Moscow City Council

Regular Meeting
~Minutes~

Laurie M. Hopkins
City Clerk

www.ci.moscow.id.us

208.883.7015

Tuesday, **February 22, 2022**	**7:00 PM**	**Council Chambers** **206 E. Third St.**

The meeting was called to order at 7:00 p.m.
PRESENT: Mayor Art Bettge, Sandra Kelly, Maureen Laflin, Hailey Lewis, Julia Parker, Gina Taruscio, Anne Zabala
STAFF: Bill Belknap, Mia Bautista, Cody Riddle, David Schott, Kelly, Tyler Palmer, Megan Cherry, Laurie M. Hopkins

PLEDGE OF ALLEGIANCE
Council Vice-President Laflin led the Pledge of Allegiance.

CONSENT AGENDA

1. All Consent Items (ACTION ITEM)

A. Approval of Moscow City Council February 7, 2022 Minutes - Laurie M. Hopkins

B. Disbursement Report January 2022 - Sarah Banks

Staff presented the January 2022 Accounts Payable Report to Public Works / Finance Committee on February 14, 2022. The Committee received the report and approved the disbursements as presented.

ACTION: Receive the Disbursements Report for the month of January 2022.

C. Approval of Liquor License for University of Idaho Golf Course - Laurie M. Hopkins

On December 14, 2021, the University of Idaho applied for a new liquor license including beer, wine and restaurant certification for the UI golf course. Moscow City Code Title 9, Section 7-3 requires approval of the City Council prior to the City Clerk issuing a license to sell liquor. State of Idaho and Latah County licenses have been obtained by the University. This was reviewed by the Administrative Committee on February 14, 2022 and recommended for approval.

ACTION: Approve the alcohol license and restaurant certification for the University of Idaho golf course.

D. Resolution for Destruction of City Records - Laurie M. Hopkins

In December 2021, the City Council adopted Resolution 2021-27 classifying City records as temporary, semi-permanent, and permanent, each with a retention schedule. Idaho Code allows for the destruction of temporary and semi-permanent records according to the retention schedule and the adoption of a resolution listing the various types of records. City Staff from City departments have reviewed the retention schedules and its current records in order to recommend documents for destruction. The proposed Resolution is based upon the review by participating departments and the list has been reviewed by the City Attorney. This was reviewed by the Administrative Committee on February 14, 2022 and recommended for approval.

ACTION: Approve the resolution for destruction of certain records.

E. Anderson 7th Addition Development Agreement - Todd Drage

Jim Swift, has submitted to the City a final plat for the development of a property just east of Anderson Frontier Park. On June 21, 2021, the City Council approved the preliminary plat for this property. The final plat is titled Anderson 7th Addition and will be presented for City Council approval on February 22, 2022. If the final plat is approved by the City Council, a development agreement is necessary to address construction of public improvements, parkland dedication, and as-constructed drawings. The agreement included in the packet covers these items. This item was reviewed by the Public Works Finance Committee on February 14, 2022 and was recommended for approval.

ACTION: Approve the Development Agreement with Jim Swift for Anderson 7th Addition.

F. Anderson 7th Addition Monumentation Agreement - Todd Drage

Jim Swift, has submitted to the City a final plat for the development of a property just east of Anderson Frontier Park. On June 21, 2021, the City Council approved the preliminary plat for this property. The final plat is titled Anderson 7th Addition and will be presented for City Council approval on February 22, 2022. If Council approves the final plat, the interior property corners will not be set until after the final plat has been filed, the earthwork has been completed, and the utilities have been installed. In such instances, an agreement obligating the establishment of these interior corners is required by Idaho Code. This item was reviewed by the Public Works Finance Committee on February 14, 2022 and was recommended for approval.

ACTION: Approve the monumentation agreement with Jim Swift for Anderson 7th Addition.

G. First Step Internet Paradise Pathway Fiber License Agreement - Bill Belknap

The City was recently approached by representatives of First Step Internet who are working with the Whitepine School District to extend fiber optic service to the District's school facilities to provide high-speed internet access. First Step is seeking approval to install the underground conduit and fiber optic cable along the edge of the Paradise Path from the Alturas Drive crossing to the City's eastern city limit boundary just west of Carmichael Road. Staff has prepared a non-exclusive license agreement to allow the installation of the requested conduit and cable and, in exchange, First Step will provide the City with 1 fiber strand to the current, or future city limit boundary for the City's potential future use. The license agreement would have an initial term of 10 years, with a second 10-year renewal term. First Step would also be required to repair any damage to the pathway that may occur during the installation. This item was reviewed by the Public Works Finance Committee on February 14 and recommended for approval.

ACTION: Approve the License Agreement with First Step Internet.

H. Anderson 7th Addition Final Plat - Mike Ray

On June 21, 2021, Moscow City Council approved the Anderson 7th Addition preliminary plat with three conditions. On January 5, 2022, the applicant submitted the final subdivision plat to be reviewed by the Planning and Zoning Commission and City Council. The Planning and Zoning Commission reviewed the final subdivision plat at their meeting on January 26, 2022 and recommended approval to City Council. This item was reviewed by the Public Works/Finance Committee on February 14, 2022 and recommended for approval.

ACTION: Approve the Anderson 7th Addition Final Plat.

Kelly moved and Taruscio seconded to approve the consent agenda as presented. Roll Call Vote: Ayes: Unanimous. Nays: None. Abstentions: None. Motion carried.

REGULAR AGENDA

2. Staff Recognition Report - Bill Belknap

Belknap introduced the legacy of leaves award that recognizes the community who organizes the best Arbor Day celebration. Criteria used to determine the winner of the award are the dollar amount leveraged with the grant funds; uniqueness of the Arbor Day celebration; and support of local volunteers. Belknap asked David Schott to the podium. Schott said the Idaho Nursery and Landscape Association presented the award to the City on January 20, 2022. The Arbor Day celebration last year was held at Lola Clyde Park. The Tree Commission planted three cherry trees with the assistance of kids from PCEI's Palouse Roots. The Mayor was in attendance along with Tree Commission members, a Idaho Department of Lands representative and kids from PCEI. There was also a special appearance by Mr. Tree. Schott presented the award to Mayor Bettge and Ellis Eifert, chair of the Moscow Tree Commission.

3. Mayors Appointments (ACTION ITEM)

None offered.

4. Public Comment and Mayor's Response Period (limit 15 minutes)

None offered.

5. Becker Memorial at ITC Sculpture Garden (ACTION ITEM) - Megan Cherry

The public art project at the ITC Sculpture Garden, funded by a donation from the family of Andrew Becker, was open for artist submissions from July - September 2021, with an extended submission period open from October – November 2021. No artist submissions were received, and following conversations with local arts professionals, City Administration and Legal staff as well as the donor, the MAC voted during the January 11, 2022 meeting to recommend the use of the direct artist invitation option as stated in the 2021 Public Art Guidelines section III. C. 4.b. 2. The MAC recommends local artist J. Casey Doyle to create the memorial, as his service at the University of Idaho and active work in the public art field are aligned with the project's goals. Further, the MAC noted that Doyle has been integral to the development of the Sculpture Garden since its inception in 2012.

Further artist input about the project included the concern that the budget would not accommodate the material requirements set forth by the City. These material parameters stipulate the use of materials that are impervious to environmental degradation, and are meant to prolong the life of accessions into the Permanent Public Art Collection. Staff have identified available funds in the FY22 Community Public Art budget (120-200-642-25) to augment the $5000 in donor-provided funds, increasing the project budget from $5000 to $8000. The additional $3000 will not cause an overrun in this line item, as the available funding results from the annual vinyl wrap installation costs being lower than anticipated.

PROPOSED ACTIONS: Approve project budget increase, approve the Becker Amended Donor Agreement, Becker Memorial Design Contract, and Becker Memorial Artwork Commission to create a memorial sculpture at the ITC Sculpture Garden, or provide staff further direction.

Cherry introduced the item as written above. This is the first donor funded art. The donor will be involved so they will know what it will look like, but didn't want a seat on the committee. Laflin moved, Zabala seconded to approve the project budget increase, approve the Becker Amended Donor Agreement, Becker Memorial Design Contract, and Becker Memorial Artwork Commission to create a memorial sculpture at the ITC Sculpture Garden. Roll Call Vote: Ayes: Unanimous. Nays: None. Abstentions: None. Motion carried.

6. Commission Code Updates to Include Subcommittees (ACTION ITEM) - Laurie M. Hopkins

City commissions play an important role in all aspects of programs, preservation, and enhancement of Moscow. Establishing subcommittees assist the commissions in carrying out the duties of their particular commission. This proposed ordinance provides for the establishment of subcommittees for the Moscow Arts Commission,

Parks and Recreation Commission, Fair and Affordable Housing Commission, Historic Preservation Commission, and the Moscow Tree Commission. This was reviewed by the Administrative Committee on February 14, 2022 and recommended for approval.

PROPOSED ACTIONS: Approve the Ordinance under suspension of the rules requiring three complete and separate readings and that it be read by title and published by summary; or consider the Ordinance on first reading and that it be read by title; or reject the Ordinance; or take other action deemed appropriate.

Hopkins introduced the item above. Having no questions, Laflin moved and Taruscio seconded to approve the Ordinance under suspension of the rules requiring three complete and separate readings and that it be read by title and published by summary. Roll Call Vote: Ayes: Unanimous. Nays: None. Abstentions: None. Motion carried.

Mayor Bettge read Ordinance 2022-05:
AN ORDINANCE OF THE CITY OF MOSCOW, IDAHO, A MUNICIPAL CORPORATION OF THE STATE OF IDAHO; PROVIDING FOR THE AMENDMENT OF THE FOLLOWING CHAPTERS OF TITLE 3 – COMMISSIONS & BOARDS: CHAPTER 3 PARKS AND RECREATION COMMISSION, CHAPTER 4 ARTS COMMISSION, CHAPTER 6 FAIR AND AFFORDABLE HOUSING COMMISSION, CHAPTER 10 HISTORIC PRESERVATION COMMISSION, AND CHAPTER 13 MOSCOW TREE COMMISSION; PROVIDING FOR THE ALLOWANCE FOR SUBCOMMITTEES AND/OR ADVISORY COMMITTEES; PROVIDING THAT ALL OTHER CHAPTERS OF TITLE 3 SHALL BE IN EFFECT; PROVIDING THAT THE PROVISIONS OF THIS ORDINANCE BE DEEMED SEVERABLE; AND PROVIDING FOR THIS ORDINANCE TO BE IN FULL FORCE AND EFFECT FROM THE DATE OF ITS PASSAGE, APPROVAL AND PUBLICATION ACCORDING TO LAW.

7. Environmental Services/Sustainability Report – Kelly Cooper / Kyle Steele

Palmer said in 2011 the City set a goal of a 20% reduction of climate emissions using 2008 as the benchmark with a 20% reduction by 2020. The City reached the goal last year. It was the very first measurable goal achieved in the state of Idaho. The City Council had a workshop last April whereas the council had the desire to establish new goals. Another workshop in September 2021, Council gave direction to staff to include the ICLEI Race to Zero campaign goals and the Sierra Club RF100 Club goals. The SEC, Climate Action Justice League, Climate Action working group and the Environmental Services Division have collaborated to create the Plan.

Kelly said the ICLEI Race to Zero goal is 50% reduction by 2030, and net zero by 2050. Cities have a different targetable reduction. For Moscow the targetable reduction goal is 56.6%. The Race to Zero does not have a specific goal for city operations, only city-wide (community) goals. Staff created a goal for city operations of net zero by 2035. The plan goes into where current emissions are for both community and city operations. The action section of the plan is broken up between a community section and city operation section. Each section includes sectors. Each sector includes strategies and subsequent actions.

Palmer said a public comment period will open Thursday, February 24 and will include a press release and social media. Concurrently, Council can review and send comments. An open house is scheduled for March 9 where staff can present content to the public, field questions from the website and live submittal questions. The public comment period closes on March 24. A Council workshop is scheduled on March 25 which will generate a final document to take to Council for adoption. Review of the capital plan and city-wide collaboration has been part of this draft plan. Laflin wants this to be marketed all over as a model on how to do a climate action plan.

Mac Cantrell, Moscow, has been lobbying for climate change but is attending as a citizen. The City has spent a tremendous amount of work to put this together. If he had been asked two years ago would the city have a plan like this, he would have said no. This will help the town financially, healthier and be ahead of the game. This

could lead to cheaper clean energy, integration, hydro/nuclear into a stable grid that uses no fossil fuels. He suggested adding a paragraph on the website that says all the positives this plan will lead to.

REPORTS

City Council

Moscow Urban Renewal Agency – Laflin said the Board spoke on the Sixth and Jackson project which is still in process.
Transportation Commission – Taruscio said the Commission reviewed the shared mobility agreement; Suhr reported on the Sixth Street bridge project.
Palouse Basin Aquifer Committee – Taruscio reported the Committee discussed the executive manager transition from 3/4 to full time, title change from manager to director and the location of the office. Also discussed was water supply alternatives workshop.
Moscow Pathways Commission – Zabala said the Commission set the annual bike to work day to April 7 and it will include refreshments at 6th and Main Street.
Moscow Arts Commission – Lewis reported the Commission discussed vinyl wraps and the Palouse Plein Air exhibit will be held at the Third Street Gallery.
SMART Transit – Lewis said SMART is in need of bus drivers.
Sustainable Environment Commission - Parker said new member Olivia Wiebe was introduced. The Commission had a presentation on pesticides in parks and the rotation program; a process of the city becoming a bee city USA; and Earth Day award nominations will begin in March.

Mayor

The Mayor attend the United Way auction; the State of the City address takes place tomorrow; Town and Gown is scheduled for March 1.

Staff

No report.

ADJOURN

It was moved, seconded and mutually agreed upon to adjourn at 7:49 p.m.

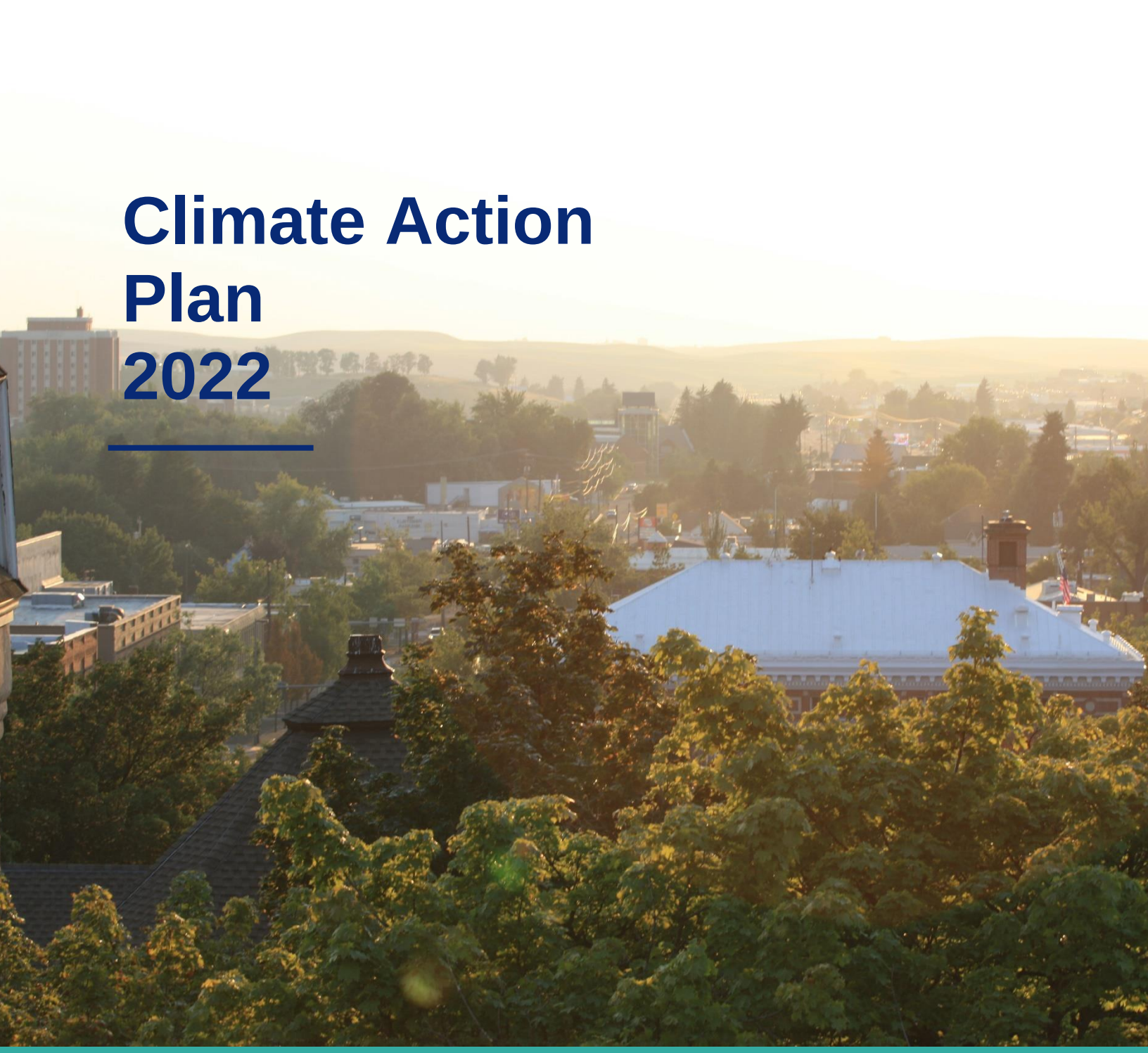
Art Bettge, Mayor

ATTEST:

Laurie M. Hopkins, City Clerk

CITY OF MOSCOW INCORPORATED JULY 12 1887 STATE OF IDAHO

Climate Action Plan 2022



FEBRUARY 23, 2022

City of Moscow Environmental Services Department

Primary Author: Kelli Cooper

Acknowledgements

Sustainable Environment Commission

Steve McGeehan | Tina Hilding | Victoria Seever | Jassen Bluto | Jamal Lyksett | Asaph Cousins
Al Poplawsky | Gordon Wilson | Marley Pankratz | Amber Ziegler | Nicole Xiao

Climate Action Working Group

Tina Hilding | Nancy Chaney | Al Poplawski | Mary Dupree | Alycia Bean | Tom Lamar | Ben Aiman
Elizabeth Stevens | Amber Ziegler | Judy Meuth | Robby Cooper | Daniel Cronan | Kristin Haltiner
Jeff Hicke | Tyler Barron | Kinsey Freeman | Olivia Wiebe | Brandy Sullivan

"Unless someone like you cares a whole awful lot, nothing is going to get better, it's not" – The Lorax by Dr. Suess

Front Cover: Stock photo- City Hall from the East

City Staff

Executive Summary

Climate change is a pressing global concern. According to the Intergovernmental Panel on Climate Change report *Climate Change: The Physical Science Basis Summary for Policy Makers*, atmospheric concentrations of carbon dioxide ($CO_{2)}$ are at the highest level that they have been in at least the last 2 million years. Concentrations of methane and nitrous oxide, two other major greenhouse gasses, are at the highest they have been in at least the last 800,000 years. Concentrations of all three continue to climb. The same report sites human activities as responsible for 1.1°C of warming since the beginning of the industrial era and are on track to reach 1.5°C (2.7°F) in the next 20 years unless significant action is taken to reduce greenhouse gas emissions. Keeping warming below the 1.5°C (2.7°F) threshold is critical to avoid the worst of climate change impacts.

Many of the impacts of climate change are already being observed across the globe and the City of Moscow is no exception. The Climate Change Impacts Assessment for Moscow, Idaho, completed in 2020, noted that air temperatures have increased in Moscow over the last 100 years. Without change in emissions, temperatures are expected to continue to increase, leading to a host of impacts such as decreased snow pack, drier summers, more frequent heat waves, lengthened fire season and reduced summer streamflow.

In 2017, the City's various commissions conducted the first comprehensive Commission Survey. In that survey, City residents were presented with the following statement:

"There are concerns that adverse climate patterns are having an effect on precipitation, temperatures, aquifer recharge, snowpack, air quality, and pest incursion on the Palouse."

To gauge the level of resident concerns, the City asked respondents to indicate their feelings on the matter. The Likert Scale used ranges from "Very Concerned" to "Not Concerned." **68 percent** of respondents noted they are either "Concerned" or "Very Concerned," whereas 10 percent said they are "Not Concerned."

The Moscow City Council has identified climate change as a major challenge area to be included in the City's Strategic Plan and tasked City Staff to begin working to develop a Climate Action Plan (CAP) in September 2021.

A CAP provides a science-based strategy (targets) to reduce greenhouse gas emissions and address ways the climate is already changing. CAPs can consist of actions to reduce greenhouse gas emissions (mitigation) and actions to reduce severity of impacts (adaptation). Many states, cities, and counties are creating Climate Action Plans in order to better understand their own baseline emissions and

develop a path toward decarbonization**.** In 2019, Community emissions in Moscow were equal to 150,734 metric tons of Carbon Dioxide Equivalent (CO_2e). Of that, 3,655 metric tons CO_2e, or 2.4% of the total Community emissions can be attributed to the City's municipal operations.

With the adoption of this CAP, the City of Moscow is pledging to be carbon neutral by 2050, with an interim goal to reduce emissions 56.6% by 2035. In order to lead by example, the City will also pledge through adoption of this CAP to achieve carbon neutrality for City municipal operations by 2035.

This CAP sets forth an ambitious set of climate goals/targets for the Community and Moscow Governmental Operations and lays out programs, policies, and projects that will enable the City to meet those goals. The CAP is a path toward sustainability, not just for City government, but also for the community as a whole. This CAP will be updated periodically to reflect changes and incorporate lessons learned.

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Introduction

Background

Climate change is a pressing global concern. According to the *IPCC Climate Change: The Physical Science Basis Summary for Policy Makers report,* atmospheric concentrations of Carbon Dioxide ($CO_{2)}$ are at the highest level that they have been in at least the last 2 million years. Concentrations of methane and nitrous oxide, two other major greenhouse gasses, are at the highest they have been in at least the last 800,000 years. Concentrations of all three continue to climb. According to the latest Intergovernmental Panel on Climate Change Report, human activities are responsible for 1.1°C of warming since the beginning of the industrial era and are on track to reach 1.5°C in the next 20 years unless significant action is taken. Keeping warming below the 1.5°C threshold is critical to avoid the worst of climate change impacts.

History of Climate Action in Moscow

In 2007, as part of a comprehensive sustainability initiative, the City joined the International Council for Local Environmental Initiatives (ICLEI), by way of Resolution No. 2007-13 (see Appendix A), as a fully participating member in the Cities for Climate Protection Campaign and, as a participant, pledged to take a leadership role in promoting public awareness about the causes and impacts of climate change. The resolution noted that the City would undertake the Cities for Climate Protection Campaign's five (5) milestones to reduce both greenhouse gas and air pollution emissions throughout the community, specifically:

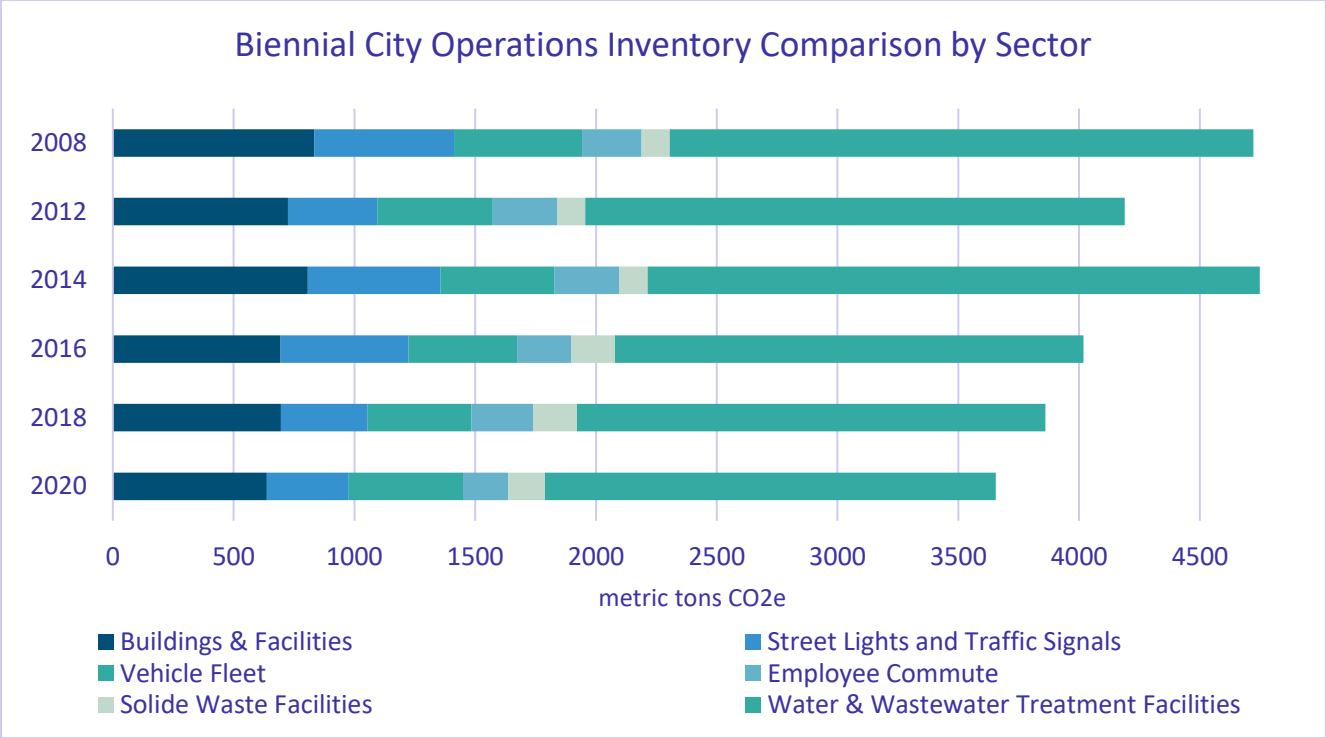
- Conduct a greenhouse gas emissions inventory and forecast to determine the source and quantity of greenhouse gas emissions in the jurisdiction.
- Establish a greenhouse gas emissions reduction target.
- Develop an action plan with both existing and future actions which when implemented will meet the local greenhouse gas reduction target.
- Implement the action plan.
- Monitor and report progress.

In 2010, subsequent to establishing a scientifically valid baseline and pursuant to Resolution 2010-18 (see Appendix A), the City adopted a greenhouse gas (GHG) reduction goal of 20% of 2005 levels (from City operations) by the year 2020. In 2013, the City affirmed the adopted GHG reduction goal for City Municipal operations (see Resolution No. 2013-16 in Appendix A). At the time, some Council members were skeptical about their authority and large-scale salability of the idea. Then in 2014, due to a change in software and lack of available data for 2005, the City Council updated the baseline year from 2005 to 2008 and once again affirmed the reduction goal of 20% of 2008 levels by 2020.

Greenhouse gas inventories of City Operations were conducted in order to track progress toward the 20% reduction goal (Figure 1). In 2008, emissions related to the City's Municipal operations totaled

4,722 metric tons CO_2e. Through the implementation of various energy efficiency improvements to water and wastewater operations, street lighting, traffic signals, as well as the EcoDriver[1] and Fleet Replacement Programs, emissions due to City Operations were reduced to 3,655 metric tons CO_2e by the end of 2020, successfully meeting the reduction goal.

Figure 1: Comparison of Completed City Operations Inventories



The City of Moscow is committed to future actions for addressing climate change. Since the beginning, the Sustainable Environment Commission has been involved in hearing public input on climate change initiatives, recommending goals and actions to City Council, as well as receiving reports from City staff about progress. In 2019, with the 2020 goal deadline quickly approaching, a subcommittee, the Climate Action Working Group, was formed to focus on climate change and next steps. On February 25, 2020, the Moscow City Council added Climate Change as a major challenge area to the City's Strategic Plan. By June of 2020, the Climate Action Working Group had developed a Climate Impacts Assessment (see Appendix B), detailing the implications of a changing climate for Moscow. The following April, Council held their first workshop, and a subsequent workshop in September 2021, to begin the process of setting a new goal for climate action in Moscow, ultimately leading to the creation of this document.

[1] **EcoDriver Program: https://www.ci.moscow.id.us/420/EcoDriver**

A plan such as this would not be possible without the help and support of City Staff. Multiple departments, especially those who will be more involved with the implementation of this plan, were consulted during its development. Where appropriate, existing strategic plans were incorporated.

Goals

Community Emissions Reduction and Sequestration

Building on past efforts, the City of Moscow has pledged to join the Cities Race to Zero campaign through ICLEI-USA (see Appendix C), committing to net-zero emissions by 2050 as a community. The Race to Zero framework follows a 4-step process, which is outlined in Figure 2. Setting science-based targets (SBTs) will be critical for success moving forward. SBTs are calculated to reflect the maximum fair share effort to reach 50% global CO2 reductions. For Moscow, this amount was calculated to be a 56.6% reduction of 2019 community emissions levels.

Figure 2: Cities Race to Zero Framework

City Operations Emissions Reduction and Sequestration

Race to Zero does not propose specific goals for City Operations. However, the City believes in leading by example. With the adoption of this plan, the City will set a goal to achieve net-zero emissions by 2035 for Operations.

The Human Element

Moscow residents place value on quality of life, stability, and sustainability. Using these as guiding principles, Moscow's climate actions will seek to improve human health, advance equity, and build resiliency within the community. Continued engagement with the community will be vital to creating sustainable change.

Current Conditions: Greenhouse Gas Emissions and Sequestration

Inventory Methodology

For consistency, ICLEI's Clearpath software[2] and associated methodologies were adopted for completing both the City Operations Inventory and the Community Inventory included in this plan. The Local Government Operations (LGO) protocol was used in determining City Operation emissions, while the Community Protocol was used to determine Community emissions. Emissions are categorized by scope and organized by sector.

Emissions across both inventory types are divided into three scopes. Scope 1 includes all emissions from the combustion of fuels, such as gasoline and diesel consumption by vehicles and natural gas consumption. Scope 2 includes all emissions resulting from purchased electricity. Scope 3 emissions include all other emissions not accounted for in Scope 1 or 2. This includes emissions from solid waste, certain wastewater treatment processes, and upstream emissions.

Emissions are further classified by sector. Breaking down emissions in this fashion allows for efficient data compilation as well as to facilitate the development of targetable areas of action. Sectors vary by inventory type to accommodate for scale, spheres of influence, and data availability.

There are nine (9) sectors available for evaluation under the LGO Inventory type but only six of those apply to current operations: Buildings & Facilities, Streetlights & Traffic Signals, Vehicle Fleet, Employee Commute, Solid Waste Facilities, and Water & Wastewater Treatment Facilities. Natural gas and electrical consumption data were compiled from the City's energy bills from Avista Utilities. These data would be used for calculations in the Building & Facilities, Water & Wastewater Treatment Facilities, and the Streetlights & Traffic Signals Sectors. Fuel consumption by the City Fleet was obtained from the Fleet Department and would be used to calculate emissions in the Vehicle Fleet Sector. Employee commute data was obtained via survey of current City employees. Solid Waste data for City Operations

[2] **Clearpath Software: https://icleiusa.org/clearpath/**

was calculated based on the size of the waste containers at all City Facilities and the assumption that these were full at the time of pick-up.

There are ten (10) sectors available for a Community Inventory type. Each was evaluated by City Staff for its applicability to the Moscow community and seven were determined to be relevant: Residential Energy, Commercial Energy, Industrial Energy, Transportation & Mobile Sources, Solid Waste, Water & Wastewater, and Upstream Impacts of Activities. Electrical and natural gas consumption data were obtained, in aggregate, from Avista Utilities and includes all use within the '83843' zip code. As such, it includes some consumption outside of the City of Moscow's jurisdiction. These data were used to calculate emissions in the Residential Energy, Industrial Energy and Commercial Energy Sectors. Traffic count data collected directly by the City were used to calculate emissions in the Transportation & Mobile Sources Sector. Each year traffic counts on a portion of City Roads are completed. Traffic data from counts completed in 2019 was extrapolated out to the City as a whole to approximate total vehicle miles traveled. Fuel use and vehicle miles traveled data were also obtained from SMART Transit in order to calculate emissions from public transit. Solid Waste calculations for the Community Inventory are based on data provided by the Sanitation Department and includes the total weight of municipal solid waste that was sent to the landfill in 2019 from the City overall. Recycling and biosolid impacts were not calculated. Water & Wastewater calculations are based on compiled data from the City's Avista bills for all water and wastewater facilities. For the purposes of the community inventory, only electrical consumption for these facilities was determined and then subtracted from the commercial Energy Sector to avoid double-counting. The Upstream Impacts of Activities Sector is made up largely of emissions from line and distribution losses from energy consumption across previously discussed sectors.

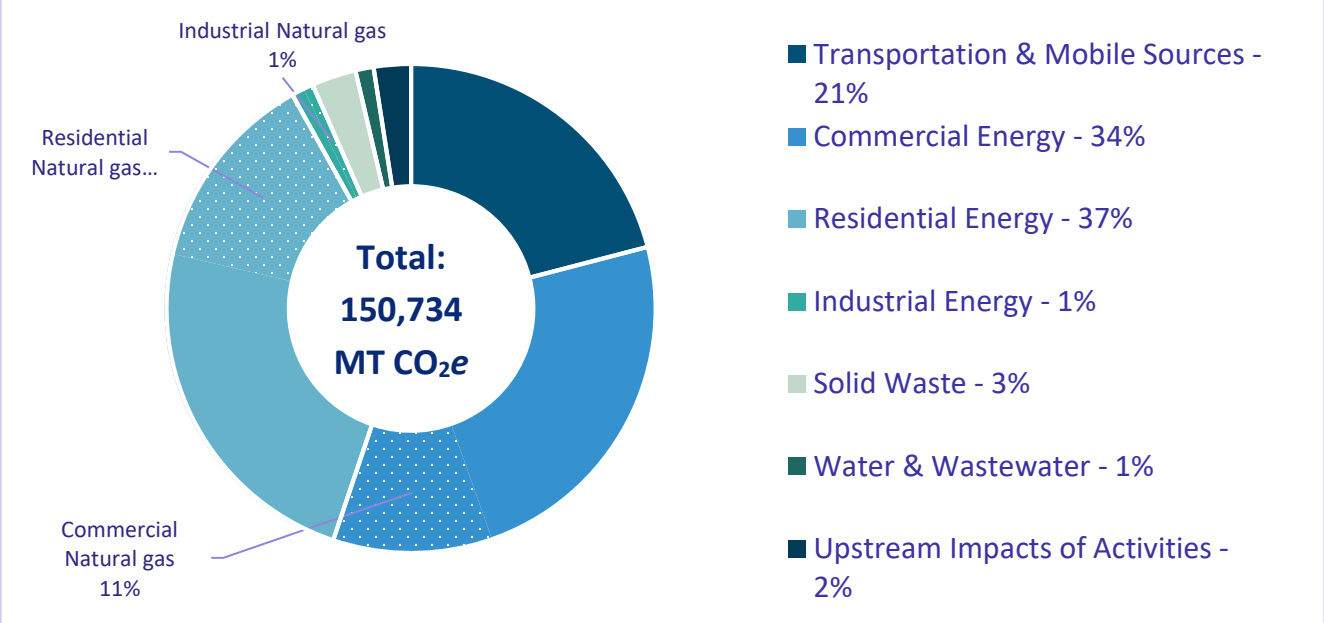
Community Emissions

A community emissions inventory was completed for the City of Moscow based on data available for the year 2019. The year 2019 was chosen as the baseline year due to the necessary data being readily available and because it would reflect a more business-as-usual scenario than 2020. Community-wide emissions were determined to be 150,734 metric tons CO_2e *(Figures 3 and 4).* The Residential Energy and Commercial Energy Sectors make up the bulk of emissions with 55,424 metric tons CO_2e (37%) and 51,577 metric tons CO_2e (34%) respectively. Both of these sectors include electrical energy and natural gas consumption. The Transportation Sector makes up an additional 31,569 metric tons CO_2e (21%) of community emissions. The remaining 8% of community emissions come from the Solid Waste (4,428 metric tons CO_2e, 3%) Upstream Impacts of Activities (3,709 metric tons CO_2e, 2%), Industrial Energy (2,217 metric tons, 1%), and Water & wastewater (1810 metric tons CO_2e, 1%) Sectors.

Figure 3: Community Emissions by Sector

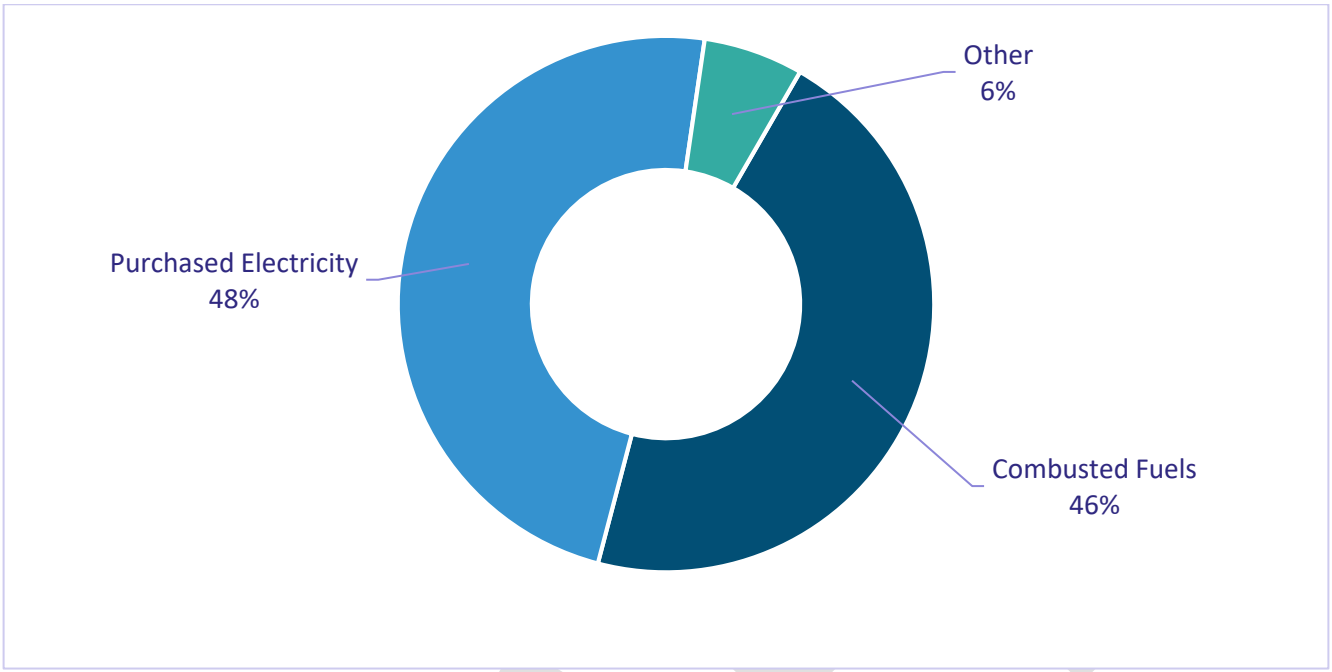
Sector	Emissions (Metric tons CO_2e)
Transportation & Mobile Sources	**31,569**
Solid Waste	**4,428**
Water & Wastewater Treatment Facilities	**1,810**
Commercial Energy	**51,577**
Industrial Energy	**2,217**
Residential Energy	**55,424**
Upstream Impacts of Activities	**3,709**
Total	**150,734**

Figure 4: Proportion of Community Emissions by Sector



The consumption of purchased electricity within the City of Moscow makes up the slight majority (48%) of all emissions, with the direct combustion of fuels a close second (46%). The remaining 6% of emissions come from solid waste management, certain wastewater treatment processes and upstream impacts of local activities (Figure 5).

Figure 5: Proportion of Community Emissions by Scope



An evaluation of the tree canopy and open green spaces within the city limits using iTree Canopy was used to determine current carbon sequestration rates for the community (see appendix for full report). Roughly 3,100 metric tons CO_2e per year are sequestered within city limits (Figures 6 and 7).

Figure 6: Groundcover Analysis of Area Within City Limits

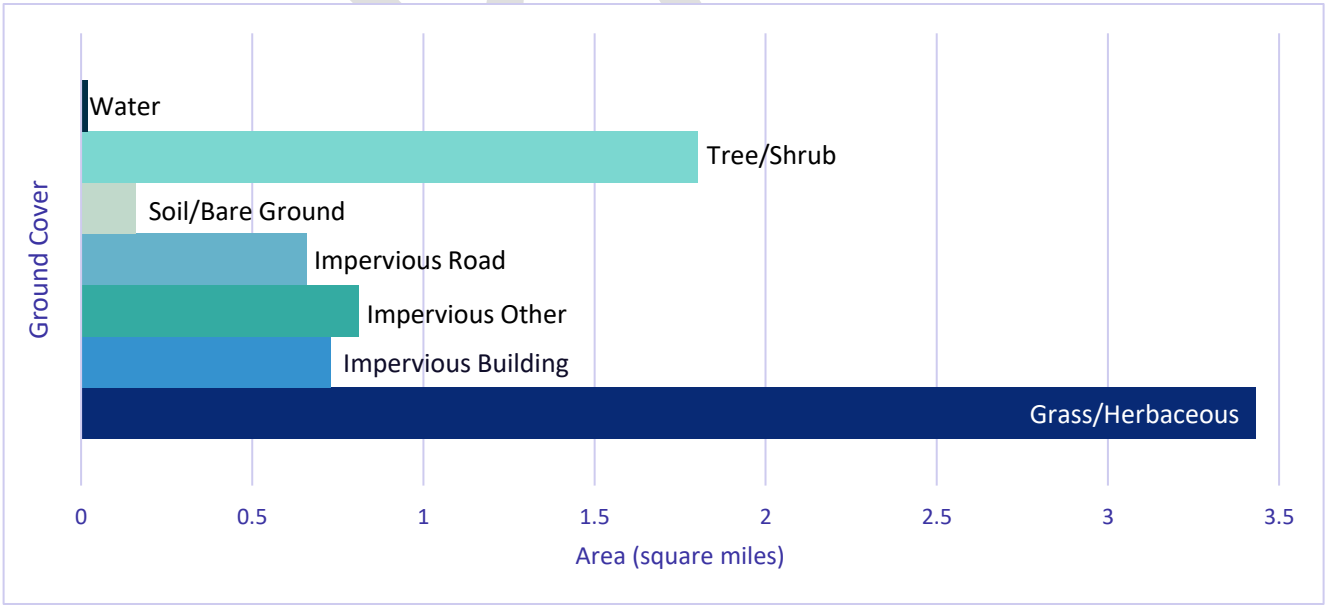


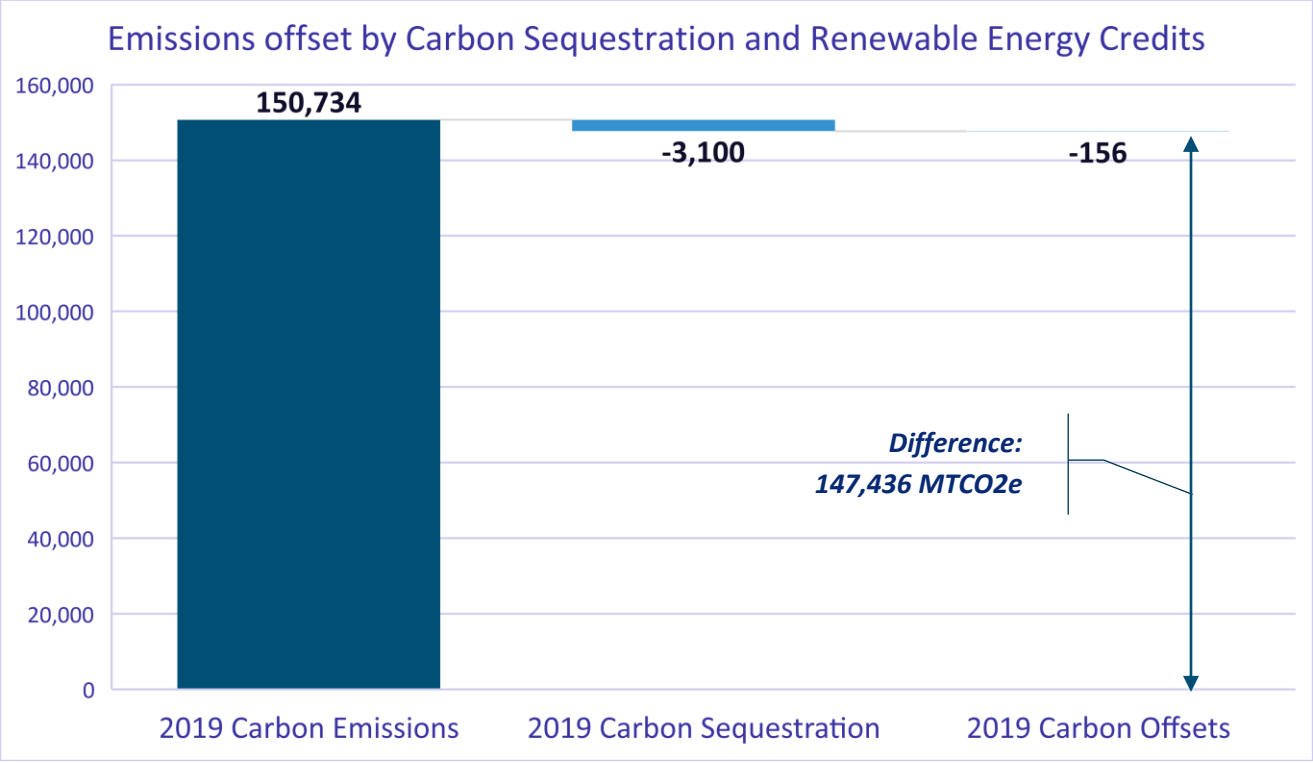
Figure 7: iTree Canopy Groundcover analysis

Cover Class	Data Points	% Cover ± SE	Area (square miles) ± SE
Water	5	0.22 ± 0.10	0.02 ± 0.01
Tree/Shrub	441	19.20 ± 0.82	1.38 ± 0.06
Soil/Bare Ground	51	2.22 ± 0.31	0.16 ± 0.02
Impervious Roads	211	9.19 ± 0.60	0.66 ± 0.02
Impervious Other	258	11.23 ± 0.66	0.81 ± 0.05
Impervious Building	233	10.14 ± 0.63	0.73 ± 0.05
Grass	1098	47.80 ± 1.04	3.43 ± 0.07
Total	2297	100.00	7.18

According to data obtained from Avista Utilities, 56 households participated in the My Clean Energy Program in 2019. The My Clean Energy program allows Avista customers to purchase renewable energy credits to offset the emissions from their electrical use. In order to account for the offset achieved through this program, a set average of 8,525 kilowatt-hours per household per year was used to determine the approximate total electrical consumption. The resulting emissions calculations conclude that another 156 metric tons CO_2e were offset by the purchase of renewable energy credits.

Approximately 2% of 2019 community emissions were offset through either sequestration or renewable energy credits (Figure 8, pg. 14).

Figure 8: Community Emissions Offset by Carbon Sequestration and Renewable Energy Credits



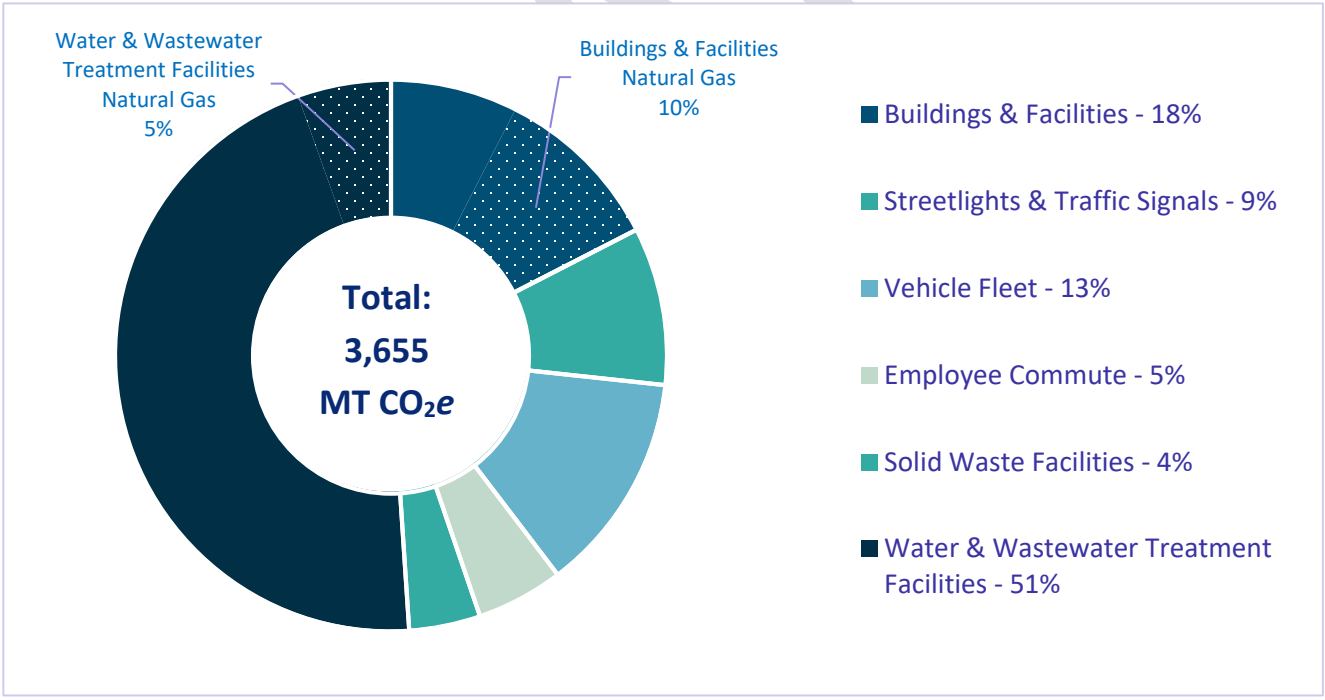
City Operations Emissions

Emissions due to City Operations were calculated to be 3,655 metric tons CO_2e in the most recent inventory (2020), making up approximately 2.5% of all emissions within the City of Moscow. Emissions are tracked across six sectors: Buildings & Facilities, Streetlights & Traffic Signals, Vehicle Fleet, Employee Commute, Solid Waste Facilities, and Water & Wastewater Treatment Facilities (Figure 9).

Figure 9: City Operations Emissions by Sector

Sector	Emissions (Metric Tons CO_2e)
Buildings & Facilities	638
Streetlights & Traffic Signals	338
Vehicle Fleet	473
Employee Commute	187
Solid Waste	153
Water & Wastewater Treatment Facilities	1,866
Total	3,655

Figure 10: Proportion of City Operations Emissions by Sector



The Water and Wastewater Treatment Facilities Sector is responsible for the largest portion of City Operations emissions (1,866 metric tons CO_2e, 51%), followed by the Buildings & Facilities Sector (638 metric tons CO_2e, 18%). Emissions in these two sectors are primarily driven by electrical energy consumption and natural gas consumption. The Vehicle Fleet Sector is responsible for approximately 13% (473 metric tons CO_2e) of City Operations emissions and is exclusively driven by the consumption

of gasoline and diesel. It should be noted that, at this time, electrical consumption by electric and plug-in hybrid vehicles within the fleet is not tracked separately. Charging stations for these vehicles are located at City facilities and are tied into the electrical consumption at those facilities. Therefore, all electrical consumption by the City Fleet is accounted for under the Buildings & Facilities Sector. The Streetlights & Traffic Signals Sector is responsible for an additional 338 metric tons CO_2e (9%). City operations emissions are rounded out by the Employee Commute (187 metric tons CO_2e, 5%) and Solid Waste Facilities (153 metric tons CO_2e, 4%) respectively.

An analysis of groundcover of city-owned and operated properties using iTree Canopy revealed that approximately 438 metric tons CO_2e are absorbed through sequestration processes annually (Figures 11 and 12). Figure 13 provides a comparison of sequestration offset with 2020 emissions.

Figure 11: iTree Canopy Groundcover Analysis of City owned and Operated Properties

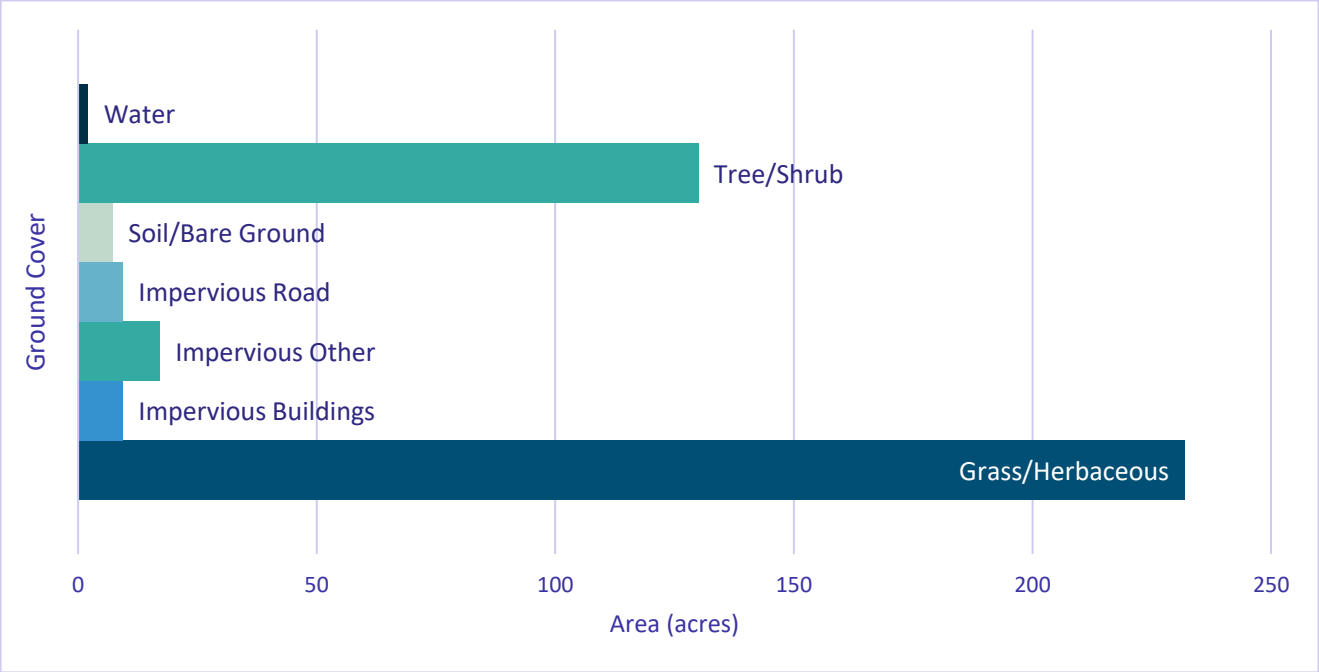
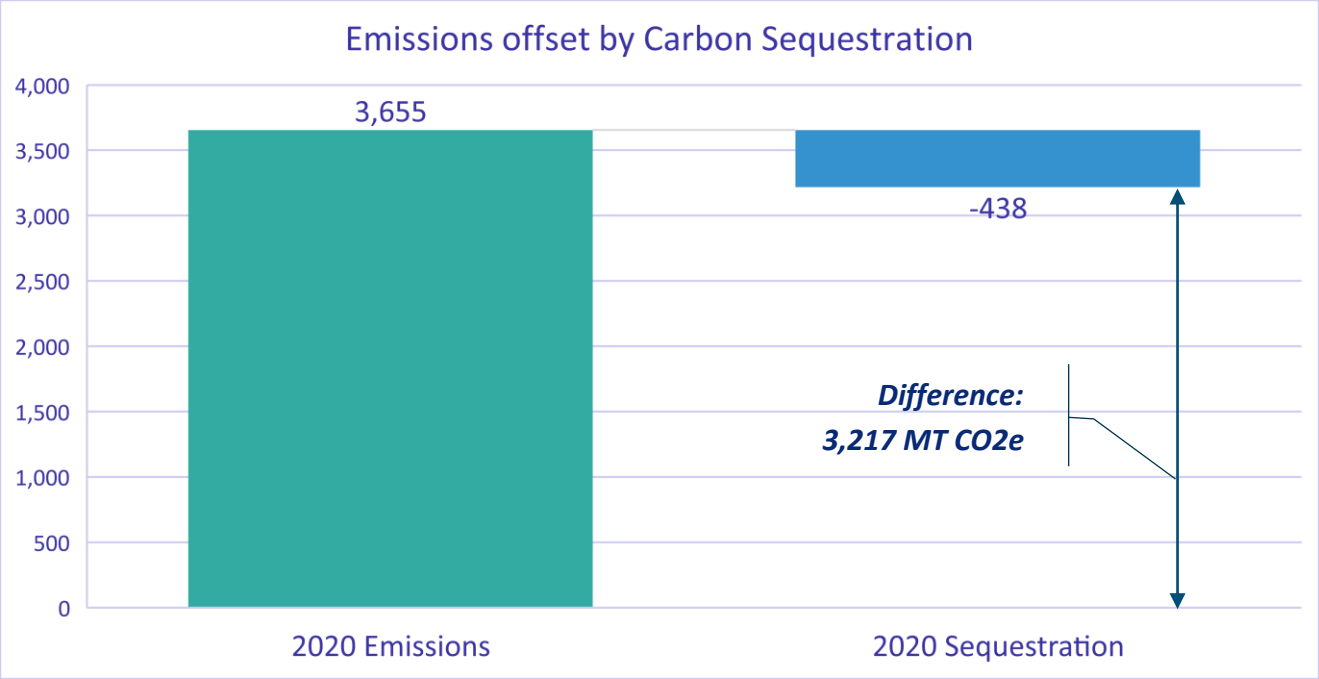


Figure 12: iTree Canopy Groundcover Analysis

Cover Class	Data Points	% Cover ± SE	Area (acres) ± SE
Water	5	0.50 ± 0.22	2.03 ± 0.91
Tree/Shrub	320	31.94 ± 1.47	129.95 ± 5.99
Soil/Bare Ground	18	1.80 ± 0.42	7.31 ± 1.71
Impervious Road	23	2.30 ± 0.47	9.34 ± 1.93
Impervious Other	42	4.19 ± 0.63	17.06 ± 2.58
Impervious Buildings	23	2.30 ± 0.47	9.34 ± 1.93
Grass/Herbaceous	571	56.99 ± 1.56	231.88 ± 6.36
Total	1002	100.00	406.90

Figure 13: City Operations Offset by Sequestration



Action

Community

As shown in Figure 4 (page 12) and based on current emissions trends, the energy sectors (Commercial, Residential, and Industrial) along with the Transportation sector, should be the main focus of climate action by the Community. These four sectors make up 93% of the emissions within the City of Moscow, making reductions in these sectors essential for achieving the goal of significant emissions reductions.

Commercial, Residential, Industrial Sectors

STRATEGY: Grid Decarbonization

Grid decarbonization refers to the elimination of carbon-based fuels used for electrical generation. The process involves the retirement of fossil fuel energy generation plants such as those that use coal or natural gas, and replacing them with renewable energy sources such as hydropower, wind or solar energy production.

ACTION: Support Avista's efforts to decarbonize.

Moscow is fortunate to receive a majority of its electricity from renewable non-carbon sources already. As of 2019, Avista Utilities, an investor-owned corporation and the only energy provider for Moscow, generates 43% of provided electricity through natural gas and coal. The

other 57% comes from hydroelectric, wind, solar and biomass sources. Avista has set aggressive targets to have a carbon-neutral electricity supply by 2027, and provide 100% clean electricity by 2045.

ACTION: Participate in and Promote My Clean Energy program

The My Clean Energy[3] program is an Avista Utilities program designed to provide customers the opportunity to offset some or all of the carbon emissions associated with their energy use by adding a premium to their monthly bills. Customers can also choose for the fee premiums they contribute to go to either regional or national clean energy generation projects. Monies that are slated to regional projects are used by Avista to fund new renewable energy production as well as grants for local solar installations. According to Avista, the average customer uses 900 kWhr of energy per month. Participation in this program offsets the equivalent of roughly four (4) metric tons CO_2e for those who participate in the program.

STRATEGY: Building Efficiency

Reducing electrical and natural gas consumption starts with increasing energy efficiency. Building inefficiencies lead to wasted energy, which adds unnecessarily to emissions and increases costs for the occupants.

ACTION: Increase participation in energy efficiency programs

Avista Utilities offers many energy efficiency programs[4]. Efforts should be made to promote these programs as well as to identify and reduce any barriers to participation entry that may exist. Low income households may experience greater barriers to energy efficiency transitions. Partnering with local non-profits and identifying state and federal funding opportunities may be necessary to support this sub-population.

ACTION: Engage consumers in energy efficiency best practices

Develop and provide Moscow specific information about reducing energy use. In order to meet the 2030 science-based target of all new buildings, 1% of existing square footage need to meet IECC 2018 standards. In addition, 5% of existing square footage needs to need to meet IECC 2018 standards.

STRATEGY: Building Electrification

The use of natural gas as a heating fuel is a significant source of carbon emissions. One quarter of community emissions in Moscow come from natural gas used in homes and businesses for heating, cooking, and water heating. Transitioning to electricity for these uses would have an immediate effect due to much lower emissions created through the production of energy under Avista's

[3] **My Clean Energy Program: https://www.myavista.com/energy-savings/green-options/my-clean-energy**
[4] **Avista Energy Rebate Program: https://www.myavista.com/energy-savings/rebate-overview**

current energy mix. In addition, as Avista achieves its clean energy target, emissions from these sources would be eliminated.

ACTION: Educate developers, consumers, and government officials on the benefits of building all-electric

The most cost-effective way to electrify is to do it when a structure is being built. This is largely due to the fact that the up-front costs associated with installing natural gas lines is avoided as are the costs of retrofitting existing structures electrical systems and wiring. Demonstrating the value, in both the short and long term, of all electric buildings will be necessary to inspire change. Promotion of available incentives may also assist in this transition.

STRATEGY: Distributed Renewable Energy

ACTION: Educate consumers of the benefits of renewable energy

Providing Moscow specific information to consumers about available renewable energy types, pros and cons, rebates, tax benefits, etc.

ACTION: Develop a community solar program

One of the largest road blocks to the installation of solar panels for homeowners is the upfront cost. Taking advantage of bulk pricing allows homeowners to reduce upfront costs.

Transportation Sector

STRATEGY: Vehicle Miles Traveled Reduction

According to the EPA, the typical passenger vehicle emits roughly 4.6 metric tons of CO2 per year assuming a fuel economy of 22 mpg and driven 11,500 miles per year. In 2019, an estimated 62 million miles were driven within City Limits.

ACTION: Reduce vehicle trips

Greenhouse gas emissions in the Transportation Sector are tied directly to vehicle miles traveled within the city. Reducing vehicles traveling on our streets will decrease emissions. Increased access to public transit (through expansion of available service), transportation incentives, increasing walkability, promotion of infill and mixed-use development to reduce vehicle dependence, and citizen outreach are all potential actions to be taken.

ACTION: Develop and expand alternative transportation options

In 2014, the City adopted the updated Moscow Multi-modal Transportation Plan to support active transportation methods and to increase access and safety for those choosing these methods. Expansion upon work that is already underway will help to further reduce greenhouse gas emissions. Implementation of a bike-sharing or scooter-sharing program would increase use of the City's extensive, and ever-growing, pathway network and reduce vehicle traffic. These options are also ideal for the student population who may or may not have a vehicle at their disposal. However, it is important to note that these options have limitations.

For example, scooters or bikes might not be suitable for a trip to the grocery store due to lack of storage capacity. In this case, an electric car sharing program and coordinated home delivery services may also be beneficial.

STRATEGY: On-Road Electric Vehicle Adoption

ACTION: Grow electric vehicle infrastructure

A major road-block to electric vehicle adoption in Moscow is the lack of charging infrastructure. Consumers are naturally hesitant to convert electric options, especially in small rural city. Increasing charging options that are accessible to the public are integral to expanded adoption of EVs. Other actions might include incentivizing

Solid Waste

STRATEGY: Waste Reduction

The average American generates 4.4 pounds of municipal solid waste per person per day, more than any other nation in the world. Unfortunately, that waste is collected and deposited into a landfill where it breaks down anaerobically and releases landfill gas. Landfill gas is primarily comprised of methane and carbon dioxide. The landfill currently used by Moscow includes a landfill gas collection system that is able to recover some of that gas and convert it to energy. From a climate change standpoint, methane is a more potent greenhouse gas than carbon, so anything that can be done to reduce production of this gas is beneficial.

ACTION: Compost program

According to the EPA, over one third of all food produced in the United States is wasted. A composting program would have multiple environmental and financial benefits. First, when food waste is composted rather than landfilled, it breaks down in an aerobic environment, which does not lead to the production of methane. Additional environmental benefits include reduced surface water run-off where applied, increased moisture retention, reduced erosion, reduced use of artificial fertilizers, reduced landfill needs, and supporting healthy plant growth. Financial benefits include reduced landfill costs, reduced hauling fees, and a marketable product.

ACTION: Enhance and expand recycling programs

Recycling programs in the United States have suffered greatly since China implemented new regulations that restrict the import of low grade and contaminated recyclables in 2017. Continuous improvement of current recycling programs and adoption of emerging opportunities will be important moving forward.

ACTION: Evaluate and update construction and demolition standards to improve waste diversion

According to the EPA. 600 million tons of construction and demolition debris was generated in the United States in 2018. Many of these materials, if properly handled, can be reused or repurposed. Diversion of these materials conserves landfill space, offsets environmental impacts from extraction and production from virgin materials, and can create employment and economic activities.

ACTION: Consumer education

Empowering consumers with Moscow specific information regarding types of waste and how to prevent it can motivate change.

Water & Wastewater Treatment Facilities

The City of Moscow owns and operates its own water and wastewater treatment facilities. Therefore, most actions in this sector will be discussed below under City Operations.

STRATEGY: Water Conservation

ACTION: Continued implementation and expansion of Water Conservation Plan

Water Conservation is critically important for reducing emissions through reduced energy consumption. Moving water takes an incredible amount of energy. Until the grid is clean, this energy will continue to be a source of emissions. Conserving water also makes our community more resistant to water challenges, particularly with projected population growth.

Sequestration

STRATEGY: Augmentation of urban tree canopy

ACTION: Develop a tree program

Trees play a vital role in sequestering carbon in Moscow. Many older neighborhoods have extensive tree canopies. However, some of the larger trees may be approaching the end of life and may be more susceptible to disease. Newer neighborhoods lack good shade trees because the trees have not had a chance to grow. Current standards require developers to plant street trees in new developments. Developing a tree program that helps homeowners keep their trees healthy and helps homeowners replace any trees that need to be removed are some potential options to include in such a program.

STRATEGY: Wisescape® Program

ACTION: Educate citizens on the benefits of planting native species

It is unrealistic to rely solely on trees to provide sequestration services because the Palouse Region has not been historically tree-rich. Restoring native prairie where feasible and planting

native plants will help not only sequester carbon at least as effectively as grass, but will also pull the carbon deeper into the soil.

City Operations

General

STRATEGY: Renewable energy credits

ACTION: Participate in Avista Utilities' My Clean Energy Program

Emissions in the Buildings & Facilities, Street lights & Traffic Signals, and Water & Wastewater Treatment Facilities Sectors are tied to electrical consumption. Therefore, participating in this program has the potential to offset electrical consumption by these sectors.

Buildings & Facilities

STRATEGY: Increase energy efficiency

ACTION: Energy Efficiency upgrades

Many City Facilities underwent LED lighting and HVAC system upgrades in pursuit of the 2020 reduction goal. Building on that work will reduce emissions as well as save money on energy costs.

ACTION: Building Envelope Assessments and Repairs

A building's envelope, the structural part of a building designed to repel the elements, is critically important in keeping energy use low. Damaged or inefficient envelopes lead to energy waste since they may not properly retain air that has been heated or cooled by artificial means. Comprehensive assessments of all City Facilities should be completed to identify any issues and repairs should be made accordingly. Doing so provides the dual benefits of reducing emissions while also saving money on heating and cooling costs.

ACTION: Building Electrification

Over half the emission attributed to the Buildings and Facilities Sector are produced through the consumption on of natural gas. Currently, electrical generation produces fewer fossil fuels than natural gas. In the long term, as the grid becomes cleaner, even fewer emissions would result.

Street lights & Traffic Signals

STRATEGY: LED lighting upgrades

ACTION: Ballfield lights

Switching to LED lights at the various ballpark facilities in Moscow, will cut energy consumption by at least half, while still maintaining quality lighting. Costs to operate these facilities would

also be reduced as a result. LED lighting should also be adopted as the standard for any new or updated facilities. Any reduced energy consumption reduces emissions from the grid.

ACTION: Street lights

LED street light and security lighting provide higher quality light at a lower operational cost than traditional options. Currently, all residential street lights are slated to be changed out by Avista Utilities. The City will be responsible for changing out the downtown corridor, highway lighting, and security lighting in multiple parking lots. LED lighting should be adopted as the standard for any new or updated facilities. Solar street lights may also be considered for further emissions savings as technological advances occur.

Vehicle Fleet

STRATEGY: Alternate Fuel Transition Plan

ACTION: Mower electrification

City of Moscow currently maintains 339.87 acres of parkland. In 2020, the City used over 1000 gallons each of gasoline and diesel on mowing alone. Agricultural equipment also burns fuel less efficiently than on-road vehicles. Replacing the current mowers with suitable electric models will eliminate the need for fuel for this purpose, reducing emissions and fuel costs.

ACTION: Electric vehicle adoption

Continued adoption of electric vehicles is necessary to further reduce fuel consumption. Replacement of larger equipment should also be considered as technologies develop.

Employee Commute

STRATEGY: Telecommuting

ACTION: Develop a telecommuting policy

Telecommuting, as a response to the COVID-19 pandemic, played a significant role in reducing emissions from the Employee Commute Sector. Telecommuting is becoming increasingly prevalent in the job market and provides multiple benefits to both the employer and the employee.

STRATEGY: Alternative transportation incentive

ACTION: Develop an alternative transportation incentive for employees

Money was the number one answer when employees were asked via survey what would persuade them to consider an alternative form of transportation. Financial incentives to encourage the use of, or to help purchase, alternative modes of transportation could help lower emissions tied to employee travel. Alternative transportation methods may include, but are not limited to, carpooling, walking, biking, or bussing.

STRATEGY: Electric vehicle infrastructure

ACTION: Install electric vehicle charging stations at City Facilities that are open to employees

Many City employees live outside of City limits. Without proper charging infrastructure in place at their work location, or even in town, employees may be hesitant to adopt electric vehicles as their daily commuter.

Solid Waste Facilities

STRATEGY: Sustainable purchasing

ACTION: Update sustainable purchasing policy

Originally developed and adopted in 2008, the current policy is outdated. An evaluation of the current policy as well as the City's current purchasing needs should be considered in order to develop an updated policy.

STRATEGY: Improved waste tracking

ACTION: Develop and implement a method for tracking waste generated at City facilities

The current method of determining the waste produced at each City facility is determined based on the size of the container, how often it is picked up, and an average weight per yard. Developing a method to track actual weight would improve accuracy of the calculated emissions as well as provide a tool to gauge effectiveness of any waste diversion initiatives. This may also include incentives for minimizing department waste.

Water & Wastewater Treatment Facilities

STRATEGY: Energy efficiency

ACTION: Participate in Department of Energy SWIFt program

The Department of Energy Sustainable Wastewater Infrastructure of the Future (SWIFt) initiative is designed to help wastewater treatment facilities identify and implement changes to reduce energy consumption.

ACTION: Energy efficiency

Each water and wastewater facility should undergo an energy audit to determine what energy efficiency upgrades could be made in order to reduce consumption. This could include lighting, heating/cooling, variable frequency drives, pump efficiencies, etc.

ACTION: Building electrification

Some of the facilities included in this sector use natural gas as a heating source. Eliminating the need for natural gas will greatly reduce emissions in this sector.

STRATEGY: Renewable Energy integration

ACTION: Alternative energy feasibility assessment

Conduct an assessment to determine feasibility of integration of renewable energy at all water and wastewater sites. Grid-tied renewable energy production by the City would supplement power received from the Grid. In addition, any renewable energy produced would help create a cleaner grid, thereby indirectly reducing emissions elsewhere.

Appendix A

City of Moscow Climate Change Related Resolutions

Resolution 2007-13: Climate Protection

Resolution 2010- 18: Greenhouse Gas Reduction Goal Setting

Resolution 2016-16: Greenhouse Gas Reduction Goal Reaffirmation

Resolution 2018-23: Revenue-Neutral Carbon Fee and Dividend Policy

RESOLUTION NO. 2007 - 13

A RESOLUTION OF THE CITY OF MOSCOW, A MUNICIPAL CORPORATION OF THE STATE OF IDAHO, CONFIRMING THE CITY'S INTENTION TO JOIN THE INTERNATIONAL COUNCIL FOR LOCAL ENVIRONMENTAL INITIATIVES (ICLEI) AS A FULL MEMBER AND TO PARTICIPATE IN THE CITIES FOR CLIMATE PROTECTION CAMPAIGN; PROVIDING THIS RESOLUTION TO BE EFFECTIVE UPON ITS PASSAGE AND APPROVAL.

WHEREAS, scientific consensus has developed that Carbon Dioxide (CO_2) and other greenhouse gases released into the atmosphere have a profound effect on the Earth's climate; and

WHEREAS, in 2006 the U.S. National Climatic Data Center confirmed clear evidence of human influences on climate due to changes in greenhouse gases; and

WHEREAS, the Urban Environmental Accords adopted by local government delegates during UN World Environment Day 2005 call for reduced emissions through energy efficiency, land use and transportation planning, waste reduction, and wiser energy management; and

WHEREAS, in 2003 the American Geophysical Union adopted a Statement noting that human activities are increasingly altering the Earth's climate and that natural influences cannot explain the rapid increase in near-surface temperatures observed during the second half of the 20th century; and

WHEREAS, in 2001, at the request of the Administration, the National Academy of Sciences (NAS) reviewed and declared global warming a real problem caused in part by the actions of humankind; and

WHEREAS, the 2001 Third Assessment Report from the International Panel on Climate Change (IPCC) and the 2000 U.S. Global Change Research Program's (USGCRP) First National Assessment indicate that global warming has begun; and

WHEREAS, 162 countries including the United States pledged under the United Nations Framework Convention on Climate Change to reduce their greenhouse gas emissions; and

WHEREAS, energy consumption, specifically the burning of fossil fuels, accounts for more than eighty percent (80%) of U.S. greenhouse gas emissions; and

WHEREAS, local government actions taken to reduce greenhouse gas emissions and increase energy efficiency provide multiple local benefits by decreasing air pollution, creating jobs, reducing energy expenditures, and saving money for the local government, its businesses, and its residents; and

WHEREAS, after inquiries initiated by the Mayor and other city staff, the City of Moscow has been invited to join ICLEI – Local Governments for Sustainability, and to become a partner in

the Cities for Climate Protection Campaign (CCP), a nationally recognized program sponsored by ICLEI;

NOW, THEREFORE, BE IT RESOLVED by the Mayor and City Council of the City of Moscow as follows:

That the City of Moscow, Latah County, Idaho will join ICLEI as a Full Member and participate in the Cities for Climate Protection Campaign and, as a participant, pledges to take a leadership role in promoting public awareness about the causes and impacts of climate change.

BE IT FURTHER RESOLVED, that the City of Moscow, Latah County, Idaho will undertake the Cities for Climate Protection Campaign's five (5) milestones to reduce both greenhouse gas and air pollution emissions throughout the community, and specifically:

- Conduct a greenhouse gas emissions inventory and forecast to determine the source and quantity of greenhouse gas emissions in the jurisdiction;
- Establish a greenhouse gas emissions reduction target;
- Develop an action plan with both existing and future actions which when implemented will meet the local greenhouse gas reduction target;
- Implement the action plan; and
- Monitor and report progress; and

BE IT FINALLY RESOLVED that the City of Moscow, Latah County, Idaho requests assistance from ICLEI's Cities for Climate Protection Campaign as it progresses through the milestones.

That this Resolution shall become effective as of July 2, 2007.

PASSED AND APPROVED by the Mayor of the City of Moscow, Idaho, this 2nd day of July, 2007.

Nancy Chaney, Mayor

ATTEST:

Stephanie Kalasz, City Clerk

CITY OF MOSCOW INCORPORATED JULY 12 1887 STATE OF IDAHO

RESOLUTION 2010 - 18

A RESOLUTION OF THE CITY OF MOSCOW, A MUNICIPAL CORPORATION OF THE STATE OF IDAHO, AUTHORIZING THE ADOPTION OF A CITY OF MOSCOW GREENHOUSE GAS REDUCTION GOAL OF 20% OF 2005 LEVELS BY THE YEAR 2020; PROVIDING THAT THIS RESOLUTION BE IN EFFECT UPON ITS PASSAGE, APPROVAL AND PUBLICATION ACCORDING TO LAW.

WHEREAS, pursuant to Resolution 2007-13, City staff, through a membership with the International Council for Local Environmental Initiatives (ICLEI), established an inventory of 2005 greenhouse gas (GHG) emissions for the municipality; and

WHEREAS, based upon the inventory results and available resources, staff prepared the 2010 Greenhouse Gas & Energy Efficiency Report (Report) and presented the Report to Council on August 2, 2010; and

WHEREAS, the Report highlights the results of the inventory, outlines municipal and community measures that have been and are being addressed, and makes recommendations for future measures that could be addressed; and

WHEREAS, City staff identified additional items that could reduce the City's GHG emissions to be referenced and included as an attachment to the Report; and

WHEREAS, the Report recommends a GHG reduction target for the City of Moscow as an organization of twenty percent (20%) of 2005 levels by the year 2020; and

NOW, THEREFORE, BE IT RESOLVED by the Mayor and the Council of the City of Moscow, Idaho as follows:

1. Adopt the 2010 City of Moscow Greenhouse Gas Inventory & Energy Efficiency Report; and
2. That the City of Moscow commits to achieving a twenty percent (20%) reduction of 2005 Greenhouse Gas levels by the year 2020.

PASSED by the City Council and **APPROVED** by the Mayor this 16th of August, 2010.

Nancy Chaney, Mayor

ATTEST:

Stephanie Kalasz, City Clerk

CITY OF MOSCOW INCORPORATED JULY 12 1887 STATE OF IDAHO

RESOLUTION 2013-16

A RESOLUTION OF THE CITY OF MOSCOW, A MUNICIPAL CORPORATION OF THE STATE OF IDAHO, AFFIRMING THE ADOPTION OF A CITY OF MOSCOW GREENHOUSE GAS REDUCTION GOAL OF 20% OF 2005 LEVELS BY THE YEAR 2020; PROVIDING THAT THIS RESOLUTION BE IN EFFECT UPON ITS PASSAGE, APPROVAL AND PUBLICATION ACCORDING TO LAW.

WHEREAS, pursuant to Resolution 2007-13, City staff, through a membership with ICLEI, established an inventory of 2005 greenhouse gas (GHG) emissions for the City of Moscow as an organization; and

WHEREAS, based upon the inventory results and available resources, staff prepared a 2010 Greenhouse Gas & Energy Efficiency Report (2010 Report) and presented the Report to Council on August 2, 2010; and

WHEREAS, City staff has determined that ICLEI continues to be the preferred resource for management of data for GHG emissions data; and

WHEREAS, with improved methodology and research methods, figures presented in the 2010 Report have been clarified and confirmed adjusting the resulting carbon emission figures for accuracy in a 2013 Green House Gas Emissions and Energy Efficiency Report (2013 Report); and

WHEREAS, City staff will continue to update and refine emissions data reporting as resources and methodology continue to improve; and

WHEREAS, the 2013 report has been presented to the Sustainable Environment Commission who expressed their enthusiasm and support for the ongoing work by City staff to document City GHG emissions; and

WHEREAS, in Resolution 2010-18 the City Council adopted a GHG reduction target for the City of Moscow as an organization of twenty percent (20%) of 2005 levels by the year 2020; and

NOW, THEREFORE, BE IT RESOLVED by the Mayor and the Council of the City of Moscow, Idaho as follows:

1. Adopt the 2013 Energy Efficiency and Green House Gas Emissions Update, which clarifies the 2005 baseline figures previously clarified in the 2010 Green House Gas Inventory and Report
2. Reconfirm the City of Moscow's commitment to achieving a twenty percent (20%) reduction of 2005 Greenhouse Gas levels by the year 2020.

PASSED by the City Council and **APPROVED** by the Mayor this 16th of December, 2013.

CITY OF MOSCOW ★ INCORPORATED ★ JULY 12 1887 ★ STATE OF IDAHO

Nancy Chaney, Mayor

ATTEST:

Stephanie Kalasz, City Clerk

RESOLUTION NO. 2018 – 23

A RESOLUTION OF THE CITY OF MOSCOW, IDAHO, A MUNICIPAL CORPORATION OF THE STATE OF IDAHO, URGING THE UNITED STATES CONGRESS TO ENACT A REVENUE-NEUTRAL CARBON FEE AND DIVIDEND POLICY FOR THE UNITED STATES; PROVIDING THAT THIS RESOLUTION SHALL BE IN EFFECT UPON ITS PASSAGE, AND APPROVAL.

WHEREAS, the City of Moscow's Comprehensive Plan states that "[t]he residents of Moscow value quality of life, stability and sustainability"; and

WHEREAS, City has taken numerous steps to function in a more sustainable manner and respond to climate change. Those steps include:

- The EcoDriver program to increase fuel efficiency in City's fleet;
- Energy efficiency upgrades to City facilities and other infrastructure;
- A Water Conservation Program to reduce water consumption, including the innovative Wisescape program;
- Adoption of a Multi-modal Transportation Plan which commits to expanded non-motorized vehicle routes and facilities;
- Cooperation in the creation of a City-wide SMART public transportation system;
- A commitment to addressing climate change by adopting the 2013 Energy Efficiency and Green House Gas Reductions Goals Update (Resolution No. 2013-16);
- Establishment of annual Mayor's Earth Day Awards; and
- Co-establishment and continued participation in Palouse Basin Aquifer Committee.

WHEREAS, the Moscow City Council recognizes that effects of climate change have impacted Moscow and northern Idaho and threaten natural resources, food security, public health, quality of life, and the economy; and

WHEREAS, if left unattended, the consequences of a changing climate, including drought, higher temperatures, altered precipitation patterns, increased forest fires, more plant and animal pests and disease, and increased air pollution, have the potential to increasingly impact all Moscow residents; and

WHEREAS, impacts of unmitigated climate change can harm key public goods and economic sectors of agriculture, forestry, fisheries, water resources, and human health, and impose additional cost on City budgets and saddle future generations with costly economic and environmental burdens across the State of Idaho and beyond; and

WHEREAS, the Moscow City Council recognizes that people and governments need to act to mitigate climate change and its effects; and

WHEREAS, the continued use of fossil fuels is supported by a market failure wherein the costs of carbon emissions are not included in the price of fossil fuels; and

WHEREAS, the urgent need to transition away from fossil fuels can be accomplished effectively with a market-based program in which a revenue-neutral carbon fee on fossil fuel production includes a full rebate or dividend to all U.S. households;

NOW, THEREFORE, BE IT RESOLVED by the Mayor and City Council of the City of Moscow as follows:

1. The City Council strongly urges the United States Congress to pass legislation, and the President of the United States to sign into law, a national, market-based fee on the carbon in fossil fuels that will ensure a policy that significantly reduces carbon emissions and returns the entire fee minus administrative costs to all households, in order to protect the economy and the climate today and for future generations.
2. Further, the City Council encourages that such legislation include clear processes and objectives and that the application of such legislation also minimize financial impacts to our most vulnerable citizens, including the economically disadvantaged.
3. The City Council encourages other communities to join them in this request for the United States to recognize and address the global problems of carbon emissions in this manner.
4. The City Council directs the City Clerk to forward a copy of this Resolution to the delegations representing Moscow in both houses of the United States Congress, the State Legislators representing Moscow, and the Idaho Governor within thirty (30) days after passage of this Resolution.
5. That this Resolution shall become effective as of the 17th day of December, 2018.

PASSED AND APPROVED by the Mayor of the City of Moscow, Idaho, this 17th day of December, 2018.

Bill Lambert, Mayor

CITY OF MOSCOW INCORPORATED JULY 12 1887 STATE OF IDAHO

ATTEST:

Laurie M. Hopkins, City Clerk

Appendix B

Climate Change Impacts Assessment Report

June 16, 2020

Climate Change Impacts Assessment for Moscow, Idaho

"The consequences of a changing climate, including drought, higher temperatures, altered precipitation patterns, increased forest fires, more plant and animal pests and disease, and increased air pollution, have the potential to increasingly impact all Moscow residents."

City of Moscow Resolution, 2018

Climate Change Assessment Team

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Kristin Haltinner, Moscow Sustainable Environment Commission
Tina Hilding, Moscow Sustainable Environment Commission
Russ Moore, Moscow Sustainable Environment Commission
Al Poplawsky, Sierra Club
Elizabeth Stevens, Moscow Human Rights Commission
Amber Ziegler, Moscow Sustainable Environment Commission

Photo courtesy of City of Moscow

"Eleven Years"

A poem by Young Brown Clevenger, Age 12, Moscow Middle School

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11 years.

That's what the United Nations stated in March 2019.

11 YEARS at this rate until climate change is irreversible. Our lives wasted in 11 years.

In 11 years, I will be 23. 23!

And that was last year. Last year was the warning, by this point we have 10 years.

These ten years will go by in a snap, and if we don't do anything about it, we are screwed.

And this is your fault. My fault. OUR fault.

But these are not going to be our last moments, our last memories. WE CAN CHANGE THIS, together.

Together, we can save the polar bears, the tigers, the elephants.

Together we can save those in poverty and sickness. We can save this Earth, OUR Earth.

Because, without this Earth, without each other, where would we be?

Because we need time and time needs us to heal. To fix the mistakes we made so we can live and die, knowing we did right.

We have 10 years to fix what we've done. Not 10 years to live. 10 year to fix our mistakes.

Executive Summary

Climate change is happening now and is expected to continue into the future. Understanding the magnitude of climate change and how it impacts Moscow and the surrounding landscapes is critical for justifying actions that will reduce greenhouse gas emissions ("mitigation") and minimize any negative effects ("adaptation"). This Climate Change Impacts Assessment of the Palouse Region reports on a) the extent that the climate has changed over the past several decades, b) the changes expected in the future, and c) the effects climate change has had and will have on the people and ecosystems of the Palouse Region.

Air temperatures have increased in Moscow over the last 100 years, and depending on future societal choices about greenhouse gas emissions, it is projected to continue increasing for decades to come. Warming will occur in all seasons, and heatwaves are expected to increase in severity and frequency. Precipitation has increased slightly since 1950; projections indicate that future annual precipitation will increase, but that summer precipitation will decrease. As a result of warming, precipitation will shift toward more rain and less snow, and snowpack will decline and melt earlier. The reduced snow season will mean longer, drier summers, with resulting increases in fire season length and more fires and reduced summer streamflow that will affect aquatic ecosystems and water quantity and quality for human uses. Human health will be affected through additional smoke from more wildfires, increased heat-related morbidity and mortality, more pollen and ozone pollution, and expansion of vectors of disease. Agriculture will be affected both positively (through carbon dioxide fertilization and longer growing seasons) and negatively (through reduced summer soil moisture and increased pest outbreaks). Some forests at higher elevations in northern Idaho could benefit from longer growing seasons, and lower-elevation forests may decline because of additional moisture stress.

The impacts described in this assessment will provide input to the next step, a Climate Action Plan, that will be undertaken to identify specific areas and sectors of the Moscow region that will be susceptible to climate change and outline a plan to adapt to and mitigate the impacts of climate change.

Data Used in this Report

Historical Data

Statements about historical (the last 100-150 years) climate change are best made with the longest, most reliable observations possible. In the United States, those are from the Historical Climatology Network (HCN), a set of high-quality stations with long-term records and minimal gaps. Temperature and precipitation (rain plus snow) have been recorded since about 1900 (varies by station). Although the HCN stations are somewhat sparsely distributed geographically, the HCN station nearest to Moscow is located at the University of Idaho.

Projection Data

Climate projections are produced by running a climate model with a prescribed "scenario" of greenhouse gas emissions (see box at right). Climate model outputs are analyzed for different periods in the future, typically near-term (next decade), mid-century, and end-of-century. Because of variability in climate model complexity, projections from multiple models are often presented, with the average among models often assumed to be most representative.

Impact Data

The information in this report is drawn from the peer-reviewed scientific literature and summaries, syntheses, and reviews of climate change in local, national, and international assessment reports (see end of document). Idaho examples are provided where available; some findings may be based on regional (US Northwest) studies of impacts; in cases where local or regional studies are not available, information is based on the best scientific understanding of climate influences.

How climate models work

A variety of inputs to climate models is included when making projections about future climate change. The most difficult input to determine is any change in human behavior that may affect the emissions of greenhouse gases. Therefore, scientists have developed different scenarios for use that are not predictions but rather possible future pathways. These scenarios span the range from low emissions in the future that minimize future climate change (such as "RCP4.5") to moderate emissions scenarios to high emissions scenarios (such as "RCP8.5") that project continued emissions growth and a higher amount of climate change. Different emissions scenarios (e.g., low versus high) associated with different possible societal choices, population growth, and socioeconomics result in different amounts of climate change and illustrate the effects of reducing emissions. Recent greenhouse gas emissions have been most similar to the RCP8.5 scenario.

For more information see:
"Climate Models" by NOAA
https://www.climate.gov/maps-data/primer/climate-models
"Evaluation of Climate Models" by IPCC
https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter09_FINAL.pdf

University of Idaho Arboretum by Kristin Haltinner, 2014

Climate Change Impacts in the Palouse Region

Temperature Changes

Recent climate change has been caused in large part by increasing greenhouse gases in the earth's atmosphere, which trap more heat than would otherwise escape to space, causing the earth to warm[1]. The amount of climate change is not the same across the earth due to variability in land features and air and water circulation patterns[1]. This section looks at the historical and projected temperature changes for Moscow, Idaho, and the region.

Climate station records indicate that temperatures in our region have already increased. From 1900 to 2018, the average annual temperature increased by 1-1.5 ºF[2]. Due to the impacts of other environmental factors–such as snowpack and water–the increase in average temperature is not evenly distributed over the year. Rather, the increase in warming has been slightly greater in the winter than in the summer: the coldest temperature of the year has increased by 2-5 ºF[3] while the warmest temperature of the year did not change significantly.

Climate model projections using higher emissions scenarios (RCP8.5) suggest that Moscow will continue warming by another 6-12 ºF through 2070-2099[4,5] (Figures 2 and 3). In the Northwest region, warming of 3.7 ºF (lower emissions scenario, RCP4.5) to 4.7 ºF (higher emissions scenario, RCP8.5) is projected by mid-century, with warming of 5-8.5 ºF by late century[3].

Since 1900 annual average temperatures have increased 1-1.5 ºF. They are expected to increase another 6-12 ºF by 2099.

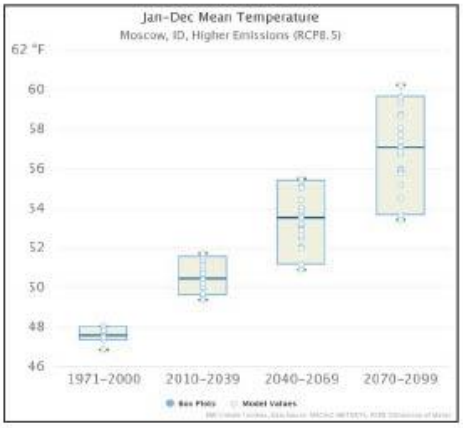


Figure 2. Projected average annual temperature for Moscow, ID, using the higher emissions scenario (RCP8.5). For each time period, dots indicate different climate model results, the black line indicates the median temperature, and the green box indicates the 25-75 percentile range of models.

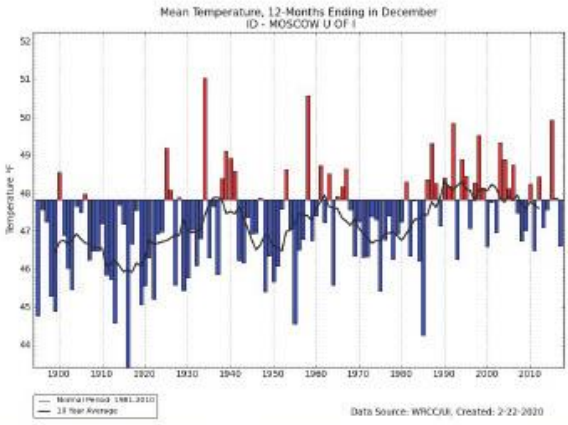


Figure 1. Observed average annual temperature for Moscow, ID, recorded by the Moscow HCN climate station. Blue bars are below the average temperature, red bars are above.

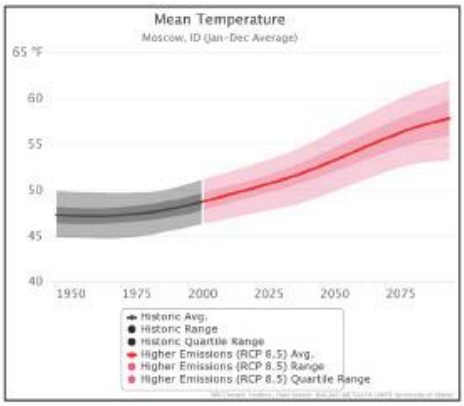


Figure 3. Projected average annual temperature for Moscow, ID, using the higher emissions scenario (RCP8.5). Black lines indicate model results for historical period, red lines indicate model projections into the future; bands indicate range of results from different climate models.

Summer Temperatures

Summer maximum temperatures are expected to increase by 12 °F.

Summer temperatures in Moscow are projected to increase significantly. Currently summer high temperatures average around 80 °F (Figure 4)[4]. Considering all climate model results, summer temperatures are projected to increase to 92 °F by the last decades of the century. Regional trends are similar: the warmest day is projected to increase by 6 °F by mid-century. Heat waves will also become more intense: the temperature of the most extreme (1-in-10 year) heat waves (5-day warm conditions) is expected to increase by 12 °F[4]. The number of days with a heat index (a measure of "apparent temperature" that combines temperature and relative humidity) above 90 °F is projected to increase from fewer than 10 today to more than 50 by 2070-2099 (Figure 4). Extremely hot days (temperatures above 100 °F or 105 °F) are also expected to increase. These conditions are rare today but are projected to occur frequently by the end of this century (Figure 4)[4].

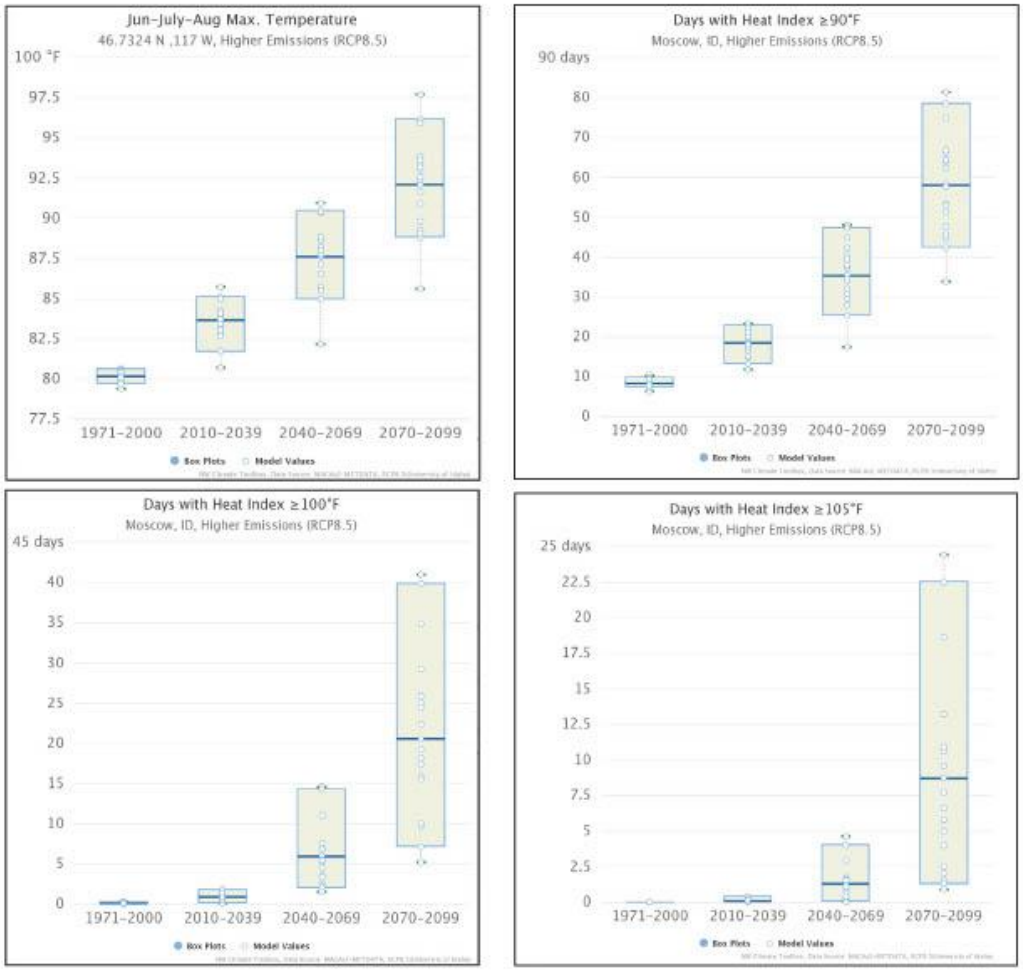


Figure 4. Projected summer temperatures (upper left) and heat indices (upper right, lower left, lower right) for Moscow, ID, using the higher emissions scenario (RCP8.5). See Figure 2 for more details about box plots.

Winter Temperatures

Winter temperatures are expected to rise from below freezing to 41 °F. The annual number of days above freezing will increase from 240 to 330 by 2100.

Winter temperatures in Moscow are also projected to increase. Average winter (December-January-February) temperature is projected to increase from below freezing to 41 °F by late century (Figure 5)[4]. This change is particularly significant as it will influence whether precipitation falls as snow or rain and will impact the amount and duration of snow cover. The number of days with minimum temperature above freezing will increase from a current average of 240 to 330 by the end of the century (Figure 6). The temperature of the coldest day of the year for the Northwest is projected to increase by 7 °F by mid-century, and the temperature of extreme cold snaps (5-day temperatures for 1-in-10 year events) is expected to increase by 11 °F[3].

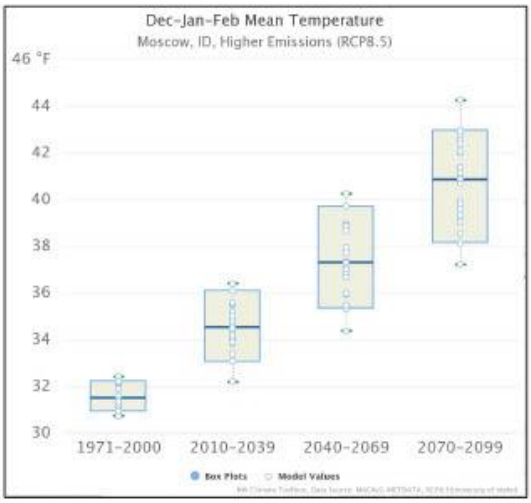


Figure 5. Projected winter (December-January-February) temperature for Moscow, ID, using the higher emissions scenario (RCP8.5). See Figure 2 for more details about box plots.

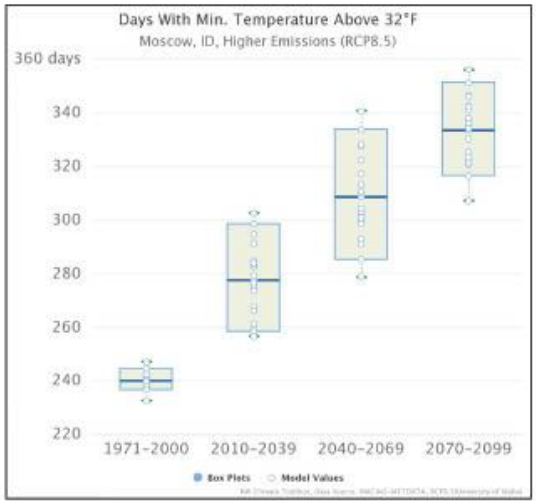


Figure 6. Projected number of days with minimum temperature above freezing (32 °F) for Moscow, ID, using the higher emissions scenario (RCP8.5). See Figure 2 for more details about box plots.

Precipitation Changes and Water Impacts

In addition to changes in temperature, climate change will also alter precipitation patterns[1].

Northern Idaho has experienced slightly higher annual precipitation in the last 100 years, with decreases in fall and winter precipitation and increases in spring and summer precipitation (Figure 7). Since 1900, total annual precipitation has increased slightly, with most of the increase occurring in the last 50 years (Figure 8)[2]. Between 1900 and 2018, summer precipitation–important for plant growth–has varied greatly and demonstrated little long-term trend (Figure 9). In the Northwest region, extreme precipitation events have increased somewhat in frequency in the 20th century, although the total amount of extreme precipitation has not varied significantly[3].

The intensity of precipitation is projected to increase throughout the region.

Climate models project that annual precipitation for Moscow will increase overall. Model results from both high and low emissions scenarios project an increase from 27" of annual precipitation in recent years to between 28 and 29" by late century (Figure 10)[4]. The largest increases are expected to occur in winter and spring, and summer precipitation is projected to decrease by 0.5" (14%), from 3.7" to 3.2" (Figure 11).

The intensity of precipitation is projected to increase across the Northwest region. The amount of precipitation during extreme events is expected to increase by 9-19%, depending on time period and emissions scenario. Model results using the highest emissions scenario project an increase in the frequency of extreme precipitation events by a factor of 2-3[3]. Extreme precipitation events can lead to flooding and soil erosion[6].

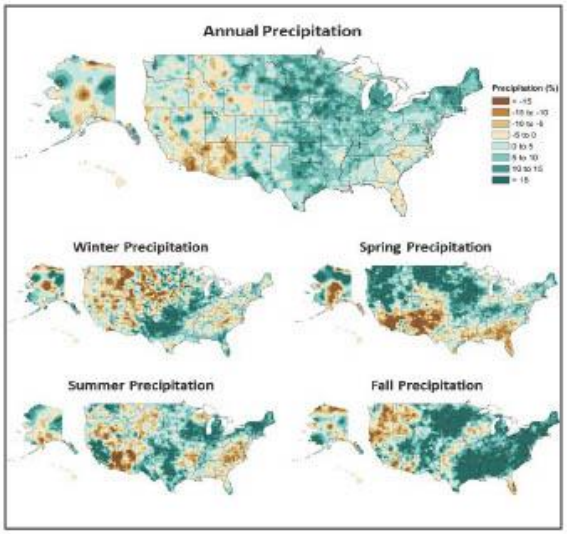


Figure 7. Annual and seasonal changes (1986-2015 average minus 1901-1960 average divided by 1901-1960 average) in precipitation. From USGCRP, 2017.

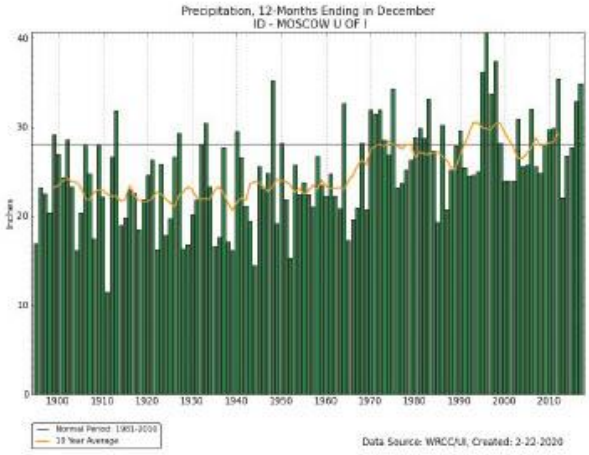


Figure 8. Observed annual precipitation for Moscow, ID, recorded by the HCN climate station. Horizontal black line indicates average during 1981-2010; orange line indicates running 10-year average.

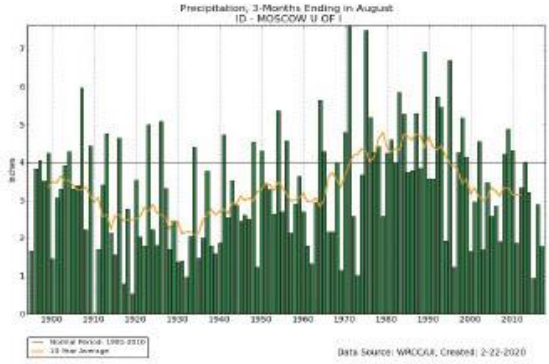


Figure 9. Observed summer (June-July-August) precipitation for Moscow, ID, recorded by the HCN climate station. Horizontal black line indicates average during 1981-2010; orange line indicates running 10-year average.

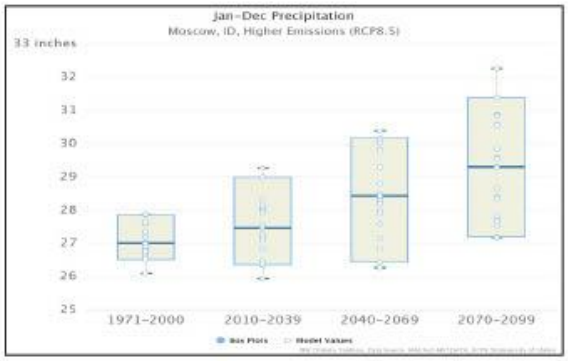
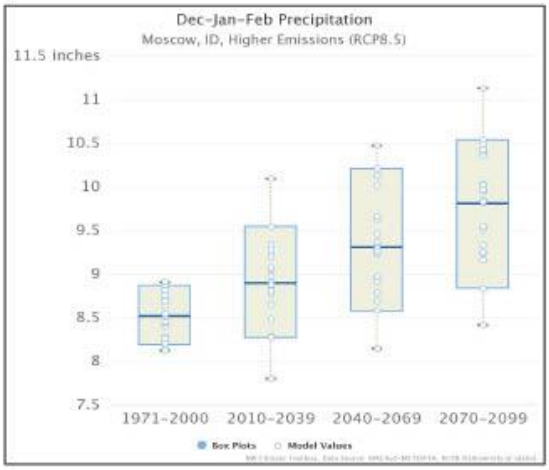
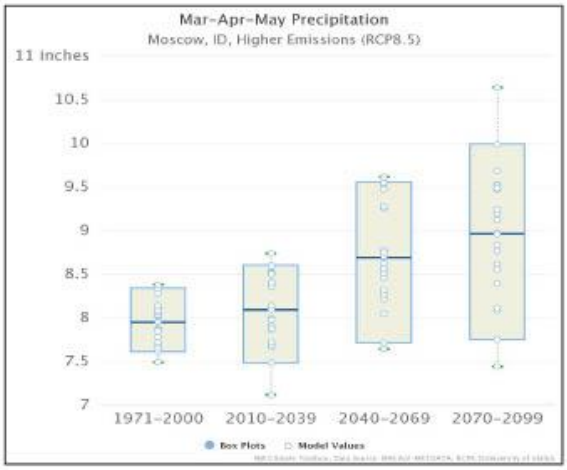
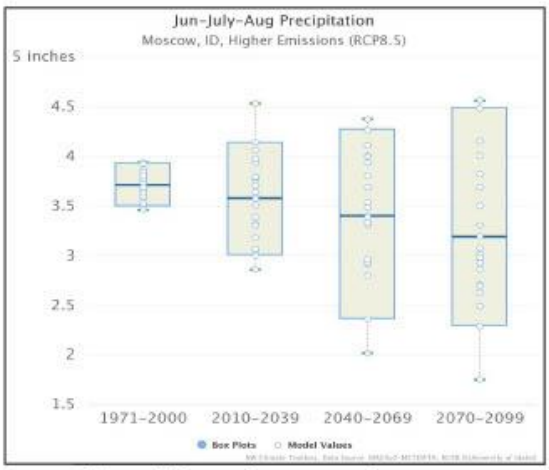


Figure 10. Projected annual precipitation for Moscow, ID, using the higher emissions scenario (RCP8.5). See Figure 2 for more details about box plots.







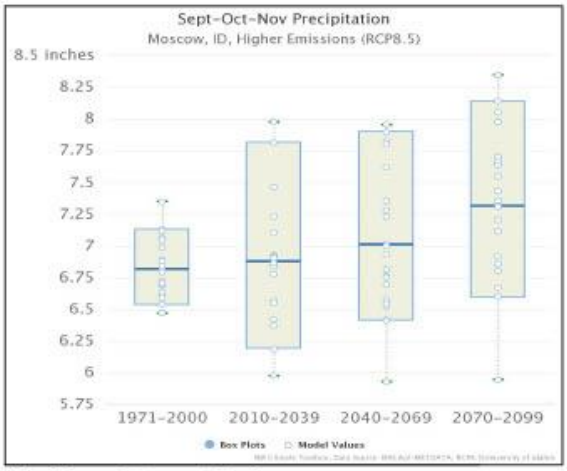


Figure 11. Projected precipitation for winter, spring, summer, and fall for Moscow, ID, using the higher emissions scenario (RCP8.5). See Figure 2 for more details about box plots.

Local Experiences with 2019 Flooding

by Al Poplawsky

I have lived in Moscow since 1988 and during that period have observed major flooding several times, with the worst occurring in 1996 - until last year.

These previous floods were classic "rain on snow" events which occurred when a "pineapple express" (warm rainstorm) came roaring into the region in the late winter with lots of snow on the ground. These events are very predictable and are generally forecast by the National Weather Service (NWS) several days in advance.

From 1988 until 2019 I had never heard of a flash flood in our region and I thought of these more in terms of the Southwest of our country. However, in 2019, we experienced the effects of two flash floods locally. The first, in April 2019, occurred with no snow on the ground.

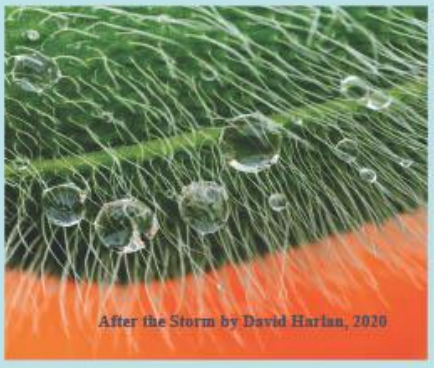
I walked at mid-afternoon in the driving rain from the UI Ag Science building a few blocks to the Sixth Street Greenhouse and noticed torrents of water running in the street gutters into the storm sewers. I was a bit confused. I am a weather nut and had just checked the NWS website which predicted showers but nothing major, and there were no warnings up.

After spending an hour at the greenhouse, I came out the door to return to the Ag Science building and was amazed by what I found. The pavement on Sixth Street and Stadium Way from the intersection to 20-30 yards in all directions was completely underwater! The storm sewers had been overwhelmed in a very short period of time. The NWS now had flood warnings up on their website.

When I rode my bike home an hour later water was up to the axles at the intersection of Sixth and Washington in downtown Moscow. There was also major flooding in north Moscow near North Main and D Streets, and east of Mountain View on D Street. In the latter location, several residents suffered major losses because they had no warning and thus no time to move their belongings to higher ground. In Pullman, Grand Avenue turned into Grand River.

There was a second, smaller flash flood just east of Moscow less than a month later, which deposited large quantities of mud on the Latah Trail. Neither of these floods had been predicted by the NWS because they were caused by unpredictable, intense rain events. These were the first such events I had ever experienced during 30 years in Moscow.

Flooding in Moscow by Randy Stuart, 2019



After the Storm by David Harlan, 2020

Snowpack

During the latter part of the 20th century, warming caused declines in snowpack and earlier snowpack melt across the western United States[7]. Moscow, Idaho shows similar trends: snow water equivalent (a measure of snowpack) at Idaho sites near Moscow decreased by 40-80% between 1955 and 2016[7].

In recent decades, as melting has occurred earlier, Idaho streamflow peaks associated with snowmelt have also come earlier. The volume of water has also been reduced[8,9]. Historically, the watersheds that are influenced by snowpack experience peak streamflow volume in June. During the 60 years between 1948 and 2008, the annual percentage of streamflow that occurs in June has decreased in northern Idaho watersheds by 1-15%[8]. This shift indicates that snowmelt is occurring earlier, that the amount of snowmelt is reduced and, as a result, there is less streamflow during summer. Projections also indicate reduced future winter (December-February) snowpack in Idaho, particularly at lower elevations, with more reductions associated with greater warming in later years[3]. As a result, summer streamflows near Moscow are projected to decrease by 20-40% by the 2040s under a moderate greenhouse gas emissions scenario[8].

Reduced snowpack can have consequences for fire season, agriculture, and winter recreation. For example, the length of the ski season in northern Idaho is projected to decrease by 50% or more by 2050[10].

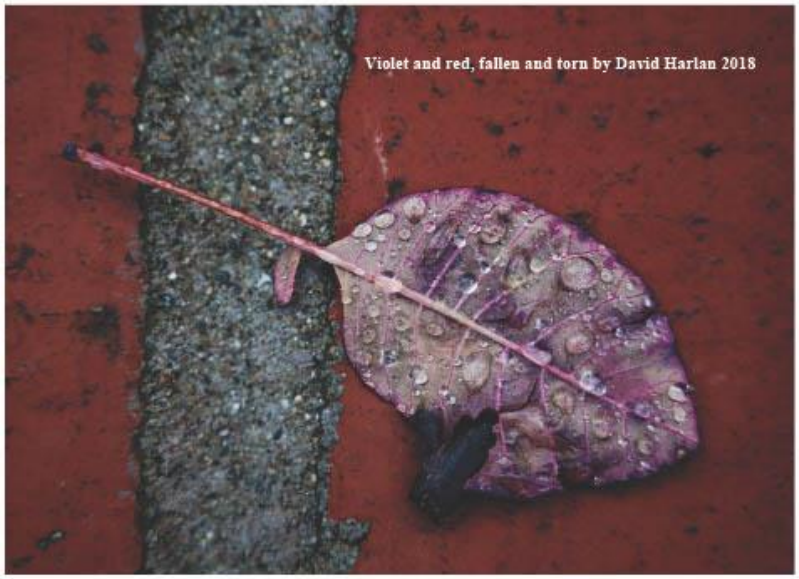
"Hello Walk", University of Idaho, by Kristin Haltinner, 2019

Streamflows in northern Idaho have decreased since the mid-1900s, and summer streamflows are expected to decrease 20-40% by the 2040s.

Snake River, by Kristin Haltinner 2016

Soil Moisture

Despite projections of increased precipitation in the winter, spring, and fall, summer soil moisture is expected to decrease[3] and annual water deficit (an indicator of plant stress) is expected to increase (Figure 12)[11] as a result of decreased summer precipitation and increased evaporation rates associated with higher projected temperatures. These increasingly drier conditions will have impacts on agriculture and fire seasons.



Water Quantity and Quality

As described above, observations and projections indicate reductions in snowpack amount, timing of spring runoff, and streamflow throughout the year. These alterations indicate the likelihood of significant impacts to fisheries and aquatic ecosystems, dam operations, hydropower, and farm irrigation. In addition, lower summer water flows and higher air temperatures will increase summer water temperature, and higher air temperatures will increase water temperature in lakes and streams. The last 50 years have brought a 1.5 ºF increase in water temperature for the North Fork of the Clearwater River[9]. Higher water temperature affects freshwater ecosystems, including fish, and increases the potential for harmful algae blooms[12].

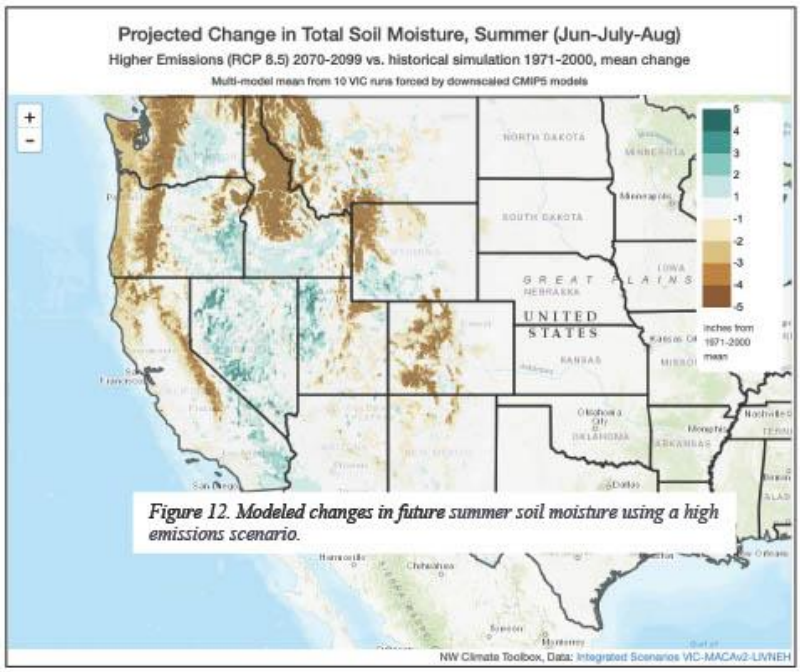


Figure 12. Modeled changes in future summer soil moisture using a high emissions scenario.

Wildfires

Over the past 30 years the western US has experienced a warming and drying climate that has led to a greater prevalence of dry fuel for forest fires and subsequent increase in area burned[13]. In the past 25 years, Idaho fire seasons have lengthened by 47 days[9].

The annual area burned is expected to increase by a factor of 10 by 2050.

The number of large fires has also increased in recent years. Across the Rocky Mountains, the number of large fires between 1984 and 2011 rose from less than 20 fires per year in the 1980s to more than 40 per year in the 2000s[3]. However, there was substantial variability from year to year.

Future projections indicate that forest fires will continue to increase throughout Idaho, including near Moscow. The annual area burned is expected to increase by a factor of 10 by 2050 (using a moderate greenhouse gas emissions scenario) with additional increases by 2100[14]. For Moscow, the number of extreme fire danger days is projected to double by 2050 from 11 to 22 (under the high emissions scenario; Figure 13)[4]. Increasing fire frequency and size will have significant negative impacts on the community. We will face additional losses related to infrastructure (structural damage), injury and deaths due to fire, the effects of reduced air quality from smoke on human health, economic costs of fire suppression, recreational land closures because of higher fire risk, and soil degradation and siltation of streams after burns.

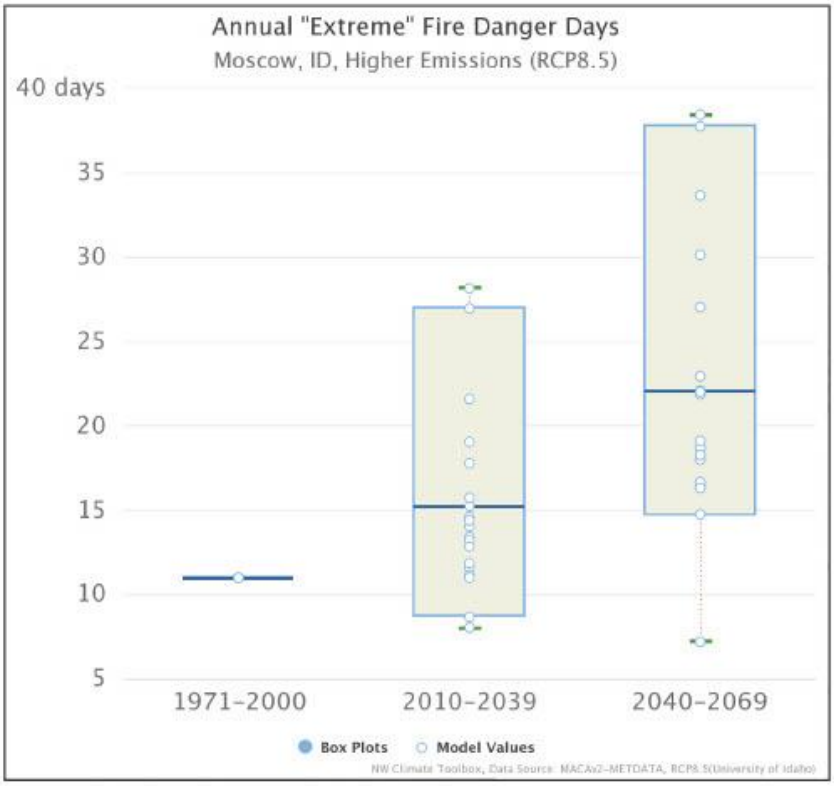


Figure 13. Modeled changes in future number of days with extreme fire danger using a high emissions scenario. See Figure 2 for more details about box plots.

Public Health

Climate change is expected to have profound impacts on public health.

First, the increase in wildfire activity is expected to cause a decrease in air quality. Decreased air quality is correlated with a rise in respiratory and cardiovascular illnesses[15]. Respiratory problems are also likely to increase as a result of increased ozone and pollen[8]. People with asthma or weakened immune systems, the very young, the very old, and those who lack health care are at greater risk of negative effects of poor air quality and therefore these impacts of climate change[15].

Second, the rising temperatures in the summer and increase in heat waves are likely to cause a rise in hyperthermia (overheating) and heat-related deaths throughout the region[8]. High air temperature is also correlated with cardiovascular illnesses, respiratory illnesses, kidney function, mental health, and premature childbirth[16]. These problems are exacerbated in the very young and the very old.

Projected warming is expected to lead to a reduction in cold-related mortality in Idaho that may outweigh the increase in heat-related deaths, possibly resulting in a reduction in overall climate-related human mortality[17]. However, this conclusion is subject to some uncertainty because of confounding factors such as humidity and air quality as well as inconsistent and underreported experiences with both hyperthermia and hypothermia[16].

Third, the rising water temperatures resulting from increased temperature and earlier snowmelt are expected to lead to an increase in water-borne illnesses. Two such illnesses of local concern are caused by *Cryptosporidium* and *Giardia*[18]. Surface water for human consumption is at risk for contamination as a result of pathogens or toxic algae blooms[18].

Fourth, vector-borne illnesses are expected to spread across the region as conditions warm, affecting the range and seasonal activity of insects, such as ticks, and other vectors[19]. The number of days that it is warm enough for disease carrying mosquitoes to survive, termed "disease danger days," increased from 113 to 126 in the Lewiston area between 1970 and 2017[20]. West Nile virus occurs in Idaho[21], and projections indicate an increased probability of the virus occurring as temperatures increase[22]. Studies of the responses of such diseases to increasing temperatures are unavailable for Moscow.

Local child at Moscow's Rural Fire Station by Kristin Haltinner, 2017

Agriculture and Food

Multiple impacts of climate change to agriculture could occur; however, detailed scientific understanding is currently incomplete. Generally, the impact on wheat farming is expected to be positive, with an increase in wheat yields projected as a result of CO_2 fertilization and warmer temperatures[17,23,24]. Yield increases are expected to plateau or yields to decline by the end of the century, depending on scenario and location[24]. For other crops, the impact of warmer temperatures and decreased soil water is likely to decrease growth[25]. Climate change will also lead to a change in the best locations for crops to grow. For example, higher temperatures may lead to an expanded area of conditions suitable for growing perennial crops such as almonds[26]. Carbon dioxide fertilization may lead to lower nutritional value for some crops important for human food[27].

Insects, pathogens, and weed pests may increase in response to climate change, thereby offsetting some projected yield increases[24].

Climate change is also projected to impact livestock. Domestic animal foraging may increase because of a longer grazing season and shorter period of winter feeding of animals[28,29]. However, hotter summers are expected to lead to greater heat stress of livestock, which reduces productivity[30].

Higher temperatures and precipitation changes will also impact local fish populations and fisheries. As temperatures rise, fish become stressed, leading to fish die-offs or poor migratory returns, which may impact recreational fishing and related tourism in the region.

Experience of Local Farmers by Ian Clark

As dryland farmers, we gamble on future favorable weather every time we put a crop in the ground.

Here in the Palouse, we have been very fortunate to live in a relatively stable climate which has been excellent for producing grains, legumes and other crops. Climate change threatens this stability and the crops that depend on it.

An increase in unstable and volatile weather (which is predicted for this area) has the potential to devastate the current farm economy as we know it. Extreme weather events such as drought, flooding, temperature swings, heat, or hail can ruin a crop overnight.

Winter wheat, the backbone of dryland PNW ag, takes over 10 months from seeding to harvest. This means that for over 80% of the year our wheat is susceptible to extreme weather.

Adaptation and resilience is a necessity as things are always changing but climate change has the potential to strain local farmers past what they are capable of.

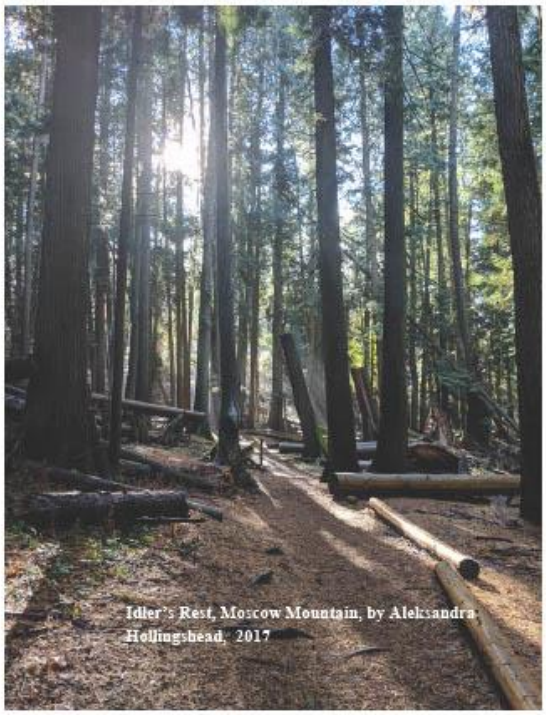
The existence of a changing climate is not what we should be asking in agriculture, it is are we ready, willing, and able to adapt quick enough to continue to make a living farming on the Palouse.

Ian Clark

Photo courtesy of Ian Clark

Forestry

Idaho has 20.5 million acres of federally designated forest land, covering about 40% of the state[31]. Climate change is expected to impact forests in our region. Tree species that have adapted to lower-elevation and moisture-limited landscapes, such as Douglas-fir or ponderosa pine, will be stressed more by warming[32]. Higher-elevation spruce and larch may be eliminated from many landscapes as conditions become too warm or dry[33]. Forests are also threatened by an increasing likelihood of forest fires.



Idler's Rest, Moscow Mountain, by Aleksandra Hollingshead, 2017

Forests are also expected to be impacted by an increase in insects and pathogens. Tree mortality from bark beetles has already resulted in a loss of 1.5 million acres of trees in the last several decades[34]. Bark beetles thrive in warmer, drier climates as do some forest pathogens[35-38], and as a result, bark beetle outbreaks are expected to increase with warming[35].

As a result of a changing climate, Idaho is likely to experience shifts to non-forest vegetation types (e.g., shrublands) where hotter, drier conditions can no longer support forest vegetation[33]. Projections also indicate that southern Idaho will see the expansion of deserts and the northern part of the state may experience the loss of forests[33].

Sunset in Moscow by Kristin Haltinner, 2020

Economic Impacts

Economic impacts of climate change are difficult to predict. The results presented here are incomplete and subject to some uncertainty. A forthcoming report by the University of Idaho McClure Center will describe the economic impacts of climate change throughout Idaho in greater detail[39].

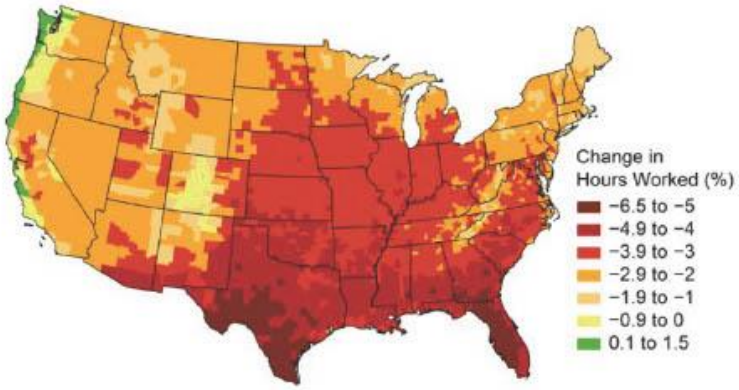


Figure 15. Percent change in hours worked in 2090 in response to projected warming using a higher emissions scenarion (RPC8.5) for high-risk industries only (which are defined as agriculture, forestry, and fishing; hunting, mining, and construction; manufacturing, transportation, and utilities). Source: USGCRP, 2018.

Overall, climate change is expected to have a negative impact on global and US economies. Increased costs are projected to cover damaged infrastructure, property loss, loss of work/labor (Figure 15), and community vitality. Because Idaho's economy relies on natural resources (Figure 16), job loss and financial loss from sales may impact the state. Additionally, costs associated with meeting increased energy demands (i.e., cooling), wildfires, and public health crises will impact local communities[25]. Crime rates may also increase[17]. Other studies suggest that costs of energy and cold-related mortality will be reduced[17].

Figure 16. Natural resources are a key part of Idaho's economy. Sales for agriculture, forestry, and fisheries sectors based on 2015 data. Source: USDA Forest Service and Boise State University and USGCRP, 2018.

There is some indication that climate change will positively impact crop production in Idaho for several decades into the future[17,23,24]. However, other climate change effects including increased pests and reduced summer streamflow and irrigation[25] were not included in these studies. Warming may decrease livestock productivity[25].

Other potential expenses, for which there is little data for analysis, include replacing infrastructure as a result of destructive fires or floods, flood cleanup, and managing the waste-water system in light of regional, seasonal floods. These findings will be clarified in the McClure Center Report scheduled for release in 2021.

Additional Resources

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Appendix C

ICLEI Race to Zero Commitment Form

ICLEI150 COMMITMENT FORM

I have read the information below about the ICLEI150 and the Race to Zero commitment and I understand all that is expected of me, my staff, and ICLEI USA. By signing below, I agree to participate and to allow ICLEI to publish our commitment, target, and actions on the ICLEI USA website and to report this information to the global Cities Race to Zero platform.

I pledge to join the ICLEI150 on the Race to Zero on behalf of _____, _____.
(name of city/county)
(name of state)

Race To Zero is a global campaign (established June 2020) of the United Nations' Climate Champions to rally leadership and support from businesses, cities, regions, investors for a healthy, resilient, zero-carbon recovery that prevents future threats, creates decent jobs, and unlocks inclusive, sustainable growth.

ICLEI's Climate Neutrality Framework provides a framework to engage with the Race to Zero, and calls for the necessary level of ambition and daring leadership to keep global temperature rise below the 1.5°C goal of the Paris Agreement and to put climate action at the center of all urban decision-making, taking full advantage of ICLEI's five development pathways: low-emissions, resilient, circular, nature-based, and people-centered / equitable. The Climate Neutrality framework directs our work with you as an ICLEI member.

The "ICLEI150" represents a movement of 150 local governments across the ICLEI USA network that are stepping up to join the Cities Race to Zero to cut global emissions in half by 2030 and to zero by 2050.

The ICLEI150 communities in the Race to Zero participants will:

1. **Pledge**: at the head-of-organization level to get to zero greenhouse gas emissions as soon as possible and by 2050 at the latest. Set a 2030 interim target reflecting maximum fair share effort to reach 50% global CO2 reductions.
2. **Plan**: the actions necessary to achieve both the 2030 and 2050 targets within 12 months of joining.
3. **Proceed**: with high-impact action to achieve the targets during 2021
4. **Publish**: report Race to Zero actions by 2022

ICLEI USA will provide ICLEI150 leaders and communities with:

- Your community's 2030 Science-Based Target, putting you on a path to climate neutrality by 2050.
- Community-specific high-impact actions to meet the 2030 target.
- Technical assistance to proceed with one or more high-impact actions during 2021.
- Personalized support package, pairing ICLEI's resources with your community's goals.
- Reporting your commitment and actions to the global Race to Zero platform. (Targets are reported via the CDP-ICLEI Unified Reporting Platform).
- National and international recognition for your ambition and action from ICLEI USA and ICLEI World Secretariat.
- Provide opportunities to speak about and share your community's Race to Zero ambition.

As a leader joining the Cities Race to Zero, I endorse the following principles:

1. We recognize the global climate emergency.
2. We are committed to keeping global heating below the 1.5°Celsius goal of the Paris Agreement.
3. We are committed to putting inclusive climate action at the center of all urban decision-making, to create thriving and equitable communities for everyone.
4. We invite our partners – political leaders, CEOs, trade unions, investors, and civil society – to join us in recognizing the global climate emergency and help us deliver on science-based action to overcome it.

As an ICLEI150 Leader, I will:

- **Commit my staff to work with ICLEI** to develop our "member journey" of technical and implementation aspects of the Race to Zero.
- **Spend 15 minutes each month** amplifying the Race to Zero movement within their community, with other elected officials, and at national and international forums.
- **Provide a 1- to 2-minute video** highlighting specific examples of what they are doing or planning to do to equitably reduce GHG emissions and why they are excited to be an ICLEI 150 leader in the Race to Zero. Submit Here within 30 days or email to sarah.ditton@iclei.org.
- **Provide a statement** about why the Race to Zero initiative is important to me and my community (in the box below). Please include a link to a portrait or include an attachment in your submission email. This will be used on the ICLEI USA website and social media to highlight your ambition.

I anticipate my community will need ICLEI's assistance to complete the following steps of the Race to Zero:

- ❑ A declaration of a climate emergency and/or a commitment to climate neutrality
- ❑ A Science-Based Target
- ❑ Planning and implementing at least one inclusive and equitable climate action
- ❑ Reporting progress
- ❑ Unsure. I need ICLEI technical advisors to help create my plan.

Elected Official Signature

Date

Appendix D

iTree Canopy Reports

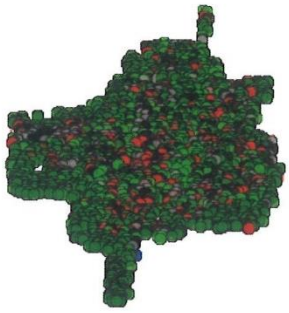
Community Report

City Operations Report

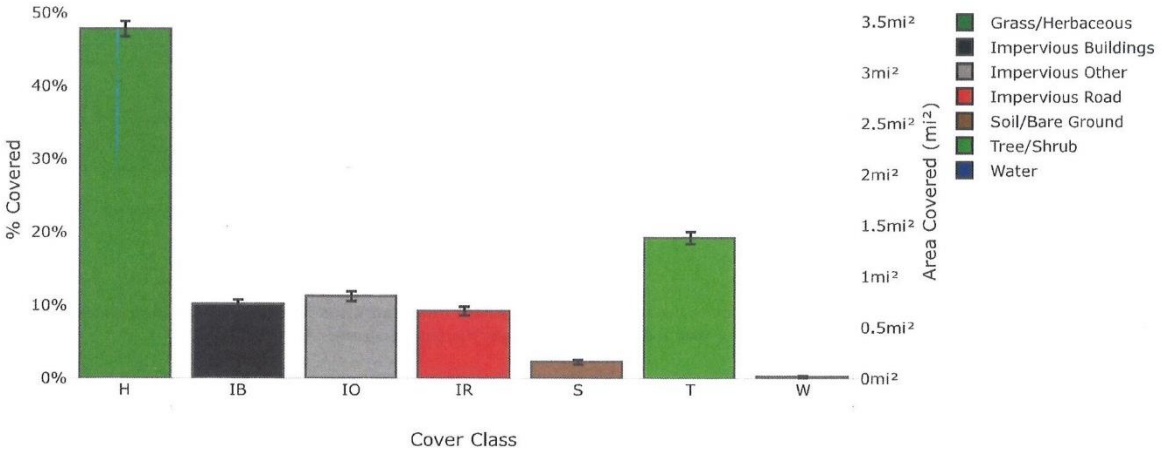
i-Tree Canopy v7.1

Cover Assessment and Tree Benefits Report

Estimated using random sampling statistics on 9/2/2021



Land Cover



Abbr.	Cover Class	Description	Points	% Cover ± SE	Area (mi^2) ± SE
H	Grass/Herbaceous		1098	47.80 ± 1.04	3.43 ± 0.07
IB	Impervious Buildings		233	10.14 ± 0.63	0.73 ± 0.05
IO	Impervious Other		258	11.23 ± 0.66	0.81 ± 0.05
IR	Impervious Road		211	9.19 ± 0.60	0.66 ± 0.04
S	Soil/Bare Ground		51	2.22 ± 0.31	0.16 ± 0.02
T	Tree/Shrub		441	19.20 ± 0.82	1.38 ± 0.06
W	Water		5	0.22 ± 0.10	0.02 ± 0.01
Total			**2297**	**100.00**	**7.18**

Tree Benefit Estimates: Carbon (English units)

Description	Carbon (T)	±SE	CO_2 Equiv. (T)	±SE	Value (USD)	±SE
Sequestered annually in trees	724.41	±31.01	2,656.17	±113.70	$123,549	±5,288
Stored in trees (Note: this benefit is not an annual rate)	30,255.14	±1,295.06	110,935.51	±4,748.54	$5,160,036	±220,873

Currency is in USD and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Amount sequestered is based on 525.315 T of Carbon, or 1926.155 T of CO_2, per mi^2/yr and rounded. Amount stored is based on 21939.921 T of Carbon, or 80446.378 T of CO_2, per mi^2 and rounded. Value (USD) is based on $170.55/T of Carbon, or $46.51/T of CO_2 and rounded. (English units: T = tons (2,000 pounds), mi^2 = square miles)

Tree Benefit Estimates: Air Pollution (English units)

Abbr.	Description	Amount (lb)	±SE	Value (USD)	±SE
CO	Carbon Monoxide removed annually	717.07	±30.69	$9	±0
NO2	Nitrogen Dioxide removed annually	1,170.53	±50.10	$2	±0
O3	Ozone removed annually	32,379.83	±1,386.00	$296	±13
SO2	Sulfur Dioxide removed annually	663.95	±28.42	$0	±0
PM2.5	Particulate Matter less than 2.5 microns removed annually	7,910.99	±338.63	$3,581	±153
PM10*	Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	11,860.53	±507.68	$720	±31
Total		**54,702.91**	**±2,341.53**	**$4,608**	**±197**

Currency is in USD and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Air Pollution Estimates are based on these values in lb/mi^2/yr @ $/lb/yr and rounded:
CO 519.994 @ $0.01 | NO2 848.829 @ $0.00 | O3 23,480.666 @ $0.01 | SO2 481.471 @ $0.00 | PM2.5 5,736.762 @ $0.45 | PM10* 8,600.826 @ $0.06 (English units: lb = pounds, mi^2 = square miles)

Tree Benefit Estimates: Hydrological (English units)

Abbr.	Benefit	Amount (Kgal)	±SE	Value (USD)	±SE
AVRO	Avoided Runoff	285.46	±12.22	$2,551	±109
E	Evaporation	92,624.52	±3,964.74	N/A	N/A
I	Interception	93,625.87	±4,007.61	N/A	N/A
T	Transpiration	60,172.49	±2,575.65	N/A	N/A
PE	Potential Evaporation	494,785.38	±21,179.03	N/A	N/A
PET	Potential Evapotranspiration	419,450.44	±17,954.36	N/A	N/A

Currency is in USD and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Hydrological Estimates are based on these values in Kgal/mi^2/yr @ $/Kgal/yr and rounded:
AVRO 207.007 @ $8.94 | E 67,167.914 @ N/A | I 67,894.054 @ N/A | T 43,634.892 @ N/A | PE 358,800.263 @ N/A | PET 304,170.121 @ N/A (English units: Kgal = thousands of gallons, mi^2 = square miles)

About i-Tree Canopy

The concept and prototype of this program were developed by David J. Nowak, Jeffery T. Walton, and Eric J. Greenfield (USDA Forest Service). The current version of this program was developed and adapted to i-Tree by David Ellingsworth, Mike Binkley, and Scott Maco (The Davey Tree Expert Company)

Limitations of i-Tree Canopy

The accuracy of the analysis depends upon the ability of the user to correctly classify each point into its correct class. As the number of points increase, the precision of the estimate will increase as the standard error of the estimate will decrease. If too few points are classified, the standard error will be too high to have any real certainty of the estimate.

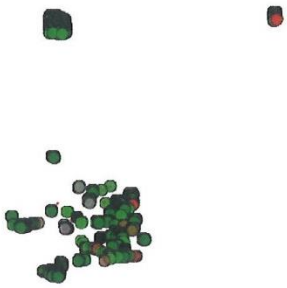
Additional support provided by:

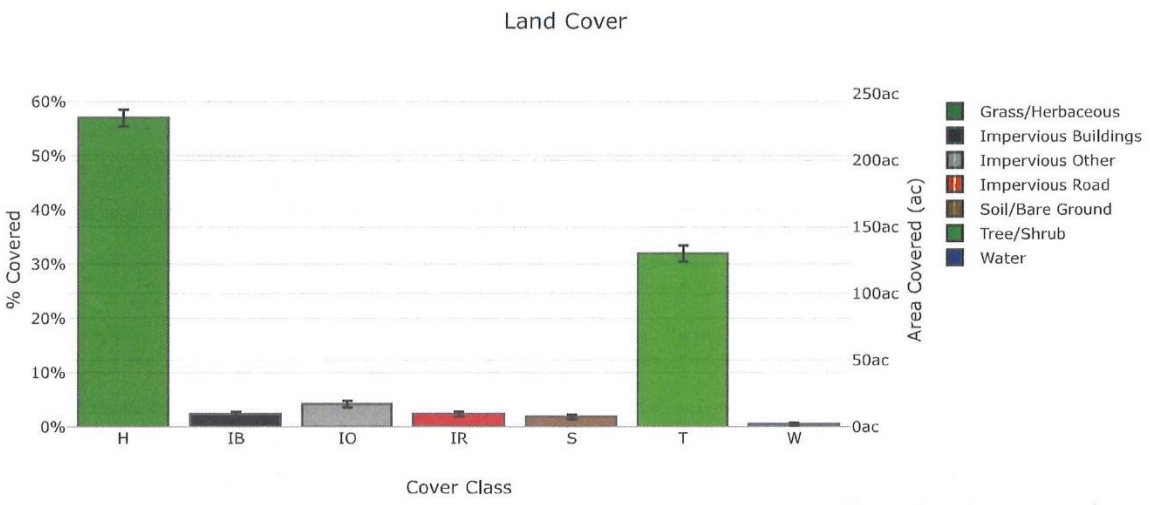
Use of this tool indicates acceptance of the EULA.

i-Tree Canopy v7.1

Cover Assessment and Tree Benefits Report

Estimated using random sampling statistics on 7/12/2021





Abbr.	Cover Class	Description	Points	% Cover ± SE	Area (ac) ± SE
H	Grass/Herbaceous		571	56.99 ± 1.56	231.88 ± 6.36
IB	Impervious Buildings		23	2.30 ± 0.47	9.34 ± 1.93
IO	Impervious Other		42	4.19 ± 0.63	17.06 ± 2.58
IR	Impervious Road		23	2.30 ± 0.47	9.34 ± 1.93
S	Soil/Bare Ground		18	1.80 ± 0.42	7.31 ± 1.71
T	Tree/Shrub		320	31.94 ± 1.47	129.95 ± 5.99
W	Water		5	0.50 ± 0.22	2.03 ± 0.91
Total			**1002**	**100.00**	**406.90**

Tree Benefit Estimates: Carbon (English units)

Description	Carbon (T)	±SE	CO_2 Equiv. (T)	±SE	Value (USD)	±SE
Sequestered annually in trees	106.66	±4.92	391.10	±18.04	$18,191	±839
Stored in trees (Note: this benefit is not an annual rate)	4,454.79	±205.45	16,334.22	±753.32	$759,767	±35,040

Currency is in USD and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Amount sequestered is based on 0.821 T of Carbon, or 3.010 T of CO_2, per ac/yr and rounded. Amount stored is based on 34.281 T of Carbon, or 125.697 T of CO_2, per ac and rounded. Value (USD) is based on $170.55/T of Carbon, or $46.51/T of CO_2 and rounded. (English units: T = tons (2,000 pounds), ac = acres)

Tree Benefit Estimates: Air Pollution (English units)

Abbr.	Description	Amount (lb)	±SE	Value (USD)	±SE
CO	Carbon Monoxide removed annually	105.58	±4.87	$1	±0
NO2	Nitrogen Dioxide removed annually	172.35	±7.95	$0	±0
O3	Ozone removed annually	4,767.63	±219.88	$44	±2
SO2	Sulfur Dioxide removed annually	97.76	±4.51	$0	±0
PM2.5	Particulate Matter less than 2.5 microns removed annually	1,164.82	±53.72	$527	±24
PM10*	Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	1,746.35	±80.54	$106	±5
Total		**8,054.49**	**±371.47**	**$678**	**±31**

Currency is in USD and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Air Pollution Estimates are based on these values in lb/ac/yr @ $/lb/yr and rounded:
CO 0.812 @ $0.01 | NO2 1.326 @ $0.00 | O3 36.689 @ $0.01 | SO2 0.752 @ $0.00 | PM2.5 8.964 @ $0.45 | PM10* 13.439 @ $0.06 (English units: lb = pounds, ac = acres)

Tree Benefit Estimates: Hydrological (English units)

Abbr.	Benefit	Amount (Kgal)	±SE	Value (USD)	±SE
AVRO	Avoided Runoff	42.03	±1.94	$376	±17
E	Evaporation	13,638.10	±628.98	N/A	N/A
I	Interception	13,785.54	±635.78	N/A	N/A
T	Transpiration	8,859.84	±408.61	N/A	N/A
PE	Potential Evaporation	72,852.54	±3,359.91	N/A	N/A
PET	Potential Evapotranspiration	61,760.17	±2,848.34	N/A	N/A

Currency is in USD and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Hydrological Estimates are based on these values in Kgal/ac/yr @ $/Kgal/yr and rounded:
AVRO 0.323 @ $8.94 | E 104.950 @ N/A | I 106.084 @ N/A | T 68.180 @ N/A | PE 560.625 @ N/A | PET 475.266 @ N/A (English units: Kgal = thousands of gallons, ac = acres)

About i-Tree Canopy

The concept and prototype of this program were developed by David J. Nowak, Jeffery T. Walton, and Eric J. Greenfield (USDA Forest Service). The current version of this program was developed and adapted to i-Tree by David Ellingsworth, Mike Binkley, and Scott Maco (The Davey Tree Expert Company)

Limitations of i-Tree Canopy

The accuracy of the analysis depends upon the ability of the user to correctly classify each point into its correct class. As the number of points increase, the precision of the estimate will increase as the standard error of the estimate will decrease. If too few points are classified, the standard error will be too high to have any real certainty of the estimate.

Additional support provided by:

Use of this tool indicates acceptance of the EULA.