



THE COMMONWEALTH OF MASSACHUSETTS  
WATER RESOURCES COMMISSION  
100 CAMBRIDGE STREET, BOSTON MA 02114

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**Meeting Minutes for July 8, 2010**

**Members in Attendance:**

Kathleen Baskin	Designee, Executive Office of Energy and Environmental Affairs
Marilyn Contreas	Designee, Department of Housing and Community Development
Jonathan Yeo	Designee, Department of Conservation and Recreation
David Terry	Designee, Department of Environmental Protection
Gerard Kennedy	Designee, Department of Agricultural Resources
Tim Purinton	Designee, Department of Fish and Game
John Lebeaux	Public Member

**Others in Attendance:**

Anne Carroll	DCR	Sue Beede	Mass. Rivers Alliance
Michele Drury	DCR	Jennifer Pederson	Massachusetts Water Works Assn.
Linda Hutchins	DCR	Pam Heidell	MWRA
Bruce Hansen	DCR	Philip Guerin	Worcester DPW&P
Sara Cohen	DCR	Peter Weiskel	USGS
Marilyn McCrory	DCR	J. Cary Parsons	Woodard & Curran
Duane LeVangie	DEP	Andy Miller	CDM

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**Agenda Item #1: Executive Director's Report**

Baskin announced that the Executive Office of Energy and Environmental Affairs and the Massachusetts Emergency Management Agency anticipate the need to convene a meeting of the Drought Management Task Force on July 29. The task force plans to approve an updated drought management plan, and would not be likely to declare a drought until August. Hutchins added that the task force relies heavily on DCR's partnership with the U.S. Geological Survey to monitor groundwater and streamflow conditions. In response to a question, Baskin offered to distribute a list of the members of the Drought Management Task Force once it is updated.

Lebeaux inquired about the status of appointments of public members of the Water Resources Commission, particularly appointments to fill vacancies. Baskin said she is hopeful that the administration will make appointments this summer. She added that one benefit of the Water Resources Commission is that it provides a forum where various interests are represented and an opportunity for the public to vote on water policy issues. Lebeaux noted that the public members, unlike state agency members, do not have the option of designating alternate attendees, so that a full complement of public members is important. Baskin thanked the existing public members for their attendance, and invited suggestions of candidates for appointment to fill both vacancies and the positions of members with expiring terms. She added that the Water Resources Commission will play a key role in deliberating on and adopting recommendations of the Sustainable Water Management Initiative, and it will be important to have a full commission during those deliberations.

Hansen provided an update on the hydrologic conditions for June 2010. During June, the state received about 83 percent of average rainfall, with some variation across the regions of the state. Little recent rain coupled with hot weather have started to create streamflow and fire danger concerns. The central drought region shows below-normal groundwater levels. The National Weather Service Drought Outlook shows low probability of drought before September.

Yeo called attention to the map of Massachusetts communities that have instituted voluntary or mandatory outdoor water-use restrictions; Baskin noted that more than 40 communities have instituted such restrictions to date, and the Massachusetts Water Resources Authority has reported peak demand of 307 mgd recently, compared to normal demand below 200 mgd.

**Agenda Item #2: Vote on the Meeting Minutes of May and June 2010**

Baskin invited motions to approve the meeting minutes for May 13, 2010, and June 10, 2010.

<b>V O T E</b>	A motion was made by Lebeaux with a second by Yeo to approve the meeting minutes for May 13, 2010.
	The vote to approve was unanimous of those present with one abstention (Purinton).

<b>V O T E</b>	A motion was made by Contreas with a second by Kennedy to approve the meeting minutes for June 10, 2010.
	The vote to approve was unanimous of those present with one abstention (Purinton).

**Agenda Item #3: Presentation and Discussion: The Massachusetts Water Indicators Project: Summary of results and discussion of application**

Weiskel provided an overview of the results of the study, *Indicators of Streamflow Alteration, Habitat Fragmentation, Impervious Cover, and Water Quality for Massachusetts Stream Basins*. He acknowledged contributions by Linda Hutchins of DCR, USGS collaborators, and a task force convened by DCR to provide feedback during the course of the study.

Weiskel outlined two objectives of the study: (1) to develop indicators for Massachusetts of streamflow alteration and habitat fragmentation associated with reported withdrawals and discharges, impoundments/dams, and the effects of private domestic wells and septic systems; and (2) to develop indicators of water-quality status at the statewide scale. He described the indicators of streamflow alteration that the study quantified, including percent flow alteration for various conditions. The study also quantified unimpacted flows from the USGS-MassDEP Sustainable Yield Estimator application (see list of attachments at the end of these minutes).

He reviewed two of the measures of flow alteration: August median flow and long-term relative net demand. In August, the low-flow month, approximately 33 percent of the basins statewide show varying degrees of potential impact (i.e., greater than 10 percent depletion or greater than 10 percent surcharge) from water withdrawals and wastewater returns. He noted that surface reservoir withdrawals were excluded from the analysis of August median flow.

Long-term relative net demand included all types of withdrawals, including surface reservoir withdrawals, and Weiskel noted that about 88 percent of basins are indicated to be essentially unimpacted (defined by USGS in this report as less than 5 percent alteration) at the annual level.

Weiskel reviewed several maps that showed degrees of potential flow alteration. On the map showing median August flow alteration, he pointed out considerable surcharging of the mainstems of certain rivers. He highlighted the mitigating effect of septic discharge during the low-flow season, pointing to areas that experience a net import of water resulting from the import of public water supplies from outside the subbasin, combined with local discharge of wastewater through septic systems.

Weiskel showed two maps of August median flow at different scales to illustrate the importance of scale in assessing flow alteration. He noted that a disadvantage of doing the analysis at the standard HUC-12 scale is that impacts that occur in smaller areas may be attributed to a larger area.

Where reservoirs are a factor, he noted that the study could not analyze withdrawal effects at the monthly level because reservoir storage dynamics are complex, and the data needed to do the analysis were not available statewide. He also described another metric, water-use intensity, which measures the magnitude of withdrawals and returns together compared to natural flow.

Weiskel also discussed dam density, an indicator of habitat fragmentation by dams, noting that dams and impoundments affect fish passage, sediment transport, streamflow regimes, and water quality. The statewide average for dam density is 1 dam per 6.7 stream miles. (Note: Massachusetts has about 11,700 miles of perennial streams.)

Another indicator, percent impervious cover, is becoming recognized as a significant driver variable for water quality and streamflow. Weiskel noted the recent availability of MassGIS data layers for total impervious cover at a one-meter resolution. He pointed out the correlation between percent impervious cover and transportation corridors, particularly in the eastern half of the state. Generally, watersheds for reservoirs have the lowest percent impervious cover.

Weiskel concluded by summarizing major findings of the study and listing report and related products available (see list of attachments at the end of these minutes).

Baskin asked how the Massachusetts Water Indicators (MWI) study is related to the Sustainable Yield Estimator (SYE) application and the Fish and Habitat study. Weiskel explained that the SYE enabled estimation of natural flows at the 1,395 subbasins analyzed statewide and included DEP's data on water use, enabling the mapping of flow alteration. The indicators studied in the MWI report are, in turn, being used in the Fish and Habitat study to account for observed variability in fish communities. All these studies will be used in the development of policy related to streamflow classification.

Pederson requested clarification of an issue related to septic flows identified by Nigel Pickering of the Charles River Watershed Association. Weiskel acknowledged Pickering's assistance in identifying an error in the computer script that initially underestimated private well withdrawals and septic system returns. Baskin commented that septic system returns are not without impact to water quality and fisheries, and that it should not be concluded that septic system returns reestablish a natural flow regime. Weiskel clarified that septic system returns mitigate flow depletion, but "offset" may be a better word to describe the import of water from another basin.

Beede asked if any results came as a surprise, and Weiskel responded that the degree of surcharging of flows in some mainstem rivers was a surprising result. In response to a question

from Cohen, Weiskel said the report assumes 15 percent consumptive use for areas with private wells and private septic systems, based on literature values and USGS studies from other states.

Guerin requested confirmation that the study indicates that streamflow for a majority of streams is not significantly altered by water withdrawals. He added that the 2001 Stressed Basin report indicated that a majority of streams were impacted by low flows. Weiskel explained that, using a consistent methodology statewide and best available water use data, the water indicators study concludes that about 66 percent of basins show less than 10 percent net alteration of median August streamflow by groundwater withdrawals. He added that about 12 percent of the basins are indicated to be extensively altered (greater than 40 percent alteration of median August flow). There are many fewer basins dominated by surface-water reservoirs, and these have site-specific effects that need to be examined. Yeo clarified that these statements apply only to the effects of water withdrawals and do not apply to flow alteration resulting from other causes, such as impervious cover.

Baskin explained that the Stressed Basins report indicated that in 19 of the 27 river basins, some portion of these basins was considered stressed. Since 2001, the state has been working with USGS to recharacterize basins. She clarified that the MWI report does not tie 10 percent alteration or any other particular amount of alteration to a biological response. Weiskel added that the ongoing Fish and Habitat study will shed more light on fish response to changes in flow, impervious cover, and other factors.

Beede noted that ongoing studies by Todd Richards of the Department of Fish and Game show that, for brook trout, a significant drop in species abundance occurs at less than 10 percent August median flow alteration. She added that, though decisions have yet to be made about the percent alteration categories, the 10 percent threshold may need to be revisited for cold water species, since even a very small amount of alteration can be significant. Yeo clarified that Richards' work shows that one begins to see changes at these alteration levels.

Carroll noted the memo, distributed with the Commission's July meeting materials, summarizing efforts to identify levels of stress in Massachusetts river basins. The 2001 Stressed Basins report was the first iteration of this effort. She invited ideas on how the data and results of the Massachusetts Water Indicators report could be applied to state policy and regulatory programs. She proposed that, at a minimum, the commission vote, at its next meeting, to adopt the MWI report for future use in policy making.

Pederson commented that the proposed motion gives broad basis to use the report, and voting on this motion may be premature, given that the MWI report has just been released. She requested that more time be given for stakeholders to understand the findings of the report. She asked about the status of a "report card" approach to classifying streams which had been discussed at previous commission meetings. Carroll responded that the "report card" idea may still be incorporated, but is on hold pending the results of the Sustainable Water Management Initiative and other efforts. She noted that the water indicators report itself does not draw stress boundaries and does not incorporate biological factors. The ongoing Fish and Habitat study will help determine the cutoff points for categories of alteration.

Baskin added that certain regulatory programs refer to the Stressed Basins report, and state agencies will need to examine how the water indicators could be used to guide these programs. Carroll noted that there are many ways in which the indicators in the MWI report could be used, and requested specific ideas on how these water indicators can be used.

Beede suggested that the indicators could be used in the triennial review of the Massachusetts water quality standards. Baskin responded that the Water Resources Commission does not review or vote on these standards, though there could be a nexus with any standards related to cold water fisheries.

Baskin requested ideas on how the water indicators report can be used in transitioning from the Stressed Basins report. Ideas and comments should be submitted by August 9 for discussion at the September 16 meeting of the Water Resources Commission.

Kennedy requested clarification on what it would mean for the commission to “endorse” the water indicators report. Baskin responded that the Water Resources Commission serves as the water-policy-setting body for the state, and “endorsement” means that the commission accepts the water indicators report as technically valid and as a tool that can inform the state’s policy decisions in the future. Carroll invited ideas from commission members on the wording of the motion to endorse the report.

Regarding a transition from the Stressed Basins report, Cohen pointed out that the coastal watersheds are defined as “unassessed” in this report. Weiskel clarified that new stream gages provided data for determining natural flow in some coastal areas, though some areas remain unassessed.

**Agenda Item #4: Update and Discussion: Stream Categorization and Sustainable Water Management Initiative**

Baskin provided an overview of the June 22, 2010, meeting of the Advisory Committee of the Sustainable Water Management Initiative (SWMI). The committee articulated some substantive policy questions, such as the implications for Water Management Act permits if Safe Yield in a basin is exceeded, the goals that should be put in place for different streamflow categories, and how differing conditions in the western and eastern parts of the state should be reflected in policy.

Baskin summarized efforts of the SWMI Technical Subcommittee to categorize streams based on habitat and the condition of fisheries, recognizing that the condition of fisheries is a good indicator of the condition of the aquatic environment. She briefly reviewed the goals of the USGS Accelerated Fish and Habitat Study, which describes physical basin characteristics and fish community characteristics and correlates these with the human alteration factors described in the MWI study (see link to the full USGS open file report at the end of these minutes).

Baskin reviewed details of the study, including factors for selecting the 756 fish sites analyzed, the explanatory and response variables that were examined, and analytical methods. Explanatory variables include basin characteristics and anthropogenic factors. Response variables include relative abundance, richness, and percent of fluvial fish species. The study examined relationships between conditions and fluvial density. Baskin showed some key findings of the study: for example, keeping all other variables static, a unit increase in impervious surface is associated with a 5.5 percent decrease in fluvial-fish relative abundance, and a unit increase in percent alteration of August median streamflow is associated with a 0.4 percent decrease in fluvial-fish relative abundance.

Results of the USGS Accelerated Fish and Habitat Study are being used by the Department of Fish and Game’s Division of Fisheries and Wildlife to support a habitat categorization effort being piloted in the SuAsCo, Nashua, and Westfield Rivers basins. DFW has adopted a

biological condition gradient to define categories that describe the degree of biological alteration. Baskin concluded by outlining the decisions that need to be made to build on this pilot study of three watersheds and expand the study statewide.

Pederson asked how existing impervious cover in each subbasin factors into the analysis. Hutchins explained that study authors chose a low impervious cover percentage as a baseline against which all subbasins could be compared. Baskin added that zero percent impervious cover might set up unrealistic expectations about what fish abundance should be. Carroll added that the regression equation from the USGS Accelerated Fish and Habitat Study was used to calculate the reference condition; subbasins can be compared to the reference condition to estimate biological loss. Baskin added that the SWMI Technical Subcommittee is examining these underlying assumptions of the analysis, but has agreed on the type of analysis that should be done.

Meeting adjourned.

Attachments distributed at or before meeting or presented at meeting:

- WRC Meeting Minutes:
  - May 13, 2010
  - June 10, 2010
- Weiskel, P.K., Brandt, S.L., DeSimone, L.A., Ostiguy, L.J., and Archfield, S.A., 2010, Indicators of streamflow alteration, habitat fragmentation, impervious cover, and water quality for Massachusetts stream basins: U.S. Geological Survey Scientific Investigations Report 2009–5272, 70 p., plus CD–ROM. (Available at <http://pubs.usgs.gov/sir/2009/5272/>)
- Technical Memorandum from Water Resources Commission staff to the Water Resources Commission : A Brief History from 2001 Stressed Basins to 2010 Massachusetts Water Indicators
- Letter dated June 23, 2010, from Water Resources Commission to MEPA office: Comments on Draft Environmental Impact Report (DEIR) and Comprehensive Wastewater Management Plan (CWMP) for the Town of Mattapoissett’s wastewater management project
- Interbasin Transfer Act project status report, 24 June 2010
- Current Water Conditions in Massachusetts, July 8, 2010
- Link to Archfield, S.A., Vogel, R.M., Steeves, P.A., Brandt, S.L., Weiskel, P.K., and Garabedian, S.P. 2010. The Massachusetts Sustainable-Yield Estimator: A decision-support tool to assess water availability at ungaged stream locations in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2009–5227, 41 p. plus CD-ROM (available at <http://pubs.usgs.gov/sir/2009/5227/>)
- Presentation handouts: Stream Categorization: Describing the Current Condition. Kathy Baskin. July 8, 2010
- Link to Armstrong, D.S., Richards, T.A., and Brandt, S.L. 2010. Preliminary assessment of factors influencing riverine fish communities in Massachusetts: U.S. Geological Survey Open-File Report 2010–1139, 43 p. (available at <http://pubs.usgs.gov/of/2010/1139/>)