2017-2018

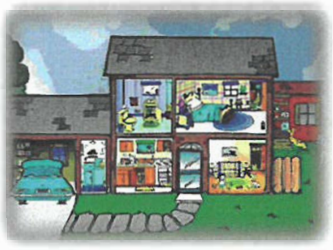
East Shore District Health Department

Annual Report PART II

ESSENTIAL SERVICE #6: ENFORCE LAWS AND REGULATIONS THAT PROTECT HEALTH AND ENSURE SAFETY

We have a well-trained, experienced staff of Registered Sanitarians working under the Assistant Director of Health to carry out our environmental health programs. Sanitarians are environmental health inspectors whose professional pursuits and duties are necessary to the promotion of life, health, and well-being of the public. Our sanitarians enforce the CT Public Health Code as well as State statutes and local health ordinances and work in an advisory role in many environmental health areas. The laws and regulations we uphold include duties such as food inspections, water monitoring, and subsurface sewage disposal system inspections.

Housing Code Enforcement - The health department is dedicated to ensuring safe housing through education and inspections. Local codes and state statutes concerning housing standards are to protect anyone who rents their residence. With enforcement supported by the State's Attorney's office and education provided to those who rent residences, we protect the health and welfare of many of our residents.



Food Service Inspection Program - Approximately 355 food establishments are inspected regularly by our environmental health staff and licensed annually. Food establishments are assigned a food classification (Class I, II, III, or IV) depending on the scope of food prepared and served. This classification determines the inspection frequency. The main purpose of our inspection program is to ensure food safety and to prevent the occurrence of food borne illness in our communities. Special attention is given to safe food practices, prevention of food contamination and food temperature control. Reports of food borne illness are also investigated by department.

Food Service Establishment Inspections by Class 2017-2018				
	Branford	**North Branford**	**East Haven**	**Total**
Class I	27	8	17	52
Class II	25	9	11	45
Class III	75	30	50	155
Class IV	202	48	110	360
Totals	329	95	188	612

East Shore District Food Establishment Inspection Numbers

Temporary Event Inspections - The Health District is also responsible for inspecting and permitting food vendors at temporary events such as fairs and festivals. The shoreline is very rich in the diversity of foods available at events and fairs. We are pleased to have inspected over 160 booths in 70 different events, some single day and some multiple day. From Thai food to fried dough, gyros to cannoli's, our inspectors have dedicated countless hours to ensuring proper food handling and sanitation at area events. Annual temporary event food safety training classes were held for the large events to train food vendors and food booth managers on the basics about preventing illness during outdoor events.

Other Food Service Inspections 2017-2018				
	Branford	**North Branford**	**East Haven**	**Total**
Plan Reviews	84	15	16	115
New Food Svc. Pre-Op	25	7	6	38
Temporary Inspection	103	76	29	208

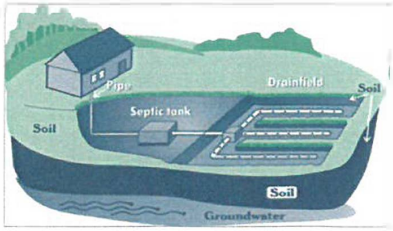
Other East Shore District Food Establishment Inspection Numbers

Private Well Water Supplies - The Health District regulates new private well water supplies and assists the Connecticut Department of Public Health on regulation of private, non-community and community water supplies. We provide guidance to homeowners served by private wells. Our activities include ensuring compliance with the Connecticut Public Health Code for drinking water quality standards, interpreting water analyses, inspecting and approving well sites, approving completed wells for use and enforcing well construction standards.

WATER SUPPLY Inspections 2017-2018				
	Branford	**North Branford**	**East Haven**	**Total**
Well Site Inspection	4	28	0	29
Well Water Sample	1	0	0	1
Analysis Review	29	64	6	99

East Shore District Water Supply Inspection Numbers

Subsurface Sewage Disposal - On-site subsurface sewage disposal systems are regulated by the Health District. This includes evaluation of new and existing lots for sewage disposal capacity and code compliance through deep test pit and percolation testing and lot development plan reviews. Permits are issued for new installations, repairs, and alterations to all systems. Our installation inspection program ensures system construction compliance with the Connecticut Public Health Code and technical standards. Additions and alterations to buildings and homes are regulated by the District by evaluating lots for sewage disposal capacity prior



to construction approval. Below is a table of subsurface sewage disposal activities handled by the East Shore District Health Department this year.

SEWAGE DISPOSAL 2017-2018				
	Branford	**North Branford**	**East Haven**	**Total**
Soil Test (new)	8	19	0	27
Soil Test (B100)	19	12	2	33
Soil Test (repair)	21	39	2	62
Subdivision Soil Work (1/lot)	3	11	0	12
Subdivision Plan Review	0	56	0	56
Engineer Plan Review	26	77	4	107
Non-Eng. Plan Review	45	45	1	91

East Shore District Soil testing and plan review numbers

Barbering/Hairdressing/Cosmetology and Tattoo Parlor Inspection - The District established a local ordinance early in 2004 to inspect hair salons, barber shops, spas and manicure/pedicure facilities, and tattoo parlors. The ESDHD inspected these facilities as well as massage parlors. Education & training are provided to operators. This year the health department offered education to nail salon owners and employees on proper hygiene for nail salons.

Cosmetology Establishments 2017-2018				
	Branford	**North Branford**	**East Haven**	**Total**
Beauty Salon/Barber Shops	114	30	49	193
Massage	11	3	2	16
Tattoo Parlors	2	1	3	6
Nails	22	5	14	41
Beauty Salon/ Massage Combo	5	0	0	5

East Shore District Cosmetology Inspection Numbers

Other Activities Performed by ESDHD Environmental Staff - The ESDHD staff also inspects daycare centers, motels, pools, beaches, and collects ground water and lead samples.

OTHER INSPECTIONS 2017-2018				
	Branford	**North Branford**	**East Haven**	**Total**
Day Care Centers	7	3	2	12
Motels	14	0	1	15
B100	55	64	2	121
Pools (Public)	30	5	28	63
Beaches	111	32	45	88
Surf. /Groundwater Samples	0	1	0	1
Lead Samples	2	10	1	13

Other East Shore District Inspection Numbers

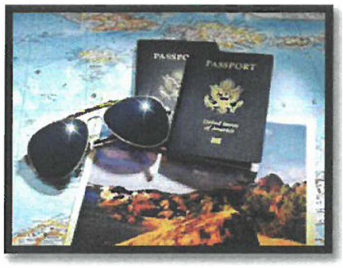
ESSENTIAL SERVICE #7: LINK PEOPLE TO NEEDED PERSONAL HEALTH SERVICES AND ASSURE THE PROVISION OF HEALTH CARE WHEN OTHERWISE UNAVAILABLE

Annual Influenza Vaccinations – Flu season comes around every year, and in the fall the health department provides flu vaccine to the residents we serve. Each year the season presents different challenges. Last year we saw an increase activity in flu cases and an increased demand in flu clinics. We went to each town for extra clinics in January and February and continued providing the vaccine well into March, which is not usually seen. In addition to our traditional community flu clinics we collaborated with the Wallingford Health Department to organize a flu clinic for their community, held a clinic at the YMCA here in Branford, and again worked with our district schools to provide flu vaccinations to the staff. New to the school clinics are Overbrook School in East Haven for their pre-k students (the state requires preschool students enrolled in school to get a yearly flu shot). Over 1,200 residents and town employees were vaccinated this past year at ESDHD clinics.

Even with all the changes and events we continue to provide the services to our towns in a timely and convenient manner to our community, which includes offering the popular program of our drop-in Mondays for the community at large.

We continue to provide free vaccine for folks who for various reasons don't have insurance or their insurance doesn't cover vaccines, the number of people who get the free vaccine has declined as more people have insurance coverage.

MMR (measles, mumps rubella) vaccine – MMR continues to be available for adults going back to college. We most often get calls in the summer before college starts and hear the relief in resident's voices when the realize they can get the vaccine through their health department.



Travel Clinic – The Travel Clinic opened in spring of 2013. Residents are traveling all over the world to places like Antarctica, Haiti, Zimbabwe, Brazil, the Galapagos Islands and many more. The Travel Clinic provides travel-related vaccinations, travel health guidance and written information for the planned trip. Vaccines such as Yellow Fever, rabies, Hepatitis A and typhoid are among some of the vaccines available for people traveling internationally. There was a shortage of Yellow Fever vaccine this past year while the lab where it is made

is upgraded. Prescriptions are written for conditions such as travelers' diarrhea, anti- malaria and altitude sickness. The service to our communities of providing travel-related vaccines and travel health information makes us a more well-rounded health district. The clinic, which is staffed by an experienced and knowledgeable physician and public health nurse, is open twice a month on Wednesdays, from 9 am-12 noon. Appointments are required. The travel clinic is open to adults and children. In the past year, we administered 62 typhoid vaccines, the most sought vaccine for travelers. Since we started the travel clinic we have administered over 60 yellow fever vaccines, a vaccine we are certified by the state of Connecticut Department of Public Health to administer.

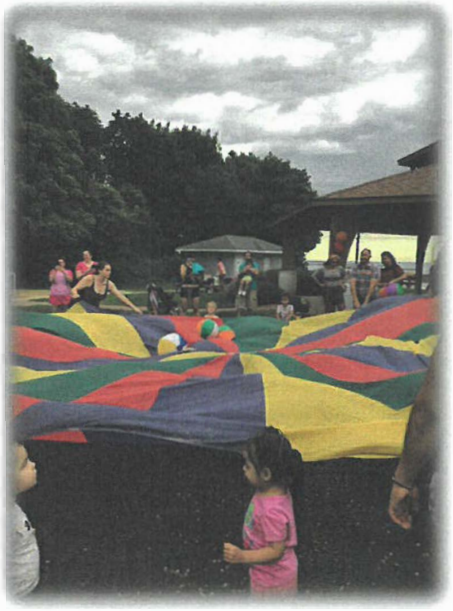
The Cocooning Program - This very popular program provides the Tdap vaccine (tetanus, diphtheria and pertussis, also known as whooping cough) to adults who live with or care for a baby younger than 12 months of age. Pregnant mothers are recommended to get the vaccine between 27-36 weeks of pregnancy to maximize the maternal antibody response and passive antibody transfer to the infant.

Whooping cough is on the rise in the United States. The vaccine is free for residents in our district and $20 for persons living out of the Health District. Over 30 residents took advantage of this program to get their Tdap vaccine to protect themselves, in order to protect the babies, they care for.

Work-Site Wellness – Work-Site Wellness is a new program offered through the health department. The Public Health Nurses (PHN) visit worksites to assess and educate employees on their *'numbers'*. The numbers being assessed by the PHN include blood pressure, pulse, pulse oximetry (level of oxygen in the blood), total blood cholesterol, blood sugar and body fat analysis. Once assessed, the PHN spends individual time with each employee by reviewing their results and providing health guidance and education on ways to improve their numbers. If needed, the PHN will refer the employee to their physician for further work-up. This program is very popular with businesses of all sizes.

Department of Public Health Clinic- We were very excited this past year to receive our clinic license from the Department of Public Health. ESDHD is one of the few Connecticut local health departments with this license and we can now provide more services to our community. The services include: blood pressure screenings, blood glucose screenings, diabetes monitoring, blood cholesterol screenings, health guidance, vaccination services including birth control vaccines and Vitamin B-12 injections.

The East Shore District Health Department Nurturing Families Network - The East Shore District Health Department (ESDHD) Nurturing Families Network is a free service for expectant parents or parents with infants 3 months and under in the towns of East Haven, West Haven, Milford, Branford and North Branford. We also provide bridge families to services from other towns in times of transition. Family Support Providers offer weekly home visits as well as pregnancy and parenting information, developmental screenings, father guidance, development-centered activities, monthly get-togethers and connections to resources in the community. Services are offered prenatally up to the child reaching age 5. This program is contracted with the Office of Early Childhood and funded by the Maternal Infant Early Childhood Home Visiting grant through the Health Resources and Services Administration (HRSA). The goals of the federally funded Nurturing Families Network Program are to improve maternal and newborn health, prevent child abuse and neglect, improve school readiness and achievement, reduce instances of crime or domestic violence, improve family economic self-sufficiency and connect families to resources in the community. Our Family Support Providers utilize the Parents as Teachers® program, an evidence-based approach and curriculum which emphasizes parent-child interaction, development-centered parenting and family well-being. We also offer individual home visiting services to all fathers with babies three months or under in our communities.



One of our many programs highlighted this year, was our first Community Baby Shower. Every expecting family that participated, received a gift bag and raffle ticket as well as the opportunity to visit with providers that were present and enjoy lunch. We had our local Family Resource Centers on hand, as well as representatives from Yale New Haven Hospital, Blackstone Library, the Connecticut Dental Health Partnership, La Leche League, the Connecticut Breastfeeding Coalition and The Branford Early Childhood Collaborative.

Our home visiting staff provided a safe sleep demonstration and we also had a local Doula present to do a newborn care workshop. All moms enjoyed a free chair massage from a licensed massage therapist that donated her time for this cause.

East Shore District Health Department Nurturing Families Network has met the performance measure standards for the 2017-2018 reporting year for Parents as Teachers, providing quality services to 63 families this year and 182 families since 2013.

ESSENTIAL SERVICE #8: ASSURE A COMPETENT PUBLIC HEALTH WORKFORCE

The East Shore District Health Department is staffed by full-time and part-time professionals dedicated to the public health of the community. Registered Sanitarians are state certified in several areas of environmental health. The District is staffed with experienced professionals who are dedicated to their respective duties.

2017 - 2018 Staff

Michael A. Pascucilla, M.P.H., R.E.H.S.	**Director of Health**
Alex Cinotti, R.S., M.P.H.	**Assistant Director of Health**
Hillary Lawrence, R.S.	**Registered Sanitarian**
Chris Buter, R.S., M.P.H.	**Registered Sanitarian**
Brianna Weller	**Preparedness Coordinator /Health Educator**
Rita Foster, R.N., M.S.N.	**Public Health Nurse Supervisor**
Alison Tyliszczak, M.S.W., L.C.S.W.	**NFN Program Clinical Supervisor**
Karene Reid-Oriabor	**NFN Family Support Provider**
Gay Firth	**NFN Family Support Provider**
Cindy Hernandez	**NFN Family Support Provider**
Able Lugo	**NFN Father Family Support Provider**
Barbara Naclerio, M.P.H., C.H.E.S.	**Public Health Educator**
Marsha Davis	**Administrative Supervisor/Bookkeeper**
Frances Golino	**Administrative Assistant**
Victoria Ramada	**Administrative Assistant**
Zachary Faiella	**Environmental Intern**
Sarah Carbone	**Health Education Intern- Fall 2017**
Casey Altmannsberger	**Health Education Intern- Spring 2018**
Lena Tayo	**Opioid Program Intern – Summer 2018**
New Staff:	
Daisy Hernandez	**Preparedness Coordinator /Health Educator**
Liz Early	**Administrative Assistant**

Staff Development - Among the various professionals that work in the Health District, nine are licensed, registered or certified. Six members of our full-time staff hold Master's degrees in Public Health, Nursing, or Social Work and most staff members hold a bachelor's degree. Mechanisms are in place to ensure that training needed to maintain appropriate continuing education is made available to all staff and that all required qualifications are current. Our staff is trained in Cardio-Pulmonary Resuscitation (CPR) and Automated External Defibrillator (AED) use as well as the Incident Command System used in emergencies. Our staff has also participated in risk management training in handling biological hazards. Special training is provided in the role each person might have in the event of a public health emergency. The State Department of Public Health, professional organizations and academic institutions provide special public health training throughout the year to local public health agency staff. The Commissioner of Public Health meets twice a year with all the Directors of Health for updates.

Workforce Development Team – Our Workforce Development Team took strides this year to overhaul the employee evaluation process. The team designed an evaluation form that better reflects the work of each individual in the basic competencies of public health work: Communications, Accuracy, Teamwork, Performance, Position Knowledge, Service Engagement, Collaboration, Flexibility, and Leadership. The evaluation ensures that personal development goals are addressed There is also a supervisor evaluation component also. It will be evaluated and modified as needed.

Staff Trainings - Our staff is striving to provide our community with the best and most accurate services. To meet this objective, staff trainings and seminars are part of everyone's year. Below is a sampling of the training that our staff attended throughout this year:

Our entire staff participated in trainings this year focused on Sexual Harassment, Cultural Sensitivity, Dealing with Difficult Customers and Customer Service for Government and Municipal Workers.

ESDHD Staff Trainings 2017-2018			
Environmental	**Community Health**	**Preparedness**	**Administration**
• 2018 Revised Technical Standards • Technical Standards for Subsurface Sewage Systems • Food Inspector Training • Salon and Tattoo training • FDA Food Code Training • CPHA Conference • CEHA Annual Meeting	• Adaptive Leadership • Systems Thinking • Reaching vulnerable populations • Syndromic Surveillance • Trauma informed Care • Identifying and working with parents • Prematurity Prevention Summit • Supporting Children Exposed to Family Violence • Nurturing Families in Action • Home Visitor IMH Training Series • Screening to Succeed: A Call to Action • Attachment: Enhancing Attachment Bonds	• PH Preparedness Summit 2017 • Web EOC Training • HE Best Practices • Crisis Emer. Risk Comm. • Risk of social media • HSEEP Training	• HR Training • Finance & Acct • Basic Supervision • Diversity working w/others • Mistakes Leaders Make • Exceptional Customer services • HIPPA Compliance • Making for Better • Customer Service-online

ESDHD Internship Program - The Internship Program at ESDHD employs 2 to 3 interns a year to participate in new and ongoing projects. Each college Intern is also given a stipend if allowed by the college or university as our budget allows. Between community health programs and environmental health projects there are always fun and interesting things happening at the health department. We accept both graduate and undergraduate students that want a taste of public health in action. Interns at our agency get exposure to environmental health duties as well as ongoing community health programs such as our maternal-child health and many health educational programs. They also got the opportunity to participate in our emergency preparedness trainings if they wish.

This year two interns from Southern Connecticut State University (SCSU), Sarah Carbone and Casey Altmannsberger, were hired in the Fall and Spring semester, respectively, to help with various health education programs. Sarah assisted in the flu clinics and created and presented a talk on food safety. Casey assisted in the Biggest Winner program as well as helping with the reparations for our Second Annual Health Educator Summit. Casey also created and presented about the importance of sleep. Both interns took the opportunity to shadow other employees of the health department in public health nursing and environmental health.

Volunteerism - Shoreline Medical Reserve Corps: As we continue to refine our membership, we have continued a year-long training and exercise plan based on a mass-dispensing model to ensure our members are trained for the challenges we may face as an organization. Frequent trainings have been very successful, and have incorporated our partners at Branford Fire Department and Guilford Fire Department with the numbers of attendance growing every month.

Pictured are members of our Shoreline Medical Reserve Corps (MRC) and ESDHD staff at the MRC Recognition dinner held in February.

ESSENTIAL SERVICE #9: EVALUATE EFFECTIVENESS, ACCESSIBILITY AND QUALITY OF PERSONAL AND POPULATION-BASED HEALTH SERVICES

Nearly all of our community health programs and projects go through evaluation by participants and by the staff to assess the efficiency and effectiveness of the programs. Monthly staff meetings are held, enabling staff to "check-in" on all current projects and programs as well as the day-to-day operations of the health department. The staff is encouraged to analyze their processes and brainstorm on ways to address and overcome any trouble they may encounter or concerns that they have.

Quality Improvement Projects: All staff at our health department were trained in the summer of 2016 in quality improvement. A Quality Improvement Plan was created for the Health department by Rita Foster. The first project that was worked on is our B-100 process, the process to get approvals for additions and small structures and improvements on properties that contain wells and/or septic systems. This project analyzed the process from administration through environmental staff review to find places where it could be stream-lined and better understood by the public. The B-100 Quality Improvement Team worked on this project meeting periodically to improve the process through new building new forms and communications with the building departments of the towns. The resulting documents are currently being used and evaluated by the residents that use them. The assessment of the forms and their usefulness will be analyzed after a certain number of customers have used them. Any changes will be made after careful analysis.

Grant funded projects through the State and Federal government include money to address childhood obesity, lead poisoning prevention, public health preparedness and maternal/child health education. All of these grants require evaluation and performance-based objectives to continue. Our staff evaluates and reports on these programs regularly.

ESDHD Accreditation

One of the essential steps for ESDHD accreditation is creating a strategic plan. In order to do so it was important that we collect feedback from Staff, Partners, Regulated customers and customers and our residents to tell us what their perception of the health department was. We needed to find out what they thought we did well and what we needed to improve upon. During the spring of 2018 we embarked on having customer satisfaction surveys, regulated customer surveys, and partner surveys conducted.

ESDHD Strategic Plan

One of the essential steps for ESDHD accreditation is creating a strategic plan. In order to do so it was important that we collect feedback from Staff, Partners, Regulated customers and customers and our residents to tell us what their perception of the health department was. We needed to find out what they thought we did well and what we needed to improve upon. The following entities completed surveys and focus groups for our data analysis: Customers, Regulated Customers, Partners, Board of Directors and Staff. During the spring of 2018, we embarked on having customer satisfaction surveys, regulated customer surveys, and partner surveys conducted. We also held several focus groups to get into more depth about their feelings.

With that data in hand from the surveys and focus groups, the ESDHD Accreditation Team began work on the Vision, Mission, and Value Statements and started discussion with the ESDHD Board Strategic Planning sub-group. After holding several meetings, the Mission, Vision and Value Statements were brought to the entire staff and board at a retreat on May 15th. At the retreat staff and board members got to discuss the vision, mission and value statements as well as share their thoughts on the Strengths, weaknesses, opportunities and strengths of the health department.

The following is the result of that work:

Vision Statement:
ESDHD supports a thriving community that is healthy, resilient, and overcomes health disparities and environmental inequities through prevention, education, and access to adequate resources.

Mission:
ESDHD is a local full-service health department that provides committed leadership to improve the health and well-being of all people. Utilizing results-based policies and programs, we prevent disease and injury and respond to public health challenges for present and future generations.

Our Values:

- A committed staff whose integrity, honesty, respect, diversity, and consistent practice serve the community with education and clear communications.
- Prevention and wellness policies and programs that are innovative and culturally sensitive.
- Policies and Programs that create pathways to lifetime health by improving health and promoting healthy lifestyles.
- Policies and programs that are science and evidence-based that include assessment, collaboration, and the use innovative practices.
- A model of health that is holistic and includes oral, mental and social health as part of over-all health.

- Health Equity within our community based on a premise of social justice or finding the root causes of inequities in the distribution of disease and illness through public health practice and their organizational structure.

- Fiscal responsibility to our towns and their residents, State and grant funders.

- Education as a means of constant improvement in our staff.

- Respects the environment and the Earth and all of its ecosystems.

- Collaboration and partnerships to improve programs and share resources.

- Governance by a Board of Health who represent the community and oversees programs through sound principles, fiscal responsibility and transparency.

The following diagram shows the results of our data collection from partners and customers and residents along with the SWOT analysis completed with the staff and the Board of directors.

STRENGTHS

- Knowledgeable**
- Professional**
- Responsive**
- Fiscally responsible*
- Courteous*
- Helpful
- Flexible
- Listens well
- Explains well
- Respectful
- Innovative
- Easy Access
- Smooth and Organized
- Values Community*
- Values Diversity
- Many Programs
- Timely
- Understands the Community
- Provides resources*
- Looks to the future
- Many Partners**
- Nice Facility
- Technology
- Relationship with towns
- Leadership**
- Grants

WEAKNESSES

- Staff needs more training
- Staff turn-over
- Consistency
- Old Forms
- Slow turn-around
- Lack of Staff*
- Clarity on standards
- Streamlining of approvals
- Lack of funding*
- Public understanding of public health
- Not focused enough
- On site IT expert
- Communications
- Funding insecurity*
- Public expectations
- Lack of environmental grants
- Marketing
- Infrastructure
- Too healthy to be needy
- No room for job advancement
- Lack of State funding*
- Town based government
- Board turn-over
- volunteers

OPPORTUNITIES

- More meetings with regulated customers
- Online forms and services
- Continued health education
- Flu clinics
- Nail salon safety
- Opioid crisis
- Marketing and media
- Regionalization
- More partnerships
- Strategic planning
- Work with legislators to implement plans
- Grants
- Billing for services
- Internships and academia
- Trainings and education
- Data
- Community diagnosis
- Cross-training
- Other funding streams
- Research
- Autonomy of health department and towns

THREATS

- Flu*
- Pollution*
- Public understanding of Public Health *
- Lack of Public support*
- Lack of critical thinking in the public
- Fear of knowledge and denial
- New health threats
- Natural Disasters*
- Regionalization
- Partnerships
- Communications
- Access to health information
- Follow through
- Capacity to innovation
- Funding
- Climate change
- Political Climate
- Cost of everyday life
- Grant competition
- Mental health
- Poor health choices
- Technology
- Out-of-date regulations
- Access to care
- Public demands
- Unfunded mandates
- Deregulation
- No leadership from the State

With this information collected and analyzed, the Accreditation team will be able to create a plan that addresses the needs of the health department and the community to serve as a guide for the next four years.

ESSENTIAL SERVICE #10: RESEARCH FOR NEW INSIGHTS AND INNOVATIVE SOLUTIONS TO PUBLIC

The health department is currently involved in several research endeavors to better our services and improve the community's environmental health:

Nurturing Families Network (NFN): Our NFN program is part of State of Connecticut research project to determine best practices for early intervention in pregnancies for better outcomes of children and families. Partners in Social Research, LLC is conducting an evaluation of the Maternal, Infant, and Early Childhood Home Visiting program. The focus of the evaluation is on the effectiveness of the fatherhood component services in improving outcomes for fathers, mothers, and children. In order to see how well these programs, work, interviews with mothers and fathers at the baseline, 6 month, and 1-year marks are conducted.

Beach and Bathing Water Evaluations: The Health District also conducts research into the water quality of our local beaches after significant rainfall. District beaches are sampled each week during the summer from Memorial Day until Labor Day. The data of bacteria counts, tides, and other parameters are correlated with so that we may be able to pre-emptively close beaches at set rainfall amounts removing the lag-time of state testing.

Health Education: The Y Be Fit and LiveWell Chronic Disease and Diabetes Self-Management programs are all research-driven. Data is collected from these programs and reported to the entities who administer training and evaluate the over-all effectiveness and needs for updates or changes.

Unique Public Health Research: As a local health department, we value and understand the importance of data and public health research, as this information drives our decision, especially in these times of limited resources. To that end, this past year our research abstracts have been accepted at many local, state and national conference venues. We also plan to submit this research to the international community in the coming year.

Pump Out Boat Research Study "Climate, Health, and Cost Impacts of Solar-Electric Pump out Boats"
ESDHD collaborated with the Yale School of Public Health to Study the efficiency, economic and environmental impact of using solar powered pump out boats to remove waste from recreational boaters.

Pump out (PO) boats collect waste from recreational boats in order to prevent sewage dumping into waterways. Many PO programs in the United States are funded in part by the federal Clean Vessel Act (CVA). Our project sought to assess the climate, health and cost benefits of using a solar-electric PO boat as opposed to a traditional gasoline-powered PO boat. The project was conceived by the East Shore District Health Department of Branford, Connecticut, which is constructing a solar-electric PO boat (Figure 1). The project was part of the Yale School of Public Health course "Practicum in Climate Change, Sustainability, and Public Health," and was enabled through financial support from the Connecticut Department of Energy and Environmental Protection.

Project Aims:

1. Perform a national assessment of PO boat programs, supplemented by assessment of international programs
2. Estimate greenhouse gas emissions, health, environmental, and cost impacts of using a solar-powered vs. a gas-powered boat
3. Use the results from the first two aims to assess the feasibility and benefits of converting to solar-electric PO boat technology on a national scale"

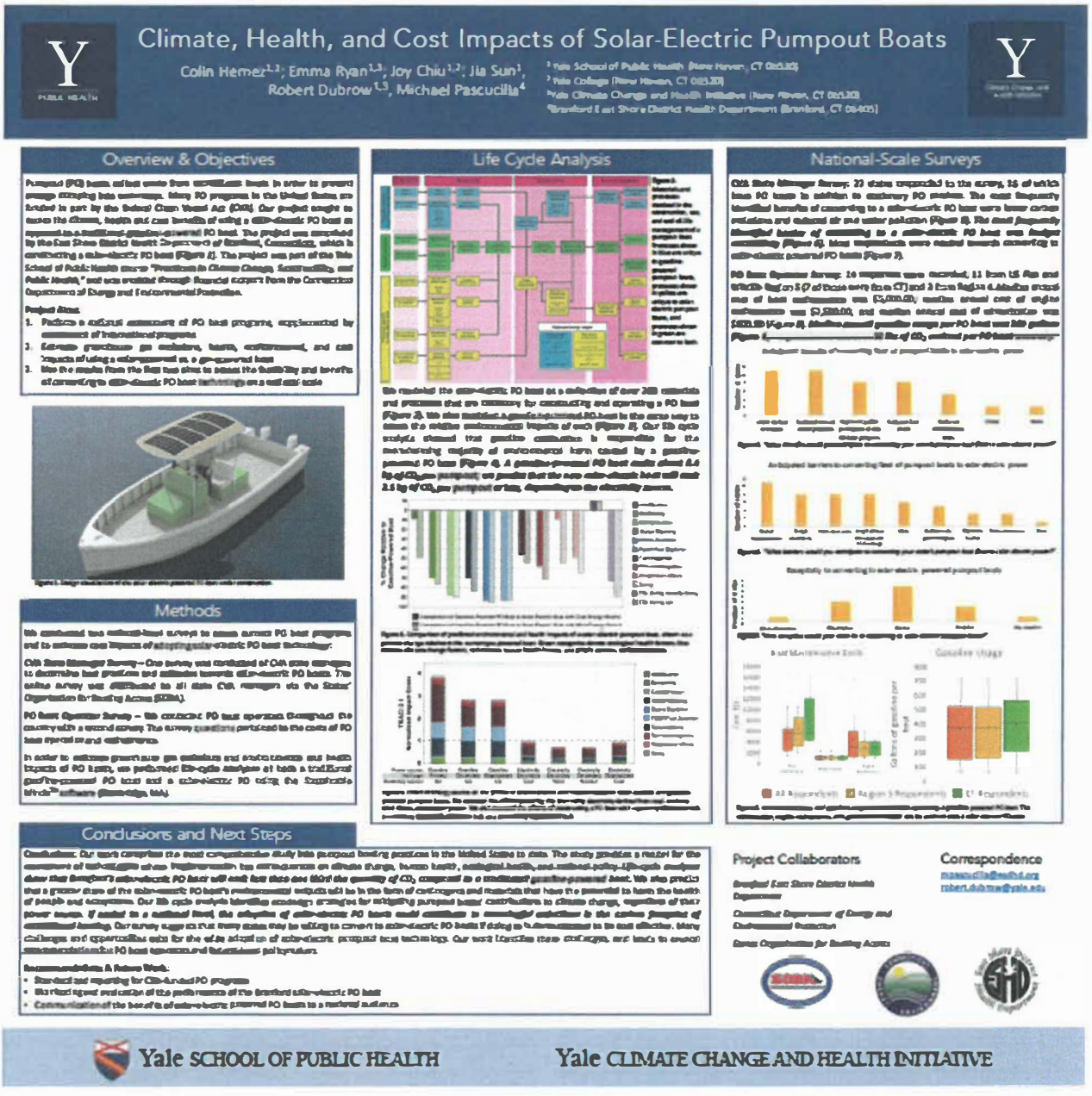
Methods: Two national-level surveys were conducted to assess current PO boat programs and to estimate cost impacts of adopting solar-electric PO boat technology:

- CVA State Manager Survey – One survey was conducted of CVA state managers to determine best practices and attitudes towards solar-electric PO boats. The online survey was distributed to all state CVA managers via the States' Organization for Boating Access (SOBA).
- PO Boat Operator Survey – We contacted PO boat operators throughout the country with a second survey. The survey questions pertained to the costs of PO boat operation and maintenance.

In order to estimate greenhouse gas emissions and environmental and health impacts of PO boats, we performed life-cycle analyses of both a traditional gasoline-powered PO boat and a solar-electric PO using the Sustainable MindsTM software (Cambridge, MA)."

Conclusions: Our work comprises the most comprehensive study into pump out boating practices in the United States to date. The study provides a model for the assessment of technologies whose implementation has consequences on climate change, human health, ecological health, and national policy. Life-cycle analyses show that Branford's solar-electric PO boat will emit less than one third the quantity of CO2 compared to a traditional gasoline-powered boat. We also predict that a greater share of the solar-electric PO boat's environmental outputs will be in the form of carcinogens and materials that have the potential to harm the health of people and ecosystems. Our life cycle analysis identifies eco-

design strategies for mitigating pump out boats' contributions to climate change, regardless of their power source. If scaled to a national level, the adoption of solar-electric PO boats could contribute to meaningful reductions in the carbon footprint of recreational boating. The survey suggests that many states may be willing to convert to solar-electric PO boats if doing so is demonstrated to be cost effective. Many challenges and opportunities exist for the wide adoption of solar-electric pump out boat technology. The work identifies these challenges, and leads to several recommendations for PO boat operators and federal-level policymakers.



Microbial Source Tracking (MST) Analyses in the Sasco Brook, Lower Farm River, and Goodwives River Watersheds: ESDHD was involved in the collection of samples, data and support for this research project whose aim it was to develop a protocol to identify sources of bacteria from various sources by utilizing DNA test markers and monitor the water quality of each Connecticut watershed. This DNA tracking should accurately identify significant human and nonhuman sources of bacterial contamination, use the identified sources to develop strategies to reduce and/or eliminate bacterial sources, while raising awareness and support for evidenced based watershed planning.

A PCR water sample testing protocol and implementation process was developed and tested. Three tributaries to Long Island Sound, Saco Brook in Westport, Goodwives River in Darien, and the Lower Farm River in Branford, were selected as model watersheds to utilize qPCR to detect host specific genetic markers and identify sources of bacteria in the watersheds. *Water samples were collected over a 12-month period and analyzed for traditional fecal indicator bacteria (Escherichia coli) using culture-based methods.* Samples were then analyzed for total Bacteroidetes, in an effort to identify host specific detection from multiple sources including human, ruminants, and other animal sources.

This study did not detect significant human contributions to the bacteria levels in the three watersheds. Furthermore, DNA markers associated with feces from poultry, dogs, and cattle were analyzed, but not found in any sample results. Ruminant markers were also used in this study as they encompass cattle and sheep, and wildlife such as deer. Detection of the ruminant marker was rare at the selected sites with no positive samples in Darien, one in Branford, and two in Westport. Finally, the two assays associated with sea gulls and general avian sources failed to pass the quality screening for successful runs. The inability to pass the quality screenings means these assays are not included in the analyses.

The results indicated that there is not a detected high level of contribution of bacteria from any of the selected potential sources. While this information does not result in action-based recommendations to address the elevated *E. coli* levels observed at the monitored sites, it still provides a valuable starting point for future work to develop more reliable markers for birds and other potential sources of bacteria.

Microbial Source Tracking (MST) - Analyses in the Sasco Brook, Lower Farm River, and Goodwives River Watersheds in CT

Lead Authors: Lauren Brooks, Postdoctoral Scholar and Mark A.R. Cooper, MPH, RS
Co- authors: Adalgisa Caccone, Ph.D., Senior Research Scientist Dept. Of Ecology and Evolutionary Biology, Yale University, David Knauf, MPH, MS, REHS, and Michael A. Pascucilla, MPH, REHS

Westport Weston Health District

Background:

- Long Island Sound (LIS) is designated as an Atlantic Ocean tidal estuary of national significance by the United States Congress.
- Over nine (9) million people live within the watershed area meaning its water quality is greatly impacted by the quality of water from the tributaries.
- Due to public health concerns, swimming waters and shellfish beds are closed when bacteria levels are elevated, causing residents and commercial users to lose access to these resources.

What We Found:

- Traditional monitoring for *E. coli* at three watershed sites revealed the occurrence of elevated bacterial counts at all three sites, and the quantity of *E. coli* and the frequency of exceedance over acceptable standards varied.
- The samples were significantly higher in summer months, especially in July and August, when the samples often exceeded 10,000 CFU/100 ml.

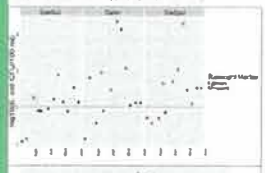


Figure 1 (left): *E. coli* levels at the sites varied with date and location. The black line represents the regulatory cutoff of 104 CFU/100ml.

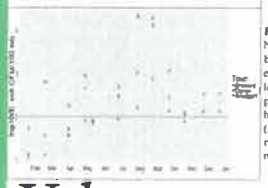


Figure 2 (left): No relationship between elevated E. coli levels and the presence of the human marker (a) or the ruminant marker (b)

Abstract

Goals of this project were to: develop a protocol to identify sources of bacteria from various sources by utilizing DNA test markers, monitor the water quality of each Connecticut watershed to accurately identify significant human and nonhuman sources of bacterial contamination, use the identified sources to develop of strategies to reduce and/or eliminate bacterial sources, while raising awareness and support for evidenced based watershed planning.

A growing body of research indicates Microbial Source Tracking (MST) using Real Time Quantitative Polymerase Chain Reaction (qPCR) may be a useful tool for identifying species contributing bacteria found in waters. A PCR water sample testing protocol and implementation process was developed and tested. Three tributaries to Long Island Sound, Sasco Brook in Westport, Goodwives River in Darien, and the Lower Farm River in Branford, were selected as model watersheds to utilize qPCR to detect host specific genetic markers and identify sources of bacteria in the watersheds. *Water samples were collected over a 12-month period and analyzed for traditional fecal indicator bacteria (Escherichia coli) using culture based methods. In addition, Bacteroidetes, a largely anaerobic phylum of bacteria commonly used in MST approaches, were analyzed using culture-independent qPCR.* Samples were then analyzed for total Bacteroidetes, in an effort to identify host specific detection from multiple sources including human, ruminants, and animal sources.

This study did not detect significant human contributions to the bacteria levels in the three watersheds. Furthermore, DNA markers associated with feces from poultry, dogs, and cattle were analyzed, but not found in any sample results. Ruminant markers were also used in this study as they encompass cattle and sheep, and wildlife such as deer. Detection of the ruminant marker was rare at the selected sites with no positive samples in Darien, one in Branford, and two in Westport.

Finally, the two assays associated with sea gulls and general avian sources failed to pass the quality screening for successful runs. Steps taken to improve performance of both the GFC (specific for seagulls) and the GFD (associated with birds) assays failed, resulting in non-specific amplification or no amplification. The inability to pass the quality screenings means these assays are not included in the analyses.

The results indicate that there is not a detected high level of contribution of bacteria from any of the selected potential sources. While this information does not result in action-based recommendations to address the elevated *E. coli* levels observed at the monitored sites, it still provides a valuable starting point for future work to develop more reliable markers for birds and other potential sources of bacteria.

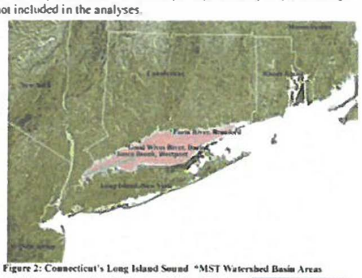


Figure 2: Connecticut's Long Island Sound *MST Watershed Basin Areas

Special thanks to CT-DEEP, the Connecticut Agricultural Station & Yale University for their funding/research support. Special thanks to Dr. Lauren Brooks

Future Considerations:

Limitations posed by using indicator organisms illustrate the need to develop other methodologies for assessing sources of potential contamination.

- An additional or alternate direction for future studies could be to employ next generation sequencing technologies to assess likely sources of bacteria, and to attempt to detect actual pathogens rather than focusing on surrogate indicators.
- Additionally, a modified sampling schedule could be utilized.
- This approach could also be used to evaluate whether the discrepancies between E. coli and GenBac results are due to the differential survival rates of the two 15 types of indicators.

Limitations

The two assays specific for seagulls and birds that failed to pass the screening for successful runs could not be included in further analyses. Thus, the study could not validate nor refute the significance of geese or seagulls as a source of pollution, even though they were periodically observed at collection sites.

- Traditional monitoring for fecal contamination relies on the culturing of fecal indicator bacteria (FIB). Numerous short comings associated with these methods have since been identified, including a lack of correlation with pathogen counts or reported illnesses (Colford et al., 2007; Wade, Pai, Eisenberg, & Colford, 2003), and the fact that samples must be cultured for 24 hours before results are known.
- The time lapse between sample collection and test results presents a dilemma since, in marine waters, the 24 hour time period represents two tide changes ensuring different water quality when samples are taken, and the results obtained.
- Bacteria found at a beach or shellfish bed may originate in beach sand or be transported downstream, making it difficult to pinpoint specific non-point sources.

This project is being funded by the CT-DEEP through a CWA Section 319 Grant.

THE DISTRICT HEALTH DEPARTMENT FISCAL YEAR 2017/2018 BUDGET

REVENUES Fiscal Year 2017/2018	
Program	**Amount**
CT DEEP Pump-out Boat	$9,000
Lead Grant	$8,722
State of Connecticut	$105,594
Preventive Health Grant (Block grant)	$17,910
Emergency Preparedness	$51,970
Fees	$180,151
Immunization/PH Nursing Program	$33,288
MRC Grant (Regional & Local)	$60,000
Interest	$6,511
Local Contribution	$569,349
Maternal Child Health Grant	$325,000
Carry Over Fund Balance	$881,892
Less Working Capital Requirement: ~ 5 months operating reserve)	-$639,908
Total	**$1,539,479**

EXPENDITURES Fiscal Year 2017/2018	
Salaries	$913,716
Payroll Taxes	$70,000
Fringe Benefits	$225,913
Consultants	$116,900
General Expenditures	$187,950
Total	$1,514,479

CAPITAL Fiscal Year 2017/2018	
Capital Equipment/Contingency Fund	$25,000
GRAND TOTAL EXPENDITURES	$1,639,479

BOARD OF DIRECTORS

Branford
Lois Lehr
Darlene Zimmermann
Elaine Anderson

East Haven
Dennis Nastri, Chairman
Elias Najjar
Angela Carrano

North Branford
Chris Manna
Virginia H. Fallon

Medical Advisor: Margaret K. Ikeda, M.D.

The East Shore District Health Department Board of Directors exists to lead the Health Department in its efforts to better the health of the community. Utilizing the Board and the Director of Health's guidance, the staff works to complete the vision of a healthy environment for all residents in our three district towns.

The Board of Directors is composed of representatives from each of our constituent towns. The term of office for members is three years. Members of the Board of Directors may be appointed for successive terms. The ESDHD Board of Directors meets every second Thursday of the month. The meeting schedule can be obtained at any of the three town websites.
PLEASE VISIT OUR WEBSITE! www.esdhd.org