September 18th Microfiber Pollution Working Group Notes:

- Welcome: Tom Metzner, DEEP
- Background on the Law: Senator. Ted Kennedy Jr.

Sen Kennedy discussed inspiration behind the law establishing this working group.
Key points included:

- interest in protecting Long Island Sound and Estuary
- understanding the causes of microfiber pollution
- a charge of the working group is to develop a public education campaign – what ordinary consumers can do
- to understand what industry is currently doing on microfiber pollution
- come up with a series of recommendations for the legislature
- Discussion in Connecticut has impact on national understanding of this issue ("national public policy ramifications")

- Introductions by each member here including remote

- Introduction & welcome by Rob Klee (Commissioner at DEEP)
  Key points in Commissioner Klee's remarks:
  -Protecting our land and water
  -Thank you to academia, industry, environmental advocates
  -Impressive group on this topic
  -Importance of Connecticut's contribution to national dialogue
  Commitment to clean Long Island Sound
  -concern about and plastics, including but not limited to microfibers and impact on waterways
  - sense of urgency around this issue (plastics in our oceans)
  -impact on aquatic wildlife – ingesting plastic
  -Wants to hear discussion from the group about what POTWs, government and consumers can do to help with microfiber pollution. What is at the forefront of the science?

- Overview: Tom Metzner, DEEP
  Focus on what the law, PA 18-81, requires us to do
  -Convene a group for the purpose of developing a consumer education campaign on synthetic microfiber pollution
  -consumer oriented information that explains the process of how microfibers are shed and get into the waterways.
  -best practices for reducing /eliminating microfiber pollution
  Efforts of the industry to address microfiber pollution
  -labeling
  -all opinions should be included in the report
  -strive for consensus
  -opportunities for voluntary agreements.

-ideas for legislation
-Two primary assumptions:
Stewardship – the principle that those that have caused the pollution should bear the primary responsibility for its correction
Precautionary principle – that even without scientific certainty, there is enough information to proceed.

- 1st Presentation: Timmit Kefala, PhD Student, Bren School-UC Santa Barbara:
    - A common source of microfiber is our clothing
    - Most of us wear synthetic clothing
    - 80% of polyester consumed is used in apparel
    - Microfibers are less than 5mm in length
    - Between .19 and 1.7 metric tons of microfibers entering our oceans annually
    - Increasingly ubiquitous in the environment, ocean, rivers, lakes, sediment, in organisms, soil, artic ice, sewage sludge.
    - The action of washing clothes releases microfibers but the type of machine, and the age of the machine can impact the amount released.
    - Microfibers can be released to atmosphere by drying clothes, or to a POTW through waste water. Most settles in sludge but some is released through effluent.
    - Largest amount of microfiber is in biosolids which may be incinerated or land applied.
    - Land applied microfibers can be conveyed to water through run off and atmospheric transport.
    - Washing of clothing is not the only route of transport of microfibers into the environment. Also present in carpet, furniture, and cigarettes. More study needed.
    - Microfibers can attach to heavy metals and other pollutants in effluent.
    - Microfibers in soil can effect symbiotic relationship between plants and microbes that support them.
    - Recent study shows microfibers decrease microbial activity; more research needed on the impacts of microfiber on soils.
    - Areas for further research include
        - Global material flow analysis and hot spot identification
        - Microfiber behavior in different waste water treatment matrices
        - Effect of microfibers on plant microbe interactions

  Question from Sen Kennedy – any suggestions for the group on best practices for removing microfibers – low hanging fruit or best bang for the buck? Industry initiatives
  Timnit- information to consumers on frequency of washing. Installation of filters on washing machines, industry is trying to understand material flow and emission sources.
  Sid Holbrook – any research on fate of microfibers in waste water treatment plants?
  Timnit – There has been research on microplastics. Microfibers are emerging as dominant source of microplastics with phasing out of microbeads.

- 2nd Presentation: Lisa Erdle (and Chelsea Rochman), PhD Student, University of Toronto: Science to inform solutions

- Increasing attention & concern on microfibers
- 190 million tonnes (metric) released per year from textiles
- Diverse wildlife are contaminated by microfiber – can be transferred from prey to predators
- Most microplastics in fish in Great lakes are microfibers.
- Studies link microfiber pollution and washing machines
- POTWs are major pathway for microfibers
- Also trying to understand the effects of other fibers including cotton
- Unknown impact on human health but microfibers found in human food
- Testing two different devices for washing machines, one filter and one internal device designed to capture microfibers.
- Proposed mitigation solutions are effective at reducing microfibers
- Question & Answers with Lisa
- Tom Metzner question - Between the clothes itself, the washing machine, and the POTW, which is the most logical point of intervention?
- Lisa – POTWs are a difficult one – major block to water flow to filter out microfiber. Material scientists are looking at shedding on clothing. The washing machines are the low hanging fruit and we have existing devices that can capture it at that level,
- Question – Are plastics going from the gut in fish into the flesh?
- Lisa – Yes, there is some work going on with that right now.
- Question from Bob K. Deputy Commissioner at DEEP – Any emerging science on other contaminants such as flame retardants, repellants, and stain resistance
- Lisa – we are currently studying that.
- Dr. Ward – How is the microfiber getting into the fish if the fish are not bottom feeders?
- Lisa – Through predation or just through the water column – Other research is showing higher concentrations of microfibers in bottom feeding fish.
- Illeana – Is there any difference in shedding using different detergents?
- Lisa – Washing behavior does make a difference. Some evidence concerning detergents and top loading and front loading machines have different rates of shedding. There is evidence that consumer behavior can impact the amount of shedding.
- Sen Kennedy – Did I understand correctly that you found about 5000 microfibers per liter in washing machine waste water?
- Lisa – yes, about 200,000 microfibers per load.
- Sen Kennedy – Should we add representation from washing machine manufacturers to the working group to get their recommendations?
- Lisa – Washing machines in Japan have a filter built in and they remove most of the microfibers.

BREAK

Group Discussion of Content for Public Awareness Campaign:
Tom M – How do we get this message to the public in a way they can understand?
What are the points of emphasis for the general public?

Demi F. Most important is to convey to the public that there are things they can do to help. Try to convey a positive message rather than overwhelming the public to the point where they feel nothing can be done to reverse the trend of pollution.
Sarah E. – Be careful not to dissuade people from buying certain garments. Other fabrics can have environmental impacts.
Lou B. – Can't assume the public is paying attention to this issue so we need to provide background but not get too technical or scientific. Put it in terms that average person can understand.
Margret M. – Use visual representations of microfibers, for example in fish, as a way to present the problem in a relatable way to the public. Interested in washing machine filters as something people can do.
Dr. Ward – While we are not finding a lot of microfibers in shellfish currently, we need to inform the public now to get ahead of this problem. Visuals are a good idea but challenging because microfibers are small. There are videos of microfibers inside a living oyster that are interesting.
David S. – What are the pivot points? It seems washing machines are one. Are washing machine manufacturers aware of this problem? Can they provide information to customers concerning washing practices and lessening shedding? Also apparel manufacturers are another pivot point where their customers can learn about this issue.
Elissa F. – We (Patagonia) are a recognized brand and we have been communicating with our customers about this issue, including washing options, available filters. Patagonia is looking at standardized test methods to determine which clothes shed more. Washing machine industry is aware of this problem.
Lou B. - People want to hear compelling information such as 80% of the fish that come to market have plastic particles. A social marketing campaign such as invasive species. Simple targeted messages with simple steps you can take.
Bill L. – Important to breakdown the plastics problem and categorize it. Start with the bigger pieces of plastic, the visuals of whales and sea turtles ingesting plastic or tangled in it, then get down to micro beads, then microfibers. Use cartoons to show microfibers. Another visual is a ball of microfibers from trawling until you get enough to see like dryer lint. Be careful not to be too alarmist on microfibers in fish because you may alienate a potential ally in the commercial fishing industry.
Tom M. – What depth of information are we trying to deliver? Information can come in short hits and visuals or through a movie.
Elissa F. – Use a blog for longer form information. They also reach their customers through the sale of "Guppy Friend" which is a bag you put in your washing machine to trap fibers. Store staff work with customers on microfiber and the use of the bag. There has been some backlash from customers who want Patagonia to do more to correct this issue. The bags cost $15 and last about 50 loads. The customers seem to understand why they are using the bags and how to properly use them.
Tom M – question for Elissa concerning washing machines having filters in Japan. How much does the filter add to the cost of the machine?
Elissa F. – Not aware of how much additional cost but the filters were not built to remove microfiber. They were installed in washing machines in Japan because many Japanese don't have dryers and line dry their clothes. It wasn't meant to filter microfibers but it has this added

benefit. Decades ago we used to have filters on washing machines in America. It is a doable technology.
Sarah E – Wanted to point out that we looked at labeling for the European commission. If there was a standard in place for measuring the rate of shedding, then labels could inform the consumer by being listed as “”high emission” or “low emission”. Washing machines could be labeled to inform the consumer if they had filters to keep microfibers out of the environment.
Margret M – questioning whether we want to stay away from telling consumers about microfibers in shellfish. (Previously suggested that telling consumers could alienate commercial fisherman)
Alicea C. – Excellent social marketing campaign used in Chesapeake Bay Campaign on crabs and fertilizer run off. Simple message and effective with visual.
Tom M. – Is there a foundation of the science that we can agree to?
Kristen K. – Don’t want to get ahead of the science. Our recommendations focus on washing behaviors. There are filters and methods that consumers can pursue to make measureable, meaningful change. Information is updated regularly and need a website that can update with changes. We acknowledge that there are microfibers in the water but there are gaps in knowledge but we (clothing) is a part of it.
Dr Evan W – part of our messaging is that microfibers come from various sources, not just clothing. We also shouldn’t shy away from saying there are microfibers in seafood but put it in context – you’re also eating microfibers in sea salt or in your coffee from the shedding that occurs outside of washing such as removing your clothes. Describe all the sources of microfibers and routes of exposure.
Tom M. - Should microfiber pollution be a subset of the plastics in the ocean discussion or should it stand alone as a distinct topic?
Vincent B. It helps and hurts to be included with larger plastics issue. Helps because there is a track record on plastics in the ocean and people have some understanding of it. Hurts because there are already preconceived notions that people may have. This microfiber pollution has been going on for 50 years, we just have a more recent awareness of the problem.
Kristen K. – Sees the connection with the larger plastics issue but the solutions are different. With the larger plastics issue it may surround banning a product such as plastic bags or straws or encouraging people not to use them, but with clothes you focus on washing behavior, not avoiding purchasing.
Edward G. (on the phone) – younger consumers are demanding more environmentally friendly products including clothing. Need to educate our members (clothing manufacturers) to stop it if possible (shredding) or at least mitigate it.
Lisa E. I think starting with a discussion of the larger issue of plastics is a great place to start but keep in mind that microfibers are the largest source of plastics in the ocean.
Senator Kennedy – I wanted to get back to our charge and that is to establish a public education program about microfibers, including but not limited to labels. One of the things we would like to see from this group is industry led initiatives, perhaps overseen by DEEP similar to what’s been done with other chemicals or products such as paint or neonics. Instead of banning, work with industry to reduce without the heavy hand of government. Legislature is poised to develop legislation on labeling or filters but would prefer industry lead voluntary initiatives. Consumer education campaign should focus on things people can do now to reduce microfiber pollution.
Vincent B – This can’t just be about Connecticut. Need to work with other northeast states that can also contribute pollution to Long Island Sound.

Kristen K – Specific to labels, industry already has a number of labels that are already on our garments, and there is a question as to how effective a label would be.
Elissa F. – also unsure how effective labels would be. There are other synthetic microfibers such as nylon and acrylic. We also don't know the effect of natural fibers. The City of Vancouver waste water treatment plant did a study and 32% of what they thought were synthetic fibers were synthetic fibers. The remaining 68% were natural fibers. We want to do more studies to determine impact of cotton – maybe switching to cotton isn't the best answer. With a better understanding of the problem, a label could be helpful but we would like to focus on preventative measures. Cotton could transfer other harmful chemicals.
Sid H. – Wanted to echo the remarks of Sen Kennedy in that if industry doesn't come forward with a solution then the legislature may have to act. Similar to mercury so we took legislative steps to eliminate mercury from coming to our plants. It's been very effective. I don't really support labeling but perhaps some public information at the point of sale.
Sen Kennedy – Would treatment plants be open to providing information to the public through inserts in their bills?
Sid H. – Speaking only for New Haven we would be open to that and think that is an excellent idea.
Sen Kennedy – bill inserts are one idea that is free. What are some of the other ideas we can use to educate the public?
Demi F. – Blog posts and documentaries are a great way to educate those already interested in environmental conservation; however, concise messages that include humor work for younger, more general audiences. Social media messages that can be displayed with engaging photos, videos, and hashtags, and are easy to comprehend in a short amount of time will be most powerful for the general consumer.
Margret M. – Sooner or later we will need one or two brochure sized handouts. Labels could be positive such as EPA's Best Buy program which may be more acceptable to the industry.

Meeting adjourned, next meeting scheduled for November 14th.