Environmental Emergencies: How Crueler Summers and Wilder Winters Are Affecting Your Patients"

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And so, if …

Climate change affects the entire veterinary domain and so Veterinary Services must, therefore, add climate change to their list of responsibilities.

World Health Organization

The World Health Organization declares:

" Climate Change is the world's biggest public health threat and there is no doubt that the same holds true for animal health"

ACP American College of Physicians® Leading Internal Medicine, Improving Lives

Toolkit: Climate Change and Health
Published: 9/16/2024

"The American College of Physicians believes that physicians and the broader health care community should support efforts to mitigate and adapt to the effects of climate change, educate others about the health risks posed by climate change, and engage in environmentally sustainable practices that reduce carbon emissions."

What is the problem and what do we need to do?

People and animals must now face and adapt to the inevitable changing patterns and rates of morbidity, mortality, and productivity.

So, we in the veterinary field must add to our goals of preventing and treating disease, maintaining productivity, and sustaining healthy systems:

- **Address pre-existing problems expected to worsen with climate change –prepare for the fallout of climate change in our own community**
- **Prepare for unanticipated threats to mitigate their impact on companion animals**

OIE WORLD ORGANISATION FOR ANIMAL HEALTH

- The World Organization for Animal Health defines the veterinary domain as:
- *"all the activities that are directly or indirectly related to animals, their products and by-products, which help to protect, maintain, and improve the health of humans, including by means of the protection of animal health, animal welfare, and food safety"*

"The World Veterinary Association (WVA) considers climate change a global emergency and advocates for action to mitigate its effects. The WVA's calls for research, education, and collaboration to protect the health of animals, humans, and the environment. "

AVMA

The American Veterinary Medical Association (AVMA) recognizes that climate change is a global emergency and a significant threat to human, animal, and environmental health.

The tricky part…

While climate change is a long-term shift in global or regional climate patterns --- the rate of climate change is **not consistent across the globe.**

So – where are we?

The **Cascadia bioregion is the PNW**-- the watersheds of the Columbia, Fraser and Snake Rivers

It encompasses all of the state of Washington, most of Oregon, all but the southeastern corner of Idaho, and portions of California, Nevada, Utah, Wyoming, Montana, Alaska, Yukon, and British Columbia.

Models predict ……for the PNW:

Winters: Will become wetter: **more rain and less snow.**

- Atmospheric rivers: More extreme precipitation events and heavy winds.
- Coastal areas: More severe storms: **more flooding**, coastal erosion, and storm surges.

Summers: **Drier and hotter.**

- Snowpack: Decreasing, melting earlier and resulting in longer dry seasons.

Other impacts

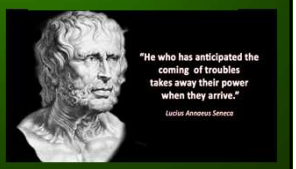
- Droughts: More frequent and severe droughts are expected.
- Wildfires: Wildfires are expected to become more frequent and severe.
- Sea level rise: Sea level rise is expected to contribute to more high-tide flooding.

You cannot hope to build a better world without improving the individuals. To that end, each of us must work for his own improvement and, at the same time, share a general responsibility for all humanity, our particular duty being to aid those to whom we think we can be most useful.

Marie Curie

Paranoid?

or Prepared??



"Learning about the connection between climate change and disease behavior can help guide diagnoses, treatment, and prevention of infectious diseases."

*Maintain **"a high index of suspicion of diseases** on the move…with improvements in our understanding of the disease, we'll miss fewer cases that way"*

Head in the Sand

- is not a strategy

OSTRICH EFFECT

-A cognitive bias wherein people tend to "bury their head in the sand" and avoid or ignore potentially negative but useful information, just to avoid psychological discomfort.

Animals will feel the impact of this climatic change many ways…including but not limited to:

Changing patterns of infectious diseases

Expanded ranges of parasites and pathogens

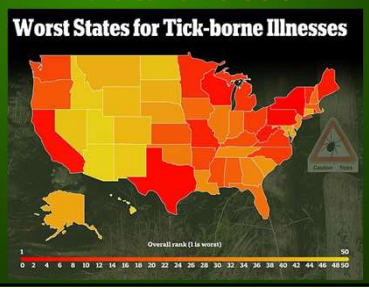
- increased exposure to heat
- higher rates of respiratory and heat related illnesses
- water and food borne diseases
- toxic and or hazardous substances in floodwaters
- extreme weather
- changes in access to the natural resources they need for daily living

Infectious Disease in a Changing Climate
JAMA April, 2204

Table. Impact of Climate-Related Changes on Infectious Disease Epidemiology

Disease type	Climate-related change	Effect on infectious disease epidemiology	Examples
Vector-borne diseases	Shorter, warmer winters Longer summers Expanding range of vectors, eg, mosquitoes and ticks Changes in precipitation patterns	Increased disease incidence Expanding seasonality into winter months Expanding geographic range, primarily northward and westward Increased likelihood of onward transmission	Babesiosis Lyme disease Anaplasmosis Powassan virus Ehrlichiosis Dengue Zika virus Chikungunya virus Malaria
Zoonotic diseases	Changes in animal migration patterns, natural ranges, and population density Habitat destruction Increased interaction between different animal species Increased human-animal interaction	Increased cross-species transmission events Emergence of novel human pathogens Increased disease incidence Expanding geographic range	Avian influenza (H5N1) Plague Hantavirus Tularemia Emerging coronaviruses
Fungal diseases	Expanded thermotolerance in fungal organisms New favorable environments for endemic fungi	Emergence of novel human pathogens Expanding geographic range of endemic mycoses	*Candida auris* *Sporothrix brasiliensis* *Coccidioides* *Histoplasma* *Blastomyces*
Waterborne diseases	Rise of sea level Extreme weather events Flooding-induced strain on water infrastructure Changes in precipitation patterns Changes in coastal water temperature	Increased disease incidence after storms Expanding seasonality Expanding geographic range, primarily northward	Campylobacter *Escherichia coli* *Cryptosporidium* *Vibrio* species

Oregon ranks in top 20 for tick borne illnesses, Washington is 17 ……..and California is 3rd



First up to bat ……..the vectors

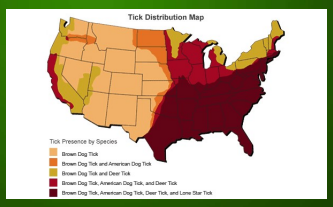
Vector borne:

- Babesia (protozoal): Brown dog tick American Dog tick
- Anaplasmosis(protozoal) Ixodes pacificus Black legged tick (flies)
- Lyme (bacteria): Ixodes pacificus Black legged tick
- Ehrlichia (bacteria): Brown dog tick, Lone Star Tick, American Dog Tick
- ***Powassan virus*** *- ticks –encephalitis. 100 human cases in last 10 years –Great lakes are, Canada. No naturally occurring illness in pets has been seen.*

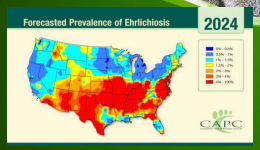
- ***Dengue virus****–mosquito-- dogs can be infected– but not symptomatic. Human cases in states --- locally transmitted in SoCal.*
- ***Zika virus****– mosquito -- no reports in animals. Seen in humans and no local transmission.*
- ***Malaria****--- protozoal– mosquito --dogs can't get the plasmodium*
- ***Chikungunya Virus*** *– mosquito-- only in Africa and Asia– only in human travelers*

???

CAPC
Companion Animal Parasite Council



A nonprofit called the Companion Animal Parasite Council (CAPC) has been collecting data and putting together parasite prevalence maps for various vector-borne diseases, including Lyme, Anaplasmosis, and Ehrlichiosis, since 2012.



Compared to 2023, **we expect increasing numbers of Ehrlichia seropositive dogs** in central California, northern Idaho, western Montana, **western and central Washington**, and parts of the Northeast (e.g., Vermont, New Hampshire, Connecticut).

Ixodes pacificus ticks infected with A. phagocytophilum have been found in Washington. **Anaplasmosis h**as been diagnosed in numerous dogs in Washington State, and the first human case likely exposed in Washington was reported in 2022.

Babesia parasites have not been identified in ticks collected in Washington; however, a small number of human babesiosis cases have reported infection in Washington.

Degree of suspicion……

Canine Anaplasmosis: Acute: lameness, joint pain, fever, lethargy, anorexia, occ thrombocytopenia. Many dogs subclinical.

Canine Babesiosis: Acute/Severe: pale mm's, depression, swollen lymph nodes, and an enlarged spleen. Anemia, thrombocytopenia, hypoalbuminemia , bilirubinuria. Depending on species, varies mild to severe.

Canine Ehrlichiosis: Acute phase: fever, swollen lymph nodes, respiratory distress, weight loss, bleeding, occ neuro signs. This stage may last two to four weeks and some dogs may eliminate the infection or head into the sub-clinical phase.

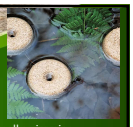
Lyme Disease: Most dogs infected with Borellia bacteria will appear healthy, with no signs at all. This is different from infected people, about 90% of whom will become ill. 5-10% of dogs may show signs of intermittent lameness, swollen joints, lethargy, swollen lymph nodes.

- Annual testing of all dogs for both antigen and microfilariae of heartworm.
- Protect all dogs from heartworm infection by using preventives year round.
- Treat infected dogs with labeled adulticides and microfilaricides (if microfilariae are present) as soon after diagnosis as medically practical.
- Prevention is best accomplished through mosquito abatement programs, by using mosquito repellents, wearing protective clothing, and remaining indoors during mosquito feeding periods.
  - Extremely difficult—if not impossible—to completely prevent mosquito bites–but there are things you can do as a pet owner to reduce your dog's risk of being bitten by mosquitoes.

Tick prevention

- **The best way to protect dogs against Tick borne diseases is to take preventive measures to reduce the chance of tick bites, and of catching the disease if bitten.**
- Use reliable tick-preventive products
- When possible, avoid tick-prone spots like tall grasses, marshes, and wooded areas. If hiking on trails with your dog, stick to cleared trails and avoid brushing against overhanging branches or shrubs.
- Examine your pet for ticks immediately after returning home from any tick-prone spots (such as after camping, hiking, or hunting), and carefully remove any ticks found.
- Make your yard unfriendly to ticks by mowing grasses, trimming bushes, and removing brush.
- Perform daily "tick checks" of all pets and people in your home during high-risk seasons (spring through fall).

* No vaccines for Anaplasmosis, Ehrlichiosis, Babesiosis. Lyme vaccine does exist.



- Remove stagnant sources of water (such as water fountains, water bowls, or small swimming pools)
- Once a week, empty and scrub, turn over, cover, or throw out items that hold water, such as tires, buckets, toys, pools, birdbaths, flowerpot saucers, or trash containers.
- **Use larvicides** to treat large containers of water that will not be used for drinking and cannot be covered or dumped out.
- Add screens to all windows and doors to keep mosquitoes from entering your home.
- Treat your yard with pet-friendly mosquito repellent.
- Mow tall grass where mosquitoes could be hiding.
- Keep your rain gutters clean, dry, and unclogged.
- Consider replacing your porch lights, or other outdoor lights, with mosquito-repelling "bug lights."
- Pet Safe Mosquito Repellant?

Do not use mosquito repellent designed for humans on your dog, as this could be toxic to your pet.

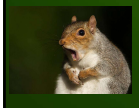
Climate change is fueling a rise in heartworms among dogs, cats in the Pacific Northwest

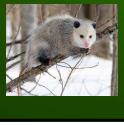
By April Ehrlich (OPB) April 29, 2024 1:52 p.m. Updated: June 10, 2024 10:23 a.m.

"From 2018 to 2023, heartworm disease among pets increased by 33% in Oregon and 55% in Washington"

Zoonotic diseases

- Changes in precipitation and temperature affect food availability, population size, and behavior of rodent hosts for plague, hantavirus, tularemia, and other rodent-transmitted diseases. These changes result in increased disease incidence as habitat suitability experiences a geographical shift northward and to higher altitudes.





Rare case of human plague identified in Oregon, likely spread by pet cat
Updated 8:13 AM EST, Wed February 21, 2024

- " Yersinia pestis" (aka "Black Death" for the oozing, blackened sores)
- Rodent to rodent and rodent to man via bite of a flea. Cats can get disease from prey rodents – give it to human.
- 1-4 days "flu-like" proceeds to draining lymph nodes, blood infection turning extremities black, respiratory failure – shock.
- Plague occurs in the rural and semirural western united states
- prairie dogs, mice, woodrats, squirrels, chipmunks, and rabbits.
- Since 2000, seven human plague cases a year.
- Pets can get Rare Cats>dogs
- Fever, swollen lymph nodes, high fever, trouble breathing, abnormal lung sounds.

The Plague

OREGON DEPARTMENT OF AGRICULTURE

- HPAI: Are exhibiting neurologic signs (including seizures, nystagmus, or blindness) or other symptoms of HPAI (fever, severe lethargy, icterus, hepatopathy, tachypnea, uveitis, acute respiratory distress) that cannot be clearly explained by another disease process.
- A history of exposure to sick poultry, wild waterfowl, or consumption of raw milk, raw meat or raw pet food are important risk factors for consideration.
- Highly Pathogenic Avian Influenza in any species is immediately reportable to the Oregon Department of Agriculture. If you suspect HPAI, please contact the State Veterinarian while the patient is still in your clinic.
- Animal health staff should wear appropriate personal protective equipment (PPE) when in contact with animals suspected or confirmed of being infected with HPAI, acutely sick animals that have history of exposure to raw milk, wild birds, or raw or undercooked animal products.
- Veterinarians are encouraged to contact ODA with any questions by email: StateVet@oda.oregon.gov, or by phone: 503-986-4711.
- Protocol For Actions Requested of Veterinarians and Animal Health Staff on Website

Hantavirus

- Hantavirus pulmonary syndrome
- People contract the disease by breathing in aerosolized virus in rodent urine and feces
- Early flu-like symptoms … then the virus attacks the cardiopulmonary system, causing a bad cough, shortness of breath, and eventually severe pulmonary edema - fluid in the lungs.
- 100,000 people in Asia: 15,000 deaths per year.
- In North America since 1993 when a cluster of hantavirus in the Southwest was first seen, 660 cases have been seen and 40% resulted in death.
- ***Evidence that Cats and dogs can get hantavirus but typically not symptomatic or sick. Can spread it to humans if they bring an infected rodent into a home

The fungus among us ….will not be the last of us……

A very few short words….about birds

- As global climate conditions change, avian migratory patterns and routes are also changing. The warmer winters and earlier onset of spring which can be seen with global warming allows moisture-reliant pathogens to survive and spread more easily. AND -- cooler and wetter conditions can enhance the survival of influenza viruses in bird droppings and contaminated water.
- H5N1 is known to be able to infect over 350 species of birds: H5N1 infected waterfowl are normally asymptomatic carriers
- H5N1 affects close to 60 species of mammals and migratory waterfowl — including ducks, swans, geese and gulls — being especially susceptible to various avian borne influenza viruses.
- From chickens and ducks to goats and alpacas to people and polar bears
- ***OREGON DEPT OF AGRICULTURE If you find a sick or dead bird, don't touch it, report it!***
- For domestic birds:
- **Oregon State Veterinarian**
  AgHealthvet@oda.oregon.gov
  635 Capitol St NE
  Salem, OR 97301
  Phone: 503-986-4711
  Alt Phone: 1-800-347-7028

For wild birds:

- **Oregon Department of Fish and Wildlife**
  Phone: 1-866-968-

Fungus response to climate change…

- Fungi adapt to warmer temperatures
  - As the Earth warms, pathogenic fungi can adapt to higher temperatures, becoming more virulent and potent.
- Fungi spread more easily
  - Climate change can affect where and how quickly fungal pathogens grow and spread. For example, the Coccidioides fungus can survive in a wider area due to climate change.
- New fungal pathogens emerge
  - Climate change can lead to the emergence of new fungal pathogens, such as Candida auris, which can tolerate heat and adapt to human body temperatures.
- Fungi become resistant to drugs
  - Fungal pathogens can become resistant to antifungal drugs. For example, a fungus discovered in Chinese hospitals was resistant to two common antifungal drugs and quickly developed resistance to a third when exposed to higher temperatures.

Fungus PNW

Coccidioides

Valley Fever, also called coccidioidomycosis, –fungus *Coccidioides* that lives primarily southwestern United States Mexico as well as Central and South America– and also south Central Washington. Animals get Valley Fever by breathing in spores from dust or disturbed soil.

Currently available models predict expansion of Coccidioides habitat throughout Eastern Washington.

Patients with pulmonary-only disease often show cough, lethargy, inappetence, fever, and tachypnea. Dogs with CNS involvement most often demonstrate seizures; vestibular signs, asymmetric cranial nerve signs, behavior changes and compulsive circling are also observed in these patients.

Cryptococcus Gatti—first appearing in humans on Vancouver Island in 1999 and in Oregon and Washington in 2004-2005 Washington: Since 2004, at least 60 animals in Washington have tested positive including cats, dogs, porpoises, and birds. **Predicted by modelling to continue spreading thoughout the PNW.**

Because cats typically inhale the spores through their nose

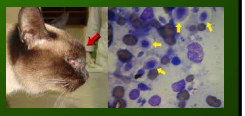
Sneezing Hard swelling over the bridge of the nose Polyps in the nasal passages, which may cause difficulty breathing Nasal discharge that may be blood-tinged, yellow, clear, or a combination of mucus and pus. Sometimes coughing and rapid labored breathing. Skin lesions are also commonly — nodules or papules that can be fluid-filled or firm. CNS Signs include Depression Behavioral changes walking in circles seizure muscle weakness Dilated pupils

ENVENOMATION

- One pit viper in Oregon: West slope Cascades N. California through WA.
- Triangular head, heat sensing depression "pit"
- Pit viper venom : toxins damage blood vessels, alter clotting, damage tissue
- Dogs more commonly affected – head/limbs

Fungal infections in pets

- Pets inhale the fungus which then colonizes the respiratory tract or spreads through the bloodstream to other body areas.
- All pets, including indoor cats, are at risk for fungal diseases because the spores can sometimes travel in the air.
- Fungal disease can look like many other illnesses, including cancer, auto-immune disease, or other infections, which often leads to diagnostic delays
- Eye inflammation or blindness--fungal infections often spread to the eyes and may cause retinal detachment or inflammation inside the eye (i.e., uveitis).
- Swollen lymph nodes
- Fever
- Lethargy
- Decreased appetite
- Coughing Tachypnea
- Limping or swollen joints
- Draining skin lesions
- Nasal discharge or facial deformity (i.e., cryptococcus)
- Neurological problems (i.e., cryptococcus)



ENVENOMATION

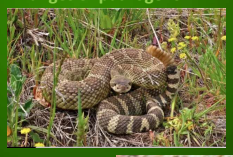
Clinical signs:

Weakness, high heart rate, drooling nausea/vomiting, bruising, bleeding from puncture sites, mouth or nose + pain at the puncture sites.

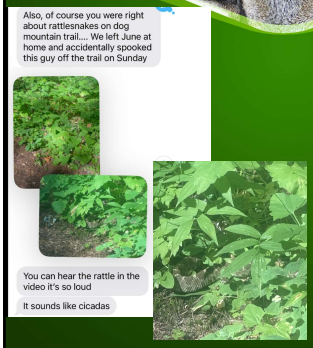
What to do?

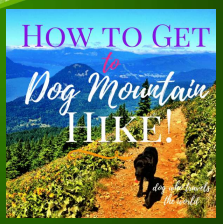
- Transport ASAP
- Keep limb/bite area below level of heart
- Do not apply ice or tourniquets
- Do not attempt to capture snake
- Do not "slash or suck out" venom
- Do not administer medications – especially NSAIDS!
- Antivenin

And one final note about extended ranges of pathogens……



Climate Change Effects on Venomous Snakes: Distribution and Snakebite Epidemiology
April 2022
DOI:10.4018/978-1-6684-5678-1.ch066
In book: Research Anthology on Ecosystem Conservation and Preserving Biodiversity (pp.1381-1396)





Moving on to how the environment will be trying to kill our pets…

HEATSTROKE/HEAT EXHAUSTION

- Dogs dissipate heat through panting. They only "sweat" through glands in their feet.

Heat exhaustion: Exposure of the body to excessive heat.

Heat Stroke: T>105

Animals will feel the impact of this climatic change many ways…including but not limited to:

- changing patterns of infectious diseases
- expanded ranges of parasites and pathogens

Increased exposure to heat

Higher rates of respiratory and heat related illnesses (allergies, asthma)

- water and food borne diseases
- toxic and or hazardous substances in floodwaters
- extreme weather
- changes in access to the natural resources they need for daily living

Clincal Signs of Heat Stroke

- Restlessness/ Agitation
- Heavy drooling with thick saliva
- Bright red tongue/gums
- Weakness
- Vomiting
- Diarrhea
- Racing pulse
- Limbs that are hot to the touch
- Disorientation

Heat Stroke/Heat Exhaustion

- Dogs > Humans
- Obese, untrained dogs
- Exercising in hot weather
- Lack of acclimatization
- Limited access to water
- Enclosed space: car, kennel
- Brachycephalics!
- Young dogs - hunting, hiking
- Cats rarely affected

FIRST AID FOR HEAT STRESS

COOLING MEASURES:

- DO NOT use ice water, ice baths or apply ice to an overheated dog.
- Apply wet, cool towels along the pets chest, abdomen, between legs + around the neck.
- Encourage an overheated dog to drink *but* DO NOT force an overheated dog to drink water.
- Fans ok

Portland cooling center provides relief for people, pets

BEFORE THE HEATWAVE ARRIVES:

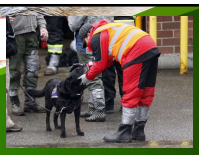
Provide advice on **cooling methods**: best areas in house and yard for shade, fresh water, cooling mats, damp towels, ice cubes, and even making special ice treats

Discuss the benefits of **appropriate grooming** to remove excess fur, especially for dogs with thick coats.

Advise on **adjusting exercise routines** to cooler times of the day-early morning or late evening-- limiting strenuous activity.

Community outreach: **Emergency cooling stations**: Explore options for providing temporary cooling spaces for pets in areas with limited access to air conditioning.

Floodwaters



Can contain toxic chemicals, viruses, bacteria, sewage, debris

1) Viruses and Bacteria
   - Dogs are immune > humans to waterborne diseases
   - Prevention is key: Consider Leptospirosis vaccination, Heartworm (* don't forget about mosquitoes!)
   - Decontamination*

2) Hazards hidden below the surface (sharp objects), Sewage, Mold, Floating trash and food: Keep dogs away from floodwaters, having fresh/clean water always available

3) Control Rodent population before and after – don't put food out for wildlife. Put pet food and water in sealed containers. Trap/eliminate rodents.

4) Flood warning – make a plan!

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- changing patterns of infectious diseases
- expanded ranges of parasites and pathogens
- increased exposure to heat
- higher rates of respiratory and heat related illnesses

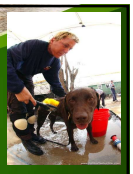
Water and food borne diseases

Toxic and or hazardous substances in floodwaters

- extreme weather
- changes in access to the natural resources they need for daily living

Sea level rise: Sea level rise is expected to contribute to more high-tide flooding.

Decontamination



Removing potential contaminants:

- High volume with low pressure water in conjunction with soap
- Water with dishwashing soap (Dawn®): dilute with water
- Soap's high pH neutralizes many chemicals, dissolves some petroleum agents
- Go from head to tail, shoulder to forelegs, back to belly, hips to back legs
- " Rinse-wash-rinse-repeat" cycle as needed

Potential contamination of Eyes, Ears, Nose, Mouth:

- Avoid getting soap into eyes, nose, and mouth
- Flush gently with OTC Eye rinse such as saline
- If unable to rinse, remove debris from around the eyes with non-alcohol moist towelettes
- Do not apply eye ointments (or any oil-based ointments) : potential to absorb contaminants and damage cornea
- Soaps are not as harmful in ears but in some breeds "wet" ears can predispose to ear issues down the road.

Weekend storm floods the Rogue Valley

Dec 29, 2024 Updated Dec 30, 2024

Leptospirosis

"The Most Widespread Animal-to-Human Disease in the World on the Rise"

- Infected dogs – swim or drink infected water with "leptospire" bacteria
- "Lepto" transmitted through contact water contaminated with the urine of infected animals --- environment the main vector
- Bacteria remain viable for months in stagnant water, soil or food
- Human contact: open skin with dog urine
- 90% mild cases "flu-like"… severe cases = hepatitis, meningitis, kidney failure
  - ~ 5% mortality
  - 2024 study in California found widespread pathogenic Leptospira prevalence in all five urban wildlife populations (raccoons, coyotes, skunks, possums-- -bacteria circles in densely populated areas. 90% of urban rats shed Leptospira in their urine.

Leptospirosis

Awareness in the hospital:

- Leptospirosis cases increased in recent years and ----frequently flooded areas near dog's home locations have been identified as a factor increasing risk 4-fold for canine leptospirosis
- Exhibiting non-specific flu-like symptoms: fever, muscle weakness, loss of appetite, and depression. Vomiting and dehydration can follow. If there is liver involvement, the skin may appear jaundiced.
- Ask questions: Standing water, interaction potential with local wildlife, wading, drinking, or swimming in stagnant water or floodwater that has been contaminated…..dogs have picked up the disease in their own backyards, where infected wildlife have presumably passed through.
- Prevention: As with floodwaters: Try to limit your dog's exposure to stagnant or standing water, especially if leptospirosis cases have been reported in dogs in your area. Control rodent populations. Discuss Vaccination strategies.

Animals will feel the impact of this climatic change many ways…including but not limited to:

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- expanded ranges of parasites and pathogens
- increased exposure to heat
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Extreme weather

Changes in access to the natural resources they need for daily living

- Droughts: More frequent and severe droughts are expected.
  Wildfires: Wildfires are expected to become more frequent and severe.

Cyanobacteria

Climate change will lead to higher air temperatures which can have a corresponding effect on raising water temperatures, which, when combined with increased stormwater runoff of nutrients can result in conditions favorable for algal blooms. Consequently, with a changing climate, harmful algal blooms can occur more often, in more fresh or marine waterbodies, and can be more intense.

"Oregon Health Authority (OHA) issued a recreational use health advisory today for South Tenmile Lake due to the presence of a cyanobacteria bloom and microcystins above recreational use values for human and animal exposure."

Wildfire Season

- Before the fire season:
  - Set up a room with a high efficiency air cleaner/purifier
- Wildfire Smoke
  - Keep pets indoors in a room with good ventilation
  - Dogs outside briefly for bathroom breaks
  - Use an air purifier
  - Do not fry/broil foods, burn candles or incense, use cigarettes/smoke inside the home.
- Get your pet ready to evacuate

Cyanobacteria …

- Also known as "Blue-Green Algae"
- Some contain "cyanotoxins"
- These toxins affect the nervous system and the liver
- Clinical signs: vomiting, weakness, diarrhea, muscle rigidity, tremors, seizures, paralysis …..and death within 45 minutes to 24 hours
- NO ANTIDOTE
- Best treatment is PREVENTION: Don't let your dogs swim in standing water with algae blooms

- Currently :
- south Umpqua river
- South Tenmile river

Drought, high winds, continued heat and dry weather….
Example: Oregon Fall 2020

The wildfires that impacted Oregon in 2020—known as the 2020 Labor Day Wildfires— burned more than 1.2 million acres of land, destroyed upwards of 5,000 homes and businesses, and claimed nine lives, producing the most destructive sequence of simultaneous wildfires in the state's history.

The New York Times

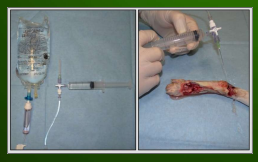
Oregon, a New Climate Menace: Fires Raging Where They Don't Usually Burn

The northwest part of the state, usually much wetter, has dried out this year, enabling flames driven by powerful winds to "just explode down these canyons."

The lesson …is that the state must now prepare for more of the same, said Dr. Mote, the Oregon State climate scientist… "This situation of large fires, and that low snow year — these are both things that I and my colleagues who've studied climate change in Oregon for 20 years have been saying would happen eventually," he said. "And now they're happening."

Initial wound care

- Irrigation/lavage
  - Removes debris and bacteria and hydrates the wound
  - Quantity > sterility or antimicrobial additives
  - Best choice is LRS, but 0.9% NaCl can also be use
  - Tap water or 0.05% chlorhexidine can used for extensively contaminated wound
  - Optimal pressure is 9 psi : attained using a 35 mL syringe w/18 or 19 gauge needle
  - Bacterial adhesive pressure overcome > 8 psi
  - Higher pressure may cause tissue damage or drive bacteria into the wound



Smoke inhalation

- Assess "ABC"s
- Examine for facial burns, soot in the mouth or nose, coughing or wheezing
- Cherry red membranes = Carbon Monoxide
- **Carbon Monoxide Toxicity: Main cause of acute death from smoke inhalation – less oxygen delivered to tissues.**
- Apply oxygen mask: reduce half-life of carbon monoxide

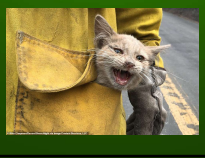
Initial wound care

BURNS

Examine for burns on feet, face, ears – burns in oral cavity

Examine burned tissue and apply cool saline or water

Place wet wrap onto burned tissue and transport animal to a veterinary facility



FELINE ASTHMA

Cats>dogs

Hypersensitivity reaction to inhaled antigens

To prevent onset of asthma "attack" with wildfire smoke:

Prevention for the pet owners:

Keep inside, away from smoke, close windows, and use an air purifier

- Avoid triggers: aerosol sprays (Febreze, air fresheners, cleaners), incense/candles , perfumed litter, and cigarette smoke.
- Keep yourself and the pet calm
- Do not give anything by mouth
- Keep in a cool environment
- Immediate transport to emergency veterinary hospital if needed

Preparation:

- Develop and educate clientele on developing a disaster plan for their homes and their families including their pets.
- Create a packet or pamphlet for owners which contains education/information they would need to know in times of crisis.
- Example of information to include in Disaster Pamphlet:
  - Proper methods of ID for their pet: microchip, tags, photo id
  - How to prepare a disaster kit
  - Means and methods of evacuation
  - Information about area shelters (for people and pets)

AVMA "Save the Whole Family" Disaster Preparedness Booklet Contains a Pet Evacuation Kit Outline

AVMA "Save the Whole Family" Disaster Preparedness Booklet Contains a Pet Evacuation Kit Outline

The key is awareness and intentionality in our habits, as each small action contributes to a larger, collective impact on the environment

"What you do makes a difference, and you have to decide what kind of difference you want to make."

Jane Goodall, English primatologist and anthropologist

References:

- CAPC Pet Parasite Annual Forecasts
- Oregon Health Authority --i.e., Current Cyanobacteria Advisories
- Washington Dept of Health
- Oregon Dept of Health
- CDC information
  - Tick-borne Diseases Home
  - i.e., How to protect yourself and pets from Leptospirosis after the storm
- AVMA i.e., Protect your pets from Wildfire Smoke

- Climate anxiety and environmental existential dread is very real
- While its good to be concerned about when it comes to climate crisis -- hopelessness breeds apathy.
- Important to be truthful and accurate –including signs of hope.
- For example, in 2024, renewable energy soared, vulnerable ecosystems gained rights, and climate protocols started to pay dividends.

One Example:

euronews.

"Poop that fights climate change and the world's largest brains: Why we need to protect whales"

What do whales have to do with it?

Whales poop at the surface and fertilize the ocean

Filled with iron, supports the growth of a plant-like algae which, while providing a food source for other species, absorbs carbon dioxide and produces oxygen.

A single large whale helps remove the equivalent of over 30,000 trees over its lifespan.

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"Knowledge is the antidote to fear."
—Ralph Waldo Emerson

- Vigilant for signs of disease
- Be proactive with your own pets
- Educate your clients
- You are a valuable and irreplaceable voice and advocate

Questions?