NAV Drone Viewer version 3.6

User Manual

Doc: v. 3.0 - en - original instructions

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1 Preface

1.1 Intended audience

This User Manual is intended for anyone who intends to use NAV Drone Viewer to visualize Canadian domestic airspace and data relevant to Visual Line of Sight Operations (VLOS).

The objective of this User Manual is to help the reader understand how to use the functionalities offered by NAV Drone Viewer to visualize Canadian domestic airspace and data relevant to VLOS.

Basic familiarity with your PC platform and a supported web browser are the only prerequisites for understanding the information presented in this User Manual.

1.2 Supported software

The following web browsers are supported:

- Evergreen i.e. auto-updating browsers such as Microsoft Edge (current version and two versions back), Mozilla Firefox (current version and two versions back with major patches applied), and Google Chrome (current version and two versions back).
- Apple Safari (current version and one version back).
- Opera (current version and two versions back).

Visiting the NAV Drone Viewer website using Microsoft Internet Explorer is not supported. Please use one of the browsers listed above.

1.3 Document structure

Each chapter describes concepts and procedures to assist you in using the NAV Drone Viewer web application.

- Chapter 1: Introduction
- Chapter 2: NAV Drone Viewer
- Chapter 3: Glossary

1.4 Reader's comments

NAV CANADA welcomes your comments on this User Manual. Provide your comments at navdrone@navcanada.ca.

1.5 Disclaimer

- Illustrations shown in this User Manual may differ from the actual product.
- In some cases, there is more than one way to perform an action in the application. In the context of this User Manual not all alternatives are being described.
- The product features available to you depend on your configuration, as well as to your role and responsibilities. Therefore, you may not have access to all functionalities described in this User Manual.

2 Introduction

NAV Drone consists of the following applications:

- The NAV Drone Viewer: accessible at https://map.navdrone.ca.
- The NAV Drone Web: accessible at https://portal.navdrone.ca.
- The NAV Drone Mobile App: available for both Apple iOS and Google Android.

NAV Drone Viewer is a web application which displays Canadian domestic airspace and data relevant to VLOS.

Together, the NAV Drone Web and the NAV Drone Mobile App offer a complete and user-friendly solution for recreational and professional drone pilots, drone operators and drone crew members.

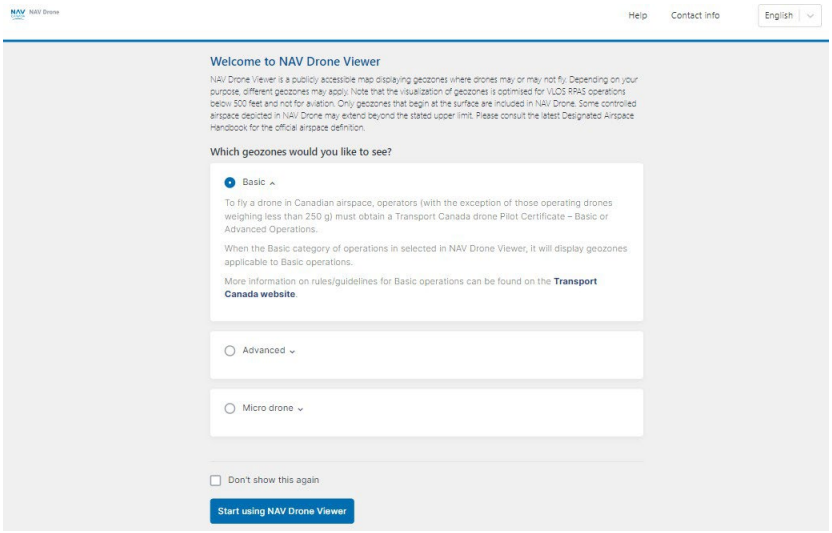
This user guide focuses on how to use the NAV Drone Viewer.

3 NAV Drone Viewer

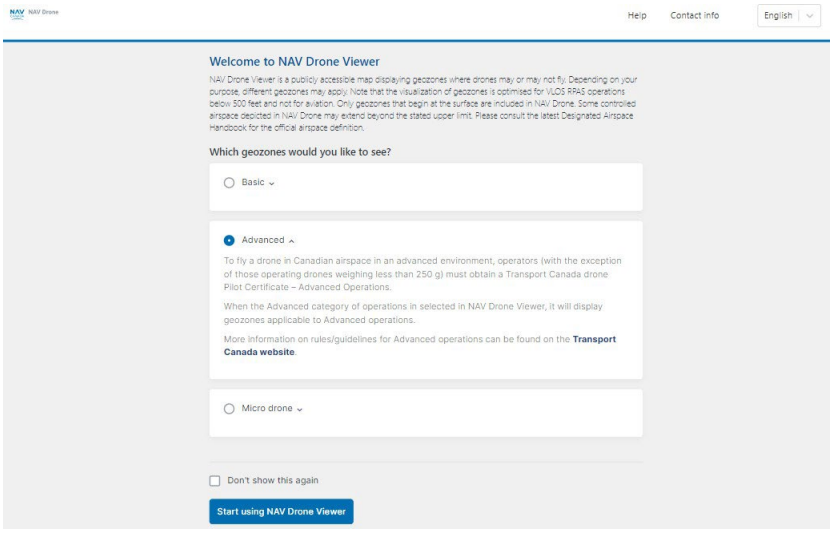
3.1 Open NAV Drone Viewer

Start your browser and open the NAV Drone Viewer (https://map.navdrone.ca). When opening NAV Drone Viewer, the *Welcome* screen offers a choice between three options:

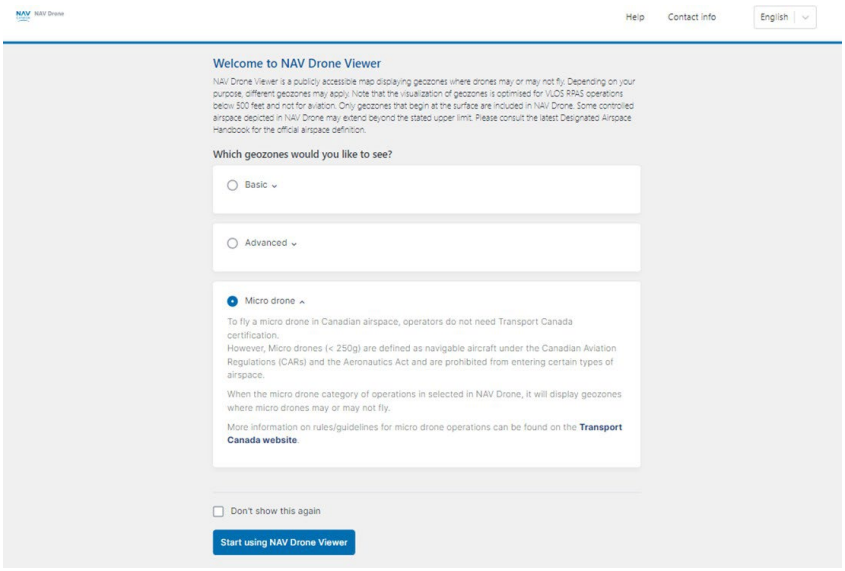
1. Visualize the airspace information applicable for *Basic* operations.



2. Visualize the airspace information applicable for *Advanced* operations.



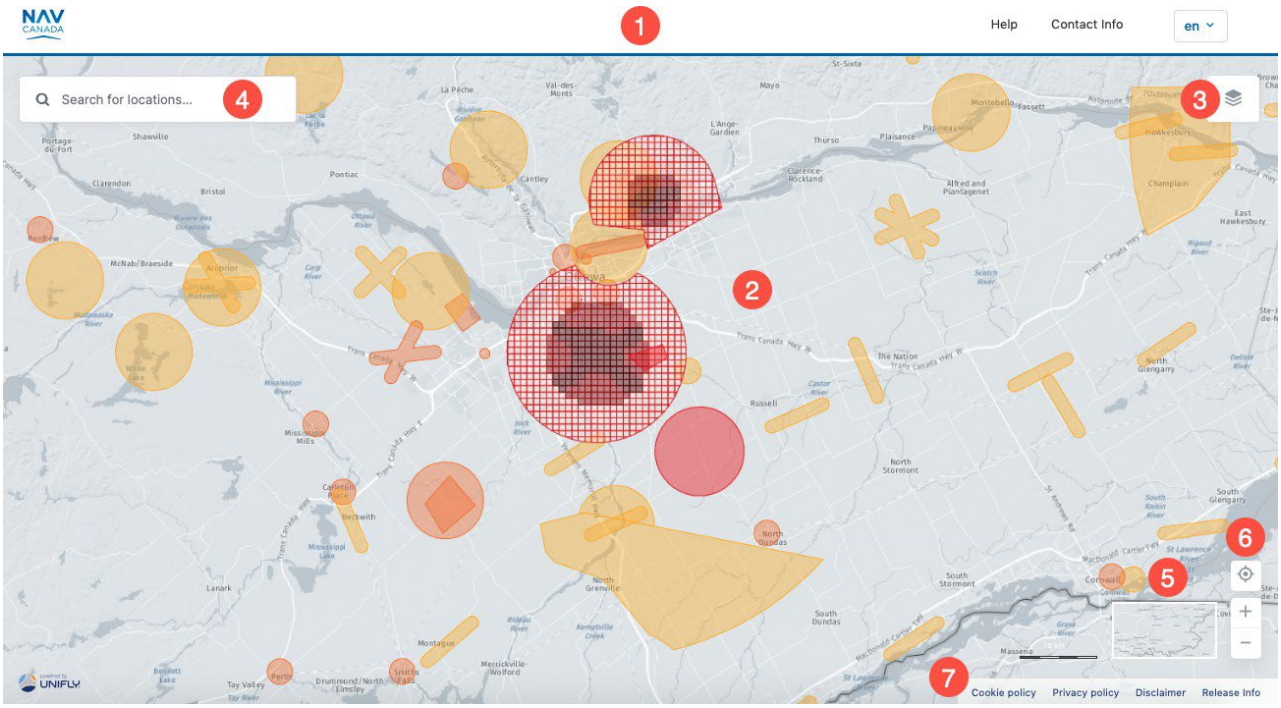
3. Visualize the airspace information applicable for *Micro drone* operations



The *Welcome* screen is displayed every time you start NAV Drone Viewer. If you click on the *Don't show this again* checkbox, this screen will not be displayed again. Toggling between *Basic*, *Advanced* and *Micro drones*, however, remains possible. See also "Hide/display map layers" on the facing page.

3.2 User interface overview

The NAV Drone Viewer includes the following user interface elements.



N°	Description
1	The *Top menu bar* allows you to select the language (English or French) and provides additional information about the application, such as *Help* and *Contact Info* to reach out to NAV CANADA.

N°	Description
2	The map window displays information about the Canadian airspace. The example above shows airspace information for Advanced operations. See also "Display airspace information" on page 11.
3	The *Map layers* button allows you to configure which layers should be visible on the map. See also "Hide/display map layers" below.
4	The *Search* field is used to search for locations. Click on the field, start typing an address or latitude/longitude coordinates. Selecting one of the search results will reposition and zoom the map and put a blue marker on the location.
5	The *Display Mode* button allows you to select the map's display mode. See also "Change display mode" on page 14.
6	Locate me. Click on to return to your current location. This is based in IP (Web App) or GPS (Mobile App). Zoom the map: - by using the + and - controls - by using the mouse scroll wheel - by double clicking a location on the map At low zoom levels the map does not display the drone relevant zones as indicated by a message at the top of the page. Zoom in to be able to see them.
7	The *Bottom menu* bar provides additional information about the NAV Drone Viewer, such as the *Cookie Policy*, the *NAV Canada Privacy Notice*, the *Terms and Conditions of Use*, as well as the application's *Release info* (release version). Clicking on any of these buttons displays a new dialog box in the middle of the screen which can be closed by clicking on the ✕ icon at the top right of this dialog box or by clicking anywhere outside this dialog box

3.3 Hide/display map layers

The map presented in the NAV Drone Viewer is created by displaying a number of map layers on top of the base map (background map). The base map is always displayed, but the map layers can be hidden or displayed.

The following information is visible as a layer on the map for *Basic* operations:

Map Layer	Colour
Controlled airspace	Red

Map Layer	Colour
Delegated airspace	Red
Class F airspace	Red (Restricted or danger) & yellow (Other)
Airports	Red (Certified or military) & yellow (Registered)
Parks	Orange
Additional NOTAMs	Red
Temporary no drone zones	Red

The following information is visible as a layer on the map for *Advanced* operations:

Map Layer	Colour
Controlled airspace	Orange
Delegated airspace	Red
Class F airspace	Orange (Restricted or danger) & yellow (Other)
Airports	Orange (Certified or military) & yellow (Registered)
Grids	Shades of orange, depending on the maximum height of the grid cell
Parks	Orange
Additional NOTAMs	Red
Temporary no drone zones	Red

The following information is visible as a layer on the map for Micro drone operations:

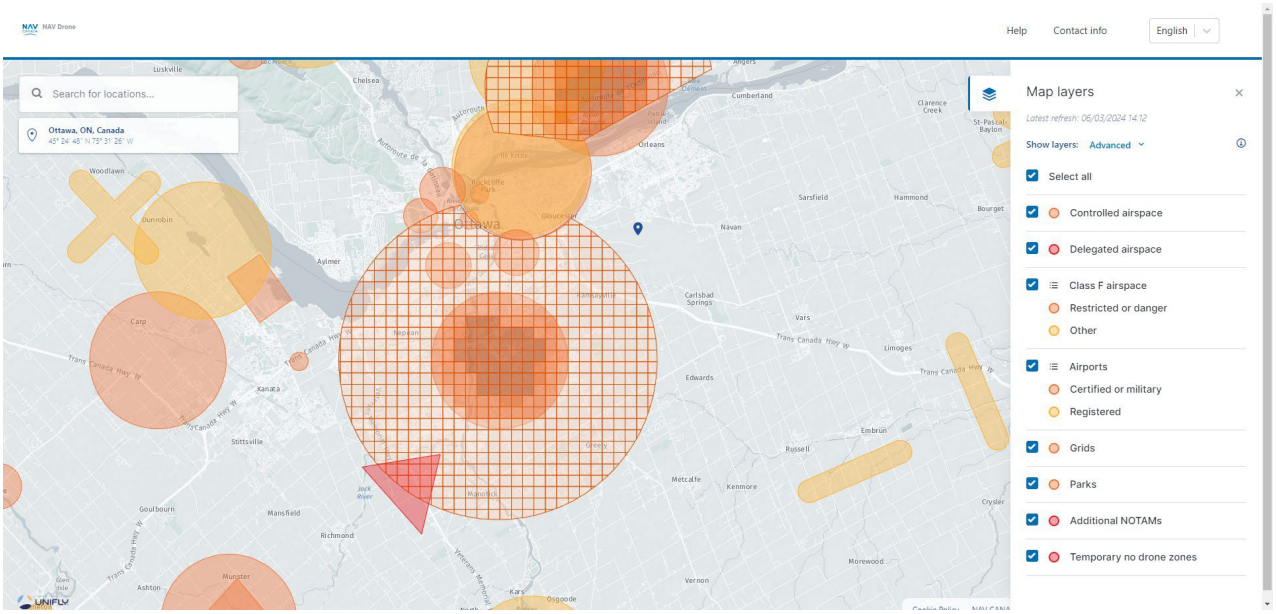
Map Layer	Colour
Controlled airspace	Yellow
Delegated airspace	Orange
Class F airspace	Red (Restricted or danger) & yellow (Other)
Airports	Yellow

Map Layer	Colour
Parks	Orange
Additional NOTAMs	Red
Temporary no drone zones	Red

Areas filled with *red* are *prohibited*. Areas filled with *yellow* require *additional caution* due to other air traffic. Areas filled with *orange* require *permission* from NAV CANADA, Parks Canada, the Department of National Defence, an airport operator, Penitentiary Authorities, or any other specified user agency.

To display/hide a map layer:

1. Click at the top right of the screen.
2. Select the type of operations (*Basic* or *Advanced* or *Micro drones*) for which you want to display the applicable airspace information.
3. Select/clear the relevant checkboxes or click *Select all* to select/clear all layers.
4. Click to hide the map layer list.



Information will only be displayed for the selected type of operations (*Basic* or *Advanced* or *Micro drones*) and for the geozones associated with displayed map.

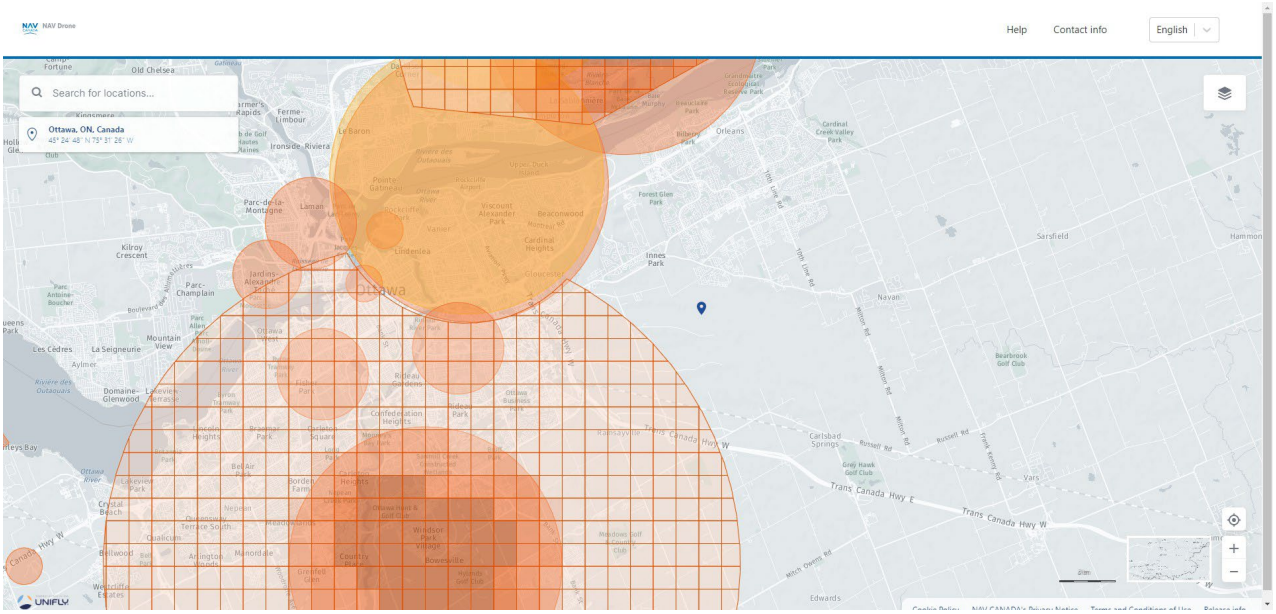
3.4 Display airspace information

Information about airspace geozones is displayed by selecting a location on the map in the Map window. Selecting a geozone will also highlight the geozone on the map.

Three scenarios are possible, as described below.

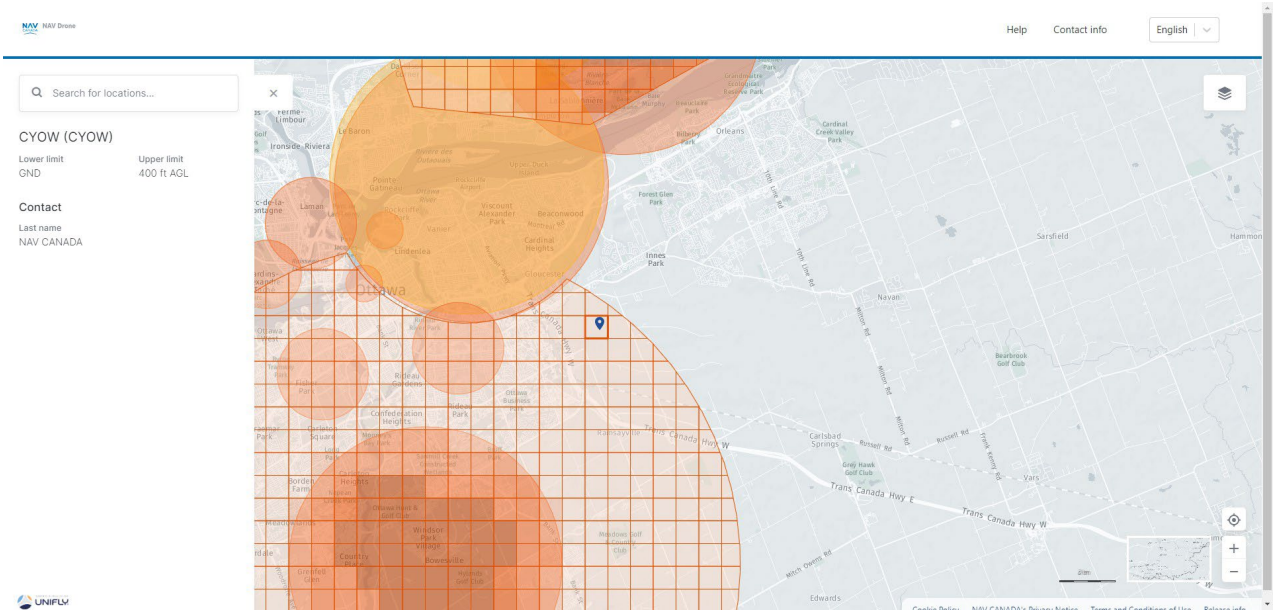
3.4.1 The location is not covered by any geozone

If the selected location is not covered by any geozone, a blue map marker ( ) is displayed at the selected location and information regarding that location (coordinates and, when available, address information) is displayed at the top left of the screen.



3.4.2 The location is covered by one visible geozone

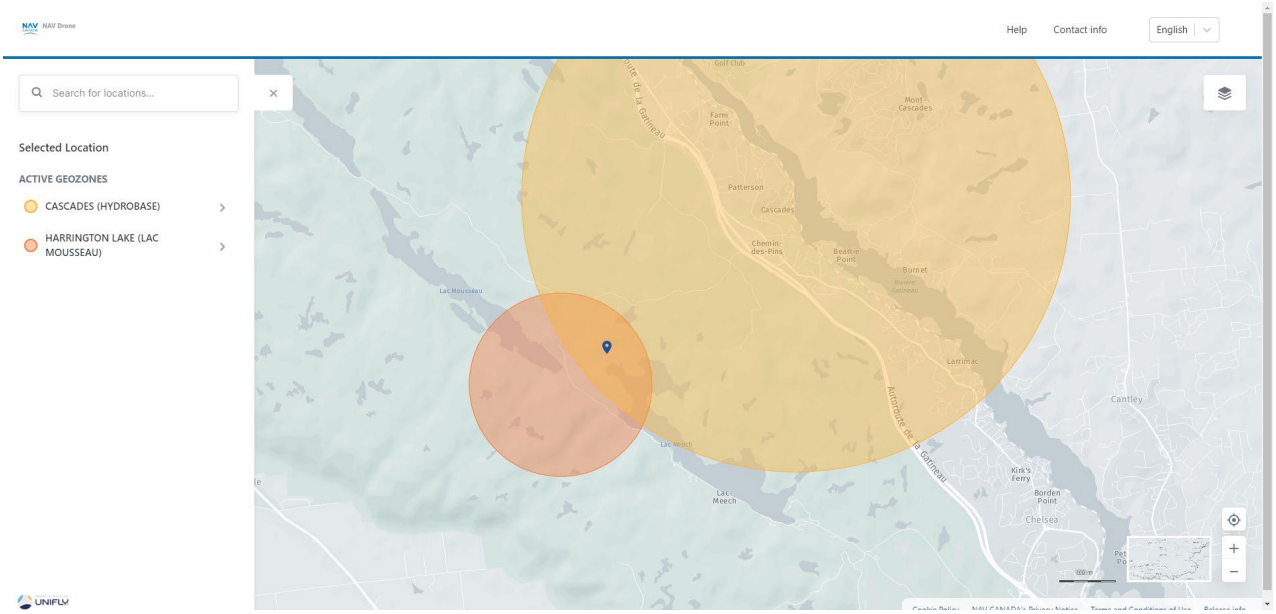
If the selected location is covered by only one visible geozone, detailed information associated with that geozone is displayed in a sidebar on the left of the *Map* window.



Click on ✖ to close the information sidebar if required.

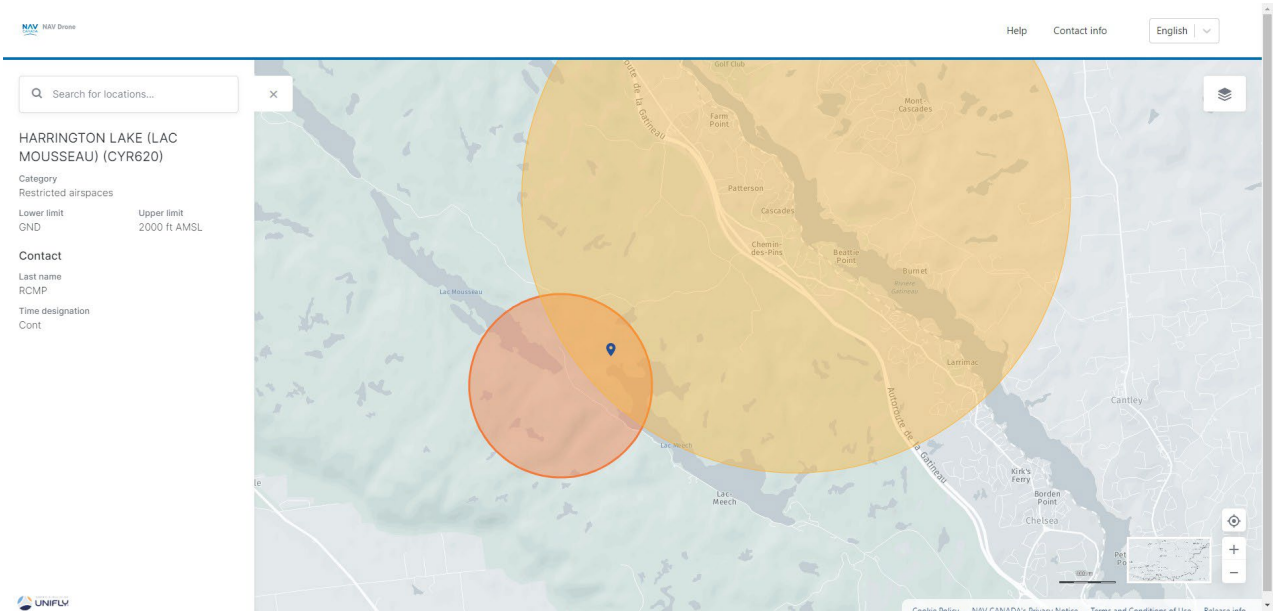
3.4.3 The location is covered by multiple visible geozones

If the selected location is covered by multiple visible geozones, a list of the geozones covering that location is displayed in the sidebar on the left of the *Map* window.



In the example above, the selected location is covered by the geozone *CASCADES* and the geozone *HARRINGTON LAKE*.

Selecting one of the geozones in the list by clicking on its name (in this case, *HARRINGTON LAKE*) displays the information for the selected geozone in that same sidebar.



The list of geozones covering the selected can be displayed again by selecting the blue marker on the map.

Click on ✖ to close the information sidebar if required.

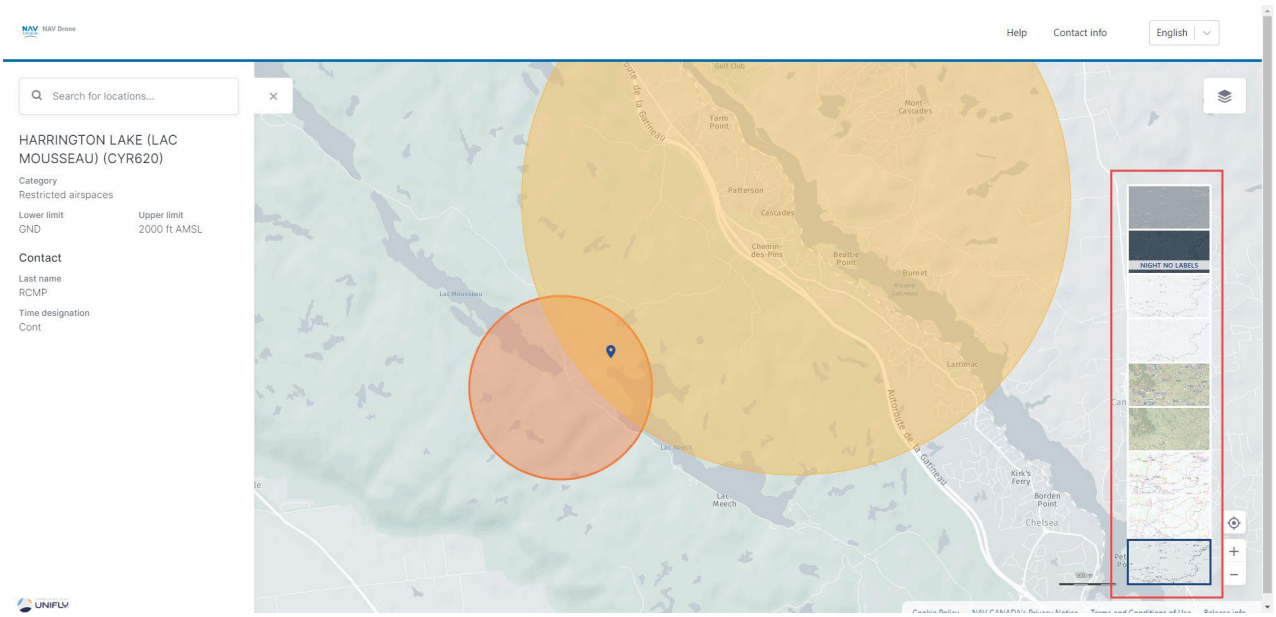
3.5 Change display mode

The base map of the *Map window* can be displayed in different modes.

- Night (dark) mode with labels
- Night (dark) mode without labels
- Day (bright) mode with labels
- Day (bright) mode without labels
- Satellite mode without labels
- Satellite mode with labels
- Colored (bright) mode without labels
- Colored (bright) mode without labels

To change the display mode:

1. Click on the **Display Mode** button to display the modes menu.
2. Hover over the available modes to display their names. Select the one you need.
3. Click the **Display Mode** button again to hide the modes menu.



4 Glossary

Title	Abbreviation	Description
Above Ground Level	AGL	The altitude expressed in feet measured above ground level.
Above Sea Level	ASL	The altitude expressed in feet measured above sea level.
Activity	-	Type of operation.
Aerodrome	AD	Any area of land, water (including the frozen surface thereof) or other supporting surface used, designed, prepared, equipped, or set apart for use, either in whole or in part, for the arrival, departure, movement, or servicing of aircraft. This includes any buildings, installations, and equipment situated thereon or associated therewith.
Aerodrome routine meteorological report	METAR	A METAR describes the actual weather conditions at a specified location and at a specified time as observed from the ground.
Air Navigation Service Provider	ANSP	Organization which is responsible for the provision of air navigation services in domestic or international airspace.
Air Traffic Control	ATC	A service provided to aircraft in controlled airspace.
Air Traffic Controller	ATC	A person holding a valid licence to control air traffic.
Air Traffic Management	ATM	A management concept aimed at ensuring full utilization of ATC systems, according to the possibilities offered by future air navigation systems, as they evolve, from both a national and an international perspective.
Air Traffic Service	ATS	Includes services provided by Air Traffic Controllers and Flight Service Specialists at Area

Title	Abbreviation	Description
		Control Centres (ACC), Towers (TWR), Flight Service Stations (FSS and Flight Information Centres (FIC).
Air Traffic Services Specialist	-	The ATS Specialist is a member of the NAV CANADA personnel who manages access to controlled airspace.
Airport Advisory Service	AAS	Provision by an FSS of information relevant to the departure and arrival phases of a flight and to the transit of an MF area.
Airspace	-	The portion of the atmosphere controlled by a country above its territory, including its territorial waters or, more generally, any specific three-dimensional portion of the atmosphere.
Altitude	ALT	The height of an object or point in reference to sea level or ground level.
Approval	-	Authorization granted to an operator to manoeuvre in controlled airspace under conditions specified by an ATS unit based on the information provided in the permission request
Area Control Centre	ACC	An ATC unit that provides ATC service to aircraft operating within a flight information region (FIR)
Area of Responsibility (Glossary for Pilots and Air Traffic Services personnel - TP11958E)	AOR	A geographical area within which alerting service is provided by an ATS unit designated as the responsible unit.
Area of Responsibility (NAV Drone)	AOR	The group of control zones for which an ATS unit is responsible for coordinating the assessment of RPAS permission requests.

Title	Abbreviation	Description
Base map	-	A base map is a background layer with geographic information. A base map usually provides location references for features that do not change often such as boundaries, rivers, lakes, roads, and highways.
Beyond Visual Line of Sight	BVLOS	Flight performed beyond the pilot's/observer's line of sight.
Canada Air Pilot	CAP	A document in which the Minister may establish standard procedures for air operations at specific aerodromes. Contains descriptions of approaches, SID, STAR and airport layout and procedures.
Canadian Aviation Regulations	CARs	The rules enacted under the Aeronautics Act, that govern civil aviation in Canada. Replacing the Air Regulations and the Air Navigation Orders, the CARs and their associated standards came into force on October 10, 1996, after a comprehensive consultation process between Transport Canada and the aviation community. This co-operative and partnership approach to rule-making continues within the Canadian Aviation Regulation Advisory Council (CARAC), which discusses proposed amendments to the CARs and their associated standards.
Canadian Water Aerodrome Supplement	CWAS	A joint civil/military publication concerning water aerodromes that is intended to be used to supplement enroute charts and the Canada Air Pilot (CAP).
Certificate	-	In a professional context: a designation earned by a person to assure qualification to perform a job or task. Example: a drone pilot certificate. In a digital context: in cryptography, a public key certificate, also known as a digital certificate or identity certificate, is an electronic document used to prove the ownership of a public key.
Certification Level	-	Two categories (Basic and Advanced) of drone operations as defined under the Canadian Aviation

Title	Abbreviation	Description
		Regulations Part IX. Each category has a different set of rules drone pilots must follow.
Checkbox	-	Graphical control element that allows the user to make a binary choice, i.e. a choice between one of two mutually exclusive options. For example, the user may have to answer 'yes' (checked) or 'no' (not checked) on a simple yes/no question.
Circuit – Aerodrome traffic circuit	-	The specified path to be flown by aircraft operating in the vicinity of an aerodrome
Civil Aviation Authority	CAA	A government statutory authority in each country that maintains an aircraft register and oversees the approval and regulation of civil aviation.
Command and Control	C2	The data link between the remotely piloted aircraft and the remote pilot station for the purpose of managing flight.
Control tower	TWR	A unit established to provide ATC service to aerodrome traffic. Also called “Tower”.
Control Zone	CZ	A controlled airspace of defined dimensions extending upwards from the surface of the earth up to and including 3000 ft AAE unless otherwise specified
Coordinated Universal Time	UTC	The time system used in aviation operations and given to the nearest minute, except when the pilot requests a time check. Time checks are given to the nearest 15 s. The day begins at 0000 and ends at 2359. Synonymous with Zulu time.
Dialog Box	-	Graphical control element in the form of a small window that communicates information to the user and prompts them for a response.
Disclaimer	-	Terms and conditions that apply to a user’s access and use of the NAV Drone applications.
Drone	-	An unmanned aircraft guided by remote control or

Title	Abbreviation	Description
		onboard computers. Synonymous of RPA (Remotely Piloted Aircraft), UAV (Unmanned Aerial Vehicle), and UAS (Unmanned Aerial System).
Drone Name	-	Nickname that a pilot can associate with a drone.
Drone Operator	-	The drone operator means any legal or natural person who operates or intends to operate one or more drones.
Drone Pilot	-	A drone pilot is the person designated by a drone operator who is in command of the drone and in charge of the safe conduct of the flight. Depending on a number of factors, including the drone type and the drone operation, a drone pilot may be required to have one or more active certifications to be allowed to execute the drone flight.
Emergency		A situation that places an aircraft or other vehicle, or some person on board or within sight, in a state that requires immediate action.
Explore without account	-	Possibility in the NAV Drone mobile app to try out the mobile app without registering and logging in. Therefore, not all functionalities are available.
Flight	-	A flight is considered as one takeoff and landing sequence. Therefore, an operation can consist of multiple flights.
Flight Information Centre	FIC	A centralized ATS unit that provides services pertinent to pre-flight and the enroute phase of flight
Flight Information Region	FIR	An airspace of defined dimensions extending upwards from the surface of the earth within which flight information service (FIS) and alerting service are provided.
Flight Service Station	FSS	An ATS unit that provides services pertinent to the arrival and departure phases of flight at uncontrolled aerodromes and for transit through a mandatory frequency (MF) area

Title	Abbreviation	Description
Flight Service Specialist	FSS	A certified employee assigned duties and responsibilities at an FSS or FIC
Fly-away		An interruption or loss of the command and control link (C2 Link) where the pilot is unable to affect control of the aircraft and the aircraft is no longer following its preprogrammed procedures, all of which results in the RPA operating in an unpredictable or unplanned manner
Geozone	-	Any airspace that may have restrictions, may require permission, or may require awareness of manned aviation.
Ground Control Station	GCS	A ground control station refers to the complete set of ground-based hardware systems used to control a drone. Synonymous with Remote Pilot Station (RPS).
Height	-	In aviation: the vertical distance of an object measured from a stated reference such as the ground (above ground level = AGL). Reported in feet.
International Civil Aviation Organization	ICAO	A specialized agency of the United Nations, the objective of which is to develop the principles and techniques of international air navigation and to foster planning and development of international civil air transport.
JavaScript Object Notation	JSON	A common data format used for asynchronous browser–server communication.
Keyhole Markup Language	KML	Keyhole Markup Language (KML) is an XML notation for expressing geographic annotation and visualization within Internet-based, two-dimensional maps and three-dimensional Earth browsers. KML was developed for use with Google Earth, which was originally named Keyhole Earth Viewer. KML became an international standard of the Open Geospatial Consortium https://www.ogc.org/standards/kml in 2008. As for any XML standard, the message grammar can be

Title	Abbreviation	Description
		checked to see if it is correctly formatted so the system using it will be able to read and process the data.
Logbook	-	For pilots and operators, the logbook keeps track of all flights conducted under a user account and provides statistics regarding the total flight time for the pilots and drones.
Lost C2 Link	-	The loss of command and control link (C2 Link) contact with the RPA such that the pilot can no longer manage the aircraft's flight. A lost C2 Link does not necessarily result in a fly-away situation, as the RPA will be programmed to follow a predictable flight path until the link is reacquired or the flight is terminated. Lost C2 link procedures are programmed by the manufacturer, and on some models, may be modified/programmed by the RPAS operator.
Map Layers	-	Airspace zone categories displayed on top of the background map (base map).
Maximum Take-Off Weight	MTOW	Maximum take-off weight (MTOW) of an aircraft is a value defined by the aircraft manufacturer. It is the maximum mass at which the aircraft is certified for takeoff due to structural or other limits. MTOW is usually specified in units of kilograms or pounds. The mass is a fixed value and does not vary with changes in temperature, altitude, or runway available.
Multicopter	MC	A rotorcraft with more than two rotors. An advantage of multirotor aircraft is the simpler rotor mechanics required for flight control.
Nautical Mile	NM	The international nautical mile is defined as exactly 1852 metres (about 1.15 miles). The derived unit of speed is the knot, one nautical mile per hour.
No Drone Zone (NAV Drone)	NDZ	Specific to NAV Drone, a No Drone Zone is an airspace in which drone traffic is restricted or

Title	Abbreviation	Description
		forbidden. No Drone Zones are temporary.
Notice to airmen	NOTAM	A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
Operation (NAV Drone)	-	An operation is created by a pilot or by an operator and represented by a flight zone and associatedparameters such as the operation type, the start/end date and time, the designated pilot, the drone planned to be flown, etc.
Operator	-	A distinction is made between the operator level (commercial entity) and the user level (individual). One operator can invite multiple users to join their crew (drone pilots, observers, and payload specialists). In the same way, one user can be associated with multiple drone operators, as is the case for a freelance pilot who is contracted by multiple operators, for example.
Permission Request	-	For Advanced operations in airspace controlled by NAV CANADA, the operator must submit a permission request to NAV CANADA. Permission requests are evaluated either automatically or manually, depending on the height and location of the operation's flight zone. The possible statuses for a permission request are: Draft, Initiated, Sent, In Review, Needs Action, Approved, Rejected, Rescinded, and Cancelled.
Pilot in Command	PIC	See "Drone Pilot".
Registration Number	-	A registration number assigned to a drone by Transport Canada
Remote Control	RC	The use of control signals transmitted by radio to remotely control a device.
Remote Pilot	RP	See "Drone Pilot".

Title	Abbreviation	Description
Remotely Piloted Aircraft	RPA	See "Drone".
RPAS Traffic Management	RTM	An international aviation concept that brings an automated ATM- like system to very low-level airspace which will be occupied primarily by unmanned aircraft (commonly referred to as drones).
Shape handle	-	Graphic control element in the form of a small square, used for editing a shape by dragging the handle.
Tasks	-	For a drone operator, the Tasks tab list all tasks related to an operation, in three categories representing three different task statuses: Action Required, Submitted and Resolved. In the context of NAV Drone, tasks are associated with a permission request.
Tooltip	-	Common graphical user interface element displayed as an informational text box when hovering over an item. It is used in conjunction with a cursor, usually a pointer.
Transport Canada	TC	The federal authority responsible for regulating civil aviation
Transport Canada Aeronautical Information Manual	TC AIM	A primary Transport Canada publication of aeronautical information intended to serve as a pre-flight reference source for pilots and that contains information essential to aircraft operations in Canadian Domestic Airspace (CDA). It consolidates information of a lasting nature into a single document. Topics covered are general flight information, communications, meteorology, rules of the air and ATC procedures, entry and departure requirements for international flights, search and rescue, aeronautical charts and publications, licensing and registration, health, and airmanship

Title	Abbreviation	Description
Uncontrolled aerodrome	-	An aerodrome at which a control tower has not been established. This designation also applies during the non-operational period when an established control tower is on reduced hours (part-time)
User agency	-	The agency, organization, or military command responsible for the activity for which Class F airspace has been provided. The user agency shall be identified for Class F restricted areas, military operations areas, and danger areas and, where possible, should be identified for Class F advisory areas.
Validation	-	An operation validation consists in verifying that the operation complies with applicable rules and regulations.
Vertex	-	In geometry, a vertex is a point where two or more curves, lines, or edges meet. As a consequence, the point where two lines meet to form an angle and the corners of polygons are vertices.
Very Low Level	VLL	Very Low-Level airspace (VLL) is usually understood to be the volume of air below 500ft above (non-built-up) ground level.
Visual Flight Rules	VFR	The rules that govern the procedures for conducting flight under visual conditions. The abbreviation is used by pilots and controllers to indicate a type of flight plan or weather conditions.
Visual Line-of-Sight	VLOS	Unaided visual contact at all times with a remotely piloted aircraft that is sufficient to be able to maintain control of the aircraft, know its location, and be able to scan the airspace in which it is operating in order to perform the detect and avoid functions in respect of other aircraft or objects.
Visual	VMC	Meteorological conditions, expressed in terms of

Title	Abbreviation	Description
Meteorological Conditions		visibility and distance from cloud, equal to or greater than the minima specified in CAR 602.

For all information about the NAV Drone Viewer, please visit https://www.navcanada.ca/en/flight-planning/drone-flight-planning/nav-drone-support.aspx.

If you have any questions, please contact us by sending an email to navdrone@navcanada.ca.