DRINKING WATER RESOURCES PROTECTION: GROUNDWATER RISE & SALTWATER INTRUSION

LOCATIONS:

- Coastal Communities
- Freshwater
- Shorelands
- Tidal Waters
- Surface Waters
- Flood Zones
- Inland Communities
- Groundwater Resources
- Projected Sea-Level Rise Impacted Areas
- Entire Community
- Coastal Zone Designated Communities
- Locally Designated Areas and Districts

REGULATION OPTIONS:

1. Groundwater Protection
2. Surface Water Buffer Protection
3. Groundwater Rise & Saltwater Intrusion*

* Denotes current section

COMMUNITY GOAL REGULATIONS:

- Open Space Protection
- Flood Protection
- Drinking Water Protection
- Environmental Protection
- Stormwater Management
- Water Quality Protection
- Infrastructure Protection
- Economic Development
- Recreation Options
- Transportation Enhancement
- Historic and Cultural Preservation
- Community Design & Aesthetics
- Community Equity

WHY ADOPT THESE REGULATIONS?

- Increase protection of groundwater resources.
- Establish legal justification for enacting provisions for standards to deal with groundwater rise impacts as best practices and modeling predictions are refined.

BACKGROUND & PURPOSE

As municipalities in Southern New Hampshire and the Seacoast continue to experience development pressures, it will be important for communities to take necessary steps, which may include regulating certain land uses which could contribute pollutants to designated wells or local aquifers, to ensure long-term access to safe and clean drinking water for existing and future citizens.

REGULATION LANGUAGE

Step 1: Conduct a groundwater modeling study to delineate boundaries for a Groundwater Rise Overlay District. Utilize existing groundwater models where possible.

Step 2: Develop language for the **Groundwater Rise Overlay District**.

MODEL LANGUAGE

NOTES AND EXPLANATIONS

I. PURPOSE[1]

- It is no longer prudent to rely upon historic environmental conditions as the basis for planning, design, and permitting. Future projections based on climate science must be utilized to the maximum extent possible.
- To protect the quality and sustainability of current and future water supplies.
- To identify and prioritize road and underground infrastructure that is vulnerable to premature failure and increased maintenance and repair costs from rising groundwater.
- To identify communities vulnerable to increased flooding (basements and septic systems) as groundwater rises.
- To ensure the protection of current and future wetland areas and preserve their functions for flood control, water quality improvement, and wildlife habitat.
- To reduce the impacts of rising groundwater on stormwater systems.
- To identify and reduce groundwater and surface-water quality impacts from rising groundwater and failing septic systems or the mobilization of hazardous wastes.

1. These are goals and objectives that a coastal community may wish to use to frame what they wish to accomplish with this type of regulation.

II. AUTHORITY[2]

- Governing body must adopt/approve/accept the projected relative sea level rise for coastal New Hampshire as referenced in the New Hampshire Coastal Flood Risk Summary Part 1: Science.

2. Before drafting any regulatory language, a community should follow these steps to ensure they have the legal authority to enact this regulation.

- Permitting authorities must require project proponents to follow the New Hampshire Coastal Flood Risk Part 2: Guidance including the guidance on the appropriate projections to use for the specific project, criticality and lifespan, and location.

II. APPLICABILITY[3]

- The provisions of the Groundwater Rise Zone Overlay District (GWRZOD) shall apply to the district boundaries, defined as the area titled "Groundwater Rise Zone." The GWRZOD is a zoning overlay district which imposes additional requirements and restrictions to those of the underlying district. In all cases, the more restrictive requirement(s) shall apply.
- Groundwater Rise Zone –The GWRZ is the area where groundwater rise caused by sea level rise will occur. The magnitude of groundwater rise varies with distance from the coast, geological features, and anthropogenic conditions. The GWRZ will mark the inland-most boundary of the overlay district or can mark the inland boundary of a particular level of groundwater rise, i.e., 1 foot, 2 feet, 3 feet, etc. within the overlay district. Due to the complexities inherent in groundwater modeling and evaluation, a hydrogeologist will be required to run the groundwater model for various sea-level rise scenarios or to interpret model results.
- Groundwater modeling should be done at a scale appropriate for the scale of the projects under consideration.

3. Similar to other environmental overlay districts that are adopted through the innovative land use techniques, this overlay would apply to the existing underlining zoning to require additional provisions to protect drinking water supplies from groundwater intrusion as a result from sea level rise..

WHERE DO THESE REGULATIONS GO?

The regulation language offered in this model is intended to be incorporated into a town or city's Groundwater Rise Overlay District.

HOW TO ADOPT THESE REGULATIONS

The planning board is responsible for preparing and, in towns, holding public hearings on proposals to adopt or revise the zoning ordinance. RSA 674:1 outlines the duties of the planning board. RSA 674:1, V states that the Planning Board "may, from time to time, recommend to the local legislative body amendments of the zoning ordinance…."

In towns, a zoning ordinance or revision of the ordinance must then be adopted by ballot vote at Town Meeting

In cities and town council towns where the municipal charter determines how a zoning ordinance is to be adopted or revised, a public hearing is still required for all zoning ordinances and amendments

SUGGESTED SUPPLEMENTARY INFORMATION AND RESOURCES TO COMPLEMENT THESE REGULATIONS:

Recommendation	Type	Details
Zoning Map with base zoning districts	Maps/GIS Data	Find in local Zoning Ordinance.
Wellhead Protection Areas/ Public Water Supply Wells	Maps/GIS Data	Available via NHDES or Regional Planning Commissions.
Parcel Map	Maps/GIS Data	Find via Municipal Tax Maps.
Groundwater Rise Zones	Maps/GIS Data	Accessible via the New Hampshire Sea-Level Rise, Storm Surge, and Groundwater Rise Mapper (Sea-Level Rise Mapper).
Zoning Administrator	Personnel	Interprets and administers the regulation.
Town Engineer	Personnel	Assists with performance standards (for communities that don't have a Town Engineer, an outside consultant could be required to review site plan applications on an as needed basis).
Conservation Commission	Volunteers	Reviews and comments on conditional uses.
Planning Board	Volunteers	Approves/denies site plan applications or conditional use permits within protection areas.

HOW DOES THIS RELATE TO OTHER TOPICS?

- References to the Master Plan
  - The need/desire to protect drinking water supplies

CASE STUDIES

- Sea-Level Rise Impacts on Drinking Water: A Groundwater Modeling Study in Newmarket, NH
- Sea-Level Rise Impacts on Groundwater and Water Quality Planning Study in Durham, NH

WHO HAS ADOPTED THESE REGULATIONS?

None in New Hampshire due to the need for additional research on the extent of impacts and establishment of best management practices.

ADDITIONAL RESOURCES AND REFERENCES

- New Hampshire Coastal Flood Risk Summary Part 1: Science
  https://scholars.unh.edu/cgi/viewcontent.cgi?article=1209&context=ersc

FUTURE INFORMATION NEEDS:

Additional information is needed on how best to structure the regulations. Below are some options that need further exploration:

- Performance Standards and Best Management Practices
  - Require that any development within the GWZ conduct a water quality study to determine if existing chloride levels meet water quality standards.
    - The Planning Board shall require that proposed developments with elevated chloride levels, which approach the EPA's 250 mg/L secondary standards (the point at which water can be expected to have a salty taste), tie into the municipal water service.
    - If municipal water service is unavailable, the applicant will be responsible for providing documentation on what pretreatment technologies will be used and periodic testing to ensure water quality goals are being met and the system is operating properly.
  - For existing developments within the GWZ:
    - Increase the rate of inspections for existing septic system including requiring an inspection of the whole system every time a property is sold.
  - For proposed developments within the GWZ:
    - Require a greater distance between the bottom of the leachfield and the high-water mark.
    - Require advanced nitrogen removal septic systems
- If a community doesn't want to require this type of system, they could offer incentives which may include tax rebates, free or reduced cost inspections, or assistance with purchasing.
- Require major subdivisions to implement water efficiency standards that would limit the amount of water that can be pumped for outdoor irrigation
- Planning in low-lying, vulnerable areas must be coordinated to create opportunities to address a myriad of problems simultaneously and avoid a piecemeal approach. Coordinating capital improvements in the roadways, drainage systems, and water and sewer infrastructure will reduce the overall project costs, improve planning, and reduce construction disruption.
- Design Criteria Conditional Use Permits