Byrd Polar & Climate Research Center | State Climate Office of Ohio

Building Climate Change Resilience in Columbus through University and Community Engagement

Aaron Wilson, Jason Cervenec, and Geoff Dipre

FRAMEWORK

STEPS TO RESILIENCE

Individuals, businesses, and communities can respond to the challenges of our changing climate. This framework can guide you through the process of planning and implementing resilience-building projects.

OVERVIEW ›

STEP 1: EXPLORE CLIMATE THREATS ›
STEP 2: ASSESS VULNERABILITY & RISKS ›
STEP 3: INVESTIGATE OPTIONS ›
STEP 4: PRIORITIZE ACTIONS ›
STEP 5: TAKE ACTION ›

Figure 1. Steps to Resilience. From U.S. Climate Resilience Toolkit provided by the National Oceanic and Atmospheric Administration. https://toolkit.climate.gov/#steps

- A Climate Change Action Plan Task Force was formed in autumn 2016 and charged with creating a document to outline specific actions the City of Columbus could take to address climate vulnerabilities identified in the 2016 report *Climate Change in Columbus Ohio*. (https://bpcrc.osu.edu/greenteam).

- The Task Force was charged with creating a document that includes both necessary actions that the city must take and aspirational actions that the city should take - realizing that the number of aspirational actions the city takes will depend on budgetary and staffing priorities - to make Columbus more climate resilient.

COLUMBUS CLIMATE CHANGE THREATS

Average Temperature

2.3°F
1951-2012

Average temperatures warmed by 2.3°F from 1951 through 2012, faster than the national and global rates. Models project this trend will continue, with temperatures rising approximately 3-5°F by mid-century.

SUMMER IN THE CITY

CLIMATE CENTRAL

SUMMER HEAT IN

Columbus

UP TO
24.0° HOTTER IN THE CITY THAN IN NEARBY RURAL AREAS

AVERAGE
4.4° CITY SUMMERS ARE HOTTER THAN IN RURAL AREAS

16 MORE DAYS ABOVE 90° F EACH YEAR, THAN RURAL AREAS
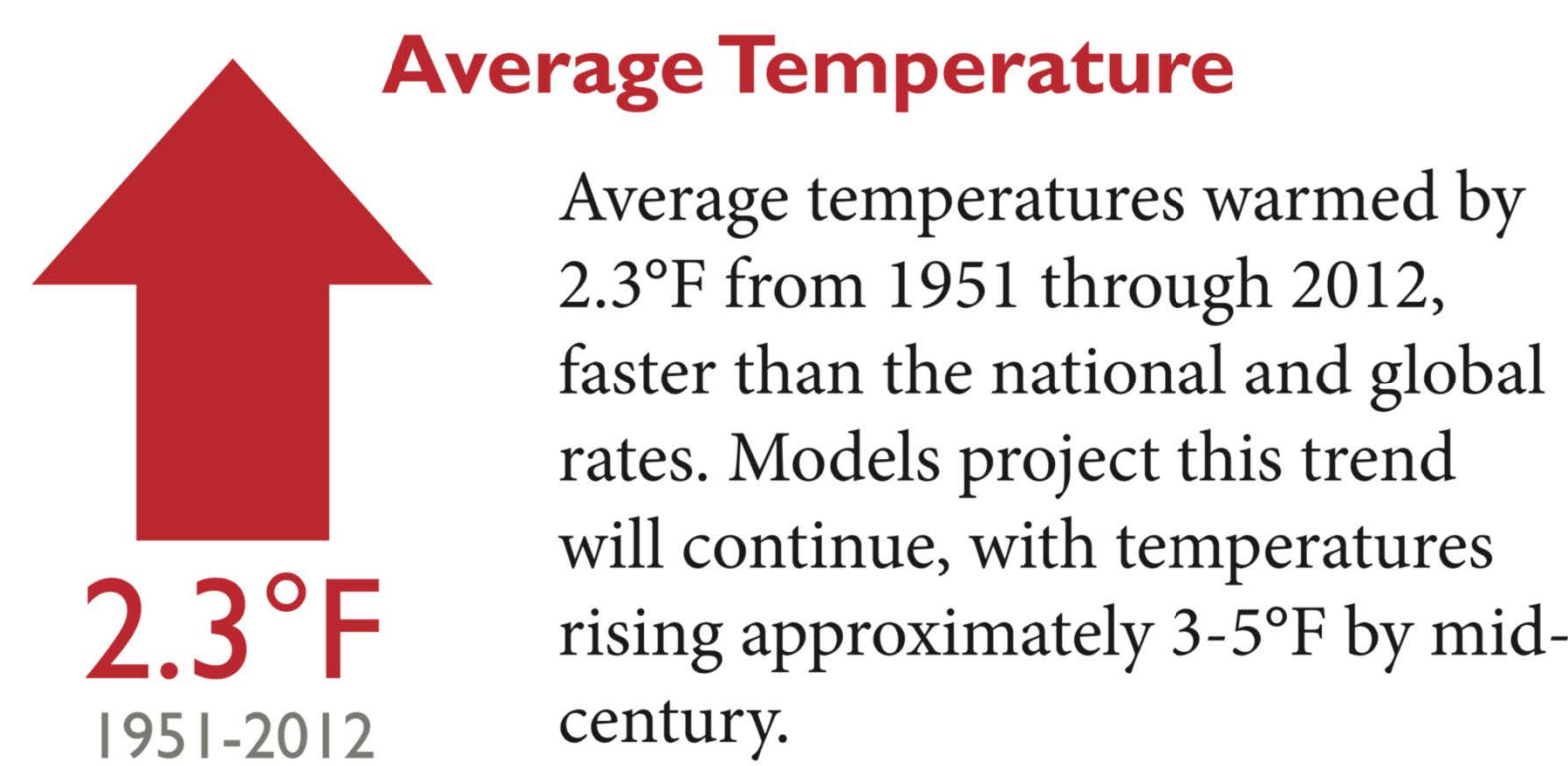
No.8 BIGGEST DIFFERENCE BETWEEN URBAN AND RURAL TEMPERATURES

Figure 2. Urban Heat Island in Columbus. http://climatecentral.org/news/urban-heat-islands-threaten-us-health-17919

How the Future Climate of Ohio Compares to Current Climates Elsewhere

2003 Winter
2030
2030
2095
2095 Summer

Source: Hayhoe and Wuebbles, modified

Heavy Precipitation

32%
1951-2012

Between the 1951-1980 and 1981-2010 periods, the number of very heavy precipitation events increased by 32%.

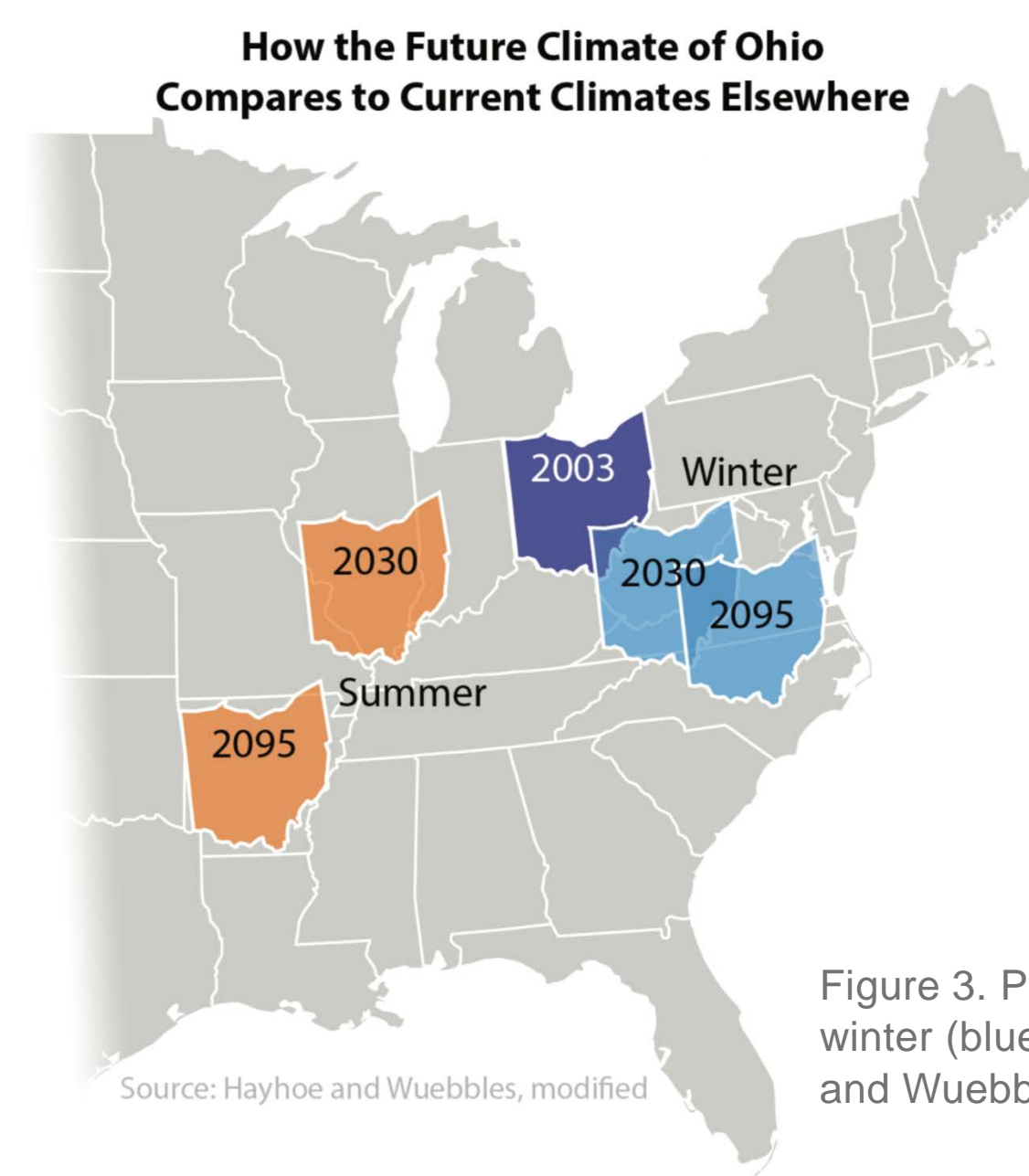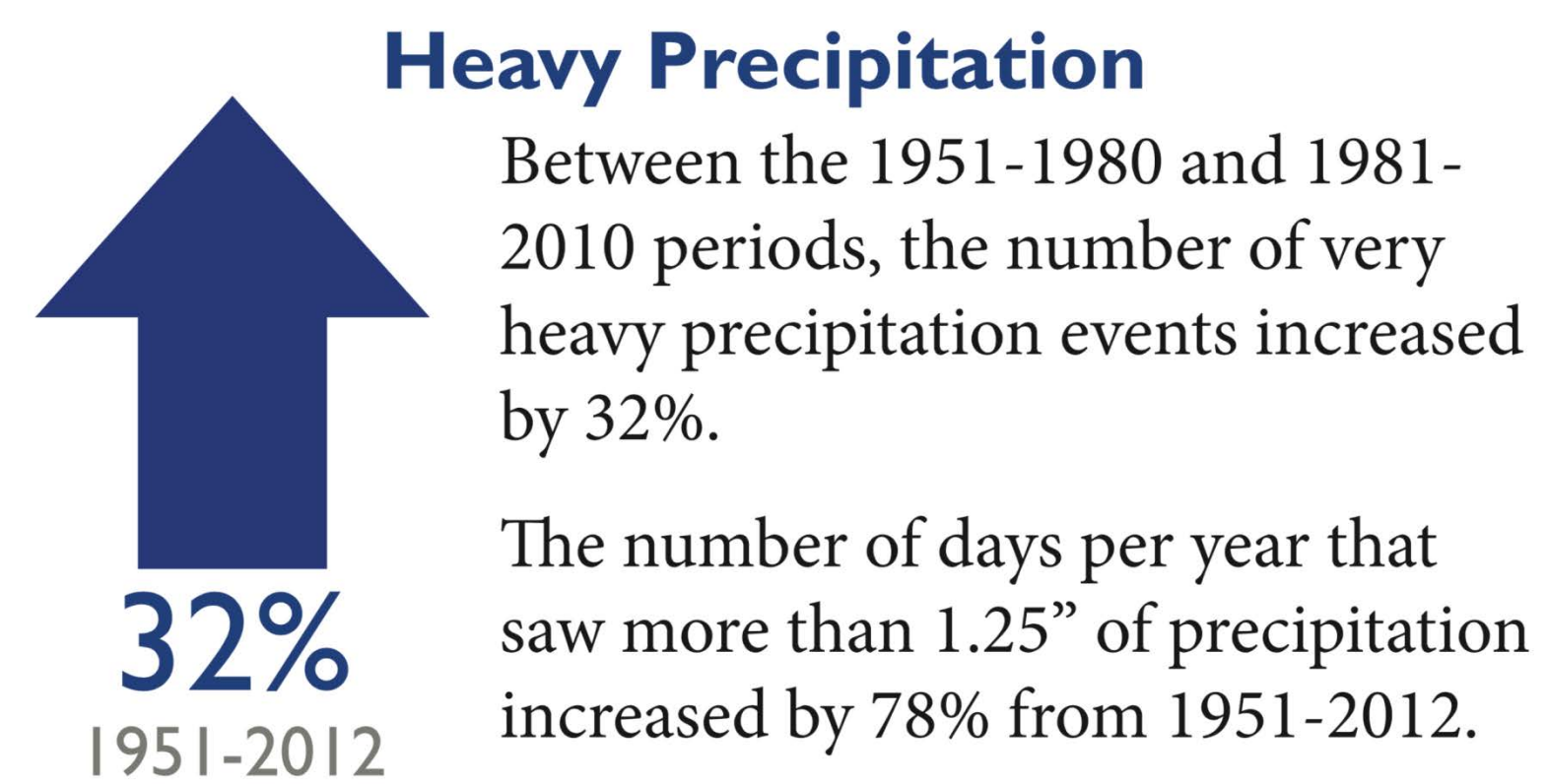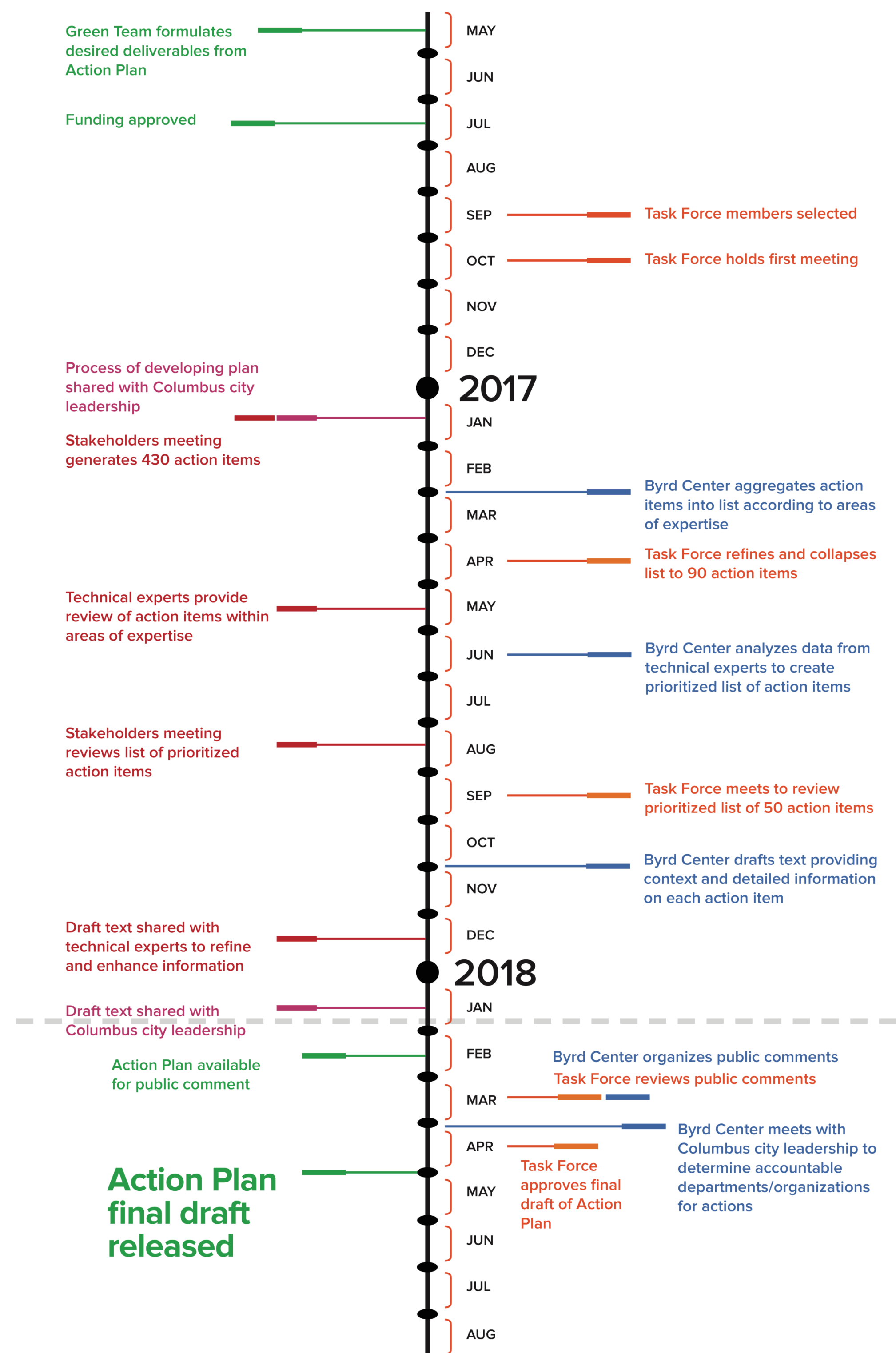The number of days per year that saw more than 1.25" of precipitation increased by 78% from 1951-2012.

Figure 3. Projected changes in Ohio summer (orange) and winter (blue) climate by mid- and late 21st century. Hayhoe and Wuebbles, modified.

TIMELINE

MAY — Green Team formulates desired deliverables from Action Plan
JUN
JUL — Funding approved
AUG
SEP — Task Force members selected
OCT — Task Force holds first meeting
NOV
DEC
2017
JAN — Process of developing plan shared with Columbus city leadership
FEB — Stakeholders meeting generates 430 action items
MAR — Byrd Center aggregates action items into list according to areas of expertise
APR — Task Force refines and collapses list to 90 action items
MAY — Technical experts provide review of action items within areas of expertise
JUN — Byrd Center analyzes data from technical experts to create prioritized list of action items
JUL
AUG — Stakeholders meeting reviews list of prioritized action items
SEP — Task Force meets to review prioritized list of 50 action items
OCT — Byrd Center drafts text providing context and detailed information on each action item
NOV
DEC — Draft text shared with technical experts to refine and enhance information
2018
JAN — Draft text shared with Columbus city leadership
FEB — Action Plan available for public comment / Byrd Center organizes public comments / Task Force reviews public comments
MAR
APR — Task Force approves final draft of Action Plan / Byrd Center meets with Columbus city leadership to determine accountable departments/organizations for actions
MAY — **Action Plan final draft released**
JUN
JUL
AUG

FURTHER ENGAGEMENT

- Public review period will be held in February 2018.

- Climate Action Plan will be released in April 2018 for utilization by the City of Columbus in addition to individuals, organizations, and businesses.

ACTION STATEMENTS

- Bold colors denote *Necessary* actions and light colors denote *Aspirational* actions.

Chapter	Action Statement
Extreme Heat	Establish a larger, better coordinate, and more responsive network of cooling centers and draft clear guidelines for network members
	Implement educational campaign, health advisories, and best practices for time spent outdoors in extreme heat
	Internalize climate resilience practices in city planning to reduce the urban heat island
	Provide programs to distribute fans, air conditioners, and water to vulnerable populations
Air Quality/Energy	Modernize electric grid for greater resiliency and more efficient distribution
	Implement program for individuals and businesses to reduce energy usage during peak demand
	Implement idling reduction educational campaign
	Implement educational campaign on energy audits and renewable energy to reduce emissions for residential and business users
	Increase investment in and/or purchase of renewable energy
	Increase number of air quality monitoring stations to provide baseline data and public educational opportunities
	Use data and best practices to adapt transportation modes and inform economics of transportation. (e.g., reduce single occupancy, lower polluting fuels, lower emissions vehicles, incentives or requirements to provide EV charging stations, expand transportation options and times to reduce overall transportation pollution)
Flooding	Adopt and enforce building codes to reduce localized flooding and basement/sewage backups
	Reduce impacts of storm-water runoff and promote green infrastructure in new development and redevelopment
	Develop emergency transportation plan that can be implemented during a flood
	Assess and ensure adequate transportation and logistics for critical resources
	Lobby state and federal government to implement policies that reduce erosion and runoff and promote infiltration
	Retrofit flood gates or backflow preventers on storm-water infrastructure
Water Quality	Understand the types of events, likelihood of occurrences, and ranges of severity that adversely impact drinking water quality
	Create long-term management plan for entire watershed serving Columbus that ensures sufficient drinking water
	Continue upgrades to water and sewage treatment infrastructure to reduce sewage contamination of waterways
	Implement educational campaign for individuals and businesses on proper treatment and use of contaminated drinking water
	Improve data collection to anticipate and respond to harmful algal blooms
	Continue upgrades to water and sewage treatment infrastructure to reduce harmful algal bloom toxins in drinking water
Water Use	Implement educational campaign to reduce water use
	Develop event-based water use criteria
	Update building code to require more efficient water use
	Improve efficiency of water use in city fountains, pools, splash pads, and ponds
	Create method of measuring and reporting water used from streams and rivers for irrigation
	Improve irrigation through changes in infrastructure and practices that more efficiently use water
Ecosystems	Implement educational campaign to promote holistic, long-term ecosystem health
	Promote sustainable landscaping practices for residential, commercial, and industrial properties
	Develop policies on application of fertilizers, herbicides, pesticides, and animal waste
	Collaborate with landscaping and fertilizer companies to improve products and their application
	Implement educational campaign for landowners to promote responsible use of fertilizers, herbicides, and pesticides
	Collaborate with organizations, agencies, and private landowners to identify and create additional green space, urban tree canopy, and urban farms
Emergency Preparedness	Use GIS to map fixed critical assets and vulnerable populations susceptible to environmental hazards
	Review interagency and city-wide training and response to environmental hazard emergencies
	Evaluate capacity to clean up, restore services, and care for citizens following environmental emergencies
	Track and communicate costs associated with preparing for and responding to environmental hazards
	Establish contingency contracts so that sufficient resources are available in case of environmental hazard emergencies
	Develop new app or integrate with existing app for environmental hazard alerts
	Create community health action teams for environmental hazards
	Implement educational campaign to inform the public about insurance and other shared risk programs available for environmental hazards
Vulnerable Populations	Identify representative advocacy organizations for diverse and vulnerable populations
	Facilitate cross-cultural dialogue, offer training for service providers, and share best practices
	Ensure diverse modes of communication during environmental hazard emergencies to reach diverse and vulnerable populations
	Implement educational campaign on environmental hazard preparedness to reach diverse and vulnerable populations
	Develop a public-private partnership to manage food and water access for vulnerable populations during environmental hazard emergencies
	Require disclosure of known property problems for sale or rental of property
	Require or incentivize monthly utility costs for rental properties are reported to potential tenants