

Changing Land Use Decision Making One Town at a Time

The NEMO Project At the Ten Year Mark

Laurie A. Giannotti and Chester L. Arnold

University of Connecticut Cooperative Extension System

Originally published in *NOWEP Notes*, published by North Carolina State University, June 2002

Introduction

The *Nonpoint Education for Municipal Officials* (NEMO) Project was created in 1991-1992 at the University of Connecticut, as a collaboration the Cooperative Extension System, the Natural Resources Management and Engineering Department, and the Connecticut Sea Grant College Program. A major objective of NEMO was to demonstrate the effectiveness of using remote sensing and geographic information system (GIS) technologies to inform and enhance educational programs linking local land use decisions to water quality issues. The most important aspect of NEMO, however, was not its use of technology but its focus on local land use decision makers as the educational target audience.

NEMO was created in recognition of the relative lack of education and assistance available for local land use decision makers. Land use decisions are a key determinant of the social, economic, and environmental health of our communities, and land use in the United States is predominantly a local issue (Arnold, 1999). Land use policies are developed, and land use decisions are made, by elected and appointed officials at the county and municipal or town level. Most of these critical decision makers are volunteers with little or no training in land planning or natural resource protection, and many lack professional staff or outside assistance.

The original pilot project, funded by USDA, was an outgrowth of the Long Island Sound Study National Estuary Program and focused on three coastal towns. Although the size of the project has remained modest, at present NEMO has worked with over two-thirds of the 169 municipalities in Connecticut, and is an integral part of the state of Connecticut's Nonpoint Source (NPS) Management Program. The project is also the coordinating center for the National NEMO Network, a confederation of 23 projects in 21 states and territories (see related article).

This article briefly reviews the evolution of NEMO's methods in Connecticut, and provides examples of the changes to local plans, regulations, policies, and practices that our local partners have implemented, with the assistance and support of the NEMO Project.

Methods

Both the topical content and the delivery methods of NEMO's educational programs have changed over its ten years of existence.

The pilot project created the "basic" NEMO educational program, *Linking Land Use to Water Quality*, which uses a combination of digital photos, carefully simplified GIS maps, and remote sensing images to take the audience through the impacts of development on the water cycle, the concept of watersheds, and the role of land use in determining the health of the watershed

(Arnold *et al.*, 1993; Stocker *et al.*, 1999). The emphasis of the latter half of the program is on the relationship between impervious cover and watershed health, a concept now widely supported by the literature (Schueler, 1994; Arnold and Gibbons, 1996). Community decision makers are then presented with a three-tiered strategy of planning, development design, and best management practices as way to address nonpoint source pollution.

Linking Land Use was synonymous with NEMO for the first five years of the project, and continues to be a programmatic mainstay. However, the NEMO educational package has broadened considerably in the last five years. This is partly in response to the needs of our towns, and partly driven by the evolution of project philosophy to embrace natural resource based planning as the overall framework of how communities can best balance growth and environmental protection in their community. Natural resource based planning begins with resource inventories that identify and prioritize natural, cultural, and other resources, which then inform both the conservation and development halves of community planning. The need for communities to address both the conservation and development sides of the community planning equation is key aspect of the process (Arnold and Gibbons, 2001).

At least 10 additional educational “modules” have now been integrated into the project. Some were newly developed, some (primarily community planning programs) were co-opted from longstanding Extension programs, and some were developed by partners such as the Sea Grant program and the Extension Forestry program. The entire menu of NEMO educational programs can be reviewed on the project web site at:

http://nemo.uconn.edu/workshops_initiatives/index.htm

For most of the lifespan of the project, delivery of educational programs has been largely reactive, as staff responded to requests from Connecticut towns generated by our work in the pilot communities. By 1998, NEMO’s CT staff (principally two people) were conducting about 150 educational workshops a year, most by request. As the educational offerings of the project expanded, the nature of the interchange between a “client” town and the project changed somewhat. While *Linking Land Use* continued to be the most common “point of entry” into a town, town officials were encouraged to avail themselves of the full educational package. As a result, although “one shot” educational programming still occurred, in many cases more extensive relationships began to develop between the project and certain towns.

To further capitalize on this evolution, in 1999 project staff, in collaboration with the Nonpoint Source Section of the Connecticut Department of Environmental Protection (CTDEP), developed the *Connecticut Municipal Initiative*. The Municipal Initiative allows the NEMO Team to focus more resources on fewer municipalities, establishing relationships between the project and these towns that exist from the initial educational program through to implementation of on-the-ground changes.

Each year, NEMO distributes a Request for Proposals (RFP) to all 169 towns in Connecticut, soliciting admission into the Municipal Program. The application form is quite simple – one page – but its underlying purpose is to get municipalities to commit to the process of working with the University as partners on a long-term educational program with specific goals. Five municipalities, one for each of the five major Connecticut river basins, are chosen each year. Towns are selected based on the following criteria: (1) desire to incorporate NEMO’s strategies in the five categories listed below; (2) willingness to establish a NEMO Task Force committed to working with the NEMO team to achieve implementation; (3) willingness to serve as a model to other CT municipalities, as well as to members of the NEMO National Network.

Selected towns must designate a “contact person” for the project who will be responsible for facilitating communication both between the project and the town, and among various bodies within the town. The contact person works with the NEMO team’s Connecticut Programs Coordinator to set up an initial meeting between the project team and the town’s NEMO task force. Membership of the task force must include, at a minimum, members of the following commissions or boards: planning, zoning, inland wetlands, conservation, and the office of the chief elected official (town council; board of selectmen, mayor’s office). Other groups, such as town departments, land trusts and economic development commissions are also encouraged to participate.

At the initial meeting, the Coordinator reviews the NEMO Project and its educational offerings, and describes the Municipal Initiative and its objectives. Task force and project staff then agree to a “laundry list” of specific town objectives, drawn from the general categories suggested by NEMO but heavily influenced by the needs and interests of the town. The categories are:

1. Changes to the **administrative procedures**. Examples include establishing new commissions, or separating a “combined” commission (e.g., conservation and wetlands) into two commissions, for more effective operation. These changes create a decision making structure that is more conducive to proactive planning.
2. Foundational **research and information gathering**. For example, conducting a natural resource inventory to identify priority natural resource areas for protection, or a study to identify the town’s economic assets. These initiatives help provide the local data upon which rational land use plans and decisions can be based.
3. Changes to **planning documents**, such as open space plans, economic development plans, comprehensive plans, or watershed plans. Plans are critical documents that provide the “big picture” vision, goals and priorities of the community.
4. Changes to **regulations**, including zoning, subdivision, and road design regulations. Regulations give “teeth” to plans, and provide specific objectives to be met.
5. Changes to town **policies**, for example, road sand sweeping procedures and catch basin and detention/retention pond maintenance. Policy changes help ensure that a town takes care of its own responsibilities, in addition to directing the actions of others.

In addition to the educational presentations, NEMO provides support through guidance documents (fact sheets, publications, CD’s), Internet tools, GIS and remote sensing information, and consultation via telephone or meetings. Team staff occasionally will review documents or regulations that the town is creating or updating, to advise on the how the management strategies promoted by the project are being incorporated. However, the NEMO Project draws a fairly firm line in the sand about its educational role, and does not write regulations, produce planning documents, review site plans, testify at public hearings or provide “on-demand” GIS mapping.

Results

While NEMO (along with its sister projects across the nation) is continually seeking better ways to capture and relate project impacts, we can say with certainty that as a result of participation in the Municipal Program, towns are making changes in the five categories outlined in the previous section. Following are four brief case studies of towns that are part of the “Year One” (2000-2002) class of the Municipal Initiative. Information can also be found at:

http://nemo.uconn.edu/case_studies/index.htm

Woodstock

Woodstock is a rural community in the northeast corner of Connecticut, with a relatively large area (61 square miles) and a population of about 7200. Our latest remote sensing-based land

cover information indicates that developed land (urban and residential uses) accounts for about 18% of the Woodstock landscape, while over 70% is forested.

The first meeting of project staff with the new Woodstock NEMO task force took place in April, 2001. Although Woodstock is still a town that typifies the regional nickname of the “Quiet Corner” of Connecticut, local decision makers expressed concern about the preservation of open space and their rural community character in the face of increasing development, as people commit to making the long commute to Hartford, or the even longer commute to Providence. They were also interested in implementing a sewer avoidance strategy, particularly around their lakes. Based on discussions with the task force, NEMO educational programs that have been delivered to date in Woodstock include *Open Space Planning*, *Site Plan Review for Compliance with an Open Space Plan*, *Creating an Open Space Plan Map*, and *Wet Lands*. In addition, NEMO staff have participated in multi-commission discussions on several occasions.

As a result, the town Conservation Commission has conducted a **natural resources inventory**, which was completed in 2000. The inventory, which identifies key natural resources such as agriculture and unfragmented forest, was done entirely with volunteer effort, supported by the NEMO team, which advised on sources of data and types of data layers that were most relevant.

The inventory is entirely digital, and has also been converted into a *Powerpoint* presentation that can be given to various groups and commissions in town. An **open space plan** was completed and formally adopted in 2001. The plan outlines the rationale and objectives of preserving open space in town. The task force is currently working on refinements to the plan, incorporating the latest natural

resource inventory data to develop a detailed open space plan map (Figure 1).

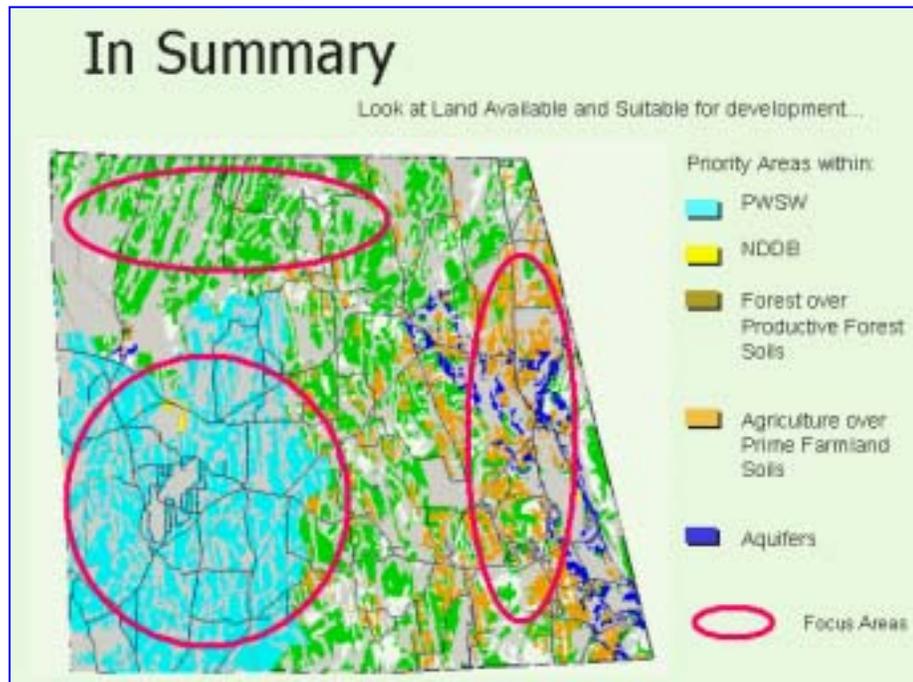


Figure 1. Detail from a map taken from Woodstock's open space plan.

As part of the implementation of the open space plan, the Planning and Zoning Commission has asked the Conservation Commission to **review subdivision applications** for consistency with the Open Space Plan. The idea is that any open space set-asides requested from developers at the time of subdivision should be located and managed in order to maximize the benefits to the town open space network. NEMO staff, along with staff from a sister project, the Green Valley

Institute, conducted a specially-designed workshop on subdivision review for the Conservation Commission.

Planning and Zoning is also **updating their comprehensive plan**, called in Connecticut the Plan of Conservation and Development, or POCD. The consultant engaged to assist the town has met with the Conservation Commission and NEMO staff, to discuss the process of incorporating the open space plan and NEMO stormwater management principles into the Plan. Sea Grant staff associated with the NEMO project conducted the “*Wet Lands*” educational workshop for the Inland Wetlands Commission, who are interested in strengthening their wetlands and watercourses **buffer regulations**. The Economic Development Commission has been re-activated and attended NEMO’s Economic Development Planning workshop as a means to organize their efforts.

Salem

Salem is a semi-rural town in the center of the state, with about 15% developed land and much of the rest in forest. Salem is one of the three towns that comprise most of the Eightmile River watershed, a tributary of the Lower Connecticut River and the focus of a University of Connecticut watershed initiative that began in 1996 (Kane and Worthley, 2000). Local interest generated by the watershed project facilitated the recent Federal designation of the Eightmile as a Wild and Scenic River. However, town decision makers also wanted to move forward more aggressively on a number of other, more local land use initiatives.

NEMO staff met with the Salem task force in May of 2001. The town Conservation Commission had already embarked on a **natural resource inventory**, incorporating information from previous studies done as part of the Eightmile River project. The inventory, which was reviewed by NEMO staff, is now completed. NEMO conducted an open space-planning workshop in July 2001, and NEMO staff are working with the town on folding the inventory information into a new draft **open space plan**, which is expected to be completed over the summer of 2002.

In addition, NEMO staff are working with the Zoning Commission on possible changes to their regulations that would incorporate the concept of “**net buildable area**” and other NEMO principles. At the request of NEMO, the Extension Forestry program held a workshop about forestry practices and logging in September 2001, as a first step toward addressing town concerns about the impacts of logging in wetland areas. NEMO held an Economic Development Planning workshop in March, and we expect to provide guidance to the Economic Development Commission as they work to produce a plan by the end of 2002. A workshop on aquifer protection (to be developed with the CT Department of Environmental Protection and Department of Health Services) is planned for fall of 2002. The First Selectman is working with the NEMO Team and a Professional Engineer from NEMO’s Advisory Committee to assess the possibility of redeveloping a cul-de-sac to reduce imperviousness.

Old Saybrook

Old Saybrook is a suburban town that lies at the confluence of the Connecticut River and Long Island Sound. The town’s landscape is approximately 35% developed, with much of the undeveloped land in either forest or tidal marsh. Old Saybrook has a long history with the NEMO Project, extending back to 1993-94, when it was one of NEMO’s original pilot communities. While some changes to zoning regulations and BMP requirements were made as a result of NEMO’s early work with Old Saybrook, the addition of a full time planner in 1999, and

the inclusion of the town in the Municipal Initiative, have created the critical mass needed for real change.

The town NEMO task force had their first meeting with staff in January of 2001. Town officials were beginning an update to their POCD, and were concerned about both topical issues (e.g., water resource protection) and process issues (e.g., lack of communication between boards and commissions). The town Conservation Commission has conducted a **natural resource inventory**, and is working with the NEMO team on an **open space plan** that incorporates the inventory information (Figure 2). The Conservation Commission is working with the Planning and Zoning Commission to then insert the open space plan into the updated POCD.



Figure 2. Members of the Old Saybrook NEMO task force review maps from the town natural resource inventory.

A number of initiatives are underway relating to development design that is more protection of water resources. In 2001, the Board of Selectman drafted and issued a **Official Policy Statement** that incorporates NEMO's nonpoint source management strategies and supports alternative design standards for site development. In response to this statement, the task force is working with the Town Engineer and others to revise the towns **road ordinances** to allow for alternative storm water management practices that are more in line with NEMO principles and the state/federal Phase II Storm Water Management Program.

In addition, the Planning & Zoning Commission, in collaboration with The NEMO Task Force, Town Engineer and a local developer, have implemented a "**model subdivision**" in town (Figures 3 and 4). The subdivision incorporates vegetated swales, narrow road widths and clustering to help manage stormwater runoff and reduce nonpoint source pollution. Planning and Zoning is also updating its regulations to incorporate **impervious surface limits** in their business districts, in order to minimize impacts from development to their coastal resources and Long Island Sound.

Finally the Commission will be considering incorporating nonpoint source management strategies in the update of its POCD.

The Economic Development Commission will hold NEMO's Economic Development Planning workshop this May, as a kickoff to their planning initiative. In the coming year, Old Saybrook will also be the "guinea pig" town for NEMO in the field testing of two new educational programs, *Site Plan Review to support Natural Resource Based Planning* and *Coastal Resource Protection*, a new module that focuses on priority coastal habitat areas.



Figure 3. Old Saybrook model stormwater subdivision, showing grassed swale drainage system. The NEMO task force poses at subdivision site with the site developer, the town's First Selectman, and the NEMO CT Programs Coordinator.

Naugatuck Valley Brownfields Pilot

The Naugatuck Valley Brownfields Pilot (The Pilot) was established by an EPA grant in November 1996 to provide Brownfields management capacity and financial resources for its member towns. The Pilot involves ten towns in the Naugatuck Valley, a former industrial area in the central part of the state. Two appointees from each municipality and interested parties from the region are on its Board of Directors. The Executive Director of the Pilot attended a NEMO workshop at a conference in 1998. With the stated desire to "not to make the same mistakes twice," he organized a *Linking Land Use* workshop (2000) for the Board. As a result The Pilot has decided to "...require review for inclusion of **design components that reduce the impacts of impervious surfaces** in any project that accepts Pilot assessment funds." This ensures that NEMO design principles will be incorporated into brownfields development in this urban environment.

In addition, The NEMO team is working with The Pilot, regional planning agency staff and several consultants to **incorporate NPS management strategies into the update of the regional plan**. The process involves first updating the individual municipal plans before making changes to the regional plan. The first town to complete its update is Beacon Falls, which has incorporated NEMO's stormwater management and design guidelines into its revised POCD

Additionally, the City of Derby (one of the Pilot towns) has been accepted into the Municipal Initiative. The NEMO team is working with the Mayor's office and the Pilot to help the City's Recreation Commission incorporate nonpoint source management strategies into its plans and projects. NEMO is also working with the City Engineer and the Planning Commission toward updating its road regulations.

Discussion & Conclusions

That professional education of the type that NEMO offers can be an agent for real change, and not just “feel good” fluff, is being realized by a growing number of agencies and organizations. In Connecticut, NEMO is referenced in the state Plan of Conservation and Development, “319” Nonpoint Source Plan, “6217” Coastal Nonpoint Source Plan, and the upcoming Phase II Stormwater Guidance Manual. Some of our older National Network projects are making similar inroads in their states.

Less than two years into the Municipal Initiative, we are already convinced that it is a major improvement over our former, reactive mode of operation. Philosophically and practically, we see no alternative to changing land use decision making “one town at a time” (we might call this the *Smith Barney* model). The Municipal Initiative is designed with that basic fact in mind. The rapidly evolving world of geospatial technology, and its fusion with internet technology, offers potential assistance for local land use decision makers far beyond what we could have foreseen in 1991 (Arnold *et al.*, 2000). However, we believe that this technical support is far more effective – and much more likely to be used -- when mediated by professional education. And, our experience over ten years is that even more than topical information, it is *process* information that is most often needed by our client towns. Helping local leaders initiate new processes, or change existing ones, requires the give-and-take of intensive education.

Our only concern about the Municipal Initiative is not the effectiveness of the model, but its sustainability at our current level of staffing. In an ideal world, towns would “graduate” every 2 years, freeing staff to take on new participants. In reality, the needs of some towns actually become greater with time, as change begets more change and creates the demand for more assistance. One factor that may help is our plan to use Municipal Initiative towns as example for others. No town wants to be the first to adopt something new, but as we put more pictures, case studies, sample documents, and testimonials up on the web, and perhaps begin a list-serve so that town officials and planners can exchange ideas, we envision an exponential increase in the adoption rate of natural resource based planning measures. With enough real-life examples to examine and experienced colleagues to talk to, it may be that an increase in adoption rate will not create a corresponding increase in the need for educational programming.

Finally, because of the National NEMO Network, we always examine Connecticut models in the light of their transferability. The Municipal Initiative, which depends on towns coming to us and committing to a two-way partnership, is probably only possible because of NEMO’s long track record in Connecticut, which created a reputation that makes the RFP approach work. Thus, some might envision that an RFP of the Connecticut type might be met with a tidal wave of indifference in another state. This may or may not be true, but our growing experience with the National Network shows us that there are plenty of “clients” out there, and that the educational model – if not the solicitation method -- is still applicable. The needs of local land use decision makers will only increase with the implementation of new programs like Stormwater Phase II, Source Water Area Protection, and Total Maximum Daily Loads (Arnold and Giannotti, 2000; Arnold and Schueler, 2001)

For project staff, the NEMO experience in Connecticut has been a gratifying lesson in the power of dedicated volunteers to foster change in their communities. We have found that practically every town has resources to put toward natural resource based planning, and chief among these are human resources. But even the most motivated and talented people need assistance in the form of information, education, guidance and tools, and by providing this assistance, NEMO acts as a catalyst for local leadership of the planning process. This approach has real differences from efforts that either arrive in town with their own impetus and solutions (the “we’re from the government and here to help you” approach), or make changes without providing any education, context, or significant local involvement (the consultant approach). Placing the burden of leadership, and at least some of the work, on local officials creates ownership of

new initiatives and gives institutional memory on these issues a fighting chance, thereby making resultant changes in plans and policies more likely to survive into the future.

References

Arnold, C. L. and C. J. Gibbons. 2001. Natural Resource-Based Planning for Watersheds: A Practical Starter Kit. University of Connecticut Cooperative Extension Bulletin, 27pp.

Arnold, C.L. and T.R. Schueler. 2001. New Tools for Communities are Needed if NPS Regulation is to Succeed. Nonpoint Source News Notes, published by the EPA, March 2001. http://www.epa.gov/owow/info/NewsNotes/issue64/64_issue.pdf

Arnold, C.L., and L. A. Giannotti. 2000. The Role of Land Use Education in Assisting Urbanizing Communities in the Newest Round of Water Resource Regulation. Proceedings of the Watershed 2000 Conference, Vancouver, Canada, published on CD. 14pp.

Arnold, C.L., D.L. Civco, M.P. Prisloe, J.D. Hurd, and J.W. Stocker. 2000. Remote-Sensing-Enhanced Outreach Education as a Decision Support System for Local Land Use Officials, Photogrammetric Engineering and Remote Sensing 66(10): 1251-1260.

Arnold, C. L. 1999. Educating Municipalities: Land Use is the Key to Managing Nonpoint Source Pollution. Water Environment and Technology 11(1): 41-44.

Arnold, C.L. and C. J. Gibbons, 1996, Impervious Surface Coverage: The Emergence of a Key Environmental Indicator. Journal of the American Planning Association 62(2): 243-258.

Arnold, C.L., H.M. Crawford, C.J. Gibbons, and R.F. Jeffrey, 1993, The Use of Geographic Information System Images as a Tool to Educate Local Officials about the Land Use/Water Quality Connection. *Proceedings of Watersheds '93*, Alexandria, Virginia, pp. 373-377.

Kane, L. and T. Worthley, 2000, Watersheds of a Last Great Place. Proceedings of the Watershed 2000 Conference, Vancouver, Canada.

Schueler, T. R, 1994, The Importance of Imperviousness. Watershed Protection Techniques 1(3): 100-111.

Stocker, J., C. Arnold, S. Prisloe and D. Civco. 1999. Putting Geospatial Information into the Hands of the "Real" Natural Resource Managers. Proceedings of the 1999 ASPRS Annual Convention, Portland, Oregon. pp. 1070-1076.