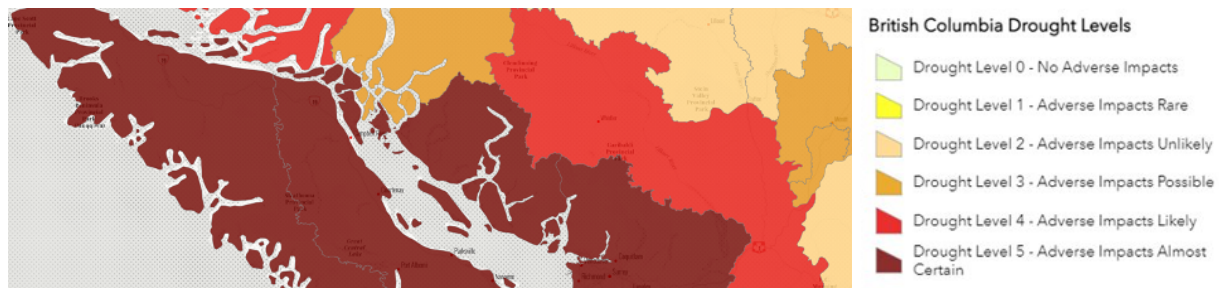


FOCI Report: Climate Change and Drought

By Forrest Berman-Hatch

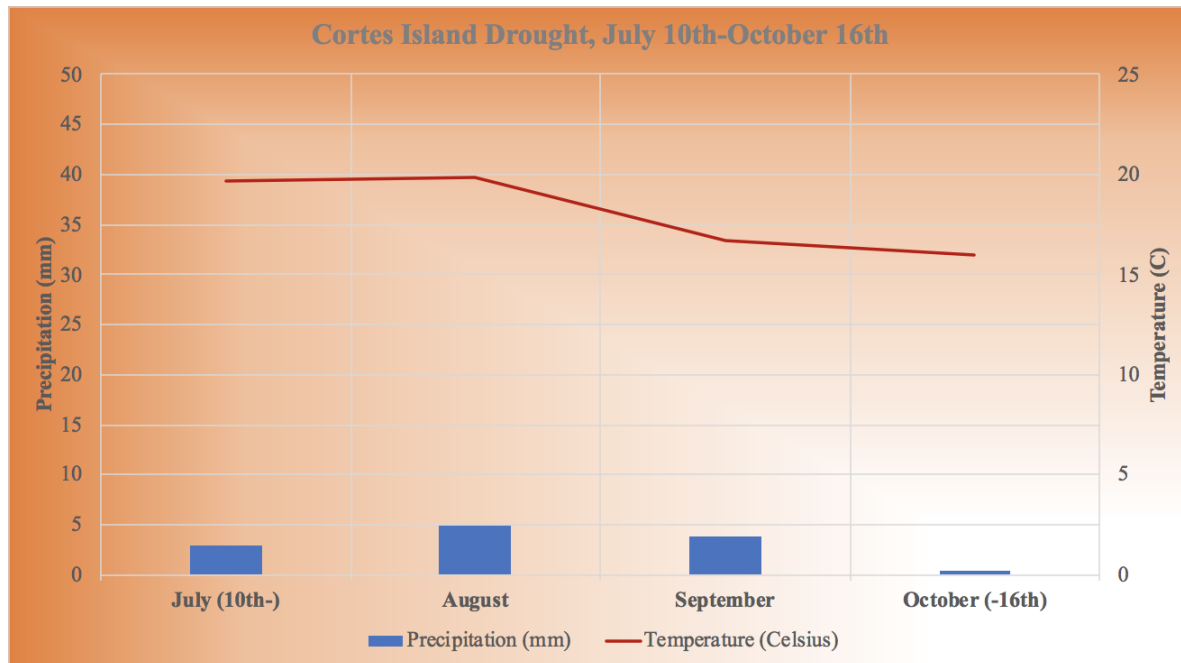
Cortes Island has been in a level 5 drought which weather forecasts predict will end soon. According to BC's Drought and Water Scarcity Response Plan, level 5 droughts bring "adverse impacts to socio-economic or ecosystem values" which are "almost certain" (Ministry of LWRs, [2022](#), p.16). Impacts can include the drying of shallow wells and wetlands, increased risk of wildfires and drying of streams during salmon spawning season. The plan recommends local water restrictions be put in place at stage 5 and warns regulatory action and even emergency response to be possible.

The Shíshálh Nation and the districts of Sechelt and the Sunshine Coast have declared a State of Local Emergency, which restricts non-essential water use. No such restrictions have been announced by the Strathcona Regional district as of yet, with rain forecast for the weekend.



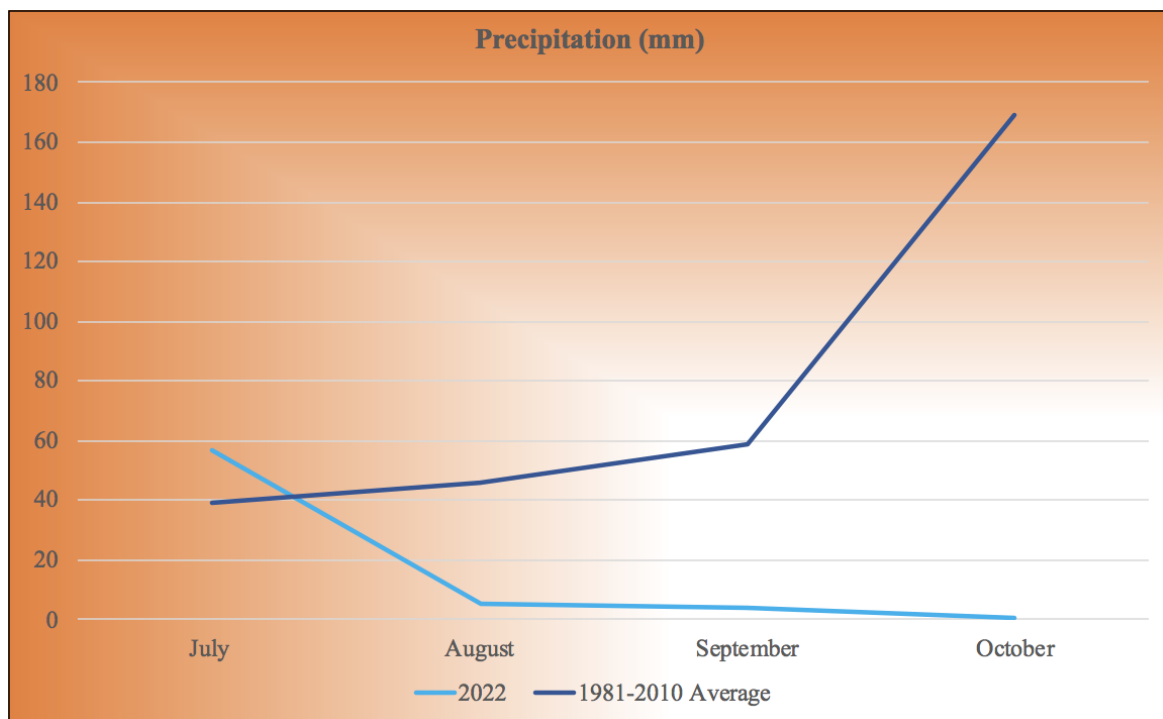
British Columbia Drought Map (Source [British Columbia Drought Information Portal](#))

Effectively it has not rained for over 90 days, with daily average temperatures staying well above 15 degrees in mid October.



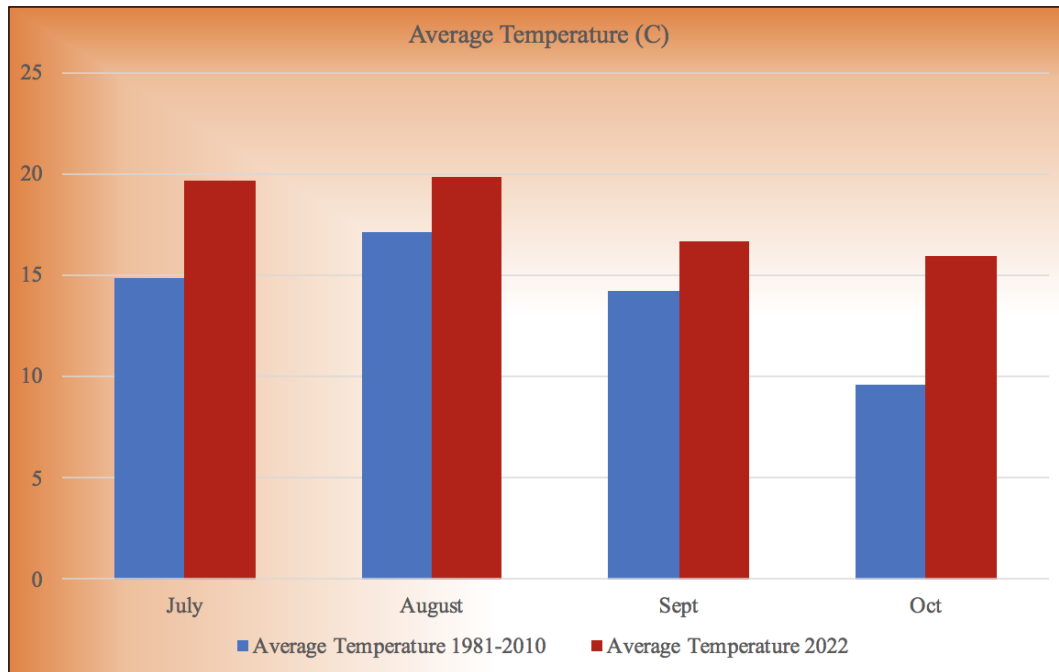
All Weather Data Courtesy of [Environment Canada](#), using Cape Mudge (Quadra) Weather station as proxy for Cortes. Rainfall here is on a scale of 50mm, which is the average cumulative rainfall for August and September.

By comparing these numbers to average temperatures and precipitation recorded by Environment Canada between 1981 and 2010, we can see the scale of the 2022 drought in comparison to recent history.



Source: Environment Canada

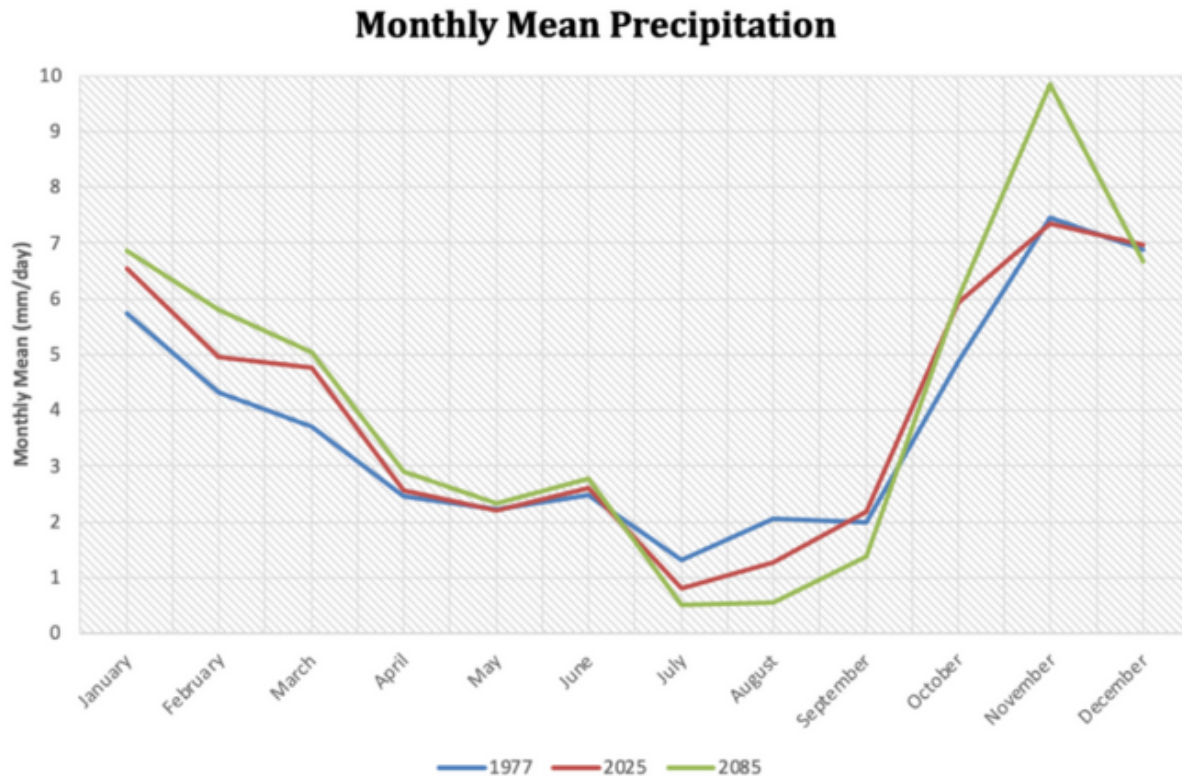
Since the rain in early July, we can see a stark contrast to historic rainfall, with effectively no rain for the better part of four months. Historic averages, on the other hand, show higher overall rainfall, with a steep increase in October.



Source: Environment Canada

2022 has seen significantly higher average temperatures compared with historic levels, something that is consistent with climate change models, which predict steadily rising temperatures throughout the coming decades.

Climate modeling work done for FOCI can give us insight into how to situate the current drought within the shifting normal. As seen below, the months of July, August and September are expected to become increasingly dry, with monthly mean precipitation for 2025 in the Salish Sea region predicted to average roughly 1-2mm per day in the summer. Interestingly, models also predict an *increase* in average rainfall in future Octobers.



The above figure summarizes the findings by illustrating the monthly precipitation trends for three separate time periods: 1977, 2025 and 2085. Overall precipitation is expected to increase in the winter months and decrease in the summer months. Increased precipitation in the winter months can contribute to flooding and storm surges. This has implications for the destruction of infrastructure and transportation lines, threatening food and housing security. Furthermore, emergency evacuation routes may be compromised, necessitating appropriate emergency preparedness planning. Regarding environmental risks, flooding can increase the flow barrier for returning salmon, threatening both the species and the fisheries industry. Possible washout, river and stream erosion, and various fish species. On the other hand, decreased precipitation and resultant longer dry seasons during the summer months will contribute to an increased incidence of wildfires. Periods of drought also threaten the productivity and viability of crops, which can generate food insecurity. (Source: Conradi, 2022). Modeling was done using RCP 8.5, an emission pathway used by the Intergovernmental Panel on Climate Change and the standard for climate adaptation planning.

Two important points of note: Firstly, the 2022 drought is already worse than expected for the year 2025. That we are already exceeding predictions from climate models can be taken two ways: either this drought is an anomaly— a freak weather occurrence, or the situation is worse than expected. It is the latter which fits with the tendency of climate models to be accurate for the general trends of weather prediction, but unable to capture the extreme weather events which are arriving much faster than predicted ([Portner et al, 2022](#)). Unfortunately, it is this theory that has the backing of the scientists who crafted the sixth IPCC report, which also warns that **“Any further delay in concerted anticipatory global action on adaptation and mitigation will miss a brief and rapidly closing window of opportunity to secure a liveable and sustainable future for all.”** ([Portner et al, 2022](#), p.33).

So, while we can and will use models based on climate emissions pathways for adaptation planning, we would be wise to remember that the extreme events may outstrip our charts.

Secondly, as seen above our models predict that the Octobers to come will be wetter on average than has historically been the case (Conradi, 2022). This may mean historical droughts will be more intense, but that this one is uncharacteristically long. Despite this, the 2022 drought should serve as a reminder not to count on the October rains.

The rain that follows drought brings its own problems. Long dry periods result in parched and compact soils, consequently, when the rain does come it can run off the surface rather than soak into the aquifers below ([Wehner et al, 2017](#); [Gimbel et al, 2016](#)). In this way, droughts increase the chances and damage of floods ([Katwala, 2022](#)). This can be particularly dangerous on stream banks, where flooding can contribute to erosion. It is worth familiarizing ourselves with this phenomenon as droughts become more frequent due to climate change (Portner et al, 2022). Furthermore, forest soils with a history of drought can continue to repel water, long after drought conditions have passed ([Gimbel et al, 2016](#)). Human changes also affect the landscape—agricultural and residential ditches and irrigation, combined with deforestation, divert and drain water from the watershed, leaving the ecosystem more susceptible to drought ([Hales, 2022](#)).

Other impacts of the drought itself can include lowering the flow rates of streams and even drying them. A drought this late in the season can coincide dangerously with salmon spawning season. If it rains enough to swell the streams, giving returning Salmon the incentive to make their way upstream, then, if conditions dry again, the fish can become stranded and unable to spawn ([Brend, 2022](#)). Heiltsuk conservation manager William Housty observed a dramatic example of this, posting a horrific [video](#) of a dry creek bed littered with dead salmon (Housty, 2022) . As far as a drought of this scale goes, we are not out of the woods when the rain returns.

Looking Forward

The rain will eventually fall and—as we all know, it will likely keep falling until June. We will welcome the return of the rainforest, but we cannot forget the heat. Droughts put immense stress on ecosystems and if the island's aquifers are not able to sufficiently recharge, future droughts will compound stress on Cortes' watershed. Next summer will come and with it the heatwaves, wildfires and drought-conditions that have become commonplace.

The climate crisis is here and we need to act while we can. This means cutting emissions to curtail warming temperatures and thus soften the blows, but we must also prepare for the climate impacts that are already inevitable. To this end, FOCI is undertaking a climate change adaptation, resilience and mitigation planning process. You can reach out to get involved or support the work. To those of us lucky to have grown up in the rainforest, these issues feel foreign, but as the climate changes we must as well. As the British Columbia Water Scarcity Response Plan recommends, it may be useful to create a local drought response plan to record lessons learned and mitigate future damages. There are any number of ways our community

could take action. We need to begin planning for thresholds to recommend water restrictions, how best to restore wetlands and reinforce the banks of salmon bearing streams.

The one action the Cortes community cannot afford is to do nothing.

To get involved contact FOCI's Climate Project at climate.foci@gmail.com.

To share local knowledge or discuss these issues please contact forrest.j.bh@gmail.com

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