

TRAVEL REPORT FORM

출장보고서

결 재	팀장	부서장	부서장	
	12/14 김광형	12/14 김형진	대결 12/14 김형진	
협 조				

I. Reporter 보고자

Department 소속	Position 직위(직급)	Name 성명	Travel Date 날짜	Note 비고
사업기획팀	팀장	김광형	2016.12.04.-10	미국 플로리다

II. Major Activities 주요업무 수행내용

1. Main Contents and Activities 주요내용 및 활동

- 1) 농업 기상기후의사결정도구 학회 (12/5-7) 참석
 - 학 회 명 : Weather & Climate Decision Tools for Farmers, Ranchers & Land Managers Conference
 - 목 적 : APCC 연구결과 발표, 기상기후정보를 활용한 농업의사결정 도구 활용에 대한 최신 동향 파악 및 잠재적인 공동연구기회 창출
 - 발표 제목 : IMPROVING AGRICULTURAL RESILIENCE TO CLIMATE VARIABILITY THROUGH ENSURING DATA AVAILABILITY AND ENHANCING CLIMATE SERVICES (초청구두발표)
- 2) AgroClimate.org 프로그램 담당교수인 Dr. Fraisse와 업무협의를 및 실제 의사결정도구 활용 농가들을 방문

2. Relevance to APEC Climate Center's Activities 결론 및 소감

- 1) 농업의사결정도구 기획 및 개발: Extension이 초기단계부터 기획 및 개발에 관여할 필요가 있음 -> Extension은 활용도를 중심으로 농민들과 긴밀한 논의를 통해 실제 활용이 가능한 의사결정도구의 개발이 필요함. 개발 중 농업현장에서 지속적 테스트 및 피드백을 받으면서 향상이 되어야 할 필요.
- 2) 농업의사결정도구 활용 및 유지: 현장에서의 활용 또한 Extension이 중요한 역할을 할 수밖에 없는 상황임 -> 농민들과 이미 신뢰가 존재하고 직간접적으로 커뮤니케이션이 가능하기 때문. 의사결정도구의 활용 뿐만 아니라 유지를 가능하게 하는 것은 사용자의 요구와 새로운 기술을 반영한 혁신, 사용 편의성, 해당 도구의 지속적인 업그레이드임, 또한 개발된 도구의 활용을 위한 교육이 반드시 함께 이루어져야 함, -> 이러한 모든 것을 가능하게 하는 것은 지속적인 사업자금의 확보임, 상업화를 통한 유지자금의 확보도 대안으로 제시됨
- 3) USDA(미국 농무부)나 NOAA(기상청) 기관 수준에서 미국 전역을 대상으로 하는 농림 분야별 기후정보서비스 (가뭄조기경보, 가뭄모니터링, 허리케인모니터링, 가공된 기후정보 등) 소개, 권역별로 일부 주 단위로 서비스가 되는 농업 및 임업 기후정보서비스 (동남권역 Agroclimate.org, 서북권역 산불경보시스템 등) 소개함

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- 4) 수많은 의사결정도구가 개발되어 각 지역의 특성에 맞춰 활용이 되고 있음. 하지만 중복적인 요소들이 많기 때문에 (예를 들어 농업관계의사결정도구는 웹서비스 뿐만 아니라 스마트폰 앱으로 개발되어 활용하고 있음) 그러한 기술들이 서로 공유되고 다른 지역으로 확장될 수 있는 시스템이 갖춰져 있다면 경제적인 효율성을 높일 수 있을 것임
- SERCH LIGHT: 농림 가뭄전망 (Monthly drought outlook), 소 열스트레스 예보(Cattle heat stress forecast) 등은 이메일 구독을 통해서 해당 정보를 지속적으로 받을 수 있음. Southeast Regional Climate Hub를 통해 개발되고 지속적인 운영이 됨
 - 병해충 의사결정도구: Strawberry Advisory System, Pic-a-WheatField, Blightpro 등 대부분의 시스템이 현재 관측정보를 이용해 병해충 위험도 정보를 전달하지만 일부 기상예보를 활용하는 시스템이 존재하긴 함. 그럼에도 불구하고 예보의 불확실성으로 인해 모니터링이 주 임
 - 탄소 발자국 또는 Filed Print 등 생산부터 가공, 마케팅에 이르는 전 과정에 대한 탄소량을 계산하는 의사결정도구도 개발되어 활용되고 있음
 - 과실나무 동해위험 의사결정도구, 대농민 교육 웹, Extension 정보 웹, 사용자 참여형 교육 및 개발, 위성정보를 활용한 농업수자원관리도구, 민관 협력을 통한 의사결정도구의 개발 등에 대해 논의가 됨
- 5) 결론: 의사결정도구의 기획 및 개발은 급하게 서둘러서는 대부분 실패할 수 밖에 없음. 현장의 수요와 기술 현황 및 역량, 사용자 분석, 시스템 등이 전혀 분석이 되지 않은 상황에서의 개발은 무의미함. 따라서 APCC 사업에서 의사결정도구가 최종 목적인 경우, 적어도 1-2년 이상은 상황을 파악하고 필요기술을 개발, 개발된 기술의 실효성, 의사결정도구로써의 활용가능성 등이 먼저 분석되어야 함. 이후 확실한 운영자와 사용자가 확인된 후에 의사결정도구의 기획 및 개발이 결정되어야 함, 또한 기술적인 면 뿐만 아니라 대상지역의 사회경제적인 현황을 함께 분석해야 활용성 및 지속가능성을 높일 수 있음. 운영자/사용자와의 지속적인 논의, 교육 및 검증, 현장 적용, 지속적인 운영을 위한 시스템의 구축, 기금의 확보 등에 대한 총체적인 접근이 필요함, 연구자는 밸류체인상에 있는 모든 목소리에 귀 기울여야 함. 농업의 경우, 정책결정자, 정부기관 담당자 뿐만 아니라 현장 Extension, 대학, 농민, 그리고 농업관련 NGO 등으로부터 의견을 수렴하고 논의해야 할 것임.

III. References 참고사항

(with attachment of any information or report in case of attendance of conferences, workshops and meetings) 학술대회, 워크숍, 회의 등 참석 시 관련 정보 및 문서 첨부

1. Presented and Collected Materials 주요 수집자료

2. Suggestions and Remarks 건의사항



Institute of Food and Agricultural Sciences
Agricultural and Biological Engineering Department

271 Frazier Rogers Hall
PO Box 110570
Gainesville, FL 32611-0570
352-392-1864 ext. 271
Fax: 352-392-4092
Website: www.abe.ufl.edu
E-mail: cfraisse@ufl.edu

September 23, 2016

RE: Conference on Weather and Climate Decision Tools for Farmers, Ranchers, and Land Managers

Dr. Kwanghyung Kim
Strategic Planning Team Leader
Climate Application Department
APEC Climate Center
Republic of Korea

Dear Dr. Kim,

It is my great pleasure to invite you to attend the Conference on Weather and Climate Decision Tools for Farmers, Ranchers, and Land Managers taking place in Gainesville, FL, USA Dec 5-7, 2016. You can find detailed information about the program and logistics in the conference website: http://conference.ifas.ufl.edu/decision_tools/

Our conference will address the urgent need for the development of decision support tools designed to translate weather and climate information into practical decisions aimed at reducing production risks on our working lands. As a team leader in the Climate Application Department you will greatly contribute and benefit from the discussions and presentations planned for the various sessions. I also strongly encourage you to submit an abstract for an oral presentation.

Sincerely,

A handwritten signature in black ink, appearing to read 'Clyde Fraisse', with a stylized, cursive script.

Dr. Clyde Fraisse
Conference Chair and Associate Professor
Agricultural and Biological Engineering Department
University of Florida

The Foundation for The Gator Nation

An Equal Opportunity Institution

Weather & Climate Decision Tools for Farmers, Ranchers & Land Managers

December 5-7, 2016

University of Florida, Gainesville, FL USA

Conference Goal

Present information and engage participants in a discussion about the state-of-the-art in decision support tools designed to give producers and land managers a competitive edge in increasing productivity and reducing risks associated with climate variability and change.

Objectives

1. Engage extension professionals, producers, land managers, policy makers, researchers, private sector and agency representatives in the development of climate education and decision support tools;
2. Present recent progress on the development of climate web-based and mobile phone apps for agriculture;
3. Facilitate information sharing on stakeholders' needs and knowledge gaps;
4. Foster collaboration that will lead to more comprehensive and widely applicable tools.

Day 1 – Monday, December 5th, 2016

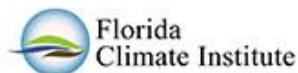
Venue: University of Florida – Reitz Union (Rion Ballroom)

7:00 – 8:00 **Registration**

8:00 – 8:45 **Conference Welcome and Goals** Dr. Jack Payne – UF IFAS, Dr. Nick Place – UF IFAS

8:45 – 9:15 **Keynote Speaker** Dr. Sonny Ramaswamy – USDA NIFA

9:15 – 10:15 **Tools Café**
Interactive session featuring a display of tools on tablets, smartphones and/or computers. Conference participants have the opportunity to get hands-on experience with the tools and discuss with tool developers and current users.



10:15 – 10:45 Break & Networking

10:45 – 12:00 **Climate Education Tools** (Dr. David Herring – NOAA)

3 presentations featuring educational programs and tools offering interactive visualizations for exploring climate variability cycles including ENSO, probability of extreme events, and climate change projections.

12:00 - 1:15 Lunch (provided) & Networking

1:15 – 2:15 **Preparing Working Land Managers for Drought** (Dr. Mark Svoboda – National Drought Mitigation Center)

3 presentations featuring applications of drought monitoring and forecasting tools in agriculture, rangelands and forests. Examples of drought indices use to characterize water stress and yield losses in working lands.

2:15 – 3:15 **Managing Water and Nutrient under Climate Extremes** (Dr. Kati Migliaccio – University of Florida)

3 presentations featuring extreme events trends in the SE USA, tools targeting water management, irrigation scheduling, and nutrient management.

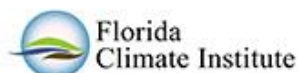
3:15 – 3:45 Break & Networking

3:45 – 4:45 **Plant Disease Alert Systems – Climate and plant diseases** (Dr. Natalia Peres – University of Florida)

3 presentations featuring weather and climate-based tools to monitor and forecast disease risk levels and recommend control actions.

4:45 – 5:00 Break & Networking

5:00 – 7:00 **Reception and Poster Session**



Day 2 – Tuesday, December 6th, 2016

Venue: University of Florida – Reitz Union (Rion Ballroom)

7:30 – 8:45 Registration

8:45 – 9:15 Keynote Speaker Dr. Marshall Shepherd – University of Georgia

9:15 – 10:15 **Tools for Sustainable Production Systems under a Changing Climate** (Dr. Edward Barnes – Cotton Incorporated)
3 presentations featuring sustainability indicators and footprints calculators (Carbon, Water, and Nitrogen footprint).

10:15 – 10:45 Break & Networking

10:45 – 12:00 **Crop Management Tools** (Dr. Gerrit Hoogenboom – University of Florida)
What do producers need to know before and after planting?
3 presentations featuring tools to monitor and inform managers about the effects of climate variability on crop development and yield.

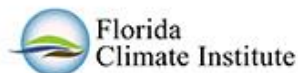
12:00 - 1:00 Lunch (provided) & Networking

1:00 – 2:00 **Forest Management Tools** (Heather Aldridge – North Carolina State University)

3 presentations featuring tools to monitor and inform forest managers about the effects of climate variability on forests.

2:00 – 3:00 **Livestock and Pasture Management Tools** (Dr. Mark Risse – University of Georgia)
3 presentations featuring tools to monitor and inform livestock operation managers about the effects of climate variability on livestock and pasture.

3:00 – 3:15 Break & Networking



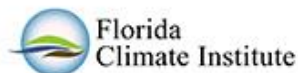
- 3:15 – 4:00 **Engaging Extension and Working Land Managers in Tool Development and Use** (Dr. Wendy-Lin Bartels – University of Florida)
3 presentations featuring methods and experiences in engaging Extension and producers in climate education and tool development.
- 4:00 – 5:00 **Lessons Learned**
Discuss lessons learned, usefulness of current tools and how they can be improved. Gap analysis: Suggest new target areas for tool development.

Day 3 – Wednesday, December 7th, 2016

Venue: University of Florida – Straughn Professional Development Center

Climate Tools Development Workshop

- 7:30 – 8:00 Registration
- 8:00 – 8:15 Workshop Welcome and Goals
- 8:15 – 9:45 **Data Sources for Weather and Climate Tools** (Dr. Arthur DeGaetano – Cornell University)
Review of existing data sources, APIs, and issues related to obtaining, storing and processing data, including comparisons of gridded and weather station-based data
- 9:45 – 10:15 Break & Networking
- 10:15 – 11:45 **Challenges for the Long-term Sustainability of Tools** (TBD)
Challenges associated with maintaining data and tools over time, and needs for sustainable funding, and opportunities for regional collaborations
- 11:45 – 12:00 **Summary and Closing Remarks**



IMPROVING AGRICULTURAL RESILIENCE TO CLIMATE VARIABILITY THROUGH ENSURING DATA AVAILABILITY AND ENHANCING CLIMATE SERVICES

Kwang-Hyung Kim¹, Uran Chung¹ and Steven Crimp²

¹Climate Application Department, APEC Climate Center, Busan, Korea

²CSIRO Agriculture and Food, Black Mountain, Canberra, Australia

Agricultural resilience requires understanding the impacts of climate variability and the dynamics of farmer adaptation. Weather and climate forecasting enables to predict yields with potential risks of crop damage and thus to explore adaptation strategies, but the challenge lies in translating low-to-moderate skill climate information into useful information for farmers. In fact, anyone who works in climate would recognize the awkwardness of talking about climate prediction to a group of people who are experiencing the opposite in reality. Similarly, any agricultural information translated from the climate prediction has no choice but to inherit the untrustness within the stakeholder groups. Complex climate-crop interactions are made relevant to the lay people through building easy-to-use tool kits, but these tools are only useful to end users if a decision support environment (building relationships and trust among stakeholders, continued/iterative communication in co-generating products) is created instead of only decision support systems. Therefore there need to develop ways to effectively communicate the long-term, variable nature of such climate prediction and its agricultural information by-product. We will highlight these issues by telling the story of climate smart agriculture. The climate smart agriculture here refers to the smart use of climate information for agricultural decision making, which results in maximizing the positive and minimizing the negative influence of climate. Several case studies will be shared, emphasizing on how improved data availability by a stakeholder-participatory approach led to enhanced agro-met services and eventually improved agricultural resilience to climate variability in the communities.

Contact Information: J. Mark Genesis, Soil & Water Science Department, University of Florida, PO Box 000, Gainesville, FL 11111, USA, Phone: 000-555-5555, Email: sscientist@emailaddress.net

WEATHER & CLIMATE DECISION TOOLS FOR FARMERS, RANCHERS & LAND MANAGERS



1. Who Should Attend.

Extension professionals, producers, land managers, policy makers, researchers, private sector and agency representatives involved in the development of climate education and decision support tools

2. When December 5-7, 2016

3. Where University of Florida, Gainesville, FL USA

REGISTER NOW

http://conference.ifas.ufl.edu/decision_tools/index.html

SUSTAINABILITY **Disease** **TECHNOLOGY**
Nutrients **Climate-Smart** **Decision-Making**
WATER
Livestock **CROP**
TOOL **DROUGHT**
AGRICULTURE **Pasture**
Management **WEATHER** **Innovation**

Conference Goal

Explore the state-of-the-art in weather and climate technology for agriculture!

KEYNOTE SPEAKERS



Dr. Sonny
Ramaswamy
USDA NIFA



Dr. J.
Marshall
Shepherd
University
of Georgia