



## MEMORANDUM

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TO: REDACTED

FROM: Aladdine Joroff, Staff Attorney & Lecturer on Law

DATE: April 10, 2017

RE: Addressing Climate Change Adaptation in REDACTED'S Wetlands Bylaws

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***This memorandum does not constitute or provide legal advice, and distribution of this memorandum to anyone outside of Harvard Law School's Emmett Environmental Law & Policy Clinic does not create an attorney-client relationship.***

This memorandum was written in response to a review of draft bylaw provisions for a specific non-coastal community in Massachusetts; the identity of the town has been redacted from the document. This advice should be tailored to a specific municipality's circumstances and needs.

### Climate Change Adaptation Comments

- In the Purpose section, you could add "Adaptation to Impacts of Climate Change" as a protected value of the Resource Areas, but this is not necessary in order to integrate many substantive climate change adaptation-related measures.
- The Purpose section could explicitly note that the purpose of the bylaw includes protecting wetlands from the adverse impacts of climate change and protecting the ability of wetlands to mitigate negative impacts of climate change, including to natural resources, public health and safety, public infrastructure, and municipal resources and services. As an alternative, the current language could be revised to reflect a purpose of protecting "persons and property against the hazards of current and projected [or expected, or future expected] flood water inundation ..." (I like your reference to both present and future inhabitants in this section.)
- In the definition of "Alter," consider adding "changing the capacity of wetlands to respond to the impacts of climate change." Alternatively, this could read "changing the capacity of wetlands to respond to changes in (i) the timing, intensity and amount of precipitation, (ii) temperatures, (iii) increased intensity and/or frequency of storms or extreme weather events, and (iv) droughts." (Or some selection of those changes that are of greatest concern to [the Town].)

- Other definitions from the WPA Regulations that could be amended, or new definitions that could be added, include the following (note, these all make explicit reference to climate change, but often could be revised to avoid such references, as illustrated in the alternative example of “alter” noted above):
  - Impacts of Climate Change mean, but are not necessarily limited to, (i) changes in temperature, (ii) changes in the timing, intensity and amount of precipitation, (iii) rising sea levels, (iv) increased intensity and/or frequency of storms or extreme weather events, and (v) droughts. (New definition)
  - Adaptation to the impacts of climate change means measures designed or intended to protect wetlands from the impacts of climate change and to protect the ability of wetlands to mitigate the impacts of climate change. (New definition)
  - Flood Control means the prevention or reduction of flooding and flood damage, *both as currently expected to occur and as projected to occur based on the best available data regarding the impacts of climate change*. (Existing definition, proposed language in red and italics)
  - Plans means such data, maps, engineering drawings, calculations, specifications, schedules and other materials, if any, deemed necessary by the issuing authority to describe the site and/or the work, *to describe current conditions and projected impacts of climate change on the resource areas and their functions*, to determine the applicability of M.G.L. c. 131, § 40 or to determine the impact of the proposed work upon the interests identified in M.G.L. c. 131, § 40. (See also General Instructions for Completing Notice of Intent (Form 3) and Abbreviated Notice of Intent (Form 4).) (Existing definition, proposed language in red and italics)
  - Practicable means available and capable of being done after taking into consideration costs, existing technology, proposed use, logistics and potential adverse consequences (e.g., degradation of Rare Species habitat, increased flood impacts to the built environment, *impaired ability to mitigate negative impacts of climate change to natural resources, public health and safety, public infrastructure, and municipal resources and services*) in light of the overall project purposes and is permissible under existing federal and state statutes and regulations. (Existing definition, proposed language in red and italics)
  - Significant means plays a role. A resource area is significant to an interest identified in M.G.L. c. 131, § 40 when it plays a role in the provision or protection, as appropriate, of that interest, *including by mitigating any adverse impacts of climate change in the provision or protection of that interest*. Within the context of the protection of the riverfront area, no significant adverse impact means the level of protection of the performance standards provided under 310 CMR 10.58. (Existing definition, proposed language in red and italics)

- Storm Damage Prevention means the prevention of damage caused by water from storms, *as currently occurs and is predicted by best available data to occur from the impacts of climate change*, including, but not limited to, erosion and sedimentation, damage to vegetation, property or buildings, or damage caused by flooding, water-borne debris or water-borne ice. (Existing definition, proposed language in red and italics)
- Consider redefining “Land Subject to Flooding” and “Bordering Land Subject to Flooding” so that the boundary determinations are not dependent on the FEMA 100 year floodplain, particularly if the FEMA maps for [the Town] are outdated. One idea would be to use FEMA’s 500 year floodplain boundaries instead, based on studies such as EPA’s that recommend “adopting the 500-year flood plain as the ‘locally regulated flood plain.’”<sup>1</sup> As far as I know, no community in Massachusetts has adopted this approach, which could result in a large change of jurisdictional area.

As an example of an alternative boundary determination that makes smaller changes to the boundaries, the technique adopted by Arlington is included in Appendix A. Arlington’s methodology closely follows the WPA procedure, but allows for deviation from the FEMA maps when the Commission determines that the National Flood Insurance Program data is outdated, inaccurate or not reflecting current conditions. While helpful, this approach does less to address projected impacts of climate change than account for current conditions.

To maintain flexibility to account for future information, consider directing the Commission to adopt this definition via regulations adopted under the bylaw.

- Consider requiring applicants to review precipitation rates other than the “TP40” rates currently referenced in the WPA regulations and to use such other rates when the selected methodology has a higher precipitation value. (Alternatively, the bylaw could adopt an alternative methodology without any reference to the TP40 rates, but that may require a scientific determination as to the best methodology that is beyond the scope of the Commission.) The precipitation frequency statistics currently referenced in the WPA regulations are based on a technical paper from 1961. DEP is currently reviewing the use of precipitation frequency statistics from either (i) the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, or (ii) the Northeast Regional Climate Center (NRCC) at Cornell University.<sup>2</sup> Until DEP amends the WPA regulations to reflect more current precipitation data, the bylaw could require consideration of such information.
- Other provisions of the WPA regulations could be amended, via the bylaw, to more directly require and allow consideration of climate change impacts. This could be done via a single

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<sup>1</sup> EPA, “Smart Growth Fixes for Climate Adaptation and Resilience,” EPA 231-R-17-001 (Jan. 2017), *available at* [https://www.epa.gov/sites/production/files/2017-01/documents/smart\\_growth\\_fixes\\_climate\\_adaptation\\_resilience.pdf](https://www.epa.gov/sites/production/files/2017-01/documents/smart_growth_fixes_climate_adaptation_resilience.pdf).

<sup>2</sup> See e.g., <http://www.mass.gov/eea/docs/dep/water/resources/a-thru-m/mapreciprates.pdf>.

addition to a bylaw, or via amendments to multiple provisions of the WPA. A single change might provide something along the lines of the following:

“When evaluating the potential for adverse impacts to resource areas, issuing Orders of Conditions, or otherwise implementing its obligations under the WPA or bylaw, the Conservation Commission shall (i) consider climate change impacts, including on resource areas, precipitation patterns and floodplain delineations, when measuring potential adverse impacts to resource areas, and (ii) protect resource areas both as they currently exist and as are reasonably expected to exist based on the best available data on the projected impacts of climate change.”

Examples of revisions to particular provisions of the WPA regulations could include the following:

- Within Section 10.02(b)(1), regarding minor activities and factors to consider when measuring potential for adverse impacts, consider providing that:

“Minor activities, as described in 310 CMR 10.02(2)(b)2., within the buffer zone and outside any areas specified in 310 CMR 10.02(1)(a) through (e) are not otherwise subject to regulation under M.G.L. c. 131, § 40 provided that the work is performed: solely within the buffer zone, as prescribed in 310 CMR 10.02(2)(b)2.a. through q., in a manner so as to reduce the potential for any adverse impacts to the resource area during construction, and with post-construction measures implemented to stabilize any disturbed areas. Factors to consider when measuring the potential for adverse impacts to resource areas include the extent of the work, the proximity to the resource area, *the projected impacts of climate change on the resource area, current and projected precipitation patterns and floodplain delineations*, the need for erosion controls, and the measures employed to prevent adverse impacts to resource areas during and following the work.” (Existing definition, proposed language in red and italics)

- Within Section 10.05(6), regarding Orders of Conditions, consider providing that:

“The Order of Conditions shall impose such conditions as are necessary to meet the performance standards set forth in 310 CMR 10.21 through 10.60 for the protection of those areas, *both as currently exist and as reasonably expected to exist based on the best available data on the projected impacts of climate change*, found to be significant to one or more of the interests identified in M.G.L. c. 131, § 40 and the Stormwater Management Standards provided in 310 CMR 10.05(6)(k) through (q). The Order shall prohibit any work or any portion thereof that cannot be conditioned to meet said standards.” (Existing 10.05(6)(3)(b), proposed language in red and italics.)

To fully implement such changes, it would be helpful to define “impacts of climate change” and “best available data on the projected impacts of climate change.” This latter definition should clarify whose responsibility it is to identify the best available data; for greater uniformity, the Commission should identify the projections to be used

by all applicants. To allow flexibility, one option would be to authorize the Commission to identify such “best available data” via regulations, which can more easily be updated as needed. As a starting point, “best available data” could be Massachusetts-specific projections from entities like EPA, NOAA or UMass, with the Commission revisiting the issue at set periods, *e.g.*, every 1-3 years.

As an alternative, this type of provision, whether written as a single bylaw provision or as amendments to multiple WPA regulation provisions, could be written without referencing climate change, but instead focusing on the climate change impacts of most concern to [the Town].

- Consider authorizing the Commission to use Orders of Conditions to mitigate both project impacts on resource areas and climate change impacts on resource areas.
- Consider (i) supplementing the WPA regulatory findings on the significance of various resource areas to reflect adaptation values, and (ii) integrating adaptation measures into the WPA regulatory performance standards. Consider authorizing the Commission to implement such changes via regulations adopted under the bylaw.

#### General Comments

[REDACTED]

## Appendix A

### Definitions of “Land Subject to Flooding” and “Bordering Land Subject to Flooding”

#### Arlington (bylaw)

“Land subject to flooding or inundation” shall mean the land within the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm; said boundary shall be that determined by reference to the most recently available flood profile data prepared for Arlington within which the work is proposed under the National Flood Insurance Program (“NFIP”). Where NFIP data are unavailable or outdated, the boundary of said land and shall be based on the maximum Lateral extent of flood water which has been observed or recorded, or other evidence presented and considered by the Commission. Said land shall also include isolated areas which frequently or seasonably hold standing water; such areas may or may not be characterized by wetland vegetation or soil characteristics.

#### Arlington (regulation)

LAND SUBJECT TO FLOODING OR INUNDATION - shall mean the land within the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm; said boundary shall be that determined by reference to the most recently available flood profile data prepared for Arlington within which the work is proposed under the National Flood Insurance Program (“NFIP”). Where NFIP data are unavailable or **deemed by the Commission to be** outdated or inaccurate or not reflecting current conditions, the boundary of said land shall be based on the maximum lateral extent of flood water which has been observed or recorded, or other evidence presented and considered by the Commission. Said land shall also include isolated areas which frequently or seasonably hold standing water; such areas may or may not be characterized by wetland vegetation or soil characteristics. [Difference from bylaw definition noted in bold]

#### Arlington (regulations)

##### B. Definitions, critical characteristics and boundaries.

###### (1) Bordering land subject to flooding.

- (a) Bordering land subject to flooding is an area with low, flat topography adjacent to and inundated by floodwaters rising from brooks, creeks, rivers, streams, pond or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland.
- (b) The topography and location of bordering land subject to flooding specified in the foregoing Subsection B(1)(a) are critical to the protection of the interests specified in subsection A(1) above.
- (c) The boundary of bordering land subject to flooding is the estimated or observed maximum lateral extent of floodwater which will theoretically result or has resulted from the statistical one-hundred-year-frequency storm.

- i. Said boundary shall be that determined by reference to the most recently available flood profile data prepared for the Town of Arlington within which the work is proposed under the National Flood Insurance Program (NFIP, currently administered by the Federal Emergency Management agency, successor to the U.S. Department of Housing and Urban Development). Said boundary, so determined, shall be presumed accurate. This presumption may be overcome only by credible evidence from a registered professional engineer or other professional competent in such matters.
- ii. Notwithstanding the foregoing, where NFIP profile data is unavailable or is determined by the Commission to be outdated, inaccurate or not reflecting current conditions, the boundary of bordering land subject to flooding shall be the maximum lateral extent of floodwater which has been observed or recorded or the Commission may require the applicant to determine the boundary of Bordering Land Subject to Flooding by engineering calculations which shall be:
  1. based upon a design storm of 8.48 inches of precipitation in 24 hours (from “Cornell” atlas);
  2. based upon the standard methodologies set forth in U.S. Soil Conservation Service Technical Release No. 55, Urban Hydrology for Small Watersheds and Section 4 of the U.S. Soil Conservation Service, National Engineering Hydrology Handbook; and
  3. prepared by a registered professional engineer or other professional competent in such matters.