Climate Change Leadership Academy

Upper Valley Adaptation Workgroup and Vital Communities

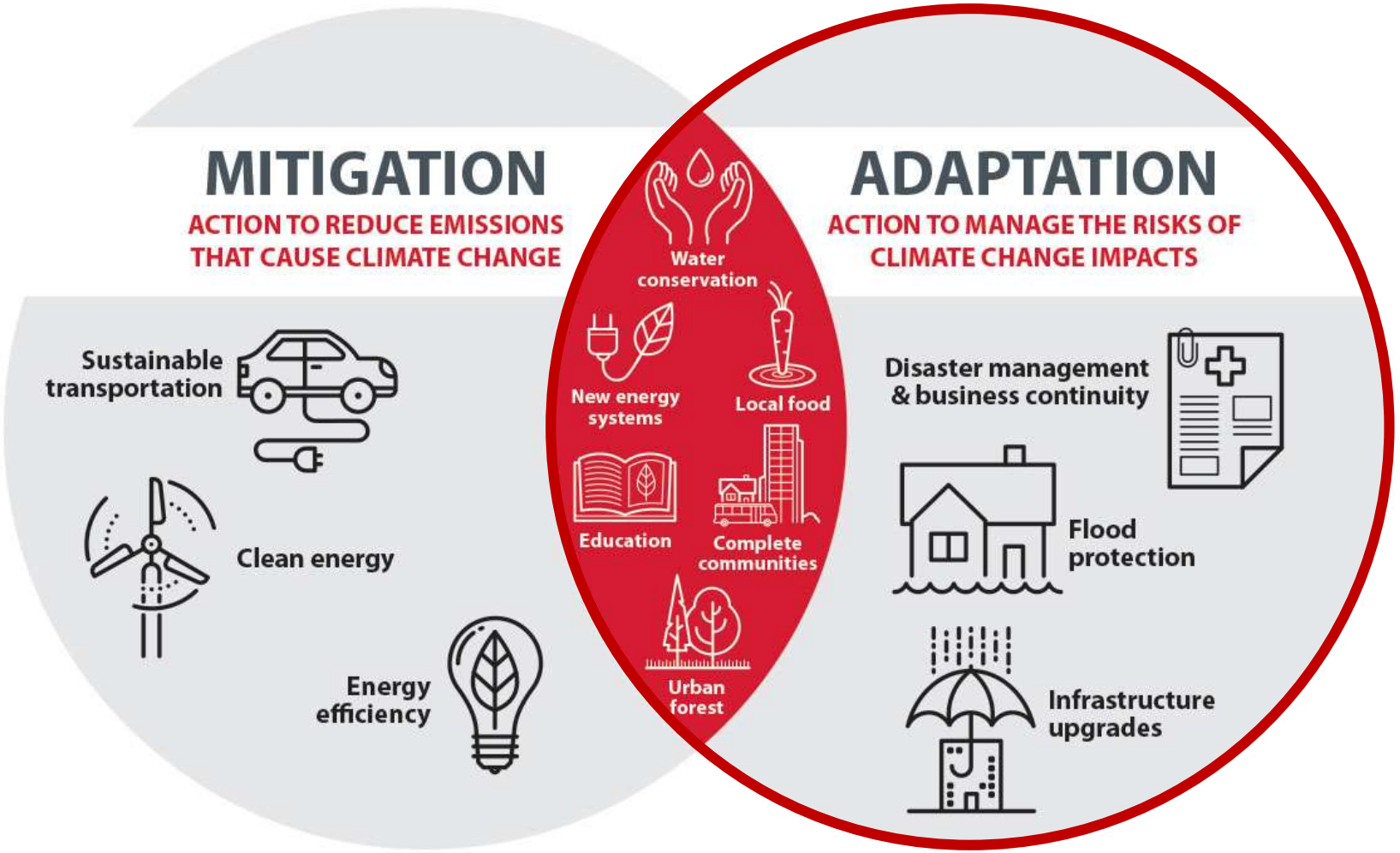
Adaptation

January 8, 2020

Sherry Godlewski
Resilience and Adaptation Manager
NH Department of Environmental Services

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Building Climate Resilience



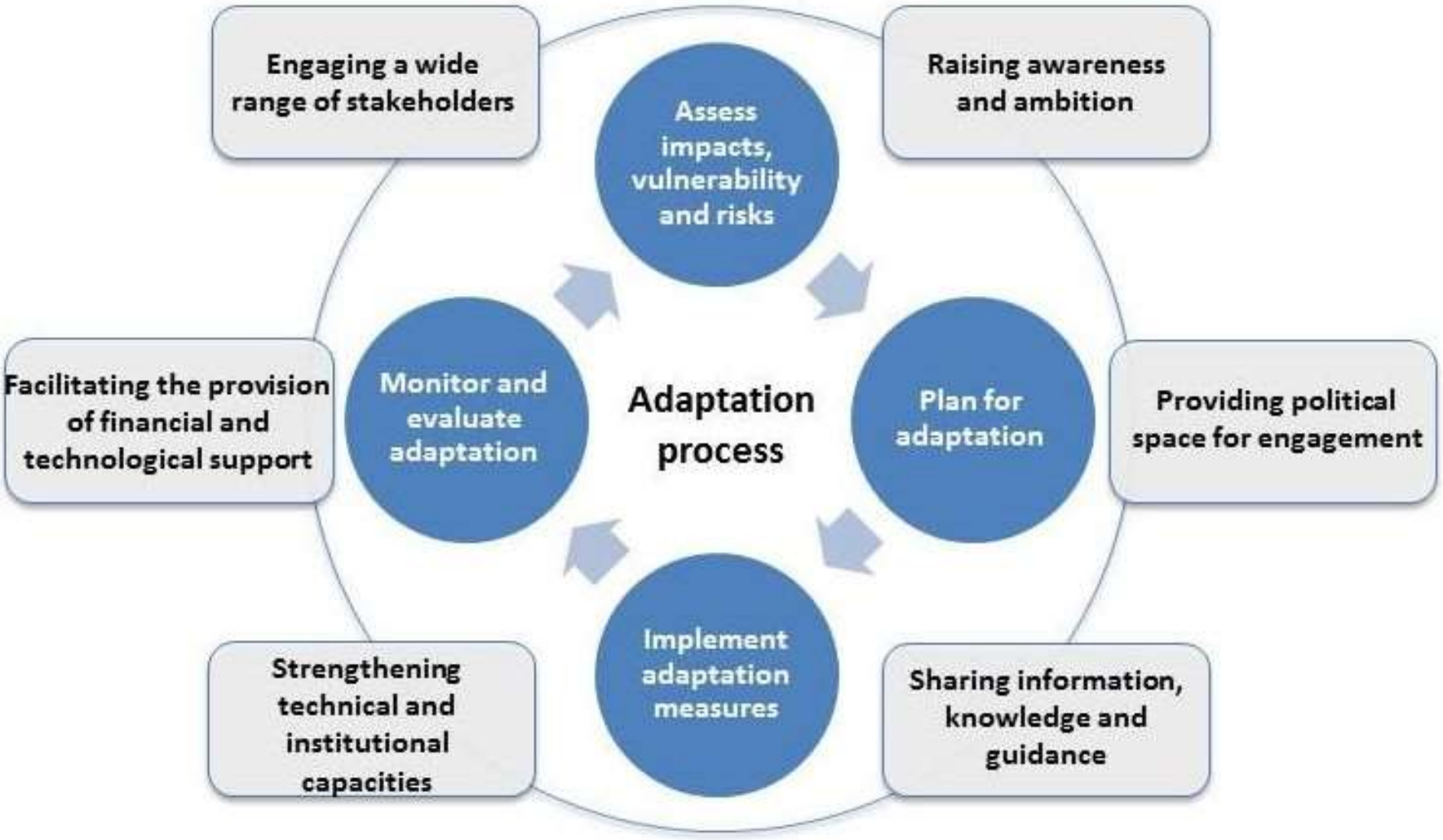
https://www.calgary.ca/UEP/ESM/Pages/Energy-Savings/Climate-Change.aspx?redirect=/climateprogram

Mitigation = reducing our emissions; reducing the impacts

Adaptation = social + ecological changes to reduce vulnerability from impacts

Resilience = the capability of social + natural systems to respond + recover

The Adaptation Cycle



https://unfccc.int

What are our Adaptation Choices?

Do nothing – Continue with business as usual

Adaptation Choices to Protect from Flooding

"Protect and fortify" built infrastructure

Adaptation Choices for Flooding

"Accommodate" using natural systems (buffers & wetlands) and alternative construction techniques

Adaptation Choices for Flooding

"Retreat" by relocating or removing built infrastructure from highly vulnerable areas and those damaged repeatedly

National Adaptation Example

Executive Order 13690 (Obama) January 30, 2015 (Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input). Use a resilience standard based on both the vertical elevation and the horizontal extent of the floodplain for federally funded projects

Executive Order 13807 (Trump) August 15, 2017 (Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure) stream line permitting + environmental review, speak as one federal voice

Section 6. Executive Order 13690 of January 30, 2015 (Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input), **is revoked**.

On the bright side, HUD still required that new construction/substantial improvements be built to the federal flood risk management standard (at least 2' above base flood elevation; 3' for critical facilities) for projects that received funding after Hurricane Harvey, Irma, and Maria.

National Adaptation Example

Executive Order 13693 (Obama) March 2015 'Planning for Federal Sustainability in the Next Decade' is to maintain Federal leadership in sustainability and greenhouse gas emission reductions. Building efficiency, infrastructure, water use, fleet vehicles…

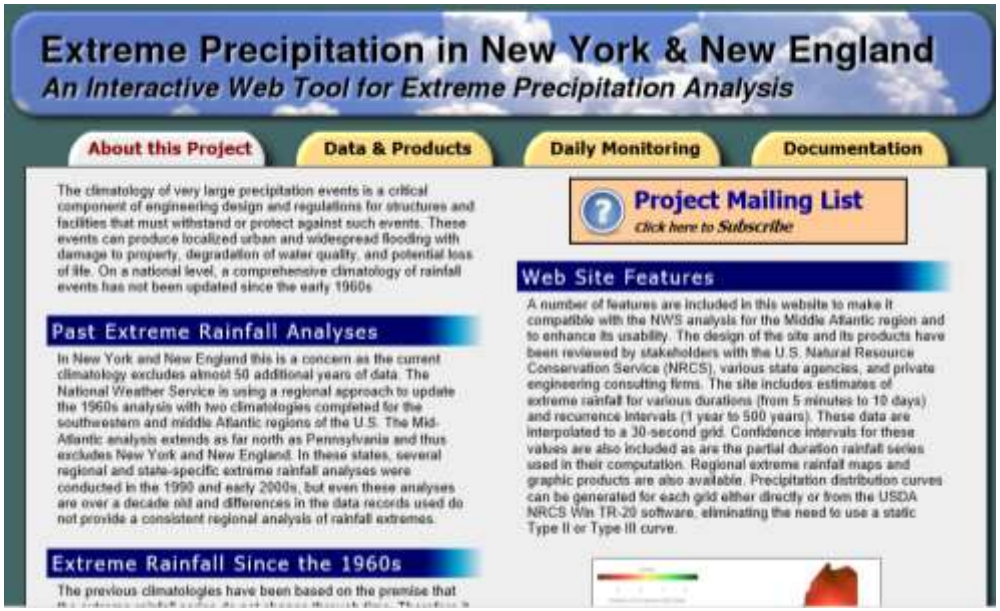
Executive Order 13834 (Trump) May 2018 'Efficient Federal Operations' Affirms "that agencies shall meet such statutory requirements in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment."

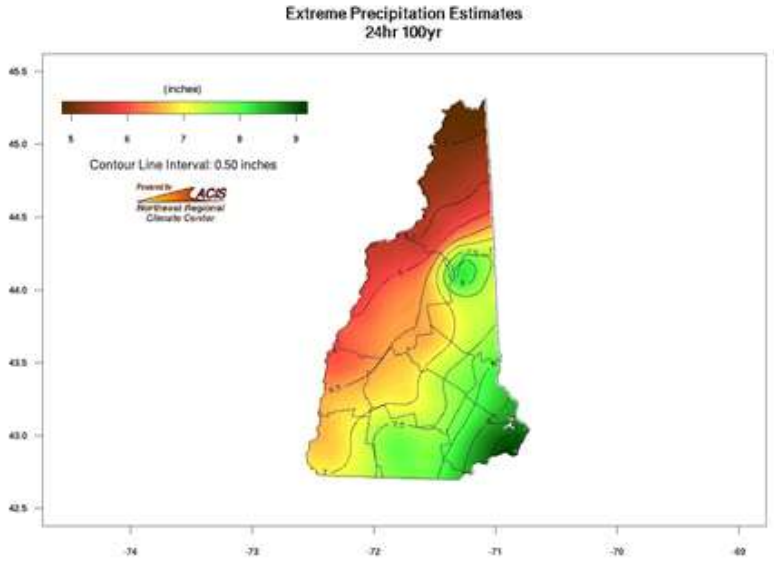
Section 8. Executive Order 13693 of 19 March 2015 (Planning for Federal Sustainability in the Next Decade), **is revoked**.

NH State Adaptation Examples

NH Alteration of Terrain Program

Permit requires rainfall amount be obtained from the Northeast Regional Climate Center; include extreme precipitation table… (2012)



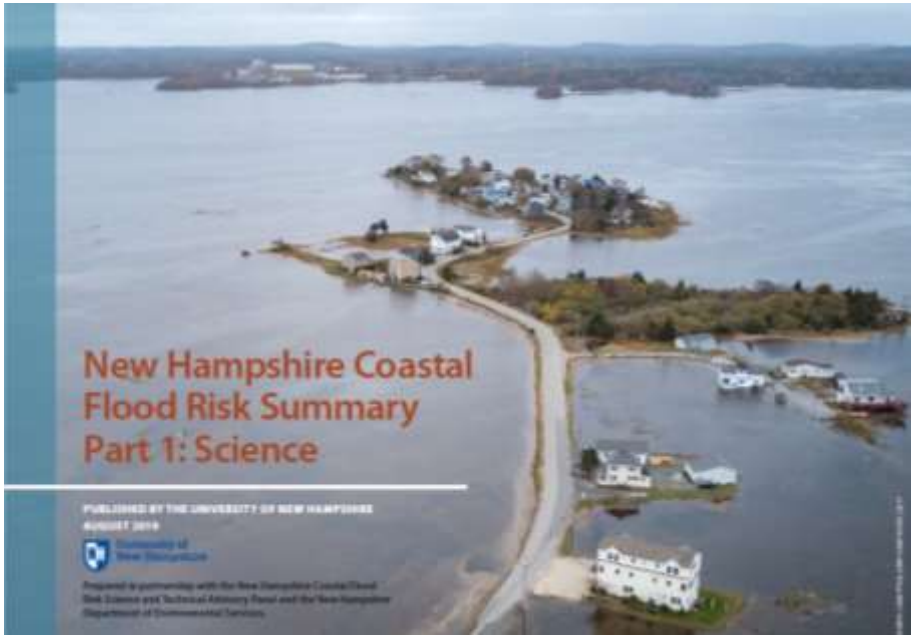


http://precip.eas.cornell.edu/

NH State Adaptation Examples

Chaptered Law 121/SB 374/RSA 483-B:22 (2016)
AN ACT requiring the department of environmental services to update coastal flooding trends every 5 years

2019 Update
1. Updated sea level rise scenarios
2. Storm surge and tidal currents
3. Extreme precipitation
4. Groundwater Rise
5. Freshwater flooding



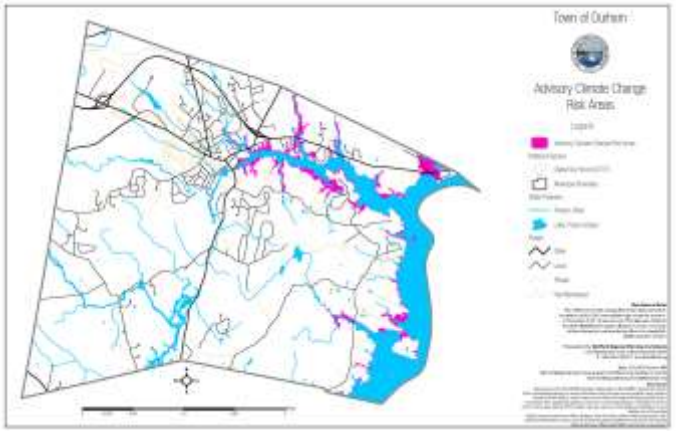
NHDES Wetlands Rules and Alteration of Terrain Permits
- Require consideration of these data for coastal projects

Community Adaptation Examples

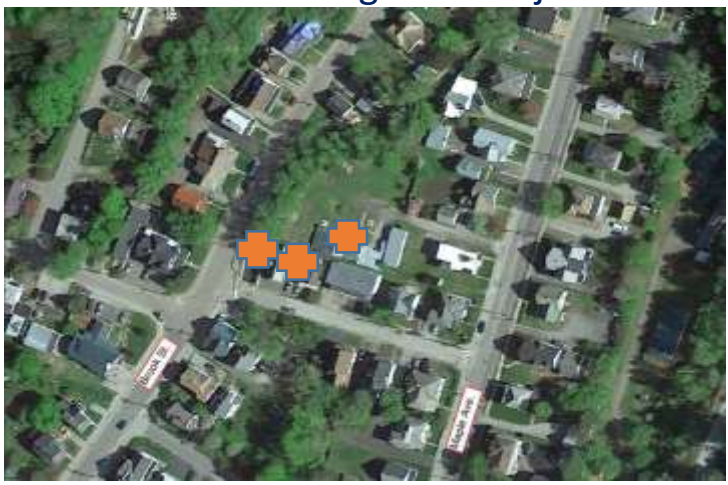
- Climate change chapters in Master Plans
- Climate change in Hazard Mitigation Plans
- Freeboard requirements
- Extended flood hazard overlay districts
- Shoreline stabilization approaches
- Stormwater management BMPs
- Culvert replacement
- Road construction and maintenance
- National Flood Insurance Program Community Rating System (CRS)
- Buyouts - VT after Irene

- Wastewater engineering
- Solid and hazardous waste management
- On the ground projects that incorporate future conditions
- **Educational Events**

Town of Durham, NH: Coastal Flood Hazard Overlay District



City of Barre, VT: Buy-outs + Flood Mitigation Project



Culvert Replacement
Barrington, NH

Personal Adaptation Examples

- ✓ Pay attention to storm warnings; act accordingly
- ✓ Have a personal/family preparedness plan (include your pets!)

- ✓ Be prepared to be without electricity (keep jugs for water, non perishable food & batteries on hand)
- ✓ Be aware of others dependent on electricity for health reasons (i.e. oxygen)

- ✓ Check your home and property for adequate drainage to prevent washouts
- ✓ Maintain driveways, culverts & storm drains; move things out of areas that flood

- ✓ Remove large trees that could damage structures

Personal Adaptation Examples

- ✓ Do regular tick checks & be aware of signs of Lyme Disease (& other vector borne illnesses); pets & people

- ✓ Use rain barrels/rain gardens
- ✓ Purchase heat pumps/mini splits for heating & cooling

- ✓ Purchase drapes for large windows – keeps heat in; keeps sun out
- ✓ Evaluate whether you need to purchase a generator for periods of no electricity
- ✓ Participate in community conversations to support preparedness in your town

- ✓ Vote for local initiatives including increased efficiency in municipal buildings, culvert maintenance, tree removal etc…

One Size Does Not Fit All

- Different needs for each community
- Different types of environments
  - Valley prone to flooding
  - Steep slopes
  - Low lying areas
  - Rural vs. Urban
- Different areas of concern
- Different community demographics
- Different capacity
  (paid staff vs. volunteer boards)

Solutions must:

- Be rooted in local knowledge
- Respond to local needs/concerns
- Reflect local culture and values
- Include equity
- Consider vulnerable populations

Natural Hazard Mitigation Saves



Natural Hazard Mitigation Provides the Nation $6 in Benefit for Every $1 Invested

National Benefit-Cost Ratio (BCR) Per Peril *BCR numbers in this study have been rounded	Beyond Code Requirements	Federally Funded
Overall Hazard Benefit-Cost Ratio	$4:1	$6:1
Riverine Flood	$5:1	$7:1
Hurricane Surge	$7:1	Too few grants
Wind	$5:1	$5:1
Earthquake	$4:1	$3:1
Wildland-Urban Interface Fire	$4:1	$3:1

Interim Study quantified a number of benefits from mitigation, including reductions in:

- Future deaths, non-fatal injuries + PTSD
- Repair costs for damaged buildings
- Sheltering costs for displaced households
- Loss of revenue for businesses
- Loss of economic activity
- Loss of service to the community when emergency services + buildings are damaged
- Insurance costs
- Costs for urban search + rescue

2018 National Institute of Building Science https://www.nibs.org/

High Level Summary

- Seek co-benefits [adaptation and mitigation]
- Adaptation now, saves money in the future
- Adaptation + Mitigation = Resilience

Challenges

- Very local | no one size fits all
- No established adaptation metrics | evaluation criteria
- Need financial support | funding
- Regulate requirements?
- Political Support

Sherry Godlewski
Sherry.Godlewski@des.nh.gov
603.271.6801