Drone-Forestry Career Pathways

North State Forestry Collaborative Workforce Event

Josh Metz, Justin Cummings, Becca Fenwick & Michael Matkin
October 14, 2021

◎DART
DRONE AUTOMATION & ROBOTICS TECHNOLOGIES

Overview

- Project
- Opportunity
- Education
- Wages
- Demand
- Diversity
- Career Pathways

Project

MORGAN FAMILY
F O U N D A T I O N

- Funding
- Study Area
- Scope

31 of 58 California Counties included
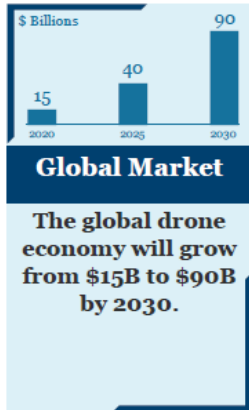in North State Forestry Project study

Opportunity

- **2020 CA fire season:** 8100 fires and 4.5 million acres burned

- *Fire recovery, fuels & ecosystem management*

- Uncrewed aerial systems (UAS) provide **unique capabilities**
  - Mapping
  - Dispersal
  - Cargo

Opportunity

Global Market

The global drone economy will grow from $15B to $90B by 2030.

Fastest Growth

Enterprise will remain the fastest growing segment until 2025. Logistics will become the fastest after 2025.

- Global drone economy will grow from **$15B to $90B** by 2030
- **$2.3B** invested in 2020
- **104k+** new jobs

Education

University Name	City	Type
California Baptist Univ	Riverside	4-yr
Fullerton College	Fullerton	CC
Merced College	Merced	CC
Mira Costa College	Carlsbad	CC
Mt. San Antonio College	Walnut	CC
Palomar College	San Marcos	CC
San Diego Miramar College	San Diego	CC
Santa Rosa Junior College	Santa Rosa	CC
Southwestern College	Chula Vista	CC
West Valley College	Saratoga	CC

- **FAA UAS Collegiate Training Initiative** (UAS-CTI)
  - Designed to recognize institutions that prepare students for careers in UAS or drones
- In California **10 of 630** community colleges, trade schools, &/or universities

Education

- **Part 107 [Certified Drone Pilot](#)**
- Certification required to operate "commercial services" under FAA rules
  - Be at least 16 years old
  - Be able to read, speak, write, and understand English
  - Be in a physical and mental condition to safely fly a drone
  - Pass the initial aeronautical knowledge exam: "Unmanned Aircraft General – Small (UAG)"

Wages

SOC Codes	Occupation	CA	Study Area
45-4010	Forest and Conservation Workers	$14.75	$15.05
17-3020	Engineering Technologists and Technicians	$34.41	$32.80
17-3030	Surveying and Mapping Technicians	$35.03	$32.44
17-1021	Cartographers and Photogrammetrists	$43.10	$41.75

- Generally, **more education** and skills lead to **higher wages**
- **Job types:** *Technicians, Operators, Analysts* **Wages:** $15-$42/hr+

Demand – BLS Data

SOC Codes	Occupation	CA	Study Area
45-4010	Forest and Conservation Workers	1902	477
17-3020	Engineering Technologists and Technicians	**12067**	**1004**
17-3030	Surveying and Mapping Technicians	573	88
17-1021	Cartographers and Photogrammetrists	22	0
Totals		**16094**	**1699**

- BLS SOC codes indicate greatest demand for **engineering technologists**

- Totals
  - **16,094 jobs in CA**
  - **1,699 in Study Area**

Real-time Intelligence (RTI) Job Postings in California and the North State Forestry Study Area from 9/16/20 to 9/16/21

Demand - Keywords

Keyword	CA	Study Area
Drone Pilot	290	29
UAV	1045	93
Remote Sensing	824	145
GIS	**9261**	**1643**

- Greatest demand for **Geographic Information System (GIS)** skills
- Totals
  - **9,261 jobs in CA**
  - **1,643 jobs in Study Area**

Real-time Intelligence (RTI) Job Postings in California and the North State Forestry Study Area from 9/16/20 to 9/16/21

Demand - Emerging

Capabilities	Mission	Job Type	Example Company
Sensor payload	Change detection; landscape characterization; health monitoring	Drone pilot; sensor technician; data analyst; field support	Treeswift; Planet; Micasense
Substance Dispersal	Reforestation; fire ignition; pest control	Drone pilot; support technician; forestry; hydrology; entomology	Drone Seed
Cargo transport	Wildfire support; search & rescue; restoration support	Drone pilot; Support technician; air traffic management;	Parallel Flight; Elroy Air

Demographics

US Census Demographics by Race
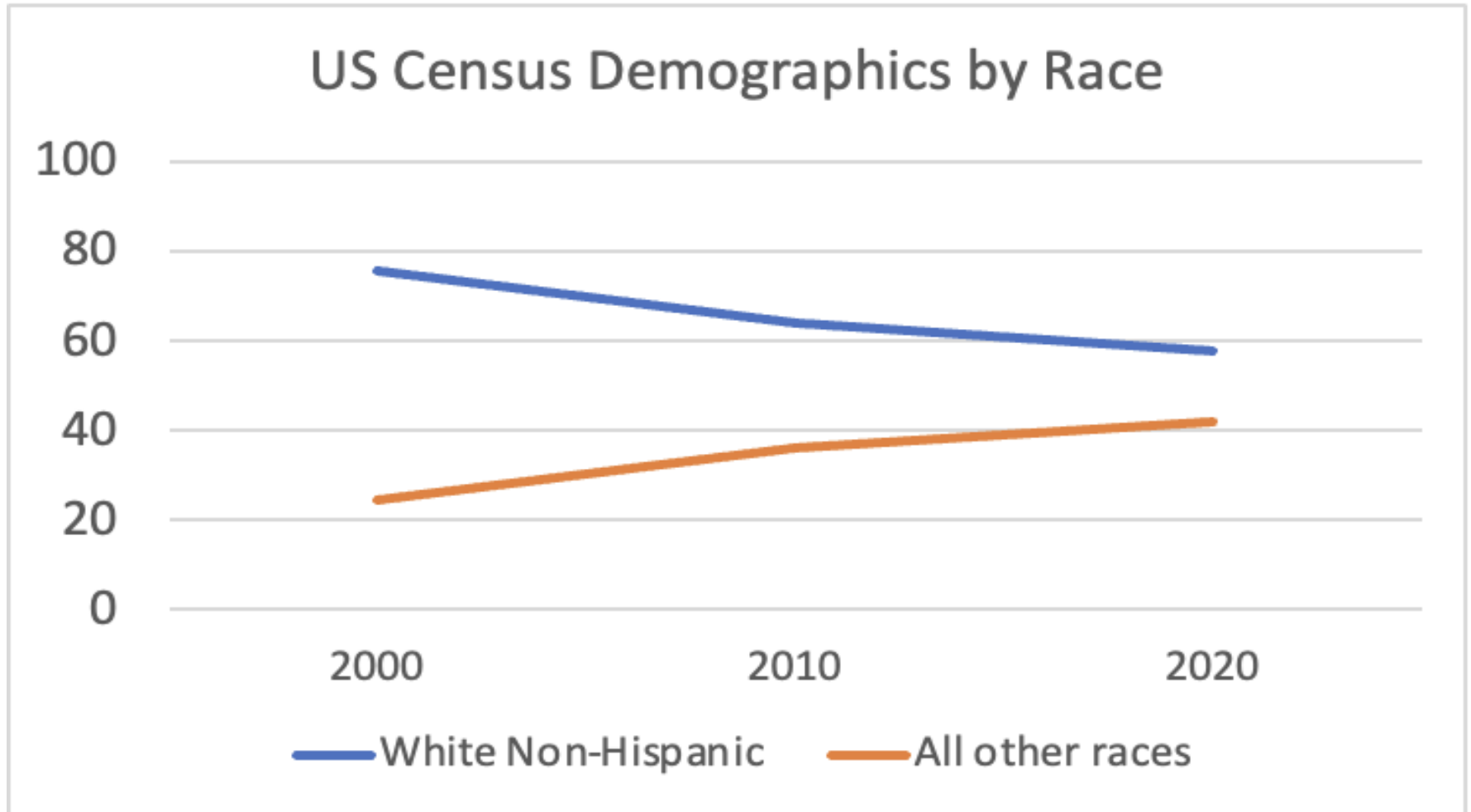
Diversity in STEM - BIPOC
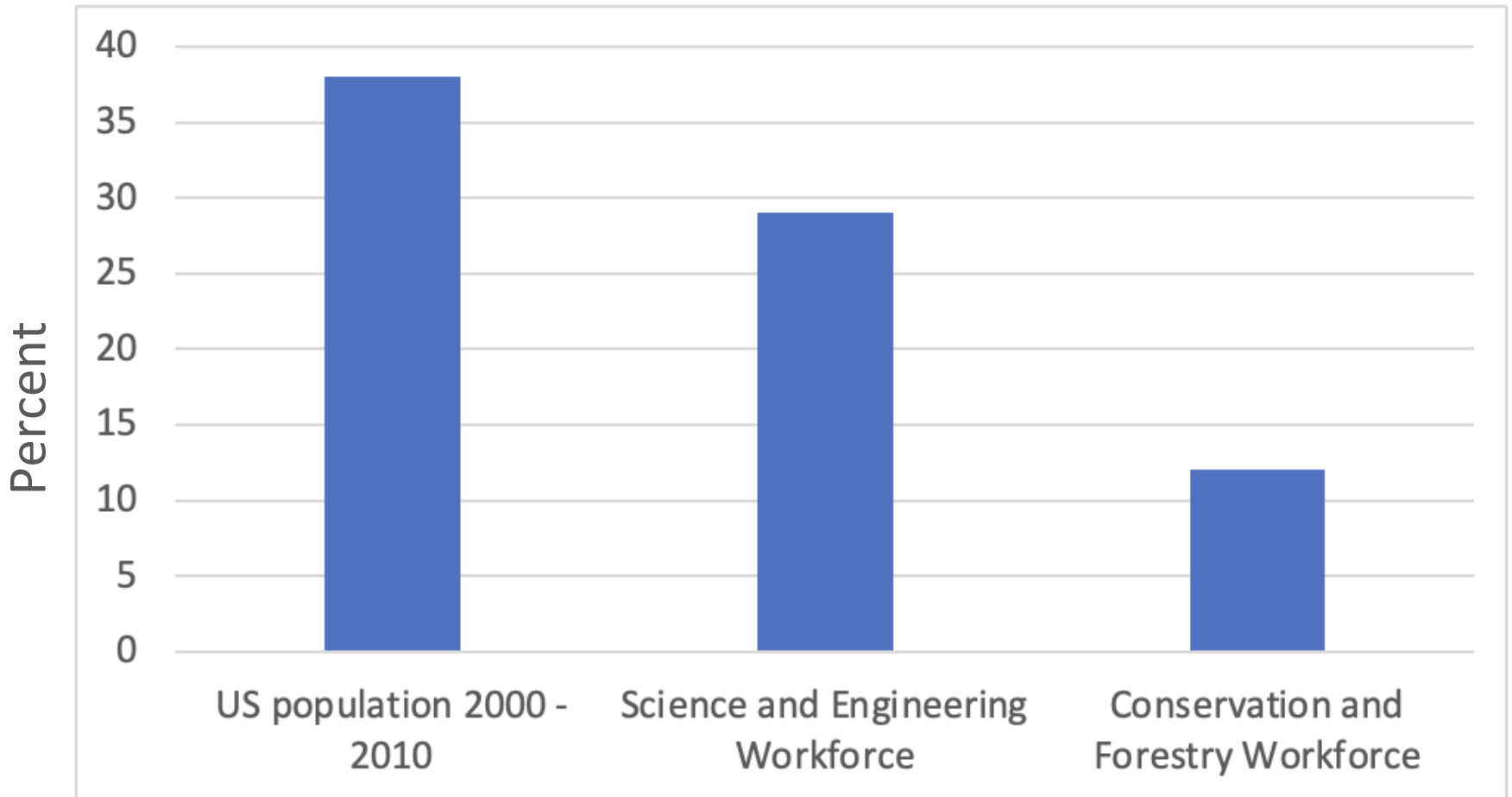
Bi-Racial Indigenous People of Color (BIPOC)

Diversity in STEM - Gender
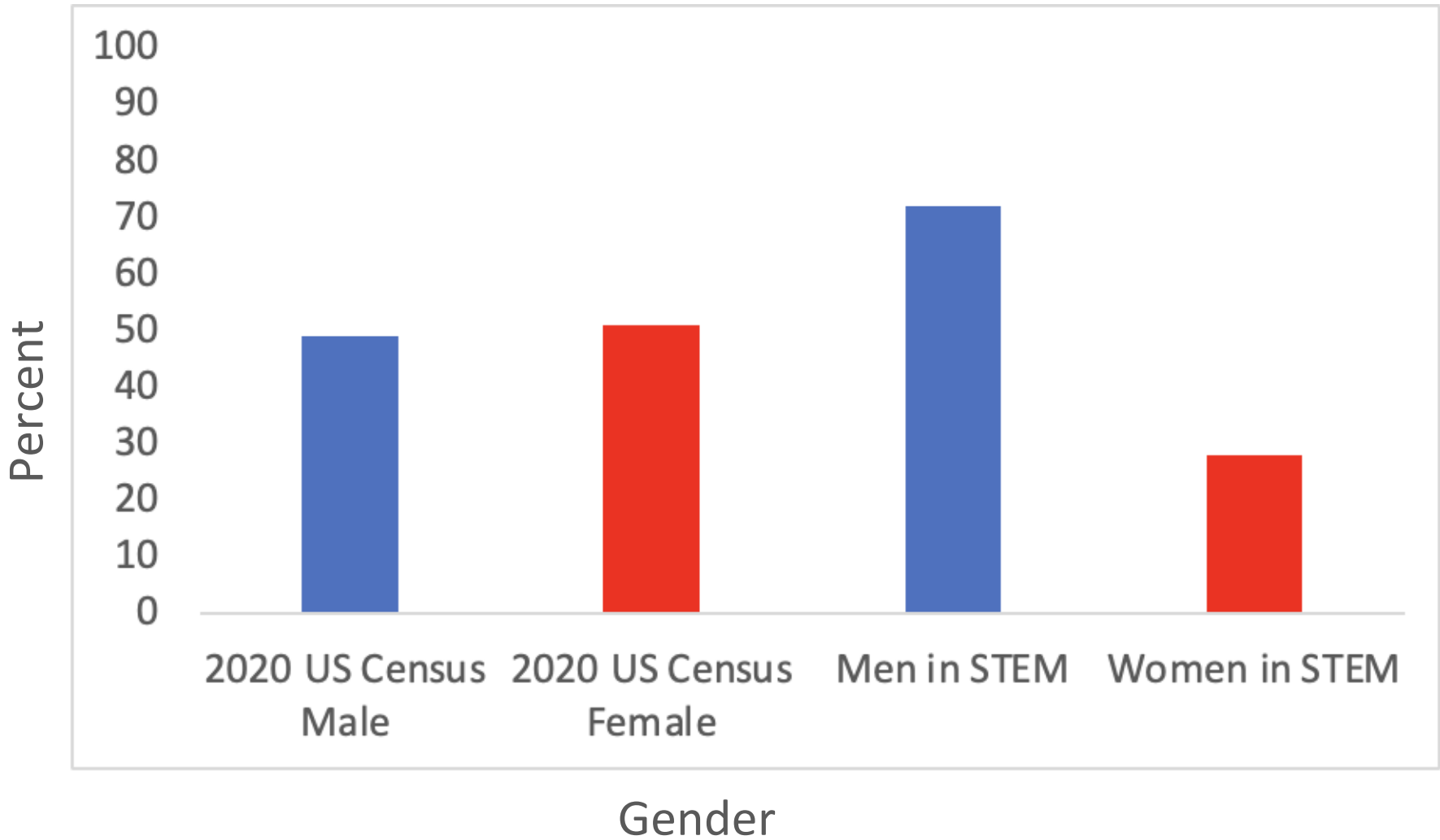
Compensation – BIPOC & Gender
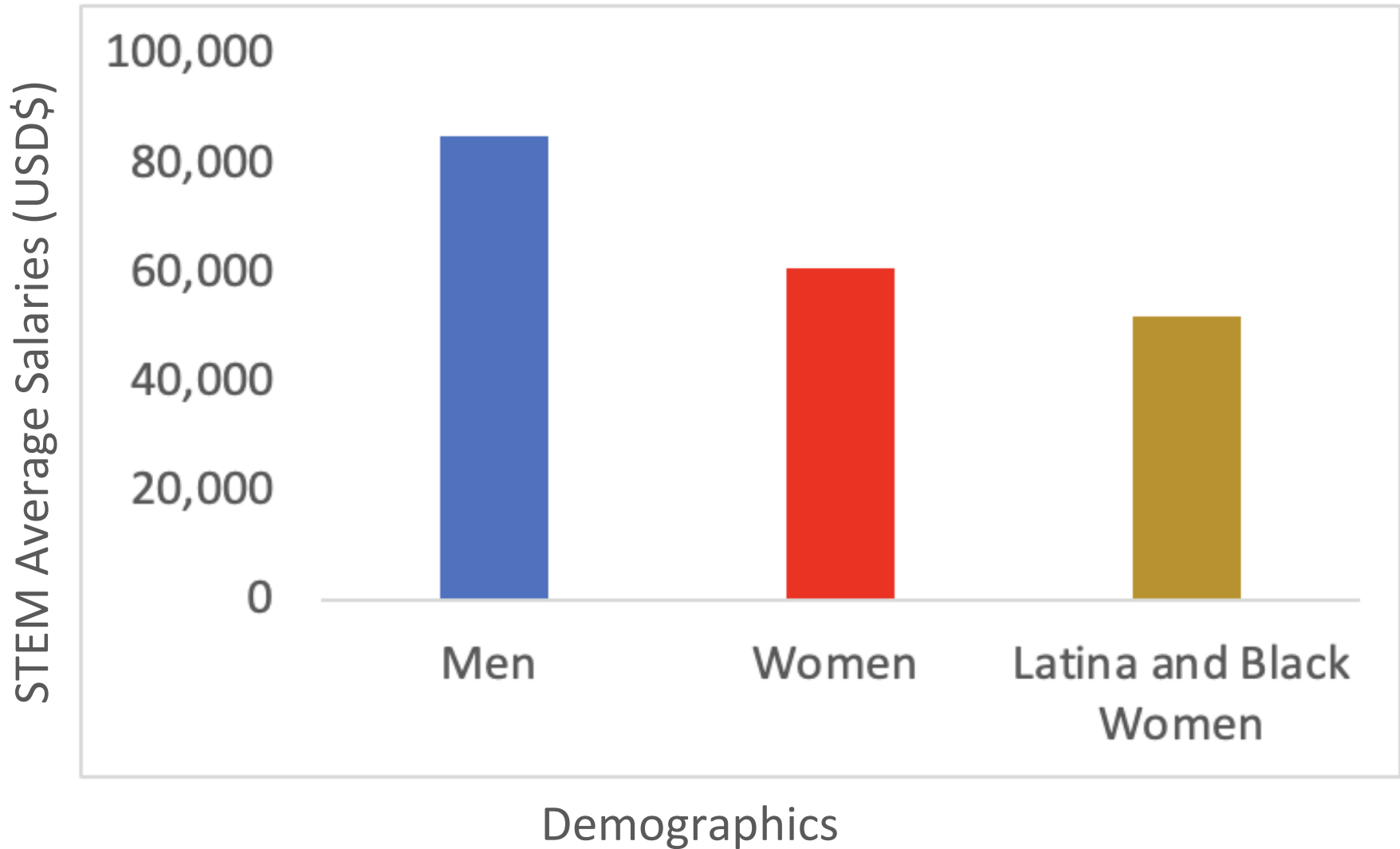
Career Pathways

DRONE-FORESTRY CAREER PATHWAYS

Cartographers and Photogrammetrists: $42+/hr
Bachelors/Masters/Doctoral Professional Degrees

Surveying and Mapping Technicians: $32/hr
Associates Degrees/Certificate of Diplomas

Forest and Conservation Workers: $15/hr
High School/GED

Earning Potential

Educational Attainment

2021 Keynote Speakers

- Admiral Ann Rondeau — President, Naval Postgraduate School
- Bonny Simi — Joby Aviation
- Toks Omikashin — California Department of Transportation (Caltrans)
- Glenda Humiston — UC Agriculture and Natural Resources
- John MacMillan — University of California, Santa Cruz
- Brian Bauw — Prime Movers Lab

2021 Overview

October 19	Theme	Panels
9 AM–12:30 PM Online / 2–5 PM (in-person) The Sea Land Air Military Research Initiative (SLAMR)	**Security** — Key Speakers: View From the Top, Innovation Opportunity	Research and Development, Industry Partnerships, Supporting Innovators
October 20 9 AM–12:30 PM Online / 2–5 PM (in-person) UC Monterey Bay Education Science & Technology Center	**Mobility** — Key Speakers: The World of New Mobility, California Mobility Futures	Autonomy & Electrification, Navigating Regulation, Community Integration, Air Mobility Opportunities & Challenges
October 21 9 AM–12:30 PM Online / 2–5 PM (in-person) Airspace Integration @ The Monterey Bay Academy	**Environment** — Key Speakers: Research & Innovation @ UCSC, Resiliency & Climate Change @ UCANR	Forestry/Wildfire, Education/Workforce, Innovation and Entrepreneurship

Virtual & In-Person **Symposium | Oct 19-21**

MontereyBayDart.org

MB Career Connect

Career path information & resources
MBcareerconnect.org/forestry-careers/

Thank you

Josh Metz

josh@montereybaydart.org