Office of the President
California State University, Chico

Executive Memorandum 19-016

May 23, 2019

From: Gayle E. Hutchinson, President

Subject: Approval of the Center for Regenerative Agriculture & Resilient Systems

Upon the recommendation of the Academic Senate and the concurrence of the Provost, I approve the Center for Regenerative Agriculture & Resilient Systems, effective immediately.

Policy Title:	EM 19-016 Approval of the Center for Regenerative Agriculture & Resilient Systems
Contact:	College of Agriculture; College of Natural Sciences; College of Communication and Education
Supersedes:	
Revision:	
Enabling Legislation or Executive Order:	

Proposal to CSU, Chico Academic Senate
Center for Regenerative Agriculture & Resilient Systems
March 2019

Name of Center/Institute: Center for Regenerative Agriculture & Resilient Systems

Names of the unit overseeing the Center/Institute: College of Agriculture; College of Natural Sciences; and College of Communication and Education

Contact person : Cynthia Daley, cdaley@csuchico.edu, 530.898.6280; Cell 530-518-4157

Names, title, rank of individual(s) primarily responsible for drafting proposal:

Dr. Cynthia Daley, Faculty College of Agriculture, Director of the Organic Dairy Unit

Dr. Tim LaSalle, Consultant, Faculty Emeritus Cal Poly SLO, Adjunct Professor COA

Dr. David Johnson, Consultant, New Mexico State University, Adjunct Professor COA

Dr. Garrett Liles, Faculty College of Agriculture

Dr. Betsy Boyd, Faculty College of Agriculture

Dr. Lee Altier, Faculty College of Agriculture

Dr. Jake Brimlow, Faculty College of Agriculture

Dr. Maria Giovanni, Faculty College of Natural Sciences

Taylor Herren, Staff for the Regenerative Agriculture Initiative, Chico State Alum

Ahmad Boura, VP University Advancement

(Section 5 EM 18-018)
Relevance of the proposed AU to the missions of Chico State, the CSU, the North State, and/or other key stakeholders:

The proposed Center is fully aligned with CSU Chico Strategic Priorities 1, 2, 4, and 6:

Strategic Priority #1: ***"Believing in the primacy of learning, we will continue to develop high-quality learning environments both inside and outside the classroom. "***

Creating innovative and engaging curriculum around regenerative systems is a strategic priority for the Center. Working together with faculty from across disciplines, other institutions, and industry partners, the Center will create sustainability learning modules to infuse into existing curriculum with applications to a wide variety of disciplines where sustainability factors and building/establishing systems-based resiliency is critical.

To create these learning modules, the Center will host Fall & Spring Seminar Series and the "**This Way To Sustainability**" conference (TWTS) each spring. Keynote speakers will be captured on video and made available for learning module content development. For example, Dr. Thomas Goreau, a climate geochemist, will present the latest data on the climate crisis, environmental impacts and what he sees

as viable solutions. From this presentation, learning modules can be created around marine ecosystem restoration research, economic impacts of climate change on the fishing industry, or the socio-economic impacts of the decline in ocean ecology on native populations, as a few potential examples.

This year we are also hosting Dr. Alice Julier, Director of the Center for Regional Agriculture, Food, and Transformation (CRAFT) at Chatham University. Alice will discuss a number of topics related to food and culture, her book of the same name is used widely in *Food Studies* programs throughout the world. Her presentation could provide material for a number of learning modules that may include the inequality in our food system or the "political economy of obesity" for those in nutrition, food science, dietetics, business, or political science.

Through these campus experiences, the Center will create/support curriculum development across multiple disciplines.

The Center also focuses on continuing education for the agricultural community and the consuming public as a whole. Several events have been executed over the course of the last two years with excellent attendance. The Regenerative Ag Initiative (RAI) hosted an organizational meeting for organic vegetable producers to discuss potential no-till production practices that may reduce damage to soil health and enhance soil carbon sequestration. Working together with UC Cooperative Extension Service, we have successfully garnered a USDA Conservation Innovation Grant to support demonstration development on five farms, including the University's Farm, Five Points Experiment Station in Fresno, and Fresno State University Farm.

Each cooperating farm is responsible for conducting on-farm field trials that will produce meaningful demonstration data and educational materials. As these projects progress, the Center will document the developments through videography and case study analysis. As a component of the CIG grant, each farmer must host a field day to showcase their work, and provide internship opportunities for young farmers, or ranchers. The new Center will support (and expand) this activity with video production and case study development, all posted to our site: www.csuchico.edu/regenerativeagricutlure/, for on-line access. We anticipate that the learning community will include students, faculty, staff, industry professionals and the agricultural community.

The Center will also support the development of degree programs in regenerative science and resilient systems, including the "Sustainability" degree program. We are looking forward to co-hosting planning sessions for any faculty interested in participating in curriculum development around sustainability and resilient systems.

Strategic Priority #2: "***Believing in the importance of faculty and staff, and their role in student success, we will continue to invest in faculty and staff development."***

We believe that learning is a community effort, as we host conferences and field days, conduct field research and participate in industry related issues, ideas are exchanged, new thoughts are created around content that may be new or old content presented in a new light. These Center sponsored events are golden opportunities for everyone (faculty, staff, students, industry, local community) to learn and grow in breadth and depth of our knowledge.

The Center also represents opportunities for professional development in the more traditional sense. For example, Colleen Wolfchuck (staff manager of the OVP) and Matthew Housley (staff manager of the Horticulture Unit) will attend an on-farm workshop in no-till production methods from the award winning "Singing Frogs Farm" in Sebastopol in March. The training they received is sponsored by RAI (the future Center), for the specific purpose of learning new production techniques that can be used in their programs on farm.

Jeff Boles, and the rest of his farm crew, (six staff members) have already benefited from the expertise of Master Farmer Scott Park, a member of the Center's Advisory Board with a 30 year history in Regenerative Farming practices. The crew has toured Scott's farm and we have hosted Scott at the University Farm to support changes to our management strategies on our demonstration sites. Scott has given the crew a number of ideas with respect to no-till farming methods and the necessary equipment to optimize the transition. RAI has also provided support for faculty to attend events at the Paicines Ranch in Paicines, CA and the Eco-Farm Conference in Asilomar, CA. The Center has plans for regular faculty and staff development opportunities.

Additionally, and perhaps most importantly, professional development is provided through the many research projects that are established through our network and through our support with grant writing and facilitation. These grants benefit faculty, staff, students, campus administration and the industry.

Strategic Priority #4: ***"Believing in the value of service to others, we will continue to serve the educational, cultural, and economic needs of Northern California. "***

Northern California has a very diverse socio-economic populace that is interwoven throughout an equally diverse patchwork of agricultural production systems and watersheds. As our climate continues to change, creating disruption to our normal way of life, a Center that focuses on building resiliency will be instrumental in helping our communities cope, adapt, and hopefully thrive, under what may be some truly horrific climatic events. For instance, 2018 wildfire season was the deadliest and most destructive wildfire season on record in California, with over 8,527 fires burned an area of 1,893,913 acres, the largest amount of burned acreage recorded in a fire season, according to the California Department of Forestry and Fire Protection. The fires have caused more than $3.5 billion in damages including $1.792 billion in fire suppressions costs alone. Clearly, building resiliency into our communities, farms, and watersheds, can be of no greater importance.

To address the fire aftermath, RAI has promoted and co-sponsored webinars with Point Blue Conservation Science, on post-fire recovery processes for watersheds and agricultural land owners. In May, RAI will bring Nicole Masters to campus, a soil scientist and ecologist, who will specifically address soil management strategies in a post-fire environment.

Strategic Priority #6: ***"Believing that each generation owes something to those that follow, we will create environmentally literate citizens, who embrace sustainability as a way of living. We will be wise steward of scarce resources and, in seeking to develop the whole person, be aware that our individual and collective actions have economic, social, and environmental consequences locally, regionally, and globally. "***

RAI fully recognizes our responsibility, as a campus community and as an individual, to embrace sustainability as a way of living. Thinking sustainability and living sustainability, requires a level

consciousness that can only come from a concerted campus-wide effort to build in sustainability concepts throughout every program on campus. The Center will continue to support the Campus-wide Sustainability Committee, as it expands its purview into all aspects of campus activity, establishing subcommittees to specifically address, develop, and implement resiliency throughout FMS, AS, Academic Affairs and the University Foundation operations, so that all decisions are made with transparency, and as if our planet depended on it.

Why the urgency?

Soil loss/degradation and climate change are two major threats to human wellbeing worldwide. Investing in research, practices, food choices, education, and policy to provide farmers and ranchers resources to build or rebuild soil carbon levels requires well-informed, well-designed action in the immediate future. The Center for Regenerative Agriculture & Resilient Systems will serve as a leading research center, demonstration site, and policy think-tank that will provide practical and timely solutions that will allow thriving agriculture that robustly sustains Earth's complex biogeochemical systems.

Atmospheric carbon dioxide serves a critical role in maintaining an atmosphere warm enough to support life as we know it. However, the anthropogenic increase in atmospheric carbon dioxide experienced over the past two centuries has altered what sorts of plants and animals can thrive and where they can thrive, and has already led to economic losses and adverse human health outcomes. The current trend of adding carbon if not intentionally changed, will continue to alter our biogeochemical environment, with substantial harm to economy, agriculture, and human wellbeing. The increased carbon dioxide has likewise acidified the global ocean, and projected acidification will harm corals, fisheries, shellfish, causing potentially massive harm to ocean biodiversity.

Returning much of this carbon to Earth's soils will not only mitigate these destructive impacts, it will improve and cleanse our water cycles, add fertility and life to the soils, build climate resilience into farmed and grazed lands, and reduce or eliminate the need to cut tropical rain forests globally. A key remedy to this great challenge is to rapidly regenerate that which underlies our life here on planet Earth, our soils.

(Section 5 EM 18-018)
Mission, goals, and objectives of the proposed AU and an explanation of why these cannot be met within the existing university structures.

Mission: The Center for Regenerative Agriculture & Resilient Systems has been created to study and support regenerative practices and activities that will drawdown legacy levels of greenhouse gases (GHG), restore soil resiliency, and increase the economic, social and ecological viability of our communities.

Goals/Objectives:

- Create collaborative, multidisciplinary, research teams to study regenerative systems, including healthy soil, healthy food (nutrient dense), healthy communities, and resilient ecological & social systems.
- Create sites for effective demonstrations, hands-on learning, and applied research in regenerative agriculture and resilient systems.
- Encourage/support regional/local food systems that reduce carbon emissions, promote food security, and revitalize our rural communities.
- Forge national and international collaborations with other academic institutions, agencies, and nonprofits focused on best practices to reverse the effects of climate change and soil loss.
- Create/support interdisciplinary curriculum development in regenerative/resilient studies.
- Create and publish a peer-reviewed biannual on-line Journal for Regenerative Agriculture that will support multiple internship opportunities for students in agriculture, environmental science, communications and journalism.
- Create opportunities for communications and journalism interns interested in videography; journalism; social media; and a wide array of digital media to support outreach for the Center's strategic priorities.
- Coordinate the annual Sustainability Conference together with the Associated Students; Facilities Management; and Academic Affairs; to elevate the conversation, raise consciousness, and create a "call to action" around climate change.

Only by working together can we address the urgent need for action through trans-disciplinary education, applied research, creative forms of outreach and extension to and with our industry partners. The Center will focus on building resiliency within our agricultural ecological systems as a way to ensure food security and economic viability of our agricultural communities in the face of adverse weather patterns.

(Section 5 EM 18-018)
Description of how the proposed AU differs from other existing AUs and units at Chico State, and the proposed relationships with them:

The Center for RARS is quite unique with respect to its mission and goals, however, there are two ancillary units on campus that have some alignment and could be potential partners.

The Center for Water and the Environment (CWE) focuses primarily on water, energy and the environment. Like CRARS, CWE is interdisciplinary and is therefore supported by the Colleges of NS, ECC, BSS, and AGR, and has a similar goal of connecting people across campus and within the community. The research emphasis of CWE includes surface water monitoring; bio-assessments of ecosystem health as related to macroinvertebrate taxonomy; and the interconnected issues of water and environment in Northern California, which makes CWE a very unique and distinct entity from what is proposed for the CRARS. A new aspect recently proposed for CWE focuses around climate change and the impacts on soil, fire and resiliency of our natural systems. While this is a rather new component of CWE, the Center for Regenerative Agriculture & Resilient Systems sees this alignment as an opportunity for collaboration and

synergism. In speaking with the Center's managing director, Jennifer Rotnem, we hope to work together on areas of overlap to support each other with expertise, applied research, and community outreach programs. For example, RAI is supporting and promoting several webinars and workshops for post-fire rangeland management strategies with Point Blue Conservation Science. Working together, CWE and CRARS could reach a wider audience on campus and perhaps access a broader array of government agency personnel that will enhance our reach to the affected community. With over 8,700 acres affected by the Camp Fire, entire watersheds were impacted, as were many area ranchers and farmers, all in need of post fire support. While CWE is focused on the resiliency of watersheds and natural systems, the CRARS is interested in developing resiliency in our agroecosystems, to ensure food security through proper management of our rangelands and cropping systems.

The CRARS addresses the issue of resiliency through agronomic management practices that affect soil organic matter (SOM). As SOM increases, more carbon is sequestered (draw down), and the water holding capacity of the soil is greatly enhanced, reducing the need for additional irrigation throughout the year. The NRCS suggests for every 1% increase in SOM, the soil can hold an additional 27,000 gallons of water per acre. Clearly an important consideration as we build drought resiliency into our agricultural landscapes and food production systems.

The Center for Healthy Communities (CHC) is a wonderful resource for nutritional education and the importance of physical activity to health and well-being. The core values for the CHC are aligned with the Center for Regenerative Agriculture & Resilient Systems, however each has a very distinct directive and emphasis. The CHC provides support and guidance for healthy eating and healthy lifestyles, while the Center for Regenerative Agriculture and Resilient Systems focuses on strategies and methods that build healthy soil, create nutrient dense food, enliven rural communities, while enhancing ecosystem services and social justice.

The link between healthy soil and nutrient dense food is only beginning to be understood, particularly as soil biology continues to develop as an active area for applied research. As an example, Dr. Maria Giovanni (Food Scientist) is working together with soil scientists, agronomists, and agricultural economists, to better understand the relationship between nutrient dense food and soil organic matter (SOM). Because soil biology is tied so tightly to agronomic methodology, the CRARS plans to test the hypothesis that production methods (RA vs Conventional) are directly correlated to nutrient density in crops, a nuance with significant implications for human health.

Many of our faculty affiliates are also members of these other ancillary units on campus, which will only facilitate our collaboration. In general, both CWE and the CHC see the need for the work currently proposed, and are supportive of the transition of RAI to the Center for Regenerative Agriculture & Resilient Systems.

(Section 5 EM 18-018)
Description of the personnel needed and their responsibilities (including the name of the proposed director):

Director: The Center Director (CD) is a faculty member within the CSUC system and will be responsible for the overall management of the center, including budgets; staffing; grants/contracts; grant writing; fundraising; creating interdisciplinary research teams; driving educational programs and on-farm demonstrations; develop the applied research and outreach programs. Dr. Cynthia Daley will serve as Director.

Program Manager (PM): The PM is responsible for public relations and outreach. This individual will create social media for the Center and promote Center activities through face-book, twitter, websites and search engines. The OC will coordinate the on-line industry outreach program and will also be responsible for creating collaborative grant writing teams focused around specific RFP's.

Research Manager (RM): The RM is responsible for carrying out the research agenda by implementation of project experimental design, collecting data, provides support to data analysis and report generation. The SRA will be responsible for coordinating interdisciplinary teams of researchers for research and for grant writing process, serve as the liaison between scientists and farmers. Grant writing, participate in research outreach and education efforts.

Graduate Student Research Fellowships: A competitive selection process will be conducted to select CSU, Chico graduate students pursuing a degree that falls within the scope of this project. Their role is to implement research, analyze data, conduct assessments of the pilot programs, and serve as education and outreach coordinators.

Undergraduate Student Research Internships: A competitive selection process will be conducted to select CSUC undergraduate students pursuing a degree that falls within the scope of this project. Their role is to collect on-site data and field samples to be analyzed by the graduate fellows and are responsible for collecting the tremendous number of samples that will be required for research. These intern positions will be supported through campus work study funds that will require project administrators to apply for on an annual basis.

Faculty Affiliates: Inter-disciplinary team of faculty actively engaged in the Center's activities.

- Dr. Lee Altier (Plant Science)
- Dr. Jake Brimlow (Resource Economics)
- Dr. Garrett Liles (Soil Science)
- Dr. Betsy Boyd (Entomology/IPM)
- Dr. Hossein Zakeri (Agronomy)
- Dr. Cynthia Daley (Integrated Agricultural Systems)
- Dr. Dave Brown (Environmental Science)
- Dr. Maria Giovanni (Food Science)
- Dr. Rich Rosecrance (Pomology)

- Dr. David Johnson (New Mexico State University; Director of Sustainable Agriculture)
- Dr. Tim LaSalle (Professor Emeritus Cal Poly SLO)
- Dr. Jim Pushnik (Professor Emeritus CSU Chico/Director Institute for Sustainable Development)

Board of Directors: Provide campus support and accountability.

Faculty Affiliate Member COA: Garrett Liles
Faculty Affiliate Member NS: Maria Giovanni
Faculty Affiliate Member COM: TBA
Campus Sustainability Member: Cheri Chastain
Associated Students Sustainability Manager: Nani Teves
Advancement Member: Ahmad Boura
Farmer Affiliate Member: Scott Park, Park Farms
Point Blue Conservation Science: Wendell Gilgert, Director of the Rangeland Initiative

Leadership Council: Grounded in industry relevance; support, and fund raising;
To be confirmed:

Lundberg Family Farms – Jessica Lundberg
Park Farms – Scott Park
Burroughs Family Farms – Ward & Rosie Burroughs
Fully Belly Farms – Paul Muller
Community Alliance with Family Farmers – Rich Collins
Brown Ranches – Gabe Brown
Paicines Ranch – Sallie Calhoun/Kelly Mulville
California Farm Bureau – Shannon Douglas

(Section 5 EM 18-018)
Estimated funding needed to initiate and sustain the proposed AU for seven years and potential sources of funding during that period. Identify specifically what campus resources will be necessary to establish and maintain the AU.

A budget has been submitted within a separate file.

General Funds are available to maintain the TWTS Conference for three years. After that, the conference needs to be self-support. The Center will work together with interested faculty, staff and students, to find a source of outside funding to maintain the conference as a campus-wide event with the specific goal of raising consciousness around sustainability.

No other State funding will be required for the function of the Center. It will be self-support.

(Section 5 EM 18-018)
Estimate space, facilities, and equipment needs and plans for meeting these needs.

Facilities include office space that has been provided by Natural Sciences. The Center will locate in Holt 381. Any research space, equipment, or land resources will be identified and approved through the

appropriate administrators, negotiated and covered within the budgets of our funded research. For example, we need transportation to the research sites, some of these fields are located out of state. UF funds gifted to RAI will be used to purchase a vehicle that can be used by our faculty, staff and students, to conduct field research and to travel to conferences when ground transportations seems logical. RAI currently has six demonstration plots at the University Farm, each area still contributes to the bottom line while contributing valuable data to the project. Any additional costs associated with the demonstration are covered by funded research or the gift accounts depending on the outcomes.

(Section 5 EM 18-018)

An assessment of any actual or potential risks involved as well as a plan of how to manage such risks.

No additional risk is anticipated beyond the normal risk associated with field research and educational field days or events. Where and when necessary, we will contact the office of Risk Management to provide appropriate procedures for our activities.

(Section 5 EM 18-018)

If relevant, information about the inter-institutional nature of the proposed AU with regard to mission, leadership, activities, funding, or other aspects.

Dr. David Johnson, Director of the Institute for Sustainable Agriculture at New Mexico State University, is an Adjunct Professor within the College of Agriculture, with specific ties to our program as a lead scientist. His participation in the proposed Center has already produced results with respect to bringing in additional research funding. David is a recognized research scientist and brings a great deal of prestige to our program.

Dr. Tim LaSalle, a leader in this global Regenerative Agriculture effort, is also an Adjunct Professor for the College of Agriculture and co-founder of the Regenerative Ag Initiative. Through his contacts and his clout within a very influential group of foundations and non-profits, we have been very successful in garnering support for this important effort.

Dr. Richard Teague, Texas A&M University. Richard is on our Editorial Board for the Journal for Regenerative Agriculture, providing much needed guidance on field research and experimental design.

Dr. Kristine Nichols, a world-renowned leader in regenerative agriculture, is the newest member of our research team. Kris was the Chief Scientist at the Rodale Institute and a Research Soil Microbiologist with the USDA ARS in North Dakota for eleven years. Dr. Nichols will be involved in a number of our projects throughout the country .

(Section 5 EM 18-018)

Proposed timeline for establishing the AU. If a time-limited AU is proposed, provide estimated sunset date.

We are well on our way, our funding has been granted for five years, with additional funding being actively pursued. We plan to grow significantly in the next 3-5 years.