Delaware Climate-Ready Workforce Pilot Project: Enhancing Climate Resilient Worker Health and Safety

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+ Outline

- Climate Impacts on Worker Health and Safety

- Project overview

- Key Findings and Recommendations

+ Climate Impacts on Worker Health and Safety

Climate Change in Delaware

- Annual and seasonal temperatures have increased by approximately 2˚F (degrees Fahrenheit) over the past century.

- Average temperatures are expected to increase another 2.5 to 4.5˚F by 2050, and as much as 8˚F by the end of this century.

- The number of very hot days (over 95˚F) is expected to increase; heat waves are projected to become longer and more frequent.

- Heavy rainstorms are expected to become more frequent and more intense, with an increasing number of very wet days with < 2 inches of rainfall.

- Sea level rise is already occurring along Delaware's coast, with an increase of 13 inches over the past century.

- Higher sea levels will likely increase coastal flooding, as storm surge reaches further inland.

Climate Change Magnifies Worker Health and Safety Risks

Industry	Affected Population	New Hazards/ Vulnerabilities	Occupational Health Effects	Work Related Factors	Individual Factors	Locations Most Affected
AIR POLLUTION						
Construction	Construction workers (including all construction trades: carpenter, electrician, heavy equipment operator, ironworker, laborer, mason, plasterer, plumber, pipefitter, sheet metal worker, and welder), day-laborers	Increased particulates and pollutants (taking into consideration changing weather and season patterns)	Respiratory illnesses, cardiovascular disease, increased allergens	Work practices, work/rest cycles, protective gear	Age, weight, degree of physical fitness, metabolism, use of alcohol or drugs, medical conditions, clothing worn	Indoor and outdoor; mostly urban
OZONE DEPLETION						
Construction	Construction workers (including all construction trades: carpenter, electrician, heavy equipment operator, ironworker, laborer, mason, plasterer, plumber, pipefitter, sheet metal worker, and welder), day-laborers	Increased UV radiation	Skin cancer, eye effects, immune dysfunction	Work practices, work/rest cycles	Age, weight, degree of physical fitness, metabolism, use of alcohol or drugs, medical conditions, clothing worn, sunblock	Mostly outdoor; urban and rural

Source: *Climate Change Vulnerability Assessment: A Report Assessing How Climate Change Will Impact Worker Health and How to Prepare for These Impacts*. National Clearinghouse for Worker Health and Safety Training, 2015.

Industry	Affected Population	New Hazards/ Vulnerabilities	Occupational Health Effects	Work Related Factors	Individual Factors	Locations Most Affected
		EXTREME WEATHER				
Construction	Construction workers (including all construction trades: carpenter, electrician, heavy equipment operator, ironworker, laborer, mason, plasterer, plumber, pipefitter, sheet metal worker, and welder), day-laborers	Floods, droughts, and disaster clean-up related hazards (such as hazardous debris, mold, sediments, etc.)	Respiratory illnesses, cardiovascular disease, rashes, allergens, vector-born infections, mental stress, heat stroke, cold stress, traumatic injuries, skin irritations	Work practices, work/rest cycles, access to water, access to shade/cooling/heating, protective gear	Age, weight, degree of physical fitness, medical conditions, previous experience with disasters, medical conditions, type of clothing worn	Indoor and outdoor; urban and rural
Construction	Construction workers (including all construction trades: carpenter, electrician, heavy equipment operator, ironworker, laborer, mason, plasterer, plumber, pipefitter, sheet metal worker, and welder), day-laborers	Mental stress	Mental stress, cardiovascular disease, headaches, depression, stress,	Work practices, work/rest cycles	Age, medical conditions, previous experience, mental health	Indoor and outdoor; urban and rural
		EXTREME AMBIENT TEMPERATURES				
Transportation	Truck drivers, public transportation operators, hazardous waste material transport drivers, construction drivers, public transportation systems (e.g., rail workers, mass-transit system workers)	Heat stress/ stroke, decreased chemical tolerance, cold stress	Heat stress (dehydration, heat rash, heat cramps, heat exhaustion, heat fatigue, heat syncope/fainting, heat stroke), cardiovascular disease, fatigue, cold stress (frost bite, hypothermia, chilblains)	Work practices, work/rest cycles, access to water, access to AC/ heating in transportation, amount of time spent on route	Age, weight, degree of physical fitness, degree of acclimatization, metabolism, use of alcohol or drugs, medical conditions, prior heat injury, clothing worn	

Source: *Climate Change Vulnerability Assessment: A Report Assessing How Climate Change Will Impact Worker Health and How to Prepare for These Impacts.* National Clearinghouse for Worker Health and Safety Training, 2015.

Industry	Affected Population	New Hazards/ Vulnerabilities	Occupational Health Effects	Work Related Factors	Individual Factors	Locations Most Affected
VECTOR-BORNE DISEASES AND EXPANDED HABITATS						
Construction	Construction workers (including all construction trades: carpenter, electrician, heavy equipment operator, ironworker, laborer, mason, plasterer, plumber, pipefitter, sheet metal worker, and welder), day-laborers	Increase and changed pathogens, increase in plant allergens, increase/ changed insect distribution (taking into consideration changing weather and season pattern, pollen season)	Vector-borne infections caused by insects (e.g., mosquitos and ticks), allergies/ asthma, dermatitis, infectious disease	Work practices	Age, weight, degree of physical fitness, medical conditions, clothing worn, use of insecticides, medication used	Mostly outdoor; mostly rural
INDUSTRIAL TRANSITIONS AND EMERGING INDUSTRIES						
Construction	Construction workers (including all construction trades: carpenter, electrician, heavy equipment operator, ironworker, laborer, mason, plasterer, plumber, pipefitter, sheet metal worker, and welder), day-laborers	Job security/ new hazard scenario	Musculoskeletal disorders, mental stress, cardiovascular disease, unknown disease	Work practices, work/rest cycles, protective gear	Age, medical conditions, degree of physical fitness, socio-economic factors, medical conditions, PPE	Indoor and outdoor; urban and rural

Source: *Climate Change Vulnerability Assessment: A Report Assessing How Climate Change Will Impact Worker Health and How to Prepare for These Impacts*. National Clearinghouse for Worker Health and Safety Training, 2015.

+ Who's Most at Risk?

- At risk workers are those who spend a majority or large portion of work hours outdoors in rural or urban environments, vehicles or facilities that are not fully protected from weather conditions

  - Indoor unconditioned spaces, indoor confined spaces, outdoor urban spaces, outdoor natural areas, outdoor suburban areas, in vehicles or with heavy equipment

  - Transportation maintenance crews, public health workers, natural resources field staff, park rangers, landscape maintenance staff, state police, and communications and emergency personnel

Adapting to Climate Change

- **Delaware has already taken important actions**
  - Executive Order 41: *Preparing Delaware for Emerging Climate Impacts and Seizing Economic Opportunities from Reducing Emissions*
  - *Climate Framework for Delaware*
  - *Delaware Climate Change Impact Assessment*
  - Strategic Opportunity Fund for Adaptation
    - Climate Mitigation and Adaptation Planning Project
    - Environmental Public Health Tracking Network
    - **Climate-Ready Workforce Pilot Project**
    - Others…

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Project Overview

+ Purpose and Team

- Purpose
  - Review and evaluate current state agency policies and practices that guide health and safety of state at-risk workers
  - Conduct outreach including to at-risk state workers to identify opportunities to improve current policies and practices
  - Recommend good practices for supporting worker health and safety and reducing climate change risks

- Team
  - Inter-agency effort among five State agencies – DelDOT, DHSS, DNREC, DSHS, OMB
  - Consultants – Four Twenty Seven, MDB

Methods

Policy Analysis

- Review relevant health and safety policies
- Categorize as a gap or good practice
- Identify opportunities to better account for worker health and safety under changing climate conditions

Key Informant Interviews

- Interviews with 11 staff responsible for defining or implementing health and safety policies and procedures
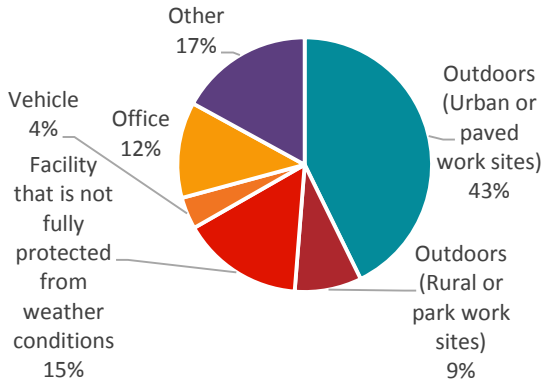- At least one key informant per agency

Surveys

- Targeted to obtain broad range of feedback from staff across participating agencies
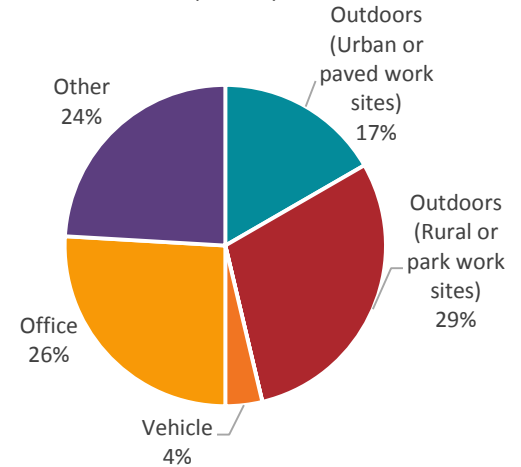- Online and paper surveys, 792 respondents

+ Findings and Recommendations

How would you describe the environment in which you spend the majority of your work day?
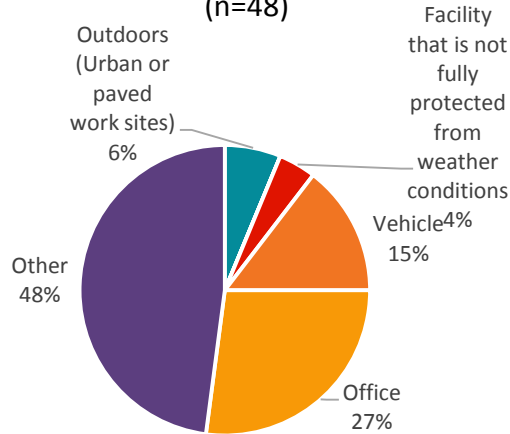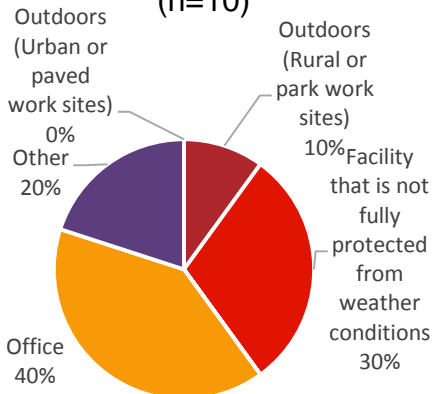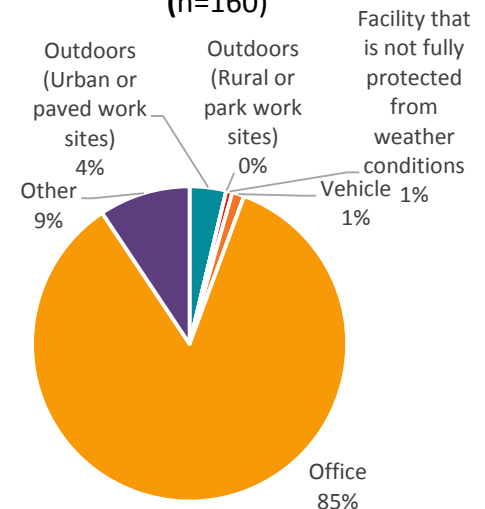

DelDOT (n=517)
- Outdoors (Urban or paved work sites) 43%
- Outdoors (Rural or park work sites) 9%
- Facility that is not fully protected from weather conditions 15%
- Vehicle 4%
- Office 12%
- Other 17%

DNREC (n=54)
- Outdoors (Urban or paved work sites) 17%
- Outdoors (Rural or park work sites) 29%
- Vehicle 4%
- Office 26%
- Other 24%

OMB (n=48)
- Outdoors (Urban or paved work sites) 6%
- Facility that is not fully protected from weather conditions 4%
- Vehicle 15%
- Office 27%
- Other 48%

DSHS (n=10)
- Outdoors (Urban or paved work sites) 0%
- Outdoors (Rural or park work sites) 10%
- Facility that is not fully protected from weather conditions 30%
- Office 40%
- Other 20%

DHSS (n=160)
- Outdoors (Urban or paved work sites) 4%
- Outdoors (Rural or park work sites) 0%
- Facility that is not fully protected from weather conditions 1%
- Vehicle 1%
- Office 85%
- Other 9%
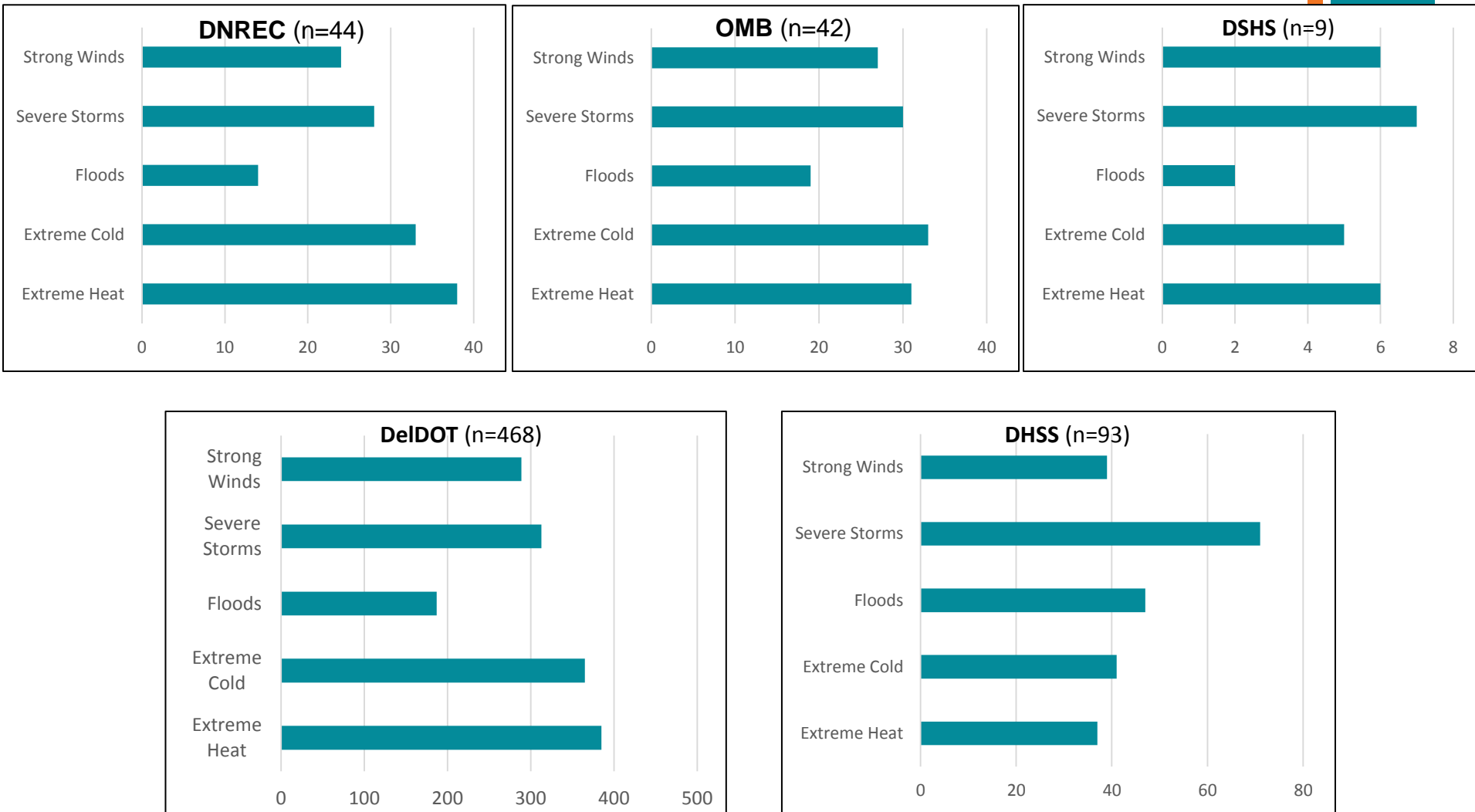
What Types of Weather Conditions are of Greatest Concern?

Key Findings – Cross-agency

Policy Guidance	Roles and Responsibilities	Communications and Training	Implementation and Enforcement	Program Evaluation and Improvement
Some agencies' policies defined roles and responsibilities and detailed required protective measures. 66.5% of survey respondents were aware of agency health and safety policies.	Survey respondents consistently rated supervisory leadership highly. Many supervisors play a key role in informing workers about agency safety and health policies. Most agencies emphasize the role of division leadership and frontline supervisors in implementing safety and health programs, allowing for better site-specific policy application.	Communications and alerts regarding severe weather events vary by agency. ~60% of survey respondents reported having been notified when extreme heat, cold, and other severe weather conditions required precautionary actions.	Systems should be in place to ensure: managers and supervisors are accountable for implementing required policies and procedures, and mandatory and awareness training is provided to ensure workers know what is required of them. Effective implementation of policies requires an action plan with personnel assigned to action steps on a detailed timeline.	Managers have the responsibility to customize, write, and implement health and safety policies for their staff as they deem necessary. Respondents generally found upper management to be supportive of these efforts. Agencies need systems to review and update policies.

+ Opportunities to Build Resilience

Policy Guidance

- Develop detailed agency occupational safety and health policies in recognition of the higher occurrence of extreme weather events. Policies should address:
  - Thermal stress, working in hot and cold environments,
  - Include detailed procedures, and
  - Describe employer provided equipment and clothing, hydration, recognition of signs and symptoms of health effects, first aid procedures, and mandatory training and communications.

- Use and reference relevant national and industry guidelines and standards in developing the above polices

Opportunities to Build Resilience

Policy Guidance

- Require development of Emergency Action Plans that address development of site-specific emergency and disaster plans
  - Floods
  - Oher extreme weather events
  - Air pollution
  - Mental health impact of exposure to traumatic events
  - Fatigue

- Develop policies, procedures, information, and training on biological exposures certain filed employees are likely to encounter such as Lyme Disease, Zika, Histoplasmosis, and mold.

+ Opportunities to Build Resilience

Roles and Responsibilities

- Ensure that policies clearly state that actors who are assigned responsibilities are adequately trained and have access to necessary resources.

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Opportunities to Build Resilience

Communications and Training

- Include training on the impacts of climate change and designate an individual to integrate the information into decision-making processes.

- Provide additional information and training such as factsheets with photos of potential threats (e.g., ticks) and training on hazard specific safety and health control programs.

- Create a regular schedule to update all staff about health and safety policies and procedures.

- Ensure that safety and health policies, standards and guidelines are posted in a visible and highly trafficked area, and that employees are aware of where they are posted.

Opportunities to Build Resilience

Implementation and Enforcement

- Establish systems for accountability to ensure programs are implemented, and timelines and responsibility are established for solving problems and updating policies and procedures.

- Promote monitoring and accountability by:
  - Tracking incidents, and
  - Ensuring staff are aware of and implement relevant health and safety policies and procedures.

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Opportunities to Build Resilience

Program Evaluation and Improvement

- Create a system of safety and health committees to provide an ongoing process for employee participation and management leadership.

- Create a regular schedule to review and update safety and health policies.

- Create a product evaluation committee and process that is charged with conducting risk evaluations and selection of protective clothing, PPE and equipment.

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