



# NIOSH OSH Workforce Training Past – Present – Future

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May 15, 2018

# Disclaimer

The findings and conclusions in this presentation are those of the author and do not necessarily represent the views of the National Institute for Occupational Safety and Health.



# Acknowledgements

- Elizabeth Maples, PhD
- Peter Grandillo, MBA
- Office of Extramural Programs

# Context for the OSH Training Mandate

- Occupational Safety and Health Act (1970) established NIOSH
- Mission to generate new knowledge in OSH and translate that into practice
- Training mandate to provide continual supply of OSH professionals

# NIOSH OSH Training Portfolio

- **NIOSH Training Program**
  - Approximately 30% of the NIOSH extramural funding
- **Education and Research Centers (ERCs)**
  - Known as Education *Resource* Centers until 1998
  - Graduate degree training in OSH core and allied fields
  - Professional CE in OSH core and allied disciplines
- **Training Project Grants (TPGs)**
  - Single discipline degree training programs
  - Undergraduate and graduate
  - Limited number of specialty non-degree TPGs
    - Firefighters
    - Maritime health and safety
    - Occupational Health Internship Program

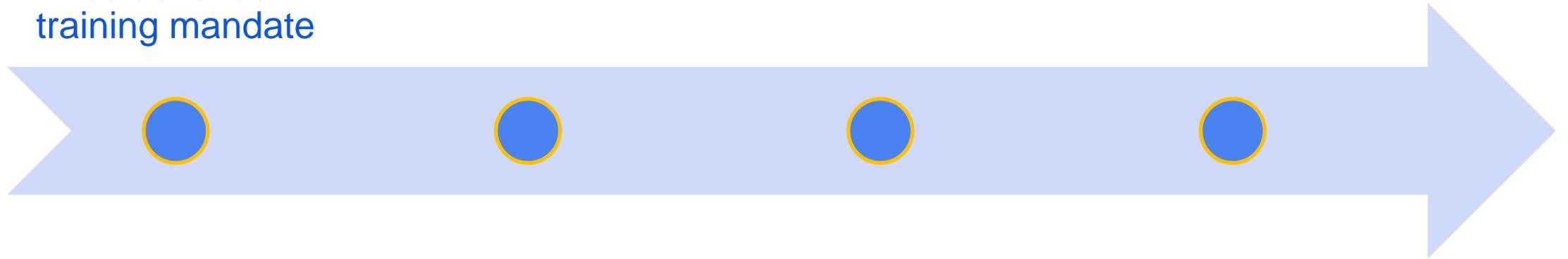
# The Early Years of OSH Training

Training Project Grants | 1970 to 1976

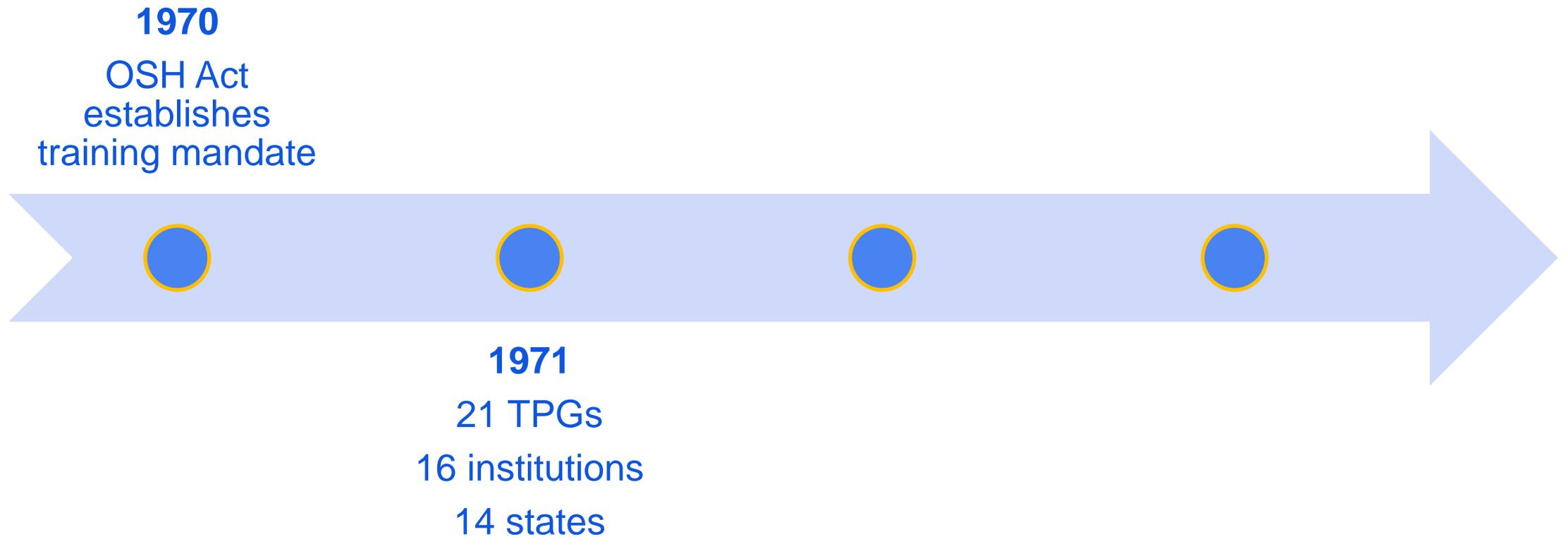
# Training Project Grants | 1970 – 1976

**1970**

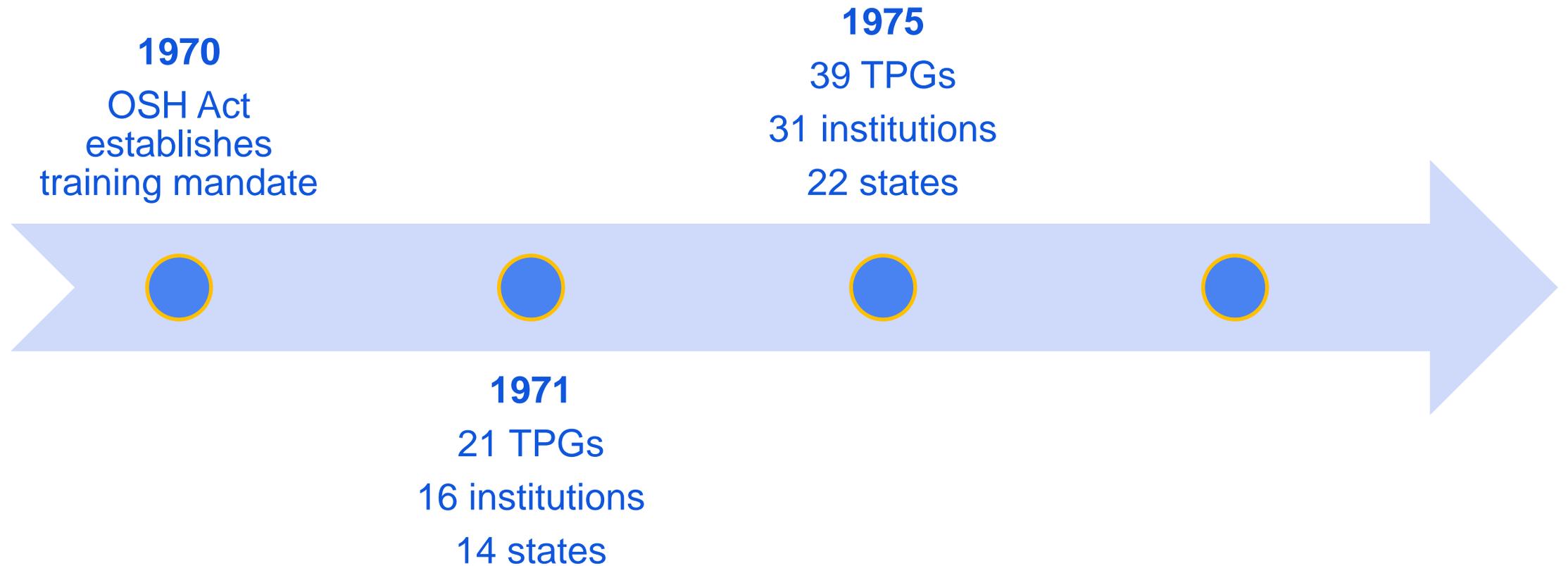
OSH Act  
establishes  
training mandate



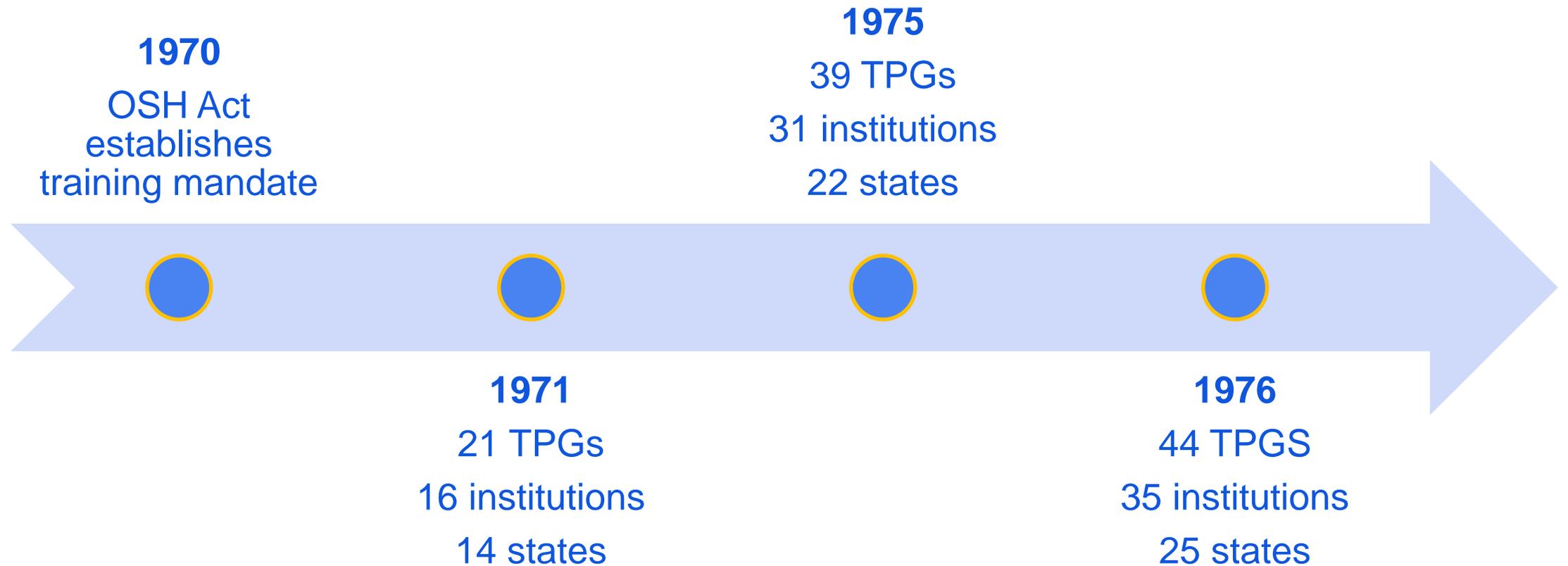
# Training Project Grants | 1970 – 1976



# Training Project Grants | 1970 – 1976



# Training Project Grants | 1970 – 1976



# TPG Training Program Areas by 1976

## Academic degree programs

- Industrial Hygiene
- Occupational Medicine
- Occupational Safety Engineering

## Short term training in allied fields

- Occupational Safety and Health
- Injury Control
- Biostatistics
- Occupational Biomechanics
- Human Factors Psychology
- Industrial psychiatry
- Acoustic Environmental Control
- Respiratory Physiology
- Environmental Health
- Bioenvironmental Engineering
- Independent Study Course in Nursing

# The Evolution of OSH Training

Education and Research Centers | 1977 – 2017

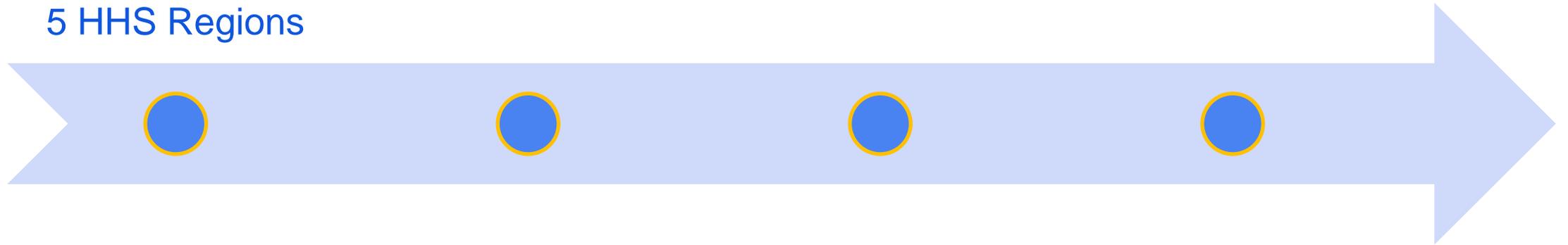
# Education and Research Centers | 1977 – 2017

**1977**

9 ERCs

9 states

5 HHS Regions



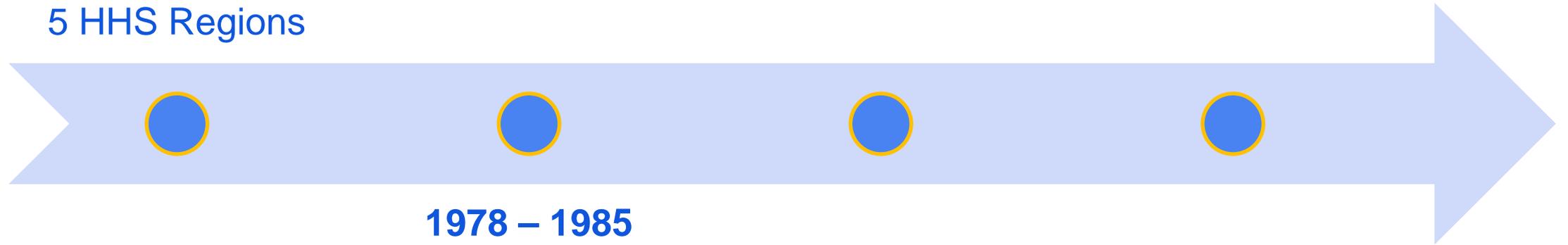
# Education and Research Centers | 1977 – 2017

**1977**

9 ERCs

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**1978 – 1985**

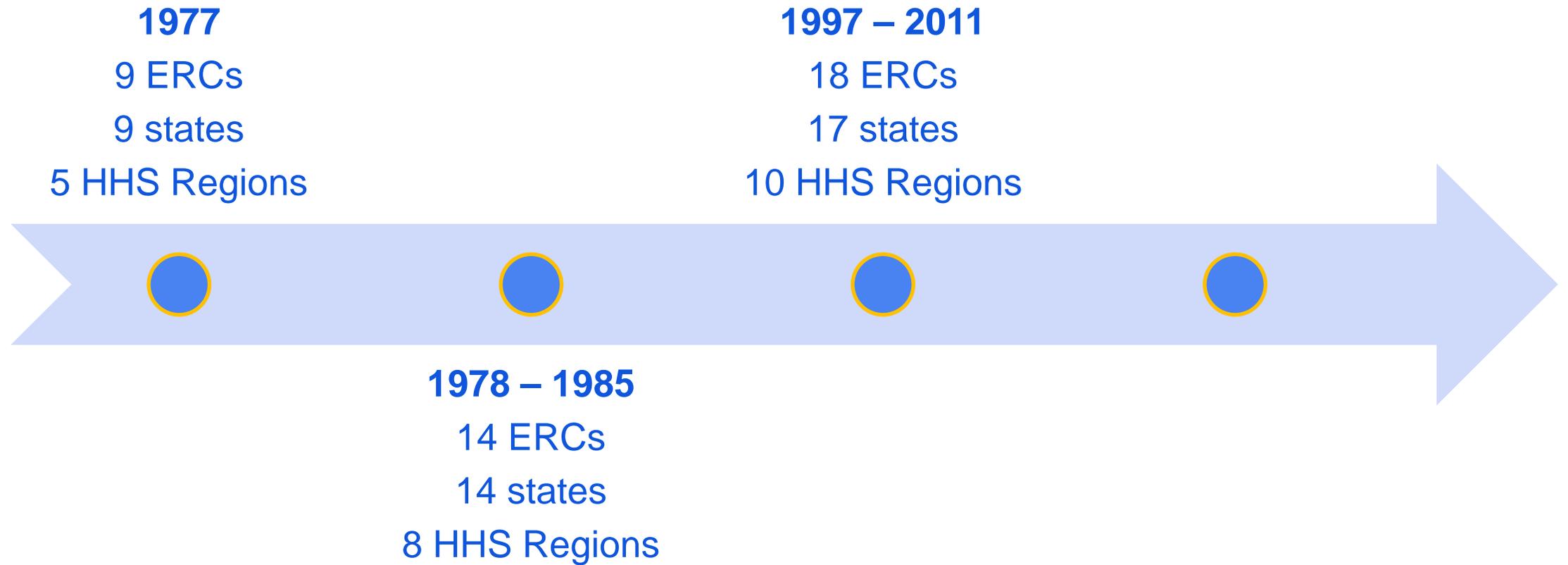
14 ERCs

14 states

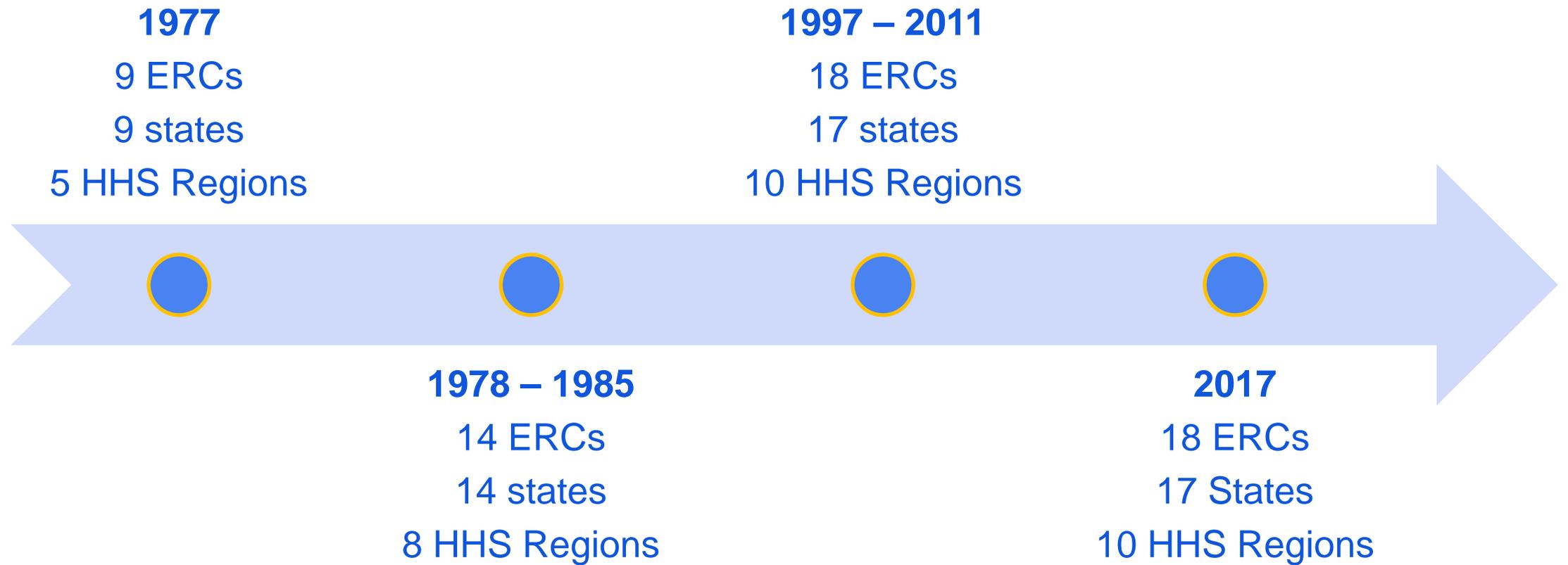
8 HHS Regions



# Education and Research Centers | 1977 – 2017



# Education and Research Centers | 1977 – 2017



# ERC Components by 2017

## Required

- **Planning and Evaluation Core**
- **Academic Training Core**
  - At least 3 academic programs
  - 2 or more core programs
  - 1 or more in core or allied areas
  - Certificate training in approved areas
- **Outreach Core**
  - OSH outreach to the HHS Region

## Optional

- **Research Training Core**
  - Pilot Project Research Training
  - Targeted Research Training
    - Includes post doctoral training
- **Outreach Core (required)**
  - Continuing Education (optional)

# ERC Academic Training Program Areas by 2017

## Core Disciplines

- Occupational Safety
- Industrial Hygiene
- Occupational Medicine
- Occupational Health Nursing

## Allied Disciplines

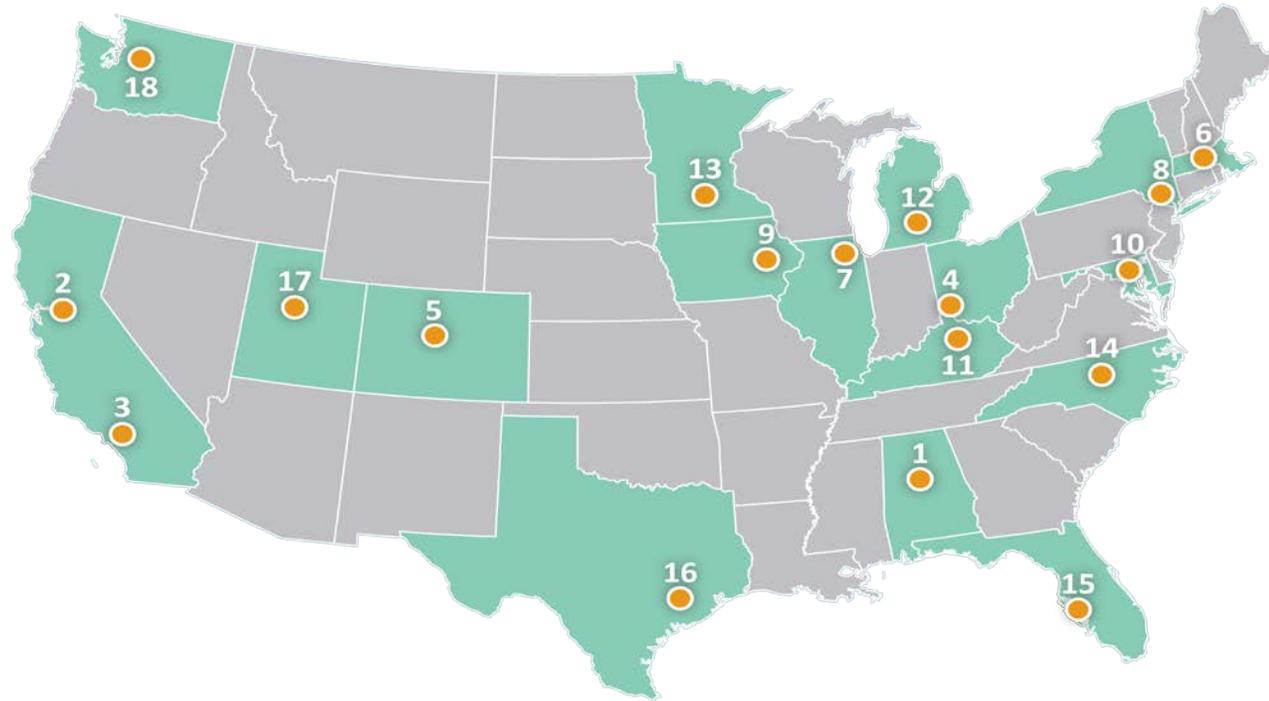
- Occupational Exposure Sciences
- Occupational Injury Prevention
- Occupational Health Psychology
- Agricultural Safety and Health
- Occupational Epidemiology
- Biomarkers of Occupational Exposure and Susceptibility
- Biological Monitoring
- Health Physics
- Occupational Ergonomics

# OSH Training Program Today

ERCs and TPGs | 2018

# Education and Research Centers in 2018 (n=18)

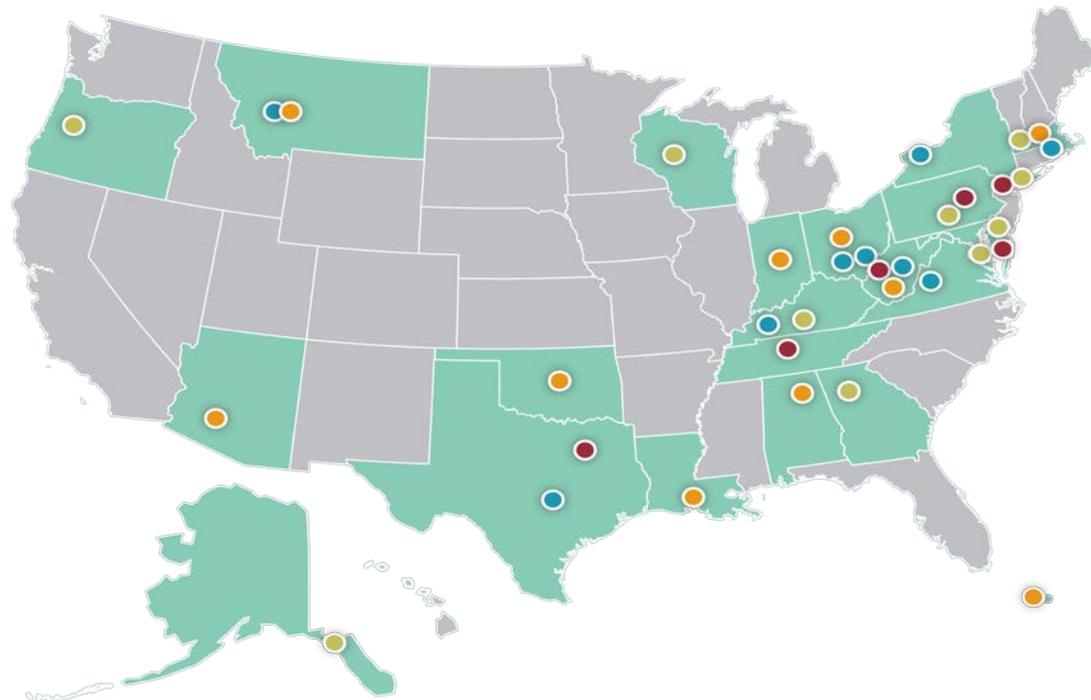
NIOSH Education and Research Centers



- |  |  |
|--|--|
| 1. University of Alabama at Birmingham   | 10. Johns Hopkins University                                 |
| 2. University of California, Berkeley    | 11. University of Kentucky                                   |
| 3. University of California, Los Angeles | 12. University of Michigan                                   |
| 4. University of Cincinnati              | 13. University of Minnesota                                  |
| 5. University of Colorado Denver         | 14. University of North Carolina at Chapel Hill              |
| 6. Harvard University                    | 15. University of South Florida                              |
| 7. University of Illinois at Chicago     | 16. University of Texas Health and Science Center at Houston |
| 8. Icahn Mount Sinai School of Medicine  | 17. University of Utah                                       |
| 9. University of Iowa                    | 18. University of Washington                                 |

# Training Project Grants in 2018 (n=34)

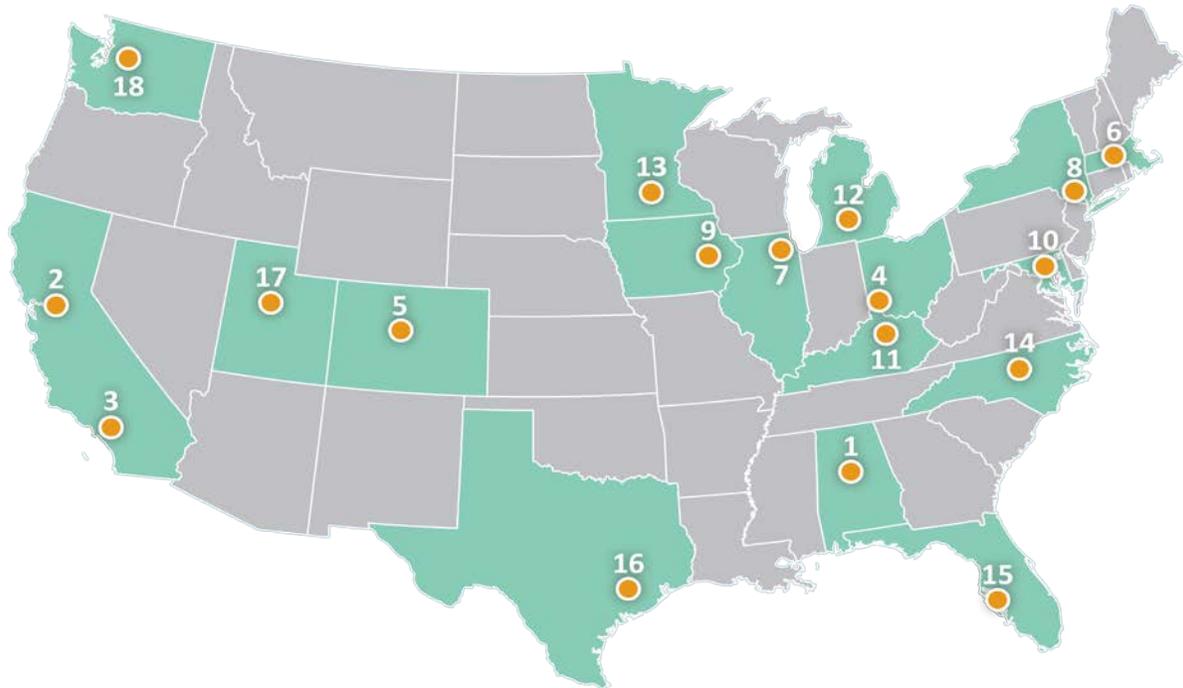
NIOSH Training Project Grants by Discipline



Occupational Safety	Industrial Hygiene	Allied Occupational Safety & Health	Occupational Medicine
MA/Lowell	Arizona	Alaska Marine	Meharry
Montana Tech	MA/Lowell	Association of Occupational and Environmental Clinics	Pennsylvania
Murray State	Montana Tech	Connecticut	Texas/Tyler
Ohio State	North Alabama	Emory	West Virginia
Ohio University	Oklahoma	International Association of Fire Fighters	Yale
SUNY/Buffalo	Puerto Rico	MA/Lowell	
Texas A&M	Purdue	Millersville	
Virginia Tech	Toledo	Portland State	
West Virginia	Tulane	Wisconsin/Stout	
	West Virginia	Western Kentucky	

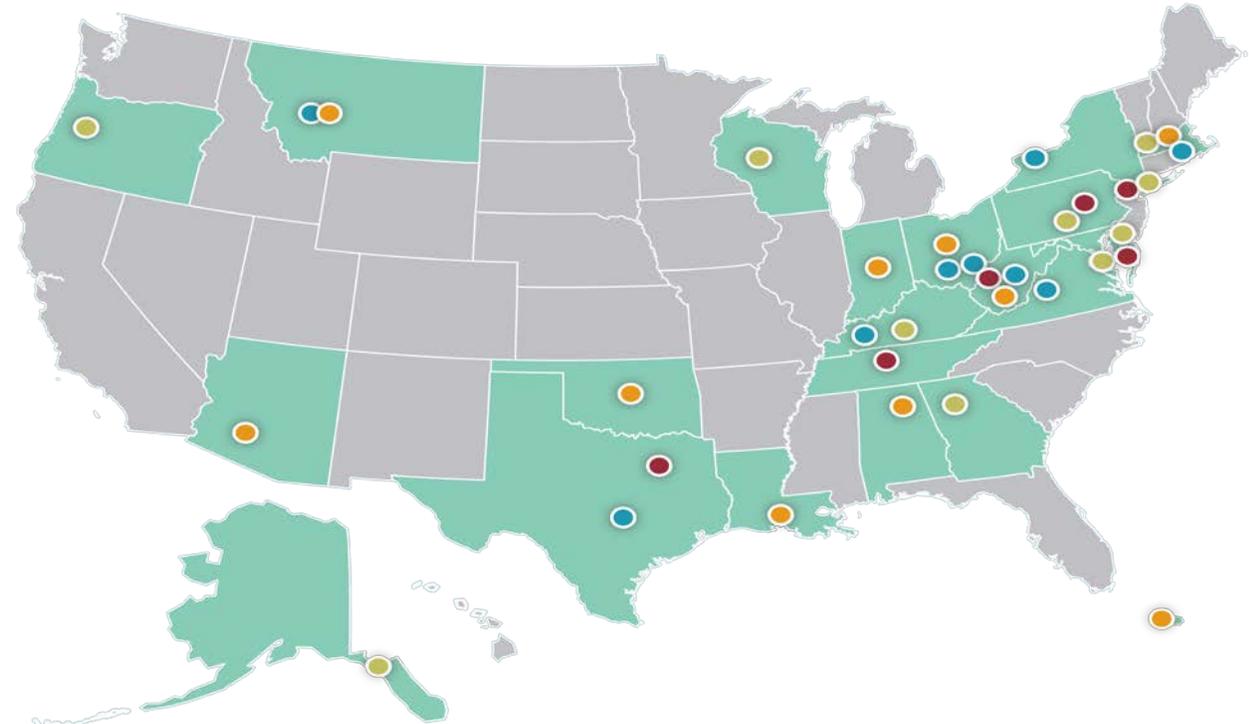
# NIOSH ERC and TPG Training Programs 2018

NIOSH Education and Research Centers



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NIOSH Training Project Grants by Discipline

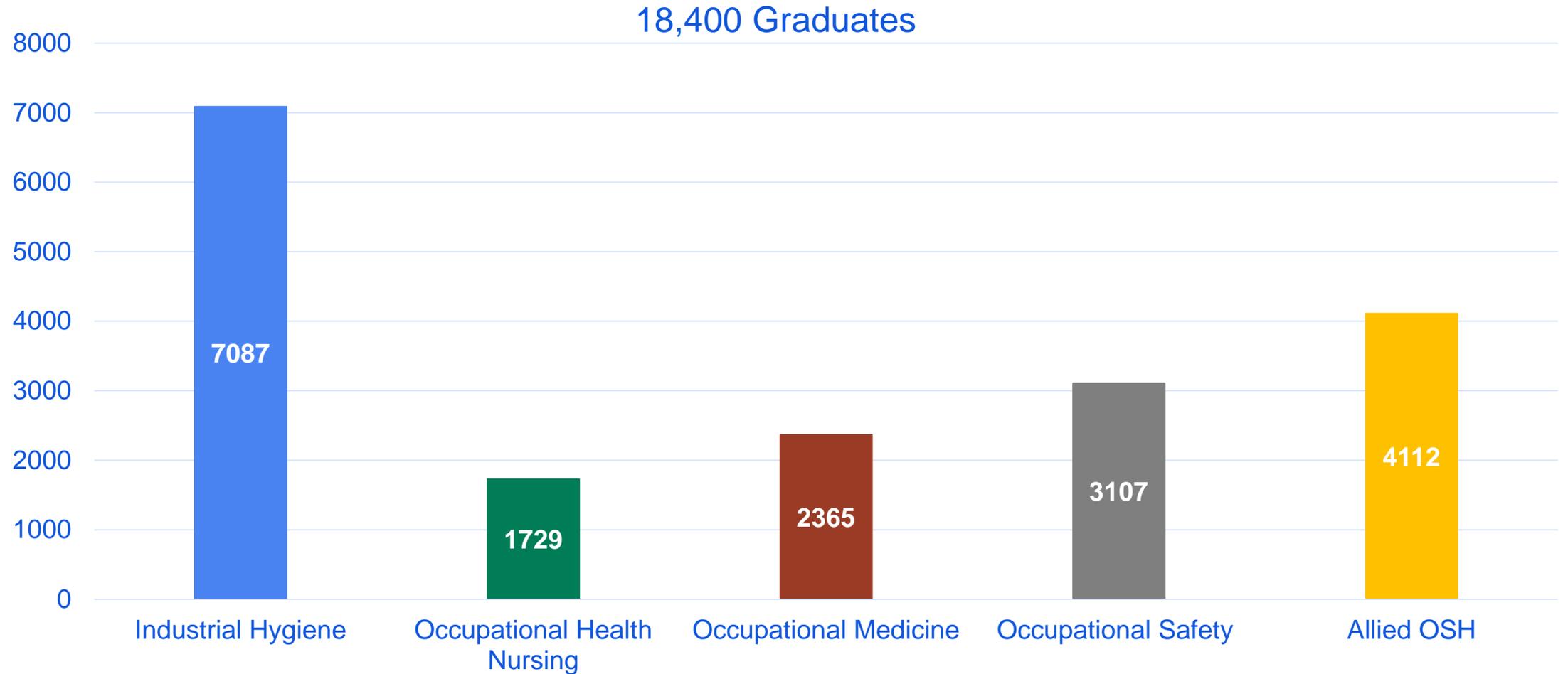


Occupational Safety	Industrial Hygiene	Allied Occupational Safety & Health	Occupational Medicine
MA/Lowell Montana Tech Murray State Ohio State Ohio University SUNY/Buffalo Texas A&M Virginia Tech West Virginia	Arizona MA/Lowell Montana Tech North Alabama Oklahoma Puerto Rico Purdue Toledo Tulane West Virginia	Alaska Marine Association of Occupational and Environmental Clinics Connecticut Emory International Association of Fire Fighters MA/Lowell Millersville Portland State Wisconsin/Stout Western Kentucky	Meharry Pennsylvania Texas/Tyler West Virginia Yale

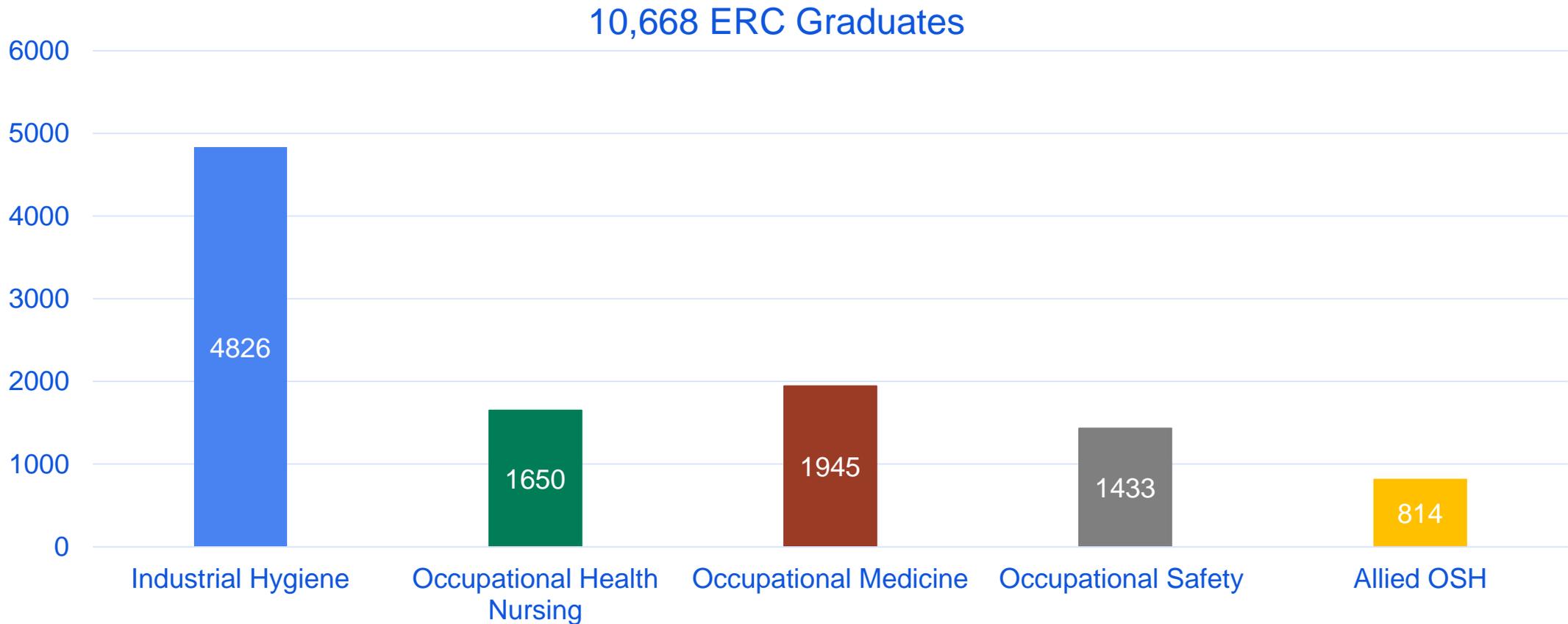
# OSH Workforce Training Outputs

ERC and TPG Graduates | 1977 – 2017

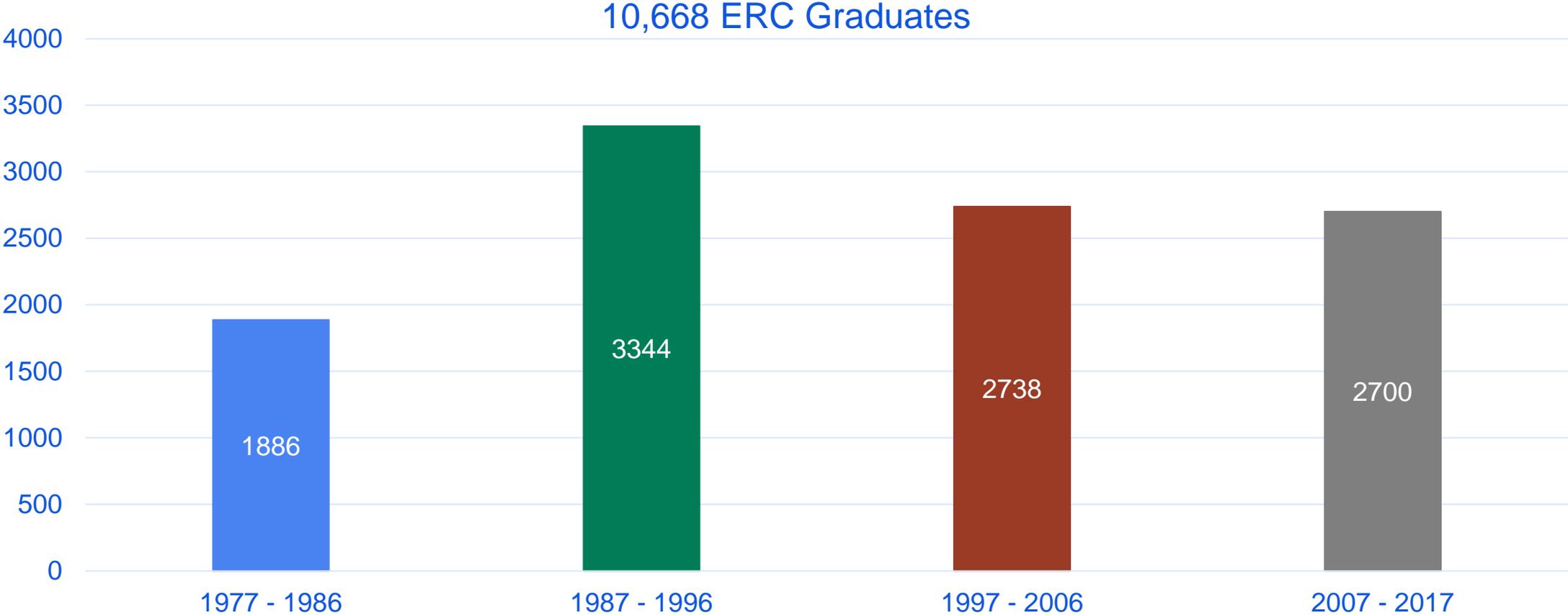
# ERC and TPG Graduates by Discipline | 1977 -2017



# ERC Graduates by Discipline | 1977 – 2017

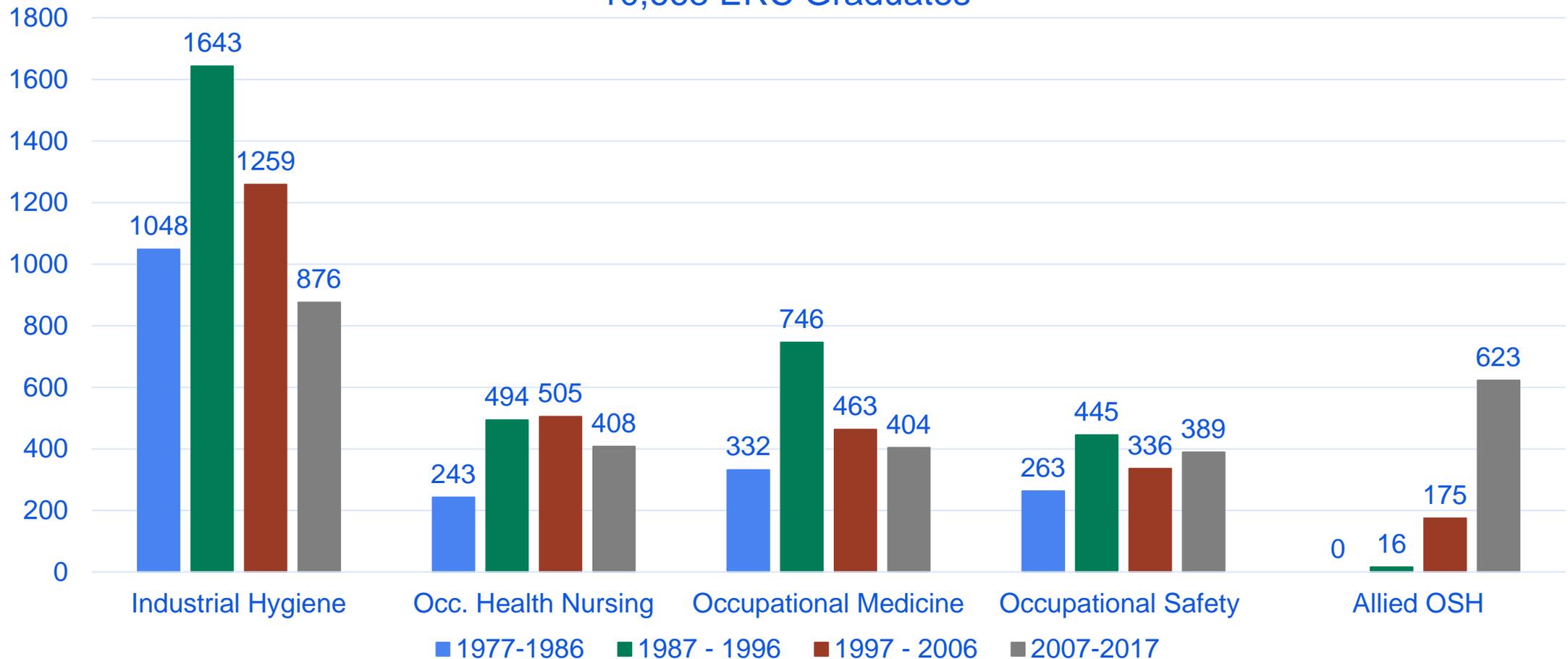


# ERC Graduates by Decade | 1977 – 2017

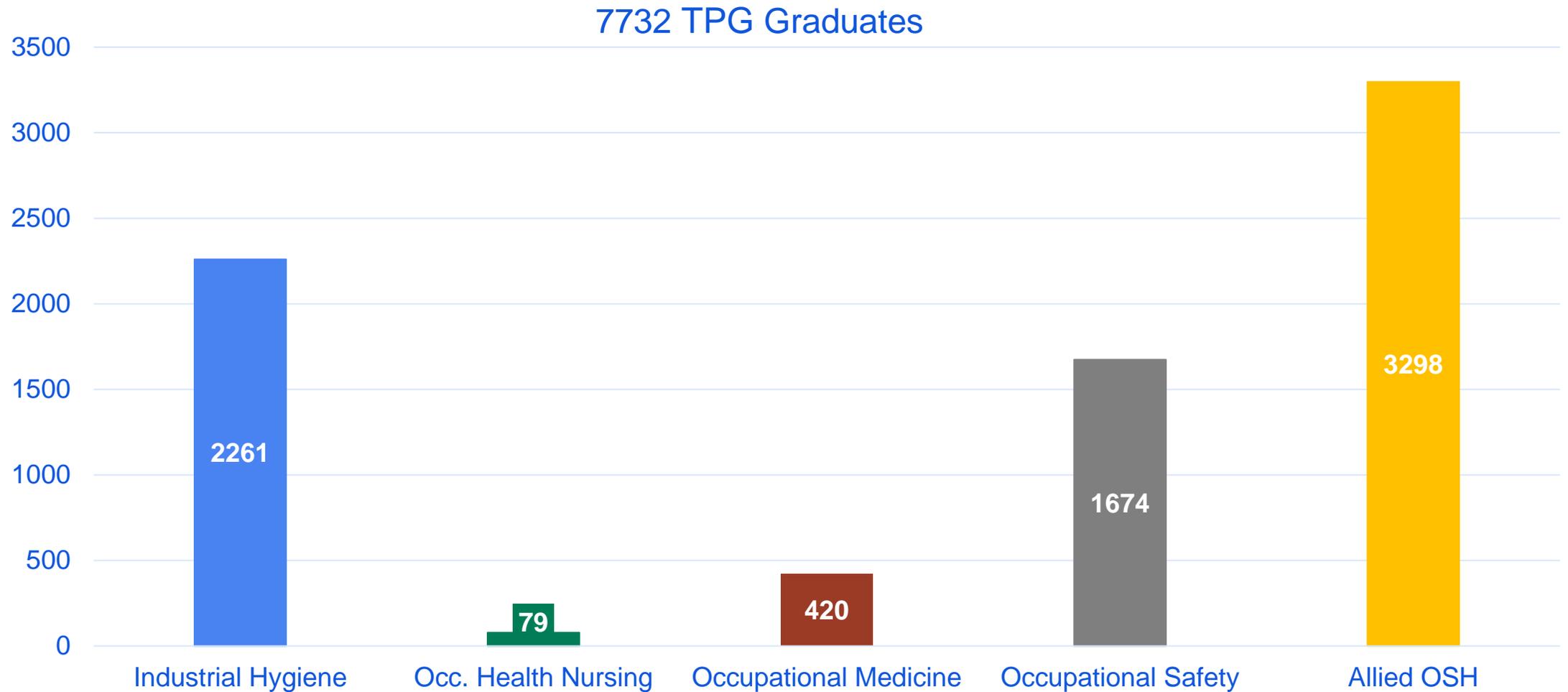


# ERC Graduates by Discipline by Decade | 1977 – 2017

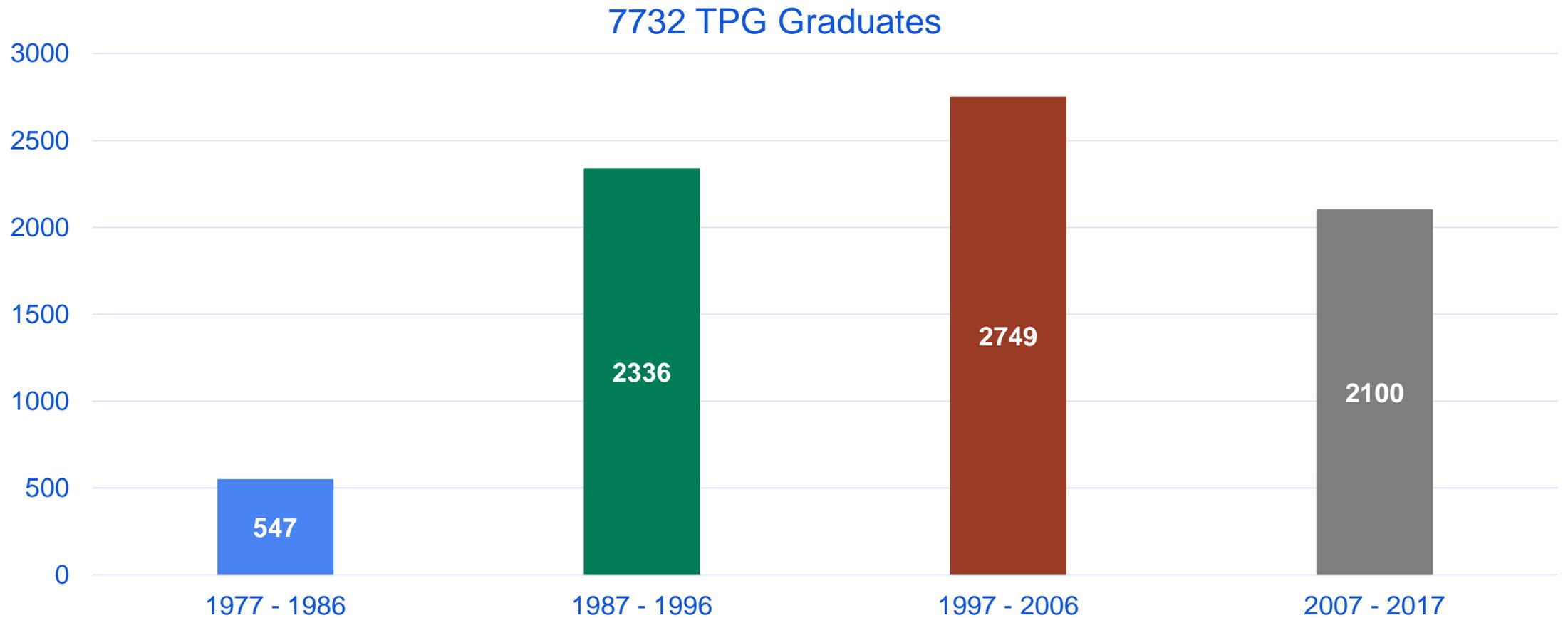
10,668 ERC Graduates



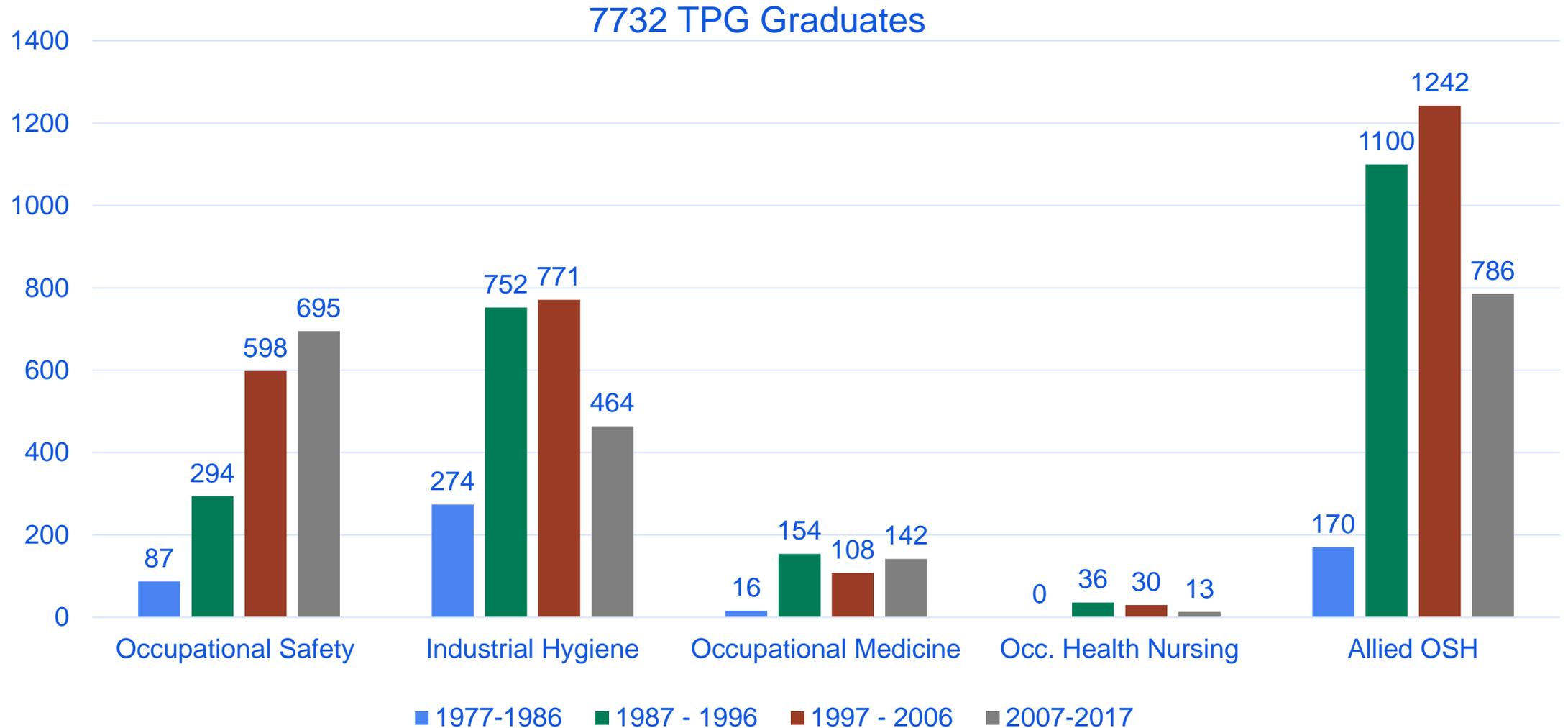
# TPG Graduates by Discipline | 1977 – 2017



# TPG Graduates by Decade | 1977 – 2017



# TPG Graduates by Discipline by Decade | 1977 – 2017

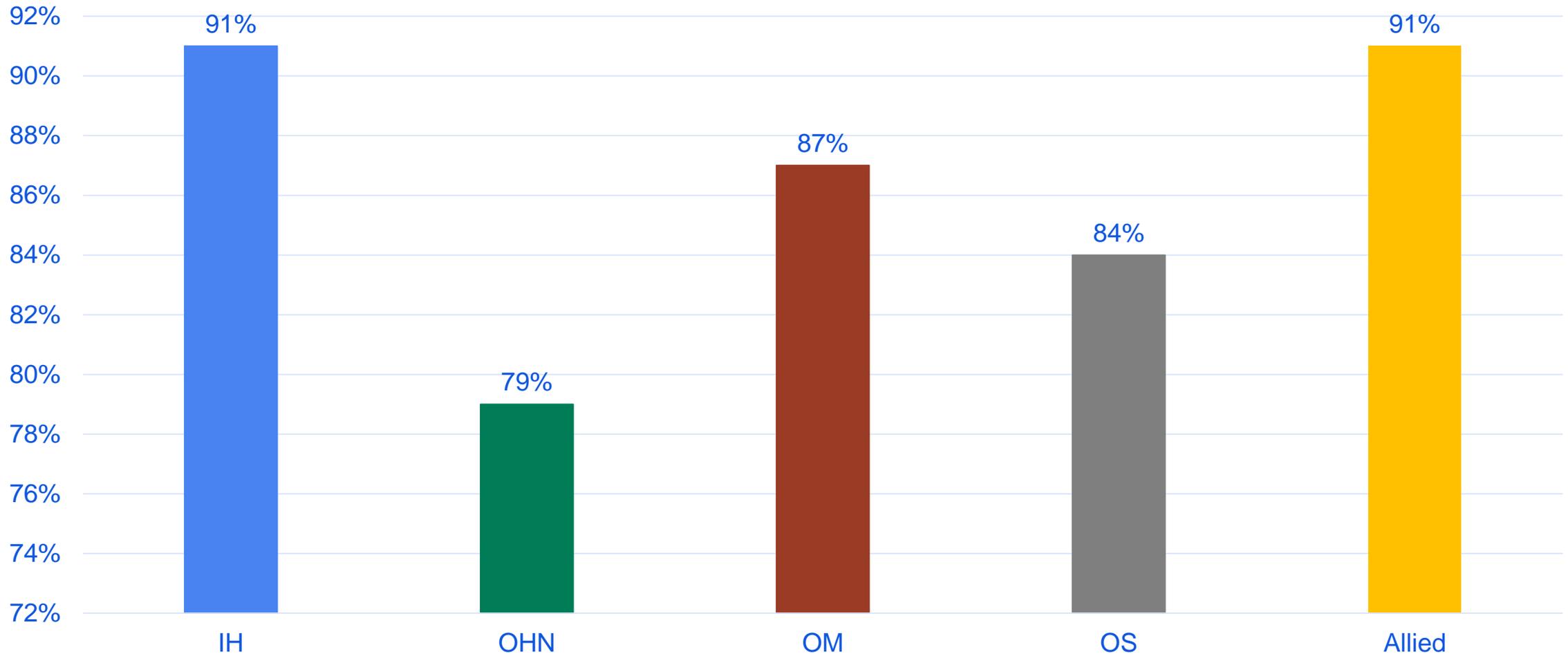


# Trainee Employment in OSH

ERCs | 2005 - 2016

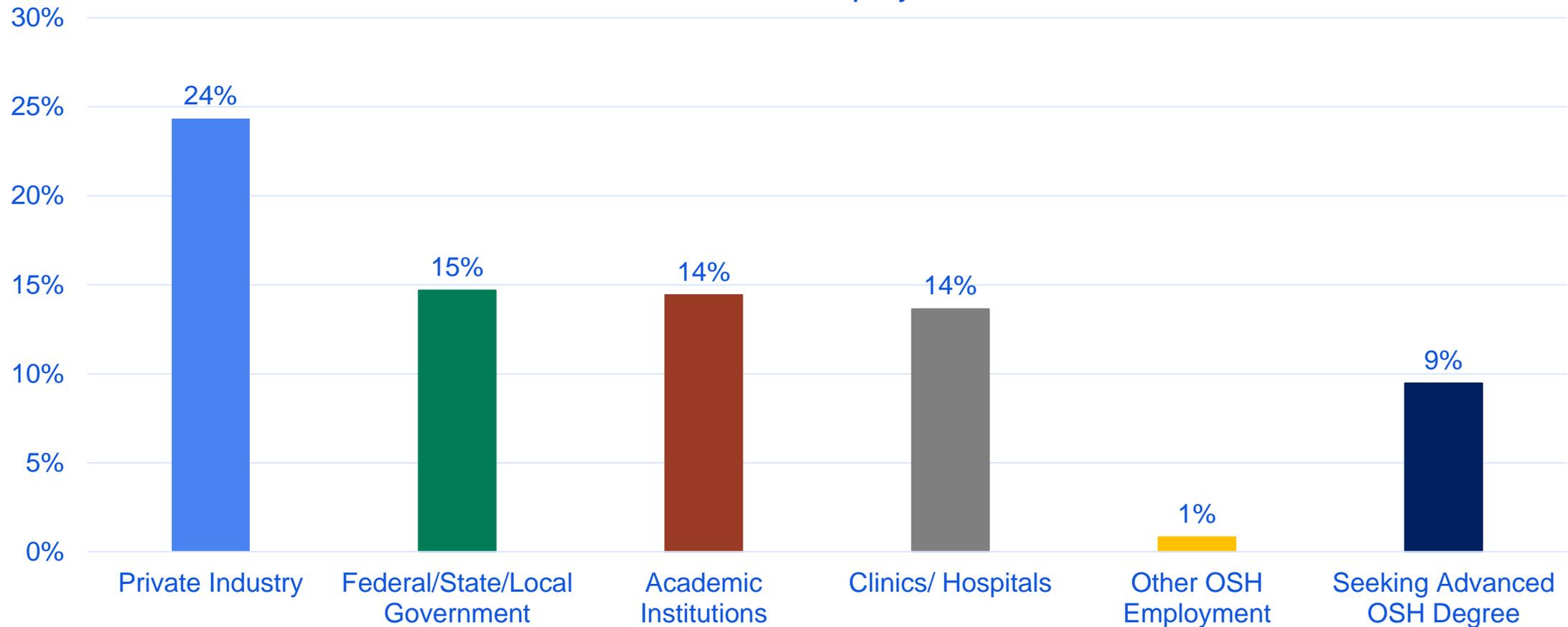
# OSH Employment by Discipline | 2005-2017

% ERC Graduates Employed in OSH



# ERC Graduate Employment by Industry | 2005 - 2017

% ERC Graduates Employed in OSH



# OSH Continuing Education Outputs

ERCs | 2005 – 2017

# ERC CE Outputs | 2005 – 2017

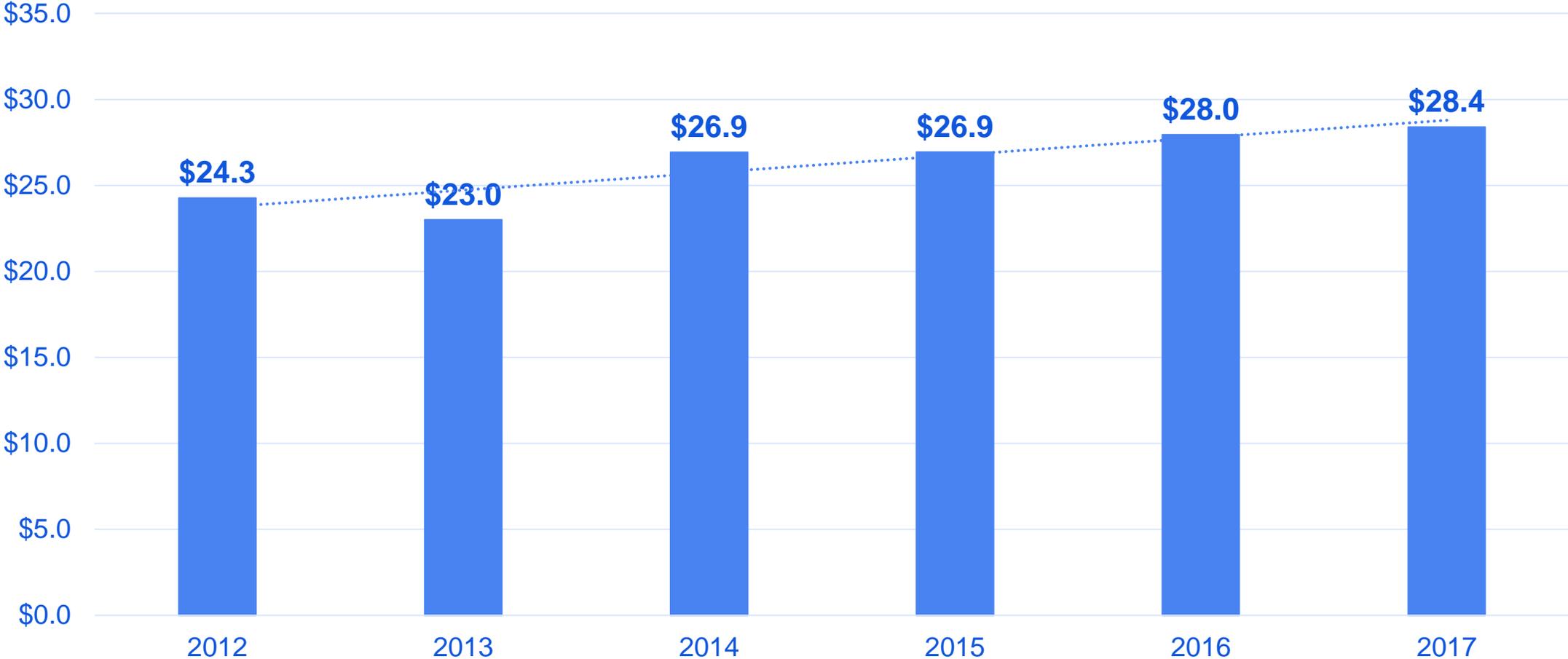
Discipline	# Courses	# Trainees	Person Hours Training
Occupational Safety	7,810	158,281	1,123,232
Industrial Hygiene	2,429	62,579	434,241
Occupational Health Nursing	2,348	73,970	356,463
Occupational Medicine	2,317	85,202	279,390
Hazardous Substances Training	1,204	23,859	88,270
Agricultural Safety	326	10,186	27,380
Other CE Offerings	3,587	142,719	639,536
<b>Total</b>	<b>18,333</b>	<b>516,219</b>	<b>2,895,639</b>

# Funding Trends

ERCs, NIOSH Centers, and Research | 2012 – 2017

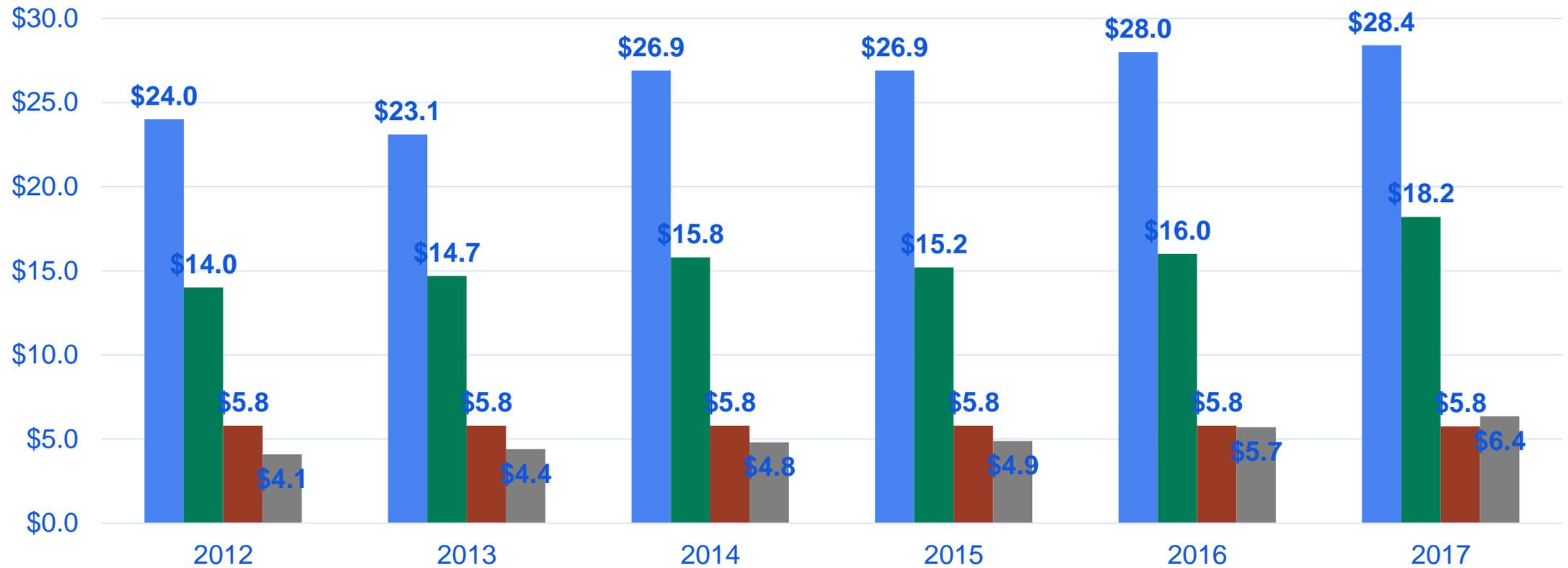
# ERC Funding Trends | FY2012 – FY2017

\$ Millions



# Extramural Centers Funding Trends\* | FY2012 – FY2017

\$ Millions

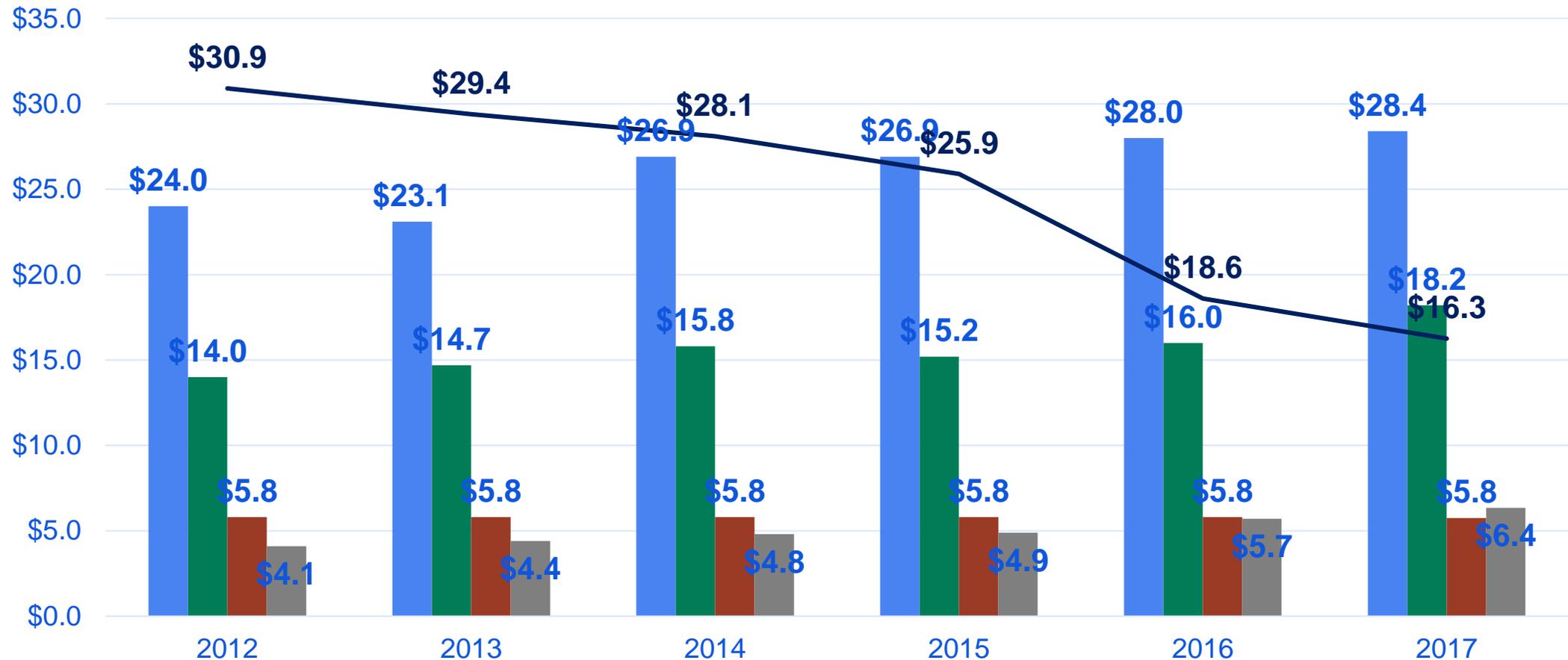


\* Funding for Centers only.

■ ERCs ■ AgFF ■ Construction ■ TWH Centers

# Extramural Centers Funding Trends\* | FY2012 – FY2017

\$ Millions



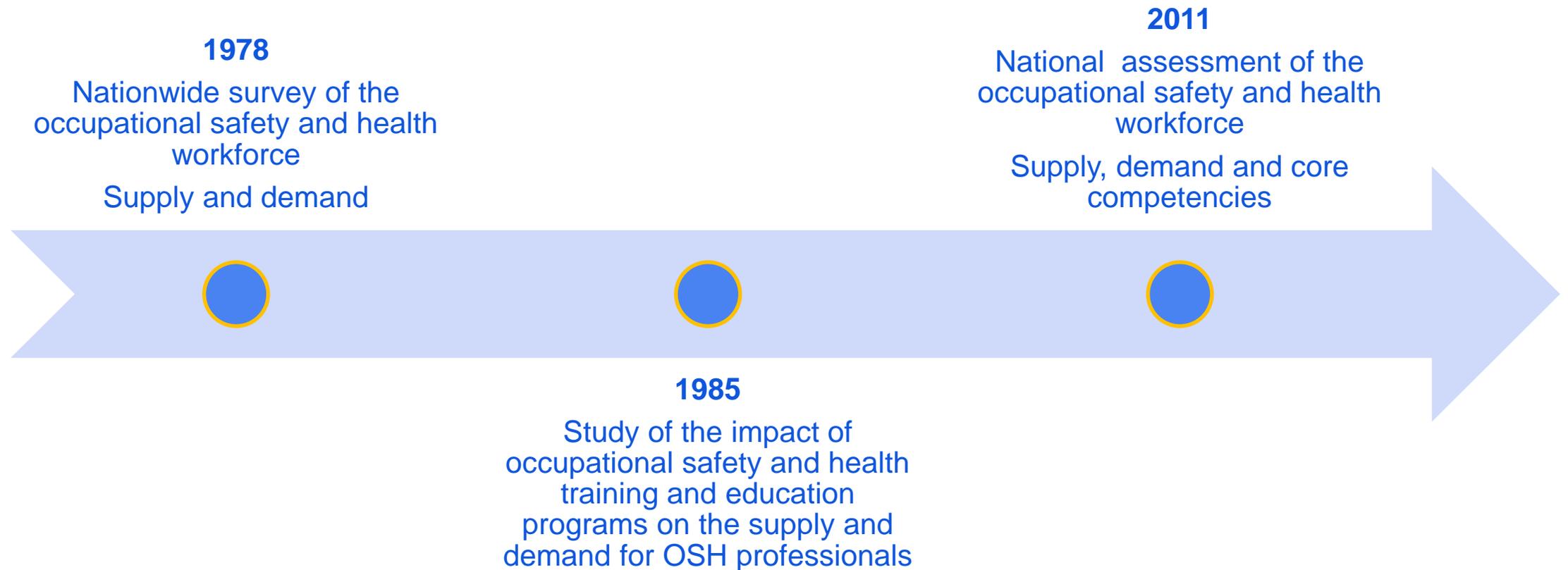
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ERCs AgFF Construction TWH Centers Research

# OSH Workforce Pipeline

Supply and Demand Assessments | 1978 – 2011

# OSH Workforce Needs Assessments



Study	Goals	Methods	Findings
NIOSH, 1978	Assess demand	Survey employers and educators	Predicted chronic shortage of graduates in safety and nursing 1980 – 1990.  Current shortage in OM but not expected to continue.

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RTI, 1985	Assess impact of OSH programs, current supply and future demand, design system to monitor match between training and demand.	Survey OSH academic programs and graduates	<p>ERC graduation rates expected to remain level except for sharp decline in safety.</p> <p>ERC graduates easily employed.</p> <p>Employers find shortage of OHN and OM graduates.</p>

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Westat, 2011	Assess supply, demand and competencies	Survey of employers and educators	<p>Five-year demand (2012-2016) will outpace supply by about 50% especially in Safety and OHN.</p> <p>Apparent decline in funding.</p> <p>Funding and lack of awareness main obstacles to recruitment.</p> <p>Employers satisfied with training.</p> <p>Future needs for inter-disciplinary training and bachelor level employees – especially safety.</p>

# Future Challenges

# Future Challenges for OSH Workforce Training

- Inextricably linked to the future of occupational safety and health
  - Turbulent environment and constrained resources
  - Demonstrate relevance and benefit
- Changes in the nature of work, workforce, and workplace challenge existing paradigms
  - Traditional OSH programs focused ensuring safe work and protecting workers
  - New paradigms (Total Worker Health) focused on protecting workers *and* advancing health and well-being
  - Core vs. allied disciplines
- New models for OSH professional training
  - Supply and demand
  - Competency based training vs. discipline based training
  - New CEPH accreditation requirements SPHs (2016)

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For more information, contact CDC  
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TTY: 1-888-232-6348 [www.cdc.gov](http://www.cdc.gov)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

