



Mapping Groundwater Recharge for Landuse Planning and Storm Water Management

by Carol Haskins, Outreach Director, Pomperaug River Watershed Coalition

The Pomperaug River Watershed is a 90-square mile watershed nestled in picturesque western Connecticut. The near pristine river and its major tributaries flow through the towns of Bethlehem, Woodbury, and Southbury. While a clean river, the Pomperaug is faced with development pressures like most rivers in the state. The rising population demands more housing and local services; the increase in impervious surfaces carries threats to both water quality and quantity as stormwater washes pollutants directly to rivers, streams, and wetlands and the hard surfaces prevent water from soaking into the ground and aquifer. The Pomperaug River Watershed Coalition, formed in the face of these threats, aims at preserving the quality and quantity of the local water resources.

The Coalition, now in its 10th year, is recognized for the scientific research that serves as the sound basis for management decisions made for protecting the river and its underlying aquifer. The Coalition is also recognized for its ability to share its knowledge and tools with local and regional decision-makers, as well as other watershed organizations. The latest of these tools, developed in partnership with the Council of Governments of Central Naugatuck Valley (COGCNV) and the Housatonic Valley Association (HVA), is "Recharge Mapping: A GIS-based tool for identifying land with significant groundwater recharge." The Recharge Mapping Tool (for short) is a planning level tool that can help ensure both the quantity and quality of groundwater and water that flows downstream.

So, what is recharge? Why should you, as an Inland Wetlands or Conservation Commissioner, care about recharge? How is recharge estimated and mapped? And how can this information help you protect your local water resources? Answers to these key questions are outlined below.

What is recharge?

Recharge is the process whereby rainwater soaks into the ground and infiltrates to the underground aquifers.

Water that is in the aquifer is slowly released into nearby streams and rivers providing "baseflow." Baseflow is the water flowing in a stream or river without additional inputs from precipitation and surface runoff or stormwater.

Why should town commissions and watershed organizations care about recharge?

Simply put – stormwater management and preserving instream flows. The 2004 Connecticut Stormwater Quality Manual (http://www.ct.gov/dep/cwp/view.asp?a=2721&q=325704&depNAV_GID=1654) encourages towns to include Groundwater Recharge as a criterion in their stormwater management plan as a way to maintain groundwater recharge rates at pre-development levels by capturing or infiltrating stormwater (See section 7.5 of the Manual) and reduce the volume of stormwater runoff. Recharging water into the ground is a cost saving stormwater management strategy; reducing the volume of stormwater runoff reduces the overall size and cost of stormwater treatment practices. By letting soil naturally infiltrate and filter stormwater, treatment costs are reduced as there is less volume to treat and less polluted runoff enters our streams, rivers and wetlands.

By letting stormwater soak into the ground, you are also helping to preserve stream baseflow. In October 2009, the CT DEP unveiled new Proposed Stream Flow Standards and Regulations, (see article, [page 13](#)) whose objective is to balance the needs of fish and other wildlife with human water consumption needs. While the regulations focus on water withdrawals and the modification of flows caused by dams or other instream structures, another line in preserving these flows would be to maintain the volume

Recharge, continued on page 3

Inside ★	Pg.
Letter from Williams Family	2
Journey to the Legal Horizon	4
Annual Meeting & Election Wrap-Up	8
Proposed Stream Flow Regulations	13

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President's Note: On November 14, 2009 CACIWC received the following letter from Bob Williams, Allan Williams' brother. It is very much appreciated.

14 Nov 2009

To everyone at CACIWC,

Please accept my sincerest thanks and deepest appreciation for affording my daughter, wife and myself the opportunity to be there today when Allan was awarded the CACIWC 2009 *Lifetime Achievement Award*. The award and dedication of the 2009 Annual Meeting in Allan's memory were a wonderful tribute. Seeing that this tribute came from one of the most *sincerely* caring group of folks that we have ever encountered made the day even more special and gave us a cherished memory that will always be there. The beautiful plaque, Alan Siniscalchi's kind words during the presentation, Allan's picture in the program, the delicious (and healthful I may add) meal, and the very appropriate setting (the natural themed buildings and grounds, the nearby working agricultural land and woodlands) and the way *everyone* there made us feel welcome meant so much to us.

The day was also memorable in that we had the opportunity to learn so much about what the attendees and presenters are doing as environmental stewards and the challenges they face in their endeavors. Seeing that this was CACIWC's 32nd Annual Meeting certainly amplifies the tenacity and dedication of this organization and its membership.

There is a saying that "*Managers Do Things Right and Leaders Do the Right Things.*" Based on the technical expertise that permeated the Meeting, we were undoubtedly amongst a group of professionals who had the scientific, engineering and regulatory skills to carry out their mission and were unquestionably quite proficient at employing those skills. Seeing how *sincerely* all those in attendance recognized the significance of environmental preservation is to their respective communities, the State of Connecticut *and* our Nation *for generations to come*, left no doubt in our minds we were *also* amongst a very special group of *leaders*.

In the memorial ceremonies we hold for those I served with in another part of the world a little over forty years ago, we include the quotation "*If you are able, save a place inside of you – and save one backward glance – when you are leaving, for the places they can no longer go.*" With that in mind, we want you to know *how much it means to us* that even though Allan's life was ended much too soon, the environmental *leadership* of all those in CACIWC will continue towards the places Allan so cherished *but can no longer go*.

With my deepest gratitude,

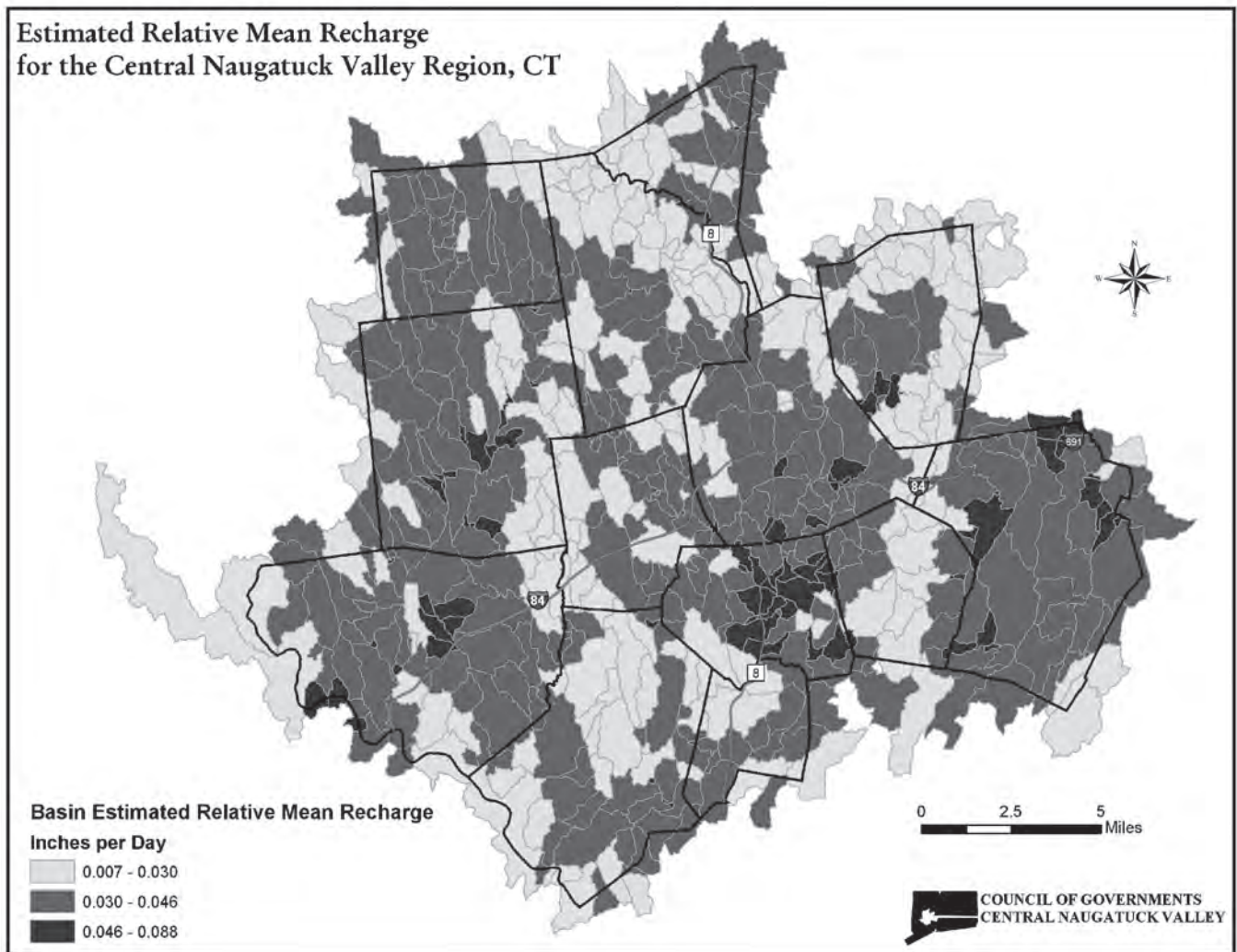
Bob Williams

Recharge, continued from page 1
of water that recharges into the ground and is slowly released into the stream at a later time. Certainly, maintaining streamflow (and thus recharge) in order to sustain biological diversity is an important consideration for both inland wetlands and conservation commissioners.

In order to address these issues a key question is raised – what are the best places or conditions to infiltrate stormwater and to recharge an aquifer? Knowing the physical attributes of the landscape is an important piece of the puzzle. These attributes include surface, subsurface, and drainage characteristics, which can be identified using readily available GIS data.

recharge. Physical attributes of the landscape are the driving factors influencing the fate of water once it hits the ground. Statistical analyses of the output from the PRMS model identified four attributes as significant in determining the fate of water: coarse stratified drift, Class D soils, impervious surfaces, and drainage density. In the simplified GIS model, these attributes were weighted to estimate the mean relative amount of water that recharges the aquifer based on historic precipitation records. The results are displayed graphically on a map for the area of interest, showing basins with high, medium, and low recharge relative to other basins in the area of interest (see map).

Mapping Groundwater Recharge as a Stormwater Management and Planning Tool



What is the basis for geographically estimating recharge?

The Recharge Mapping Tool is based on the science of the United States Geological Survey’s (USGS) Precipitation Runoff Modeling System (PRMS). The PRMS models the interaction between “rainfall” and runoff based on various physical and climatic characteristics of the watershed. Runoff includes surface, subsurface, and groundwater runoff. Over time, groundwater runoff is equal to aquifer

Why is this data important and how can it be used?

Towns can use these data for planning purposes. Emphasized above, recharge is a key component of mitigating stormwater. Not limited to stormwater, these data may also be considered in relation to new development as well as protecting the quality of public water supplies and surface water resources. Water quality implications, sustainable aquifer yields, and minimum streamflow

Recharge, continued on page 14



**Farming Exemption Considered by the Appellate Court:
Red 11, LLC v. Conservation Commission, 117 Conn. App. 630 (2009)
Canterbury v. Deojay, 114 Conn. App. 695 (2009)**

The Appellate Court has recently issued two decisions¹ involving the farming exemption to the Inland Wetlands and Watercourses Act. These cases affirm the general principles the courts have developed when applying the exemption provisions. The Appellate Court is the second highest court in the state. The decisions of both the Supreme Court (the highest court) and the Appellate Court are binding precedent throughout the state. In contrast, the decisions of the Superior Court (trial court) are binding on the parties to the lawsuit. The Red 11 case involves facts that will commonly arise in exemption matters. On the other hand as a cautionary note, in the Deojay case, the landowner is in a peculiar procedural posture which may limit the holding to its facts.

In these decisions the Appellate Court sets forth principles in applying the exemption provisions. They provide a good review of how to proceed on any kind of exemption.

Anyone claiming the benefit of an exemption has the burden of proving s/he falls within the exemption. The exemption provision cannot be interpreted so that it is rendered meaningless (i.e., that nothing falls within the exemption.) While “farming” is exempt, the legislature, by amending the statute in 1987, has established limitations on the farming exemption. You may need to pull out your agency’s regulations, typically found in § 4.1 or refer to the state statute at § 22a-40(a)(1). In previous articles I’ve referred to this as the 1st sentence/2nd sentence analysis. You begin by determining if the activities fall within the 1st sentence: is it farming? (use the definition in General Statutes § 1-1(q)). If so, then determine if it falls within the 2nd sentence that removes certain farming activities from the exemption. Affirming 1991 precedent, the Appellate Court stated in *Deojay* and reaffirmed in *Red 11, LLC* that the agency must be given the first opportunity to determine its jurisdiction, not the courts. An agency can deny a request for determination of exemption if the person fails to provide all the necessary information requested by the agency.

The Red 11 case provides additional useful holdings. This case involves the appeals of three cease and desist orders. The trial court and thereafter the Appellate Court upheld all of the orders. In resolving a cease and desist order for conducting activities without a permit, Red 11, LLC, doing business as Twin Oaks Farm, asked for and received a determination that certain specified farming

activities were exempt. Later Red 11 argued that because it received the earlier determination the wetlands agency had no jurisdiction over the “property.” The Appellate Court said no. The agency earlier considered only the activities brought to its attention. The future violations, activities outside the exemption, hadn’t been presented to the agency.

Your job is to focus on the activities, not the status of the person or the status of the person. To be absolutely clear, the following statements are not proper considerations for the agency: (1) “He’s not a farmer, he’s a *fill in the blank*, so it’s not farming.” (2) “You can’t regulate this property, it’s a farm.” Stay focused on the specified activity and determine after the 1st sentence/2nd sentence analysis, if the activity falls within the exemption.

In the 2nd sentence of the exemption, the statute excludes from the exemption “filling or reclamation of wetlands.” The Red 11 case provided a definition of “reclamation.” Relying on two dictionary definitions, the court stated “reclamation” means “making land fit for cultivation, as by draining swamps . . . or irrigating arid land” and also “the act or restoring to cultivation.”

The statute also provides that “the filling or reclamation of wetlands or watercourses with continual flow” is not exempt. In defending itself in subsequent cease and desist order proceedings Red 11 claimed the farming area was both a wetlands and a watercourse. It further claimed there was no evidence of continual flow in the wetlands, hence its activity fell within the exemption. The Appellate Court said no. It determined that it was a question of law that the courts determine. The court held, for legal reasons, that continual flow is only relevant to watercourses, not wetlands.

The best explanation I’ve heard is a technical one and comes from Steve Tessitore, the DEP’s liaison to municipal wetlands agencies: “Watercourses flow, land does not.” So, the phrase “with continual flow” modifies watercourses, *not* wetlands. Different reasoning (technical, not legal), same result.

The court also examined the exemption for a farm pond “essential to the farming operation.” Please note that this phrase only occurs in conjunction with a farm pond. It

Farming, continued on page 5

Farming, continued from page 4

does not apply to all farming activities. In defending itself in one of the cease and desist order proceedings, Red 11 offered evidence to the agency that the pond was “critical” to the farm. The court noted, however, that there was no evidence of the lack of other water sources nor why the vernal pool had to be converted to a farm pond. In addition, the court held that the agency did not have to believe Red 11’s witness. This level of scrutiny by the agency is appropriate because of the legislature’s use of the phrase “essential to the farming operation” when describing farm ponds as exempt. For all of the other farming activities which are not required to be “essential” in order to be exempt this level of inquiry is not warranted.

The *Deojay* case involved landowners who purchased an abandoned rundown farm and undertook activities to remove a residence, trailer and garage with an intent, as disclosed on a zoning application to prepare the property for residential use. Initially the landowners did not disclose an agricultural use. The wetlands agent observed regulated activities occurring on the property without a permit: a drainage ditch was dug. The wetlands agent wrote a letter asking the owners to stop and to appear at the next agency meeting. The owners did not appear, but they filed an application for a permit to clear the lot, correct drainage problems created by the previous owner and by the run-off from the town road. The agency asked for the wetlands to

be mapped. The owners did not provide soil mapping. The application was denied; no appeal was taken.

Thereafter the agency issued a cease and desist order. The owners appeared and claimed that the activities were agricultural and thus exempt. The agency upheld the order, with a condition that the owners write to the Board of Selectmen regarding the road run-off onto the property. The court decision does not indicate whether and how the agency responded to the claim that the activities fall within the exemption. This is a critical fact missing from the decision. Recall that agencies have jurisdiction over *regulated* activities. Refer to the definition of “regulated

Farming, continued on page 6



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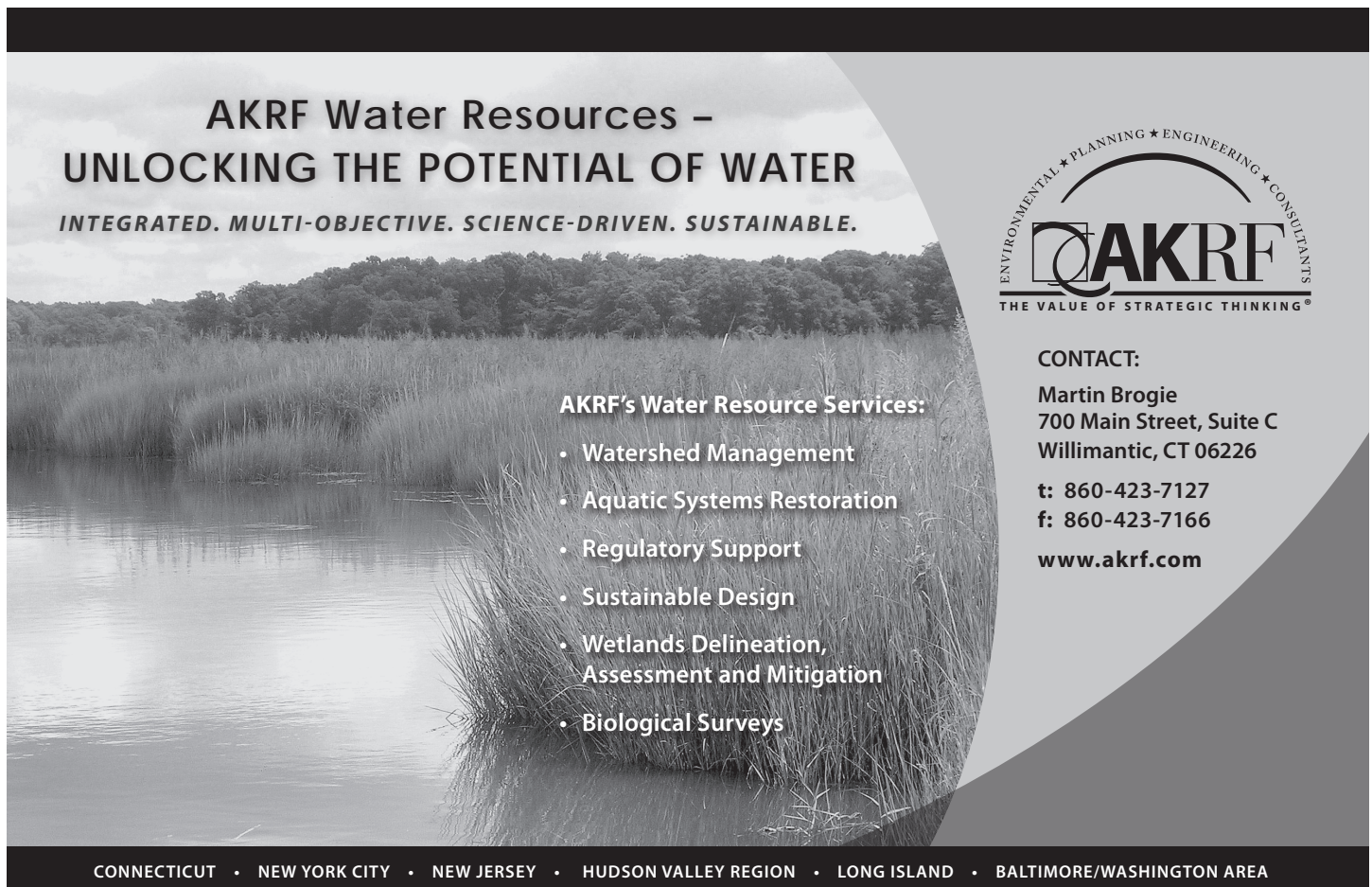
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Farming, continued from page 5

activity” and note that it excludes exempt activities. If the claim of exemption is valid, the agency does not have jurisdiction over those activities. The order was not appealed. The owners did write to the Board of Selectmen, raising many of the issues that are raised in a court appeal, such as claims of unfair process, violation of civil and constitutional rights.

The owners notified the agency that the proposed activities would be undertaken and told the agency to stay off the property. The agency filed a suit in court seeking the removal of the fill in wetlands and the restoration of the property.

While the court case was pending, the owners filed a second application with the agency. The activities listed in the court decision included constructing a farm pond, planting blueberries, constructing a house, well, septic system, shed and driveway. The court decision does not provide enough detail. Why did the owners apply for a permit for the planting of blueberries? On its face, the planting of blueberries would surely fall within the exemption. Did the proposal include change in grade and a filling of wetlands, such as changing the soil profile by the addition of 2 feet of fill to provide a drier growing medium? Why a permit for the farm pond? Was it larger than 3 acres?

Did the agency determine it wasn't essential to the farming operation? Perhaps the agency made these determinations, but the court decision does not refer to them.

At a following agency meeting the agency voted to approve the application and the lifting of the cease and desist order upon the posting of an \$8,000 bond to ensure that the farming activities occur. Note: it was to ensure farming activities occurred, not *regulated* activities. Again, no appeal was taken of this agency action. No bond was posted; thus, the order was never lifted and remained in effect. After trial the judge found that the owners continued working on the property, including digging the farm pond, although the bond was not posted. The trial judge imposed a penalty of \$10,000 plus costs and fees.

The Appellate Court ruled that the owners could not claim in court that their activities were exempt without a determination from the agency on the exemption. The court pointed to the requirement in § 4.4 of the municipal regulations, also in the DEP model regulations, of notification to the agency and receipt of a written determination from the agency prior to commencing the activity. Absent that determination, the owners could not make the claim of exemption in court -- even if the activities fall within the farming exemption.

Farming, continued on page 7

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Farming, continued from page 6

In their defense in the enforcement case in court, the owners claimed that the posting of the bond for farming activities was illegal. The Appellate Court initially entertained the argument, though eventually disagreeing, only to conclude that *the owners had not appealed the permit condition*. The Appellate Court was on firm ground in holding that permit conditions are authorized by the wetlands statute.

In a narrow sense, this decision means anyone who has not appealed a permit condition can be held liable for violations of the condition. Are you jumping to the conclusion that your agency can impose a condition of the posting of a bond on an *exempt* agricultural activity? Not so fast. How is it that your agency will be *requiring* a person to apply for a permit for exempt agricultural activities? Not pursuant to the wetlands statute. The *Wilkinson* case, the applicable case law since 1991, and relied on by the Appellate Court in both *Deojay* and *Red 11*, holds that activities determined to be exempt need no permit. No permit, thus no permit conditions. Maybe the farming activities proposed in *Deojay* didn't fall within the exemption. In that case, those seemingly agricultural activities are, in fact, regulated activities for which a condition, such as a bond, may be reasonably imposed. We just can't tell from the written decision of the court.


Confused by this? I certainly was when I read the case. I followed up with an e-mail to the DEP and the Connecticut Farm Bureau. I believe that the *Deojay* case has sufficiently muddied the case law on agricultural exemptions that we owe it to the lay, volunteer members of wetlands agencies and those trying to farm to amend the exemption provision in the wetlands statute. The amendment should reflect the procedure, rights and restrictions when the exemption provision applies. Until then, I foresee numerous cases going up on appeal to clarify what *Deojay* means -- and what it doesn't mean.

Stay tuned.

* * * *

I have recently started a blog on Connecticut wetlands law. I am eager to have you weigh in with your comments on this article or any postings you read. You can read my blog at <http://www.ctwetlands.com> - J.P.B.

(Endnotes)

¹ You may read the cases at the Judicial Website under the Archives of the Appellate Court cases. Go to www.jud.ct.gov. Click on "Courts"; go to "Appellate Court"; then to "Advance Release Opinions"; go to "Appellate Court archive"; then to "2009." Scroll down to: Published in CT Law Journal - 10/20/09, click on AC29092 for the Red 11, LLC case. Scroll down to: Published in CT Law Journal - 6/2/09, click on AC29602 for the Deojay case. 



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CACIWC's 32nd ANNUAL MEETING

Connecticut Commissioners and Staff Attend Successful Conference

Over 200 conservation and inland wetlands commissioners, along with municipal staff and other professionals, attended CACIWC's 32nd Annual Meeting & Environmental Conference held on Saturday November 14, 2009 at MountainRidge in Wallingford. This year's conference, entitled "Working Together to Preserve Connecticut's Key Habitats," provided important new information relevant to both novice and experienced commission members and staff. We again thank all those who provided information and the many attendees who spent their Saturday with us to learn and share ideas on behalf of their community and our state.

A total of 25 commercial entities and non-profit groups provided a rich array of exhibits to further inform attendees of current issues relevant to their work and volunteer efforts. The Board of Directors has begun a review of the conference evaluation forms, which included suggestions for workshop topics for next year's conference. To allow other members the opportunity to submit ideas for workshop topics and other suggestions, CACIWC will maintain the AnnualMtg@caciwc.org email throughout the year. Please keep those suggestions coming. We thank the staff at MountainRidge for hosting the conference and extend our sincere appreciation to our 2009 conference sponsors! See you at our 2010 Annual Meeting and Environmental Conference!



Patrick Comins, Director of Bird Conservation, Audubon Connecticut

◆ KEYNOTE SPEAKER

Patrick M. Comins, Director of Bird Conservation, Audubon Connecticut, addressed the lunch portion of the conference with his talk, entitled "The Role of Municipalities

in Preserving Threatened Bird Habitats in Connecticut." Patrick, discussed ways that municipalities can safeguard key habitats while reviewing the various birds who remain listed as endangered threatened or of special concern. His talk emphasized the conservation needs of our state and the value of a proactive approach, using state and regional partners to help maintain efforts in this era of diminishing resources.

◆ AWARDS

Eight CACIWC awards were given at the Saturday November 14, 2009 ceremony.

Alden W. Ringklib, Chairman of the New Hartford Inland Wetlands Commission received the 2009 award for **Wetlands Commissioner of the Year**. Mr. Ringklib was recognized for his two decades of outstanding leadership to his town. He has been a member of the New Hartford Inland Wetlands Commission for over 20 years, and seated

as Chairman for much of that time. Guided by his diligent leadership and his fair and respectful conduct of all meetings, the Commission grew to



Attendees check out exhibits

become a model for other commissions in the region. Mr. Ringklib has a long history of service to his town, state and country, starting with his Korean War tour through his years as a Connecticut State Trooper. He is well-respected by the community, and has a deep appreciation for both the people and natural habitats of the state and the Town of New Hartford.

◆ WORKSHOPS & DISPLAYS

Twelve informative workshops covering a variety of topics relevant to Connecticut commissioners were given. We thank all of the workshop leaders for sharing their expertise, and taking time to prepare and present these well-received forums.



Andrew LaBonte, Wildlife Biologist, CT DEP Wildlife Division, presenting workshop

Gwen Marrion, Chairman of the Bolton Inland Wetlands Commission was honored with the 2009 **Commissioner of the Year** award. Ms. Marrion recently retired from the Bolton Inland Wetlands Commission after her service of 20 years since it separated from the Bolton Conservation Commission. During that period she directed numerous improvements to the commission's procedures and regulations. Gwen's understanding



Gwen Marrion, Chairman, Bolton Inland Wetlands Commission, receiving 2009 Inland Wetlands Commissioner of the Year award, with other town commissioners.

of Bolton's environment, history and people is widely recognized throughout her town. She is an attorney and active civic leader, including service on the town's Charter Revision Committee, leadership of the Bolton Land Trust, and Chairman of the Bolton Open Space Acquisition and Preservation Committee. She also participated in and contributed to the DEP wetlands training program, and the training DVD produced by DEP.

Kathleen Holland, Director of the New Canaan Inland Wetlands and Watercourses Department received the 2009 award for **Wetlands Director of the Year**. Ms. Holland was recognized for her development and implementation of a comprehensive multiple-objective plan to improve the organizational efficiency and visibility of her department and its role within town government and the community. She reorganized the department into two separate units, one with focus on conservation and the other on inland wetlands, and instituted monthly meetings with Planning & Zoning, Public Works, Park and Recreation and other relevant municipal departments. She was instrumental in creating and establishing a Wetlands Enforcement Ordinance. She ensures that her department is readily available to assist the IWWC, including arranging and conducting 3 to 4 site walks a month. Kathleen takes special pride in having attended all major DEP training programs since she first joined the town in 1989.

Attorney Janet Brooks presenting an inland wetlands legal workshop



Stephen Lowrey, Zoning/Wetlands Agent for the Town of Tolland received the 2009 **Wetlands Agent of the Year** award. Mr. Lowrey was recognized for his work in the development and implementation of comprehensive low impact development (LID) regulations. Working with the town's consultant, a set of LID regulations was developed and incorporated into the town's Zoning and Wetlands regulations. These new regulations fulfill all LID objectives while meeting the town's stormwater treatment challenges. Mr. Lowrey also was a significant factor in the implementation of these regulations, from his efforts to educate wetlands commissioners in their use, to explaining their role to local developers and engineers. Mr. Lowrey played a vital role in local implementation of the Tankerhoosen Watershed Management Plan (TWMP). He conducted an in-depth analysis and review of the TWMP data and provided this information to the Tolland Inland Wetlands Commission for their oversight and action. He has worked with the Town of Tolland since 1996. In addition to serving as the Zoning/Wetlands Agent, he also oversees the town GIS mapping unit and serves as a natural resource and wildlife advisor to all town land use boards and commissions.

The **Tolland Inland Wetlands Commission** received the 2009 CACIWC award for **Commission of the Year**. Under the guidance of their chairman Lee Lafountain and the support of Zoning/Wetlands Agent Stephen Lowrey, the commission implemented one of the most comprehensive low impact development (LID) regulations among municipalities in the region. Working jointly with the Planning & Zoning Commission and other municipal agencies and departments, the Tolland Inland Wetlands Commission incorporated LID approaches into existing town regulations. These joint efforts were recognized by the Connecticut Planning Association with a chapter award and gained Tolland national recognition. The Commission has also utilized these regulations as a model in providing early feedback to applicants to help them achieve LID goals that benefit the region. The Commission also has done significant work in promoting the Tankerhoosen Watershed Management Plan (TWMP). They have been working closely with landowners within the watershed to identify and prioritize drainage structures that are in need of improvement and to seek funding to support modifications.

Meeting, continued on page 11



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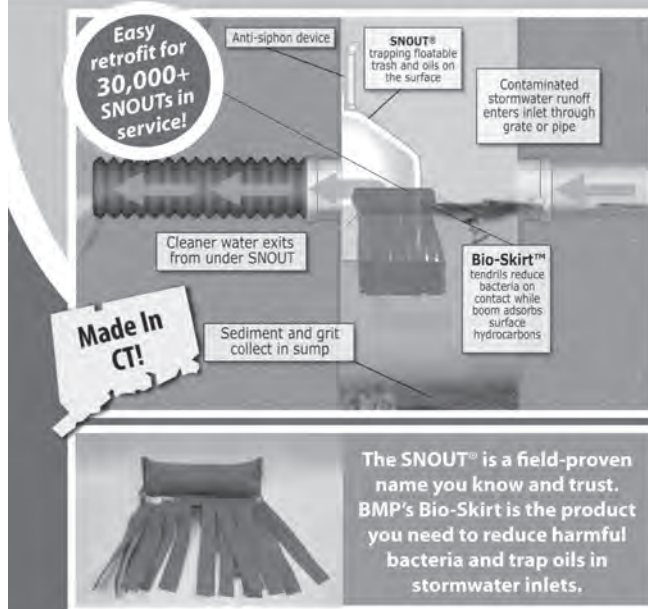
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Meeting, continued from page 9

At its 32nd Annual Meeting & Environmental Conference CACIWC will begin a new tradition of acknowledging statewide educational efforts to promote environmental conservation and habitat protection. A **Special Recognition Award** was given to **Steve Grant**. Many Connecticut residents were first introduced to Steve during his nearly 30 year career with *The Hartford Courant* where he served as environmental writer and politics editor along with numerous memorable articles on natural habitats, outdoor recreation, travel, the green movement. One of Steve's favorite topics, writing on rivers and related environmental issues, became a major educational opportunity for *Courant* readers during his 17-part article documenting his five week, 410-mile-long Connecticut River journey from its source on the Canadian border south to Long Island Sound. He received more than three dozen awards from various organizations for distinguished journalism along with six Pulitzer Prize nominations while reporting for *The Courant*. In addition to his newspaper and free lance writing, Steve promotes environmental education as member of the Society of Environmental Journalists, the New England Travel Writers Network and the Thoreau Society. He is also a founder and former president of the Capitol Bird Club in Connecticut.

A **Special Recognition Award** was also given to **Peter Marteka** for his efforts to promote hiking and conservation in Connecticut through his columns in *The Hartford Courant*. Peter started his journalism career writing for *The Regional Standard* in Colchester and the *Middletown Press* before coming to *The Hartford Courant* in 1996. His first hiking column, entitled "The Path Less Traveled," ran in local and regional editions from 1997, and appeared statewide as "Nature's Path" in 2006. During 2008, Peter reached out to additional readers with his Sunday "Way to Go" columns in iTowns. With each column, Peter prompts his readers to discover the many wonderful hiking opportunities that can be found throughout Connecticut, while inspiring a deep appreciation of our state's varied natural habitats.

In closing the 2009 awards ceremony, President Alan Siniscalchi presented a posthumous **Lifetime Achievement Award** to honor the memory of **Allan Noam Williams** who died June 26, 2009 of pancreatic cancer. Allan Williams worked closely with CACIWC for many years while at the DEP Natural Resources Center on various publications ranging from *The Habitat* to *The Handbook for Conservation Commissioners*. His lifelong passion for environmental education led him to open the DEP Bookstore to help his agency's efforts to promote Connecticut's natural environments. He even took his store on the road by starting a tradition to bring his favorite selection of books and other publications to the CACIWC annual meeting and environmental conference each



Bob Williams, with his daughter Lynn and wife Laura, accepting the Lifetime Achievement Award to honor the memory of his brother Allan Noam Williams.

year. Allan's environmental career did not end with his retirement from the DEP. His consulting practice was retained in 2007 to facilitate the development of the CACIWC strategic plan, which the board completed in

May 2008. This CACIWC award honoring Allan's decades of service in the promotion of environmental conservation in Connecticut was accepted by his brother Robert Williams, sister-in-law Laura Williams, and niece Lynn.

◆ ELECTIONS

We welcome six new Board members!

- **Kim Barbieri**, Representative, Litchfield County. Torrington Inland Wetlands & Watercourses Commission staff.
- **Mary Ann Chinatti**, Alternate, New London County. Town Planner, Salem Inland Wetlands & Watercourses Commission staff.
- **Cyd Groff**, Alternate, Hartford County. Environmental Planner, Windsor Inland Wetlands & Watercourses Commission staff.
- **Laura Magaraci**, Representative, New Haven County. Town of Branford Inland Wetlands Commission and Conservation Commission staff
- **Alicia Mozian**, Representative, Fairfield County. Conservation Department Director Town of Westport
- **Judy Rondeau**, Alternate, Windham County. Thompson Conservation Commission member, Thompson Inland Wetlands agent.

Congratulations to the elected officers, **Alan Siniscalchi**, President; **Charles Dimmick**, Vice President; and **Maureen FitzGerald**, Secretary; and other Board members, **Ann Beaudin**, Representative Hartford County; **Pat Young**, Representative, New London County; **Marianne Corona**, Representative, Middlesex County; **Rod Parlee**, Representative, Tolland County.

The Board of Directors extends its deep appreciation and thanks on behalf of the CACIWC membership to **Linda Berger**, **Marguerite Purnell** and **Diana Ross** for their dedication and contributions over the past years to the CACIWC Board. Their talents will be missed but we know where you are.

Meeting, continued on page 12

Meeting, continued from page 11

Finally we especially thank the Nominating Committee, **Maureen FitzGerald, Diana Ross, and Penni Sharp** for their thorough search and excellent recruitment efforts in bring new talent, energy and experience to the Board.


We also ask that you consider being a member of CACIWC's Board of Directors. Openings exist for Alternate Representatives in Fairfield, Litchfield, Tolland, New Haven and Middlesex Counties. If interested, please contact the Board by email: board@caciwc.org.




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Proposed Stream Flow Standards and Regulations

The Connecticut Department of Environmental Protection is proposing Stream Flow Standards and Regulations in response to PA 05-142, enacted in 2005. This statute directed DEP to develop regulations that would expand the coverage of the stream flow standards and regulations to include all rivers and streams, rather than only those stocked with fish, as was the case previously. The statute further directed DEP to develop standards that balance the needs of humans to use water for drinking, washing, fire protection, irrigation, manufacturing, and recreation, with the needs of fish and wildlife, which also rely upon the availability of water to sustain healthy natural communities.

Highlights of the proposed Stream Flow Standards and Regulations include:

- Use of best science to provide a framework to balance the human needs for water for drinking, washing, fire protection, irrigation, manufacturing, and recreation with the needs of fish and wildlife, that also rely upon the availability of water to sustain healthy, natural communities,
- Meaningful public input to the process, under the Public Trust Doctrine
- A phased implementation of regulatory requirements to encourage and support water planning and conservation efforts

Information used in developing the proposed standards can be found at http://www.ct.gov/dep/cwp/view.asp?a=2719&q=434018&depNav_GID=1654.

In short, the proposed Stream Flow Standards and Regulations are protective of Connecticut's river and stream systems, promoting better, more efficient management of our water resources and supplies, so that

needs, both human and ecological, can be met both today and in the future.

Copies of the proposed regulations, small business impact and regulatory flexibility analysis, and other related material, are available for public inspection during normal business hours at the Department of Environmental Protection's Bureau of Water Protection and Land Reuse, Planning and Standards Division, 2nd Floor, 79 Elm Street, Hartford, CT. A link to the proposed regulations is available on the Department's web site at <http://www.ct.gov/dep/publicnotices>. These documents can also be obtained by contacting Terri Schnoor at the above address, or by phone at (860) 424-3707.

All interested parties are invited to express their views on the proposed regulations at a hearing to be held at the following place and times:

January 21, 2010
9:00 a.m. – until all comments have been heard
Phoenix Auditorium, 5th Floor
Department of Environmental Protection
79 Elm Street, Hartford, Connecticut

Speakers are requested, although not required, to submit a written copy of their comments.

Written comments on the proposed regulations may also be submitted to Paul E. Stacey, Department of Environmental Protection, Bureau of Water Protection and Land Reuse, Planning & Standards Division, 79 Elm Street, Hartford, Connecticut, 06106-5127 by February 4, 2010.

Additional stakeholder meetings can be scheduled by contacting CT DEP at (860) 424-3704.


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Recharge, continued from page 3

regulations are the overarching issues these data can be used to address.

We encourage Planning and Zoning Commissions to consider incorporating a Recharge Map, though it is subject to further refinement, as reference data in their town's Plan of Conservation and Development for the sake of preserving our irreplaceable groundwater resources. As a next step, recharge should be considered in subdivision regulations as a subset of stormwater issues. Sample ordinances can be found in Appendix C of the Connecticut Stormwater Manual. The PRWC, HVA, and COG are also glad to help in this process.

Inland Wetlands Agents should be proactive in encouraging their town to adopt a recharge map. This reference map will be a useful piece of information for agents when it comes time to review plans that incorporate stormwater management facilities. As the first line of review, you can recommend changes to the plans that would benefit groundwater recharge. Remember, you are charged with the responsibility for approving or denying a project, or requesting modifications to a project prior to approving it, in order to minimize the impact to your local water resources.

Conservation Commissions, while not regulatory, should also be proactive in encouraging their town to adopt a

recharge map. This information also proves valuable to you as a reference in helping to identify lands that may be more "valuable" in terms of preserving the quality of local water resources. Areas with significant recharge should be considered prime spaces for open space conservation and preservation. The first iteration of the Recharge Mapping project, which was a "Manual for Assessing Hydrologic Value of Land Parcels based on Physical Attributes," walks the conservationist through a series of maps to help in the prioritization of open space preservation. This manual, along with the "Recharge Mapping: A GIS-based tool for identifying land with significant groundwater recharge" is available on the Watershed Science section of the Pomperaug River Watershed Coalition's website: www.pomperaug.org/NewScience.htm. Because of their non-regulatory stance, Conservation Commissions are a prime group to use the Recharge Mapping GIS-model to create a map of the "best recharge areas" in your watershed and to share this valuable information with other local land use boards.

If you have questions on how to use the tool, would like assistance in determining how to best incorporate recharge into your local land use planning measures, or have suggestions of how to make the tool more useful, please contact the Coalition at info@pomperaug.org or (203) 267-1700.



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Reduce, Reuse, Recycle: The Natural Order of Things



By Richard W. Canavan, Ph.D.
Senior Environmental Scientist, CME

Reduce, reuse and recycle is the rule for conserving our resources. Reduction and cycling also describe the behavior of elements in the environment. Understanding this elemental cycling is important for topics ranging from septic system design to global climate change. This understanding can be critical when protecting wetlands and water quality.

When leaves and other organic matter accumulate in wetlands, decomposition can consume nearly all of the oxygen. Further breakdown occurs as microbes use other compounds such as nitrate, sulfate or iron-oxides, in place of oxygen. These chemically-reduced environments can change the reactivity and mobility of chemicals, altering the quality of adjacent surface and ground waters.

For example, during decomposition, bacteria can reduce nitrate to nitrogen gas. In this process, nitrogen is converted from a nutrient that is readily available for plants and algae, to a gas that is essentially unavailable. In this manner, wetlands can actually remove excessive nutrients and improve water quality. On the other hand, reducing conditions in sediments can release phosphorus back to surface waters, promot-

ing plant and algae growth. This can impact the water quality of fresh water lakes.

WEbarchive

For more information related to this article, visit www.cmeengineering.com/services_env.html



Chemical cycling is a critical component of wetland functions and values. The interdependent chemical relationships

influence both the wetlands themselves and the water quality of their watersheds.

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The University of Connecticut Center for Land Use Education and Research (CLEAR) has made available on the web their statewide forest fragmentation analysis (http://clear.uconn.edu/projects/landscape/forest_frag.htm).

About 60% of the state is classified as “forested,” i.e., covered with trees (as determined by CLEAR’s Connecticut Changing Landscape project). However, tree cover alone is not a reliable indicator of the functional health of forested ecosystems, which are greatly impacted by proximity to non-forested areas.

CLEAR’s forest fragmentation model uses the land cover data from Connecticut’s Changing Landscape to characterize the degree to which our forests have become carved up by developed landscapes, especially roads. If you look at our [land cover maps](#), or better yet [our animations](#), your eyes can pick out the general pattern of how the green forested areas of your town or watershed have been changed by development – but we want to be able to describe those patterns objectively, and in some detail. The forest fragmentation model allows us to do this. It looks at each individual forested “[pixel](#)” and notes its relationship to the other pixels around it. By doing this for the entire state (nearly 14 million pixels!), it classifies all forested land into one of five types: interior (core) forest, perforated forest, edge forest, transitional forest and patch forest. This will help us to gain more insight into the impacts of development patterns on our forest and related wildlife resources.