NASA's Education Resource Center

A Model for Inspiring, Engaging, and Employing Students in Rural Appalachia

Todd Ensign, Ed.D.

Fairmont State University - Katherine Johnson IV&V Facility

Fairmont, West Virginia, USA

FAIRMONT STATE UNIVERSITY™

NASA West Virginia Space Grant Consortium
WVSPACEGRANT.ORG

Recognition of Partners

CASTEM Laboratory

Recognition of Sponsors

NASA West Virginia Space Grant Consortium
WVSPACEGRANT.ORG

Governor's STEM Initiative

STEM Enterprises

NASA's IV&V Program
Robotics Alliance Project

REC Foundation

West Virginia Department of Education

High Technology Foundation
Building a Stronger West Virginia

Mountaineer Area Robotics
MARS 2614

High Rocks

The Education alliance
Business and Community for Public Schools

A3L Federal Works

ASTRO
At Exit 132 | Buick•GMC

ENGILITY

SWN
Southwestern Energy®

MIT

Global Science & Technology, Inc.

Southern West Virginia Robotics Club

Putnam Area Robotics Team
PARTS

Aladdin
an elior company

CSRA

Katherine Johnson

Independent Verification & Validation Facility

- *The IV&V Facility tests mission critical software and manages risk including cyber-security.*
- *Funding for the ERC Program for over 20 years!*

Fairmont State University

- *Administers the ERC grant while maximizing the impact on WV educators and students*
- *17% indirect only on Salary and Benefits (Off-Site rate)*
- *Non-profit FSU Foundation handles charitable donations*

The NASA / FSU ERC Team

Dr. Deb Hemler
Principal Investigator

Dr. Todd Ensign
Program Manager

Josh Revels
Education Specialist

Emily Helton
Education Specialist

Jess White
NASA STEM COTR

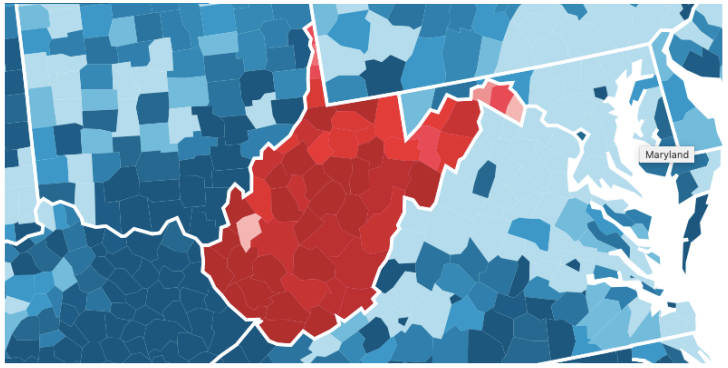
Ryan Utzman
Robotics Lead

Taylor House
NASA College Intern

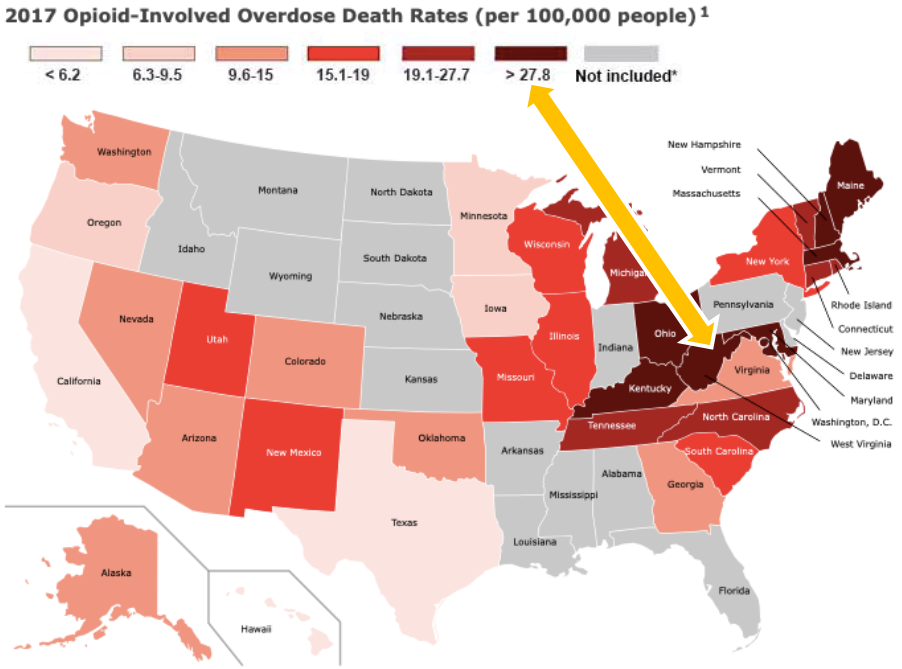
Christopher Lomasney
AmeriCorps Volunteer

West Virginia
The Mountain State

West Virginia
Our Challenges



West Virginia	2017
Population	1,784,004
People Living in Poverty	317,089
Poverty Rate	17.8%



- 38th in population and we are losing our youth faster than any state.
- 7th highest poverty rate in the US.
- 1st in Opioid related deaths.

NASA's Office of STEM Engagement!

STEM Engagement Goals:

1. Strengthen public understanding of NASA's missions.
2. Build a diverse future STEM workforce.
3. Create unique opportunities for students.

- Science Public Outreach Team
- STEM Day in the Park
- NASA School Visits

- Student Workshops
- Educator Professional Development

- Space Flight Design Challenge
- STEM Competitions
- Summer Camps

- Summer Internships
- Year Round Internships
- Space Grant Internships

INSPIRE - ENGAGE - EDUCATE - EMPLOY

The Next Generation of Explorers

- Science Public Outreach Team
- STEM Day in the Park
- NASA School Visits

Inspire

School Programs

- Bottle Rocket Competitions
- Science Public Outreach Team (SPOT)

STEM Carnivals and Festivals

- Annual Day in the Park
- NASA Day
- Maker Festival

- Student Workshops
- Educator Professional Development

Educate

Student Workshops

- Robotics, Rocketry, Space Weather, 3D printing, Weather and Climate…

Educator Workshops

- Partnership between NASA and Fairmont State University.
- Over **1,000** teachers trained annually!
- Certified to borrow Classroom Kits…

Classroom Kits

- Over **60** classroom kits of LEGO® robots, multiple portable planetariums, 3D printers, GPS and much more that are loaned to trained educators.
- This program impacts **10,000-15,000** WV students per year.

- Space Flight Design Challenge
- STEM Competitions
- Summer Camps

Engage

Robotics Summer Camps

- 6 locations across the state.
- Hundreds of students engaged

STEM Competitions

- We train coaches and run over **40** tournaments a year for 14 STEM competitions covering robotics, rocketry, cybersecurity, and aviation.
- In 8 years Robotics teams alone have increased from 75 to over 500.
- Competitions now engage well over 5,000 students annually!

FIRST LEGO LEAGUE JR.

VEX IQ ROBOTICS COMPETITION

WRO WORLD ROBOT OLYMPIAD

Real World Design Challenge

CYBERPATRIOT NATIONAL YOUTH CYBER DEFENSE COMPETITION

FIRST LEGO LEAGUE

VEX ROBOTICS COMPETITION

ROBOTICS: URBAN SEARCH & RESCUE

SkillsUSA

ZERO ROBOTICS

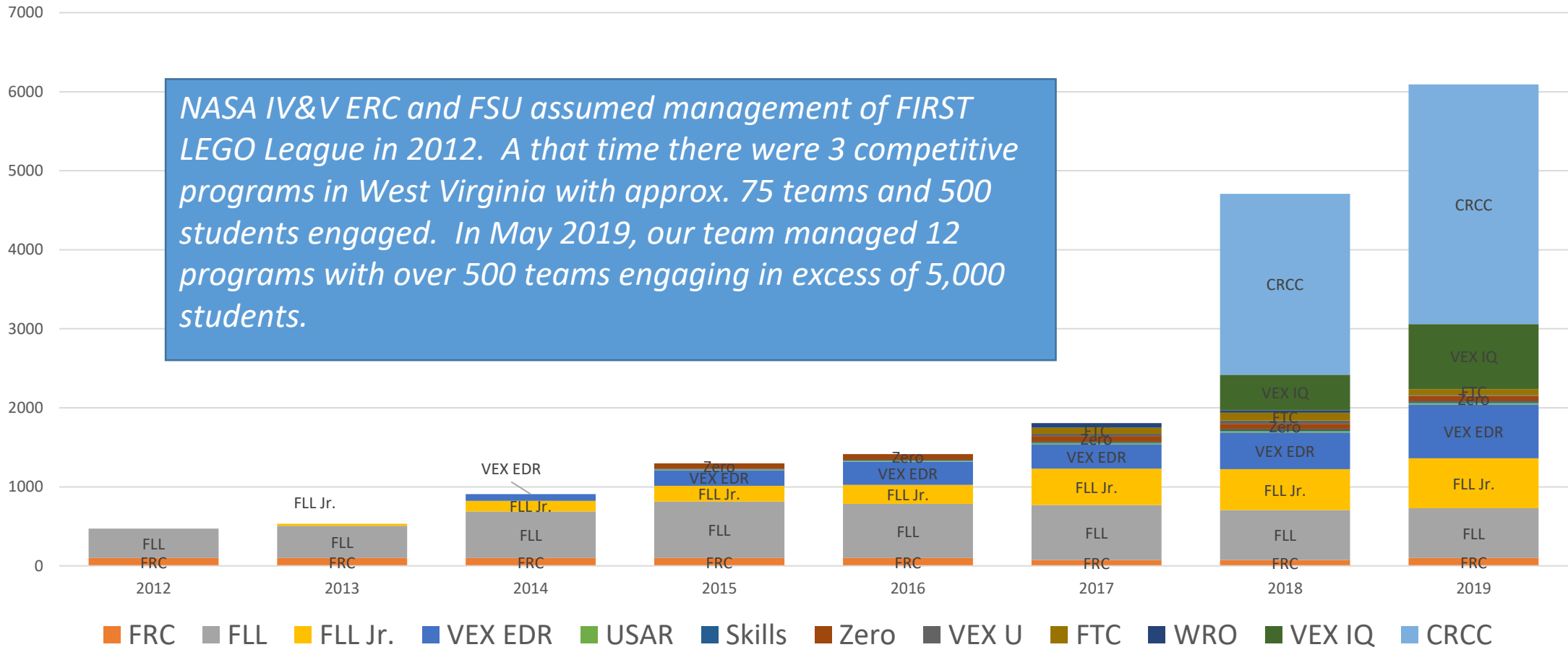
team america rocketry challenge

FIRST TECH CHALLENGE

VEX U

MOBILE ROBOTICS

Number of WV Students in Competitive Robotics



Statewide Program Through Partnership Building

- Bluefield State, *Bluefield*
- BridgeValley CTC, S. *Charleston*
- *Challenger Learning Center, Wheeling*
- James Rumsey, *Martinsburg*
- MARS, *Morgantown*
- RCBI, *Bridgeport*
- New River CTC, *Lewisburg*
- RCBI, *Huntington*
- Shepherd University, *Shepherdstown*
- WVSDB, *Romney*
- *WVSU-Beckley*
- WVU-P, *Parkersburg*
- *WVU-Tech, Beckley*
- **Fairmont State University, *Fairmont***

Wheeling
Charleston
Huntington
Bluefield
Fairmont
Morgantown
Martinsburg
Shepherdstown
Romney
Bridgeport
Lewisburg
Parkersburg
Beckley
Weirton
Wellsburg
Moundsville
Cameron
Littleton
Blacksville
New Martinsville
Paden City
Pine Grove
Middlebourne
Smithfield
Westover
Brandonville
Masontown
Kingwood
Terra Alta
Newburg
Rowlesburg
Saint Marys
Lumberport
Clarksburg
Stonewood
West Union
Ellenboro
Harrisville
Vienna
Elizabeth
Auburn
Lost Creek
Jane Lew
Philippi
Parsons
Hendricks
Thomas
Belington
Moorefield
Petersburg
Elkins
Harman
Beverly
Womelsdorf
Buckhannon
Weston
Glenville
Grantsville
Ravenswood
Reedy
New Haven
Point Pleasant
Ripley
Spencer
Leon
Buffalo
Winfield
Burnsville
Gassaway
Sutton
Flatwoods
Huttonsville
Franklin
Durbin
Addison
Cowen
Clay
Clendenin
Summersville
Richwood
Marlinton
Hillsboro
Cedar Grove
Marmet
Smithers
Ansted
Fayetteville
Quinwood
Falling Spring
Oak Hill
Ranelle
Sylvester
Madison
Chapmanville
Mitchell Heights
Kermit
Logan
Man
Oceana
Sophia
Hinton
Alderson
Williamson
Matewan
Gilbert
Pineville
Mullens
Union
Davy
Welch
Northfork
Bradshaw
Gary
War
Princeton
Keyser
Elk Garden
Paw Paw
Hedgesville
Martinsburg
Capon Bridge
Charles Town
Bayard
Wardensville
West Hamlin
Hamlin
Wayne
Saint Albans
South Charleston
Dunbar
Nitro
Hurricane
Scott Depot
Poca
Winfield
Point Pleasant
Ripley
Ravenswood
Parkersburg
Vienna
Belpre
Marietta
Williamstown
Mineral Wells
Elizabeth
Auburn
Glenville
Spencer
Sutton
Flatwoods
Weston
Buckhannon
Philippi
Parsons
Elkins
Beverly
Harman
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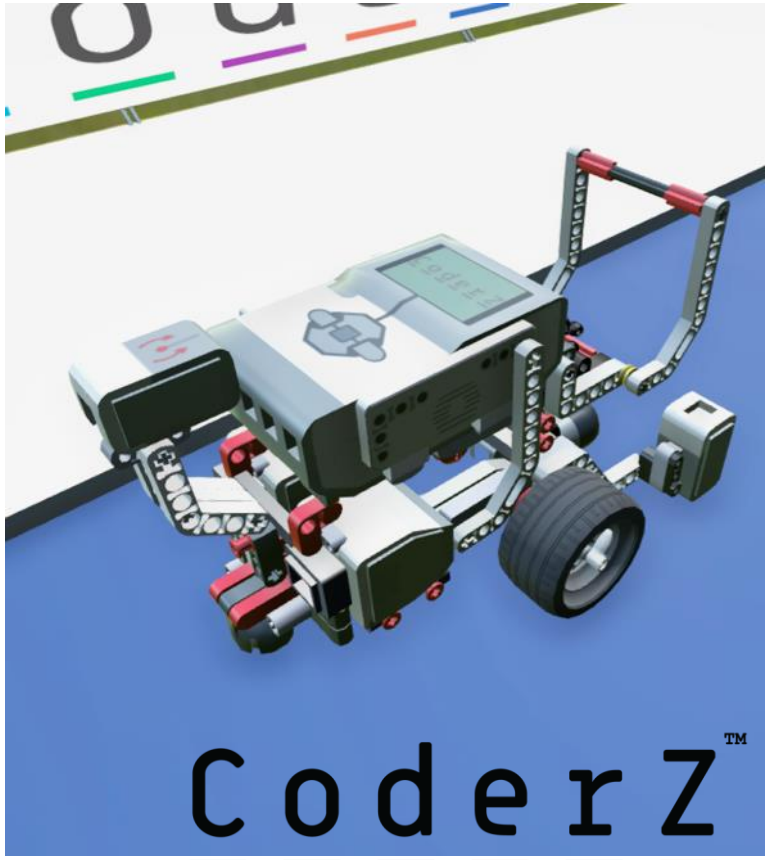
Sylvester
Madison
Chapmanville
Logan
Man
Oceana
Sophia
Hinton
Alderson
Williamson
Matewan
Gilbert
Pineville
Mullens
Union
Davy
Welch
Northfork
Bradshaw
Gary
War
Princeton
Keyser
Elk Garden
Paw Paw
Hedgesville
Martinsburg
Capon Bridge
Charles Town
Bayard
Wardensville
Moorefield
Petersburg
Franklin
Durbin
Elkins
Harman
Beverly
Womelsdorf
Buckhannon
Weston
Philippi
Parsons
Hendricks
Thomas
Belington
Lost Creek
Jane Lew
Auburn
Elizabeth
Glenville
Grantsville
Ravenswood
Reedy
New Haven
Point Pleasant
Ripley
Spencer
Leon
Buffalo
Winfield
Burnsville
Gassaway
Sutton
Flatwoods
Huttonsville
Clendenin
Clay
Cowen
Addison
Summersville
Richwood
Marlinton
Hillsboro
Cedar Grove
Marmet
Smithers
Ansted
Fayetteville
Quinwood
Falling Spring
Oak Hill
Ranelle

CYBER ROBOTICS CODING COMPETITION

FAIRMONT STATE UNIVERSITY™



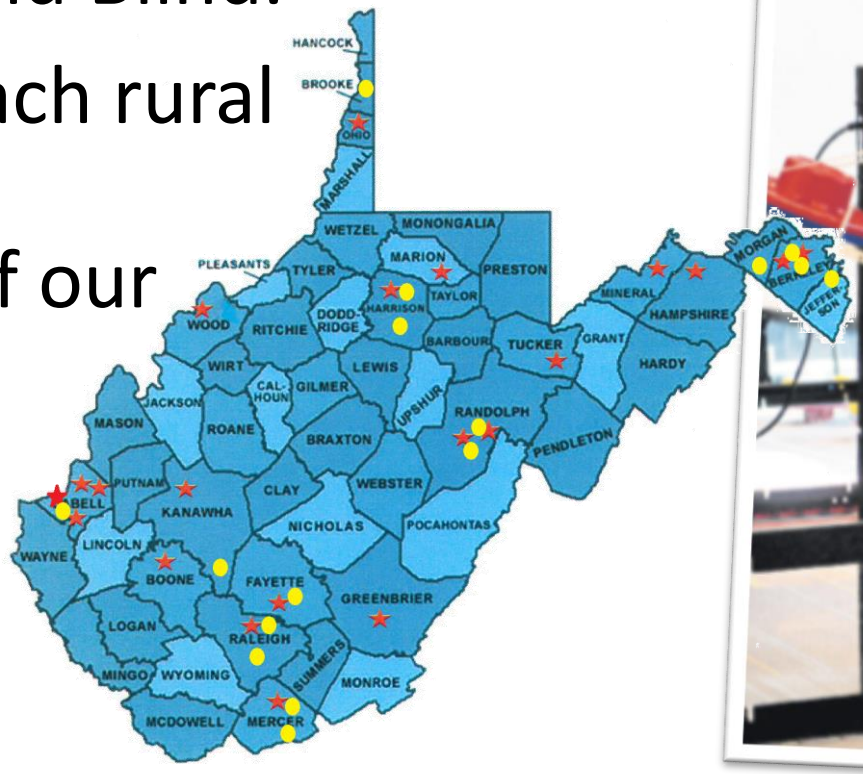
- Individualized, self-paced, online.
- 2018: WV Pilot with 2,290 students at 20 schools
- 2019: 3,034 students at 34 schools

International Robotics Tournaments

- Mountain State Invitational, FIRST LEGO League
- West Virginia Robotics Extreme, FIRST Robotics

Increasing Diversity

- Sponsor all-girls teams
- Robotics for at-risk youth
- Schools for Deaf and Blind.
- Partnerships to reach rural and economically challenged parts of our state.



- Summer Internships
- Year Round Internships
- Space Grant Internships

Employ

NASA

FIRST

VISTA
Volunteers In Service To America

FAIRMONT STATE UNIVERSITY

ENGINEERING PATHWAYS OUT OF POVERTY

www.usfirst.org/vista

REC Foundation

High Rocks

The Education alliance
Business and Community for Public Schools

Benefits of FIRST/VISTA

- Helping kids
- Supporting teams
- Living Stipend
- Health Insurance (optional)
- Advantage when applying for government jobs
- End-of-service stipend

Internships

- High School and College Level
- Summer and Year-Round
- Pathways Program leads to a job at NASA!

Questions?

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