

# **Objectives of the LCLUC Hotspot Initiative**

Chris Justice

# Context for the current LCLUC Hotspot Initiative

- Land Use Change is ubiquitous – however in some regions of the World, land cover / land use are changing rapidly and with significant impacts on the environment and consequences for society – these regions were are defining as LCLUC Hotspots.
- LCLUC ROSES Hotspots elements – 2020, 2021, 2022
- NASA Earth Science Division is identifying activities and efforts to meet the most pressing information needs of society now and in the coming years to inform development of an Earth Action Strategy - “seeks to increase the impact domestically and globally by engaging users in partnerships”

# The current LCLUC Hotspot Initiative

- Objective: to raise the visibility of the program (internally at NASA and externally) – to continue to make the case for program relevance and increased/continued support.
- Focus on areas of high impact LCLUC of national to regional importance, with significant impact and policy relevance using multi-source satellite data.
- MuSLI aimed at exploring sensor synergies (spectral, spatial and temporal) in support of LCLUC Science.
  - NASA increasing the use of international and commercial assets in support of Earth Science (e.g. Sentinel 1, Sentinel 2, CSDA)

# LCLUC Hotspot Initiative

## Program Expectations:

- “Peer-reviewed publications quantifying **high impact land-use and land-cover change** around the World....
- ...The findings of each funded research project and ‘hot spots’ will be incorporated in the interactive web page on global LCLUC Hot Spots and it is expected that P.I.’s will contribute material for the LCLUC web-site, as requested.”
  - Need for sharing and communicating your research findings
- Projects will follow NASA guidance on data sharing (Open Science).

# Hotspot map

Land-Cover and Land-Use Change Program

[Home](#) [About Us](#) [People](#) [Meetings](#) [Projects](#) [Data](#) [Education](#) [Maps](#) [Documents/Publications](#)

## WELCOME TO LCLUC

Welcome to the NASA Land-Cover and Land-Use Change (LCLUC) Program website. LCLUC is an interdisciplinary science program in the Earth Science Division of the Science Mission Directorate. LCLUC is part of the Carbon Cycle and Ecosystems Focus Area with links to some programs in other Focus Areas.

**Search LCLUC Website**

Recordings available here

« Prev   January 2022   Next »

SUN	MON	TUE	WED	THU	FRI	SAT
26	27	28	29	30	31	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5

**LCLUC Science Team Meeting Schedule**

DATE	LOCATION
04/18/2022	Bethesda, MD
10/19/2020	Virtual
07/22/2019	Johor Bahru, Malaysia
04/09/2019	Rockville, MD

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[LCLUC - Related Meetings](#)  
[LCLUC - Related Calendar](#)

Contact us: [lcluc-support@umd.edu](mailto:lcluc-support@umd.edu)  
 We are on:

**LCLUC E-Newsletter**

- Issue 9: Spring 2021
- Issue 8: Fall 2020
- Issue 7: Spring 2020
- Issue 6: Spring 2019

Join our Mailing List

**LCLUC Webinar Series**

- Impacts of Regional Conflicts on LCLUC - Webinar Series 2021
- LCLUC Central Asia Webinar Series 2021
- LCLUC Caucasus Webinar Series 2021
- LCLUC COVID-19 Webinar Series 2020-21
- LCLUC 2020 Webinar Series
- LCLUC 2019 Webinar Series
- LCLUC 2018 Webinar Series

[\[Archive\]](#)

**Featured Project**

"Water Scarcity in the Serbian Danube: Agricultural Land Use Change and Irrigation"

Principal Investigator: Sean Woznicki

Climate change is driving water scarcity in the Middle and Lower Danube River Basins.

Geographic Distribution Of Project Team Members Institutions

(Click on map to view)

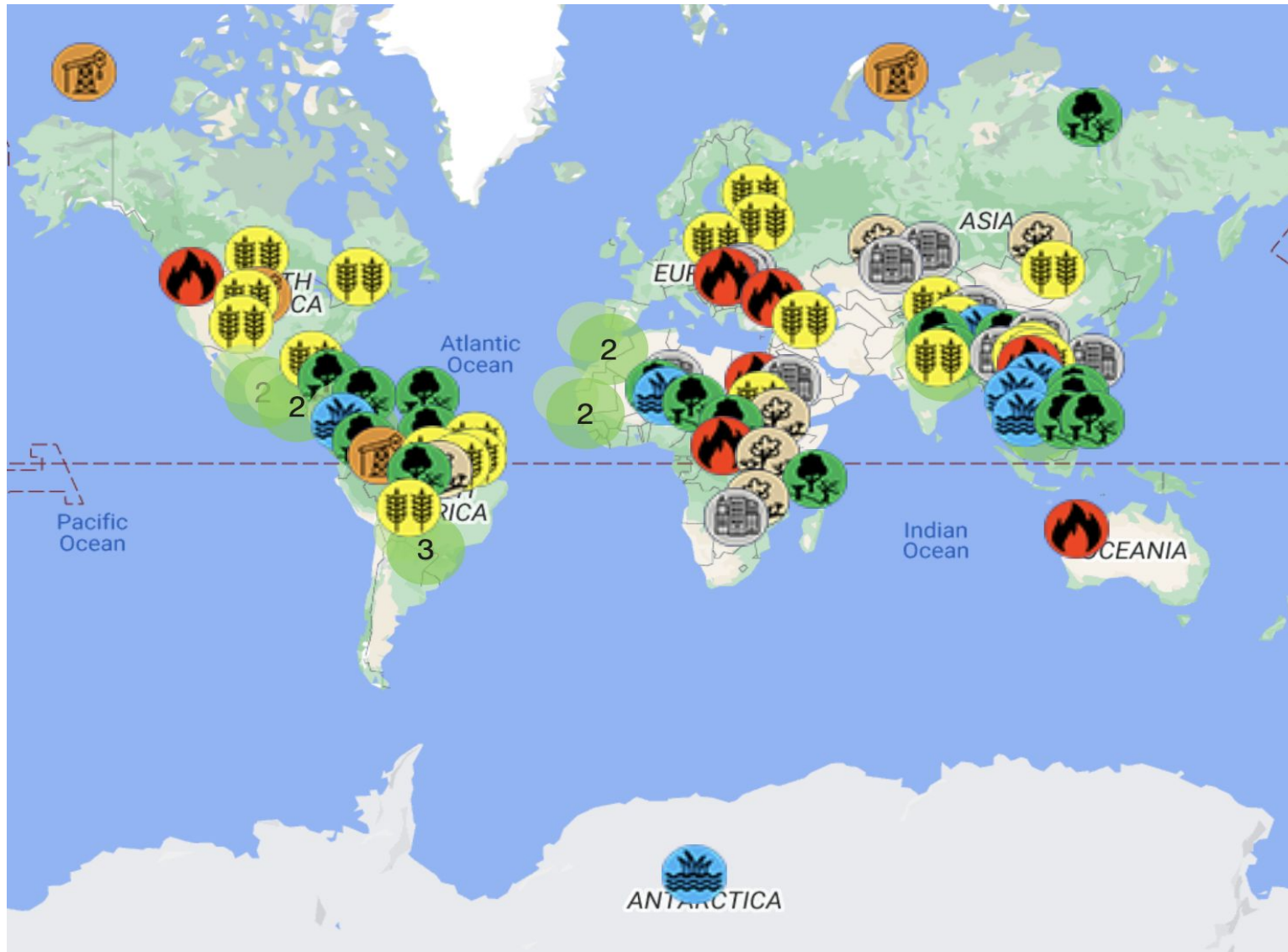
Geographic Areas Of Research Projects

(Click on map to view)

Geographic Distribution Of Hotspots

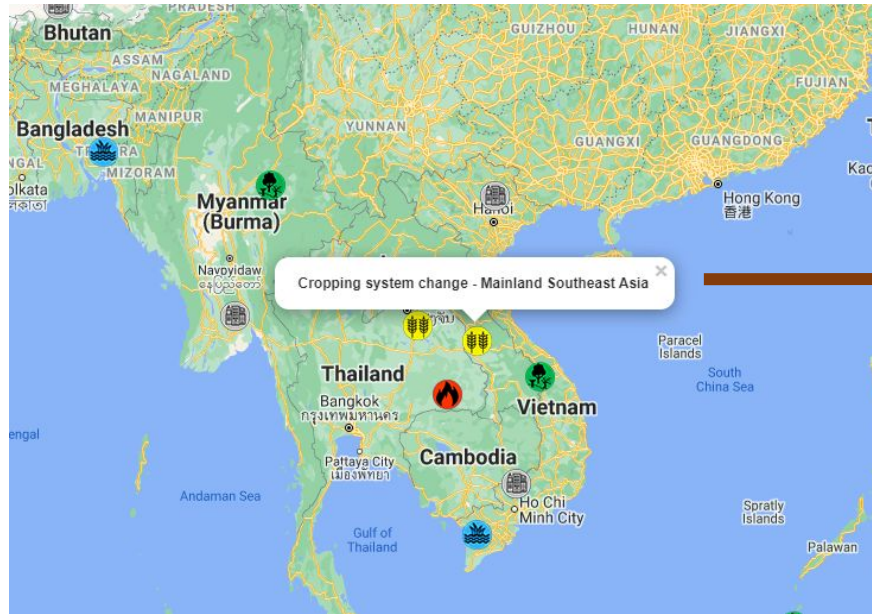
(Click on map to view)

# LCLUC Web Site Hot Spot Map



- Urban
- Savanna
- Agriculture
- Forest
- Wetland
- Extractive Industry / Mining
- Fire

# Landing Project Page



## The Agrarian Transition in Mainland Southeast Asia: Changes in Rice Farming - 1995 to 2018

Start Date: 05/01/2018  
End Date: 12/31/2021  
Grant Number: 0556541902027  
No Cost Extension: No  
Regional Initiative: South/Southeast Asia Research Initiative  
Region: Asia  
Sub-Region: Southeast Asia  
Solstation: NNM15220400LNUCLUC

Distribution of Project Team Members' Institutions

Team members:

Person Name	Person role on project	Affiliation
Jefferson Fox	Principal Investigator	Zachry Center, Honolulu, US
Colin Kingka	Co-Investigator	Center For Culture And Technical Interchange Between East and West, Madison, United States
Ian Baird	Co-Investigator	Center For Culture And Technical Interchange Between East and West,
Janon Van Den Hoek	Co-Investigator	Oregon State University, Corvallis, United States
Stegan Hunt	Co-Investigator	University of Bern, Bern, Switzerland
Stephen Leisz	Co-Investigator	Colorado State University, Fort Collins, US
S. Nishikawa	Co-Investigator	Spannhauser University,
Duong Hong	Co-Investigator	Vietnam National University of Agriculture,
Han Kimlong	Co-Investigator	Royal University of Phnom Penh,
K. Mahanand	Co-Investigator	Ubon Ratchasit University,

Abstract:  
This project responds directly to the solicitation for LCLUC studies in Southeast Asia by examining how the region's response to a simultaneous loss of agricultural labor and intensification of rice production. Major project objectives include: 1) To use comprehensive multi-resolution satellite derived datasets to characterize variability in rice production and land use changes (including rice production systems); 2) Use advanced geospatial production modeling to assess socio-economic and environmental conditions; 3) Use national, population and agricultural censuses and other available socioeconomic datasets to provide sub-unit level to quantify how changing conditions compare with changes in rice production systems through time and 4) Conduct field-based research to develop a place-based understanding of how rice farming is being used for changing livelihoods, economic opportunities and social conditions. We will explore these objectives for the major rice producing areas of four Mainland Southeast Asia (MSEA) countries as a case of rice production systems between 1995 and 2018. The four countries and six regions include 1) Vietnam (Red River and Mekong River Deltas); 2) Thailand (Northwest and Central Regions); 3) Cambodia (Kampong Chhnok and 4) Cambodia (Kampong Chhnok). We will quantify changes in rice production systems between 1995 and 2018, as a means of understanding the socio-economic and environmental conditions that have led to these changes. We will use an assemblage of complementary, multi-resolution satellite derived products (including Landsat, Sentinel 2 SAR, and Sentinel 2 SAR) to understand changes in rice production systems through time and space. We will use a machine learning-based clustering algorithm to identify rice production systems and their spatial patterns. We will use a machine learning-based clustering algorithm to identify rice production systems and their spatial patterns. We will use a machine learning-based clustering algorithm to identify rice production systems and their spatial patterns. We will use a machine learning-based clustering algorithm to identify rice production systems and their spatial patterns.

Project Research Area:

Project Documents

Year	Authors	Type	Title
2021	Nathan Green	Publications	W. Nathan Green (2021) Placing Cambodia's agrarian transition in an emerging Chinese food regime, <i>The Journal of Peasant Studies</i> , DOI: 10.1080/03066150.2021.1923007
2020	Jefferson Fox	Poster Presentation	Frazier, A.G. Stuecker, M.F. Nelson, K. Yen, B.T. Sander B.O. Fox, J.M., Promkhambut, A., Kantar, B.K., Wang D.R., Climate Variability and Rice production in mainland southeast Asia. <a href="https://agu2020fallmeeting-agu-jpostersessions.com/default.aspx?s=06-22-1F-6A-6F-94-F8-7D-B5-20-66-91-9A-40-D8-C6&amp;guestview=true">https://agu2020fallmeeting-agu-jpostersessions.com/default.aspx?s=06-22-1F-6A-6F-94-F8-7D-B5-20-66-91-9A-40-D8-C6&amp;guestview=true</a>
2019	Stephen Leisz Nghiem Thi Phuong Tuyen	NASA LCLUC Science Team Presentation	Changing Agricultural Land-Use Patterns and the Drivers of These Changes in Vietnam's Red River Delta
2019	Jefferson Fox	NASA LCLUC Science Team Presentation	The Agrarian Transition in Mainland Southeast Asia: Changes in Rice Farming 1995 to 2018
2019	Yuko Shirai Stephen Leisz Jefferson Fox	Publications	Shirai, Y., S. Leisz, J. Fox, and A.T. Rambo. 2019. Commuting distances to local non-farm workplaces and out-migration: The case of Northeast Thailand. <i>Asia Pacific Viewpoint</i>
2017	Yuko Shirai Stephen Leisz Arthur Rambo	Publications	Shirai, Y., S. Leisz, J. Fox, and A.T. Rambo. 2017. Rural household characteristics and agricultural activities in relation to local non-farm employment: A comparative study of two wet-rice-growing villages in Northeast Thailand. <i>Khon Kaen Agriculture Journal</i> : 45 (4): 721-730.
2017	Yuko Shirai Jefferson Fox Stegan Hunt	Publications	Shirai, Y., J. Fox, S.J. Leisz, H. Fukui, and A.T. Rambo. 2017. The Influence of Local Non-Farm Employment on Rural Household Structure in Northeast Thailand. <i>Journal of Rural Studies</i> 54: 52-59

that underlie observed changes to rice production systems (e.g., urbanization or industrialization). The knowledge generated by the proposed research will improve understanding of the social and ecological transformations affecting MSEA rice production and broadly advance globally-relevant theory on agriculture adaptation and change.



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# Next Steps

- Check the Web Site and Submit any Edits to the Hotspot Map and Categories (to Meghavi).
- Review/Update to your Project page on the LCLUC Web Site – with link to your project website as available (to Meghavi).
- Continued Hotspot Webinar Series (work with Melanie to schedule and prep) – attendance c. 300 attendees.
  - Emphasis on the High Impact Significance of the hotspot topic/research findings and their Policy Relevance – to the broader science community
- Populate LCLUC Metadata page and share Project Data (products) before end of project and contact Krishna (NASA Open Science).
- PLEASE notify the LCLUC Program Manager of Publications, Project Workshops, Talks, Awards, Media interviews etc (notify Garik cc. Meghavi).



# Potential Opportunities

- Possibility of a Special Edition of Papers on LCLUC Hotspots ?
  - Level of interest ?
- As the Hotspot Projects mature, we are considering a series of 1 page Science Impact - Policy-relevant Briefs from the Research to share with HQ Management – to craft these we will need your help.
  - Starting with ROSES 2020 – in 3<sup>rd</sup> Year of Funding
  - Lutz, Nolte, Healey, Skakun, Magliocca, Tyukavina, Neigh, Song, Yin, Roy, Skole...
- Other Suggestions or Questions ?