David Bronson, Mayor

2023 Stormwater Outreach Public Education and Involvement

APDES Permit No. AKS-052558

MUNICIPALITY OF ANCHORAGE
WATERSHED MANAGEMENT PROGRAM

Prepared for: Municipality of Anchorage
Watershed Management Services

Authored and prepared by Cherie Northon Ph.D.

Anchorage Waterways Council
P.O. Box 241774
Anchorage, AK 99524

January 15, 2024

WATERSHED MANAGEMENT

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Introduction

Anchorage Waterways Council (AWC) is responsible for the outreach and education sections of the APDES AKS-05258 2020-2025 permit for the Municipality of Anchorage (MOA) and Alaska Department of Transportation and Public Facilities (AKDOT). These sections are: Part 3.6.1 — "Public Education and Involvement" and Part 3.6.3 — "APDES Annual Meeting". This is the Year Three report for the current permit period.

Public education and outreach on stormwater are accomplished through a variety of avenues: tabling opportunities and events, social media, e-newsletters, lectures/presentations, publications, and regular TV/radio/news media.

This permit period has returned to the pre-pandemic level of outreach activity. Several of the regular events for outreach returned including:

- Scoop the Poop Day - April 22
- Annual Creek Cleanup – May 12-21
- Flotilla – May 20
- Reading Rendezvous – May 20
- Potter Marsh Discovery Day – June 3
- Friends of Pets' Dog Jog – July 22

In January, AWC taught four classes for Olé[1] that focused on introducing students to local waterways, their problems, and things that they could do to protect them. AWC made a presentation at the Cook Inlet Water Quality Summit in September titled "The Municipality of Anchorage's Waterways and Cook Inlet" and did a radio spot for Alaska Public Media regarding dog poop. Publications included six newsletters, one publication in *the Anchorage Daily News* and one in *The People's Paper.* Social media posts also continued on Facebook and Nextdoor.com.

Public Education and Involvement

AWC promotes public education on stormwater by focusing on a variety of topics that affect water quality. The primary ones have been, and continue to be, on pet waste; waterfowl feeding; invasive species; yard treatments; disposal of green waste; snow melts and snow removal; residential vehicle repairs and car washing; plastics including monofilament fishing line; hazardous waste and materials; trash and litter; and illegal dumping into storm drains.

Scoop the Poop Campaign

AWC's Scoop the Poop (STP) Campaign provided information and STP-related items (brochures, stickers, pet waste bags, etc.) at Scoop the Poop Day on April 22, Reading Rendezvous on May 20, Dog Jog on July 22, and other outreach opportunities. Cherie Northon did a radio interview with Alaska Public Media's Anne Hillman on May 8 titled, "Pets, vets, and picking up poop"[2]. This year's Scoop the Poop Day was held with staff, AWC board members, and several volunteers who handed out buckets, shovels, gloves, and bags to scoopers at Connors Bog and University Lake. Turnout for this event increases annually with over 100 eager volunteers, many of them showing up even before we had finished setting up!

[1] Opportunities for Lifelong Learning, a continuing education program at the University of Alaska Anchorage.

[2] https://alaskapublic.org/2023/05/08/hometown-alaska-pets-vets-and-picking-up-poop/

Reading Rendezvous was a new event for AWC, and one that is well worth it. Organized by the Anchorage Public Library and the Alaska Center for the Book, its goal is to provide children and families with books and healthy activities. AWC's emphasis was on Scoop the Poop and our "Love A Loon" campaign, and activities were provided that aimed for toddlers on up. The youngest were shown how to scoop for "poop" (dried beans in a sand box), and older ones, including adults, had to answer a series of questions (Appendix A) to receive a small prize. It is estimated that over 3,000 people attended, and, based on the number of prizes given out, at least 600 people engaged in AWC's outreach activities.

Figure 1 – AWC's Vangie Wight and volunteer Cormac Eley at Reading Rendezvous (C. Northon)

Figure 2 - Volunteer Cormac Eley showing a youngster how to scoop dog "poop" (C. Northon)

Friends of Pet's Dog Jog in July always has an enthusiastic crowd of over 200 pet lovers, and AWC was there with a variety of STP giveaways and information.

STP outreach continued full force in other areas. Multiple complaints by park and trail users about excessive amounts of dog poop before breakup in 2021 prompted AWC to look at other ways to get the message out. One that seems particularly effective were of 18" x 24" corrugated plastic signs AWC created with different Scoop the Poop messages[3]. A total of 100 signs were printed and have been given out to volunteers to post. Signs were put out again in 2022, and a new batch of 50 signs was purchased for installation during winter 2023.

Although not dog-related, horse manure is also a potential problem. As noted in AWC's *Animal Facilities 2023 Report, APDES Permit AKS-052558*[4] for the MOA's Watershed Management Services (WMS), there should be concern about the impact of horse manure on local waterways as it does contain *E. coli* which undoubtedly contributes to the fecal coliform impairment of many. To what extent it is a factor remains unknown and will remain so until microbial source tracking is done to determine sources. There has been a lot of discussion in the horse community about whether this is a problem and to what extent it might be. Most of the popular literature is heavily slanted away from it being an equine problem, so again a better answer might be forthcoming with more extensive testing.

Annual Creek Cleanup and Flotilla

This year was AWC's 39th Annual Creek Cleanup. Forty teams signed up--a fantastic turnout for the 10-day cleanup which ran from May 12 to the 21. Teams included environmental and engineering firms, recreational groups, churches, NGOs, schools, municipal, state and federal employees, medical staff, neighborhood groups, families, and individuals. Flotilla 2 was held on May 20 this year, and it attracted over 50 kayakers who fanned out to Cheney Lake, Delong Lake, Goose Lake, Taku Lake, Westchester East and Westchester West. See Figure 4 for the creek and lake areas that were cleaned.

Figure 3 – AKDOT team cleaning at Fish Creek

[3] Sign examples can be found at AWC's 2021 Stormwater Outreach Education Public Education report at https://www.anchoragestormwater.com/Documents/Archive%20APDES%20Reports/2021%20APDES%20Annual%20Report/AppG12021StormwaterOutreachSummary.pdf

[4] The report will be posted at https://www.anchoragestormwater.com/documents.html in 2024.

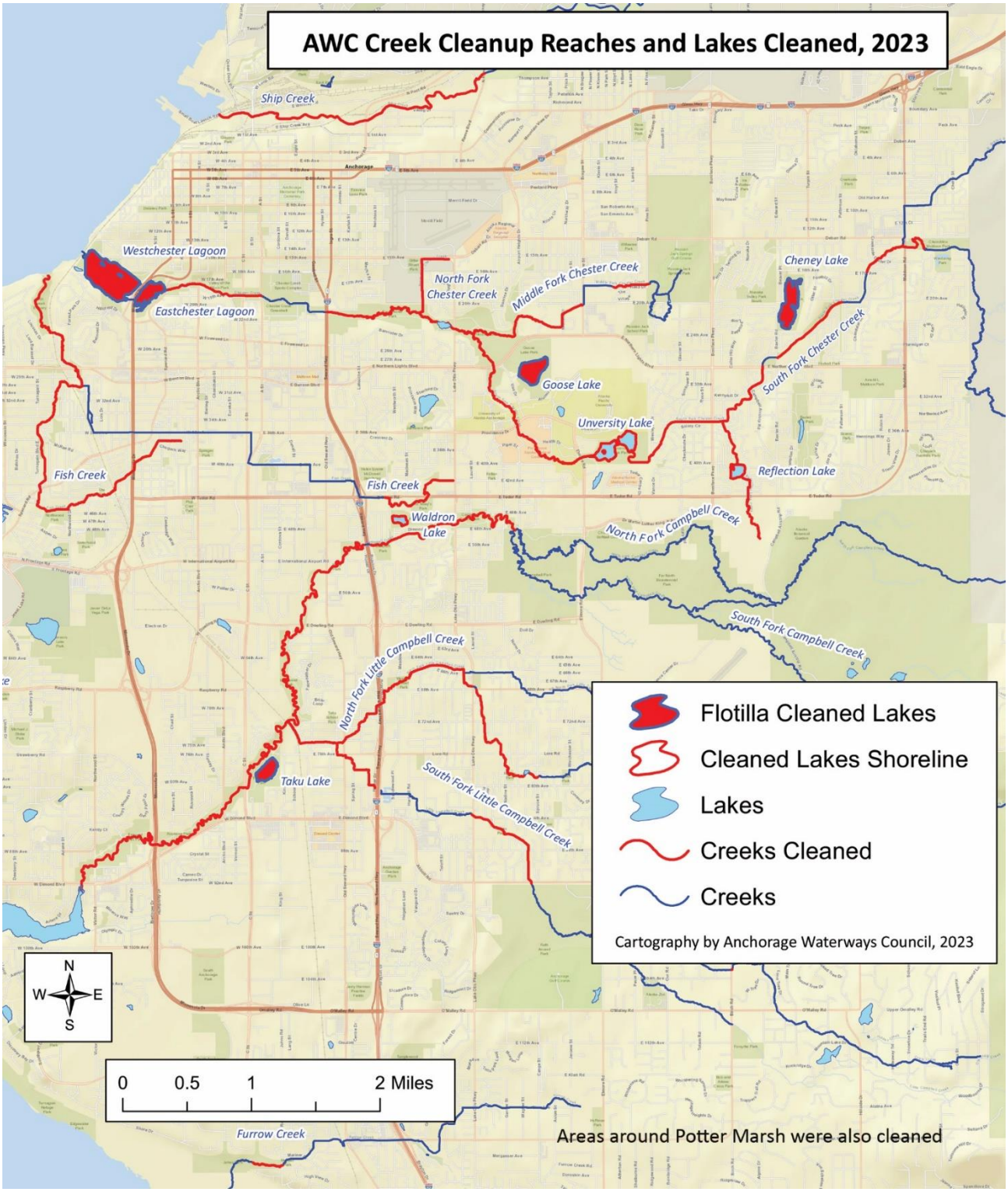


Figure 4 – 2023 Creek Cleanup locations

Potter Marsh Day

Potter Marsh Day is always an exciting family-friendly nature celebration in early June, and traditionally AWC uses hands-on activities with benthic insects to explain their use in determining water quality. A special emphasis was placed on the Scoop the Poop program—again trying to encourage youngsters to participate. The "Love a Loon" campaign was highlighted in a secondary location at Bird TLC's Center on Old Seward Hwy. While the weather was cooler/breezier this year, the attendance is still estimated at around 600 for the 5-hour event.

Figure 5 – AWC table at Potter Marsh Day (C. Northon)

Figure 6 – Four-year old attendee who already knew how to use a pet waste bag to pick up dog poop (C. Northon)

Issue Response

As was discussed in the Year 2 year-end report[5], AWC conducted an outreach campaign in parts of the Chester Creek Watershed during April. Various reaches of Chester Creek run along and through private property where it is important to provide the property owners and residents with information on being responsible creek neighbors. Letters tailored to Chester Creek reaches were sent to 360 residences along Chester Creek and 60 residents near Westchester Lagoon (Figure 7) along with AWC's informational rack card, "How to Live with a Creek". (Appendix B for letter and rack card).

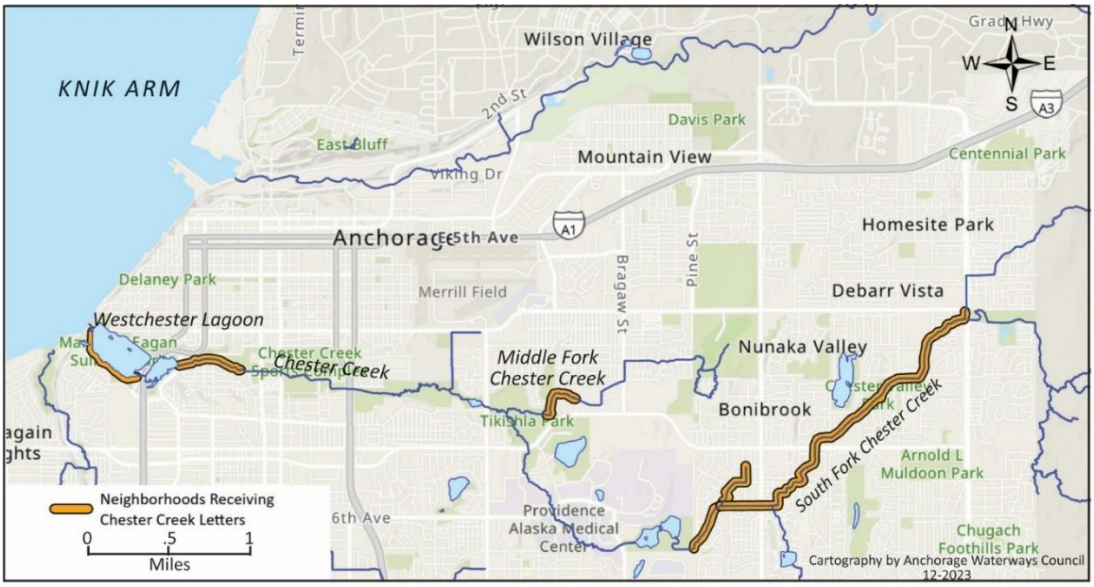


Figure 7 – Chester Creek and Westchester Lagoon neighborhoods receiving letters

This contract year was a busy one in terms of citizen reports on issues. AWC maintains a reporting form[6] so citizens can provide details for concerns that they have regarding local waterways, and it has been frequently used. As well as responding, AWC is proactive in trying to alert people to issues before they get too far out of hand.

In April, a resident of the Fairweather Park condominiums in the Taku-Campbell area contacted AWC about a pet waste problem. The homes are located just east of Campbell Creek where there are trails leading down to the Campbell Creek Trail. Resident Tim K. complained that a neighbor was continually leaving pet waste on the trail and in the condominium's parking lot, and he provided photographs. AWC worked with him and the condominium association's manager on this issue. Information was provided to the resident, and a detailed letter (Appendix B) was sent to the property manager, Cedric Burden, that offered him some suggestions about helping to improve pet waste cleanup on the over 100 properties that he manages. He later reported that the property being discussed had no more issues.

Shortly thereafter in May, a report was received from Terrence B., a resident, in the Sand Lake area where a large field was being used by neighbors to walk their dogs. The property is adjacent to a quarried area that is bounded by Kincaid Rd. and Lucy St. The pet owners were not doing a good job of cleaning up pet waste, and he was hoping to get the area spruced up for users and to encourage them to scoop the poop. Another resident had previously paid for a pet waste

[5] 2022 Stormwater Outreach Public Edu://anchoragestormwater.com/Documents/Archive%20APDES%20Reports/2022%20APDES%20Annual%20Report/App%20G1%202022%20AWC%20Stormwater%20Outreach%20Summary.pdf

[6] https://www.anchoragecreeks.org/report-an-issue

station and was covering the cost of pet waste bags. Terrence added a trash can, and once a week dragged it uphill to his property where he emptied it every week. His request was for some signage and poop cleanup tools which we gladly provided. AWC donated a variety of signs for him to place around the area as well as some 5-gallon buckets and short shovels. When I checked back in September, he said the dog owners had definitely improved their pet waste pickup.

Figure 8 – Pet waste station (donated) and AWC signage at the Lucy St. and 80th Ave. field (Terrence B)

In early July, AWC was contacted by Tammy W., a resident in a group of condominiums near the eastside dead-end of Lore Rd. just east/uphill of North Fork Little Campbell Creek. The grassy area in the dead end's ROW was being used by neighboring residents to deposit their yard waste and to walk their dogs. Her concern was that the grass and yard clippings were decaying and making a mess along with the accumulating dog poop. We discussed a plan to clean up the area as well as some suggestions for posting signage. Tammy volunteered to organize a cleanup over the July 4th weekend, and AWC provided her with bags, buckets, gloves, and signage to post. She and 2 volunteers cleaned up the area on July 2nd and placed signage cautioning against leaving yard debris. The area was weed-whacked, debris bagged, and trash hauled off. Barely 3 days later, grass clippings were again dumped there.

Figure 9 – Tammy W. and a volunteer at the July cleanup and grass clippings dumped shortly after the cleanup (T. Wilson)

At this point, AWC contacted code enforcement who had been keeping an eye on this area for quite some time. One of the cleanup volunteers provided the address for the neighbor who dumped the grass, and code enforcement paid them a visit. Even so, this was still not enough to deter dumping in the ROW, because barely a week later more grass was dumped. Again, a person was identified and also received a visit from Code Enforcement. At this point, it was decided to draft a letter from AWC (Appendix B) and mail it with our "How to Live with a Creek" rack card to forty of the adjacent

residents. Typically, there is no response from these mailings, however one resident did call and leave a message thanking us for the information. While dumping grass did continue, it has been on a much-reduced scale.

Another issue surfaced in the Tikishla Park neighborhood that involved car washing in a driveway that produced a lot of detergent runoff (Figure 10) and was about 100' from the nearest storm drain. Reported by AWC board member Birgit Hagedorn, the Chester Creek letter referenced above was sent in October to 70 residents in this neighborhood about caring for local creeks.

A similar letter was sent to a half-dozen residents in the Craig Creek neighborhood after a concern by AWC board member Alex Jefferies.

Figure 10 - Suds from car washing on Aspen Grove Ct. near Tikishla Park, October 8, 2023. (B. Hagedorn)

Road Chemicals

6PPD Quinone Update

As introduced in AWC's 2021 APDES report[7], some preliminary samplings for 6PPD quinone were taken in 2021. The analysis found the chemical at lethal amounts[8] in the stormwater entering Chester Creek at the New Seward Highway, however, it was apparently diluted enough that the amounts in the creek water were below lethal levels. The Alaska Department of Environmental Conservation (DEC) 6PPD quinone working group met on September 18 with updates. One thing of interest from the meeting to note is that laboratory studies are showing that bioretention systems can effectively mitigate >~90% of 6PPD quinone loadings to streams under most "typical" storm conditions[9]. Clearly good news, this speaks to the importance of developing more green infrastructure (GI) for stormwater capture.

[7] anchoragestormwater.com/Documents/2021AnnualReport/AppG12021StormwaterOutreachSummary.pdf, p. 61.

[8] Studies have shown that lethality is primarily in coho salmon, but there may be others that are similarly affected.

[9] https://pubmed.ncbi.nlm.nih.gov/37455862/

Electrical conductivity (EC) sampling

As first reported in 2022, AWC volunteer monitors have sampled for EC along Chester Creek since 2019. The objective is to monitor water quality parameters and water chemistry to evaluate the influence of frequent melt events in the winter on stream chemistry and evaluate if changes in street de-icing treatment affect water quality during melt events. Results from EC readings in 2023 (Figure 11) depict a consistency with data collected in previous years. The data shows, as would be expected, that EC readings increase along Chester Creek as it runs downstream, with stronger numbers between October and April due to the high use of road treatments. The idea behind this work is to look at this trend in terms of climate change with more frequent thaw and freeze events as they impact the immediate environment and infrastructure. Monitoring sites listed in the chart follow in Figure 12

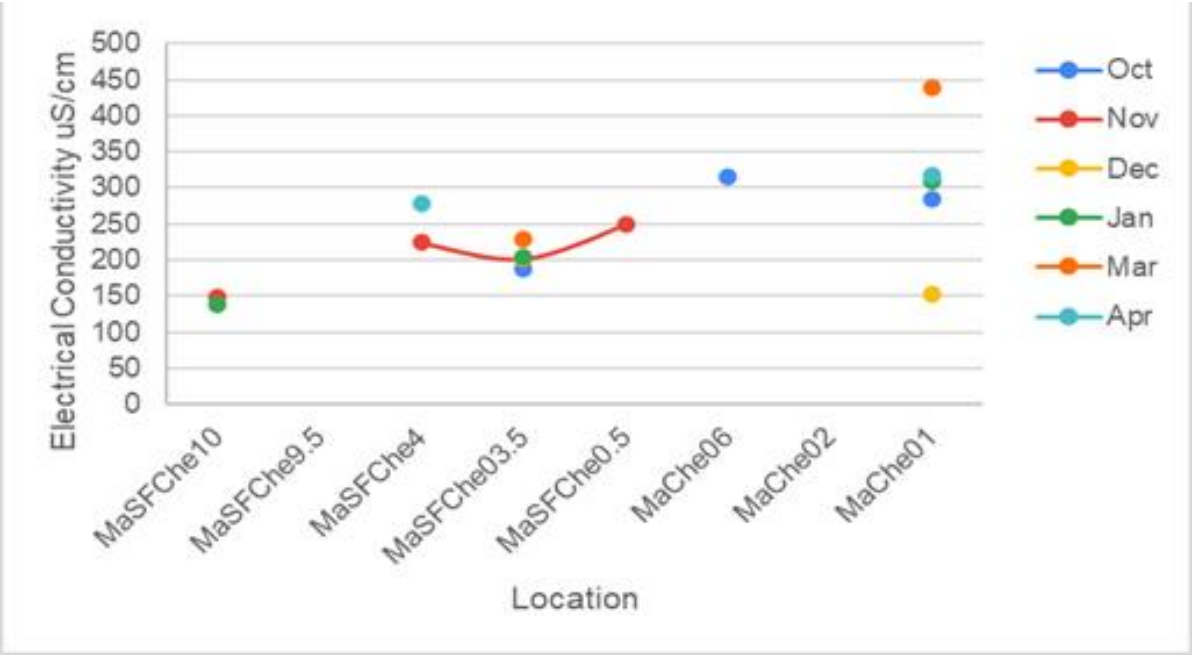


Figure 11 - EC data collected by AWC monitors from October 2022 to April 2023, from upstream to downstream[10]. (B. Hagedorn)

[10] Gaps in data indicate lack of access due to hazardous ice conditions.

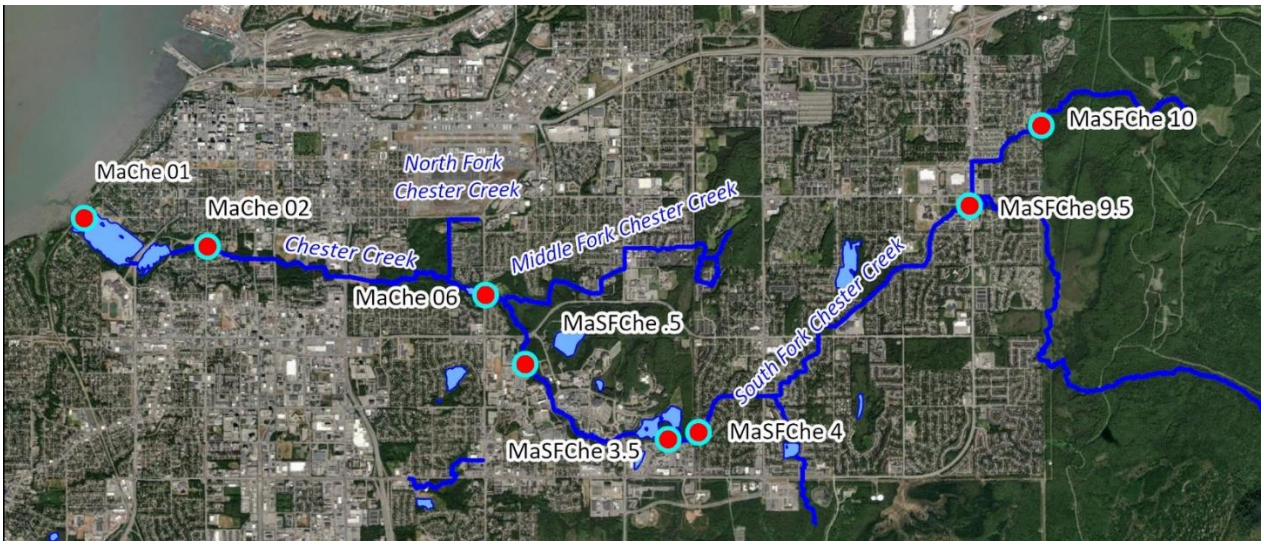


Figure 12 – AWC 2023 monitoring sites where EC samples were collected

Loons, Line and Lead program

In Spring 2023, "Loons, Line and Lead" began its second year with funding from the U.S. Fish and Wildlife Service (U.S.F.W.S.) and the Alaska Community Foundation (ACF). The primary partners are U.S.F.W.S. Migratory Birds, ACF, Bird TLC, and AWC. Our intern, Michelle Oliveira, was a recent university graduate and a resident on Joint Base Elmendorf-Richardson (JBER). This worked exceptionally well due to her availability from March through October as well as access to JBER. Over the 6-month period, she worked with AWC to visit each of the 20 monofilament recycling bins in Anchorage for cleanup, maintenance, and collection of fishing line and tackle. In addition, AWC built 9 new bins that were placed at several fishing areas on JBER. Michelle had several outreach opportunities to share information on the impact of monofilament and lead tackle on wildlife—especially loons. Over five hundred packets of non-lead fishing weights were given out to anglers, and approximately 20 miles of fishing line and 1 lb. of weights and tackle were collected from all bins.

Figure 13 – Monofilament and trash collected from a bin by intern Michelle Oliveira at Ship Creek (T. Eley)

Media

During Year 3, AWC had one Letter to the Editor on April 21 in the *Anchorage Daily News* about scooping the poop (Appendix C), one radio interview on May 8 about pet waste with Anne Hillman of Hometown Alaska on Alaska Public Radio station KSKA[11], and one article in November's *The People's Paper* titled, "Keeping all waterways healthy" (Appendix C).

Newsletters

AWC sent out eight newsletters during this period that announced upcoming events, discussed its various programs, and provided a wrapup of events. The six most pertinent *Streamline* issues are in Appendix D. Current readership is increasing with about 300 from the direct email using Constant Contact, and the newsletters are also boosted on Facebook where another 2,000+ readers receive them.

Social Media

AWC continues to boost most of its outreach information using Facebook and its digital newsletter *Streamline*. Over the many years of this contract, AWC's outreach strategy has changed considerably in order to keep pace with how society wants its information delivered. Accordingly, our methods have shifted almost entirely away from printing and towards our digital newsletter, *Streamline*, and social media sites including Facebook[12] and Nextdoor. The two Facebook accounts now have over 1,200 followers, and when important information is posted, they are "boosted" for a fee. There were 52,875 AWC post recipients and 41,328 for Scoop the Poop Anchorage.

Presentations

Cherie Northon and Thom Eley taught a 4-session Olé[13] Zoom class on Anchorage Creeks early in 2023 with a very good attendance. The presentations are in Appendix E. Northon also made a presentation at the Cook Inlet Water Quality Summit on October 24 titled, "The Municipality's Waterways, Cook Inlet, and Anchorage Waterways Council" which is also in Appendix E.

APDES Annual Meeting

On March 9, 2024, AWC will present at the APDES Annual Meeting. The topic focuses on AWC's stormwater outreach methods.

Conclusion

AWC's outreach activities hit their pre-pandemic stride and expanded into some new areas during Year 3. Scoop the Poop, one of the most important programs, found new audiences, and its messaging is showing returns. Anecdotal information from trail users (including from AWC staff)on improvements in some trail areas was received and the awareness of pet waste being a big problem was echoed in citizen reports and from attendees in outreach events. Pet waste cleanup will never be 100%, but finding a growing awareness of the problem IS a win.

That being said, new waterway habitat concerns are always emerging, and AWC seeks to identify and respond to them. The impact of vehicle tire wear (6PPD quinone) and chemical road treatments in stormwater runoff are two that are currently in the spotlight along with the injury and death of birds and other wildlife from discarded fishing line and lead

[11] https://alaskapublic.org/2023/05/08/hometown-alaska-pets-vets-and-picking-up-poop/

[12] facebook.com/anchoragewaterways and facebook.com/ScoopthePoopAnchorage

[13] Olé stands for Opportunities for Lifelong Education https://www.oleanchorage.org/

fishing tackle. How to get messaging out is a continual process, and AWC uses many tactics, including social media, event participation, presentations, and, recently, targeted informational mailings. During Year 4, the residential/commercial/industrial area along the lower reaches of Little Campbell Creek will be an outreach focus as many residential yards have the creek running through them. Additionally, there are many "dirty"[14] businesses that are literally on the creek's banks. Letters and information that are applicable will be sent to the identified addresses[15]. AWC looks forward to continuing its work to educate and reduce stormwater impacts.

[14] Dirty in the sense of vehicle wrecking and repair businesses, contracting, etc.

[15] AWC uses Google Earth and field visits to identify appropriate properties.

APPENDIX A – Scoop the Poop Questions for Outreach Events

How many dogs live in Anchorage?

A. 650
B. 6,500
C. 65,000
D. 6,500,000

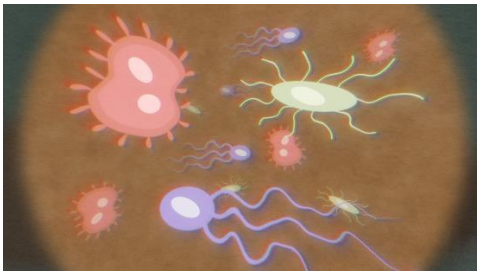
Answer:65,000!

Who is responsible for picking up your pet's poop?

A. Parks and Recreation Department
B. Your neighbors
C. You
D. Animal Care and Control

Answer: You are!

How many E. coli bacteria can be found in a drop of dog poop the size of a dime?



A. 23
B. 230
C. 2,300
D. 23,000
E. 23,000,000

Answer: 23,000,000!

Can you be fined for not picking up your dog's poop when out walking?

A. Yes!
B. No!

Answer: YES! From $50 to $250!

How many times a day does a 70 lb. dog poop?

A. 1-3
B. 4-6
C. > 6

Answer: A 1-3 or up to 21 poops a week!

APPENDIX B – Outreach Letters

Sample letter sent to Chester Creek residents – p. 20

AWC creek rack card – p. 21

Letter sent to PacRim property managers – p. 22

Sample letter sent to Little Campbell Creek residents – p. 24

Anchorage Waterways Council
P.O. Box 241774
Anchorage, AK 99524
(907) 272-7335

April 25, 2023

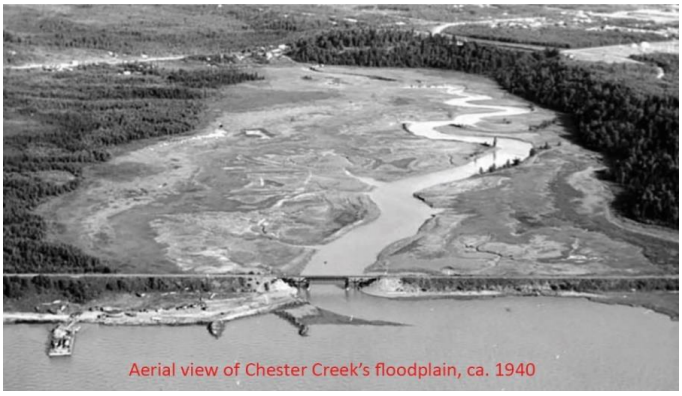
Dear Chester Creek Neighbor,

There are not a lot of urban dwellers who can say they have an anadromous creek running by their yard! Because of this proximity, I wanted to reach out to you with some important information on how you can help protect this treasure.

Anchorage Waterways Council's work focuses on keeping local lakes and creeks healthy for all to use and enjoy which is why we would like your help. In this mailing, I've included information about ways to assure good stewardship for Anchorage's waterways. Please take a minute to read it over. Being our "eyes" on local creeks helps us immensely with our work, so please contact me if you have any concerns, comments, or questions.

Here are a few facts about Chester Creek and Westchester Lagoon that might be of interest to you:

- Chester Creek's name is from the Anglicization of the *Dena'ina* word *Chanshtnu* for "Grass Creek." Several *Dena'ina* cabins, as well as a village, were found along the lower sections of the creek where salmon fishing took place. Native coho and pink salmon as well as rainbow trout and Dolly Varden inhabit Chester Creek today.
- Chester Creek runs about 30.7 mi (49.4 km) from the Chugach Mountains to Westchester Lagoon.
- Westchester Lagoon did not exist before 1973—the year the mouth of Chester Creek was dammed to create a recreational area in Chester Creek's flood plain.



Aerial view of Chester Creek's floodplain, ca. 1940

If you would like to know more about local waterways and our work, please visit our website at www.anchoragecreeks.org. We are the only organization dedicated to caring exclusively for Anchorage's creeks and lakes.

Sincerely,

Cherie Northon, Ph.D., Executive Director

Anchorage Waterways Council is a non-profit, 501(c)(3) organization. Our tax ID # is 92-0111510.

Front

How to Live With a Creek

The Municipality of Anchorage is about 2,000 mi^2 and has approximately 2,250 miles of creeks and rivers. These waterways are often listed as some of Anchorage's premier amenities. This handout endeavors to provide information on how to be a good neighbor to our creeks.

- **Be a steward for your local creek and keep an eye on it.** Report any issues online at anchoragecreeks.org and clean up any trash.
- **Don't alter the course of a creek.** Creeks have a mind of their own about where they want to go, which is protected by local, state, and federal law.
- **Stormwater and yard runoff, cigarette butts, pet waste, other pollutants and debris run directly into storm drains which lead to our creeks--NOT to the sewage plant.**
- **Don't water your driveway and paved areas, and don't overwater your yard.** Your yard only needs about 1" of water. Put an empty tuna can on the area you are watering, and when it is full--you have about 1" of water.
- **Sweep your driveway rather than power washing or hosing it.**
- **Direct your downspouts onto your yard and off of impermeable surfaces. Also consider rain barrels and rain gardens to reduce yard runoff.**
- **Use automatic car washes as their waste water is usually recycled and is directed into the sewage system--not our creeks.** If you wash at home, park your vehicle on grass or gravel, and use non-phosphate soap.
- **Ensure that storm drains and culverts are not clogged.** Obstructed culverts and storm drains can cause flooding and block fish passage.
- **Keep dogs and horses out of creeks and off of creek banks ESPECIALLY when salmon are spawning.** Bank trampling causes erosion and sediment to run off into waterways, which disturbs gravel beds where fish spawn and little ones grow.
- **Clean up pet waste because the fecal coliform bacteria found in it runs off into our creeks.** All the creeks in Anchorage (except Rabbit and Little Rabbit) are considered "impaired waters" due to fecal coliform contamination. Do your part to reduce this problem. SCOOP-the-POOP!

Back

- **Protect and preserve shoreline vegetation and don't cut trees or remove vegetation within 25' of the creek.** This vegetation provides habitat, shade to keep the water cooler, protection from prey, and stabilization of the streambank. It also reduces bank erosion. Naturally fallen wood produces in-stream habitat and nutrients for fish and other aquatic organisms. Leave NATURAL vegetation in the creek.
- **Do not dump yard wastes into the creek or cut your lawn up to the creek's edge.** Yard waste contains chemical additives and high nitrogen and phosphorus. Rather than bag your grass clippings, leave them on the lawn as a source of fertilizing mulch. Yard waste that decomposes in streams and lakes will use up dissolved oxygen in the water that is essential for fish habitat. Leave native vegetation buffers creekside.
- **Don't disturb instream rocks or build dams and footbridges.** The undersides of rocks are habitat for macroinvertebrates, which are the food for fish, birds, and other aquatic organisms. Dams can block fish passage, and during high water events, dams and footbridges can catch debris and increase the likelihood of flooding in your yard.
- **Participate in the Anchorage Waterways Council's Annual Creek Cleanup (every spring), and become a member of the organization.** Memberships help support a variety of programs.

BE THE GUARDIAN OF YOUR CREEKS!

Anchorage Waterways Council is a non-profit 501 (c) (3) corporation that is funded by memberships, donations, and grants.

anchoragecreeks.org

907 272-7335

Follow us on Facebook at Anchorage Waterways Council

AWC's creek rack card that was sent included with residential letters

Anchorage Waterways Council
P.O. Box 241774
Anchorage, AK 99524
(907) 272-7335

June 7, 2023

Cedric Burden
PacRim Properties
405 W. 27th
Anchorage, AK 99503
(via email)

Hi Cedric,

My apologies for taking so long to pull this information together for you about pet waste on shared properties.

Basic facts about dogs and poop in Anchorage:
1. The MOA estimates there are about 65,000 dogs in the Municipality.
2. They estimate that each dog poops about 3/4 lb a day which totals 48,750 lbs. of dog poop a DAY!.
3. Pet waste carries disease-causing bacteria, viruses, and parasites. A single gram of dog poop will have ~23 million *E. coli* bacteria which can cause giardia and other ailments to both humans and their pets.
4. Stormwater runoff (rain and snow melt) is the major conveyance of pet waste as it picks up anything on the ground and washes it directly across surfaces or in Anchorage's storm sewer system where it flows UNTREATED into local waterways.
5. Your property on Fairweather is directly uphill from Campbell Creek which is a major recreational waterway for rafting, kayaking, swimming, and wading. There are no buffers between your property and the creek, so everything on the ground--washes down!
The above is some of the information that we try to educate local citizens about. It's a huge problem everywhere. A lot of people do pick up, but there are so many who do not.

Some suggestions:
1. Trash cans strategically placed can really help people who are conscientious and carry their own poop bags. However, with local stores moving away from plastic (which we support), it doesn't leave pet owners with a "free" option for picking up.
2. Pet waste stations: paired with a trash can--this is an important factor in getting pet waste picked up.
3. Signage: Tim Kane who originally sent me photos of the problem sent one of a sign that warns about pet urine. This is not helpful at all, and I'm not sure why it's even up. There are a lot of ways to go with signage, many examples suggesting that people pick up can be purchased. Putting some "teeth" into the signage, such as reminding them that there are fines (Municipal) for not picking up helps. Sadly, there is little to no enforcement of this unless a property has a buildup of pet waste and a complaint is filed with Animal Care and Control. Following is the MOA's Title 17 which lists fines for pet waste:
https://library.municode.com/ak/anchorage/codes/code_of_ordinances?nodeId=TIT17AN_CH17.70ANCACOFEFICIPE

- **17.10.015 - Animals creating disturbance or nuisance.**
  A. It shall be unlawful for any owner or custodian of an animal to permit it to make chronic animal noise.
  1.The animal care and control center may, upon receiving a complaint alleging chronic animal noise, issue a written notice to comply to the animal owner or custodian. The notice shall contain:

a. The definition of chronic animal noise.
b. The nature and times of the complaint.
c. Penalties for violation.
d. Means and methods of curtailing chronic animal noise.
e. Time permitted to comply with the notice.
2. If the violation continues after the time permitted by the notice to comply, a NOV may be issued in accordance with section 4 below.
3. An animal owner issued three or more NOV's within one year period may be required to forfeit an animal to the municipality, except as provided below. The chief animal control officer may elect to make the animal available for adoption. Adoption must be made to a person other than the owner, custodian, or person residing on the owner or custodian's premises.
a. A forfeiture order shall not be sought against an owner who has taken verifiable steps to correct the problem prior to receipt of a third NOV within the one year period. Verifiable steps include, but are not limited to, debarking of the cited animal, acquisition and use of a barking control device, or structural modification of the property where the animal is kept so as to reduce noise. To the extent that such efforts are not successful, the owner may be subject to additional citations and fines as provided in chapter 17.70.
4. NOV's for chronic animal noise shall only be issued after receipt of a. or b. below, and completion of an investigation by animal control:
a. A written statement to the animal care and control center, signed by two or more persons living at different addresses, both in the immediate neighborhood of the animal making the chronic animal noise, one of whom must be both the statement preparer and the original complainant; or
b. A written statement to the animal care and control center, signed by one person living in the immediate neighborhood of the chronic animal noise, where additional date and time specific evidence is provided.
B. No owner or custodian of an animal shall permit the animal's feces to be left on public or other person's private property.
C. No owner or custodian of an animal shall permit it to upset garbage on public or private property.
(AO No. 2001-158(S-4), § 1, 1-1-03; AO No. 2004-86, § 2, 5-18-04; AO No. 2008-96, § 1, 9-16-08; AO No. 2013-142, § 2, 12-17-13)
Violations of all other provisions of title 17 - $100.00 first violation, $250.00 second violation, $500.00 each subsequent violation.

4. I don't know what sort of policy you have in place for pet owners, but this can be important. The Alpine Apartments imposed their own fine of $25 for pet waste that is left. It's something you might consider.
5. Education: I can provide you with ideas for fliers to give to your tenants if you'd like. Here's a link to a graphic animation that we produced a couple of years ago--one minute visually summarizes the problem. https://www.anchoragecreeks.org/projecto-2
6. I'm attaching an updated version of our Scoop the Poop brochure. We realize that most people do NOT read pamphlets and fliers, but these might be helpful if you find a way to distribute them.
Lastly, please contact me if you have any questions or comments. We want to help you keep poop off your property and out of our creeks.

Thanks so much,

Cherie Northon, Ph.D.
Executive Director

Anchorage Waterways Council
P.O. Box 241774
Anchorage, AK 99524
(907) 272-7335

July 13, 2023

Dear Little Campbell Creek Neighbor,

There are not a lot of urban dwellers who can say they have an anadromous creek running in their neighborhood! Because of this proximity, I wanted to reach out to you with some important information on how you can help protect this treasure.

Anchorage Waterways Council's work focuses on keeping local lakes and creeks healthy for all to use and enjoy which is why we would like your help. In this mailing, I've included information about ways to assure good stewardship for Anchorage's waterways. Please take a minute to read it over. Being our "eyes" on local creeks helps us immensely with our work, so please contact me if you have any concerns, comments, or questions.

Here are a few facts about Little Campbell Creek that might be of interest to you:

- The Little Campbell Creek watershed is the largest tributary of Campbell Creek with a length of 25.8 mi., and it encompasses 15 sq. mi. The head of the South Fork is near Glen Alps, while the North Fork (near your neighborhood) originates a little south of Campbell Airstrip. The two forks join Campbell Creek near the Old Seward Hwy and empty into it near Nathan Dr.
- Little Campbell Creek hosts rearing grounds for coho and king and silver spawning. Other species inhabiting Little Campbell Creek include Dolly Varden, trout, and stickleback.

One issue that is great concern in your neighborhood is the illegal dumping of grass clippings, yard trimmings, and trash at the end of Lore Street by Grey Wolf Circle which violates the MOA's Municipal Code (Title 25.70.040 – Prohibited activities). While this may seem innocuous because it's "vegetation", this dumping is detrimental to the area and worse for the creek. The vegetation breaks down and runs off into the creek below when it rains carrying a high hit of nitrogen from the decomposition as well as pollutants from dumped items. These things all combine to impact the water quality for the fish living in it as well as the other critters that are dependent on the water for their survival. The Muni's Code Enforcement officers will cite and fine people who are found to be dumping there, so I'm providing some options for managing your yard waste.

SAVE YOUR BACK! Take that bag off your mower and mulch your grass back into your lawn in summer and your leaves in fall! Benefits: it feeds the microbes in the soil that, in turn, fertilize your lawn! Save time, save effort, and save $$. Check out Gardener Jeff if you need convincing. https://www.adn.com/gardening/article/jeff-lowenfels-let-no-rake-movement-begin/2014/10/03/

Compost in your own yard and put your cuttings back to work! There are several classes where you can learn to compost. anchorgardens.org/wp-content/uploads/2023/06/Composting-Class-Poster-FINAL-FINAL.pdf

Anchorage and Eagle River wood lots: Trees and branches can be taken to the Eagle River wood lot that opened June 2 until the Anchorage wood lot opens. www.muni.org/Departments/Fire/Wildfire/pages/woodlots.aspx

Sand Lake Disposal Site: www.anchsand.com/sand-lake-disposal-site/ This site has a charge of $12.50/cu. yd.

Community Composting Projects: www.akaction.org/yarducopia/communitycomposting/ This site has several compost sharing and environmentally friendly options for people to connect to get rid of cuttings or collect something they need including mulch, compost, and manure.

If you would like to know more about local waterways and our work, please visit our website at www.anchoragecreeks.org. We are the only organization dedicated to caring exclusively for Anchorage's creeks and lakes.

Sincerely,

Cherie Northon, Ph.D., Executive Director
cherie@anchoragecreeks.org

Little Campbell Creek at Nathan just before it joins Campbell Creek

Anchorage Waterways Council is a non-profit, 501(c)(3) organization. Our tax ID # is 92-0111510.

APPENDIX C – Media Outreach

LETTERS TO THE EDITOR – Anchorage Daily News - 4/21/23

SCOOP THE POOP DAY

A huge thanks for Joyce Barnett's April 18 call to action for cleaning up dog poop! The Anchorage Waterways Council, or AWC, strives to educate pet owners on why it is so important to scoop the poop.

Aside from the yuck factor of humans and dogs stepping in it, pet waste left on the ground will invariably find its way into our much-loved creeks and lakes. What happens then? People and pets can become ill while enjoying local waterways. One gram of dog poop contains approximately 23,000,000 fecal coliform bacteria. Multiply all the dog poop left on the ground, and it's very disturbing to imagine how affected our creeks and lakes are. These are the places where your children swim and wade, and hundreds of residents enjoy kayaking and fishing.

This Saturday, April 22, is our annual Scoop the Poop Day where the focus is on cleaning up pet waste on local trails and in dog parks, e.g., University Lake and Connors Bog. Please consider coming out and helping there or pick your own location to clean. AWC will supply buckets, bags, trowels and gloves at the parks, or contact us — awc@anchoragecreeks.org — to pick up gloves and bags if you want to clean elsewhere. Thank you for doing your part, and please remember that every day is a Scoop the Poop Day!

— Cherie Northon, Ph.D. Executive Director, Anchorage Waterways Council Anchorage

Keeping All Waterways Healthy

QUILTS OF VALOR CREEK CLEANUP TEAM ALONG THE MIDDLE FORK CHESTER CREEK, ANCHORAGE

Contributed by Cherie Northon

Urban creeks and lakes especially need our help to keep them healthy and usable. They are home to a multitude of critters, both above and below the surface, a source of direct and indirect drinking water, and providers of enjoyment for their nature and recreation. Being urban means that they are subject to a variety of effects from both stormwater runoff and high-usage.

How can we all contribute to their well-being, and therefore to ours? Remember this: What's on the ground, washes down! Because we all live in a watershed, trash, litter, and pollutants that are on the ground will eventually flow into our waterways untreated. Stormwater (rain, snow melt, yard water) pick up anything on the ground (ciggie butts, dog poop, plastic bottles, yard clippings, oil drips, and more!) and flow into the nearest storm drain. These drains convey the pollutant-laden stormwater to the nearest waterway where they discharge untreated stormwater into places where we raft, fish, wade, and more. Is this what you want your kids and pets playing in? Is this what you want our salmon and trout to live in? Is this what you want to raft and kayak in? Probably no.

What can you do? Cleaning up after your pets when out is one of the most important things! Pet waste carries a variety of nasty bacteria and other organisms that can make humans and their pets ill. Dispose of all trash--especially cigarette butts properly. When out, grab a piece of litter and put it in its proper place. In your yard, clean up after your pets regularly and keep grass clippings and yard chemicals from running offsite. Read and use ice melt chemicals according to the directions—less is better, or consider traction sand. Use a car wash (they recycle the water, and it goes to the wastewater treatment plant), or wash your car on grass using minimal water and safe detergents. Maintain your vehicle so it doesn't leave drips on the ground or road. Organize a local cleanup or join us in our Annual Creek Cleanup which is held every May. When fishing, ALWAYS discard your used fishing line and tackle in the trash so it doesn't injure wildlife. All these actions will reduce your impact on local waterways and the wildlife who live there.

While the Anchorage Waterways Council focuses on the Municipality, all these suggestions can be applied to wherever you live or work. Water is a precious resource for all of us which is why we must protect it while enjoying it.

Check our website, www.anchoragecreeks.org, for more tips on keeping local waterways clean and healthy.

The People's Paper, November 9, 2023

APPENDIX D – Newsletters

Streamline - December 1, 2022

Streamline - January 9, 2023

Streamline - April 11, 2023

Streamline - May 3, 2023

Streamline - July 12, 2023

Streamline - October 13, 2023

Anchorage Waterways Council - *Streamline* - 12/1/22

Alaska Native Cultural Charter School students in AWC's "Creeks as Classrooms" Program, October 6, Russian Jack Springs Park

Engaging with Anchorage's Youth Along Waterways

In 2008, AWC initiated its "Creeks as Classrooms" (CAC) program with a goal to bring Anchorage students face-to-face with our city's amazing creeks and lakes. The venues have ranged from the fairly pristine North Fork of Campbell Creek to the downstream Westchester Lagoon which empties the 20+ miles of Chester Creek and its tributaries.

The program was initially funded by the U.S. Fish and Wildlife Service and the Bullitt Foundation. Since 2011, the program's support has been provided entirely by annual grants from ConocoPhillips Alaska's "Spirit of Conservation" program. Other than a hiatus during the pandemic, CAC has continued to bring outdoor experiential learning to thousands of students over the years.

This year, AWC partnered with the Anchorage Park Foundation's "*Schools on Trails*" program to work with 5th grade students from two schools: the Alaska Native Culture Charter School (ANCCS) at Russian Jack Springs Park and Muldoon Elementary at Chanshtnu Muldoon Park. During the 2-day sessions, students were divided into 4 groups, and each group spent 1/2 day with the four teaching teams. Besides working creekside with AWC, students were introduced by other instructors to geo-caching, explored soundscapes, and looked at the dynamics of forests.

The CAC curriculum focuses on examining the health of waterways and what we need to do to keep them that way, e.g. picking up pet waste

and not littering. This is primarily accomplished by showing how macroinvertebrates, a tiny benthic insect, can provide us with information on whether water is polluted or relatively pollution-free.

Macroinvertebrates are an excellent group of organisms to use because their varied life spans, which can range from a few months to many years, are long enough to evaluate the full effects of intermittent and continuous pollutants, yet short enough for populations to respond relatively quickly to water quality changes. Furthermore, there's no argument that sorting bugs is always a hit with kids as well as participating adults.

Students (above) sorted macros from the large trays by taxonomic order which were then placed into the ice cube trays accordingly. Afterwards, they were totaled by pollution tolerance and intolerance, and a judgment was made about the health of the creek. This reach of Chester Creek is about 500' downstream of Russian Jack Springs, its headwater, and was found to be relatively unpolluted.

Besides the benefit of being in an outdoor environment, this hands-on lab allowed students to experience "their" creek up close and personal as it is within walking distance of their classrooms at Bettye David East High School.

Middle Fork Chester Creek just below Russian Jack Springs

This is a busy spot for bicyclists, joggers, hikers, and the occasional moose, such as the big fellow who was following a cow upstream. Fortunately, he decided she was more interesting than we were.

A week later, we worked with eighty 5th graders from Muldoon Elementary at the far east end of Chanshtnu Muldoon Park, which is currently being enhanced with a food forest, community garden, dog park (with a separate section for small dogs), bike park, trails, and a large open recreation area. (Click *here* for a look at the plan.)

This session proved to be somewhat challenging as the group size was twice as large as the previous week, and it snowed! Many of the kids weren't well-prepared for the weather (as well as a few adults!), so it was imperative to make adjustments to keep them moving as much as possible. No moose strolling by this time, although we did have to keep an eye out for a bear that had been spotted a few days earlier.

Muldoon Elementary students were given a journaling exercise that focused on their senses as they overlooked the South Fork Chester Creek.

South Fork Chester Creek at Chanshtnu Muldoon Park, October 2022

These outdoor programs are clearly a benefit to Anchorage's students as they provide them with real-world experience (including challenges) in their environment, and we look forward to resuming this program in spring 2023. Of course, it could not happen without its dedicated staff, Thom Eley and Vangie Wight, and its wonderful volunteers, long-time board member Bob Shipley and outdoor educator Melissa O'Donnell.

Memberships and Donations

Do these projects inspire you? These are some of the things that AWC is able to do with memberships and donations. Help us to do more and be advocates for local creeks and lakes in the Anchorage watershed. Join an active community of like-minded citizens and businesses. Your *support* makes a tremendous difference to a small organization like AWC.

Donate items and shop to help AWC

Fashion Pact is a new resale shop in downtown Anchorage where items you donate and purchase generate income for AWC. This is an excellent way to reuse items and keep them out of the waste stream. EVERYTHING in the shop is $5. Everything! Of that $5, $1 goes to the non-profit that you designate when you donate items, and, if you shop--an additional $1 of the $5 goes to the non-profit of your choice. It has turned out to be a great source of revenue as well as a good place to donate gently used items. Please check it out, and consider us if you shop or donate there.

Our *Fred Meyer Rewards* program and Amazon Smile are additional ways to support our work.

Contact: 907 272-7335 or *awc@anchoragecreeks.org*
Follow us on Facebook: *AnchorageWaterways* and *ScoopThePoopAnchorage*

Visit our website

Anchorage Waterways Council - *Streamline* - 1/9/23

December 18, 2022--the last water quality monitoring event of the year on the S. Fork Chester Creek at University Lake. Air temperature: -25C/-13F
(Photo by monitor Oona Martin)*

*AWC's fantastic monitors brave the elements year-round to take water samples. This is a huge contribution to understanding the health of local waterways. Monitoring is funded entirely by donations, and it's the ONLY program collecting this data in Anchorage!

2022 is a wrap!

AWC has had a tremendous year, and you are part of it. We would like to acknowledge all of our volunteers and members who contributed to making Anchorage's popular and well-loved creeks and lakes healthier. You did this through your actions: cleaning trash from creeks and lakes, scooping poop, monitoring water quality, recycling used fishing line and tackle, helping install the new Westchester Lagoon viewing platform, and supporting AWC with your memberships and donations. THANK YOU!

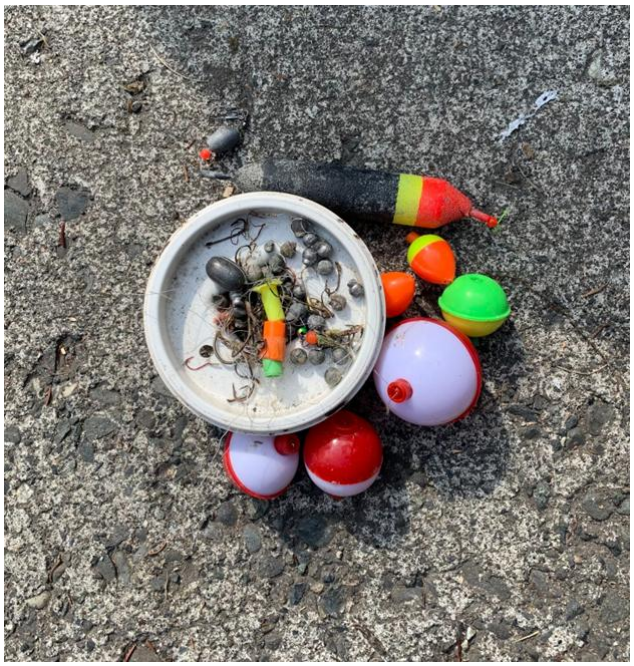
In 2022, AWC's Annual Meeting finally returned after a hiatus due to the pandemic. The meeting focus was on our recent undertakings and accomplishments. If you missed it, this newsletter is devoted to providing a recap.

2022 Annual Meeting - Recap

Our annual meeting was held on November 2 for the first time since 2019, and it was great to be back. The meeting was both in-person at the BP Center as well as on Zoom with four presentations.

*"***Loons, Line and Lead***"* was presented by USFWS summer intern Chloe Hansen, a student at the University of Wisconsin. Over the summer, Chloe developed a framework for *education outreach* aimed at protecting wildlife (especially birds) from the detrimental effects of lead poisoning from fishing tackle as well as injury and death caused by tangling with monofilament fishing line and hooks. One of the most startling facts about lead fishing weights is that a single small shot can kill a loon that ingests it. How? *Death can come when the grinding action of the loon's gizzard combined with its stomach acid break down the lead shot which then passes into the bloodstream and organs and ultimately poisons it.*

As part of the lead and line program, AWC received funding from the *Alaska Conservation Foundation* to replace old monofilament recycling bins that were installed 7 years ago (the old bins were given to the *Kenai Watershed Forum* for their program). Currently, there are 20 bins located at several *popular fishing spots*, and, in 2023, a few more will be added. Several dozen miles of monofilament were emptied from the existing bins along with a considerable amount of lead tackle, hooks, and bobbers.



Bobbers, lead shot, and hooks from monofilament bins (Photo by Chloe Hansen)

The second presentation, "**Stormwater Runoff, Water Quality, and 6PPD-Quinone",** was by board member Birgit Hagedorn who introduced two projects that she has undertaken over the past 3 years. The first involves the impact of road salts from stormwater runoff into local waterways--especially in relation to increased melt and freeze events over time. This project is a small subset of a large National Science Foundation (NSF) initiative called "*Navigating the New Arctic*". *Electrical*

conductivity (EC) testing was added to our standard monitoring protocol for 8 Chester Creek sites, and the results are then provided to the larger grant project for assessment.

Birgit's other project focuses on toxicity with the potential for a more immediate impact on local coho salmon populations. As has been shown in *Puget Sound*, antioxidant chemicals used in the manufacturing of tires break down into a compound known as 6PPD quinone where the *particles* can enter local waterways in stormwater runoff *(video of stormwater runoff into Chester Creek*). In 2021, AWC mounted a GoFundMe campaign and raised a little over $5,000 to cover the costs ($500/analysis) of water testing at stormwater outfalls and creeks near high-traffic roads in Anchorage. Lethal 6PPD quinone concentrations were found in stormwater entering Chester Creek at the New Seward Highway in April and September. Once diluted in the creeks, however, they were below lethal levels. AWC continues as part of a working group formed by the Alaska Department of Environmental Conservation (DEC) that brings a variety of government, non-profit, and industry groups to share research and progress on this concerning issue. Such projects are among those that AWC has no dedicated funding for, and this is where your membership donations can make a difference.

Dr. Hagedorn collecting samples at Chester Creek just west of the New Seward Hwy (Photo by Cherie Northon)

The next presentation was on AWC's signature project of summer 2022--the **"Westchester Viewing Platform"**. An overview of the project was given by board president Isaac Watkins and board treasurer Alex Jefferies. The new viewing platform in the Westchester Lagoon Waterfowl Sanctuary at Spenard Road came to fruition through an Anchorage Parks Foundation *"Challenge Grant" award* and with lots of volunteer time and donations which filled the "challenge" part needed

for a 1:1 match.

Ground was broken on July 6, the platform was put in place on July 20, and, on a rainy August 13, AWC held a joint celebration with the *Anchorage Park Foundation*, the *Sierra Club*, and *Alaska Environment* to recognize the 50th anniversary of the *Clean Water Act* and to formally open the new viewing platform. It was very exciting to have this great project completed in only a few months. The hard-packed beach, caused by humans, pets, and waterfowl, was manually turned over by a crew from the *Youth Employment in Parks* (YEP) who also added new topsoil, plantings, and an ADA-accessible gravel path. The eroded shoreline was excavated, and fresh willow stakes were placed in the trench to help stabilize it. Other than a few crafty mallards, the waterfowl are mostly minding their manners and staying off the newly redone landscape. To finalize this project, formal signage that highlights the problems of human-fed birds will be installed in spring 2023.

Eroded bank at Westchester - July 6, 2022 (Photo by Cherie Northon)

Bank stabilized with willow stakes -July 19, 2022 (Photo by Cherie Northon)

Newly installed platform shielding the eroded bank - July 20, 2022 (Photo by Cherie Northon)

The final presentation, **"Impermeable Surfaces and Stormwater"** by board member Donovan Camp, covered new actions that could lessen the impacts of stormwater by reducing impermeable surfaces. As some of you might have read recently, there has been a *move by the Anchorage Assembly* to come to terms with the vast amounts of paved areas in Anchorage that are devoted to parking and to use the space that would be saved towards other important needs, e.g. affordable housing and a reduction in urban sprawl. Another outcome of this plan involves reducing impermeable surfaces or turning them into areas that result in less stormwater runoff into local waterways. AWC heartily supports efforts to reduce the amounts and effects of nonpoint source pollution from impervious surfaces.

In 2022, AWC produced its second short *graphic video* which provides an understanding of the effects of stormwater runoff as well as some ways that we can reduce the amounts entering creeks and lakes. Please check it out, and consider what you can do to reduce stormwater runoff from your property.

How can you help?

Do these projects inspire you? You've seen some of the things that AWC is able to accomplish with memberships and donations. Help us to do more and be advocates for local creeks and lakes in the Anchorage watershed by joining an active community of like-minded citizens and businesses.

Pick.
Click.
Give.

January means it's time to file for your annual PFD. AWC has been the recipient of Pick Click Give donations for several years, and we now ask you to consider sharing a portion of your PFD to help AWC continue its mission. Your support makes a tremendous difference to a small organization like AWC where we can make a little go a long way! Make your Pick. Click. Give. *donation here*. Thank you!

Memberships

An annual membership is also a wonderful way to show your support for our work. Giving levels start at $30, and there are different *payment options* from online to mail.

Volunteer

There are many ways to help--join or form a *Creek Cleanup team*, volunteer to help on *Scoop the Poop Day* which will be on April 22 this year (and please ALWAYS clean up after your pets!), or *report an issue* if you have concerns.

Donate items and shop to help AWC

Fashion Pact is a new resale shop in downtown Anchorage where items you donate and purchase generate income for AWC. This is an excellent way to reuse items and keep them out of the waste stream. EVERYTHING in the shop is $5. Everything! Of that $5, $1 goes to the non-profit that you designate when you donate items, and, if you shop--an additional $1 of the $5 goes to the non-profit of your choice. It has turned out to be a great source of revenue as well as a good place to donate gently used items. Please check it out, and consider us if you shop or donate there.

Our *Fred Meyer Rewards* program and Amazon Smile are additional ways to support our work.

Contact: 907 272-7335 or *awc@anchoragecreeks.org*
Follow us on Facebook: *AnchorageWaterways* and *ScoopThePoopAnchorage*

Visit our website

Anchorage Waterways Council - *Streamline* - 4/11/23

Scoop the Poop Day!
Saturday, April 22, 11-3

To show your support for clean waterways, stop by University Lake or Connors Bog dog parks on Saturday, April 22, where you'll be greeted by smiling volunteers who will be handing out gloves, bags, buckets, and trowels.

DIY Scoop the Poop

If you wish to clean up an area of your choice, AWC can provide bags and gloves. Contact *Vangie Wight* for assistance. We'd love photos of you cleaning up and will post them on Facebook (with your permission).

How does scooping dog poop help the greater world?

A gram of dog poop contains about 23 million fecal coliform (FC) bacteria! Multiply that out to get an idea of how many FC are in the droppings of one pet for one day. All poop that is not cleaned up will eventually make its way to the nearest waterway in stormwater runoff. It doesn't take much math to get the idea of how much FC enters our waterways every day, and these bacteria have pathogens that can make *humans and their pets sick* (1:00 video). ALL water is precious, and it needs to be cared for. So please, make every day a Scoop the Poop Day!

Hoping to see you out there!

Thank you for helping to make our creeks and lakes healthier!

39th Annual Creek Cleanup!

May 12 to 21

Signups are open!

Always a great team or family event, please come on out for our 39th cleanup! For the past 38 years, thousands of Anchoragites have fanned out along local creeks and lakes to pull tons of trash from them. Last year was a banner year for the number of teams, so let's do it again!

How? AWC provides teams with a tote filled with bags, hand sanitizers, a first aid kit, a location map, and sign-in forms. This year, there will be trash pickers, safety vests, and gloves donated by Matson's *Caring for Alaska* (video 1:43) program. Besides supplies, Matson has also made a very generous donation of $10,000 to help defray our expenses. Other sponsors include ConocoPhillips Alaska - $5,500, CIRI - $2,500, and GCI - $500. A huge THANK YOU to all!

Team signups are open! If you want to check out the available locations beforehand, go to this *link*. Questions? Email: *awc@anchoragecreeks.org*

How do clean creeks help the greater world?

We all live in a *watershed* (video 1:17). Everything we do in our local environment can affect the larger world. A simple piece of trash, like a plastic soda bottle, that is left on the ground could eventually make its way to the Pacific Ocean and the "great garbage patch"! Cleaning up the trash and litter along our creeks now prevents it from making its way down into a local creek to Cook Inlet to Prince William Sound to the Gulf of Alaska and finally the Pacific Ocean!

Anchorage Adventurers Meetup on Chester Creek, 2022

Flotilla is Back! May 20!

Flotilla signups will open on May 1

Our second annual Flotilla is an on-the-water event. Anyone with a kayak, canoe, or packraft can participate. The locations will be announced on May 1 when signups open. More details to follow, so stay tuned!

Memberships and Donations

Help us be advocates for local creeks and lakes in the Anchorage watershed. Join an active community of like-minded citizens and businesses. Your annual support makes a tremendous difference

to a small non-profit like AWC.

$30-$99 Waterway Watcher
$100-$249 River Keeper
$250-$499 Habitat Protector
$500-$999 Watershed Steward
$1,000+ President's Circle

AWC is also a recipient of Pick, Click, Give donations. Please consider us when you fill out your PCG application.

DONATE TODAY
Pick. Click. Give.

Donate items and shop to help AWC

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Our *Fred Meyer Rewards* program is an additional way to support our work.

Contact: 907 272-7335 or *awc@anchoragecreeks.org*
Follow us on Facebook: *AnchorageWaterways* and *ScoopThePoopAnchorage*

Visit our website

Anchorage Waterways Council - *Streamline* - 5/3/23

GET your "CLEAN" on!

So many choices and so much trash!

39th Annual Creek Cleanup!
May 12 to 21

&

2nd Annual Flotilla!
May 20

Cleaning our well-loved and highly-used creeks and lakes is a great way to show how much you care about the health of our waterways. Here are 2 ways to help.

Sign up for Creek Cleanup and pick your spot. It's one of the most fun and rewarding ways to clean up winter's trash that is lurking along banks and shorelines.

AWC provides volunteers with bags, hand sanitizer, a first aid kit, a location map, and sign-in forms. This year, there will also be trash pickers, safety vests, and gloves donated by Matson's *Caring for Alaska*.

Or, if kayaking and canoeing are more your style, Flotilla is made for you! A one-day event (May 20), Flotilla provides volunteers with a t-shirt, water bottle, and this year's logo sticker as well as cleanup bags and gloves. Some trash pickers will be available to borrow.

Sign up and find your spot! Lakes include Cheney, Goose, Taku, Sand, Delong, Jewel, Sundi and Westchester Lagoon.

Contact awc@anchoragecreeks.org for questions.

Memberships and Donations

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$30-$99 Waterway Watcher
$100-$249 River Keeper
$250-$499 Habitat Protector
$500-$999 Watershed Steward
$1,000+ President's Circle

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DONATE TODAY

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Anchorage Waterways Council - *Streamline* -7/12/23

Rabbit Creek flowing west through Potter Marsh at the boardwalk. Photo by AWC (long-time) volunteer water monitor Margie MacNeille, June 25, 2023.

Summer in Anchorage

A cool and windy spring has morphed into a cool and rainy summer. Plants are well behind in their growth, gardeners are complaining, farmers are very concerned, and local creeks are running high and turbid. Anchorage's weather can certainly jump around! It wasn't that long ago that we broke the all-time high record of 90° on July 4, 2019, yet this Fourth of July [in Anchorage], it was 30° cooler and rainy. As Kin Hubbard once opined, "*Don't knock the weather; nine-tenths of the people couldn't start a conversation if it didn't change once in a while*." So this is my segue into what's happened this spring and summer around our local creeks and lakes.

Beyond Cleanups

Scoop the Poop day, Flotilla II and our 39th Annual Creek Cleanup are ever-popular activities for cleaning up the winter's collection of snowed-over poops, trash and litter. Hundreds of volunteers participate in these events every year as Anchorage moves into its summer regimes. Like

most things this year, breakup took quite a bit longer, and still tons of trash and waste were removed. Thank you to all who care for their local waterways and get out to help keep them healthy and enjoyable. And a HUGE thanks to our Creek Cleanup Sponsors--Matson's "Caring for Alaska" program, ConocoPhillips' "Spirit of Conservation" grant, and GCI Gives.

Quilts of Valor team on the Middle Fork Chester Creek

But, AWC is so much more than cleanups. It was a busy time for our Creeks as Classrooms program this spring. On May 2, Education Director Thom Eley and Board Member Bob Shipley met up with two 4th/5th grade classes at Westchester Lagoon as part of the Watershed Education Project (WEP) that has taken place for the past several years. The students are given lessons in their classroom, along a local creek, and finally at Westchester Lagoon. It was still chilly out with ice on the lagoon, but the students, as always, LOVED the macroinvertebrates.

WEP class at Westchester Lagoon, May 2, 2023

Besides the WEP classes, AWC also worked with students from Government Hill Elementary, where Board Member Valerie Tompkins teaches music, and Central Middle School of Science, where former AWC staff Matt Kays is now a science teacher.

In May and June, there are several large events that offer AWC outreach opportunities for educating on the importance of cleaning up pet waste and monofilament fishing line and plastics, avoiding lead tackle, and keeping local waterways clean.

A new event for us was Reading Rendezvous on May 20. It was a beautiful

day, and thousands of families enjoyed the free books provided by the Anchorage Library along with a variety of learning opportunities, music, dancing, and games. AWC's focus was on its "Scoop the Poop" and "Loons, Line, and Lead" programs. Younger kids were provided with an opportunity to scoop up poop (dry beans) and older kids were asked to answer a few questions and demonstrate how to pick up dog poop with a bag. It was amazing that so many youngsters knew how to do it and suggests that our messages are getting out! There was also a fish toss into a giant inflatable loon and loon stickers that kids could color and wear.

Reading Rendezvous, May 20, 2023 Note the large inflatable loon on the right.

Potter Marsh Day on June 3 always provides a great opportunity for engaging with families about healthy creeks. Macroinvertebrates, which are biological indicators of water quality, gave both adults and kids another way to understand how and why they can help keep local waterways usable and enjoyable for all. A very blustery day, hundreds still came out to immerse in a variety of nature activities.

Potter Marsh Day and a 4 year old who already knows how to bag up dog poop! HURRAY! Start 'em young!

Loons, Line and Lead Update - Year 2

The "Loons, Line and Lead" program, or LLL as we call it, started off early this year because our intern is local. Typically, we hire college interns who arrive in late May or early June for only 9-10 weeks. Michelle Oliveira lives on base at JBER where her husband, Dakota, is an army paratrooper. Her JBER connection has worked out well as the LLL working group, composed of U.S. Fish and Wildlife (USFWS) migratory bird specialist Tamara Zeller, *Bird TLC* executive director Laura Atwood, Aaron Poe from the *Alaska Conservation Foundation*, and AWC executive director Cherie Northon, had been planning to expand the placement of recycling bins on some of the highly popular fishing lakes on base.

Meetings were held in April, and a May site visit came up with six potential bin locations on Otter Lake, Hillberg Lake, Six Mile Lake, and Green Lake. The materials were purchased with funds from the USFWS and the *Jean Tam Loon Conservation Endowment Fund* held at the Alaska Conservation Foundation. Bins should be going up in mid-July.

Besides checking on and emptying the 20 bins in Anchorage, Michelle is promoting the use of non-lead sinkers at popular fishing spots with loon and grebe populations, such as Taku Lake, Jewel Lake, and Cheney Lake. Due to the physiology of a loon's digestive system, a single lead fishing weight can result in it dying from lead poisoning if ingested.

There's been some hesitation by fishermen because of concerns about how tin acts in the water and with fish, so Michelle is handing out free samples as our goal is to get them to at least try them. If you have any location suggestions, please contact *Cherie Northon*.

Finally, remember to check out the new "*Loon Cam*" videos that from Connors Lake where a new loon chick recently hatched.

Michelle along Ship Creek emptying monofilament line

You may have noticed that the weather was woven into the above stories as we are all affected by it in one way or another. On a final note, one of the aspects of weather that affects local waterways the most is stormwater, and it is also a major focus of our work. Before you go, please check out AWC's one-minute *stormwater video* and see how you can help to minimize its impact.

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Anchorage Waterways Council - *Streamline* - 10/13/23

AWC monitoring site at South Fork Chester Creek just east of University Lake, July 23, 2023. (O. Martin)

Anchorage's Unsung Heroes

"Unsung" is an interesting word. Its origins have to do with the verb "sing", although there is some disagreement about when and where its use truly began. Most likely, it has to do with the songs of praise that bards spewed forth in various situations. Bottom line: there are a lot of people doing good things in Anchorage who go unnoticed and unacclaimed--so I want to sing some praises to them. Fortunately for you, they're written as this is not an audio newsletter.

As the AWC director for the past 13 years, I have had the pleasure of having some serendipitous happenings fall into my lap. While AWC continues to be relatively unknown despite its nearly 40 years of existence, there are a few people who are persistent enough to find us when they need help solve a problem. This newsletter is going to highlight a few of the many people who should be recognized for going above and beyond.

Good Things Our Neighbors Do

In early spring as the snow starts to recede, some of the things bursting forth are unclaimed dog poops. Piles of brown lumps dot the landscape almost everywhere, and this irks many people both with and without dogs. AWC receives a lot of complaints for which there is little we can do after the fact. We are constantly campaigning to get dog owners' attention for the simple act of picking up after their dog in order to keep bacteria (and other pathogens) off their shoes, pet's feet, and kids as well as out of local waterways.

(Shameless Scoop the Poop plug) Pet owners should ALWAYS carry one or more bags for cleanup--stuff your pockets, backpacks, and car with bags. Yes, sometimes we forget and are in need of one ourselves (a good reason to always carry spares). If you're on a trail or in a sanctioned dog park--keep an eye out for one of the two hundred plus pet waste stations that MOA Parks and Rec has placed around. Take a bag before your walk, and PLEASE deposit bagged poop in a trash can! And, if you're one who leaves their poop bag along a trail with the intent of returning for it--here are some *alternatives*.

Let's return to those emerging brown piles in spring. Fortunately, there are some people who are passionate enough about the perils of disregarded pet waste that they take action. In spring 2020, I received an email from Katie Peck who opined, *"I just heard that scooping the poop was a "thing"! I recently got a puppy and have been frequenting the trails. There was so much poop! I decided to do something about it and started bringing a bucket. I think I'll take a sled next time as the bucket gets so heavy!"* Katie and Hatcher continued to comb the trails for poop over the next few years, but this wouldn't be necessary if we all did our "doody".

Hatcher and Katie's DIY poop cleanup (K. Peck)

Terrence lives in the Sand Lake area and took it upon himself to fix up a small field that people had begun using to exercise their dogs. With no impetus for them to pick up after their pets, Terrence began cleaning up the area and adding a few amenities, such as a handmade bench. One of his neighbors purchased a pet waste station and pays to provide bags. Terrence added a trash can that he drags up to his yard every week to empty. Even with the pet waste station, there was still a considerable amount of dog poop left on the ground.

In April, he called us, and we discussed how AWC could help him. One thing he suggested was some signage. In addition to a variety of signs, AWC provided him with some large trash bags, small hand tools, and 5-gallon plastic buckets. Recently, I checked in with him, and he said there has definitely been an improvement in poop cleanup. The area as you can see below is quite pleasant as well

Homemade bench and pet waste station

Lena is a 70 year old retiree has taken it upon herself to clean up monofilament fishing line and hooks along Ship Creek. In August, Lena called me about one of our monofilament recycling bins on the north side of Ship Creek that needed to be emptied. Our monofilament intern Michelle went out to empty it and also to meet Lena. Since then, Lena has collected several bags of monofilament from the banks of Ship Creek as well as in the parking areas which seem to be one of the major places that people cut and drop their line. (Why?!?)

In late September, I met up with Lena and learned a bit more about her. She's worked a variety of jobs before retiring--most recently as a personal care assistant. She now fills her days by traveling around Anchorage by bus and on foot doing things that make a difference. She is really appalled by the problems caused by people who carelessly discard their fishing line, weights and hooks--and this is how she works to counteract them. She's a delightful woman on a good personal mission.

We thank her for the dedication she has shown to this problem. And, please--pick up your line and tackle and dispose of it properly!

Lena at Ship Creek (M. Oliviera)

Discarded monofilament (L. Jacobs)

Tammy lives uphill from North Fork Little Campbell Creek near Lore Rd. She called AWC in early summer about an open field area at the end of Lore Rd. where people were dumping yard waste and other debris. The area is a right-of-way (ROW) and has a small open channel that carries stormwater west (downhill) into the creek which is an anadromous stream. Ducks have been observed in the area including the channel.

Tammy walks through the area nearly every day and decided that it needed cleaning up and the dumping needed to be discouraged. We collaborated on some supplies, and, on the July 4th weekend, she and some neighbors banded together for a cleanup.

Sadly, despite the cleanup and signage, a few folks persisted in dumping yard waste in the area. There are, however, some remedies for this, such as filing a complaint with *MOA's ROW/code enforcement division*. This was done, and code enforcement paid a visit to those violating the ROW. I also sent 30 letters to the immediate neighborhood area describing the lot's status and how people could properly handle and dispose of their yard waste. One fellow who received a letter called and left a voicemail to THANK ME! It's nice to focus on the positives of this situation rather than the few bad apples who spoil it. Tammy and I continue to check in with each other, and, all in all, there has been an improvement.

The value of this cleanup is immense because trashy areas attract more dumping, and water running downhill into waterways carries trash and pet waste with it. While improving their neighborhood, they also are helping to protect a beautiful little creek and its inhabitants. Is there somewhere you can make a difference?

Tammy and Austin show the results of their cleanup on July 2. (T. Wilson)

Signage (T. Wilson)

Grass dumped after cleanup (T. Wilson)

You Can Be a Hero Too!

We should all be grateful for those who see a problem and take it upon themselves to try and remedy it. I'm sure there are many of our supporters who are also unsung heroes. I'd be interested in hearing what you do or if you have any positive suggestions, so please drop *me* a note.

Helping our well-loved waterways does not take a lot. There is information on our *website* about all of our programs and how to get involved, and there are some suggestions you can take away from the above stories. One thing that I do is to pick up at least one piece (usually more) of litter whenever I'm out. You can stuff it in a pocket, place it in a trash can, or put it in your car for disposal later. I aim for plastic items, such as straws, cups and lids, etc. It's a simple act, easily accomplished, and despite what seems insignificant, it does make a big difference.

Fashion Pact Update

Two years ago, *Fashion Pact* launched its first thrift boutique that raises funds for non-profits. Since then, AWC has been the recipient of nearly $2,000 dollars. This is revenue from the donation of goods by AWC supporters as well as those purchasing items who designate AWC as a recipient. This makes a huge difference to AWC's unfunded programs, such as its volunteer water quality monitoring program which needs support for equipment, supplies, and staff time to oversee it.

Last winter, their first shop at 6th and Ingra was damaged from a snow-laden roof. A second store quickly went online on Dimond Blvd., and today, a spacious new store at 68th and Lake Otis, opened. I encourage you to donate and shop there.

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APPENDIX E – Presentations

Olé class 1 – January 18, 2023 - Introduction

Olé class 2 – January 25, 2023 - Creeks are more than water

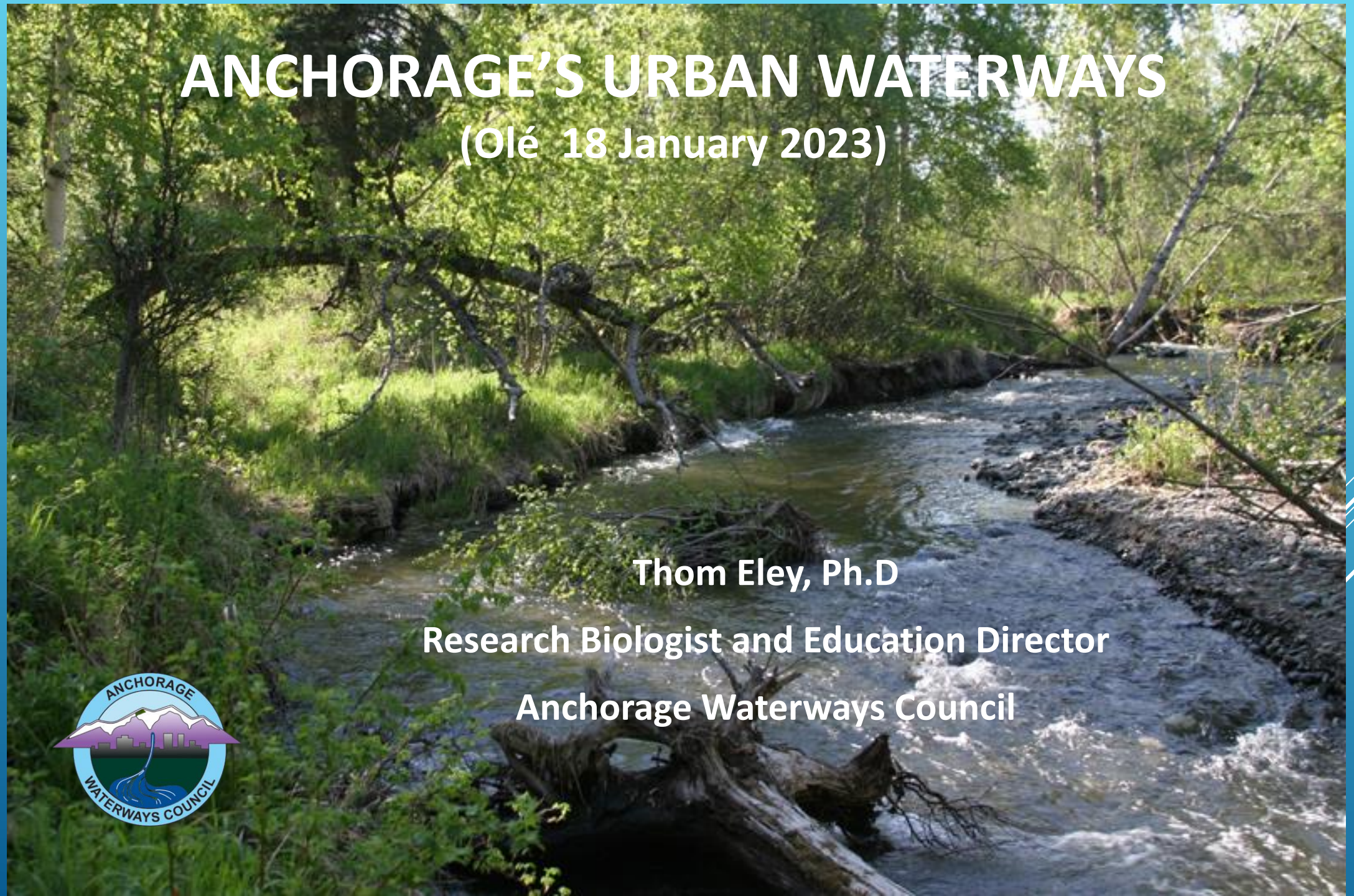
Olé class 3 – February 1, 2023 - Threats to waterways

Olé class 4 – February 8, 2023 - What you can do!

Cook Inlet Water Quality Summit, October 24, 2023 – The Municipality's Waterways and Cook Inlet

ANCHORAGE'S URBAN WATERWAYS

(Olé 18 January 2023)



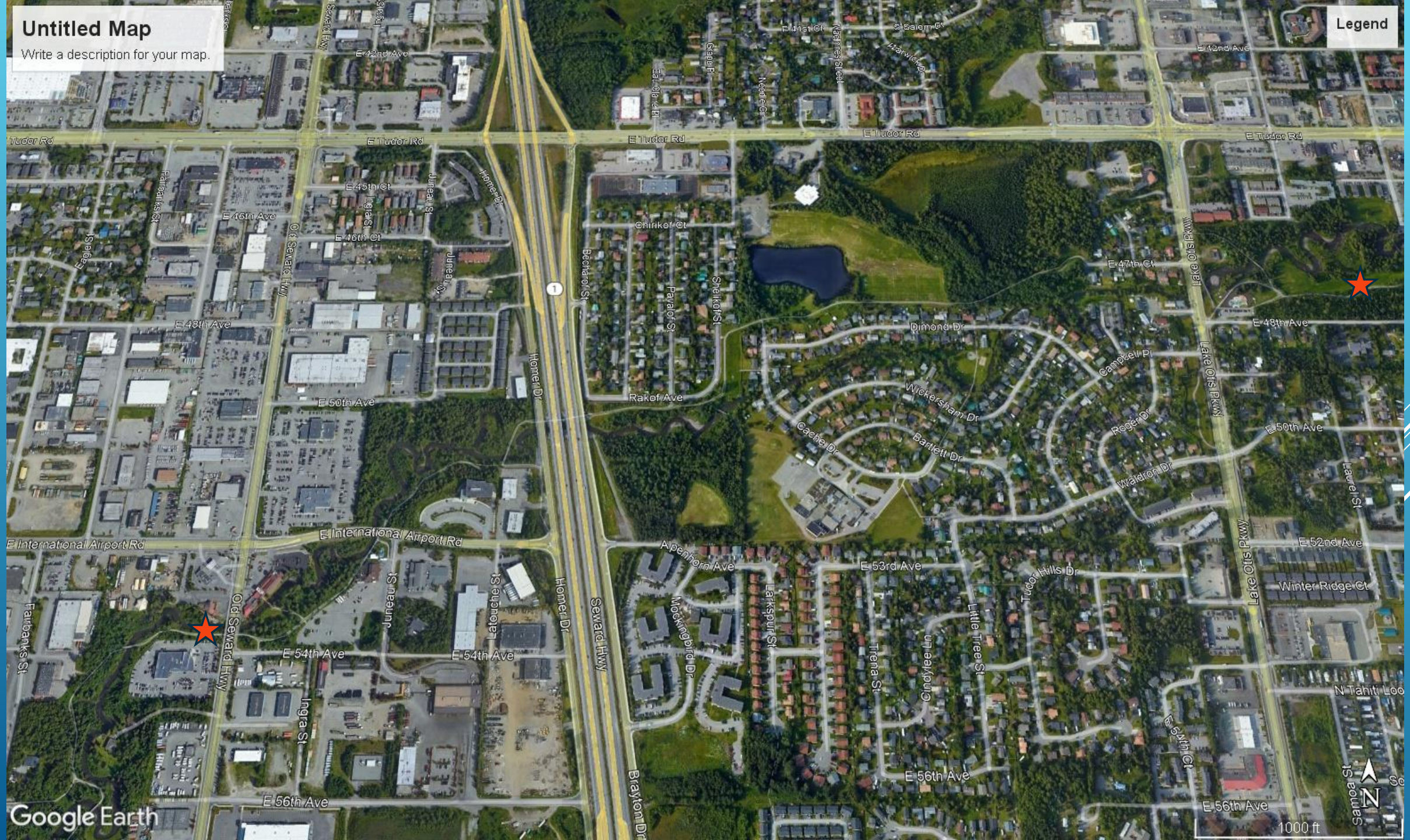
Thom Eley, Ph.D

Research Biologist and Education Director

Anchorage Waterways Council

Who we are?

- Anchorage Waterways Council (AWC) was incorporated in 1985 as a 501 c 3 non-profit.
- First Creek Cleanup in 1984
- Mission: *to promote the prevention of further environmental degradation; and to protect, restore, and enhance the waterways, wetlands, and associated uplands within the Municipality of Anchorage.*
- AWC Staff: 2.5 FTE and we don't have an office on Bragaw as Google says
- Supported by grants, contracts, donations, and memberships (become a member!)
- It was formed in response to health concerns about local streams and lakes that were called out by Dr. Rodman Wilson, public health director (1982-1987) under then-mayor Tony Knowles.
  - The Campbell Creek Classic, an annual water race in the city, was a casualty of health concerns, and was shut down in 1985 because of untreated sewage in the creek.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Write a description for your map.
Legend
E Tudor Rd
E 42nd Ave
E 45th Ct
E 46th Ave
E 46th Ct
E 47th Ct
E 48th Ave
E 50th Ave
E International Airport Rd
E 52nd Ave
E 53rd Ave
E 54th Ave
E 56th Ave
Old Seward Hwy
Seward Hwy
Homer Dr
Juneau St
Ingra St
Fairbanks St
Eagle St
Bechtarol St
Pavalof St
Sheikof St
Chirikof Ct
Rakof Ave
Dimond Dr
Wiekersham Dr
Cache Dr
Bartlett Dr
Campbell Pl
Roger Dr
Waldron Dr
Lake Otis Pkwy
Laurel St
Alpenhorn Ave
Larkspur St
Mockingbird Dr
Trena St
Little Tree St
Tudor Hills Dr
Winter Ridge Ct
N Tahiti Loop
Brayton Dr
Google Earth
1000 ft
N

University of Alaska Anchorage. Archives & Special Collections


Untitled Map
Write a description for your map.
Legend
Peanut Farm
Peanut Farm
Old Seward Hwy
Old Seward Hwy
Old Seward
Campbell Creek
Campbell Creek Trail
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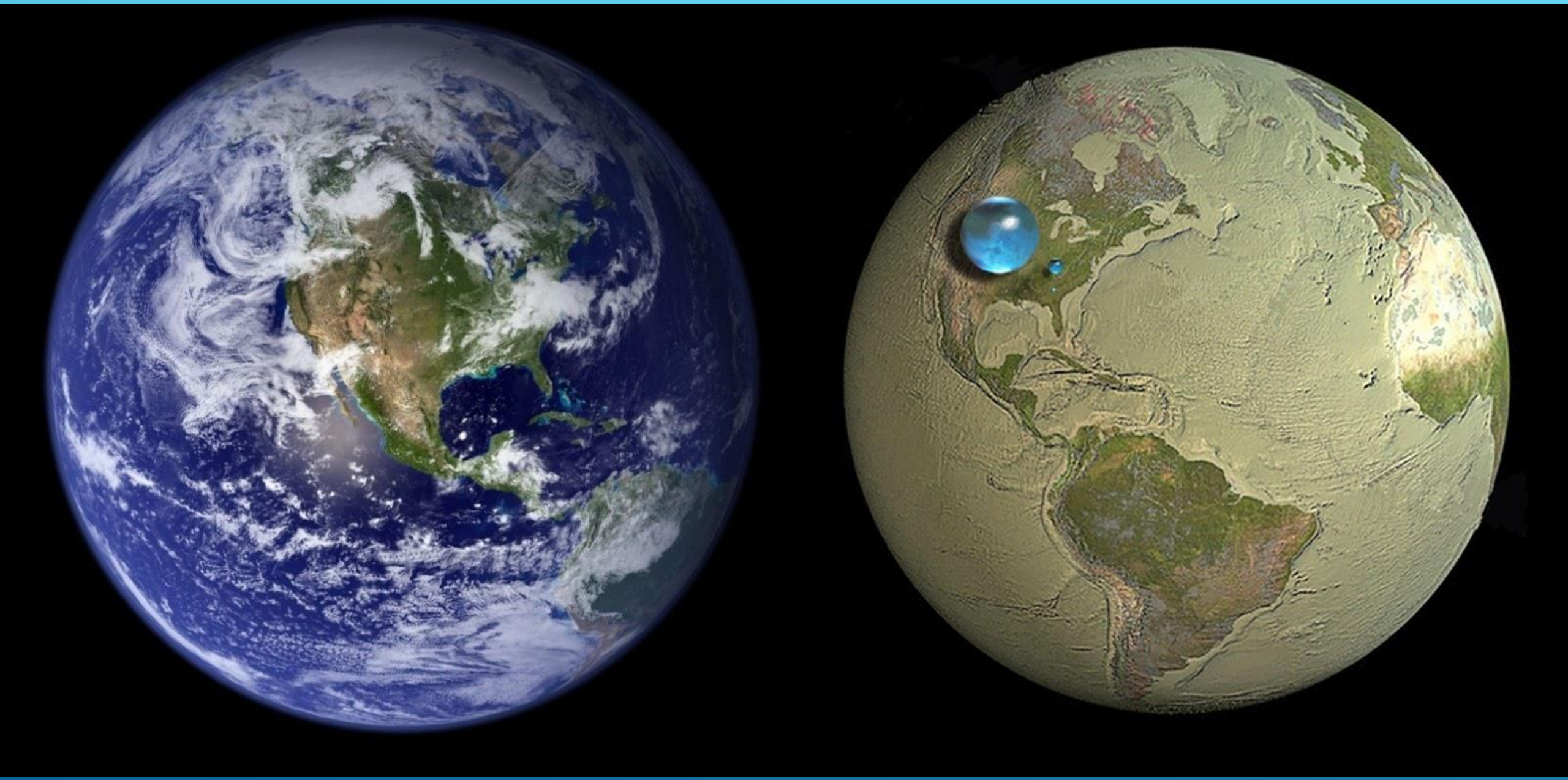
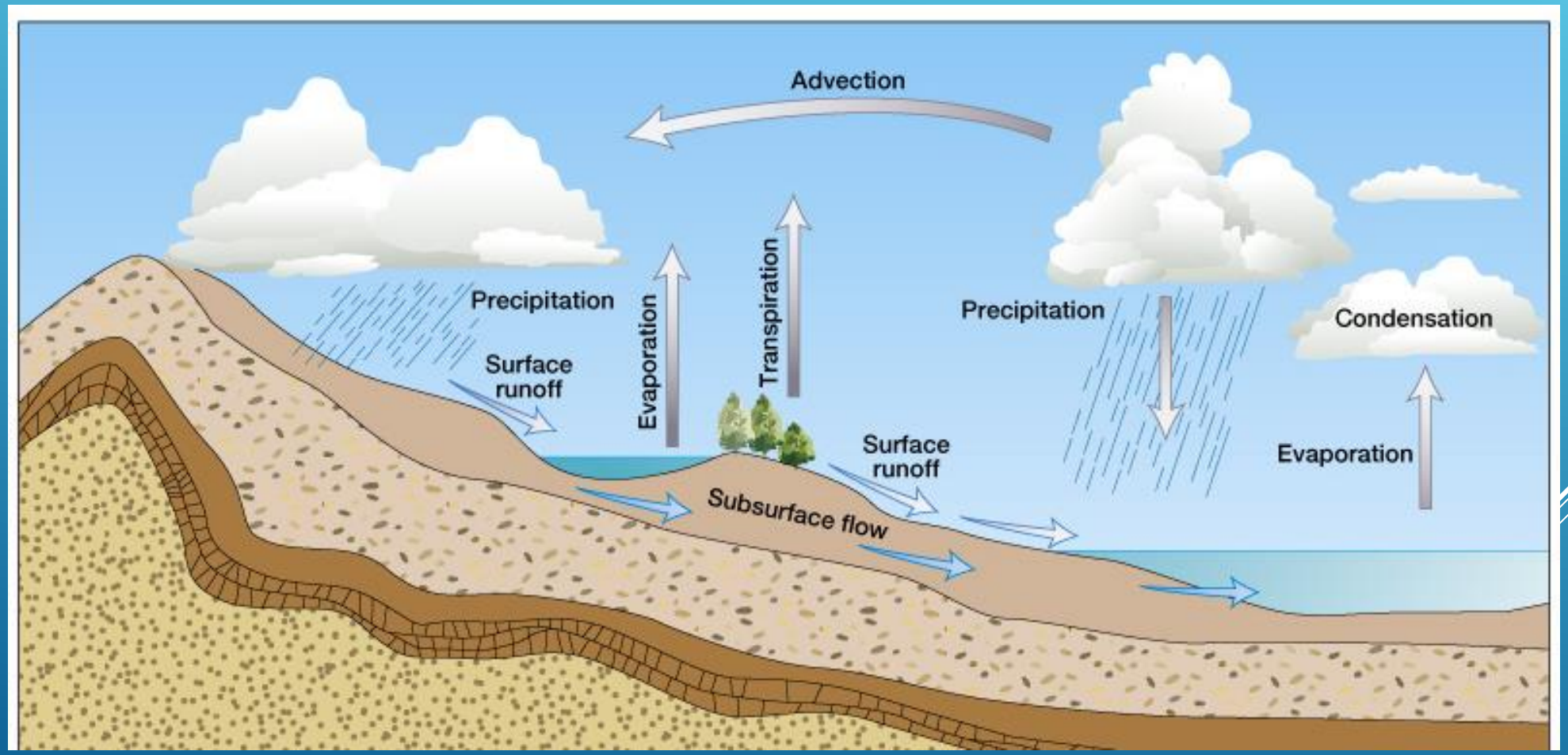
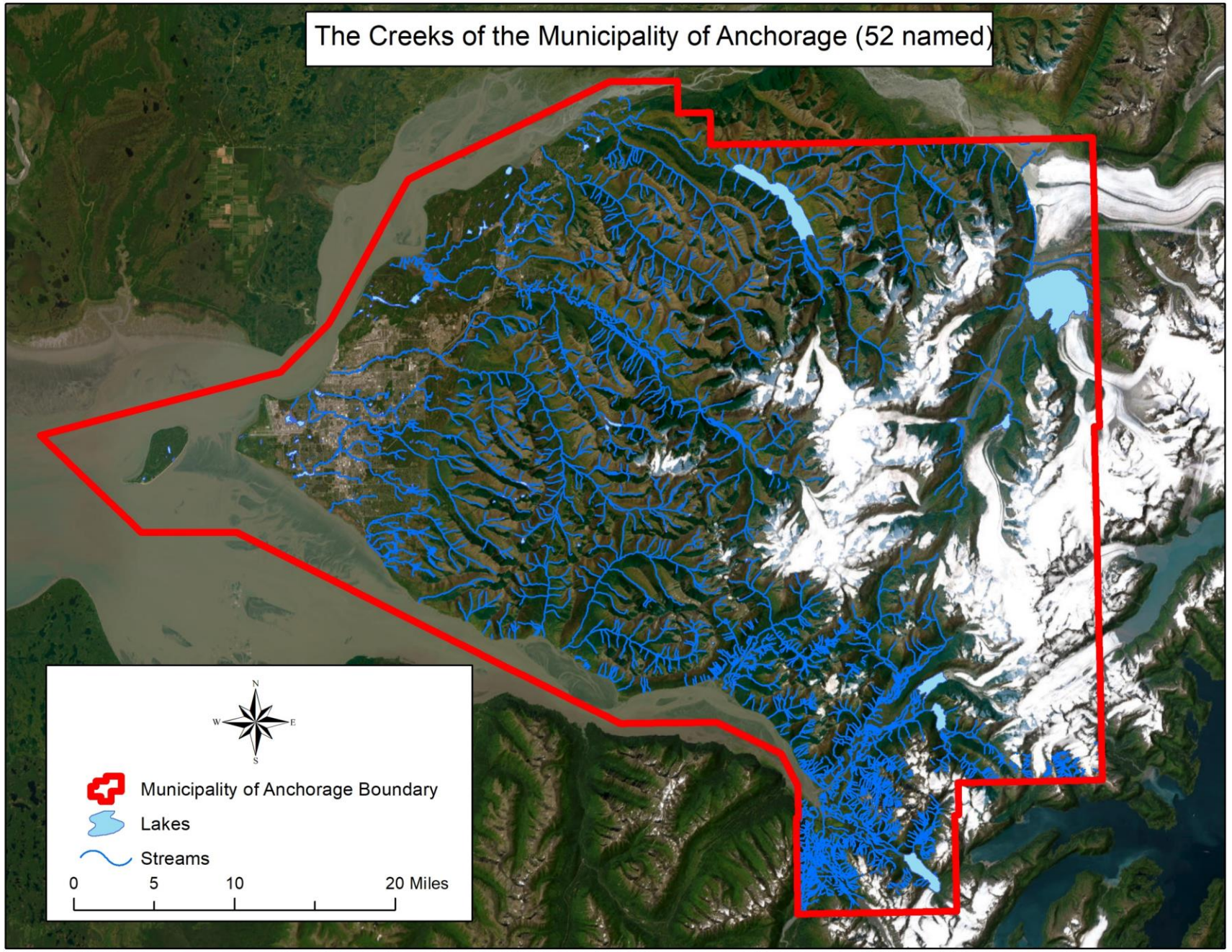


Water source	Water volume, in cubic miles	Water volume, in cubic kilometers	Percent of freshwater	Percent of total water
Oceans, Seas, & Bays	321,000,000	1,338,000,000	--	96.54
Ice caps, Glaciers, & Permanent Snow	5,773,000	24,064,000	68.7	1.74
Groundwater	5,614,000	23,400,000	--	1.69
Fresh	2,526,000	10,530,000	30.1	0.76
Saline	3,088,000	12,870,000	--	0.93
Ground Ice & Permafrost	71,970	300,000	0.86	0.022
Lakes	42,320	176,400	--	0.013
Fresh	21,830	91,000	0.26	0.007
Saline	20,490	85,400	--	0.006
Swamp Water	2,752	11,470	0.03	0.0008
Rivers	509	2,120	0.006	0.0002

THE HYDROLOGIC (WATER CYCLE)

The hydrologic cycle is the continuous circulation of water in the Earth-Atmosphere system. At its core, the water cycle is the motion of the water from the oceans and ground to the atmosphere and back again.




The Creeks of the Municipality of Anchorage (52 named)
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W
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Municipality of Anchorage Boundary
Lakes
Streams
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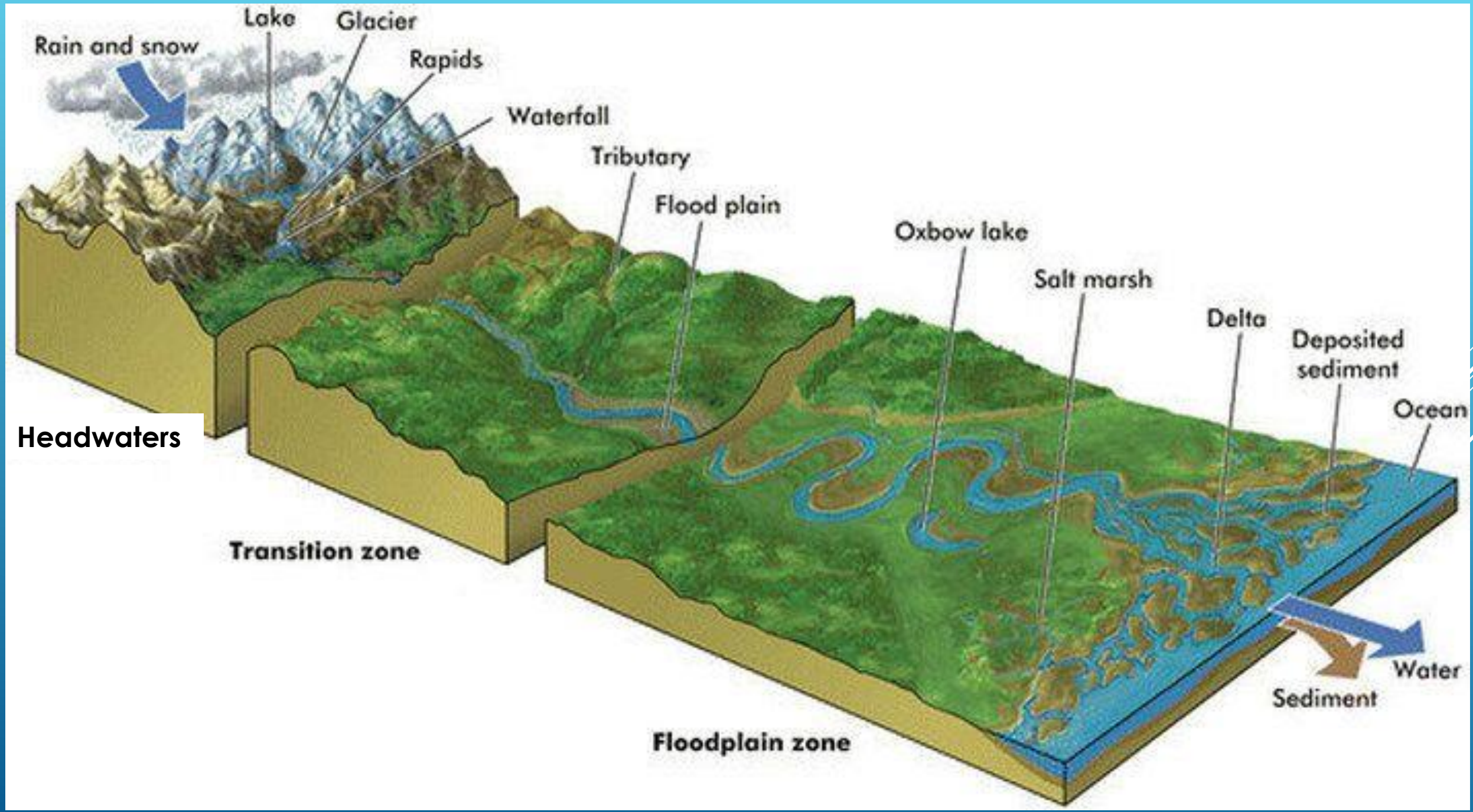
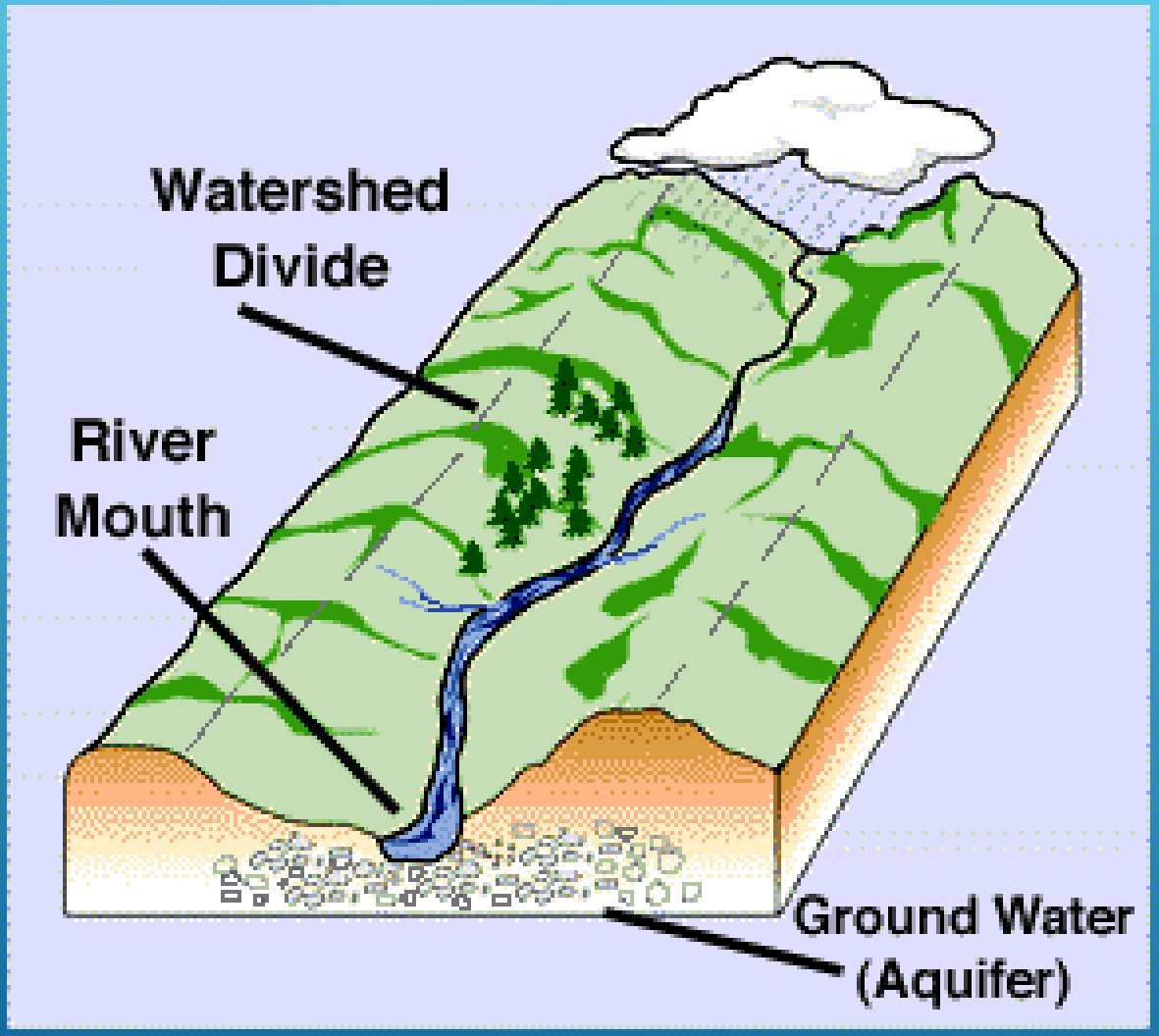
20 Miles


Rain and snow
Lake
Glacier
Rapids
Waterfall
Tributary
Flood plain
Oxbow lake
Salt marsh
Delta
Deposited sediment
Ocean
Headwaters
Transition zone
Floodplain zone
Water
Sediment



- Watershed = catchment area of a drainage basin
- Divides = controls which basin precipitation moves into
- Sheet flow > Rills > Creeks > Streams > Rivers
- Drainage patterns - determined by geology and climate of region

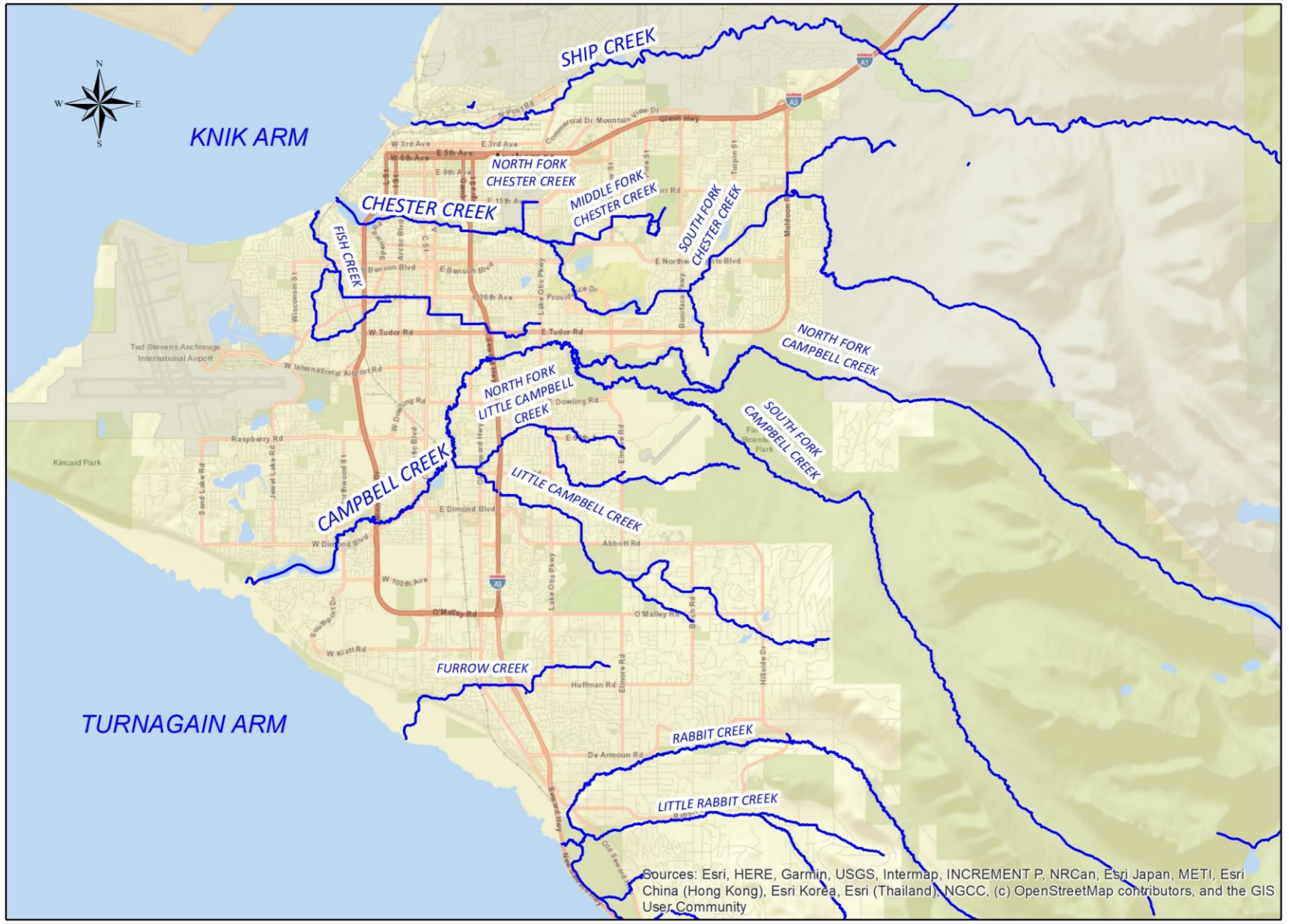
Within the Municipality's ~2,000 mi^2 boundary:

- there are 28 individual watersheds
- they are named for the most prominent creek or river within them.

AWC is primarily concerned with the 7 watersheds in its urban area:

- Eagle River,
- Ship Creek,
- Chester Creek,
- Fish Creek,
- Campbell Creek & Little Campbell Creek (a sub-watershed),
- Furrow Creek,
- Rabbit Creek, Little Rabbit Creek, and Little Survival Creek (sub-watersheds)

.


SHIP CREEK
KNIK ARM
NORTH FORK CHESTER CREEK
MIDDLE FORK CHESTER CREEK
SOUTH FORK CHESTER CREEK
CHESTER CREEK
FISH CREEK
NORTH FORK CAMPBELL CREEK
NORTH FORK LITTLE CAMPBELL CREEK
SOUTH FORK CAMPBELL CREEK
CAMPBELL CREEK
LITTLE CAMPBELL CREEK
FURROW CREEK
RABBIT CREEK
LITTLE RABBIT CREEK
TURNAGAIN ARM
Ted Stevens Anchorage International Airport
Kincaid Park
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Three major watersheds in the Anchorage Bowl

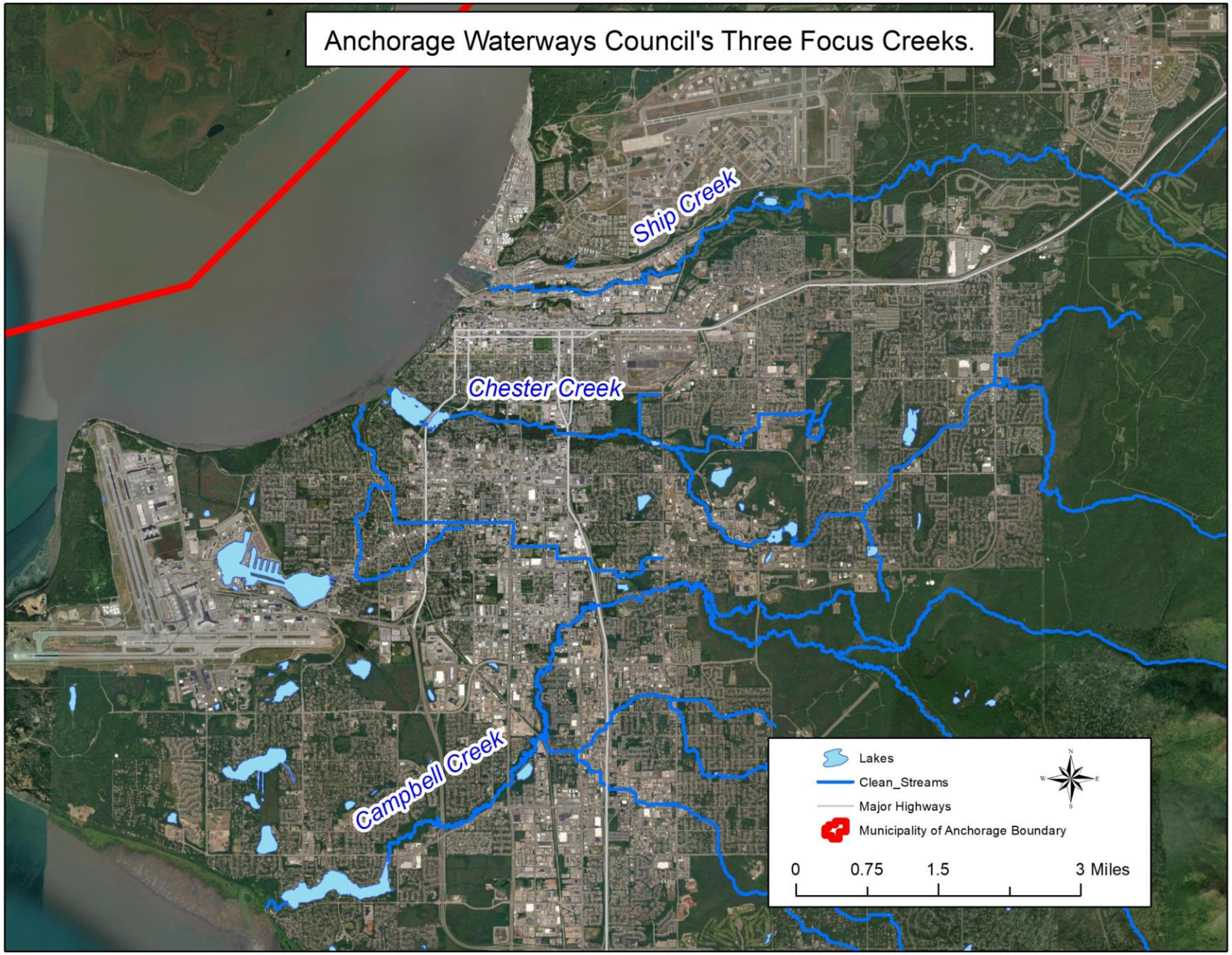
There are 2,250 Miles of creeks in the MOA

Ship Creek's tributaries extend approximately 181.1 mi. (291.5 km) from the Chugach Range to Knik Arm of Cook Inlet. The Ship Creek Watershed is 127.1 mi^2 (329.2 km^2).

Chester Creek is the second of Anchorage's three major creeks, running about 30.7 mi 49.4 km) from the Chugach Mountains and Russian Jack Springs to Knik Arm of Cook Inlet at Westchester Lagoon. Its watershed is about 30.4 mi^2 (78.7 km^2) , and its canyon cuts Anchorage into two major parts—Downtown and Midtown.

Campbell Creek (not including Little Campbell Creek) is the third of Anchorage's three major urban creeks. It is approximately 88.0 mi. (141.6 km.) in length and the area of the watershed is about 116.4 mi^2. (301.5 sq. km^2.). Campbell Creek is formed by the junction of three major tributaries with origins in the Chugach Range—the North Fork, Middle Fork, the South Fork. The main channel of the creeks runs from the Chugach Mountains to Campbell Lake and the Turnagain Arm.

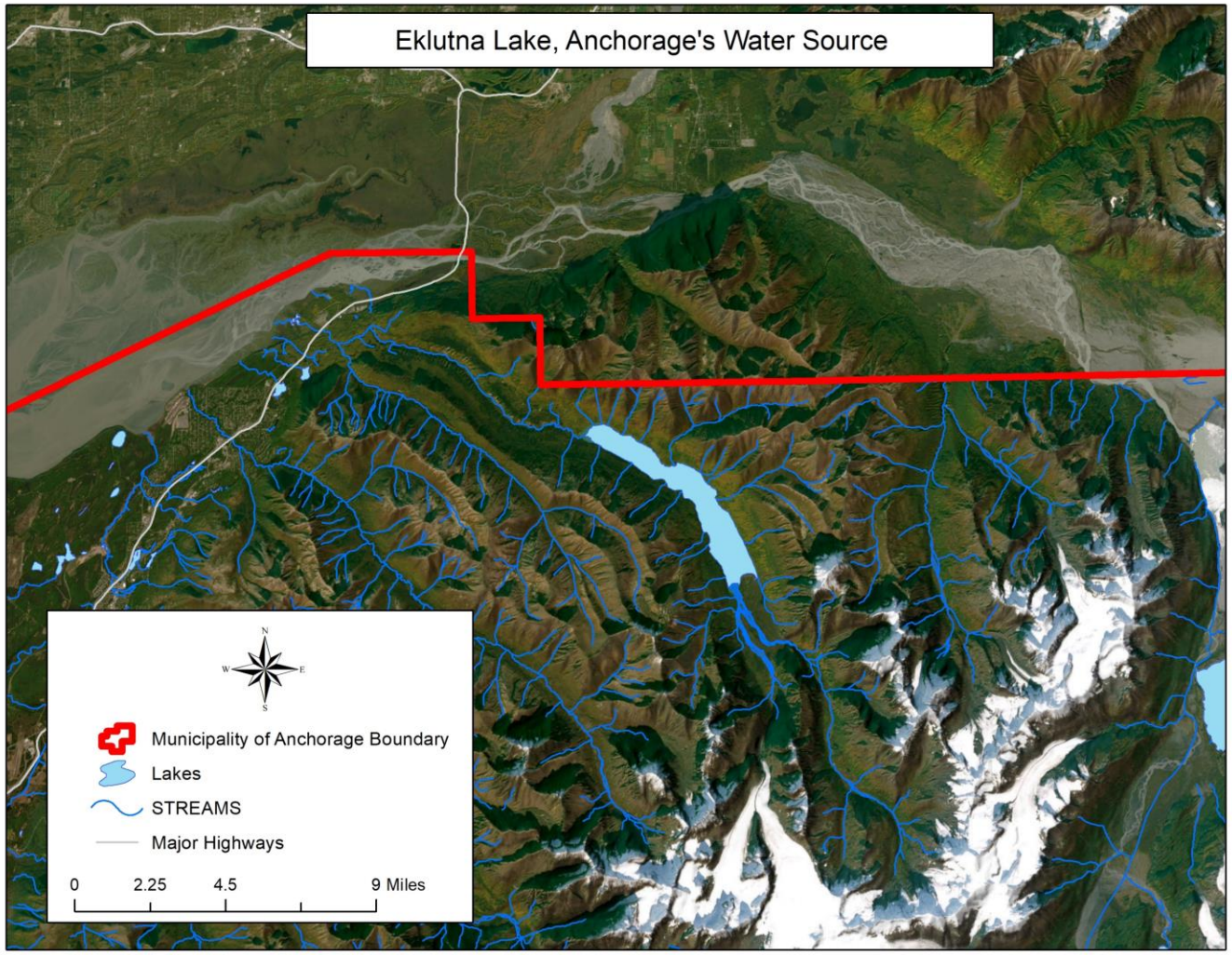
We have projects on almost all the creeks in the Anchorage Bowl.


Anchorage Waterways Council's Three Focus Creeks.
Ship Creek
Chester Creek
Campbell Creek
Lakes
Clean_Streams
Major Highways
Municipality of Anchorage Boundary
0
0.75
1.5
3 Miles

Where do Anchorage creeks get their water?

Where do Anchorage creeks get their water?

Melting snow and glaciers

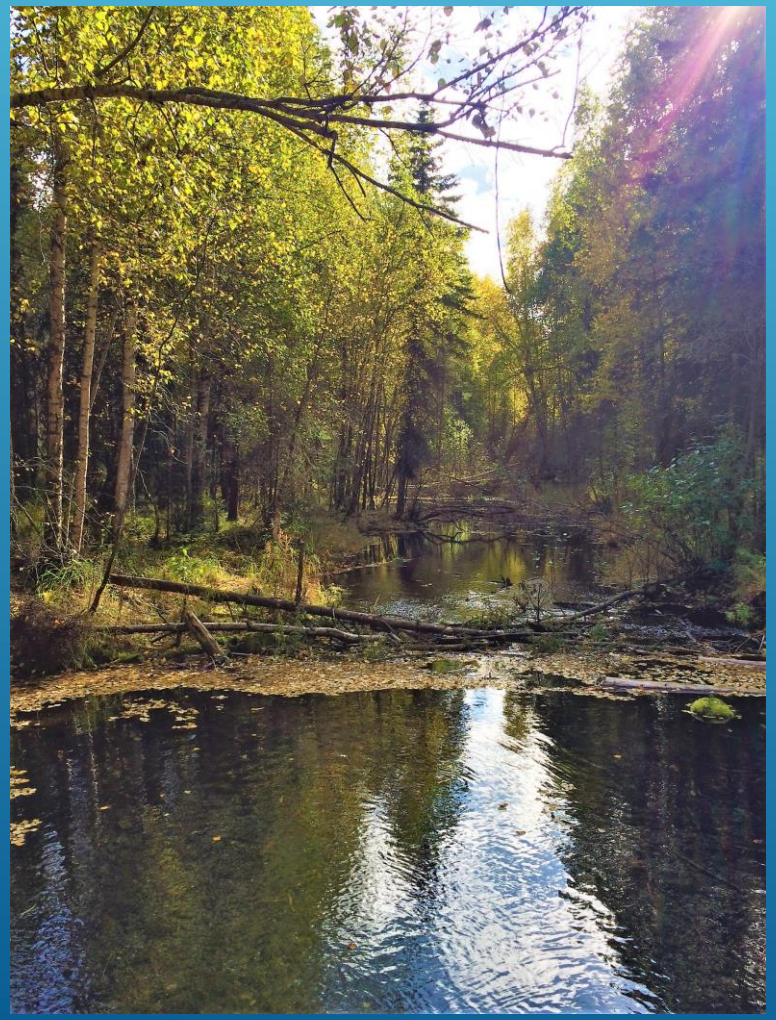


Where do Anchorage creeks get their water?

Stormwater and Rain

Where do Anchorage creeks get their water?

Russian Jack Springs



AWC deals with creeks in urban areas—a unique situation compared to creeks in wilderness.
Ditch or Creek?

All the creeks in the Anchorage bowl are considered impaired by fecal coliform bacteria except Little Rabbit Creek

What are our programs?

Water quality monitoring of our Creeks

Scoop the Poop

Taking Action on Issues

Creeks as Classroom

Fishing Line Recycling

Creek Cleanup

Monitoring our Creeks

- Monitoring program began in 1998 on a cold February day and continues today.
- It was once supported financially by DEC which went away in 2003, and now exists entirely by memberships and donations.
- Monitoring gives us some early warnings on issues
- Monitor one day per month for:
  - Water temperature
  - Air temperature
  - Color of the water
  - pH
  - Turbidity
  - Dissolved oxygen
  - Fecal coliform bacteria


MaChe01
MaChe02
MaChe06
MaSFChe0.5
MaSFChe10
MaSFChe9.5
MaSFChe4.0
MaSFChe3.5
MaCam07
MaLCam0.1
MaCam02
MaRab1.5
MaRab0.5
Monitoring Site 10/27/2022
N
W
E
S
0 0.5 1 2
Miles


Monitoring in the winter is particularly fun

Fecal Coliform Bacteria (*E. coli*)

- Found in the gut of warm-blooded animals (homeotherms)—mammals and birds
- Generally harmless
- Indicator bacteria – indicates that there is fecal contamination of the water
- Sources: dogs, horses, moose, other mammals, waterfowl, gulls and other birds as well as leaking septic tanks
- DEC and EPA, in the Alaska Water Quality Standards, have strict standards for the allowable fecal coliform bacteria colonies allowed in water
- All the creeks of the Anchorage Bowl, except Little Rabbit Creek, exceed the fecal coliform standards and are classified as “impaired.”
- Hopefully, AWC monitoring data may help get some creeks off the impaired list

20 FC/100 mL Drinking

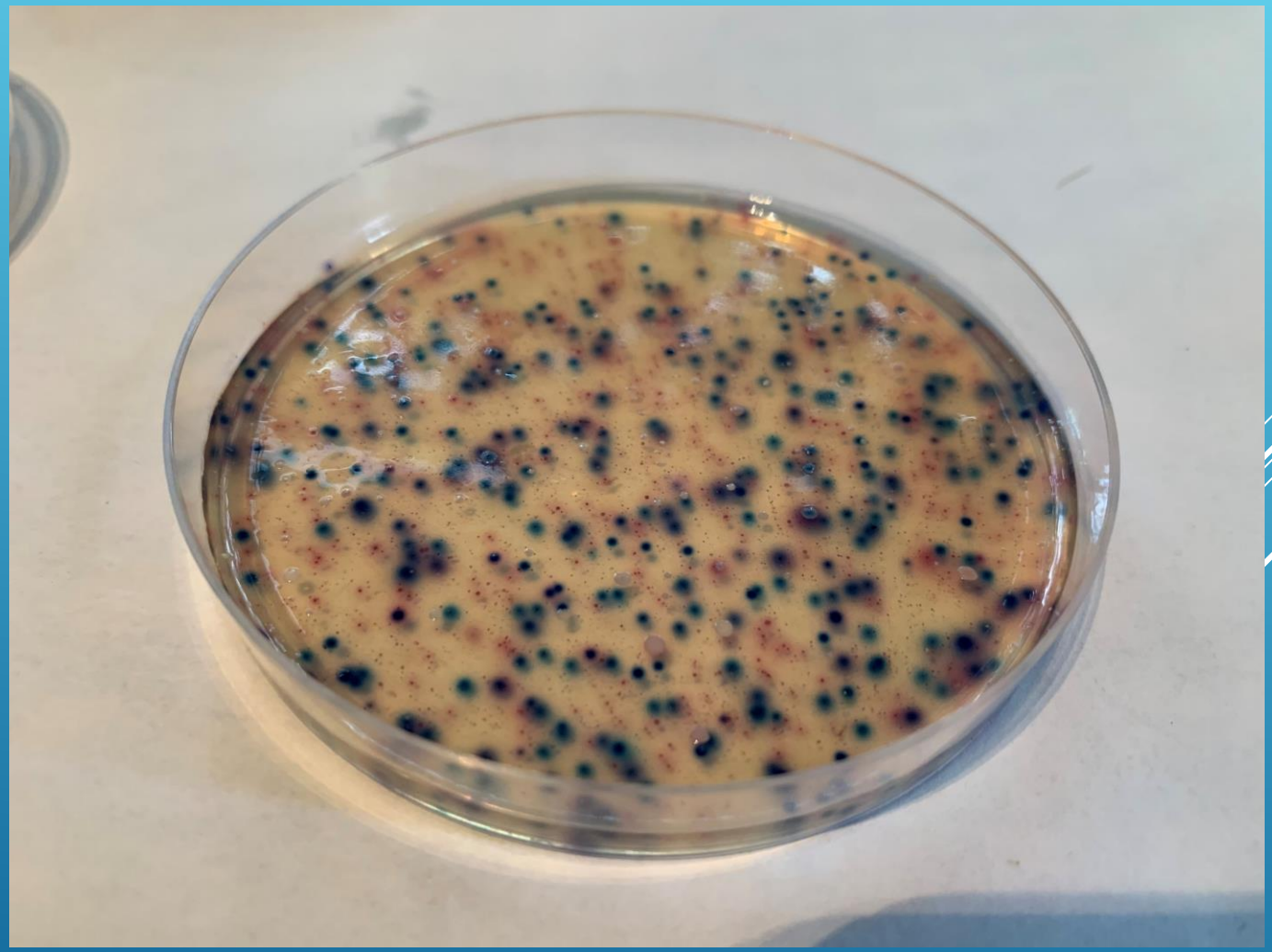
126 FC/100 mL Primary

200 FC/100 mL Secondary

Water Quality Standards for Designated Uses	
POLLUTANT & WATER USE	**CRITERIA**
(2) BACTERIA, FOR FRESH WATER USES (See note 1)	
(A) Water Supply (i) drinking, culinary, and food processing	In a 30-day period, the geometric mean may not exceed 20 fecal coliform/100 ml, and not more than 10% of the samples may exceed 40 fecal coliform/100 ml. For groundwater, the fecal coliform concentration must be less than 1 fecal coliform/100 ml, using the fecal coliform Membrane Filter Technique, or less than 3 fecal coliform/100 ml, using the fecal coliform most probable number (MPN) technique.
(A) Water Supply (ii) agriculture, including irrigation and stock watering	In a 30-day period, the geometric mean of samples may not exceed 200 fecal coliform/100 ml, and not more than 10% of the samples may exceed 400 fecal coliform/100 ml. For products not normally cooked and for dairy sanitation of unpasteurized products, the criteria for drinking water supply, (2)(A)(i), apply.
(A) Water Supply (iii) aquaculture	For products normally cooked, the geometric mean of samples taken in a 30-day period may not exceed 200 fecal coliform/100 ml, and not more than 10% of the samples may exceed 400 fecal coliform/100 ml. For products not normally cooked, the criteria for drinking water supply, (2)(A)(i), apply.
(A) Water Supply (iv) industrial	Where worker contact is present, the geometric mean of samples taken in a 30-day period may not exceed 200 fecal coliform/100 ml, and not more than 10% of the samples may exceed 400 fecal coliform/100 ml.
(B) Water Recreation (i) contact recreation	In a 30-day period, the geometric mean of samples may not exceed 126 *Escherichia coli (E. coli)* colony forming units (CFU)/ 100ml, and not more than 10% of the samples may exceed a statistical threshold value (STV) of 410 *E. coli* CFU/100 ml.
(B) Water Recreation (ii) secondary recreation	In a 30-day period, the geometric mean of samples may not exceed 200 fecal coliform/100 ml, and not more than 10% of the total samples may exceed 400 fecal coliform/100 ml.

Bacteria colonies encountered during sampling

- Blue/purple colonies are fecal coliform
- Teal are bad bacteria such as *Pseudomonas* and *Aeromonas*
- Pink are other coliform bacteria



Orange Water!!!

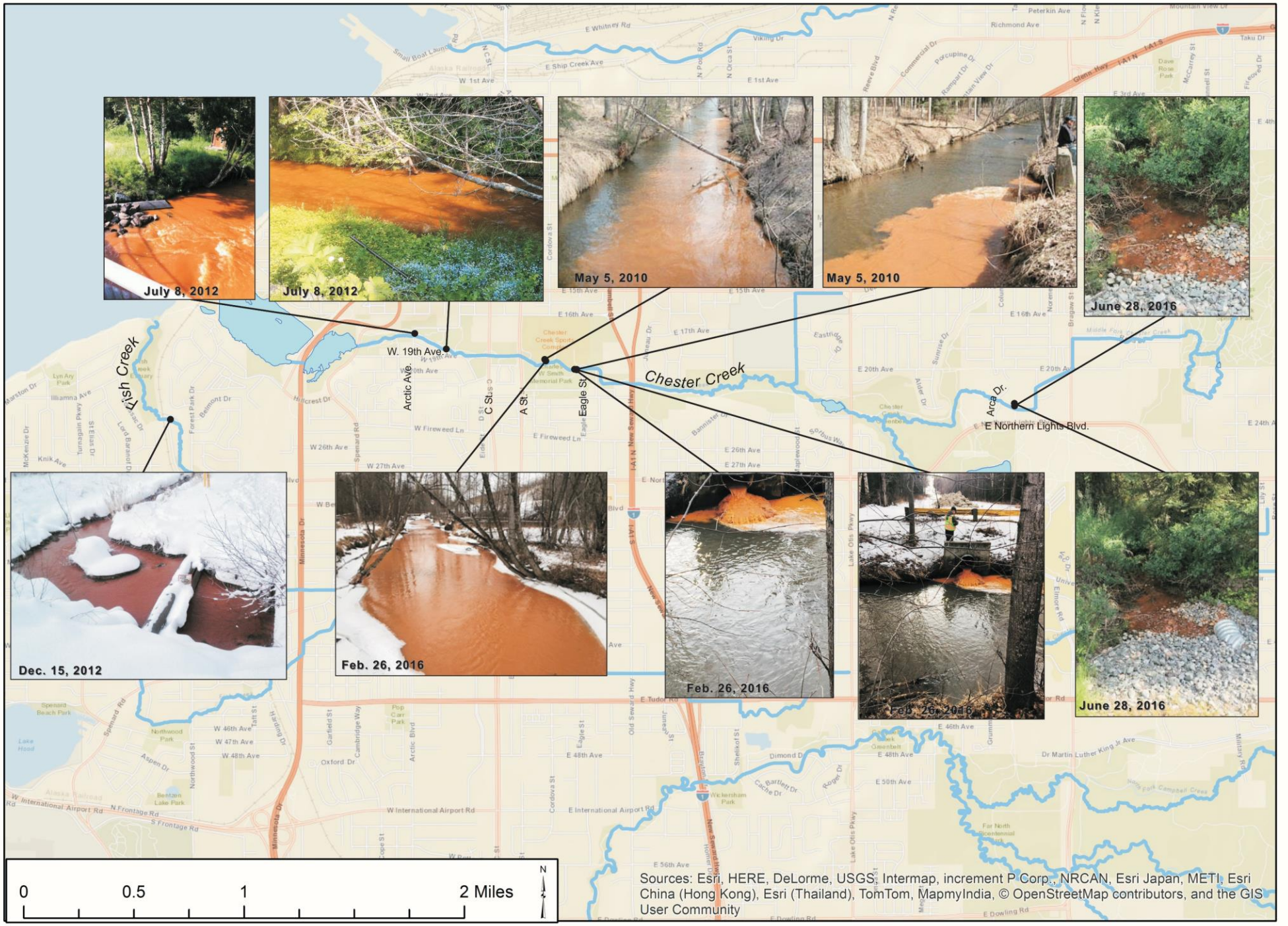


Photo Credits: Marcus Welker, Christine Tait, Cherie Northon, Ryan Astalos, Teresa Eckel, and David Clark

- Scoop the Poop Day – April every year
- Dogs are a major source of fecal coliform bacteria
  - 65,000 in MOA each pooping ¾ pounds/day
  - 48,750 lbs/day or ~25 tons of dog poop/day or 9,125 tons/year
- Work with MOA Parks and Rec to get new pet waste stations out
- Tabling at events, e.g. Friends of Pets' Dog Jog
- Facebook posts
- Make targeted contacts to areas of concern

Scoop the Poop Day

Responding to Issues

- Citizen Reporting Form https://www.anchoragecreeks.org/report-an-issue
- Telephone calls/email
- Field observations

Dewatering 52nd & Laurel - 2007 to 2008

Sediment being added to Campbell Creek

Campbell Creek at Lake Otis - 2007

Chicken coops by creeks, Little Campbell Creek east of Nathan Dr.

Creeks as Classrooms

- Established in 2008 with funding from the US Fish and Wildlife Service
- Suspended in 2019 due to Covid and lack of funding
- Resumed in 2022
- ~5,000 students - annually
- Venues:
  - Individual classes
  - Water Discovery Days
  - Outdoor Discovery Days
  - Potter Marsh Day
  - Migratory Bird Day

Students learning about aquatic insects which are indicators of water quality

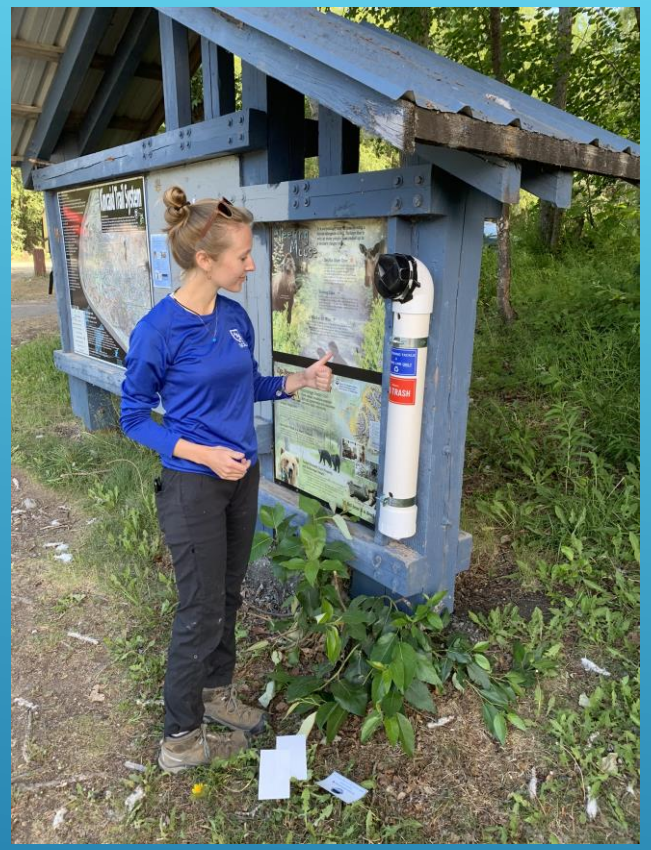
Monofilament Line Recycling

Jewel Lake common loon with monofilament

20 bins around the MOA


Ziploc
Ziploc


Ziploc
Ziploc



We also collected over a pound of sinkers, lures, bobbers, and hooks.

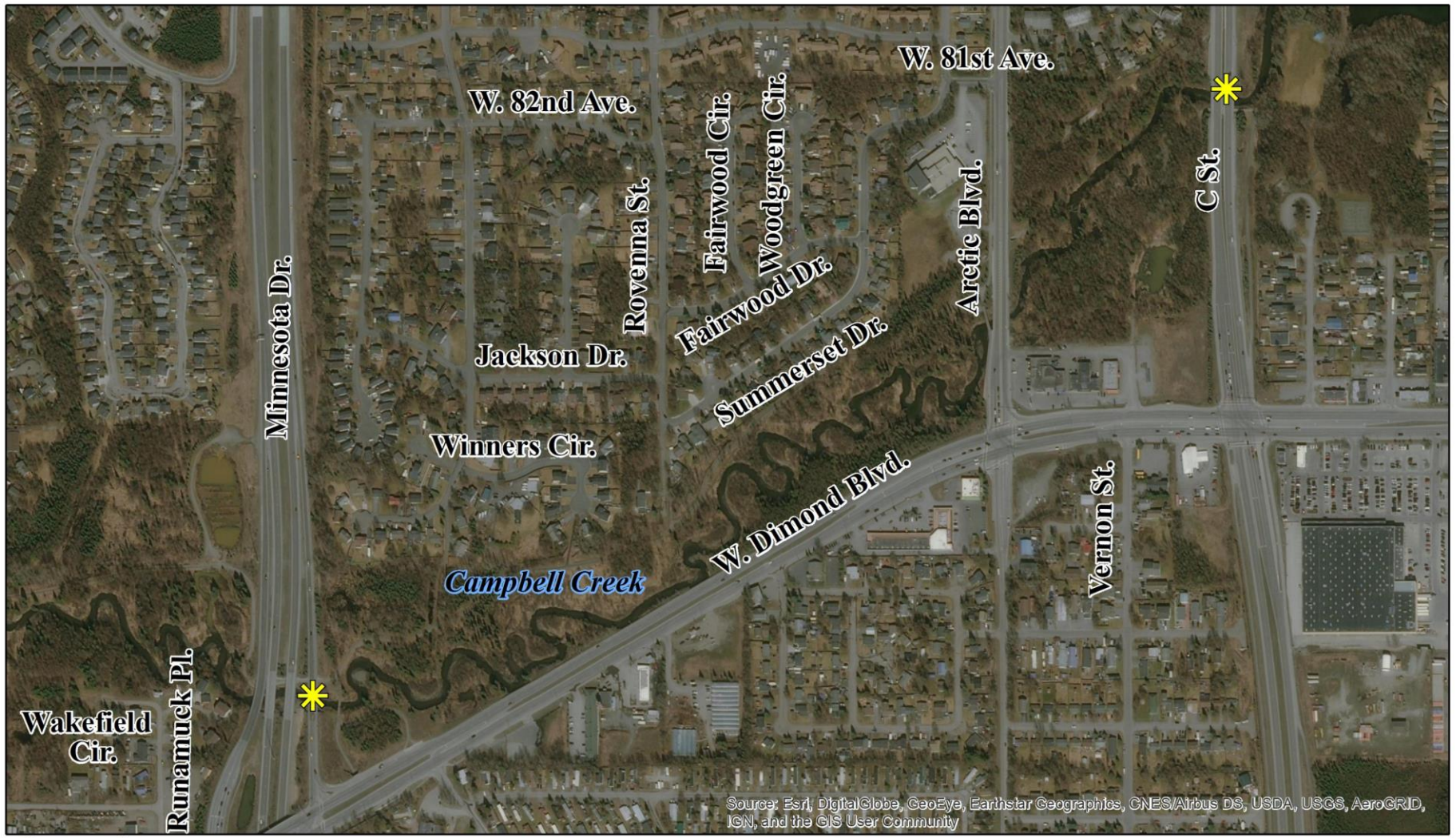

Anchorage Waterways Council
CREEK CLEANUP
MAY 12 - 24
ANCHORAGECREEKS.ORG

Annual Creek Cleanup

- Every year since 1984
- Teams select and cleanup areas they choose
- Weird things found:
  - Car
  - Loaded shotgun
  - Some of the findings are reusable

Map 26 Campbell Creek - Minnesota to C St.

Anchorage Waterways Council, 2018



Legend

- Start/end location
- Street
- Creek

0 0.075 0.15 0.3 Miles

N

Rage City Roller Derby


Caring
for Alaska
Matson

Thank you!

Questions?

anchoragecreeks.org

thom@anchoragecreeks.org

For more information on creeks and water:

https://www.usgs.gov/mission-areas/water-resources

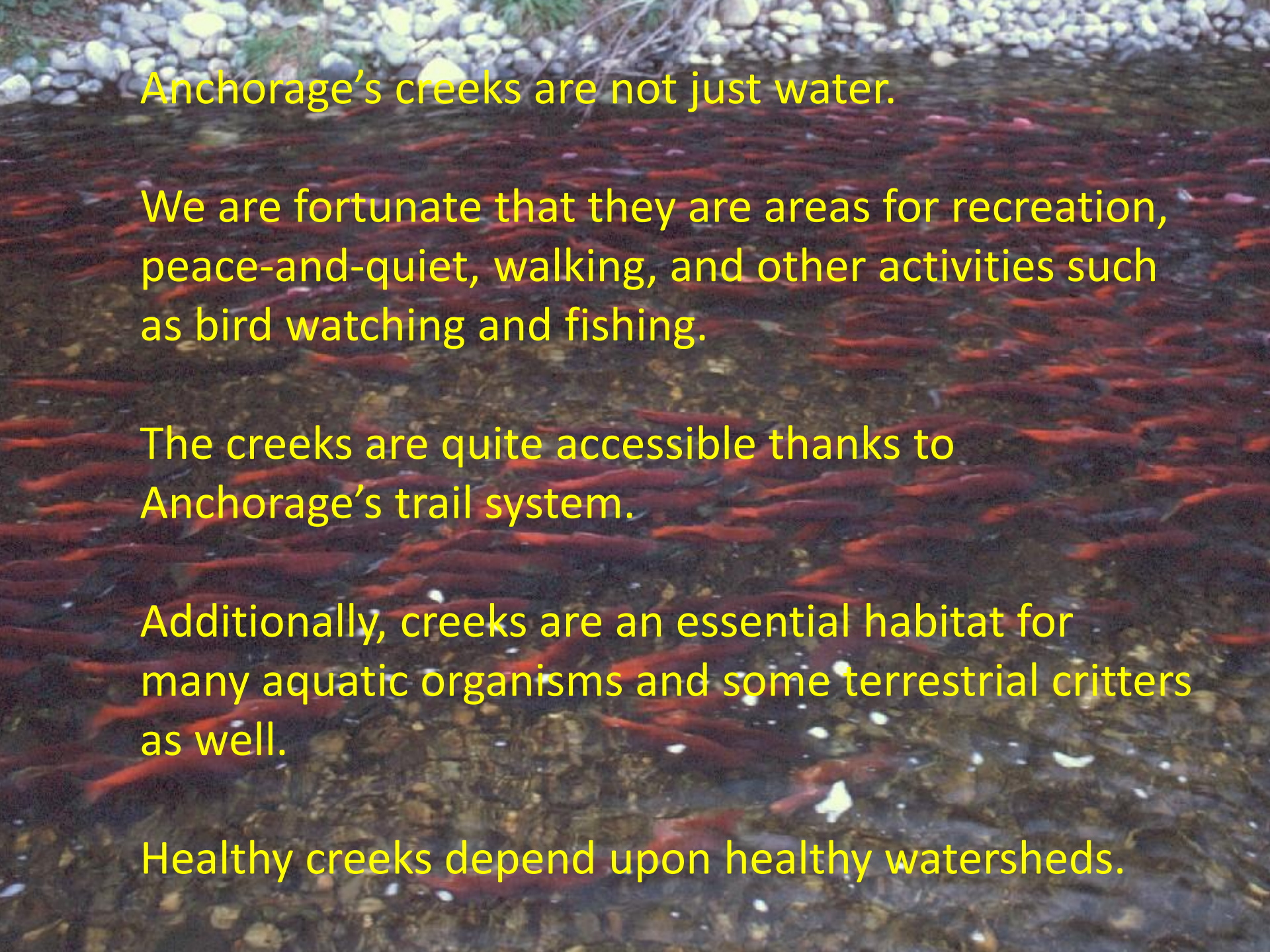
Creeks are More Than Water

Thom Eley, Ph.D

Research Biologist and Education Director

Olé 25 Jan 2023

thom@anchoragecreeks.org



Anchorage's creeks are not just water.

We are fortunate that they are areas for recreation, peace-and-quiet, walking, and other activities such as bird watching and fishing.

The creeks are quite accessible thanks to Anchorage's trail system.

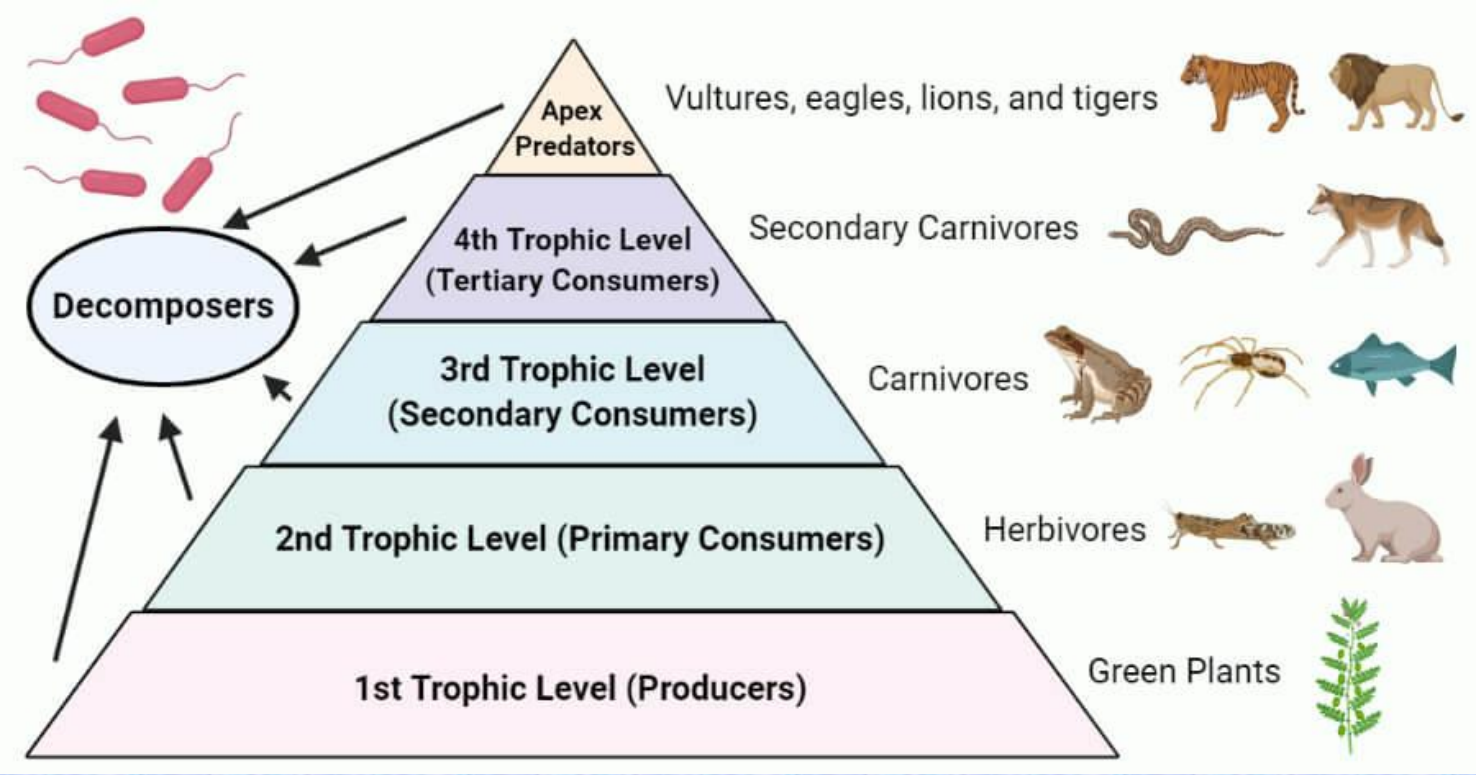
Additionally, creeks are an essential habitat for many aquatic organisms and some terrestrial critters as well.

Healthy creeks depend upon healthy watersheds.

We must understand creeks and freshwater habitats systems and needs so that we can preserve, protect, and maintain these valuable resources.

Ecosystem

- An ecosystem consists of all the **living organisms** and the **physical environment** with which they interact.
- These **biotic** and **abiotic** systems are linked together through nutrient and water cycles and energy flows.
- Energy enters the systems through **photosynthesis** and is incorporated into plant tissue.
- By feeding on plants and on one another, animals play an important role in the movement of **matter** and **energy** through the system.



Aquatic Ecosystems

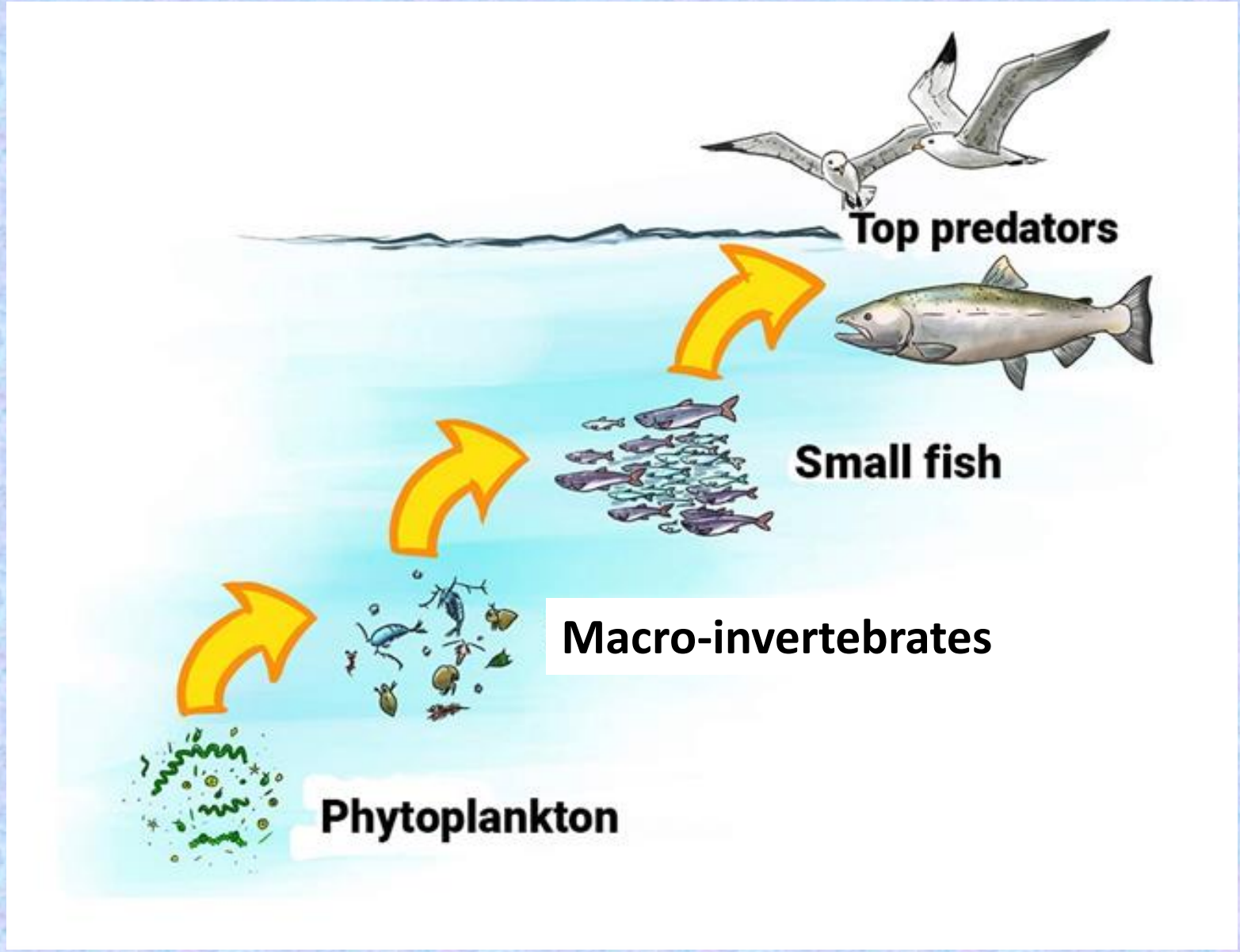
- An aquatic ecosystem is an ecosystem in water, in contrast to land-based terrestrial ecosystems.

- Aquatic ecosystems contain communities of organisms that are dependent on each other and on their environment.

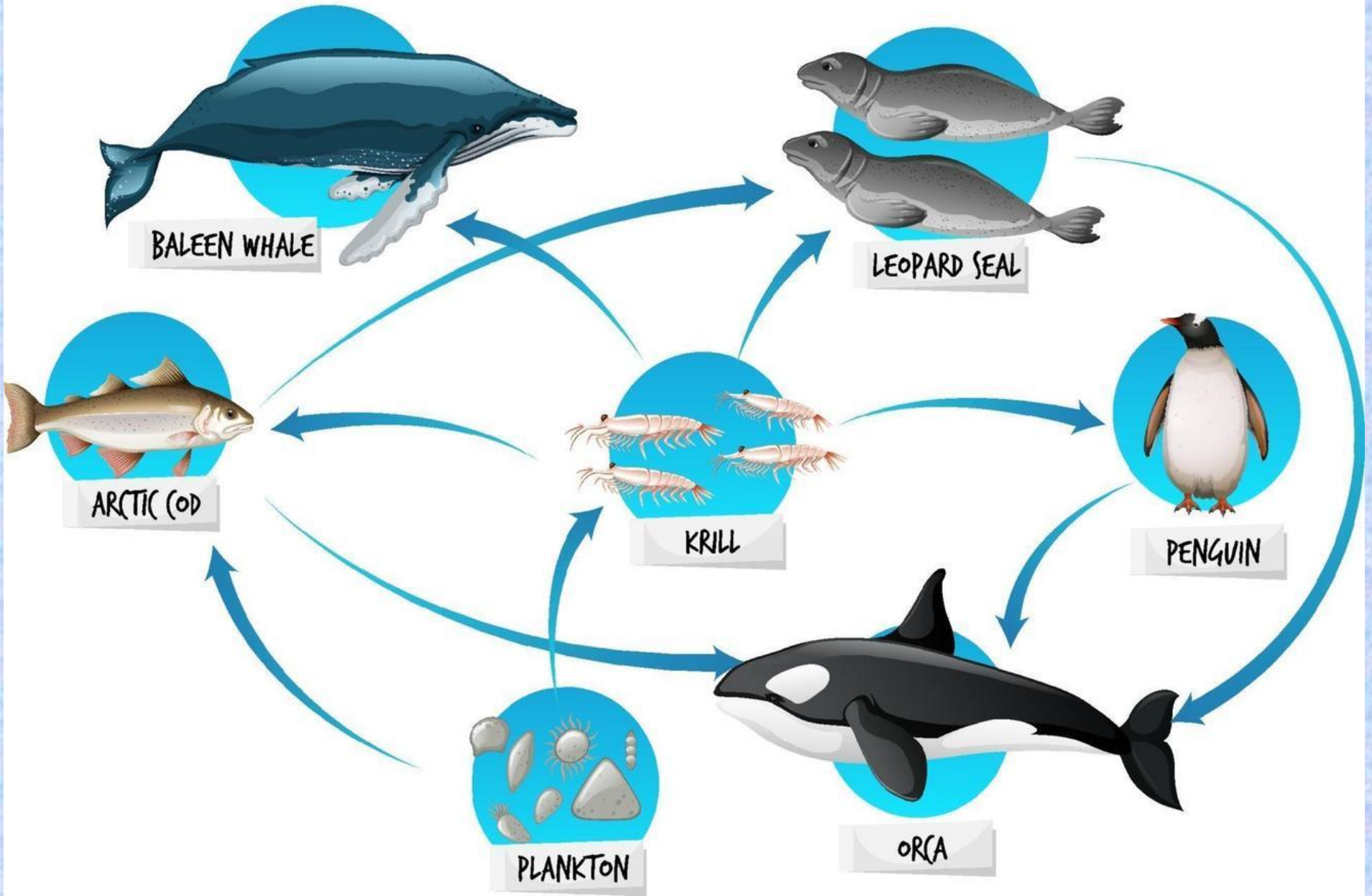
- The two main types of aquatic ecosystems are **marine ecosystems** and **freshwater ecosystems.**

- Freshwater ecosystems may be:
  - **lentic** - slow moving water, including pools, ponds, and lakes,
  - **Lotic -** faster moving water, such as streams and rivers; and wetlands (areas where the soil is saturated or inundated at least part of the time).

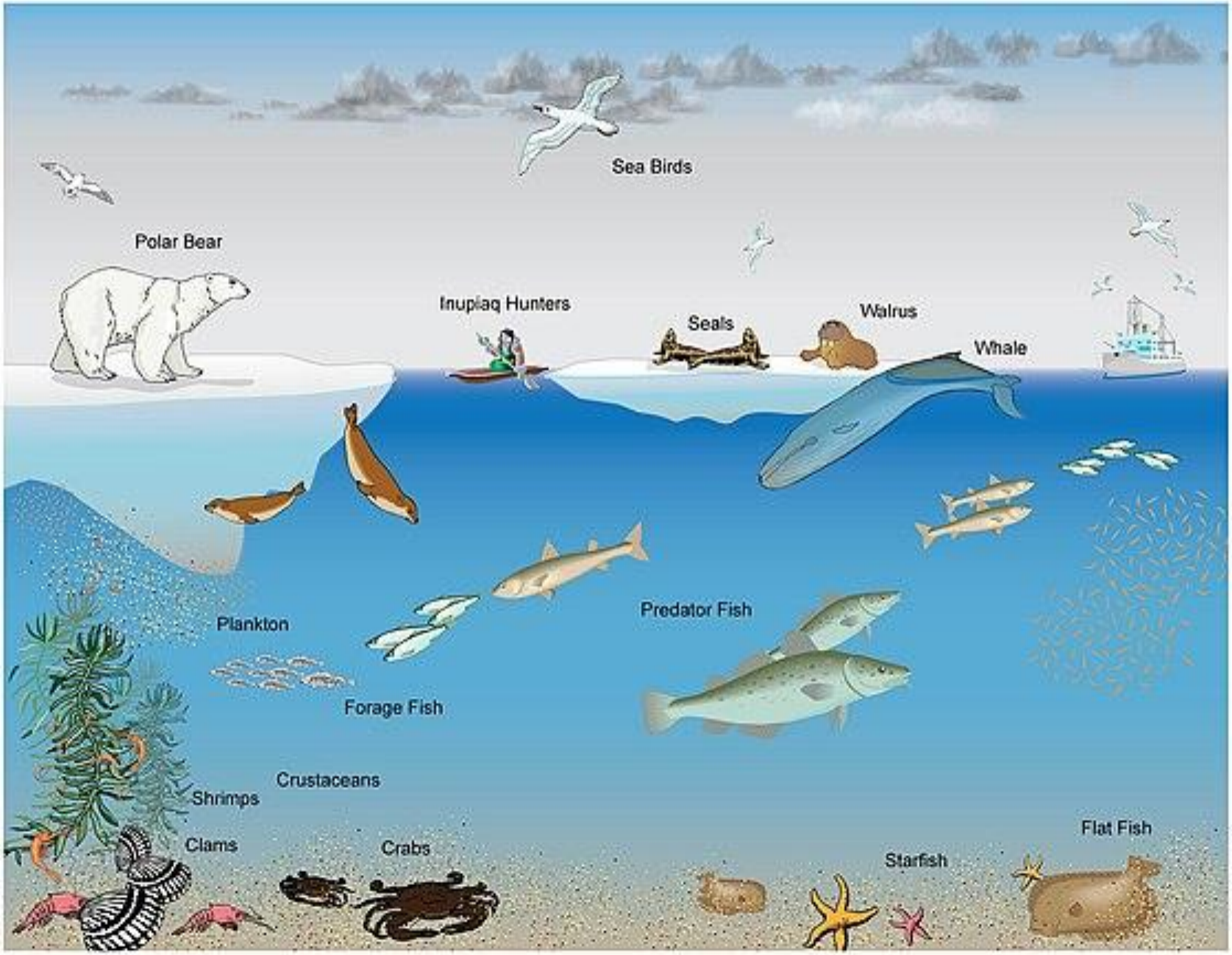
Aquatic Food Chains



ARCTIC FOOD CHAIN



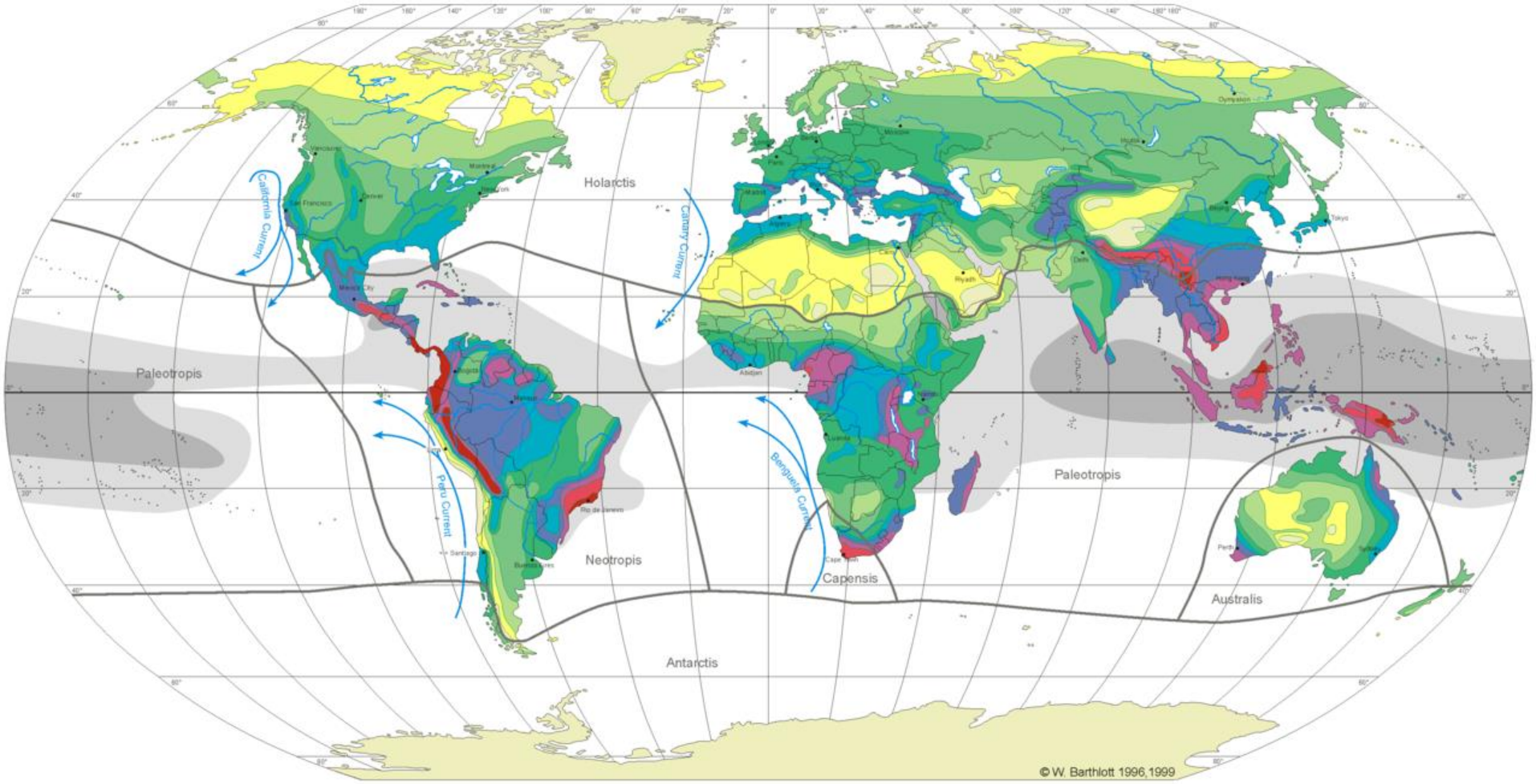
Arctic Marine Food Web



Biodiversity

- Biodiversity is a term used to describe the enormous variety of life on Earth
- It can be used more specifically to refer to all of the species in one region or ecosystem
- Biodiversity refers to every living thing, including plants, bacteria, animals, and humans. Scientists have estimated that there are around 8.7 million species of plants and animals in existence
- However, only around 1.2 million (14%) species have been identified and described so far, most of which are insects.
- This may mean that millions of other organisms remain to be discovered

GLOBAL BIODIVERSITY: SPECIES NUMBERS OF VASCULAR PLANTS



Robinson Projection
Standard Parallels 38°N und 38°S

Diversity Zones (DZ): Number of species per 10 000km²

- DZ 1 (<100)
- DZ 2 (100 - 200)
- DZ 3 (200 - 500)
- DZ 4 (500 - 1000)
- DZ 5 (1000 - 1500)
- DZ 6 (1500 - 2000)
- DZ 7 (2000 - 3000)
- DZ 8 (3000 - 4000)
- DZ 9 (4000 - 5000)
- DZ 10 (≥ 5000)

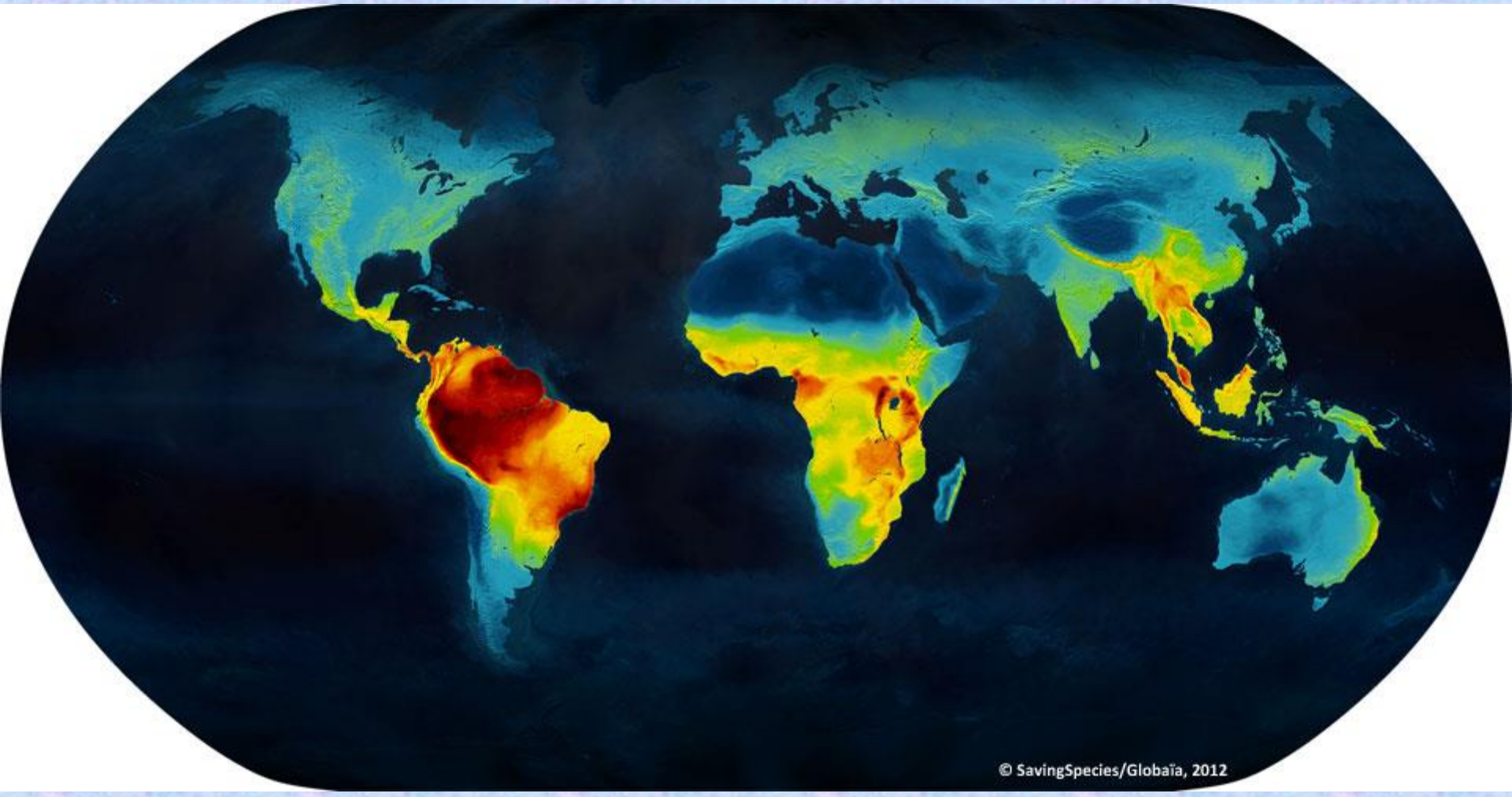
Capensis floristic regions

sea surface temperature

- >29°C
- >27°C

cold currents

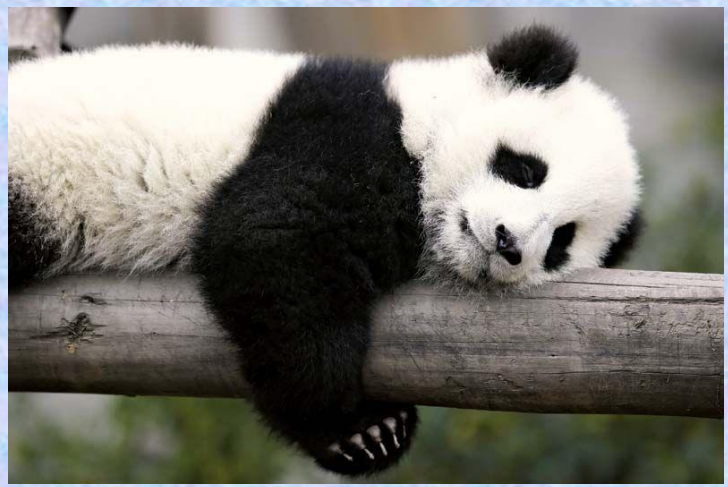
W. Barthlott, N. Biedinger, G. Braun, F. Feig, G.Kier, W. Lauer & J. Mutke 1999
modified after
W. Barthlott, W. Lauer & A. Placke1996
Department of Botany and Geography
University of Bonn
German Aerospace Research Establishment, Cologne
Cartography: M. Gref
Department of Geography University of Bonn


© SavingSpecies/Globaïa, 2012

- Ecosystems with a lot of biodiversity are generally stronger and more resistant to disaster than those with fewer species.
- **Biodiversity** is important to people in many ways.
  - Plants, for instance, help humans by giving off oxygen.
  - They also provide food, shade, construction material, medicines, and fiber for clothing and paper.
  - The root system of plants helps prevent flooding.
  - Plants, fungi, and animals, such as worms, keep soil fertile and water clean. As biodiversity decreases, these systems break down.

- **Decreasing Biodiversity**
  In the past hundred years, biodiversity around the world has decreased dramatically. Many species have gone extinct.
- **Extinction** is a natural process; some species naturally die out while new species evolve.
- But human activity has changed the natural processes of extinction and evolution.
- Scientists estimate that species are dying out at hundreds of times the natural rate.
- Groups form to try to help: *Save the Manatee, Save the Elephants, Panda International, Save the Sea Turtles, Gorilla Doctors, etc.*

Charismatic Megafauna



Ecosystem Health

- Aquatic ecosystem health indicators are used to assess the state of the water and aquatic ecosystems

- In order to determine if ecosystem processes are being compromised by natural or human-caused environmental disturbances, we need to monitor them

- Aquatic ecosystem health indicators:
  - water and sediment quality parameters,
  - water quantity parameters, flow measurements that look at physical and chemical conditions of the water and sediments
  - biological indicators that measure the population, health, or habitat of aquatic species of plants and animals.

- The role of an aquatic ecosystem health assessment is to conduct research to protect, mitigate, and enhance the health of aquatic ecosystems.
- Research conducted within programs is focused on the following 4 areas of study:
  - biodiversity determination
  - understanding the impacts of contaminants on aquatic ecosystems
  - controlling aquatic invasive species
  - fisheries and creek restoration

Biological Characteristics

- Link the chemical and physical information by telling us how the organisms that live in the water respond to it
- Typically examine fish, algae, or benthic (bottom) macroinvertebrates (large enough to see and no back bone) communities
- Diverse communities typically equate to healthy communities
- Look at insects living in the stream
  - some are pollution-tolerant
  - others are pollution-intolerant

Cranefly

Caddisfly

Why Macroinvertebrates?

- Cost-effective, easy to sample and interpret
- Limited migration patterns
- Degraded conditions easily detected
- Incorporate physical and chemical characteristics
- Illustrative of both short- and long-term effects
- Sensitive to range of stress types/levels
- Critical part of food web; meaningful to public

Sorting into Taxonomic Groups

A Healthy Biological Community is a Diverse One

EPT

Pollution intolerant

- Ephemeroptera (Mayflies)

- Plecoptera (Stoneflies)

- Tricoptera (Caddisflies)

Mayfly Characteristics

- Two or three tails
- Plate-like gills usually visible on sides of abdomen
- Swim like a dolphin

Stonefly Characteristics

- Two tails
- No abdominal gills

Glacial Stonefly
Endangered

Caddisfly Characteristics

- Many live in cases they make from small stones and/or organic material
- Three pairs of jointed legs located near the head end of a caterpillar-like body
- No tails

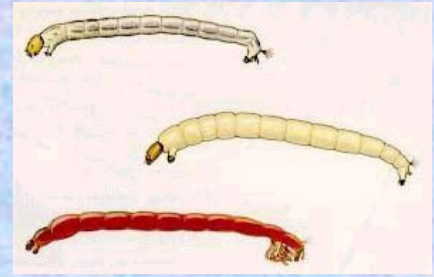
Fly Fishing

Wet Fly

Dry Fly

Mayfly

More Pollution Tolerant



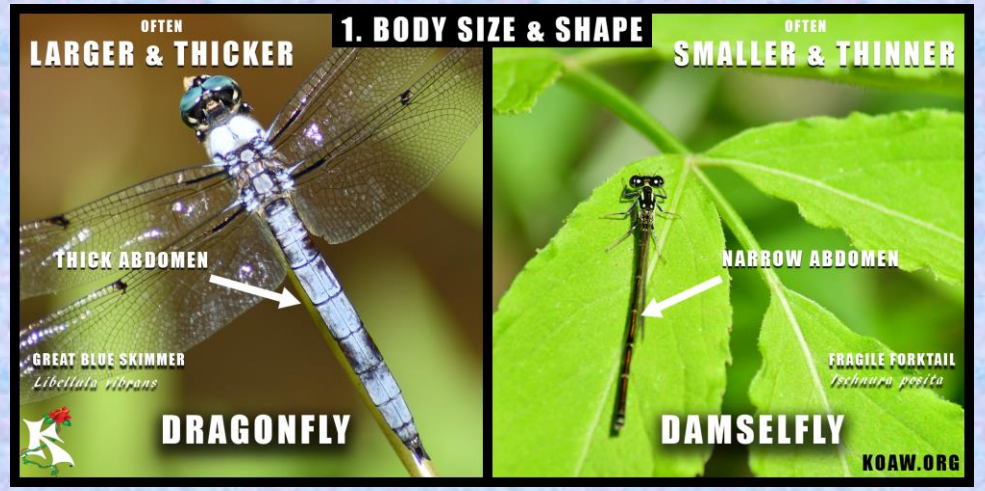
Midges

Blackflies

Craneflies

Dance Flies

Dragon Fly



Aquatic mites

Snails

Scuds

Aquatic worms

Planerian Flatworms
(high tolerance for pollution)

Leeches

Alaskan Leech

African Queen

Stand by Me

EPT

Pollution intolerant

- Ephemeroptera (Mayflies)

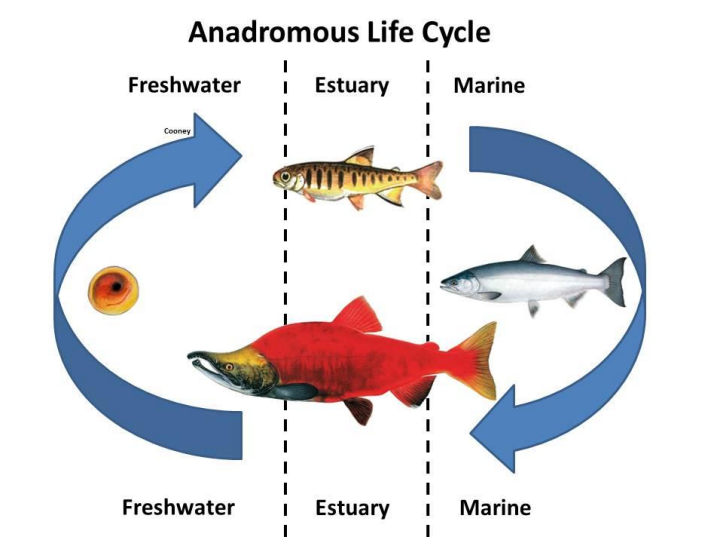
- Plecoptera (Stoneflies)

- Tricoptera (Caddisflies)

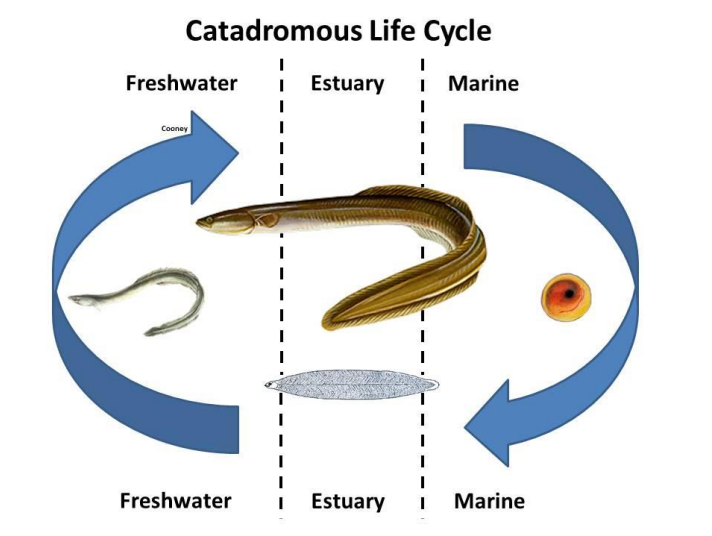
Critters of our Creeks

Some fish depend on watersheds through their entire life cycle. Others leave for a bit.

Anadromous fish are born in freshwater, then migrate to the ocean as juveniles where they grow into adults before migrating back into freshwater to spawn.



Catadromous fish are born in saltwater, then migrate into freshwater as juveniles where they grow into adults before migrating back into the ocean to spawn.



Some Fish of our Creeks

- Black fish

- Three-spined stickleback

- Nine-spined stickleback
- Slimy sculpin

- Northern pike

Salmonids in our Creeks

- Rainbow trout

- Arctic char

- Dolly Varden trout

- Grayling

Salmon in Alaska
Genus *Oncorhynchus*

Species Name	Common Name	Other Name
nerka	Sockeye*	Red
tshawytscha	Chinook*	King
kisutch	Coho*	Silver
keta	Chum?	Dog
gorbushca	Pink	Humpy
mykiss	Rainbow Trout*	Steelhead

* Found in some Anchorage creeks

How Important are Watersheds and Creeks?

- Young anadromous fish live in the watershed until they become smolts and migrate to the ocean

- 1 - 3 (or more) years

- Adult anadromous fish need the watershed to spawn

- Resident fish species depend on the creeks for their entire life cycle

Juvenile salmon in Campbell Creek

Anadromous fish are important in a watershed

- Feed in the ocean & accumulate “marine nutrients
- Some salmon may travel 3,000 miles during their feeding migration
- Some chinook salmon may spend five years feeding in the ocean
- Carcasses are eaten or decay to release marine nutrients in the watershed

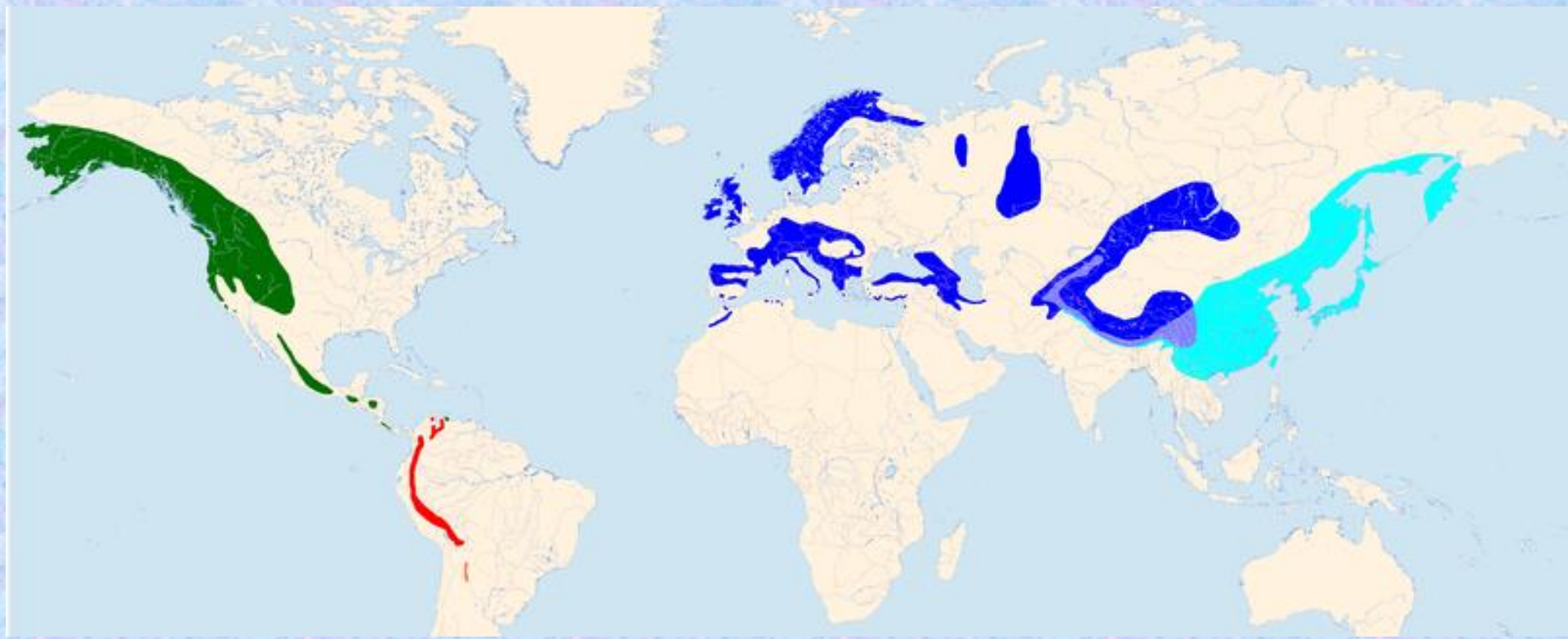
Creeks and their habitats are a factory that makes fish and other organisms

- Different parts of the factory; i.e., habitats, have different functions
- Each part (habitat) depends on the other parts
- All of the parts work together to produce a product (fish)

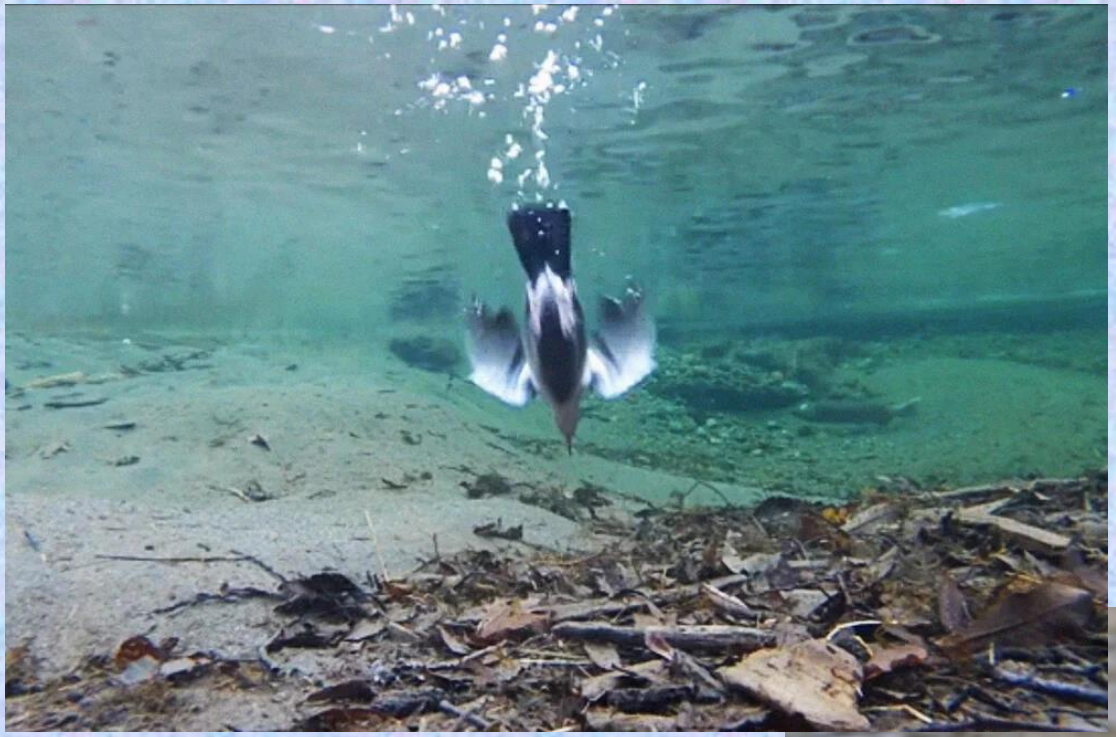
How can you help Protect Creeks and Habitats in Watersheds?

- Learn more about your watershed
- Explore the creek and its watershed
- Learn about issues in your watersheds
- Participate in a local watershed group
- Learn about proposed changes and become involved
- Beware of small, incremental but cumulative changes
- Work to retain riparian areas

Water Ouzel – American Dipper



- **green**: American dipper
- **red**: White-capped dipper
- **orange**: Rufous-throated dipper
- **dark blue**: White-throated dipper
- **light blue**: Brown dipper

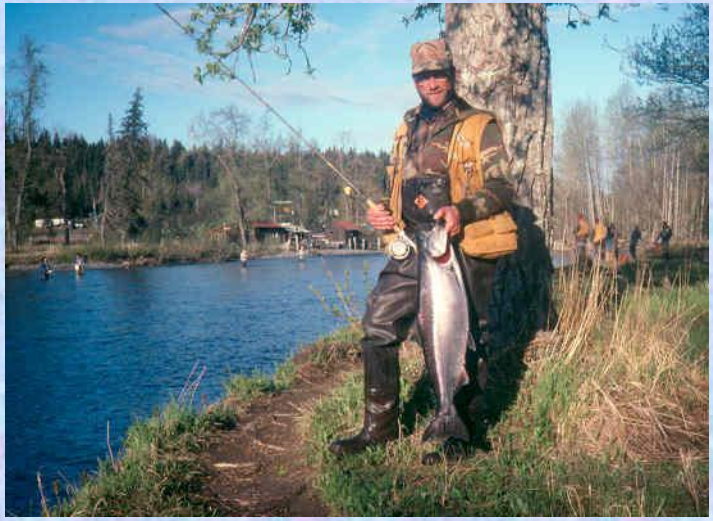


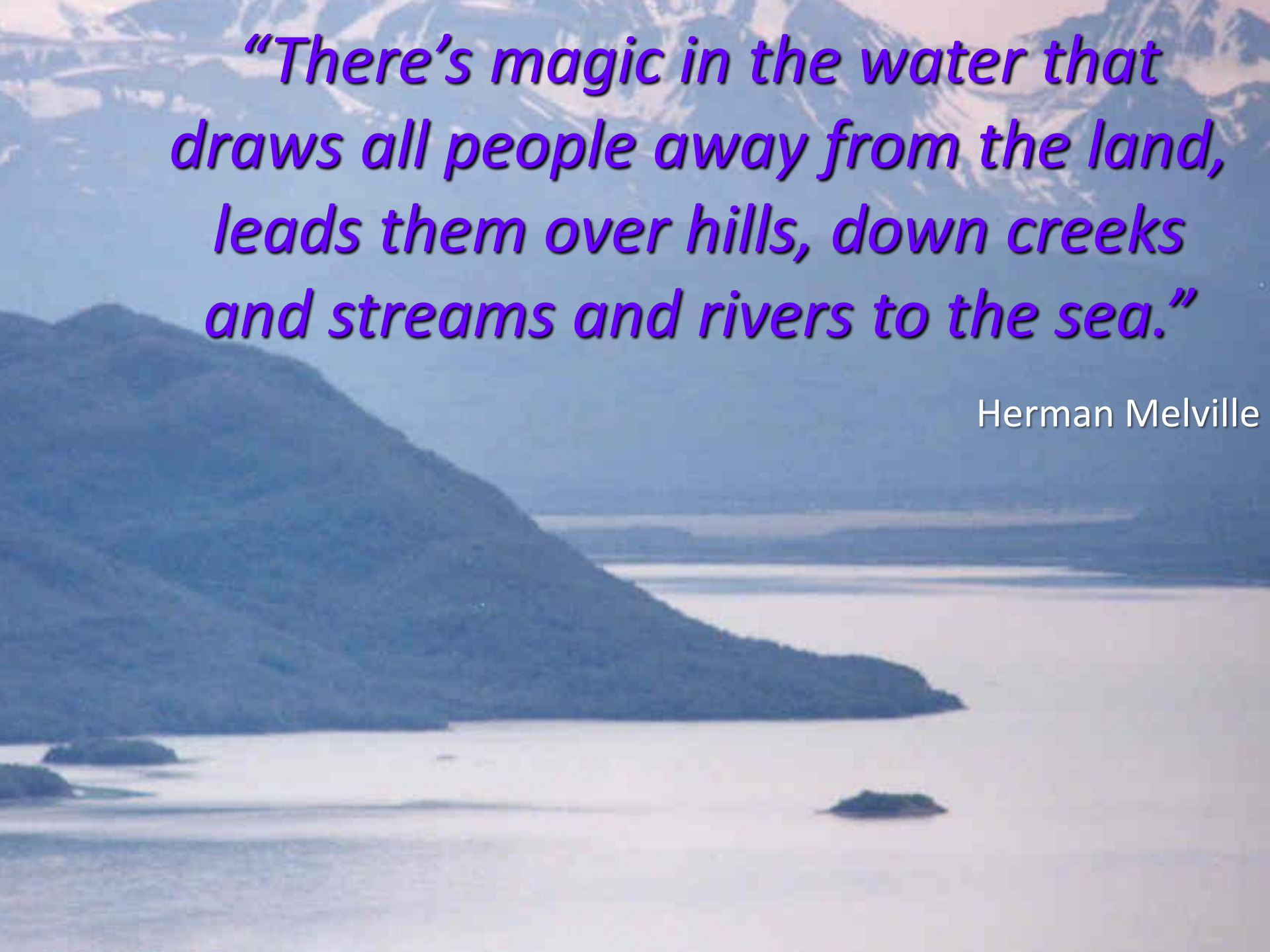
EPT

Animal Tracking

River (Land) Otter Slide, Campbell Creek

Creeks, fish, aquatic resources, and watersheds are important to Alaskans




“There’s magic in the water that draws all people away from the land, leads them over hills, down creeks and streams and rivers to the sea.”
Herman Melville

Thank you!
Questions?

thom@anchoragecreeks.org

www.anchoragecreeks.org

Threats to Waterways
What are their protections?

Cherie Northon, Ph.D.
Executive Director, Anchorage Waterways Council
OLÉ February 1, 2023

How “stuff” finds its way into waterways

- Littering, homeless encampments, carelessness with trash bins
- Illegal dumping in or near waterways
- Stormwater runoff

Littering


Campbell Creek east of Dowling

Fish Creek

Fish, Campbell, & S. Fork Chester Creeks

Little Campbell and Rabbit Creeks

Dewatering into a storm drain

Unintentional, inadvertently, or ???

- Why?
  - Negligence
    - Not keeping vehicles properly maintained
  - Not paying attention to municipal code—applies more to businesses
    - Snow plow drivers
    - Carpet cleaners
    - Mobile services, e.g. vehicle detailing, dent repair, tire changeovers
    - Failure to properly apply or maintain Best Management Practices (BMP) to situations
  - Lack of understanding on the concept of watersheds and how they work

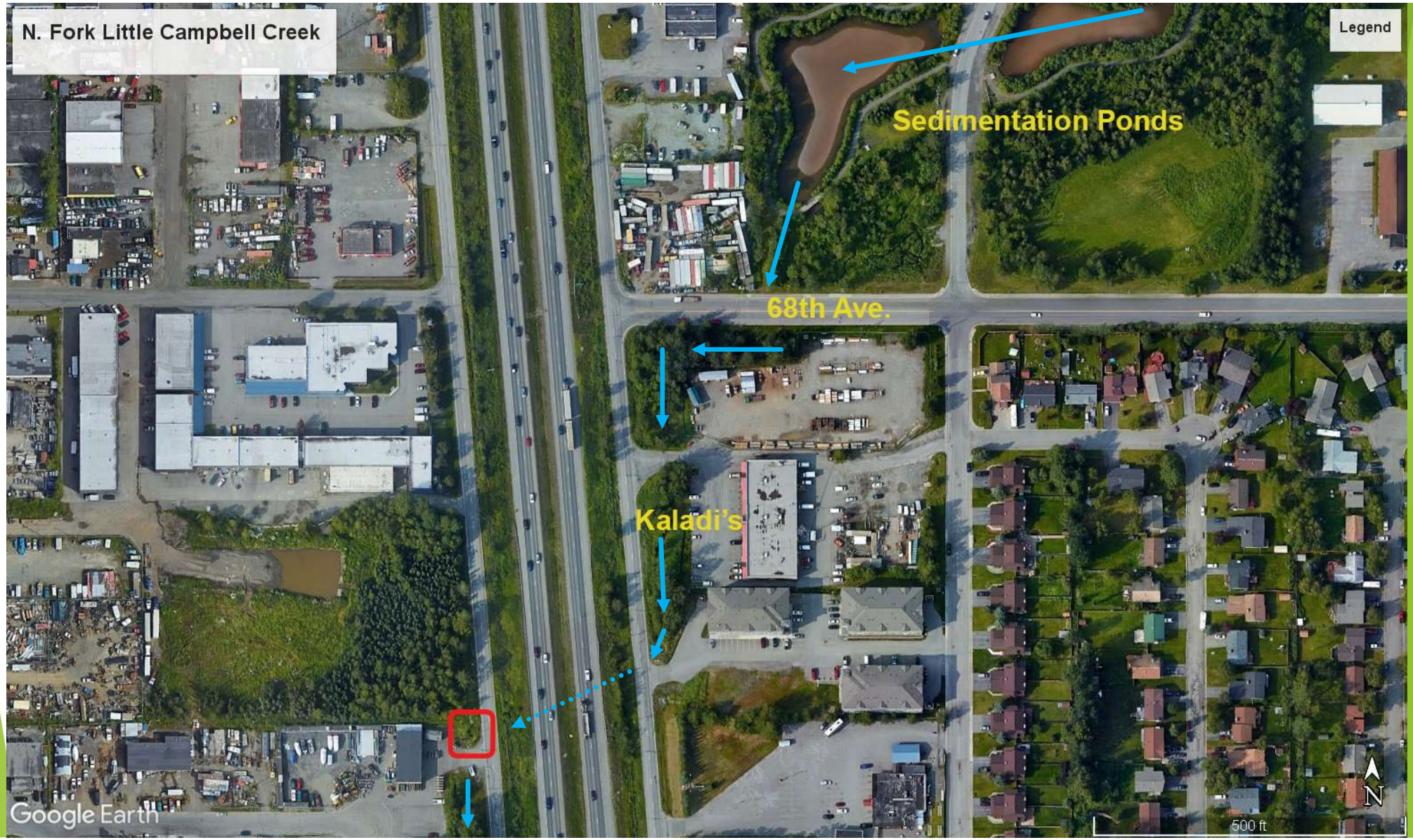
Setback Encroachments – Snow Dumping

S. Fork Little Campbell Creek

Middle Fork Chester

S. Fork Little Campbell Creek

N. Fork Little Campbell Creek


N. Fork Little Campbell Creek
Legend
Sedimentation Ponds
68th Ave.
Kaladi's
Google Earth
N
500 ft

Homer Drive & N. Fork Little Campbell Creek
August 2010 (looking north)

Culverts carrying the North Fork Little Campbell Creek under the New Seward Highway


HYDRO-SCOPIC


08/20/2017 10:43

Runoff from an equestrian facility – Birch Road

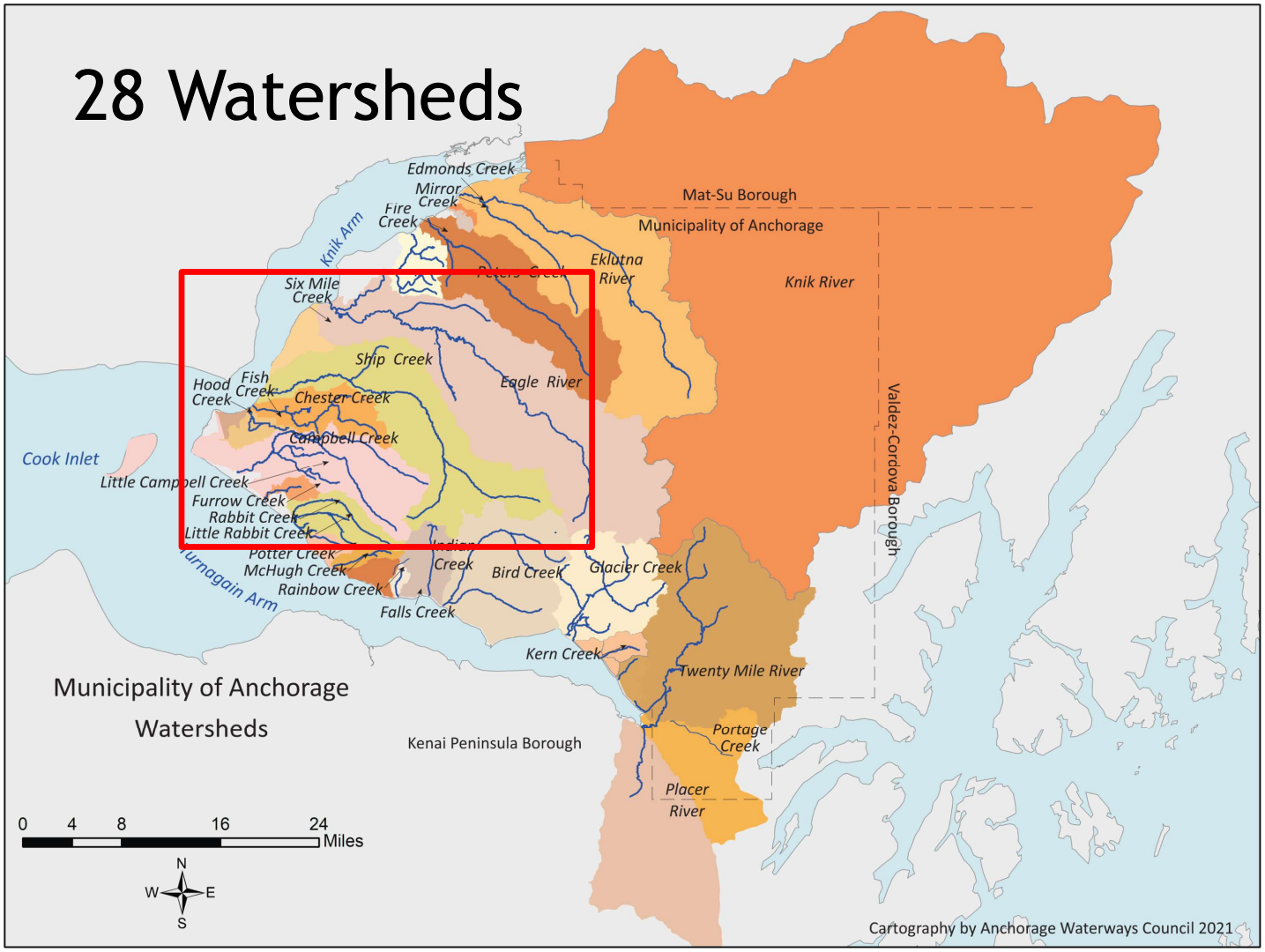
Erosion Control Failures

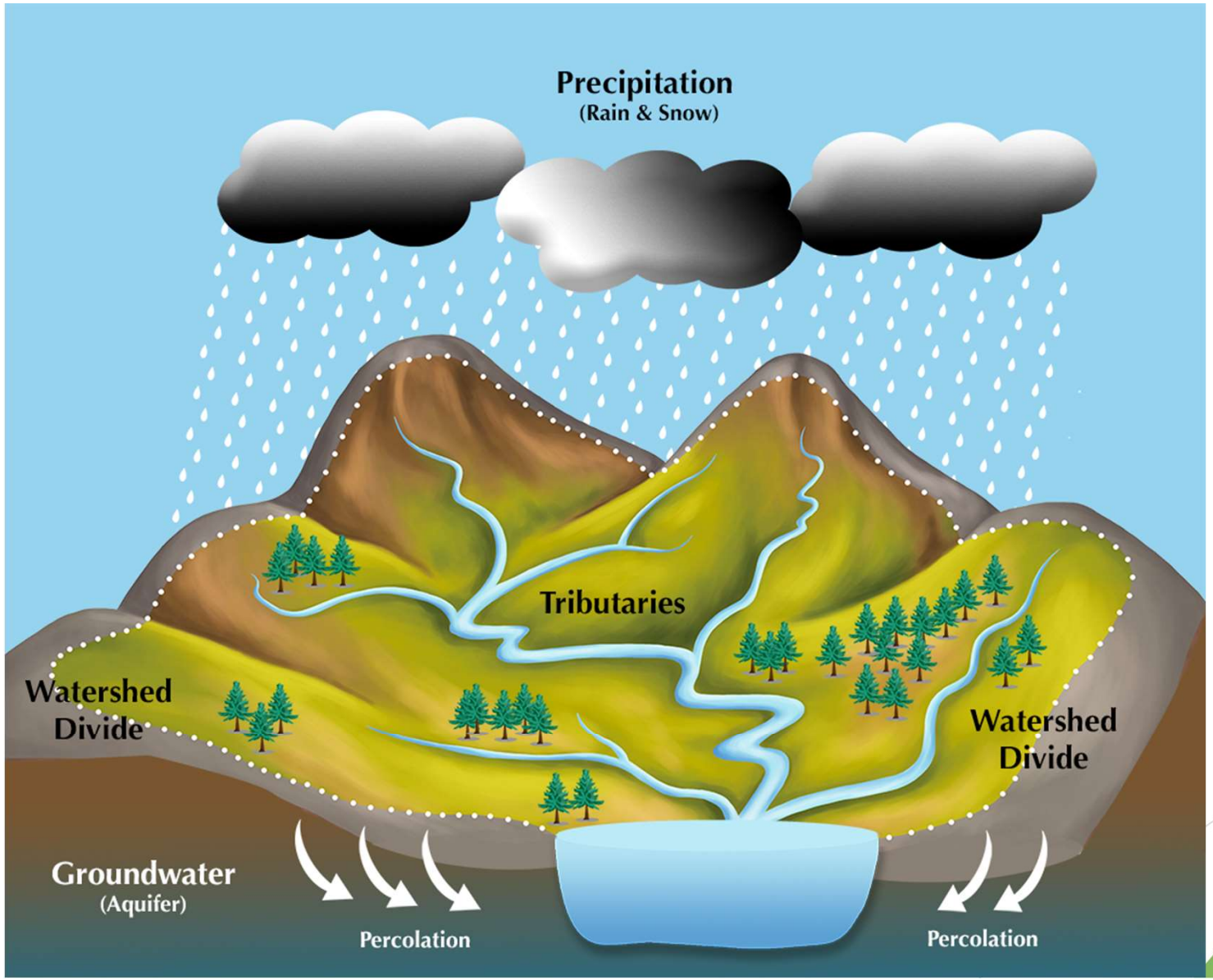
Bridge over Campbell Creek

Vehicle drips

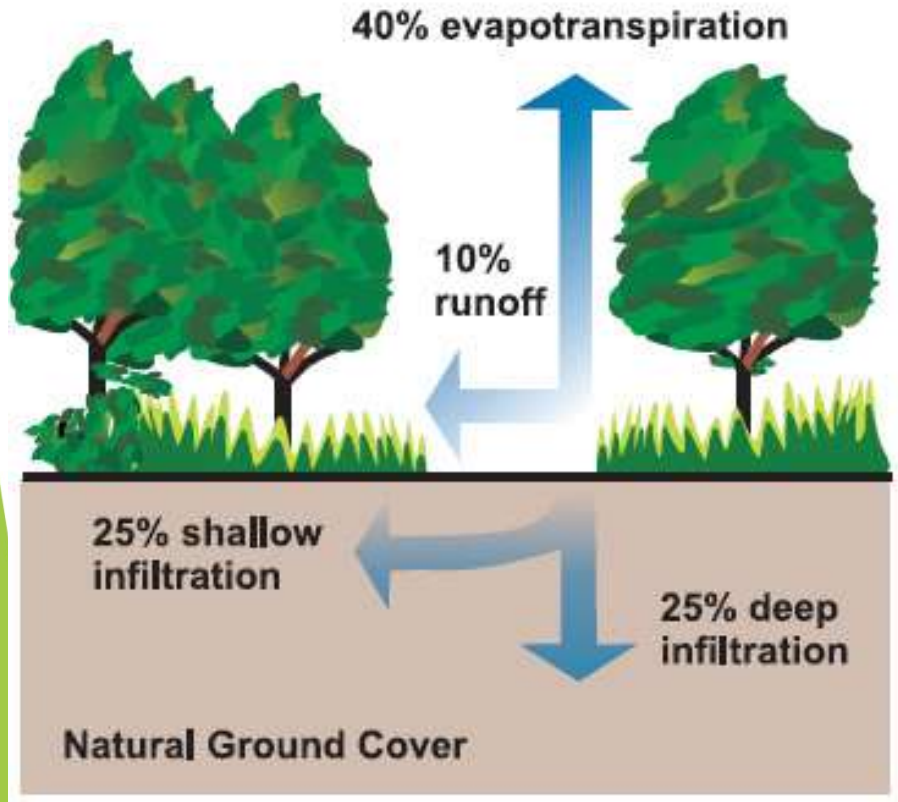
S. Fork Chester Creek near Boniface

28 Watersheds

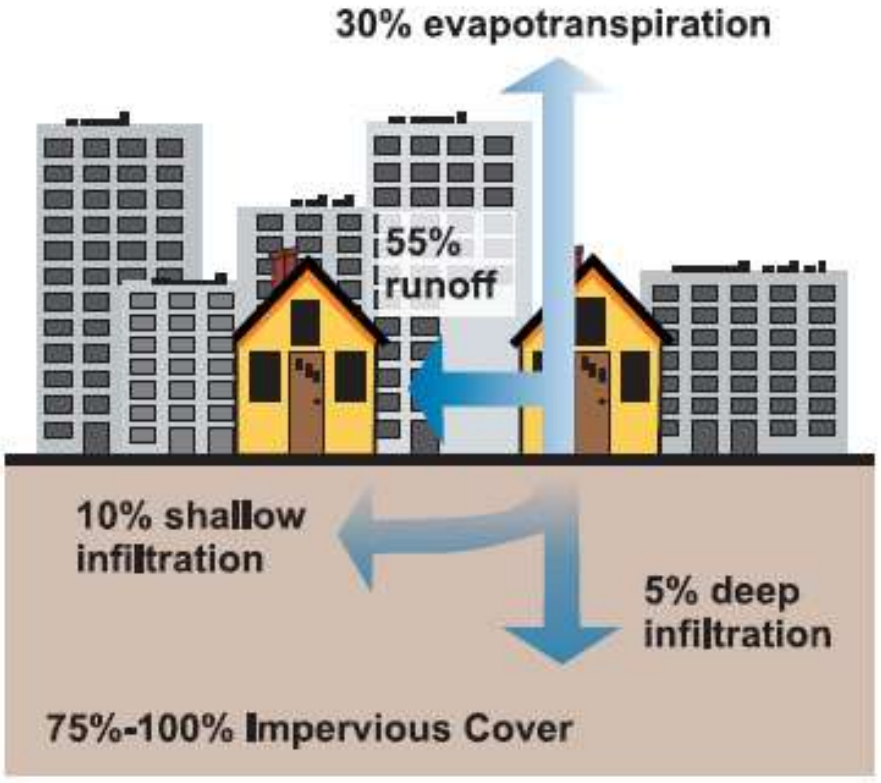



Precipitation
(Rain & Snow)
Tributaries
Watershed
Divide
Watershed
Divide
Groundwater
(Aquifer)
Percolation
Percolation

Pervious vs. Impervious Surfaces



10% runoff – 50% infiltration



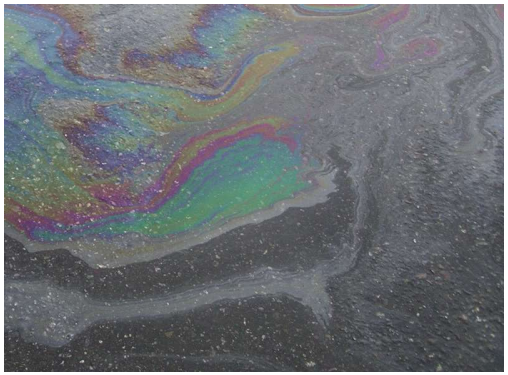
55% runoff – 15% infiltration

Stormwater discharges in Anchorage

Municipal Separate Storm Sewer System (MS4)

San Francisco (combined sewer system) advises people not to jump in puddles!

Stormwater runoff is the #1 cause of stream impairment in urban areas



Because all this, and more, is carried down through the watershed in runoff!

Stormwater video https://www.anchoragecreeks.org/stormwater-education (Click on link or copy and paste)

Where are waterway protections?

- Federal: Clean Water Act – 1972 (CWA)/National Pollutant Discharge Elimination Program (NPDES)

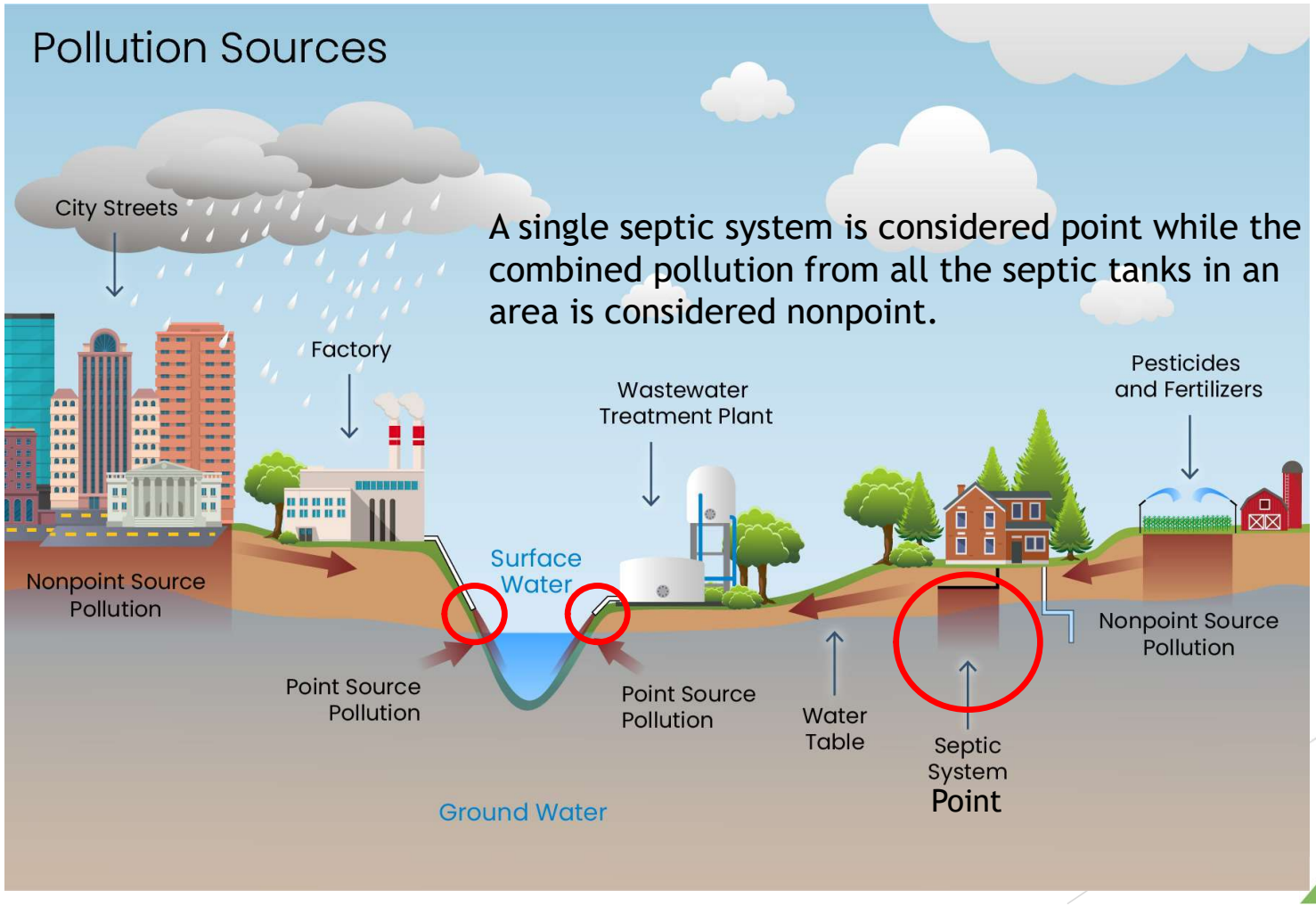
Federal Level Protections

- Environmental Protection Agency (EPA)
  - In the 1960's, a consciousness towards environmental degradation was picking up speed.
  - There were several small, disparate programs on the Federal level that were trying to address environmental concerns.
  - A formal Federal agency was proposed by President Richard Nixon in July 1970 to consolidate these programs and responsibilities.
  - The EPA was established on December 2, 1970 - epa.gov/history/origins-epa
  - Primary focus on:
    - Unhealthy air,
    - Polluted rivers,
    - Unsafe drinking water,
    - Endangered species, and
    - Waste disposal.

Clean Water Act

- Federal: Clean Water Act – 1972 (CWA)
  - Established in 1972, its overarching objective is to **RESTORE** and MAINTAIN the chemical, physical, and biological integrity of the nation's waters.
    - There was the need for a plan to address the critical problems posed by **NONPOINT SOURCE POLLUTION (NPS).**
    - The CWA established a structure for regulating pollutant discharges into the Waters of the United States (WOTUS).
      - In December 2022, a final "Revised Definition of 'Waters of the United States'" rule established that takes effect on March 20, 2023.
    - EPA was given authority to implement pollution control programs, e.g. setting **STANDARDS** for water.
    - Funding for construction of sewage treatment plants was provided.
    - Unlawful for any person to discharge any pollutant from a **POINT SOURCE** into navigable waters UNLESS a permit was obtained.
    - **Permit = National Pollutant Discharge Elimination System (NPDES)**

Point vs Nonpoint Source Pollution (NPS)



Where are waterway protections?

- Federal: Clean Water Act – 1972 (CWA) /NPDES

- State Level: Department of Environmental Conservation – Division of Water

States' roles

- The CWA prohibits anybody from discharging "pollutants" through a "point source" into WOTUS unless they have a NPDES permit.
  - Permits contain limits on what can be discharged and how much
  - Ensuring that the discharge does not hurt water quality (defined by Standards) nor people's health
  - Monitoring and reports are required
- The CWA also authorizes states to apply for authorization to oversee the NPDES program themselves.
- Once approved, the state has the authority over permitting.
- Alaska applied and received its permitting authority in 2008
- In 2012, DEC assumed full authority to administer the wastewater and discharge permitting and compliance program

Alaska Department of Environmental Conservation (DEC)

- DEC's role in regard to water quality
  - addresses nonpoint source pollution,
  - assesses surface water quality,
  - provides quality assurance assistance for QAPPs (quality assurance project plans),
  - develops regulations,
  - and reviews onsite wastewater systems.
- DEC establishes water quality standards based on NPDES which fall under the Alaska Pollutant Discharge Elimination System (APDES)
- DEC develops discharge permits (APDES) for entities, such as the Asplund Wastewater Treatment Facility overseen by the MOA

Alaska Department of Environmental Conservation
DIVISION OF WATER

Search DEC

NEWSFEED | PRELIMINARY LAB DATA | WASTEWATER COMPLAINT | HOW DO I? | IMPAIRED WATERS

You Are Here: DEC / Water / Water Quality

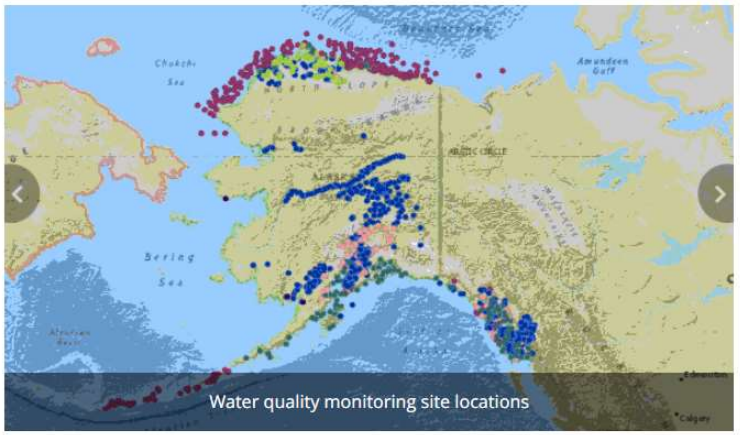
WELCOME

Water Quality (WQ) works to improve and protect Alaskan waters in numerous ways. We develop water quality standards, address nonpoint source pollution, assess surface water quality, provide quality assurance assistance, develop regulations and review onsite wastewater systems.

Program Manager: Terri Lomax
907-269-7635
Contact Information

POPULAR CONTENT

- Integrated Report/Impaired Waters
- Beaches
- AK Water Quality Standards (PDF)



Water quality monitoring site locations

Surface Water Quality Monitoring | Nonpoint Source Pollution Prevention | Onsite Wastewater Disposal Systems | Quality Assurance | Water Quality Standards

Department of Environmental Conservation
Mailing Address: P.O. Box 111800

Water Quality Standards (WQS) for fresh and marine waters (DEC)

- Bacteria
- Dissolved gas
- Dissolved inorganic substances (not containing carbon, e.g. arsenic and lead)
- Petroleum hydrocarbons, oils and grease
- pH
- Radioactivity
- Sediments
- Temperature
- Toxic and Other Deleterious Organic and Inorganic Substances, example: asbestos
- Turbidity
- Color

Where are waterway protections?

- Federal: Clean Water Act – 1972 (CWA), NPDES

- State Level: DEC – Division of Water, APDES

- Municipal: APDES Permit AKS 05255-8, held jointly by the MOA and AKDOT&PF
  - Overseen by the MOA's Watershed Management Services

Municipality of Anchorage APDES Permit

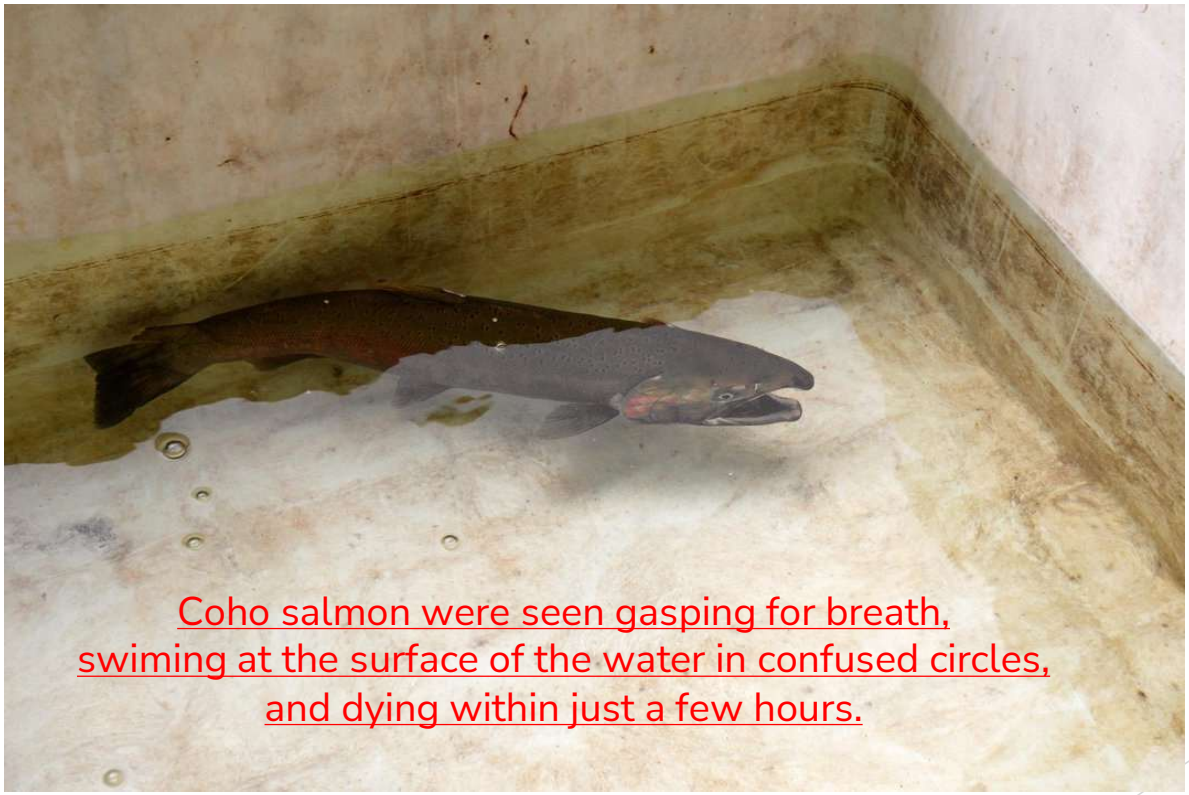
- A 5-year permit held jointly between the MOA Watershed Management Services (WMS) and the Alaska Department of Transportation and Public Facilities (AKDOT&PF)
- Its 39 pages outline:
  - Geographic coverage
  - Permitted discharges
  - Stormwater management program requirements
  - Monitoring requirements
  - Reporting requirements
  - Minimum control measures
    - Construction runoff
    - Stormwater infrastructure and street management
    - Management of illicit discharges
    - Public education and involvement

Anchorage Waterways Council (AWC)

- AWC has a contract with the Municipality to oversee the "outreach and education" portion of the APDES permit
- Methods:
  - Organize events, e.g. Scoop the Poop Day and Annual Creek Cleanup
  - Table at other events: Dog Jog, Potter Marsh Day, Migratory Bird Day, farmers' markets
  - Media stories: TV news and the *Anchorage Daily News*
  - Create outreach materials, e.g. graphic animation videos on stormwater and pet waste
  - Make public presentations
  - Investigate and respond to issues
  - Provide an annual written report to the MOA and present at the annual meeting

Scoop the Poop video
https://www.anchoragecreeks.org/projecto-2 (Click on link or copy and paste)

Emerging Threats: 6PPD Quinone
"Urban Runoff Mortality Syndrome" (URMS)



Coho salmon were seen gasping for breath,
swiming at the surface of the water in confused circles,
and dying within just a few hours.

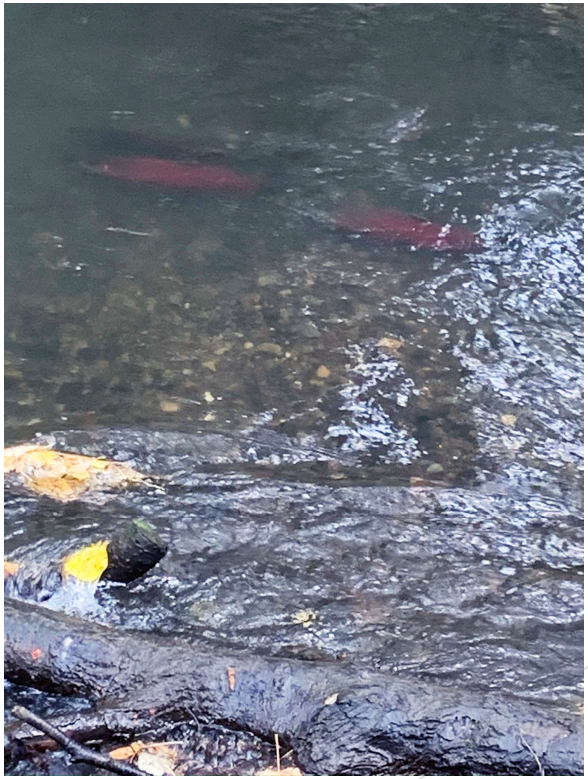
6PPD Quinone and Salmon

- 6PPD quinone is an additive for vehicle tires to reduce their breakdown from ozone and other chemicals—a safety measure.
- In 2020, it was reported by scientists at the University of Washington to be the cause of high mortality in coho salmon in Puget Sound. Recently, rainbow and brook trout are showing an increased sensitivity.
- They had linked the dust from tire breakdown, which carries 6PPD quinone, in stormwater runoff in Puget Sound where salmon were migrating to spawn.

Runoff into Chester Creek at the New Seward

https://youtube.com/shorts/qOqXuL-YznA (click on link or copy and paste)

- Dr. Birgit Hagedorn, a geochemist on the AWC board, became interested in the problem and wanted to see if the chemical was present in Anchorage.
- Testing for the chemical is very expensive, $500/analysis.
- Over $5,000 was raised in a GoFundMe campaign that allowed for 10 tests.



6PPD Quinone Sampling at Ship and Chester Creeks, Anchorage, Alaska 2021 (Birgit Hagedorn)

Location	Sample	Location	6PPD-quinone		Lethal dose	
Unit			µg/L		µg/L	±
Date			4/13/2021	7/2/2021		
Chester Creek @ New Seward Highway	storm drain	Seward Hwy storm drain - north	1.3	0.69	0.8	0.16
			1.1			
Chester Creek @ New Seward Highway	creek	Seward Hwy Chester Creek	0.13	0.017		
Chester Creek @ New Seward Highway	storm drain	Seward Hwy storm drain - south	0.36	0.19		
Ship Creek @ A Street bridge	storm drain (left side)	Ship Creek storm drain (left side)	0.34	0.38		
Ship Creek @ Viking & Sitka	storm drain	Ship storm drain @ Viking	N/A	0.35		
Ship Creek @ Ingra	creek	Ship Creek	N/A	0		
Ship Creek @ A Street bridge	storm drain (right side)	Ship Creek storm drain (right side)	0.038			

Resources

- Clean Water Act Owner's Manual
  - https://www.rivernetwork.org/connect-learn/resources/clean-water-act-owners-manual/
- Municipality's APDES permit
  - http://anchoragewatershed.com/APDES.html
- DEC's Impaired Waters List
  - https://dec.alaska.gov/water/water-quality/integrated-report/

Thank you!

Questions?

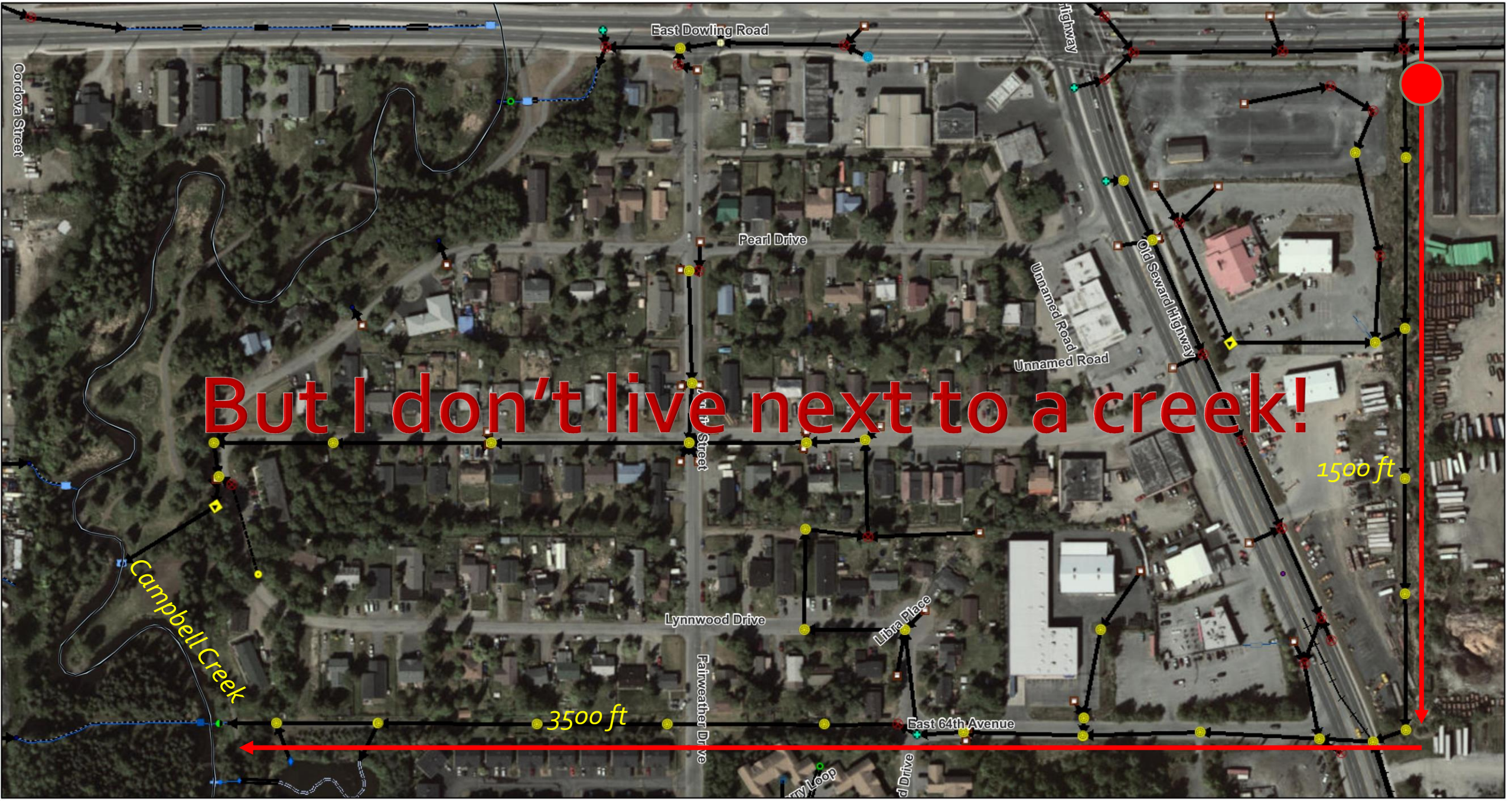
Cherie Northon – cherie@anchoragecreeks.org

Anchoragecreeks.org

Healthy Creeks for All
What You Can Do!

- Cherie Northon, Ph.D.
- Anchorage Waterways Council

- February 8, 2023


East Dowling Road
Cordova Street
Pearl Drive
Unnamed Road
Old Seward Highway
Unnamed Road
But I don't live next to a creek!
1500 ft
Campbell Creek
Lynnwood Drive
Libra Place
3500 ft
East 64th Avenue

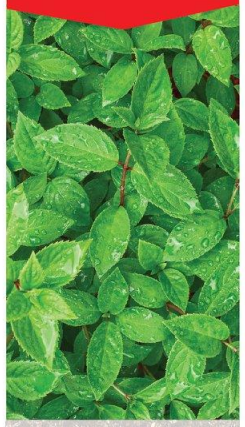
What's on the ground, washes down!

How do gardens affect waterways?

Garden fertilizers:

- All living things need nutrients to survive and thrive, plants are no exception.
- In nature, plants get their nutrients naturally from the **soil** as it recycles decaying plant and animal matter.
- When humans began growing their food, they learned to mimic nature and provide additives from plants and animals.
- In the early 1900s, petroleum- based synthetic fertilizers were developed and became immensely popular, and there was a move away from the natural.
- Over time, the cumulative effects of synthetic fertilizers have become well-documented.
- The reliance coupled with overuse has resulted in environmental consequences.

NITROGEN



The Leaf Maker

- Production of new cells and enzymes.
- Production of green pigments.
- Responsible for leaf and stem growth.
- Helps plants with rapid growth.

PHOSPHORUS

The Root Maker / Flower Inducer

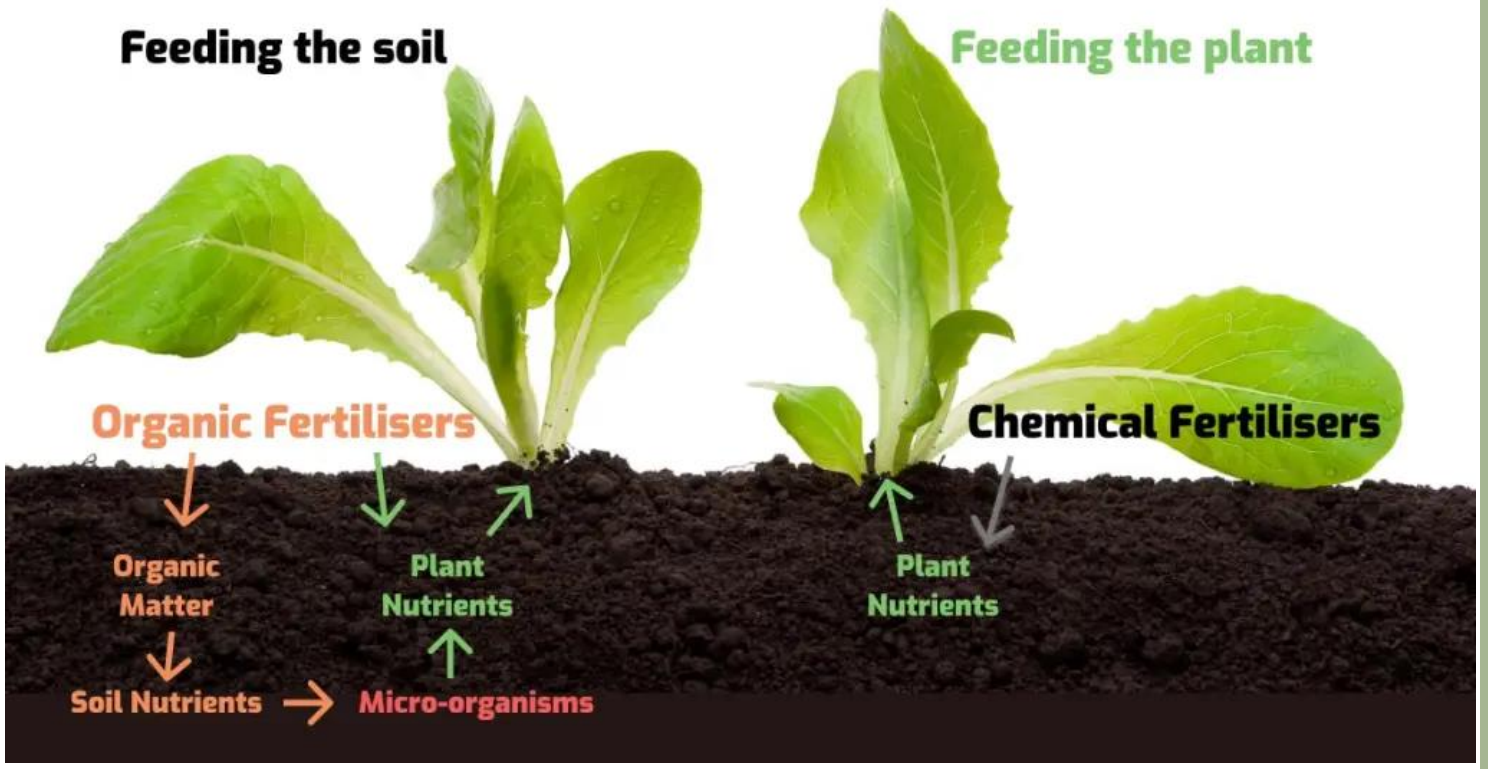
- Encourages root growth and blooming.
- Essential part of the process of photosynthesis.
- Involved in the formation of all oils, sugars and starches.
- Helps with the transformation of solar energy into chemical energy.

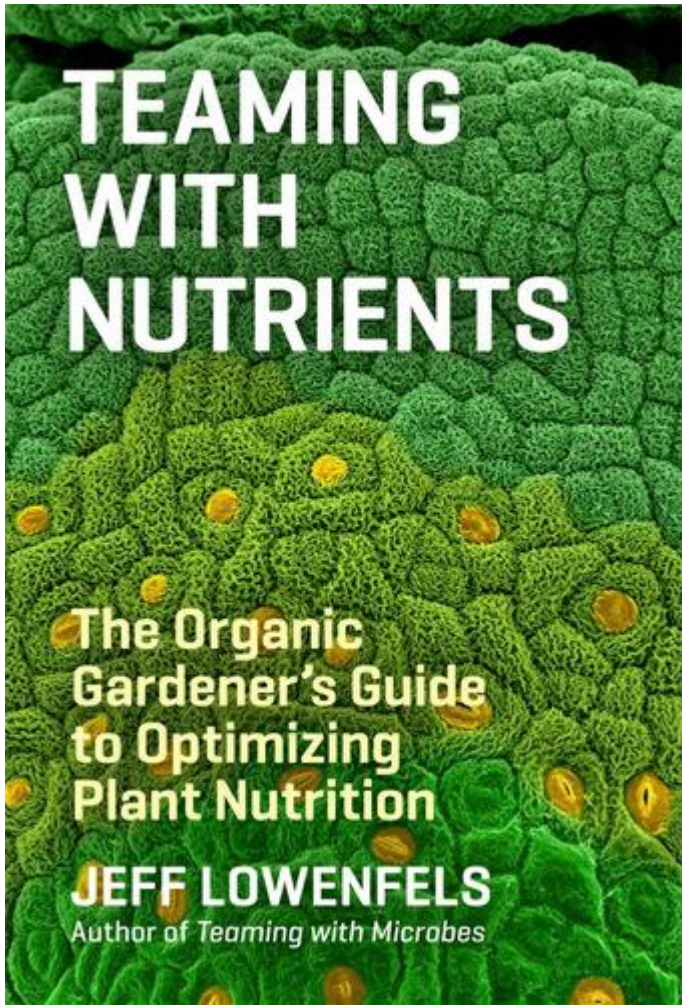
POTASSIUM

The Flower Inducer / Fruit Maker

- Encourages uptake of water.
- Essential in the development of flowers and fruits.
- Increases plants resistence to diseases.
- Helps plants make better use of light and air.

GARSONI 嘉施利





Listen to Gardener Jeff! TEST YOUR SOIL!

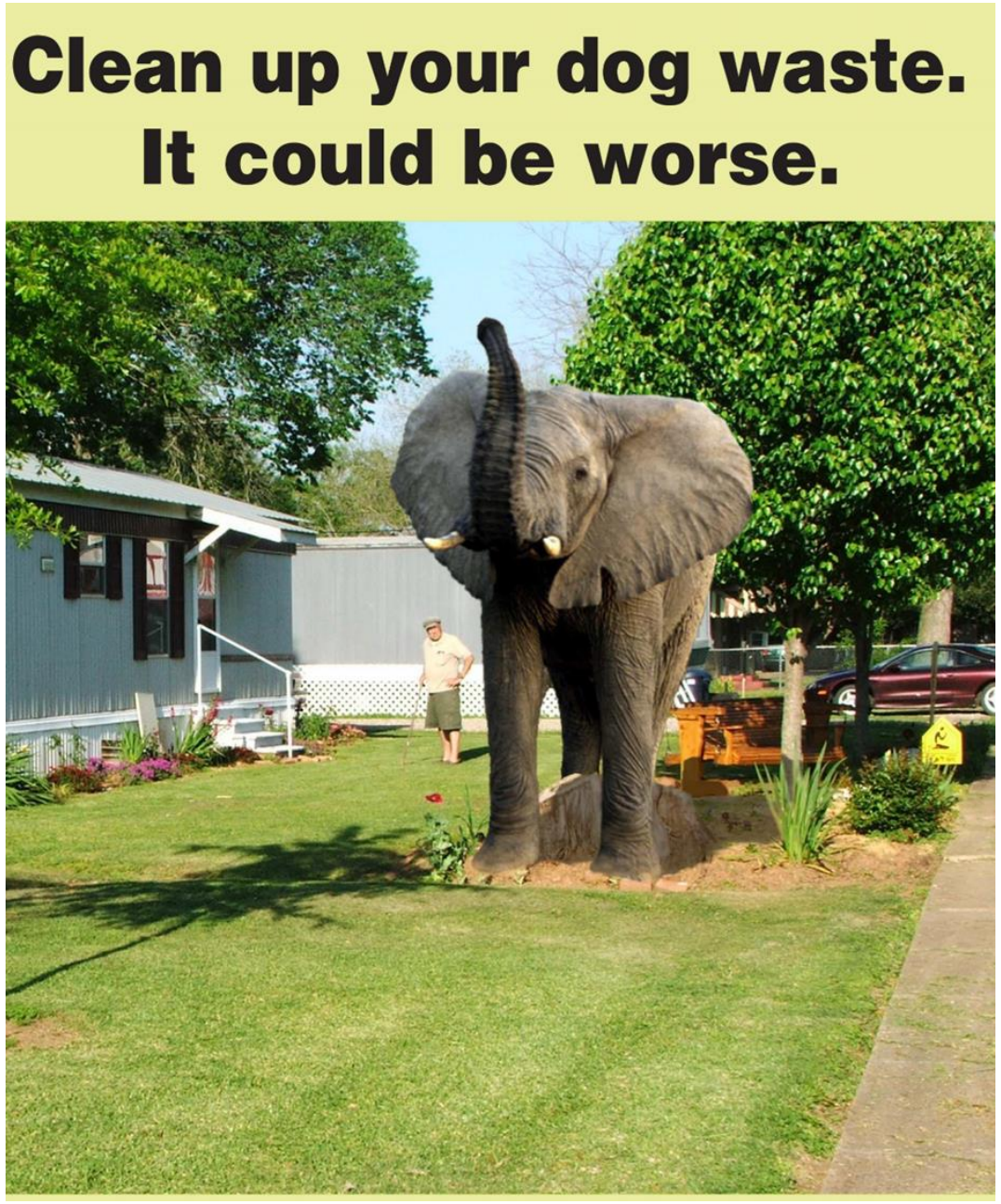
Consequences of synthetic fertilizers

- The chemicals in fertilizers have become a major source of water pollution, causing unhealthy conditions for aquatic life and for people.
- Rainstorms and overwatering lawns (and crops) picks up excess fertilizer and carries it down storm drains.
- Fertilizer that finds its way into our waterways fuels the too rapid and harmful growth of algae and other aquatic plant life.
- Sometimes the growth is so explosive it creates an algal "bloom" with millions of organisms discoloring the water. This excessive growth causes an unhealthy increase in the amount of organic matter within a water body, a process called ***eutrophication***.

Campbell Lake 2007

Chester Creek at Valley of the Moon Park

Jewel Lake



- Pet waste acts like a fertilizer because of the nutrients in it, but it is not suitable for gardens.
- Dogs are carnivores and eat high protein diets.
- Dog poop is highly acidic.
- Dog poop is full of FC bacteria—23 million in 1 gram plus other nasty organisms!

Pesticides: Herbicides, Insecticides, and Fungicides

- Excessive use of these products could lead to their deposition in lakes and streams if they are carried with sediments.
- Impacts will be on aquatic plants, benthic insects, fish, and birds.
- Water-soluble pesticides may leach in sandy soils and move to ground or surface water.
- Cornell University Cooperative Extension states, *"cleanup of groundwater contaminated by pesticides is usually impossible. The slow movement of groundwater means that it may take decades for the contaminated water to flow beyond the affected wells."*

Do not put green waste into waterways!

To bag or not to bag…that is the question!

- Mulch your grass and leaves - save your back!
- Lawn clippings contain nutrients, e.g. nitrogen (4%), potassium (1-2%) and phosphorous (0.5-1%) by weight.
- Mulching them builds soil structure and increases your soil's ability to hold moisture.
- Beneficial organisms love them.
- Keep them OUT of the landfill!

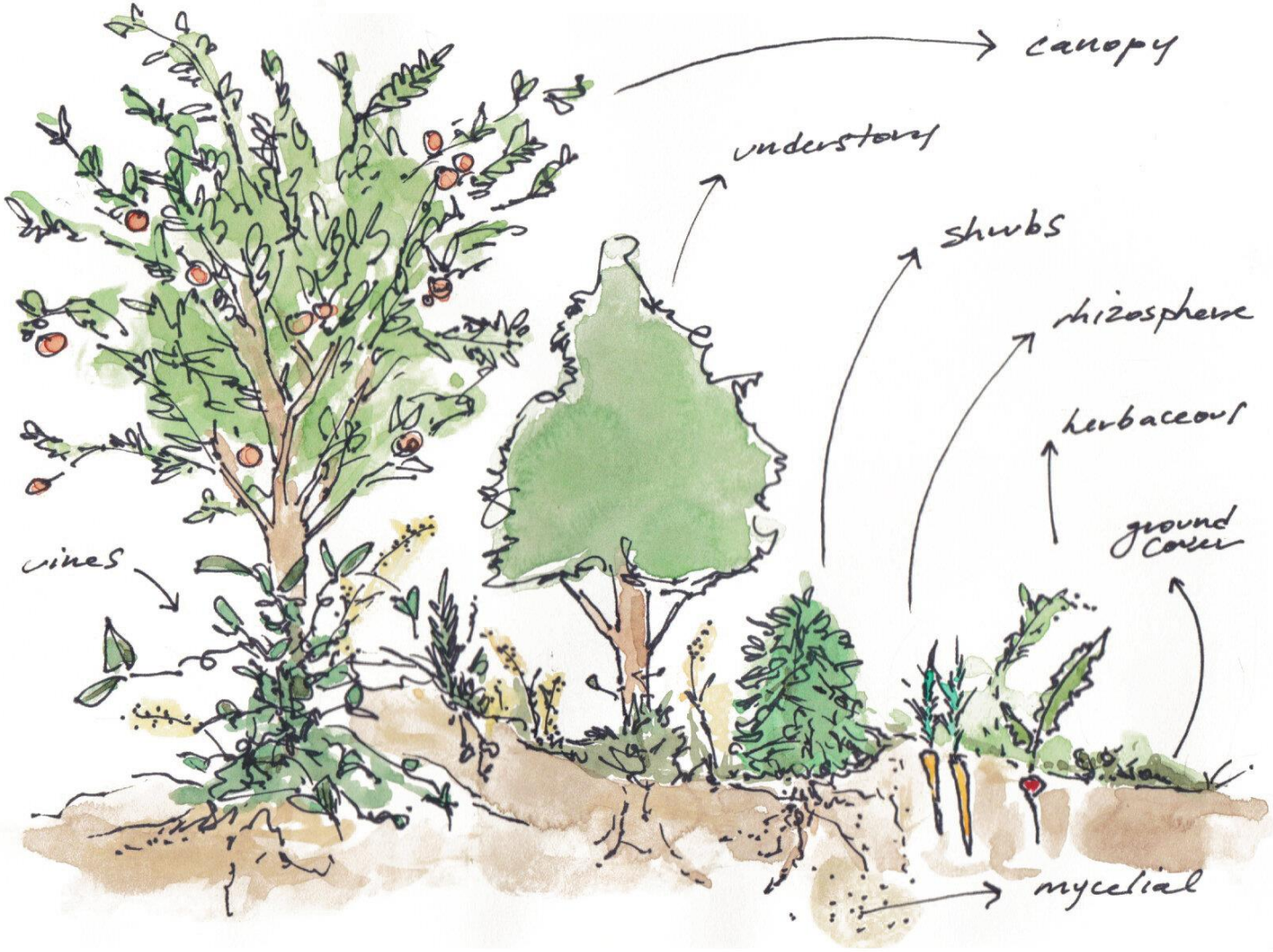
Watering

- Earlier or later in the day--reduces evaporation.
- Don’t overwater and don’t water pavement.

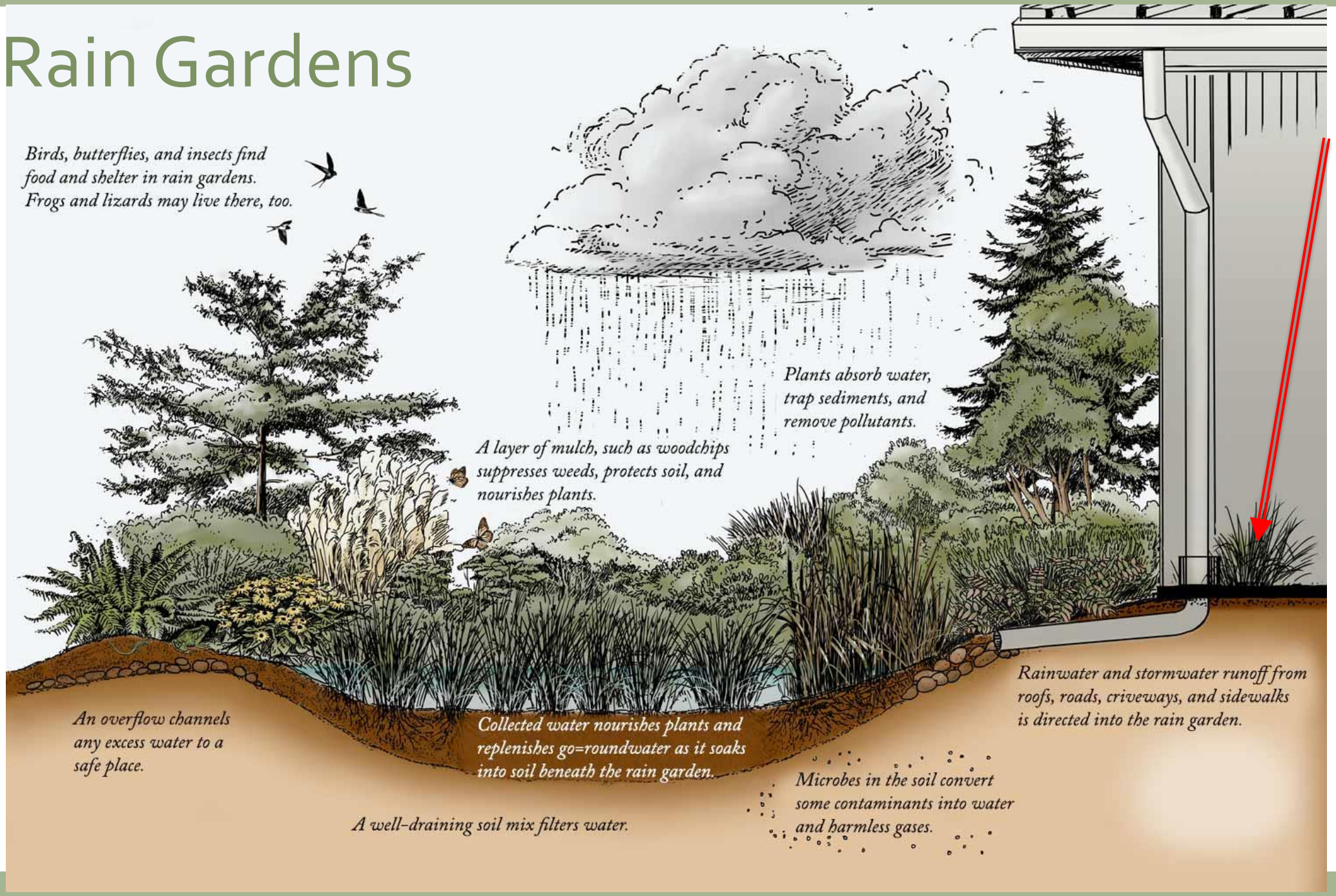
Turn your downspout!

Use a rain barrel!

Food Forests

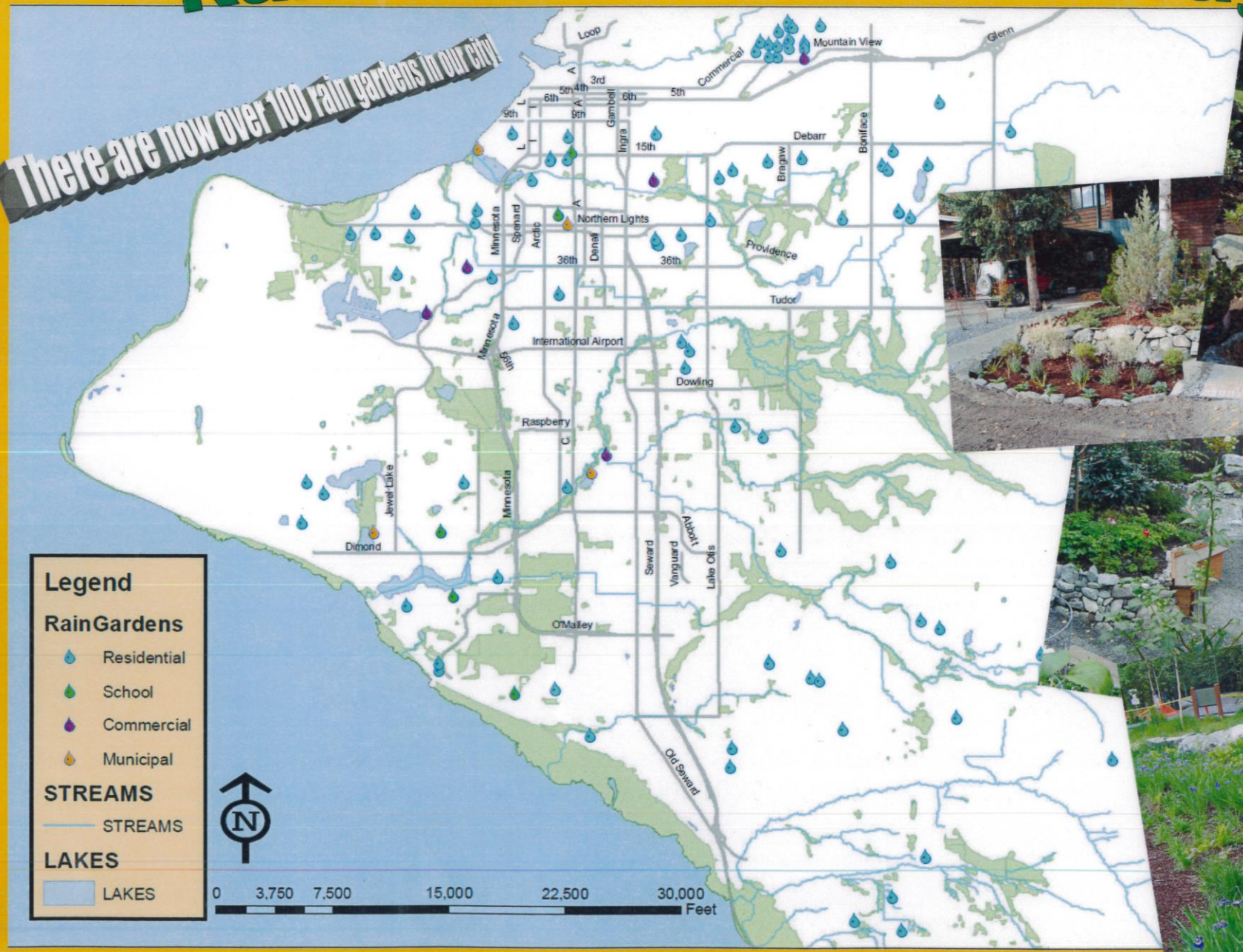


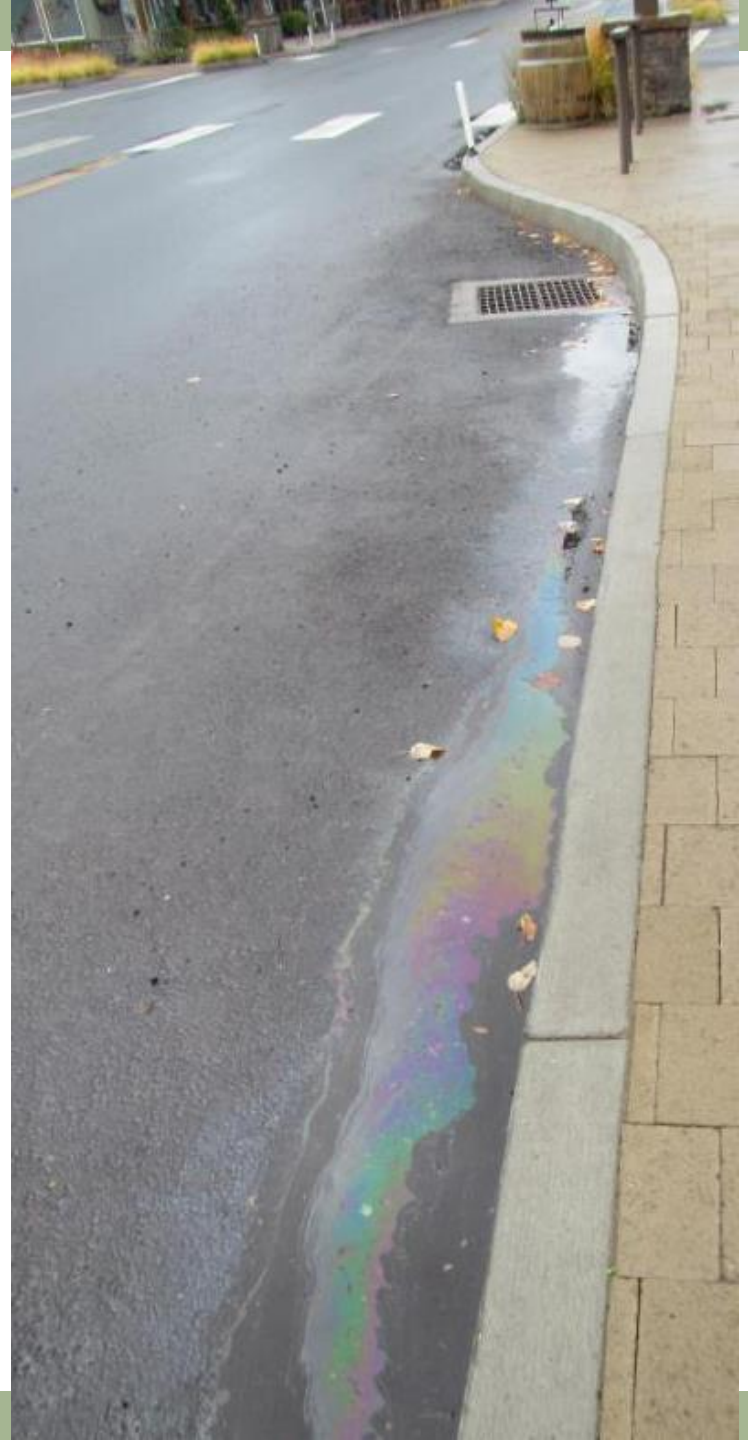
Rain Gardens



Rain Gardens in Anchorage

There are now over 100 rain gardens in our city!

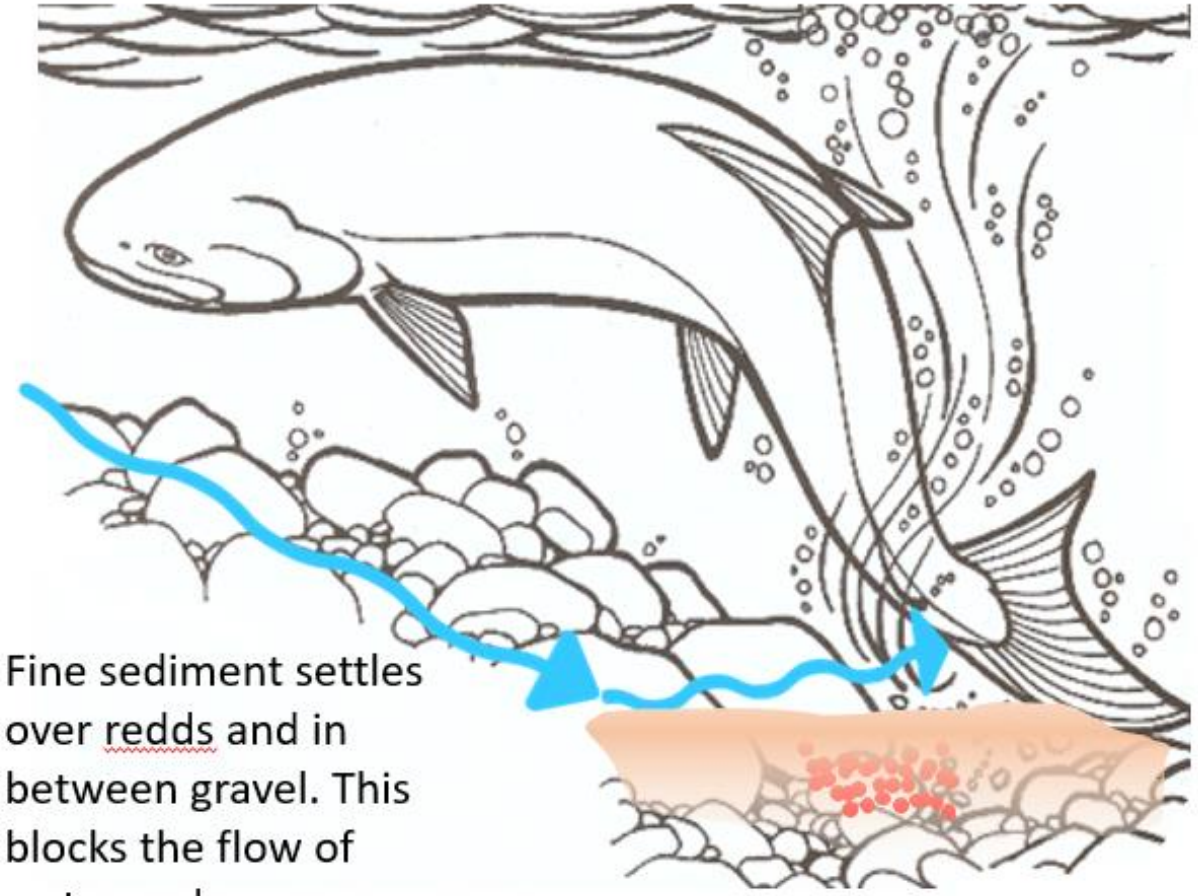




Bioswale or Infiltration Planter Sisters, Oregon

Soil erosion

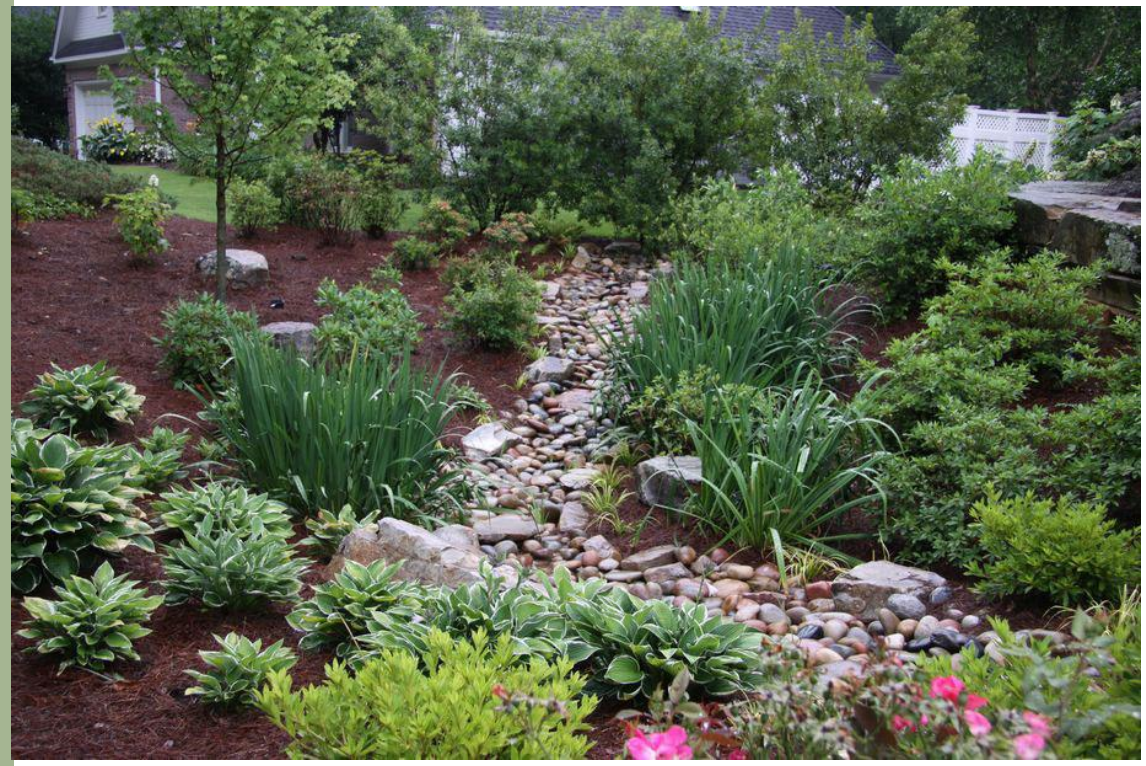
Fine sediment is **not** suitable spawning habitat

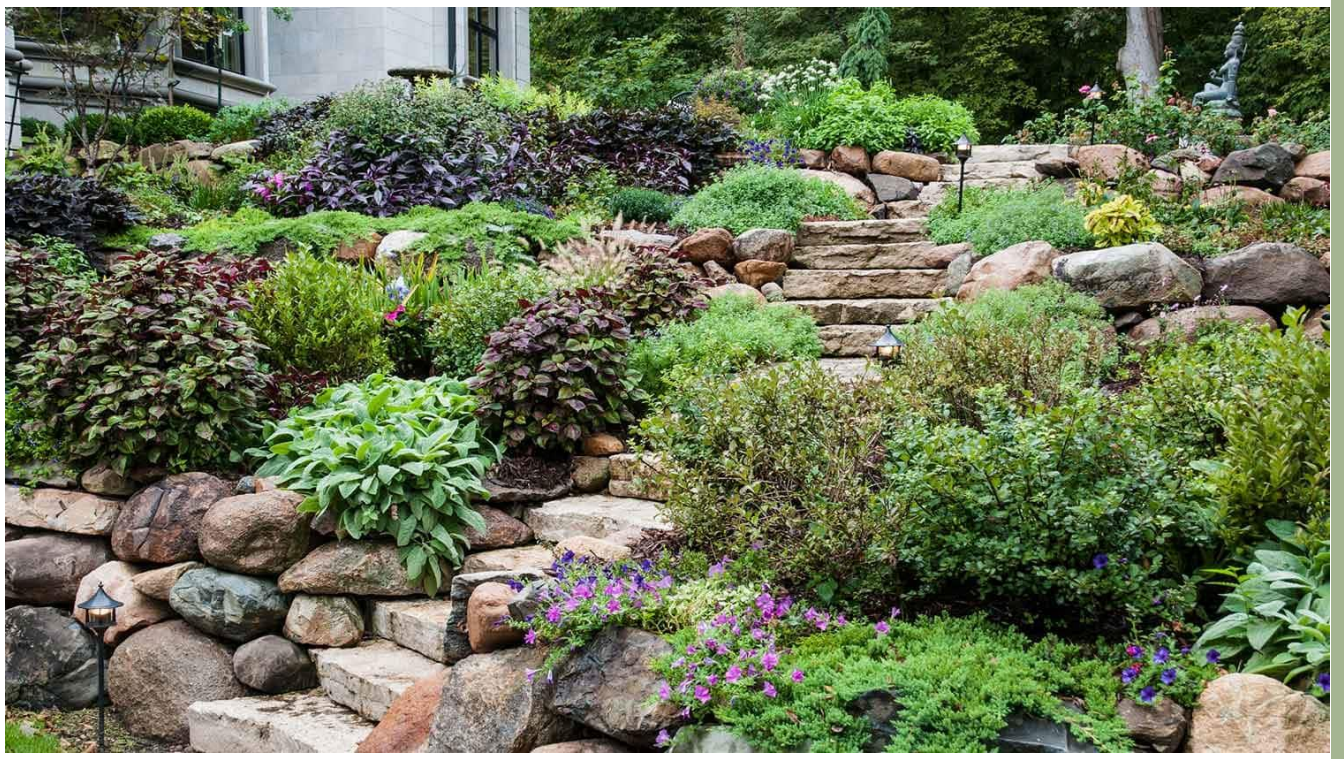


Fine sediment settles over redds and in between gravel. This blocks the flow of water and oxygen.

Less oxygen reduces hatching success.


Brown Bear
Pool
8-28-05





- Keep bare ground covered with planting of perennials, mulch, rocks, etc.
- Reduce watering or water introduction
- Avoid soil compaction, aerate lawns
- Creative landscaping

What you can do

- Know what your garden needs.
- Follow the directions – more is NOT better.
- Watch the weather when you fertilize to avoid heavy rains.
- Don’t over water when using additives.
- Plant buffers if you are along a waterway.
- If using synthetic fertilizers, try to keep them from running off into stormwater or directly into ponds, rivers, lakes and streams.

Snow melt chemicals

They're used for safety.

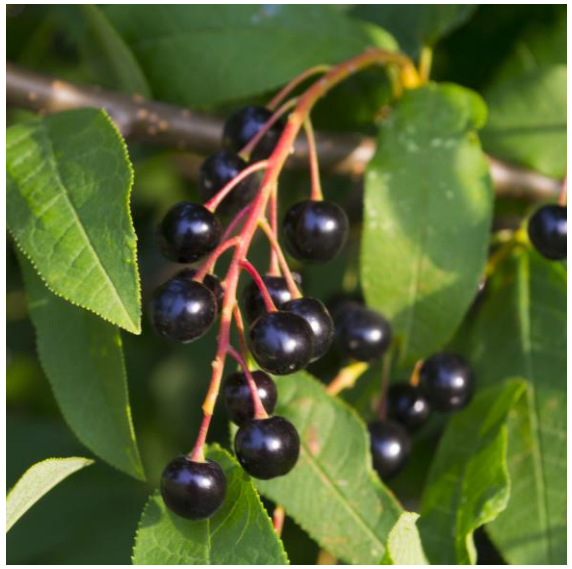
Impacts:

- **Humans** – children getting it on their hands/eating it, higher sodium levels in drinking water
- **Pets** – injury from licking their feet and ingesting it, drying out of foot pads
- **Wildlife** – birds mistake the crystals as road grit, attraction to roads where they are hit by vehicles, animals can drink snow melt which is toxic
- **Aquatic life** – salt concentrations can be toxic to fish, macroinvertebrates, insects and amphibians
- **Vegetation** – salts can disrupt nutrient uptake and injure the plants/seeds/etc., and can create a favorable environment for non-native invasive species

What you can do

- Use gravel, sand, or non-clumping kitty litter
- Shovel more – the more you remove means less chemical is needed
- Watch the temperature – most salts stop working at 15° and below, instead use sand or gravel for traction (Calcium chloride works to -20)
- Apply to clear surfaces as it is supposed to break the surface tension
- More salt does not mean more melt
- Spread evenly
- Sweep up extra

Invasives



European Bird Cherry or Mayday Tree
Prunus padus

- They crowd out native plants.
- They are opportunistic and are taking advantage of climate change and stressors on native plants.
- They love disturbed soil and wet areas and have been in Alaska since at least 1974.

Municipality banned the sales of two species

- Chapter 15.90 - INVASIVE SPECIES
- 15.90.010 - Sale of invasive species unlawful.
  - A. It is unlawful for any person to sell any of the following species:
  - 1. Bird Cherry or Mayday Trees (*Prunus padus*); or
  - 2. Reed Canary Grass (*Phalaris arundinacea*).
- 15.90.020 - Penalties.
- Violation of - section 15.90.010 shall be punishable by a fine of $250.00.

Elodea (*Elodea canadensis*)

Prevention or eradication using herbicides

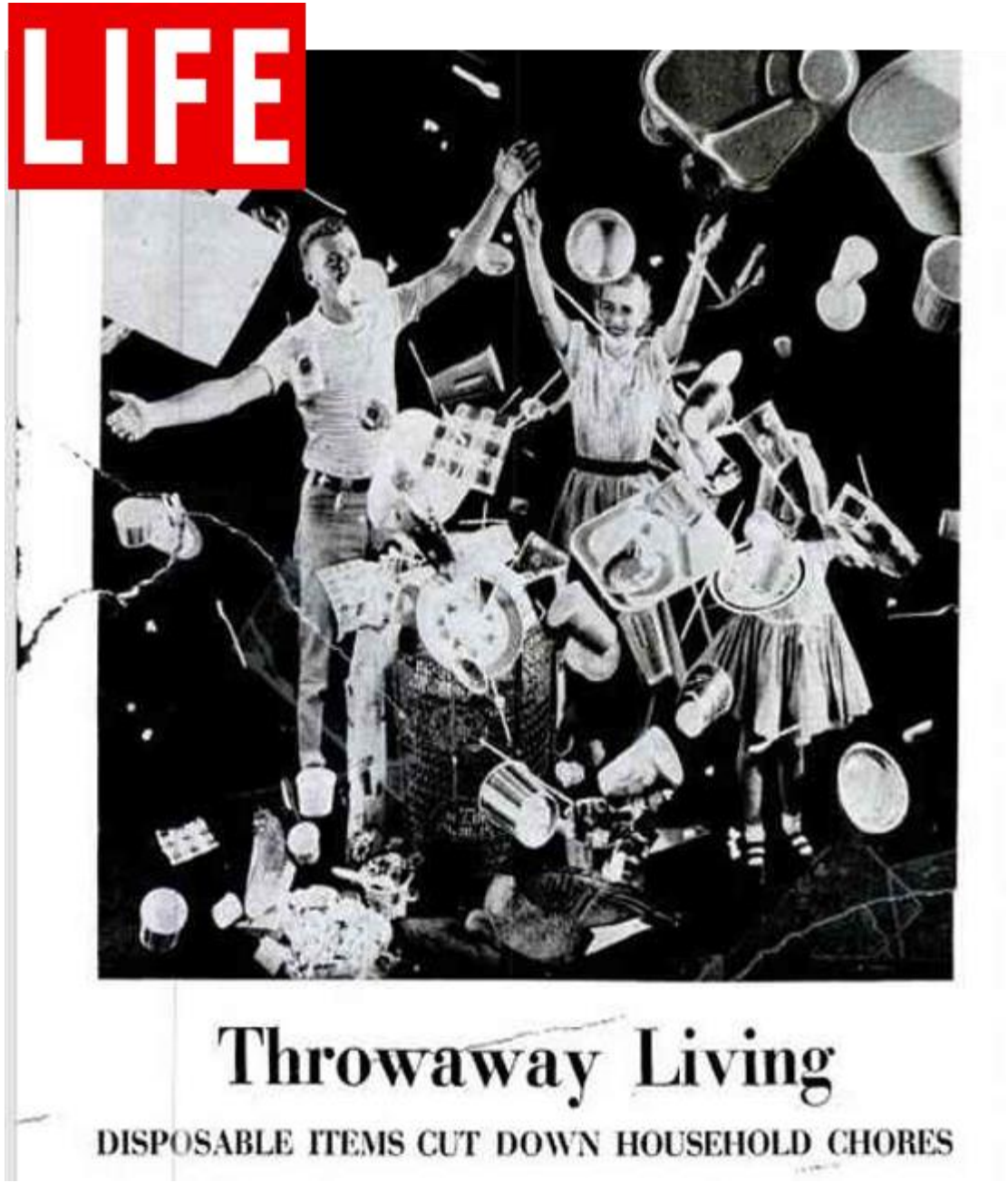
Aquarium critters

- Goldfish
- Pike
- Red-eared sliders

Plastics!

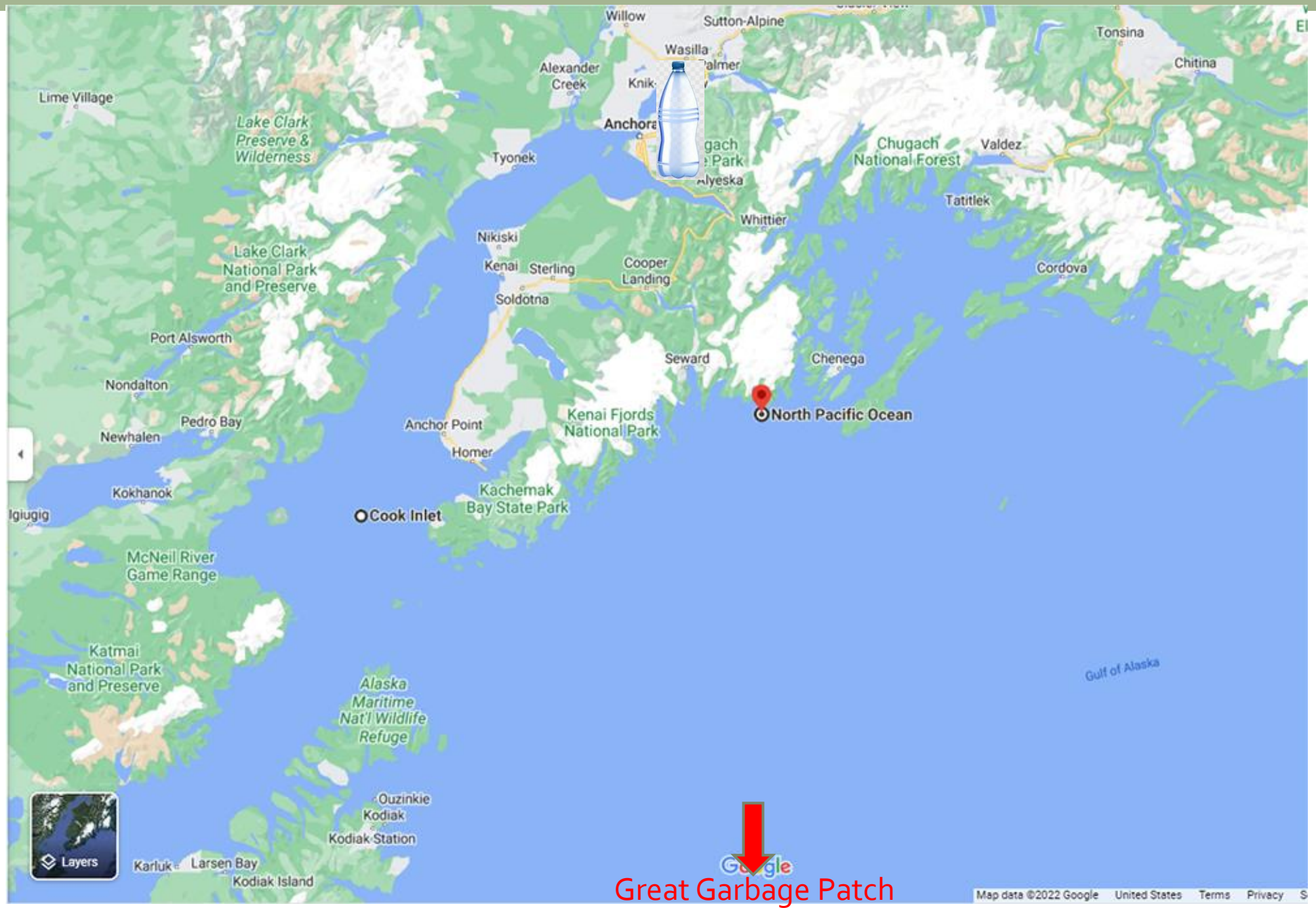
LIFE Magazine

1955

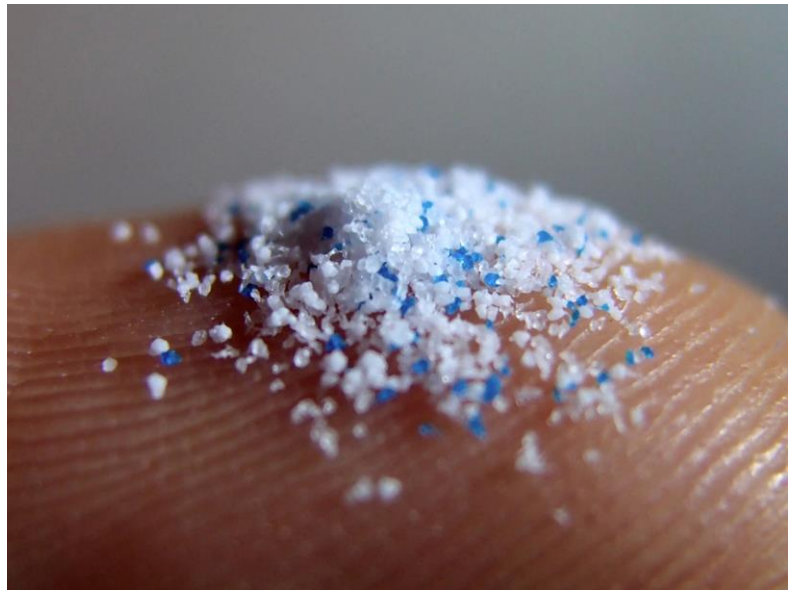


Plastics

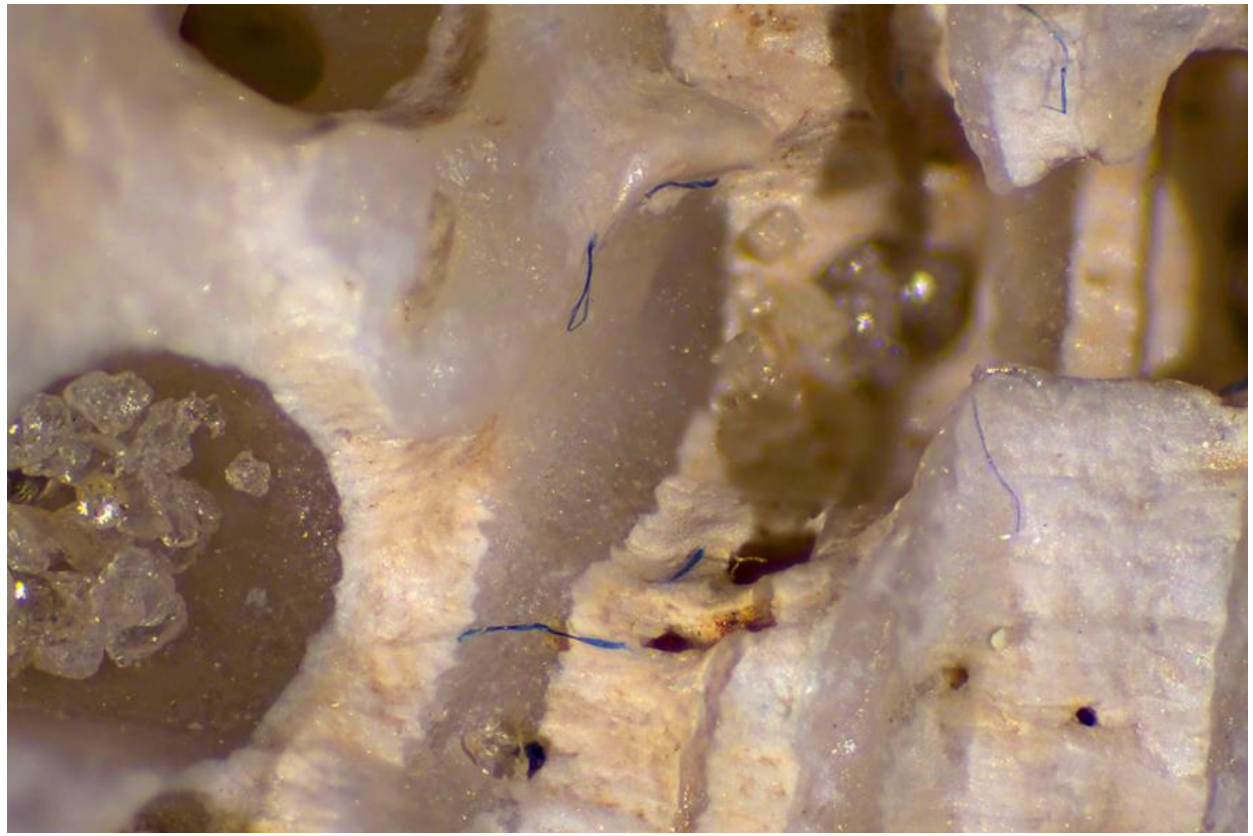
- Plastic is a durable material that is usually made from petrochemicals.
- It is pervasive in Society and cannot biodegrade, rather it breaks down into smaller and small pieces.


Willow
Sutton-Alpine
Tonsina
Chitina
Wasilla
Alexander Creek
Lime Village
Lake Clark Preserve & Wilderness
Tyonek
Chugach National Forest
Valdez
Tatitlek
Whittier
Nikiski
Kenai
Sterling
Cooper Landing
Cordova
Lake Clark National Park and Preserve
Soldotna
Port Alsworth
Seward
Chenega
Nondalton
Pedro Bay
Newhalen
Anchor Point
Kenai Fjords National Park
North Pacific Ocean
Homer
Kokhanok
Kachemak Bay State Park
Cook Inlet
McNeil River Game Range
Katmai National Park and Preserve
Gulf of Alaska
Alaska Maritime Nat'l Wildlife Refuge
Ouzinkie
Kodiak
Kodiak Station
Karluk
Larsen Bay
Kodiak Island
Layers
Great Garbage Patch
Map data ©2022 Google
United States
Terms
Privacy


Great Pacific Garbage Patch



Microfibers and microplastics Inhaled and ingested



Monofilament fishing line

2015 Kyler Ince, Eagle Scout Project

In 2015, 21 monofilament recycling bins were placed at local lakes and creeks

Monofilament and Lead Outreach 2022

- New monofilament recycling bins were built and installed at 20 locations
- A new focus on the toxicity of lead fishing tackle – Love a Loon campaign

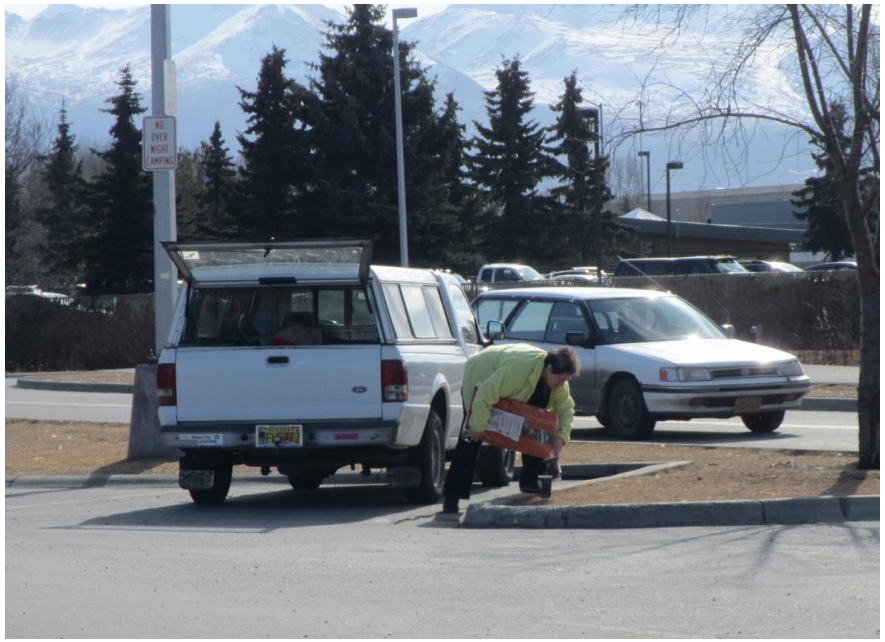

Monofilament Recycling Bins
Anchorage, Alaska
2022 (20 Bins)
Ship Creek northside
Ship Creek southside
Anchorage
KNIK ARM
Cheney Lake
Lake Otis
Campbell Creek at Shelikof
Little Campbell Lake
Delong Lake
Sand Lake
Taku Lake
Campbell Creek
Campbell Lake
Jewel Lake
TURNAGAIN ARM

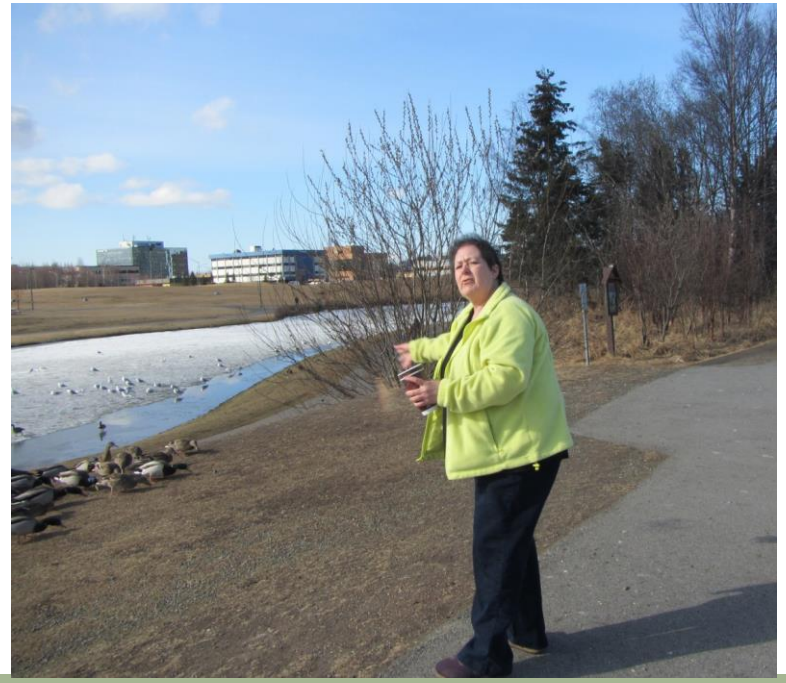

DISTURBANCE OF BIRDS, NESTS
PROHIBITED UNDER AUTHORITY OF THE
FEDERAL MIGRATORY BIRD TREATY ACT
16 ASC 703 711
NO TRASH

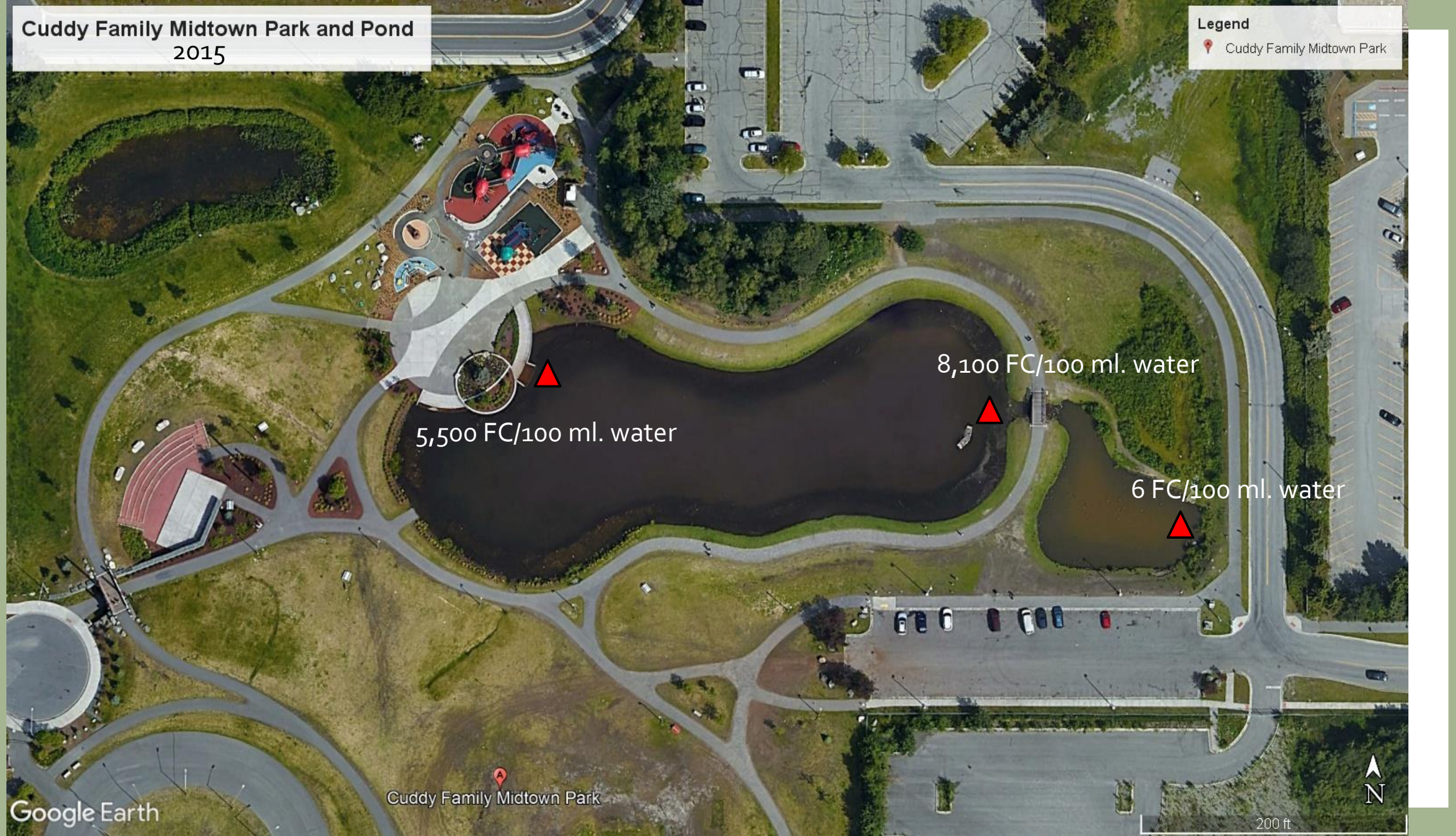
What you can do

- Recycle!
- Put litter in its place!
- If you fish:
  - Please make sure to pick up and discard your fishing line, hooks, and weights.
  - Consider switching to non-lead tackle, e.g. tin

Please don’t feed the ducks and geese!


NO
OVER
NIGHT
CAMPING




Cuddy Family Midtown Park and Pond
2015
Legend
Cuddy Family Midtown Park
5,500 FC/100 ml. water
8,100 FC/100 ml. water
6 FC/100 ml. water
Cuddy Family Midtown Park
Google Earth
N
200 ft

Eutrophication

Excessively high nutrients increase aquatic plant growth

Angel Wing

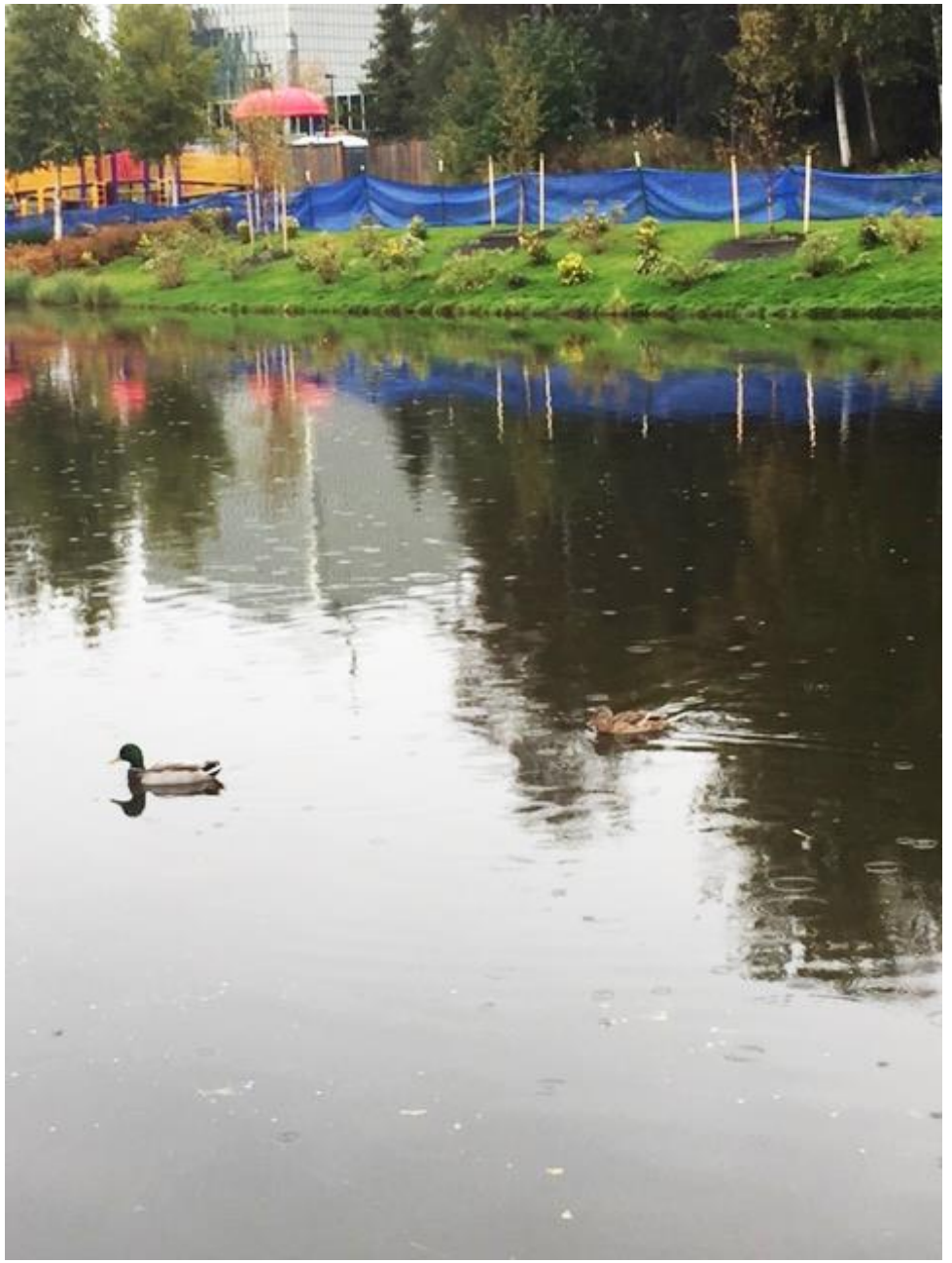
Cuddy Pond – 2015

Overpopulation and Overwintering

Highly Pathogenic Avian Influenza (HPAI)

Cheney Lake – July 2022


Your KINDNESS was HURTING the
PARK—and the GEESE and DUCKS!
That looks tasty!



Westchester Lagoon Waterfowl Sanctuary 2022

YEP Team – Youth Employment in Parks

What you can do

- Do not feed any wildlife.
- If you have the opportunity, let others know how bad this is for the environment and animal health.

Other things you can do:

- Be our "Eyes on the Creeks" – report concerns at www.anchoragecreeks.org/report-an-issue
- Join an event!
  - Scoop the Poop Day! Saturday, April 22
  - Annual Creek Cleanup, May
- Become an AWC member!
- Donate on Pick, Click, Give!

Resources:

- https://www.anchoragestormwater.com/maps.html Municipality of Anchorage Map Gallery: stormwater system, wetlands, watersheds, flood hazards, waterway setbacks
- https://www.anchoragecreeks.org/_files/ugd/1600a5_e23c1fd3c40a44559617d2514e3e73b6.pdf Plastic article from Paddle magazine, pt. 1
- https://www.anchoragecreeks.org/_files/ugd/1600a5_1ee45bc1dbc14754b08e1004254ofb61.pdf Plastic article from Paddle magazine, pt. 2
- https://www.nps.gov/articles/aps-19-1-14.htm Elodea in Alaska

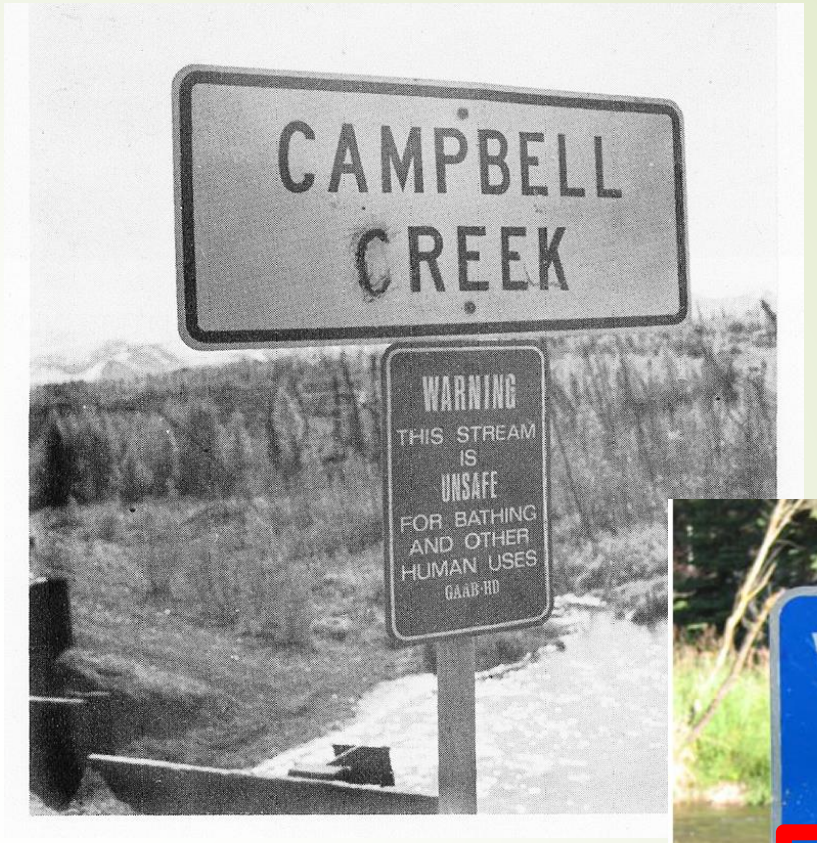
The Municipality's Waterways, Cook Inlet, and Anchorage Waterways Council

Cherie Northon, Ph.D., Executive Director
Anchorage Waterways Council
October 24, 2023

Anchorage Waterways Council (AWC)

- In the early ‘80s, alarm for the health of local citizens was raised by Dr. Rodman Wilson, public health director under then-mayor Tony Knowles.
- He reported that local creeks and lakes were contaminated with raw sewage and other waste that ran through town and into Cook Inlet.
- A group of concerned individuals came together, and the Anchorage Waterways Council, a 501 (c)(3), was born in 1984 as a response to the worsening conditions.
- ***Mission:*** *To promote the prevention of further environmental degradation; and the protection, restoration, and enhancement of waterways, wetlands, and associated uplands within the Municipality of Anchorage.*

Campbell Creek Classic Race
was also a victim and was ended in 1985.



1968

2007

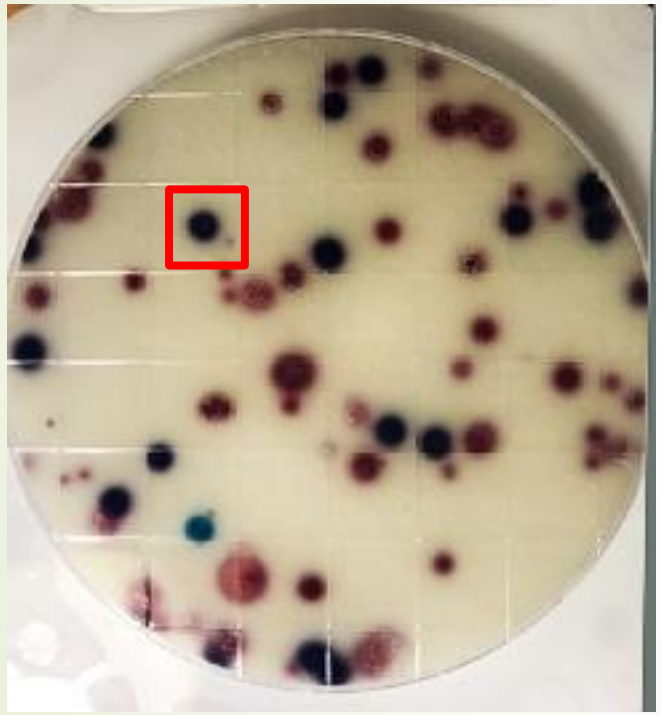
Who manages the health of our waterways?

- Environmental Protection Agency (EPA)
- Alaska Department of Environmental Conservation (DEC)
- DEC oversees the **Alaska Water Quality Standards** which provide a framework for categorizing waterways in regard to 24 parameters for fresh and saltwater.
  - Standards include: **bacteria, dissolved oxygen, petroleum hydrocarbons, pH, turbidity, radioactivity, temperature, etc.**
- Waters that do not meet these standards are placed on **Alaska's Impaired Waters List**, which is difficult to be removed from.
- Every major creek and lake/lagoon in the Anchorage **"Bowl"** has been classified as impaired due to the presence of **Fecal Coliform**.

Fecal Coliform

- Fecal coliform (FC) are organisms that are present in the **environment**, live in the **gut** of warm-blooded animals (includes humans) and are found in their **feces**.
- FC does not necessarily cause illness, but its presence in a water sample **indicates** that disease-causing organisms (pathogens) could be in the water sample.
- Major sources of FC contamination:
  - Humans
  - Pet waste left on the ground, e.g. dog parks, backyards, trails
  - Wildlife where large groups congregate, e.g. geese and ducks at Cuddy Pond
  - Failing septic systems
  - Livestock

5 ml sample from the outfall
at Westchester Lagoon
Feb. 26, 2023
Blue/purple colonies are *E. coli*

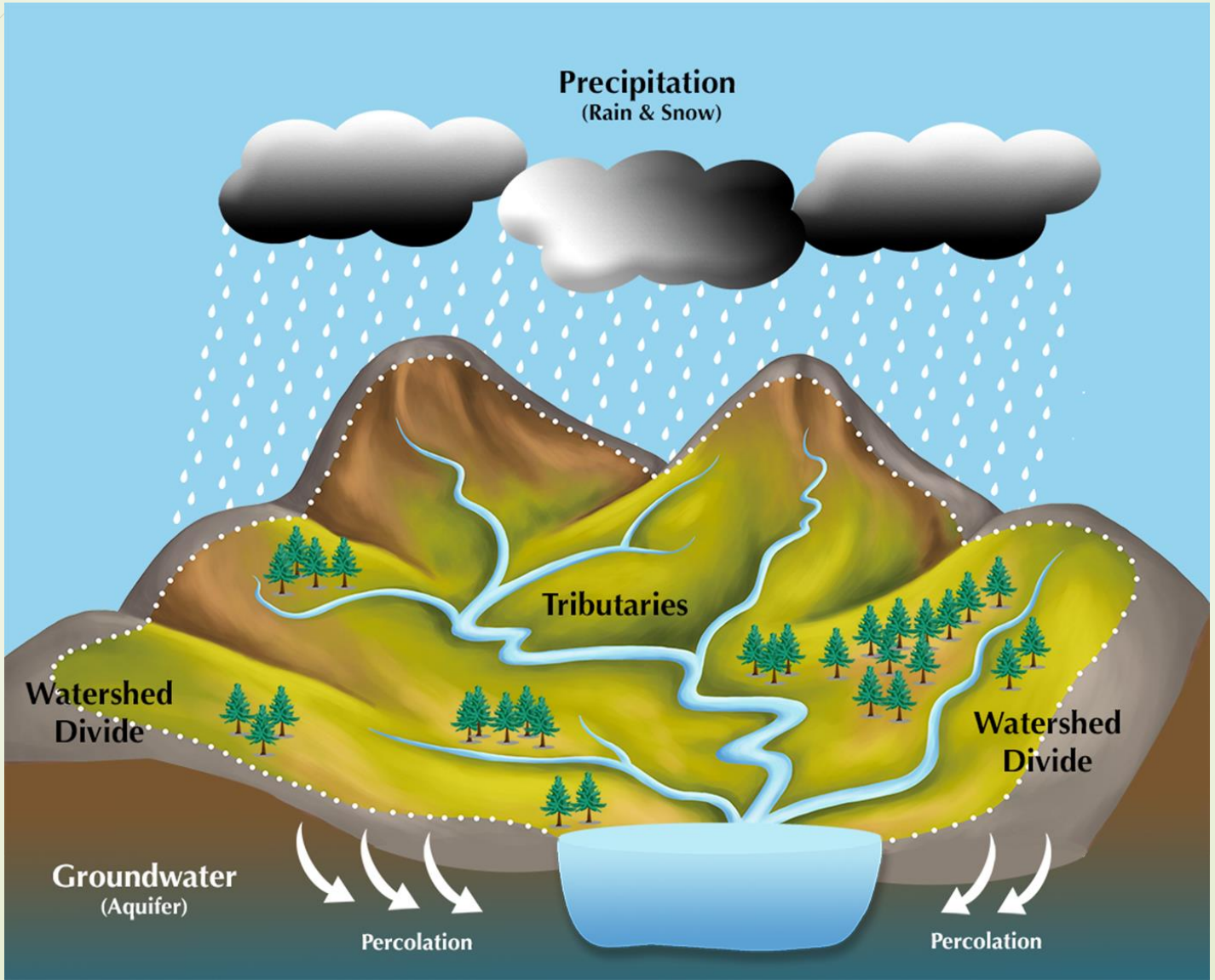


~20 FCU = **400 FCU/100 ml**
Standard for drinking water is 20 FCU/100 ml
Primary contact recreation is 126 FCU/100 ml
Secondary contact recreation is 200 FCU/100 ml

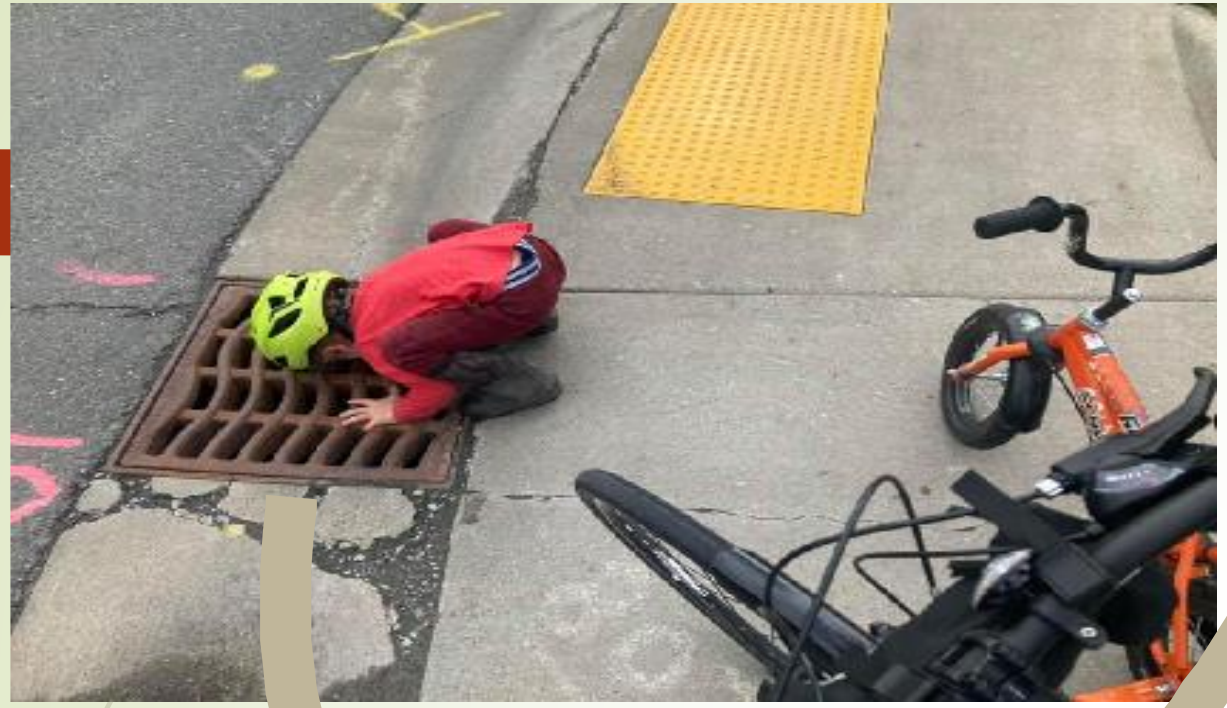
Westchester Lagoon monitoring site


IMPAIRED WATERWAYS
IN THE ANCHORAGE BOWL
2023
KNIK ARM
Ship Creek
Westchester
Lagoon
Chester Creek
Hood Creek
(not listed)
University
Lake
Fish Creek
Campbell Creek
Campbell Creek
Little Campbell Creek
Campbell
Lake
Furrow Creek
Rabbit Creek
Little Rabbit Creek
Little Survival Creek
Potter Creek
(not listed)
TURNAGAIN ARM
Watersheds
Creeks
Lakes
N
W
E
S
0 0.5 1 2 3 4
Miles
Cartography by AWC, 17 October 2023

How does fecal contamination make its way to local waterways?




HOUSEHOLD WASTEWATER
DITCH
CURB
SANITARY SEWER
STORM DRAIN
CATCH BASIN
TREATMENT PLANT
WATERWAY



Video link (YouTube) https://www.youtube.com/watch?v=xZCnyt8Y5bw

Who manages the health of our waterways on the Municipal level?

- Alaska Department of Environmental Conservation (DEC)
- Municipality of Anchorage Watershed Management Services (WMS)
  - Tasked with keeping the Municipality in compliance with its MS4* Permit
    - Obtain an Alaska Pollutant Discharge Elimination System (APDES) permit.
    - Develop a stormwater management program that is designed to prevent harmful pollutants from being washed by stormwater runoff into local waterbodies.
    - Stay in compliance with the permit.

    - *Municipal Separate Storm Sewer System

Anchorage Waterways Council's role

- Municipality of Anchorage Watershed Management Services (WMS) contracts with AWC
- Tasked with public outreach and education on stormwater since 2010
- AWC has developed stormwater education programs on:
  - Scoop the Poop!
  - Yard care and chemicals
  - Ice melt additives information
  - Vehicle maintenance, such as washing, repairs
  - Green Infrastructure (GI), such as rain gardens

Video link (YouTube) https://www.youtube.com/watch?v=6QR7w9zpy8k

Other AWC Programs:

- **Citizens' Environmental Monitoring Program (CEMP):** an unfunded volunteer water quality monitoring program begun in 1998
  - Samples for: FC, dissolved oxygen, turbidity, pH, temperature, and electrical conductivity
- **Annual Creek Cleanup:** initiated 39 years ago
  - Thousands have participated over the years
- **Loons, Line and Lead:**
  - placing monofilament recycling bins at 28 locations in Anchorage and on JBER
  - educating on the toxicity of lead fishing tackle which especially affects loons
- **Creeks as Classrooms:** outdoor experiential education for Anchorage's youth
- **Plastic reduction**
- **6PPD quinone** and salmon toxicity work
- **Responding to issues**/citizen reporting form

How are things today?

Flows to Little Campbell Creek

Little Campbell Creek

Removed from Rabbit Creek

Outflow to Campbell Creek

Campbell Creek

Little Campbell Creek

Little Campbell Creek

Storm Drain to Fish Creek

Chester Creek

AWC is a small group of committed science professionals and local residents who remain dedicated to and focused on continuing the goals and vision that the original 1984 group put in motion to protect and improve Anchorage's waterways.

Thank you!

anchoragecreeks.org