

Water Once a Month: Graduate Students and Water Scarcity Issues in Rural El Salvador

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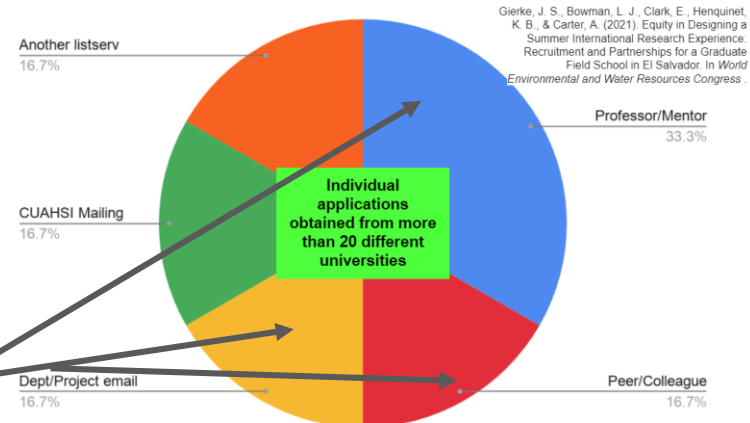
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Inc. (CUAHSI), Cambridge, Massachusetts

Presentation Purposes

- Provide an overview of our international project (what, who, where, how)
- Describe some of our activities and experiences in the first project year
- Provide a synopsis of some of the upcoming project activities
- Attract students to apply for the Summer 2022 cohort (must be enrolled in a grad program in the Fall of 2022)
- Request faculty to share this opportunity with their students

2/3^{rds} of our 2020-21 applicants inspired by faculty/dept/peers!



Gierke, J. S., Bowman, L. J., Clark, E., Henquinet, K. B., & Carter, A. (2021). Equity in Designing a Summer International Research Experience: Recruitment and Partnerships for a Graduate Field School in El Salvador. In *World Environmental and Water Resources Congress*.



Funding Program

National Science Foundation International Research Experience for Students (IRES) Program Track III: multi-week international experience for graduate students (Award No. 1855690)

- Experience is in a location that is ideal for the research
- Research results are transferable
- Student participants: Must be **US citizens**, recruited nationally, and priority to those ***without* international research experience and to diverse students.**

International Project Partnership



**Michigan
Technological
University**



CUAHSI
universities allied for water research



Lutheran World Relief
SUSTAINABLE DEVELOPMENT. LASTING PROMISE.



Universidad de El Salvador
Hacia la libertad por la cultura



“Dry Corridor”



Source: fao.org

Fuente: Basado en el Atlas centroamericano para la gestión sostenible del territorio

Diagrama de ubicación



● El Corredor Seco
Centroamericano y

- 1.6 million Food Insecure
- 3.5 million (33%) in need of humanitarian assistance
- 50-90% loss of crop harvests

Source: FAO Dry Corridor
Central America Situation
Report, June 2016

Project Design: Water scarcity in rural, agricultural communities

- 3 Distinct Cohorts (~10 students/cohort) in consecutive summers; “started” 2021 (after COVID disrupted summer 2020)
- Summer 2021 focus was characterizing the current water supply setting and assessing needs using ethnographic and social science approaches
- Summer 2022 & 2023 projects are emphasizing hydrology and water-usage assessments based on the results from Summer 2021
- 2021 cohort was selected based on interests in water & food security and their interests and skills in ethnographic methods and human subjects research
- **We are seeking graduate students with interests/skills in hydrology/hydrogeology, water quality, rainwater harvesting, rainfall-induced hazards, and ethnography for Summers 2022 & 2023**

Preparatory Activities

- Prior to Participant Selections
 - Distributed advertising information
 - Informational webinars
- Prior to Departure
 - Zoom meetings--COVID contingencies due to much uncertainty
 - 2-week **Virtual Ethnographic Field School**
 - Travel planning
- Prior to Field Work
 - 3-day acclimation/orientation in San Vicente, El Salvador
 - 2-day acclimation in California, El Salvador
 - Safety & Community Orientations by Lutheran World Relief--El Salvador
 - **Community Introductions: LWR>Alcalde>MOR & EM**



Additional Reading

Choose a few things of interest to you that you can parse through in the coming weeks and months especially in preparation for travel to El Salvador and access in-country in case you don't have a citation and writing a short paragraph on the main finding and relevance to our work.

Readings on General History and Society

1. [Arnold, Lynnette \(2020\). Communication as Care across Borders. Foreign and Co-Oriented](#)
2. [Pulsifer, Kenzie, Robert B. Feagan, Alicia Sibinski. \(2020\) Race and Participation in Inter](#)
3. [Duan, A. 2005. Through the looking glass: US aid to El Salvador and the politics of nation](#)
4. [Ross, N. and A. P. Sanchez. 2018. The Messy Little Thing Called Peace: Postwar Memory](#)
5. [Silber, Irina Carlota. \(2014\). In the After: Anthropological Reflections on Postwar El Sal](#)

Readings on Agriculture and Land Tenure

1. [Baca, Maria, Peter Ladorach, Jeremy Haeser, Gotz Schroth, Oriana Ovalle. \(2014\) An Int](#)
2. [Bouroncle, Claudis, Pablo Imbach, Beatriz Rodriguez-Sanchez, Claudia Medellin, Arman](#)
3. [Campos, Minerva, Dorlbel Herrador, Carlos Manuel, Michael K. McCall. \(2013\) ESTRA](#)
4. [DeSisto, M. & Donovan, M. \(2017\). Roots of resistance and resilience: Agroecology in](#)
5. [McSivynolds, S.A., T. Johnston, C. Geiser. 2000. The relationship of land tenure to agricu](#)
6. [Miller, N. 2016. Food sovereignty, vernacularism, and the neo-colonial politics of know](#)
7. [Olsson, Jonas E. \(2010\) "Aerarian livelihoods and Climate Change." In *Biodiversi*](#)

Readings on Water Resources

1. [Bennett, V., S. Dávila-Poblete and M. Nieves Rico. 2008. \[Water and gender: the unexp\]\(#\)](#)
2. [Cairns, M. R., C. L. Workman & I. Tandon. 2017. \[Gender mainstreaming\]\(#\)](#)
3. [Ferreira Jacques de Moraes, A. and C. Rocha. 2013. \[Gendered waters: the participation\]\(#\)](#)
4. [Osland, Anni C. \(2010\) \[Resolving Land Ownership Issues for a Community Water Proj\]\(#\)](#)
5. [Rowla, Carolina, Sánchez-Misferrer, Manuel, Rovina, María Dolores. \(2020\) Is Rainwat](#)
6. [Shah, Orit-Golan, Ana, Juan Felipe Nuliez-Erainsosa, Walter Gerardo Melis-Castillo, V](#)
7. [Haley's dissertation proposal.](#)

Readings on Risk Assessment, Vulnerability and Resilience

- For thinking about decision making, livelihoods, and risk, these sources are useful:
1. [Certe L. Badi C. Schmeck B. \(2019\) \[Subsistence migration: Smallholder food security a\]\(#\)](#)
 2. [Chibrik, Michael. 2011. \[Anthropology, Economics and Choice\]\(#\). Austin University of Texas](#)
 3. [Nvaren, Anja & Outi Mvatt-Hinonen \(2009\) \[Life here is just struggle by\]\(#\). livelihood str](#)
 4. [Tucker, Bram and Donald R. Nelson. \(2017\). \[What Does Economic Anthropology Str\]\(#\)](#)

Virtual Ethnographic Field School

- **PRE-WORK:** Readings and Videos on the Background of the Dry Corridor, Ethnographic Methods, & Human Subjects Research
- Materials prepared specifically for the field work and archived (and **available**) in our LMS (canvas)
- Zoom sessions spanned 2 weeks, M-R, 10 am - 2 pm (Eastern) w/1-hr breaks
- Additional sub-group work (HSR plans, drafting surveys and informed consent, transcribing, translating, coding responses, interview memos, data security, etc.)
- Introduction to in-country partners (and practice skills) through semi-structured interviews via zoom (effective preparation for upcoming fieldwork)



Ethnographic Field School Zoom Meetings

3 months ago

Zoom Meeting ID: 82395477637 • Host: John Gierke • Meeting Start: 06/30/2020 9:39 AM • Recording Start: 06/30/2021 @ 10:00 AM • Duration: 1 hr 49 mins



Ethnographic Field School Zoom Meetings

3 months ago

Zoom Meeting ID: 82395477637 • Host: John Gierke • Meeting Start: 06/29/2020 9:58 AM • Recording Start: 06/29/2021 @ 1:41 PM • Duration: 25 mins

Digital badge awarded for completion

1. Please reflect on places in the interviews and/or specific questions that went WELL (on green notes below) and where the conversation seemed to get STUCK (on orange notes)

Green notes (WELL):

- The internet connections were working starting fast
- Any questions regarding different NGOs working in the communities
- Financing of about providing an introduction on the community that they mentioned for new not established
- The interviewee seemed nervous and there were hesitations and some things that were hard to hear
- Interviewees seemed genuinely interested in talking to us
- We got better at probing
- when we're more conversational
- asking about everyday concrete things in everyday language easier to talk about
- Questions regarding the interviewee's personal experience

Orange notes (STUCK):

- When there was a lag in being questions it seemed as though we were not prepared
- Do people consider these cultural traditions that are not necessarily common concepts that came from the community themselves
- Trying to ask personal things like about living conditions
- Language barriers, not able to adapt on the fly
- Some questions were too vague or not well worded
- Multi-part questions can be complicated
- Questions regarding more abstract concepts or generalizations
- Having more than one person ask a set of questions sometimes seemed to take longer and didn't allow a conversation to develop
- Not the most clear questions, some were not clear, some were not clear, some were not clear
- Some questions were too vague or not well worded

Summer 2021 Work

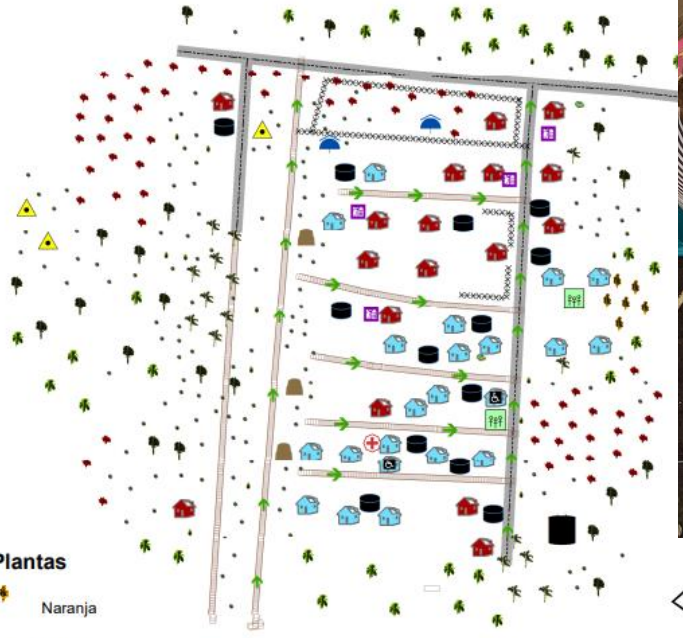
- ❑ Water availability and access and community mapping
- ❑ Gender and power relationships
- ❑ Root causes of vulnerability to inadequate access within communities
- ❑ Installed a meteorological station, tank-level logger, & shallow aquifer logger
- ❑ Currently continuing to transcribe, translate, compile, code, and interpret the 2021 ethnographic data!



Project Team Lived and Worked Together in the Community at Casa Girasoles



Mapa de Evacuación, Riesgo y Recursos Comunidad Caserío El Marne



Plantas

- Naranja
- Banano
- Café
- Piña
- Árbol
- Planta
- Cocos

Infraestructura

- Casa de Lámina
- Casa de Ladrillo
- Calle Pavimentada
- Pasaje
- Maya
- Pozo

Recursos

- Tanque Comunitario
- Tanque
- Tienda
- Vehículo
- Botiquín



Evacuación y Riesgos

- Ruta de Evacuación
- Punto de Encuentro
- Pozo Secos Zona de Peligro
- Botadero de Basura



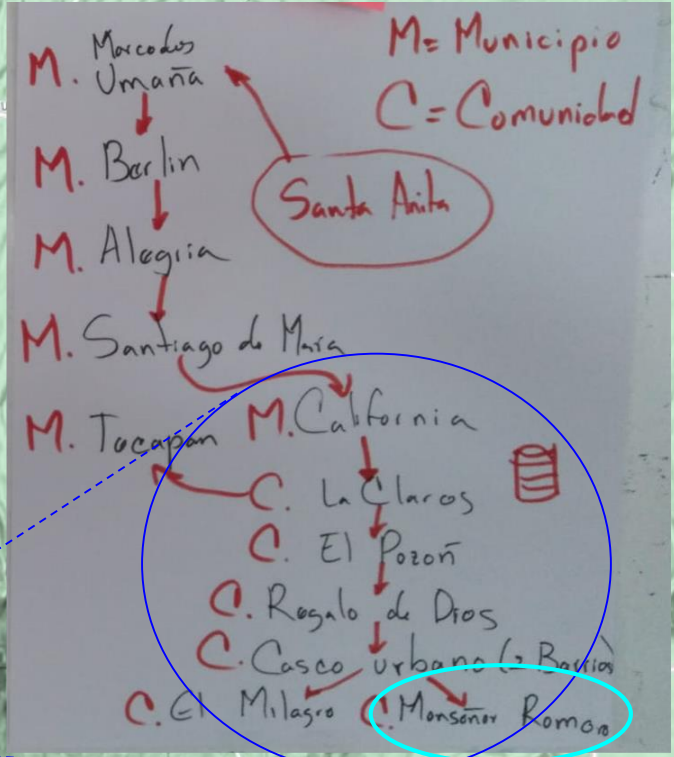
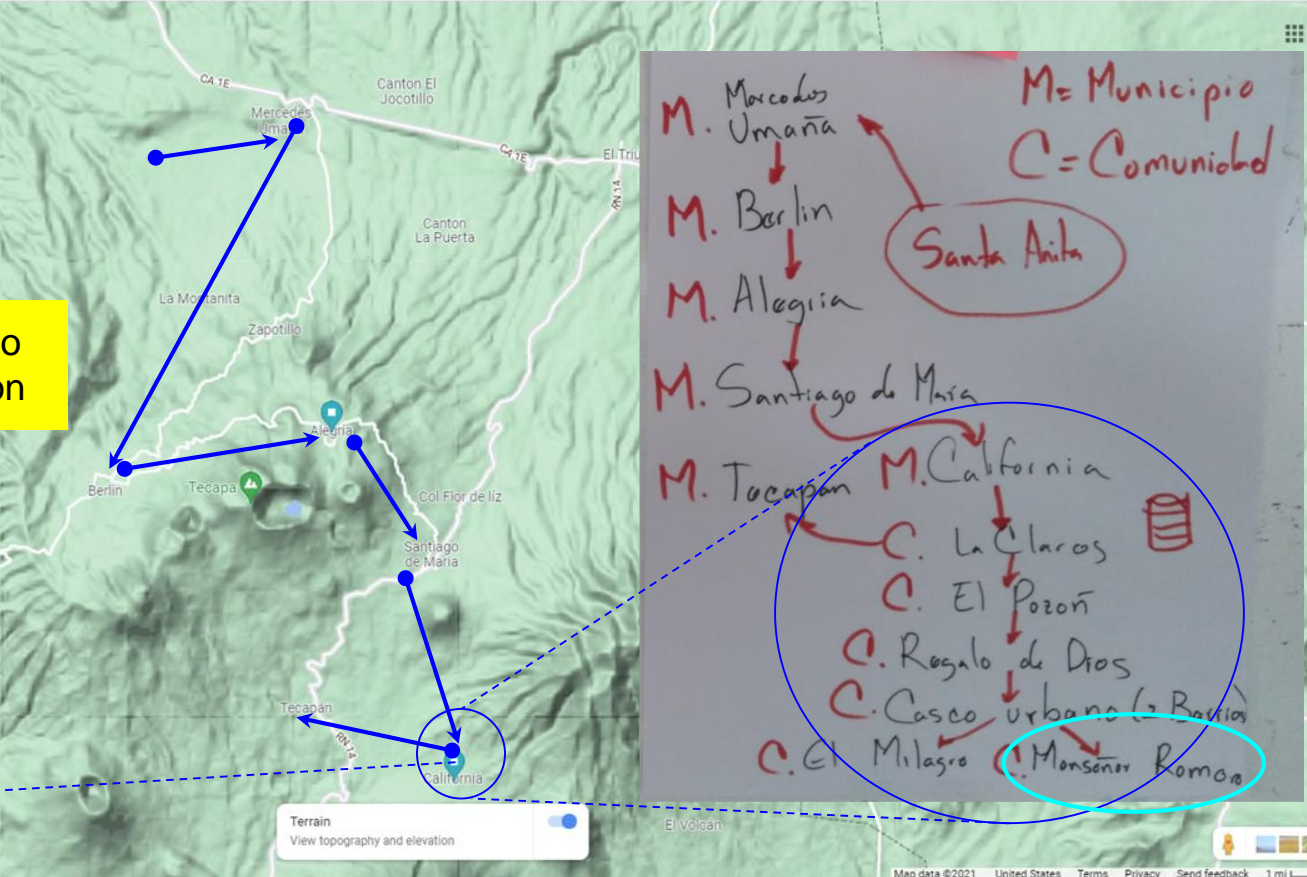
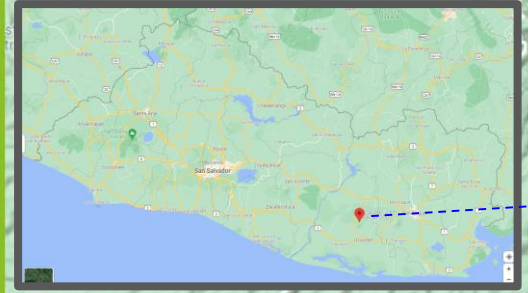
Creditos de Mapa Comunitario Agosto, 2021
 Mapas Originales por: Comunidad El Marne, Elaborado por grupo de jovenes
 Facilitado por: Hugo Mendez, Protección Civil
 Respaldo por: Carolina Campos , Lutheran World Relief
 Mapa Digital por: Hayley Joyell Smith y Lyn Watts
 Contacto: Luke Bowman, Michigan Tech University

Elaborado por grupo de jovenes, Estudiantes de Michigan, DGPL.

Search Google Maps

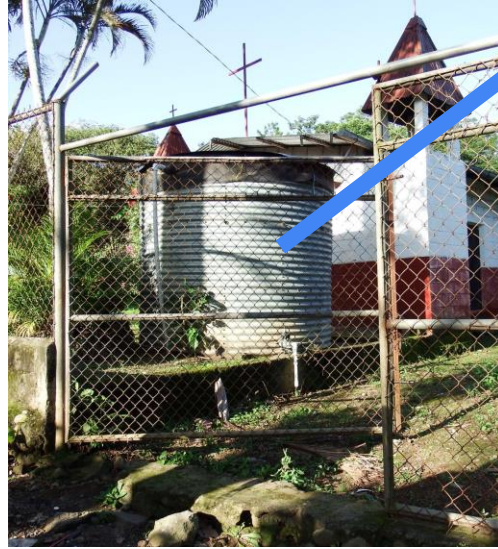
See travel times, traffic and nearby places

23-km Path from Source to California Municipal Region

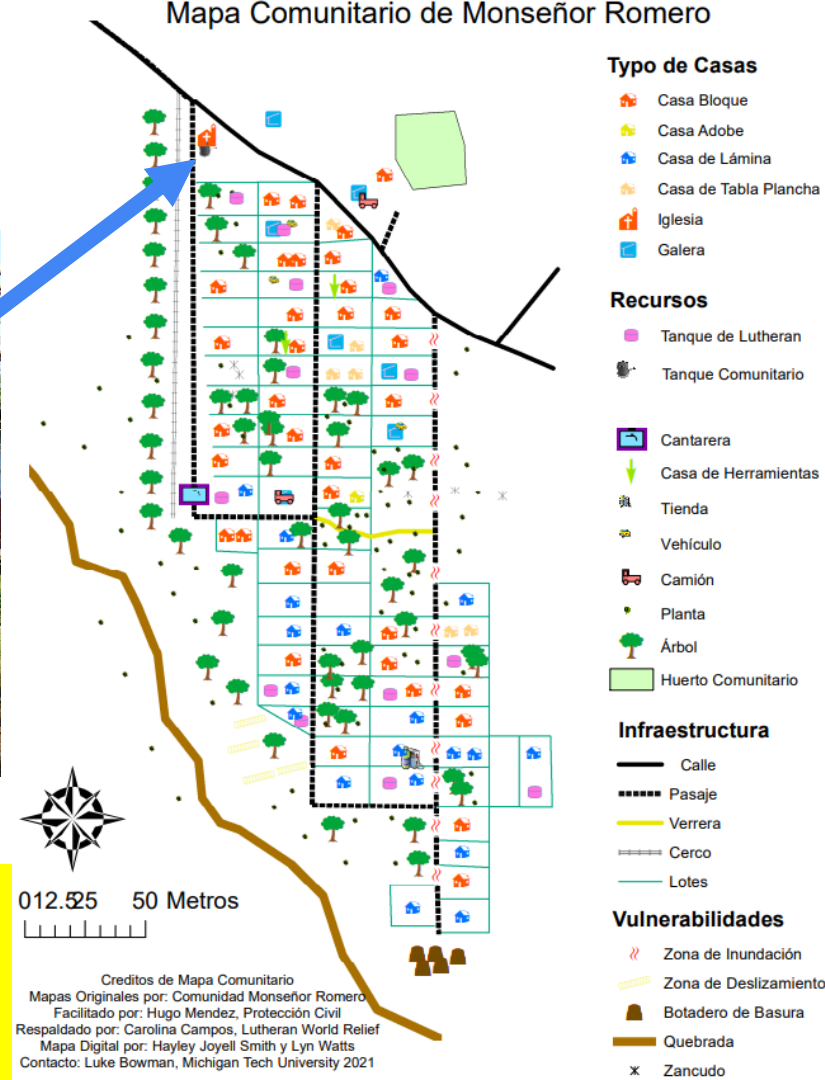


Community Water Tank in MOR

- >100 residents, ~40 families
- 2500 gallons
- Filling frequency irregular, >7 days, usually at 2 am
- *Valvulero* rings a bell; community members *la prisa* to fill containers



Rainwater collection from roofs is a source of friction in the communities



New Community Well Drilled July/August 2021

- 300-m deep
- Water-bearing interval in the bottom-most 20 m
- Aquifer setting, production performance, and water quality are not yet known

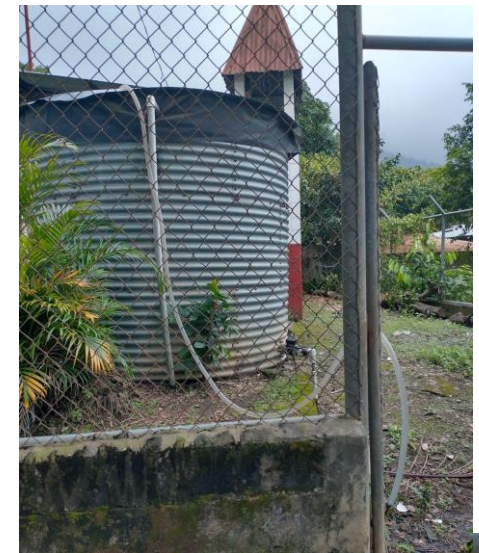
Characterizing the hydrology will be a topical focus for 2022-23

Collaborating with UES-FMP Faculty and Students



Seasonal quantities of water collected and used

Water quality of rainwater collected from roof tops is unknown, but we learned this summer that residents do not drink or wash with it because of perceived “acidity”. These will be project topics for 2022-23.



P/C: Alcaldia Municipal de California

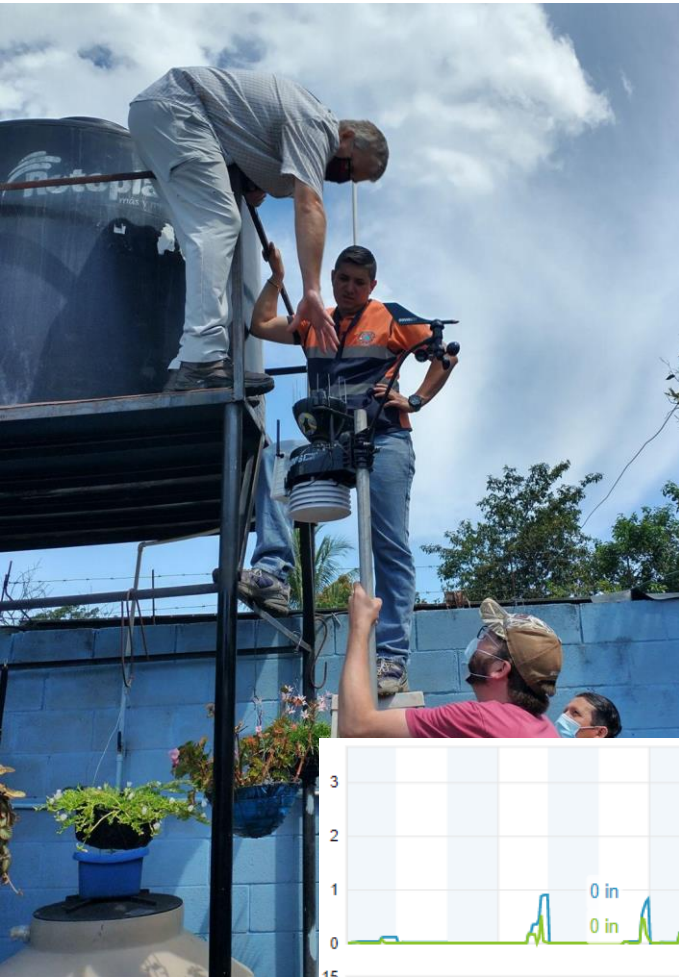


Responses of shallow aquifers to seasonal rainfall and subsequent dry season

Monitoring shallow water table elevations and precipitation & temperature



Meteorological Data Collection Since 8/10/21, Available Online



MTU IRES
Conditions as of: 14:25 Friday, Oct 08, 2021

30°C HIGH: 31°C at
LOW: 20°C at

Wind:
5 km/h SE
High gust 80 km/h @ 00:05

Humidity:
64%
Feels like 34°C

Rain:

WEATHER UNDERGROUND Sensor Network Maps & Radar Severe Weather News & Blogs Mobile Apps More

WunderMap: Houghton, MI (49916) 80°F Cloudy Eugene, OR Chassell, MI (49916) Crystal Falls, MI (49920) Baraga, MI (49908) California, Usulután, El Salvador Portland, OR Eagle Harbor, MI (49950) Centro Urbano Candelaria, San S...

Webcam hosting service will be discontinued on October 21, 2021. Read more about our decision here.

Elev 1500 ft, 13.44 °N, 88.46 °W
MTU IRES - ICALIF1
FORECAST FOR CALIFORNIA, SV

Station Summary
Online (updated 13 minutes ago)

CURRENT CONDITIONS

86.2 °F
Feels Like 93.0 °*

WIND & GUST
2.0 / 10.0 mph

DEWPOINT
72.0 °F

PRECIP RATE
0.00 in/hr

PRESSURE
29.96 in

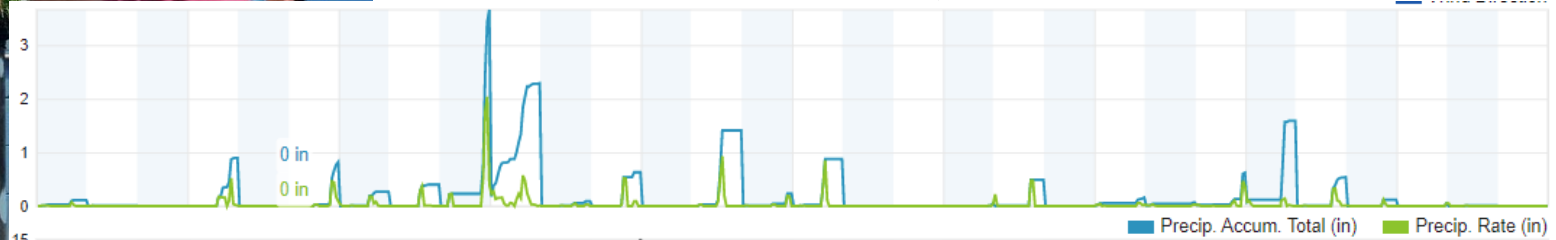
HUMIDITY
64 %

PRECIP ACCUM
0.00 in

UV
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MAP

View WunderMap



Acknowledgments

NSF Support Award No. 1855690

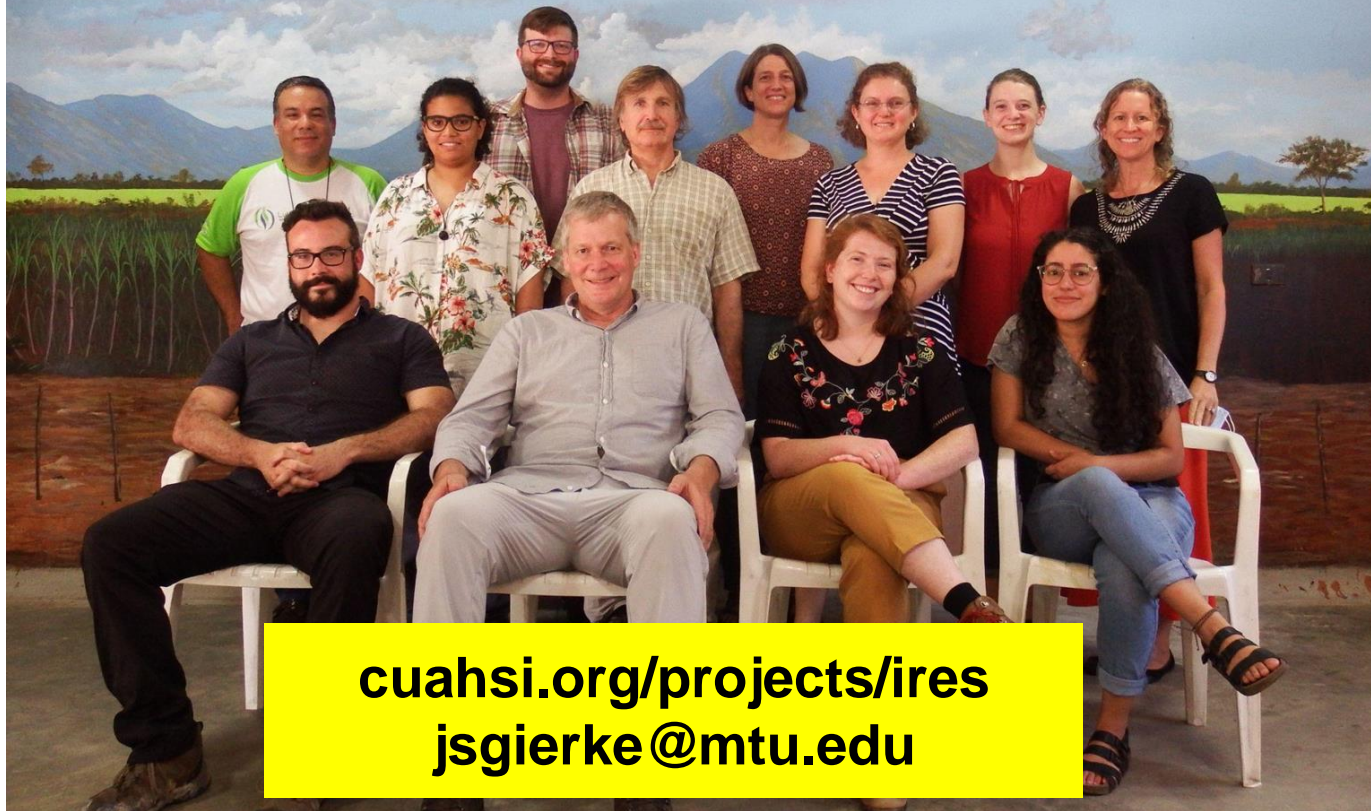


Others on our project team mentoring students in future summers: Frank Liu and Dave Watkins (Michigan Tech), and Alex Mayer (UTEP); MTU Support Staff: Carol Asiala & Brittany Buschell

Other international collaborators and logistical support, especially: E. Carolina Campo (LWR); Gustavo Aguirre and Rommel Rubio (Alcaldía Municipal de California); Hugo Mendez (Protección Civil) & Mimi & family; Community leaders and residents of the Colonia Monseñor Oscar Romero & Caserío El Marne; Universidad de El Salvador--Facultad Multidisciplinaria Paracentral; Casa Girasoles, Posada Don Pablito (Hotel Pablo Tesák), Mambos Rent a Car

2021 Student Participants: **Kyle Nauman** (CSU), **Paola Rivera-Gonzalez** (MTU), **Nelmary Rodríguez-Sepúlveda** (MTU), **Hayley Joyell Smith** (UGA), **Caitlyn Sutherlin** (NAU), **Lyn Watts** (UMass), and **Daniel Yuhasz** (Mizzou)

Gracias por su atención!
Alguna pregunta o duda?



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