October 28, 2020

Resilience & Adaptation Team (R&AT) Climate Action Initiatives

1. Create state adaptation funding

Establish and fund adaptation and resiliency financing mechanisms:

1) A cost share grant program for local units of government (LUGs) to use for assessment, planning, and design of resilient infrastructure and critical facilities; habitat protection; acquiring easements in vulnerable areas; and agricultural resilience.

2) Public Facilities Authority (PFA) administered bond funding for grants and loans to LGUs to use for resilient infrastructure projects such as waste water, storm water and water supply and other critical facilities.

3) Develop guidelines/criteria for resilient projects receiving resilience funding including ways to prioritize the needs of vulnerable populations

Adaptation funding is essential to build state and local capacity for climate resilience. Adaptation projects such as vulnerability assessments, climate adaptation planning, and the planning and design of resilient infrastructure projects are not eligible for bond funding. Water quantity projects do not qualify for bond funding under current statutory authority. Separate adaptation funding will provide necessary resources for increasing resiliency.

2. Fund U of M to produce high-resolution, dynamically-downscaled climate projections for Minnesota

Minnesota's agencies, communities, and organizations desperately need high-resolution climate projections, continuous through the century, for sound planning and implementation of projects and adaptation strategies that maintain and protect our natural environment, built infrastructure, economy, and health. These data have applications in virtually all sectors, and have been requested heavily since the early 2010s. *Please note*: projections at lower resolution and at discontinuous time "slices" are currently available through the U of M, but do not meet the needs of the state and should be viewed as an intermediate step. **(See chart on last page)**

October 28, 2020

Resilience & Adaptation Team (R&AT) Climate Action Initiatives

3. Create credit system to incentivize ecosystem-based green infrastructure and natural stormwater management

Create an NPDES permit credit system to provide storm water credits for natural lands restoration near residential areas and new developments, and support native ecosystem-based green infrastructure in urban areas/communities/population centers to restore lost habitat, control flooding, implement county conservation plans, and provide benefits to vulnerable populations. Implementation should be equitably dispersed across the urban environment to address public health and social equity.

4. Develop vulnerable populations climate data tools

Link MDH climate & health data profiles and research tools with DNR climate tools, and expand the MDH pilot program that provides extreme heat and flooding regional and county data about vulnerable populations to include climate and health data on air pollution, vector borne disease, and other climate hazards that place vulnerable population at higher risk. Funding should be provided to expand local capacity in implementing adaptation strategies to increase resiliency.

5. Increase building resiliency

Research the ability to increase resiliency of Minnesota's buildings to address extreme precipitation, urban heat islands, and other climate change impacts - especially in multi-family housing upgrades and resiliency improvements for under-resourced communities.

October 28, 2020

Resilience & Adaptation Team (R&AT) Climate Action Initiatives

6. Create a state inventory of water storage opportunities in agricultural landscapes

Inventory opportunities for on-farm and off-farm temporary storage using landscape mapping (through tools such as LiDAR), and to identify potential water storage areas. On-farm or off-farm storage includes storage basins, water capture and reuse, wetlands, drainage water management/controlled drainage, saturated buffers, two-stage ditches, and conservation practices that improve soil health and soil water holding capacity.

7. Launch Climate Change, Impacts, and Adaptation website

Create an engaging, centralized, agency-neutral website that provides public access to climate change observations, projections, impacts, and adaptation strategies specific to the state's resources and assets. Website to include customizable summaries, data sets, graphics and analyses of Minnesota's ***observed*** climate trends and ***projected*** climatic conditions through 2099. Aimed at general public, policy/decision-makers, and practitioners. Successful websites to model are Cal-Adapt (https://cal-adapt.org/); Washington (State) Climate Impacts Group (https://cig.uw.edu/); and National Climate Assessment (https://nca2018.globalchange.gov/).

October 28, 2020

Climate projections, e.g., Minnesota's future climate(s)

Relation to LiDAR: None directly, though LiDAR layers could be used in conjunction with climate data to aid decision-making and planning.
Relation to Atlas 14: None.

Color key: white cells = insufficient; *light gray cells and italic letters = better/intermediate;* dark gray = best

	What MN has had available to date	What is becoming available	What MN needs
Model type (downscaling)	Statistical	Physical/Dynamical	Physical/Dynamical
Geographic specificity	National coverage	MN only	MN or local region only
Coverage of Minnesota	100%	*99.x% (small parts of extreme north missing)*	100%
Resolution of physical processes	N/A (statistical models do not resolve physical processes)	*10-km scale: resolves some weather, but not individual thunderstorms*	4-km (quarter township): resolves most "mesoscale" weather including thunderstorms
Purpose for creation of datasets	*Develop national standardized data*	*Aid agricultural, pest, and water-valuation research projects in MN*	Specifically to produce best possible climate scenario data for Minnesota
Time coverage	Continuous through 2099	Two slices: 2040-59, 2080-99	Continuous through 2099
Time units of analysis	Monthly	*Monthly, seasonal, annual, by time slice*	Hourly, daily, monthly, seasonal, annual, multi-annual for any desired time period
Available variables:	Pre-determined: temperature, precipitation, counts of days above thresholds	*Predetermined by parent research projects, and secondarily by DNR budget: Temp, precipitation for sure;* *Possibly snow depth, evapotranspiration, solar radiation, soil moisture*	User-determined beforehand: temperature, precipitation, snowfall, snow depth, relative humidity, evapotranspiration, runoff, soil moisture, heat index, wind chill, wind speed, thunderstorm frequency, severe weather parameters, metrics of extremes, anything requested by user and deemed feasible