



What can we do to remove PFAS from our drinking water sources?

TEAM 3: PFAS REMOVAL PERFORMANCE TESTING

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Research Questions

- What is the best option to remove PFAS from drinking water among commercially available activated carbons (AC), ion exchange (IX) resins, and membrane filters?
- What do we do with the waste streams with enriched PFAS, generated during resin regeneration and membrane filtration?
- Are there promising novel PFAS removal methods we can develop?
- How successful are the household filters in removing PFAS from tap water?



Research needs



- NC Senate Bill 99 mandates “test the performance of relevant technologies in removing such compounds”
- AC, IX resins, and membranes have been shown effective in removing certain legacy PFAS, but there is limited information on emerging PFAS such as GenX
- A wide variety of AC, IX resins and membranes are commercially available, but utilities lack information for their rational selection to achieve desired PFAS removal
- AC, IX resins and membranes are all separation technologies that produce wastes with high PFAS levels, so further treatments are needed for properly waste handling
- Other innovative treatment options may provide more attractive results
- Residents are eager to know what household filters they should buy to protect their family from PFAS

Planned Approach

Evaluate 10 commercially available AC, IX resins and membranes for PFAS removal from groundwater



Challenge the top 3 candidates with PFAS-contaminated surface water



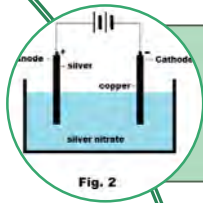
Evaluate the top 3 candidates for PFAS removal at different pH

Optimize commercial membrane chemistries

Synthesize Ionic Fluorogels using perfluoropolyethers for selective PFAS uptake

Test novel techniques using the same water matrices as existing ones

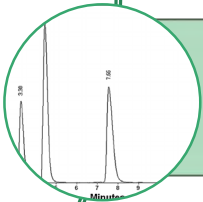
Planned Approach (cont'd)



Evaluate electrochemical processes for treating PFAS waste streams



Survey water samples before and after treatment by household filters in 100 houses



Use targeted and nontargeted LC-MS/MS and adsorbable organic fluorine analysis to quantify PFAS



All technologies will be compared based on performance and cost to optimize decisions