Session #	Session Title	The purpose and scientific content of the session
1	General Soil Science	Abstracts that do not fit into any of the proposed sessions can be submitted here
2	Data Science, Modelling and AI in Soil Science	The purpose of the session is to provide a platform to share contemporary research in advancing soil science for sustainable development, using modern data science, modelling, and artificial intelligence (AI). We invite presentations and posters on the application of big data analytics, mathematical and statistical modelling, machine learning and deep learning in, but not limited to, pedology, soil physics, biogeochemistry, hydrology, nutrient cycling, greenhouse gas emission, and agronomic and forest soil management.
3	Soil Data Curation	This session calls for coordinated effort to harmonize soil data to tackle soil data scarcity by bridging technological and data governance issues. Soil data is at the heart of analyzing different complex trends and variabilities over time and space to make informed decisions, especially in the current AI-powered digital era. However, scarcity of field observations and soil data remain significant barriers against unleashing our understanding of the past and future trends of soil resources to the fullest. Concurrently, countless soil data are available, but mostly in a disintegrated manner in ad hoc databases across Canada.
4	Soil Taxonomy and Pedology	The Canadian System of Soil Classification (CSSC) was last updated in 1998, managed largely by AAFC. Federal expertise in soil classification has declined significantly, coinciding with increased activity in the private sector. With this shift, the process for updating the CSSC has become unclear. The Pedology Committee of the CSSS is actively working towards an updated version of the CSSC, and this session will provide the opportunity for pedologists to develop technical presentations that outline proposed changes to our taxonomic system. Advances in morphometrics, specifically proximal sensing for soil horizon delineation, morphological descriptions, and prediction of soil properties is encouraged.
5	Advances in Predictive Digital Soil Mapping	Technological advances have transformed our methods for mapping, modelling, and visualization of soils over multiple spatial and temporal scales. Predictive digital soil mapping (PDSM) has been an emerging field of research in Canada over the past decade. Key issues in PDSM may include the development and assessment of spatial sampling techniques; the acquisition of soil-environmental data layers; the application of remote and proximal sensing techniques; the applications of machine-learning; the use of PDSM products to perform soil assessments; and other related topics. This session facilitates the dissemination of PDSM activities across Canada and promotes this subfield of discipline.

6	Advances in Soil Sensing	Soil Sensing is a multidisciplinary area of study that aims to develop field or laboratory-based techniques for fast, cheap, and easy measurement of soil properties over traditional soil measurements. Various principles (e.g., electromagnetic, electrochemical, optical, radar, etc.) have showed promise to measure multiple soil properties and various platforms (e.g., proximal, aerial, remote) have been used to collect soil data. The session solicits contributions highlighting the design, development and use of the state-of-the-art soil sensing technologies for rapid in-situ and ex-situ measurement, calibration of sensors, modern statistical methods for analyzing soil sensor data, methods for multi-sensor data fusion, optimizing soil sampling and fine resolution digital soil mapping using sensor data. Session invites both oral and poster contributions and it is open to students competing for awards.
7	Nature's Tracking Devices - Stable Isotopes in Soil Research	Stable isotopes are an essential research tool in soil science; they are nature's tracking devices used to study a vast array of processes that are almost impossible to disentangle by any other analytical approach. With access to increasingly reliable, portable, and easy to use equipment, the application of stable isotopes and isotopomers in soil science is more prevalent. This session will focus on the use of stable isotope approaches and techniques to better understand nutrient and carbon dynamics. If you are doing something weird and wonderful, we invite you to come and share with us!
8	Advances in Material Synthesis for Soil Remediation	Anthropogenic activities such as electronic waste burning, mining, smelting and the use of chemicals in agriculture have polluted huge areas of arable lands across the world. In such lands, soil fertility and crop productivity are reduced mainly due to oxidative stress posed by increased concentrations of potentially toxic elements and organic contaminants. One way to reclaim such soils is to apply novel soil conditioners synthesized from biomass or produced from industrial processes. This session welcomes abstracts on the advances in material synthesis for soil remediation. Such materials include, but are not limited to, biochars, composts, hydrochars, nano humus and wollastonite.
9	General Land Reclamation Session	Human activities have caused the degradation of a large land base requiring reclamation to either its original or an equivalent alternate state supporting desired functions. Reclamation of disturbed lands may either result in the establishment of anthroposols or the ecosystem's natural recovery, which can support the target end land-use. This session aims to concentrate presentations with a land reclamation-related focus. Presentations (oral, poster) are welcome for discussion in several topics, including but not limited to the following: 1) reclamation monitoring (short- and longterm) 2) ecosystem revegetation and establishment, 3) wetlands, 4) mining, 5) renewable energy and infrastructure, 6) phytoremediation, 7) landform design, and 8) regulatory/stakeholder
10	The Good, the Bad, and the Ugly: Integrating Technology in the Field, Lab and/or Classroom	New technology is increasing the variety of tools at our disposal for teaching, learning, research, and professional practice. From the use of drones in the field to soil colour apps in the lab or 3D virtual tours for self-guided learning activities, integrating current and new technology with trusted soil science tools like the Munsell colour book and shovel presents opportunities and challenges. It is great when it works, but sometimes it doesn't. We invite you to share your experiences introducing technology into your courses. What was good, what was bad, and/or what was down-right ugly?

11	Soil Properties in Nutrient and Water Transport in the Vadose Zone	We can measure water outflow or model water drainage from input, but the mystery remains of how soil characteristics, and their functions and processes affect the flow of water and subsequently nutrients through soil. With the understanding of soil aggregates becoming clearer, we can now postulate about the role of soil biology, physics and chemistry in the movement of chemicals through the soil profile. We welcome your enlightenment on these issues from the micro-scale to the watershed scale, and from the soil science perspective into investigations in the unclassified area at the boundaries of soils, ground water hydrology, and hydrogeology.
12	Soil Fertility and Nutrient Management for Sustainable Crop Production	Sustainable crop production is highly dependent upon the soils ability to supply nutrients and nutrient management for crop growth, development, and yield. Crop response and agronomic nutrient management optimization of nutrient sources such as fertilizers, manure and crop residues are dependent upon crop nutrient needs and highly influenced by soil properties such soil test nutrient levels; soil chemistry (pH and salinity); soil physical properties (soil-water relations); soil microbiology (soil nutrient availability cycling); climate; crop species; and economics. This secession will include soil fertility research and nutrient management optimization of various nutrient sources, management strategies, and new technologies.
13	Soil Fertility and Nutrient Management to Mitigate the Impact on Water Quality	Successful crop production depends on an adequate supply of nutrients to the crops to achieve optimum yield. Nutrients need to be managed to meet the nutrient requirements of crops without adversely affecting the quality of water resources. Often the run-off and leaching from agricultural fields and municipal wastewaters, results in nutrients (phosphorus and nitrogen) finding their way into aquatic ecosystems. High levels can cause eutrophication and impairment due to the over-production of algae. This secession will include soil fertility research and nutrient management optimization of various nutrient sources, management strategies, and new technologies to minimize the risks to water quality.
14	Soil Science for Precision Agriculture – Opportunities and Challenges	Precision agriculture takes advantage of field variability including soils and topography to guide variable rate control of inputs of matching strategic nutrient application to site-specific field conditions. It has the potential to improve crop production and nutrient use, and minimize nutrient losses or excessive accumulation in areas of the field, which can create environmental risks. Precision agriculture is the result of geographic positioning systems (GPS), improved computer power and software, development of soil and crop sensors and equipment with precision application control, e.g. variable rate fertilizer and irrigation systems. This secession will include soil research and input management optimization of various nutrient sources, irrigation, and new technologies to minimize environmental risks and optimize crop productivity.

15	Beyond Soil Test P: Phosphorus Biogeochemistry in Canadian Soils	Legacy phosphorus (P) in agricultural soils is a valuable source of P for sustainable crop production, but can also impede surface water quality. Novel research that integrates inorganic P (Pi) and organic P (Po) dynamics is needed to improve our understanding of the contribution of legacy P to plant-soil-water systems, as this knowledge could reduce unneeded P inputs to cropland, decrease in P loss risk, and increase P use efficiency. This session solicits oral papers and posters that address various aspects of how changes in Pi and Po affect legacy P in soils and the effects on aquatic systems, including but not limited to the fate, transport, reactivity, bioavailability, speciation, risk assessment, and role in crop nutrition/aquatic ecology.
16	Greenhouse Gas Emissions from Agricultural Soils	Agriculture accounts for approximately 8% of Canada's greenhouse gas (GHG) emissions, with about 45% of those emissions coming from soils; primarily as nitrous oxide (N_2O) from application of nitrogen fertilizers. Soil GHG emissions are simultaneously affected by a number of environmental drivers and management activities creating high variability in agroecosystems. This session will bring together researchers, using empirical and modeling studies, at plot, field and landscape scale to present and discuss their work on improving our understanding of GHG fluxes and how these can be mitigated. The session will focus on N_2O, however studies on other GHG are also welcome.
17	Canada's National Inventory Reporting of Greenhouse Gases: Meeting Target Reductions Rests on Sound Emission Estimates	Canada targets to reduce fertilizer-related emissions of nitrous oxide (N_2O) from agricultural soils by 30% by 2030. National inventory reporting of emissions and reductions are currently accounted using a Tier II Canada-specific method first introduced by Rochette et al. (2008) that uses nitrogen rates, the fraction of applied N emitted as N_2O (EF_{reg}) at a regional level with modification of precipitation to potential evapotranspiration to ecodistrict level, with texture, topography, and irrigation as modifiers. Since the introduction of Tier II methodology, our understanding of fertilizer emissions has greatly improved. Numerous studies have shown that not only does managing the rate of fertilizer nitrogen affect emissions, but so does source or nitrogen product, the timing of application, and placement of fertilizer. A framework for managing soil fertility and reducing N_2O emissions has emerged called 4R Nutrient Stewardship. This session will focus on the current understanding of 4R and other practices affecting N_2O emissions from fertilizers, how the national inventory reporting can include beneficial management practices, and brainstorm how Canada can achieve a Tier III or field-specific reporting methodology. The session will include oral and poster presentations. Let your expertise and imagination soar and contribute to this session.

18	Fostering Soil Carbon Sequestration and Protection: Advances in Our Understanding and the Practical Implications	Our evolving understanding of soil organic carbon forms, protection mechanisms, and the relative contributions of various sources has important implications for carbon sequestration initiatives. Environmental change and management can affect organic carbon storage in both surface and deep soil, in some cases leading to rapid decomposition and subsequent release of greenhouse gases. Through further study of the subsoil and advances in techniques investigating both chemical and physical protection of soil organic carbon, we can help prioritize carbon sequestration initiatives, as well as constrain soil biogeochemical models and, by extension, climate models. This session will explore topics including advances in our understanding of soil organic carbon forms, protection mechanisms, and sources, as well as their practical implications.
19	Soil and Water Conservation in the Face of Climate Change	Soil and water conservation are critical to maintaining agricultural sustainability in the face of climate change. Strategies to enhance crop production and protect the environment are important locally and at the global scale. Ensuring future resiliency and sustainability of our soil and water resources will require knowledge to anticipate how management practices will perform with changing climate. This session will explore the applications, opportunities and challenges of management practices to protect our precious soil and water resources.
20	Soil and Plant Microbiomes	Microbes are important to soil fertility and to nutrient and carbon cycling. Bacteria, fungi, and mycorrhizas, among other soil denizens shape soil health and crop productivity impacting soil aggregate stability, symbiotic plant interactions, and soil carbon sequestration. Developments in our understanding of soil microbial ecology are key to building sustainable and resilient agriculture. We invite presentations of original research on the soil microbiome and plant-microbe interactions including rhizosphere interactions and the plant microbiome.
21	Soil Structure and Soil Health	This session addresses research that examines the impact that soil structure has on agricultural soil health. The emphasis is on crop production systems that benefit from improved physical properties of soil affecting structure and characteristics such as infiltration and aeration, surface roughness, resistance and penetration, and so on. Both field- and laboratory-based studies are welcome, especially quantitative techniques, as well as research employing novel and innovative approaches.