing to help or support Kaskaskia College's GST Program?

Yes	No	Maybe	Don't Know
12	4	6	6

If yes, list the potential support:

Sending staff to take courses	Hosting Interns	Sponsoring student scholarships	Donating old or outdated equipment (i.e., GPS units, etc.)	Marketing the program
5	9	2	1	8

Comments from the surveys of "The Power of Imagery" conference 7/31/2015

Did the conference help broaden your knowledge about GST and utilization of remote sensing applications?

More about actual work to be done in Ad & Utilities.

UAV government policy.

ESRI online resources.

Imagery Applications.

Community of agencies/people working together to prosper.

UAV's, Mapping.

CropCopter was excellent.

I knew very little about imagery before today.

The imagery that does contours.

Didn't know about Ameren UIS.

It was good to see what users are doing with imagery.

The Ag applications and ESRI updates.

UAV Info.

Different perspectives led to new connections between/among disciplines.

I learned more about the real-world applications from actual participants.

Learned more about precision Ag and about electrical distribution.

Understand UAV's better.

The conference opened my eyes to other fields that utilize GIS other than Ag.

NDVI – Interesting, Story Map – Cool.

More in-depth understanding of types of imagery. Practical use of GIS / Imagery. UAV's.

Reminded for uses of thermography and some practical considerations for data accuracy. NDVI available in ArcGIS online.

GIS and CropCopter.

Versatility of UAV's and cost involved.

What did you find most useful from the conference?

Networking.

UAV Applications.

UAV usage.

All great info.

Ag related topics.

Possibilities.

Sources for information.

Networking and discussion.

UAV info.

Networking / contacts.

Farming use and UAV use.

Hearing about the changes in mapping/GIS as a broader professional option.

I learned more about the real-world applications from actual participants.

Networking.

Learned more about precision Ag and about electrical distribution.

Terms and understanding of collection and processing.

The CropCopter discussion.

Learned the most from CropCopter.

UAV procedures, i.e. more practical applications of GIS technology.

Hearing how people use the technology in different ways.

CropCopter.

Application of GIS indifferent industries.

Uses of imagery and how to apply them in the workplace. Having ESRI come and explain some of their imagery was helpful.

How could the conference be improved?

More actual applications & less about workforce, training, etc.

More networking time.

Have attendees share where they are from and their knowledge in this field. Morning was really low level.

More discussion of education requirements for people seeking career goals.

Better chairs, nice room!

Bring in criminal justice and fire related topics.

Hands-on workshops.

From my point of view, I would have liked more related to agriculture.

Well planned.

Get a few more people and presenters.

Include contact information for presenters and attendees.

Breaks between speakers so we can discuss with others.

Not sure.

More networking, name badges.

More better advanced communication.

Have a lab version.

More real application in industry.

Nothing, all was great.

Spend more time on Ag or be specific in who the audience is meant to be. Maybe gear a conference towards specific end users.

Listen to attendee's needs for other topics.

Sometimes hard to hear.

More tutorials on new tools.