

NOTE: this curriculum is subject to change based on the county in which is delivered. All counties follow a core Environmental Stewards curriculum but modify some topics based on area need and interest.

RUTGERS ENVIRONMENTAL STEWARDS MODEL CURRICULUM

<http://envirostewards.rutgers.edu>



RUTGERS
New Jersey Agricultural
Experiment Station

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Table of Contents and Schedule

Core topic indicated with an *

Dates- Wednesday mornings unless otherwise indicated	Topic	Speaker	Location	Page
1/23/2019	Introduction, program overview, and getting to know you*	Michele Bakacs	EARTH Center	3
1/30/2019	Introduction to Soils* (remote participation via Atlantic Cty class)	Clay Emerson, Senior Engineer, Princeton Hydro	EARTH Center	7
2/6/2019	Watershed and Water Quality Protection in New Jersey, Water Sampling Demonstration*	Michele Bakacs	EARTH Center	8
2/13/2019	Environmental Chemistry	Amy Rowe, Associate Professor, Rutgers Cooperative Extension- Essex/ Passaic Counties	EARTH Center	9
2/20/2019	Environmental Issues Affecting Watershed Health of the Lower Raritan	Heather Fenyk, Lower Raritan Watershed Partnership, and Johnny Quispe, PhD candidate, Rutgers Dept. of Ecology and Evolution	EARTH Center	10
2/27/2019	Earthwise Lawn Care and Pesticide Reduction	Bill Hlubik, County Agent, Rutgers Cooperative Extension of Middlesex County	EARTH Center	11
3/6/2019	Solid Waste Management and Recycling	Deanna Miller, Middlesex County Division of Solid Waste Management	EARTH Center	12
3/13/2019	Renewable Energy*	David Specca, Assistant Director for Controlled Environment Agriculture and Bioenergy, Rutgers EcoComplex	EARTH Center	13
3/20/2019	Weather or not? NJ Climate Change*	David Robinson, State Climatologist, Rutgers University	EARTH Center	14
3/27/2019	Geology of New Jersey*	TBD	Rutgers Geology Museum	15
4/3/2019	Internship Project Presentation*	Sue Meaney, Thompson Park Bluebird Trail, Judy Burr/ Linda G- Sea How High	EARTH Center	16

Rutgers Environmental Stewards Program, Middlesex County, 2019

4/10/2019	Local Techniques and Ordinances for Environmental Protection*	Elizabeth Ritter, Association of New Jersey Environmental Commissions (ANJEC)	EARTH Center	17
4/17/2019	Sustainable Jersey Program and Internship Planning	Renee Haider, Associate Director, The Sustainability Institute and Michele Bakacs	EARTH Center	18
4/24/2019	Green Infrastructure and Rain Gardens	Michele Bakacs	EARTH Center/ field visits	19
5/1/2019	TBD	TBD	TBD	
5/8/2019	Stream Biological Monitoring Training	Von Scully AmeriCorps Watershed Ambassador WMA 9	EARTH Center/ field visits	20
5/15/2019	Invasive species 101, identification and eradication strategies	Michele Bakacs	EARTH Center/ field visits	21
5/22/2019	Native bees and pollinator impacts	Colleen Smith, Rutgers PhD student, Rachael Winfree's lab (Michele out of state)	EARTH Center/ field visits	22
5/29/2019	Habitat restoration* Field visit- Ireland Brook Conservation Area	Eric Gehring, Middlesex County Park Naturalist	Ireland Brook Conservation Area, field and work day	23
6/5/2019	Administrative requirements, program evaluation, internship planning, and end of class potluck!	Michele Bakacs	EARTH Center	
6/12/2019	Make up day	Make up Day		
	Online Presentations and Recorded Webinars	Various	Online	24
TBD	Fieldtrip- Bowman's Hill Wildflower Preserve in New Hope	10:30am- 1:30pm, RSVP to Amy Rowe at rowe@njaes.rutgers.edu	Fieldtrip	
TBD	Fieldtrip- PVSC waste water treatment plant in Newark	Tuesday, Time: 9:30am- noon, RSVP to Amy Rowe, rowe@njaes.rutgers.edu Space is Limited	Fieldtrip	
TBD	Fieldtrip- Pine Barrens	9am- 4pm, Emile DeVito, NJ Conservation Foundation. RSVP to Amy Rowe at rowe@njaes.rutgers.edu	Fieldtrip	

INTRODUCTION

Welcome to the Rutgers Environmental Stewards Program!

What is a Rutgers Environmental Steward? A Rutgers Environmental Steward is a volunteer that is trained in the important environmental issues affecting New Jersey and works to help solve local environmental problems.

Since 2005 the Rutgers Environmental Steward (RES) program has been providing training and experience to its volunteers so they can help find solutions to environmental problems in New Jersey. Our program focuses on science, and public policy based on that science. Stewards learn about the techniques and tools used to monitor and assess the health of the environment. They gain an understanding of the research, non-governmental, and regulatory agencies operating in New Jersey that focus on environmental issues. Stewards are introduced to a network of expert individuals and organizations who can be of service to them in the future as they wrestle with solving local environmental problems.

It is our goal that Stewards use their knowledge to expand public awareness of scientifically based information related to environmental issues and help create positive change in their communities. The classes, fieldtrips, and internship do not replace a science degree, but help citizens educate themselves so they are prepared when presented with a real world environmental problem.

THE RES COURSE

Stewards start out by attending class once a week on topics including climate change, soil health, energy conservation, water resource protection, invasive species management, open space management, habitat conservation, protecting pollinators, and environmental policy, and more. RES classes are held normally at different county locations in New Jersey: Essex, Passaic, Somerset, Union, Middlesex, and Atlantic. Each class covers 7 core topics: geology of NJ, soil health, water resource protection, habitat conservation, climate change, alternative energy, and environmental policy. Additional topics are covered based on the needs and important issues in the region.

Leading researchers from Rutgers are joined by colleagues from government, industry and the non-profit sector to share their knowledge with the Stewards and help them make a difference in their own communities. Optional fieldtrips to environmentally significant sites around the state are included as part of the program.

A commencement ceremony is held in the fall for Stewards who have completed the course portion of the program AND those who have completed their internships.

Sakai- <http://sakai.rutgers.edu> Sakai is the online course management system we use to organize all the resources for the RES program. All Stewards will receive an email with instructions on how to login to sakai and additional details for using the system.

INTERNSHIP and CERTIFICATION

Students are certified as Rutgers Environmental Stewards once they've completed 60 hours of classroom instruction *and* 60 hours of a volunteer internship. This internship is one that the Steward develops with guidance from the program coordinator. Projects must be approved by the RES program coordinator and the host organization (if applicable) before the project begins. Guidelines for internships are as follows:

- Can be done individually or as part of a team
- Can be done with a host organization or can be done on one's own
- Should match volunteer's skill and ability and personal interests to assure satisfaction and effectiveness.
- Should be environmentally related.
- Should be achievable within an approximately 60 hour time-frame.
- Should achieve clear, measurable objectives.
- Outcome must produce benefits beyond personal wellbeing.
- Host must agree to provide appropriate support, guidance and written evaluation in a timely fashion.
- Rutgers Environmental Stewards must be represented on all promotional material for the project. For example, flyers should include the program logo and press releases should include the program as a partner along with a brief program description.

Stewards can do their internship on their own or with a host organization such as a local non-profit or government agency. The Program Coordinator will often receive requests for assistance from organizations which are then passed on to Stewards as potential internships. Planning for the internship project is woven into the course portion of the program. Ideas are discussed throughout the course and specific classes are dedicated for planning purposes.

Steward internship projects have included mapping and eradicating invasive species in local parks, completing habitat assessments of their local streams, helping farmers adapt to climate change, composting restaurant food waste, restoring native dune vegetation in shore communities, creating rain gardens, illustrating children's books on an environmental theme, raising awareness of a particular environmental issue through photography, among others. Details on past internship projects can be found the RES website- <http://envirostewards.rutgers.edu>.

Internships are normally completed after the lecture portion of the program but can begin sooner if the student has an approved project ready to go. Stewards are encouraged to complete their internship within a year of completing the course, but this is not always possible depending on the project.

Internship Reporting Forms and Deadlines

Documenting internship projects is vital in order to show the impact the RES program is having on New Jersey communities. There are over 50 Stewards completing internship projects and it is difficult for us to keep track of all the information. We have attempted to standardize the information submitted with 2 important online forms.

1. The Internship Plan

Once an internship is identified, an “Internship Plan” is completed using our online internship planning form and submitted to the Rutgers program coordinator. The internship plan needs to be approved by the RES program coordinator AND host organization (if you have one) BEFORE the project begins.

The form is available at

<http://tinyurl.com/RESInternPlan>

The internship plan is due by the last day of class

2. The Internship Impact Report

Once the internship is completed, Stewards fill out the online “Internship Impact Report”. This form provides a summary of what was accomplished as part of the internship project. Documenting the impact of your work is vital in order to show the impact the Rutgers Environmental Stewards program is having on New Jersey communities. There are over 80 Stewards completing internship projects and it is difficult for us to keep track of all the information. We have attempted to standardize the information submitted with this form. Please help us document the impact of your fabulous work by filling out this form completely with as much detail as possible. The form is available at:

<http://tinyurl.com/RESImpactReport>

The Internship Impact Report is due August 31st of the year the intern is receiving their certification.

Stay Connected!

Facebook Public Page: <https://www.facebook.com/RutgersEnvironmentalStewards>

Private Group: <https://www.facebook.com/groups/RutgersEnvironmentalStewards/>

Twitter: @RutgersStewards

Instagram: https://www.instagram.com/rutgers_environmental_stewards/

Watershed and Water Quality Protection in New Jersey- CORE

Topic Overview: Changing landscapes and the impacts of impervious surfaces and stormwater runoff are an important topic in many local and state conversations. Rutgers Environmental Stewards receive a basic class in water quality protection and watershed management in order to understand how our highly urbanized landscape affects our water resources. This basic overview provides information on stream ecosystem dynamics from the headwaters to the mouth with a discussion of discharge, base flow and flooding. These hydrologic components all vary in a stream based on the type of land use within the watershed. Non-point source pollutants, such as sediment, nutrients, and pathogens, are also influenced by land use as well as the amount of stormwater runoff. The way stormwater has been managed by New Jersey communities has changed over time with changes in the federal Clean Water Act as well as New Jersey's stormwater rules. Currently communities are being encouraged to use low impact development and green infrastructure practices to manage stormwater at the source of where it is generated. This lecture is a precursor to a more in-depth discussion of issues of concern in the Lower Raritan Watershed.

Learning objectives

Environmental Stewards will understand:

- what a watershed is and how they are delineated.
- the concept of stream order and the relationship to watersheds
- basic flow characteristics such as base flow and bankfull discharge and how these conditions change with urbanization
- the importance of the riparian buffer and the ecological benefits it provides to the aquatic community
- the relationship between stormwater runoff and impervious cover.
- the difference between point source and non-point source pollutants as well typical pollutants found in our streams.
- New Jersey's fertilizer law and its function in improving water quality
- actions everyone can take to improve water quality on their home properties including landscape practices
- different types of green infrastructure (rain gardens, rainwater harvesting, permeable pavements, green roofs, etc.) and how they function in reducing stormwater runoff and improving water quality
- a case study of local partners working to improve the Manalapan Brook watershed including planning efforts, funding, and implementation

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Environmental Issues Affecting Watershed Health of the Lower Raritan

Topic Overview:

What motivates ordinary citizens to environmental action? Why might groups organize at a regional / watershed level to address issues of local concern? What legacy and ongoing environmental issues impact the health of New Jersey's Lower Raritan Watershed? How do we know? This session will introduce New Jersey's newest Watershed Association, the Lower Raritan Watershed Partnership (LRWP). It will explain how the organization emerged in response to two threads of interest: 1) concern regarding the unknown health effects of eating fish caught in the Raritan River; and 2) a desire to increase community use of the Raritan River by improving access for secondary contact activities like canoeing and kayaking. It will describe the steps the LRWP has taken to characterize the health of the watershed and what has been learned in the process. We will discuss historic and current land use and land cover and existing land management practices, water body and watershed conditions (and specifically the Lower Raritan Watershed's lack of a TMDL), and pollutant sources including point sources and nonpoint sources. The session will conclude by highlighting actions the LRWP is framing to address these issues and what you can do to help.

Learning Objectives:

Environmental Stewards will understand:

- Where the Lower Raritan Watershed is and the historic and ongoing environmental impacts to this watershed's health.
- The need for watershed level planning to improve Lower Raritan River and local stream health, and the role of watershed management as a strategy that works with the natural layout of the land.
- What TMDLs are, and what point and nonpoint source pollutant impacts are.
- How Watershed Associations characterize the health of a watershed.
- How the LRWP is organizing to address historic and ongoing watershed impacts in the LRW.
- How they can act to protect their watershed!

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Earth-wise Lawn Care and Pesticide Reduction on Home Landscapes

Topic Overview: Over-use of pesticides and fertilizers on home landscapes contributes to water quality pollution, and endangers the health of aquatic organisms as well as our families, ourselves, and landscape professionals. There are many best practices that can be utilized to sustain a healthy, vibrant landscape without the over-use of pesticides and fertilizers. These practices include using proper plant genetics, using right plant, right place concepts, having the soil tested in order to understand the physical, chemical, and biological make-up of the soil, using appropriate cultural practices (mowing high, returning grass clippings, reduced irrigation, proper pruning techniques, etc.), and educating yourself and the public about the dangers of chemical over-application to home landscapes. This lecture will help participants adopt more environmentally friendly landscaping practices which is an important first step when focusing on improving the local environment.

Learning Objectives

Environmental Stewards will understand:

- Why it is important to introduce native and pest resistant plants to home landscapes in order to reduce fertilizer and pesticide use.
- Why and how to avoid monocultures and improving plant diversity in lawns and gardens
- The difference between warm and cool season turf grasses varieties and which are appropriate for use in the northeast
- The different types of “cultural management practices” to reduce pesticide and fertilizer use
- The steps for taking a soil test and interpreting soil test results
- Natural soil amendments (such as compost and lime) and fertilizers that help improve nutrient deficiencies, soil acidity, and organic matter
- The basics of integrated pest management for controlling pests and diseases in a landscape

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Solid Waste Management and Recycling

Topic Overview: Middlesex County's Division of Solid Waste has one of the best recycling programs in the state. The Division oversees many important programs including the household hazard waste program, compost sales, propane tank collection, and others. The county is mandated to have a solid waste management plan making it mandatory that all residents, institutions, and businesses in the county recycle. Recycling in New Jersey became law in 1987 via the Mandatory Source Separation and Recycling Act. The five R's of recycling include reduce, reuse, recycle, and the little known react, and reject. Composting is a type of recycling which enables residents to reduce the food waste that goes to local landfills. If items are not recycled they are diverted to a landfill or incinerator. Understanding the recycling process will enable environmental stewards to support effective recycling programs in their communities.

Learning Objectives

Environmental Stewards will understand:

- The history of recycling in New Jersey and the current laws in place that mandate recycling
- What the 5 Rs of recycling really mean- reduce, re-use, recycle, react, and reject
- The difference between items that are recyclable and those that are made from recycled materials
- The different plastic resin types, which ones can be recycled, and why.
- Why composting varies from one municipality to another
- The basics of different types of composting, what can and can't be composted, and the supplies needed for home composting.
- How much solid waste is generated by the state and the county and the different management practices for different types of waste.
- The structure, function, waste flow, and management of a county landfill including service fees assessed to haulers.
- How long it takes for different types of litter to decompose.

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Renewable Energy- CORE

Topic Overview: This lecture provides an overview of all energy sources and uses in the nation and New Jersey. From this larger view, a detailed discussion of renewable energy technologies is provided. Based on a Rutgers University biomass assessment for NJ, greater insight into biomass and its current and potential uses in energy production is also included. The EcoComplex, one of Rutgers University's outlying research stations, has been conducting research into the use of biomass for energy in New Jersey, especially waste-based biomass. This lecture discusses some of the results of this research along with current and future opportunities, barriers and economics for renewable energy.

Learning objectives:

Environmental Stewards will understand:

- the Program Areas of the Rutgers EcoComplex – Clean Energy Innovation Center
- current energy consumption, nationally and in New Jersey
- different types of renewable energy systems
 - Solar
 - Wind
 - Geothermal
 - Small-scale Hydropower
 - Biomass
- the New Jersey Clean Energy Program; its history and current status
- factors affecting the economics of biomass
- how Municipal Solid Waste (MSW) could be used as energy and where biomass is concentrated in the state
- the various pathways for biomass conversion to usable energy
- the Bioenergy Calculator and how it can assist with energy decisions

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Weather of Not? New Jersey Climate- CORE

Topic Overview: There may be no more debated topic in the realm of environmental discussion than climate and climate change. This class focuses on the science of climate. It provides participants with the scientific study of climate and weather. The lecture provides both overall global data and local New Jersey data. Participants will learn about past and present climate. The causes of climate change, past and present, and the projected future climate with the associated impacts of climate change will be discussed.

Learning objectives

Environmental Stewards will understand:

- that climate is a system and that New Jersey's climate is affected by various air masses, local factors, the North Atlantic Oscillation, El Nino, and other global systems the difference between climate and weather
- past weather and climate events or episodes
- how weather and climate events can severely impact daily life
- key factors causing climate change, including the greenhouse effect
- the scientific evidence used to monitor variability and change with the climate system including, rising global temperatures
 - Rising sea level
 - Shrinking sea ice
 - Shrinking glaciers
 - Shrinking snow cover
- about the potential environmental and societal impacts of climate change
- how they may participate in efforts to mitigate factors contributing to climate change
- where weather and climate changes may be headed within the 21st century the "perfect storm" scenario of Sandy and also the implications of future devastating storms

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Geology of New Jersey- CORE

Topic Overview: Geology and environmental studies overlap and a basic understanding of geologic concepts is critical for certain aspects of environmental science. The physiographic provinces of New Jersey (the highlands, ridge and valley, piedmont, and the inner and outer coastal plain) impart distinctive traits to each area including topography and groundwater availability. Different types of rocks (igneous, metamorphic, and sedimentary) are found in each of these regions and were formed over different geologic time periods via formation processes that use heat and pressure. New Jersey's geology affects many environmental issues such as development, water supply, and waste disposal. Sampling devices used by geologists provide accurate data on the flow and quality of the groundwater. New Jersey's coastal plain area currently has problems with salt water intrusion and sand loss and the New Jersey Geological and Water Survey is responding to these issues. The glacial history of New Jersey imparts topography and aquifer capacity to the northern area of our state. An understanding of geology guides or impacts many of the future topics that follow including for example; soils, restoration practices, infiltration of best management practices, climate, and water resources.

Learning objectives

Environmental Stewards will understand:

- the different types of pressures that form rocks
- the different physiographic provinces in New Jersey, their ages, the different rock types, and the processes that formed them
- the three types of rocks – igneous, metamorphic, and sedimentary, and the processes that form them
- the difference between relative and absolute dating and the limitations of both
- plate tectonics and the different movement of plates where crust is being created and destroyed
- our current topography and the weathering processes causing erosion
- how each physiographic province, with its specific geologic characteristics, is reflected in environmental issues such as salt water intrusion in the Coastal Plain, subsidence in the karst areas of the Valley & Ridge area or ground water aquifers in fractured rock areas of the Piedmont
- the Private Well Testing Act and the information it contains
- a few of the tools and field testing protocols that NJGWS employs to collect information on the geology and water of New Jersey

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Internship Project Presentation

Topic Overview: The RES internship is meant to help Stewards get experience developing and implementing a project plan focused on an environmental issue and begin to make a difference in their own communities. Often it is difficult to know how to get started and how to focus ideas into a realistic plan that can be achieved in a 60 hour timeframe. Hearing from Stewards who have had success with their internship can help new Stewards focus their ideas. Projects have varied from conducting stream assessments in a watershed to a photography art show focused on environmental issues in the Pinelands.

Learning objectives

Environmental Stewards will:

- Learn about 2 successful internship projects including how the Stewards got started and the important steps that made the project successful.
- Network with Stewards from previous classes who have completed the program.
- Begin to focus their ideas into specific objectives, tasks, and timelines and formulate a plan for their own projects.

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Local Techniques and Ordinances for Environmental Protection- CORE

Topic Overview: Local protection is crucial in order to effectively protect the environment. All land uses affect the environment and the New Jersey state legislature delegated the power to regulate local land uses to the municipalities through the Municipal Land Use Law (MLUL). Local land use management is overseen by municipal planning boards, zoning boards, and, if appointed, an environmental commission. The environmental commission (EC) is an advisory body to the municipality. One of the most important tasks an EC can complete is an environmental resource inventory (ERI) of their town. The ERI should be adopted as part of the town's master plan. A town's master plan establishes goals and policies such as protecting water quality, floodplains, and forests. It also designates areas for parkland and future growth. Municipalities establish how certain areas can be used (for examples as a commercial, residential, or open space area) through their zoning. Zoning also determines densities of these uses. Towns can adopt ordinances to protect different environmental features such as steep slopes, streams, wetlands, and trees. The master plan, ERI, zoning, and ordinances are all tools a municipality can use to protect their local environment.

Learning Objectives

Environmental Stewards will understand:

- How local governments are set up in New Jersey
- How the municipal land use law sets out powers of local boards including planning and zoning
- The function of the environmental commission
- The basic elements of an environmental resource inventory (ERI) including local geology, aquifer recharge, impervious cover, types of soils, and topography
- how an ERI, a master plan, and different types of environmental ordinances should be used to protect local environmental features
- How to read a development site plan and what environmental protection measures we should look for.

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Internship Planning and Open Discussion

Topic statement: The class will have an open discussion about internship ideas and begin to plan our projects. Stewards often overestimate how much work they can realistically achieve in a 60 hour timeframe. This is a specific time set aside for Stewards to focus on developing the internship project instead of trying to do it on their own. Specific guidelines that all projects must follow are listed at the beginning of this criteria. Even if the Steward does not have a project yet, this is an opportunity to research ideas and discuss opportunities with the program coordinator and other students. Computers will be provided to start working on the online Internship Plan. Often, once the lecture series ends, Stewards that had the best intentions of working on their project find that life's priorities get in the way. Having a plan that the Steward created with specific tasks and deadlines outlined will help the student stay on track once the lecture portion is over.

Learning Objectives:

Environmental Stewards will understand and have the opportunity to:

- Give a summary of their potential internship project, if known.
- Review the online internship plan, project impact report, and project guidelines
- Brainstorm and research ideas for their project
- Identify specific tasks needed to accomplish in order to get their project going.
- Identify any collaborations either with other Stewards or with a host agency

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Green Infrastructure and Rain Gardens

Topic Overview: Green infrastructure is an approach to wet weather management that uses soil and plant to soak up rainwater and infiltrate it into the ground. Some green infrastructure techniques involve storing rainwater for a later use such as rainwater harvesting. Rain gardens (or bioretention basins) are a popular green infrastructure technique that can be used on residential, municipal, school, or commercial properties. Rain gardens are beautiful, low maintenance, and inexpensive gardens that are used to reduce rainwater runoff. When it rains, the roof, driveway, or street runoff is directed into the rain garden. These gardens help reduce flooding and pollution in local rivers and streams. They can also be installed in parking lots, at municipal complexes, schools, or anywhere where there is a lot of pavement that does not allow rainwater to soak into the ground. The steps for installing a rain garden are not difficult but require some pre-planning and calculations to understand how large the garden should be based on the area it is draining (for example, a roof, driveway, or parking lot). Rutgers Cooperative Extension has been helping communities install rain gardens all over the state. This lecture will show some recent examples and will teach Stewards how to design, build, and install a rain garden.

Learning Objectives

Environmental Stewards will understand:

- How green infrastructure is different from grey infrastructure and the environmental benefits of these practices.
- How rain gardens can help meet the state stormwater regulations
- The environmental benefits of rain gardens
- Factors to consider when sizing a rain garden including soil type and area of drainage.
- How to install and maintain a rain garden
- The different hydrologic regimes in the rain garden and how that impacts plant selection
- Why native plants are important for a rain garden but are not the only plants that can be used
- Different plant species often used in rain gardens
- How neighborhood rain garden projects can be implemented as well as public projects.
- Where to find funding for rain gardens if you are working with a municipality, school, non-profit, etc.

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Invasive Species 101, Identification, and Eradication Strategies

Topic Statement: The lecture provide information on the problem of invasive species both in New Jersey and in the nation. Stewards will understand how invasive species impact our ecosystems, how native flora or fauna are at a disadvantage, the type of habitat that is most hospitable to invasive species, and common N.J. invasive terrestrial species. Common native plants that can be utilized in place of invasive species will be presented. In addition, stewards will learn the basics of keying out plants and important resources for identifying invasive plants in the landscape.

Learning objectives:

Environmental stewards will understand:

- the global causes of the invasive species problem.
- the impacts invasive species have on the native flora and/or fauna, including on threatened and endangered species.
- the common means of access that have allowed invasive species to flourish in N.J., the U.S. and globally.
- what makes a good home for an invasive species (e.g. disturbed habitat).
- how to identify some common terrestrial invasive species in N.J.
- planting alternatives to invasive species (i.e. natives) and other homeowner solutions to combat invasive species.
- resources available for information on invasive species in N.J.

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Native Bees and Pollinator Impacts

Topic Overview: 87% of flowering plants are pollinated by animals, including many of the crops we rely on for food. In New Jersey, bees are the most important group of pollinators. There are over 400 different bee species in the state, however, some of these species are currently threatened by a variety of environmental stressors, including parasites, pesticides and lack of flowers. Three ways to promote bee health are planting pollinator habitat restorations, setting out nesting boxes, and mowing yards in suburban areas less frequently.

Learning Objectives

Environmental Stewards will

- be able to identify the major genera of native bees in New Jersey by sight and know basic biology and life history characteristics of these genera.
- know which pollinators are currently threatened and what the major threats to these pollinators are
- have an understanding of basic restoration techniques for promoting pollinator population growth

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Habitat restoration- Ireland Brook Conservation Area

Topic Overview: Middlesex County Office of Parks and Recreation manages over 10,000 acres of parkland across the county. These include heavily manicured, actively used recreation facilities as well as large tracks of open space with diverse habitats. We will visit a recently acquired site within Ireland Brook Conservation Area in East Brunswick. The site is a former gravel quarry and has been degraded over the years by heavy equipment as well as dirt bike activity. It is immediately surrounded by unique Pine Barrens habitat similar to the Spotswood Outlier in Jamesburg Park Conservation Area. This site was restored with 375 native plants that match the species typically found in the Pine Barrens. These include Pitch pine, White oak, Sweet fern, and flowering perennials that will attract native pollinators.

Learning Objectives

Environmental Stewards will understand:

- The importance of access to open space in heavily developed counties
- How the county is working to restore a variety of habitats including partners, funding, volunteers, and planning.
- The basics of habitat restoration including planning, design, funding, and planting
- The importance of maintaining a project once it is installed

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before:

Online Presentations and Recorded Webinars:

Pre-recorded presentations and videos are available on the sakai site in the “Video Presentations” tab. These online presentations are not required but are highly encouraged.

Video presentations available via sakai:

- Restoration Ecology: Restoring Native Habitats to our Urban Centers
- The Evolution and Devolution of Environmental Law and Policy
- How to Compost in Your Backyard
- The Central Problem of Our Time: Cumulative Impacts of Human Activities
- Moving Water: Water Supply and Wastewater Infrastructure in New Jersey

Other online presentations are listed below including instruction on how they can be accessed.

Methods for Evaluating Program Impact

This presentation is available at

<https://sas.illuminate.com/p.jnlp?psid=2014-05-02.1131.M.8F39F8ADE9A84520A9F891CADD6CD7.vcr&sid=783>

It takes a little while to get it up and running so be patient. It has been played successfully with Google Chrome as the browser. There were some problems using Internet Explorer. It requires the user to OK the download of Blackboard Launcher, then click on play, click on the downloaded document, then run. Note these steps may not be the same in each browser or browser version.

Topic Statement: This lecture provides an introduction to developing an internship project. It outlines the planning process for developing objectives and identifying outcomes that are tangible and can be quantified in order to show impact. Learning how to plan out a project in a thoughtful method, whether for this internship or in other arenas, is a tool that can lead to meaningful programs and projects. Often the difference between what is seen as a highly successful project or a project that receives a tepid review is the planning that occurred prior to implementation. .

Learning objectives

Environmental Stewards will understand:

- how to develop project goals and SMART objectives and the difference between the two
- what goes into project/program development
- the difference between short, medium, and long-term outcomes
- tools that can be used to determine the impact of your project/program
- the necessary steps for successful program evaluation
- how to write a successful impact statement about their project/program

Online Presentation: The Evolution and Devolution of Environmental Law and Policy of New Jersey

Topic Overview:

This presentation is available on sakai and on youtube via the following link:

https://www.youtube.com/watch?v=ds3kfpxc_bo&feature=youtu.be

In order to understand the environmental arena in New Jersey it is critical to understand the various levels of government and different aspects of environmental law and policy. New Jersey was unique in many ways and often led the way in developing and enacting landmark environmental legislation. This lecture covers legislation enacted over many decades; federal and New Jersey-specific, in order to provide Stewards with a basic overview of environmental law and policy. The course begins with pre-Earth Day legislation and shows how New Jersey had several significant pieces of legislation in place prior to Earth Day, due to the issues that shaped it as the state that was destined to become an environmental leader. The topics covered begin with traditional conservation of public lands and wildlife designations and how these laws reach back to our history of origin as English subjects, and then move into the incredible array of landmark laws that followed. Since April 22, 1970, New Jersey has enacted more than 1,200 pieces of environmental legislation, including the law that created the New Jersey Department of Environmental Protection. This lecture takes the Rutgers Environmental Stewards on a journey through the creation of much of this legislation; but more importantly sets the backdrop for why and how this legislation was enacted created and what issues were in play at the time. The role of various levels of government, the role of the public, and how the role of the private sector has evolved over time are all critical factors to understand the intricacies of environmental law in New Jersey. Where we are now with environmental law and policy, emerging issues, and the potential future of the New Jersey environmental law and policy are also covered in this course.

Learning objectives:

Environmental Stewards will understand:

- how environmental law and policy developed on both the federal and state levels
- how New Jersey was one of a handful of states where this development took place well ahead of the pace in other states, and why that happened
- specific, definable phases in the development of environmental law and policy
- where environmental law and policy are likely to be going in the future

What did I learn? What will I do?

1. What was the most important concept you learned from this discussion?

2. Name one thing you will do as a result of this discussion that you were not doing before: