

Welcome to the 2022 Online HYSPLIT Workshop (DAY 1 of 4)

The broadcast is scheduled to start at:
09:00 Eastern Daylight Time (EDT) = 13:00 UTC

NOAA Air Resources Laboratory
June 14-17, 2022

1. **Welcome**
2. **Agenda**
3. **Go-to-Webinar Interface**
4. **Asking Questions**
5. **Screen Considerations**
6. **Recordings**
7. **Installation**
8. **Working with the Tutorial**
9. **Different Ways to Work with HYSPLIT**

These slides are available as a handout in the Go-to-Webinar interface, and will soon be posted on the Workshop Web Page

... And then, on to the course!

Welcome from
Dr. Ariel Stein

Director

NOAA Air Resources
Laboratory



**Workshop guidance
and resources posted at
[Workshop Web Page](#)**

**`https://www.ready.noaa.gov/
register/HYSPLIT_hyagenda.php`**

We will update this page each day to include any new materials or links that are relevant to the Workshop

2022 HYSPLIT Workshop Schedule

Subject to change, depending on the progression of the course and at the discretion of the instructors

UTC	Eastern Daylight Time	Monday June 13, 2022	Tuesday June 14, 2022	Wednesday June 15, 2022	Thursday June 16, 2021	Friday June 17, 2021
13:00 - 14:00	9:00 - 10:00	<i>OPTIONAL*</i> 1a. Installing HYSPLIT on Windows PC	Introduction	Introduction	Introduction	Introduction
		Break	3. Gridded Meteorological Data Files	7. Air Concentration calculations	11. Pollutant transformations and deposition (continued)	15. Radioactive pollutants and dose
14:00 - 15:00	10:00 - 11:00	<i>OPTIONAL*</i> 1b. Installing HYSPLIT on MAC	Break			
		Break	4. Trajectory Calculations	Break	12. Air Concentration Uncertainty	Break
15:00 - 16:00	11:00 - 12:00	<i>One-on-one virtual installation sessions, by appointment</i>		8. Configuring the CAPTEX simulation		16. Volcanic eruptions with gravitational settling
16:00 - 17:00	12:00 - 13:00	<i>One-on-one virtual installation sessions, by appointment</i>	Break		Break	
17:00 - 18:00	13:00 - 14:00	<i>One-on-one virtual installation sessions, by appointment</i>	5. Trajectory Options	9. Air concentration parameter sensitivity	13. Source Attribution Methods	17. Custom Simulations
18:00 - 19:00	14:00 - 15:00	<i>One-on-one virtual installation sessions, by appointment</i>	Break			
19:00 - 20:00	15:00 - 16:00	<i>One-on-one virtual installation sessions, by appointment</i>	6. Trajectory Statistics	Break	14a. Wildfire Smoke	Final Questions and Course Wrap-Up
			Day 1 Wrap-Up	10. Alternate display options		
20:00 - 21:00	16:00 - 17:00	<i>One-on-one virtual installation sessions, by appointment</i>		11. Pollutant transformations and deposition	Day 3 Wrap Up	
				Day 2 Wrap Up		

Agenda – Day 0

UTC	EDT	Agenda Item
13:00 – 13:45	09:00 – 09:45	1-2: Installation on Windows PC's
13:45 – 14:00	09:45 – 10:00	Break
14:00 – 14:30	10:00 – 10:30	1-2: Installation on Windows PC's
14:30 – 15:00	10:30 – 11:00	Break
15:00 – 16:00	11:00 – 12:00	<i>30-minute individual installation session as needed</i>
16:00 – 17:00	12:00 – 13:00	Break
17:00 – 21:00	13:00 – 17:00	<i>30-minute individual installation session as needed</i>

Agenda – Day 1

UTC	EDT	Agenda Item
13:00 – 13:30	09:00 – 09:30	Welcome, Introduction and Logistics
13:30 – 14:45	9:30 – 10:15	3. Gridded meteorological data sets
14:45 – 14:30	10:15 – 10:30	Break
14:30 – 16:00	10:30 – 12:00	4. Trajectory calculations
16:00 – 17:15	12:00 – 13:00	Break
17:15 – 18:30	13:00 – 14:15	5. Trajectory options
18:30 – 18:45	14:15 – 14:30	Break
18:45 – 19:45	14:30 – 15:45	6. Trajectory statistics
19:45 – 20:00	15:45 – 16:00	Day 1 Wrap-up

Agenda – Day 2

UTC	EDT	Agenda Item
13:00 – 13:15	09:00 – 09:15	Introduction to Day 2
13:15 – 14:45	09:15 – 10:45	7. Air Concentration Calculations
14:45 – 15:00	10:45 – 11:00	Break
15:00 – 16:30	11:00 – 12:30	8. Configuring the CAPTEX simulation
16:30 – 17:30	12:30 – 13:30	Break
17:30 – 19:00	13:30 – 15:00	9. Air Concentration Parameter Sensitivity
19:00 – 19:15	15:00 – 15:15	Break
19:15 – 20:00	15:15 – 16:00	10. Alternate Display Options
20:00 – 20:45	16:00 – 16:45	11. Pollutant Transformations and deposition <i>(start this section if time permits)</i>
20:45 – 21:00	16:45 – 17:00	Day 2 Wrap-up / Questions

Agenda – Day 3

UTC	EDT	Agenda Item
13:00 – 13:15	09:00 – 09:15	Introduction to Day 3
13:15 – 14:15	09:15 – 10:15	11. Pollutant Transformations and deposition <i>(start today or continue from yesterday)</i>
14:15 – 14:30	10:15 – 10:30	Break
14:30 – 16:00	10:30 – 12:00	12. Air Concentration Uncertainty
16:00 – 17:00	12:00 – 13:00	Break
17:00 – 18:45	13:00 – 14:45	13. Source Attribution Methods
18:45 – 19:00	14:45 – 15:00	Break
19:00 – 19:45	15:00 – 15:45	14a. Wildfire Smoke
19:45 – 20:30	15:45 – 16:30	14b. Dust Storms
20:30 – 20:45	16:30 – 16:45	Day 3 Wrap-up / questions

Agenda – Day 4

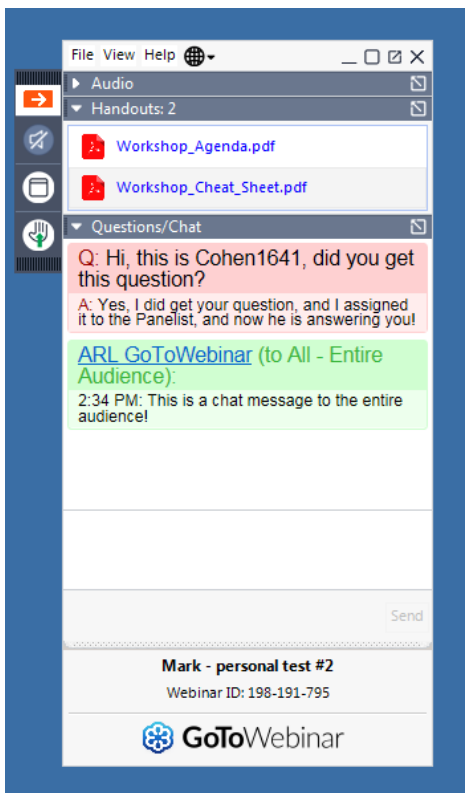
UTC	EDT	Agenda Item
13:00 – 13:15	09:00 – 09:15	Introduction to Day 4
13:15 – 14:45	09:15 – 10:45	15. Radioactive Pollutants and Dose
14:45 – 15:00	10:45 – 11:00	Break
15:00 – 16:30	11:00 – 12:30	16. Volcanic Eruptions with Gravitational Settling
16:30 – 17:30	12:30 – 13:30	Break
17:30 – 18:30	13:30 – 14:30	17. Custom Simulations
18:30 – 18:45	14:30 – 14:45	Break
18:45 – 19:45	14:45 – 15:45	Question and answer session with course instructors
19:45 – 20:00	15:45 – 16:00	Final course wrap-up

3. Using the Go-to-Webinar Interface

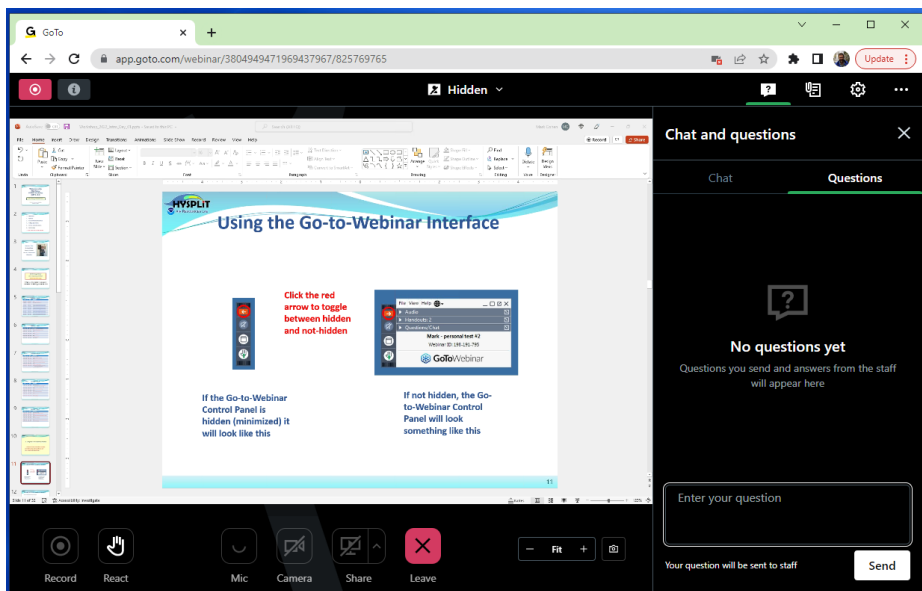
...relevant if you are live-streaming the Workshop, but not if you are just viewing a recording...

Using the Go-to-Webinar Interface

With the Go-to-Webinar Desktop Application



Or can join through an internet browser (Google Chrome or Microsoft Edge)



<https://support.goto.com/webinar/help/how-do-i-join-a-webinar-from-the-instant-join-app>

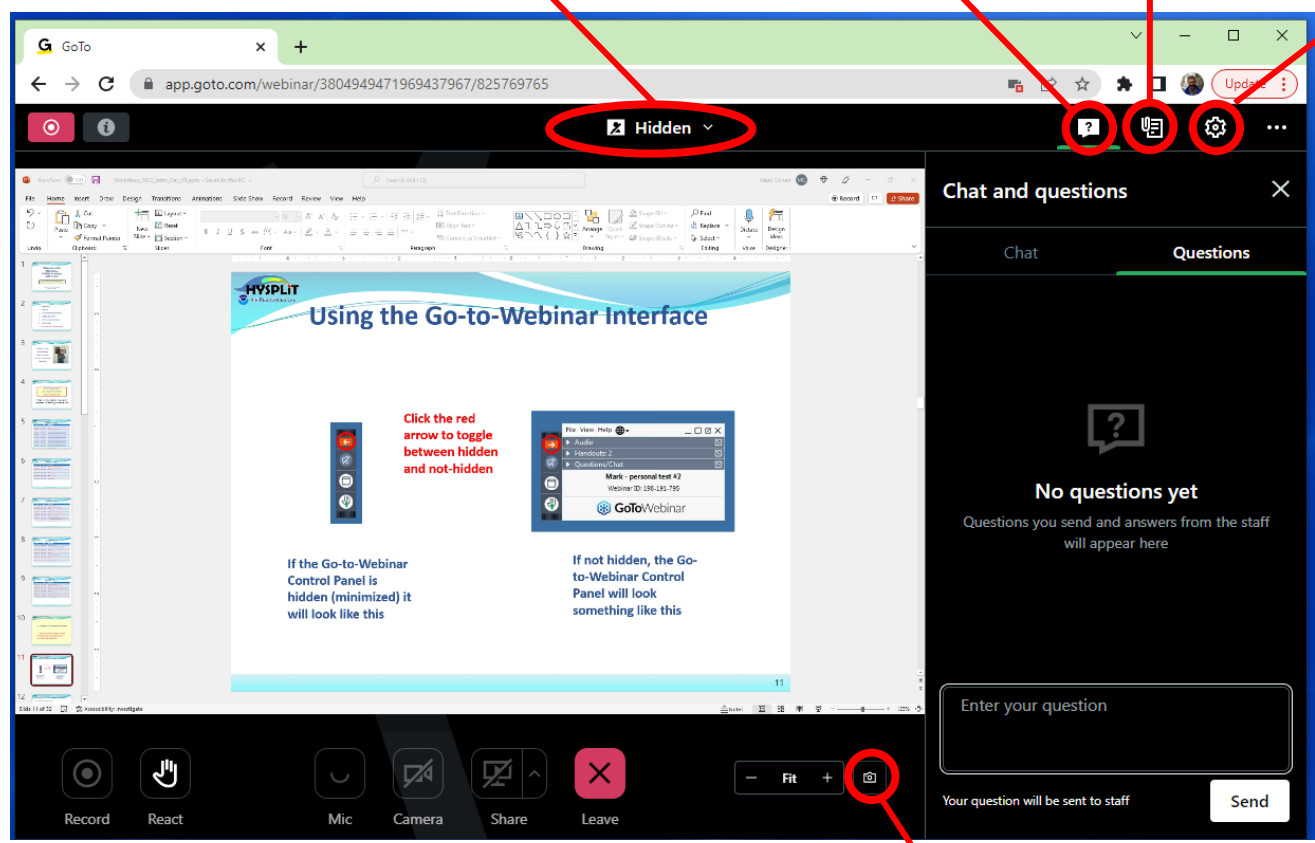
Using the Go-to-Webinar Browser Interface

Toggle presenting team's webcam view to create more room on your screen

Materials, e.g., handouts

Questions

Settings



Take a screenshot

Using the Go-to-Webinar Browser Interface

<https://support.goto.com/webinar/help/how-do-i-join-a-webinar-from-the-instant-join-app>

1. Make sure you meet the browser requirements.
 - Linux or Google Chrome OS
 - Microsoft Edge (most recent 3 versions)
 - Google Chrome (most recent 3 versions)
2. Go back to the confirmation email or You're Registered! page.
 - Copy the join links.
 - If you have the confirmation email open, right-click Join Webinar then select Copy Hyperlink.
 - If you are on the You're Registered! page, right-click join this webinar then select Copy link address.
3. In a Google Chrome or Microsoft Edge browser, paste the join link.

At the end of the URL, type in **?clientType=html5** then press Enter.

The Join link will look similar to

<https://global.gotowebinar.com/join/2057328506534099723/930505186?clientType=html5>.

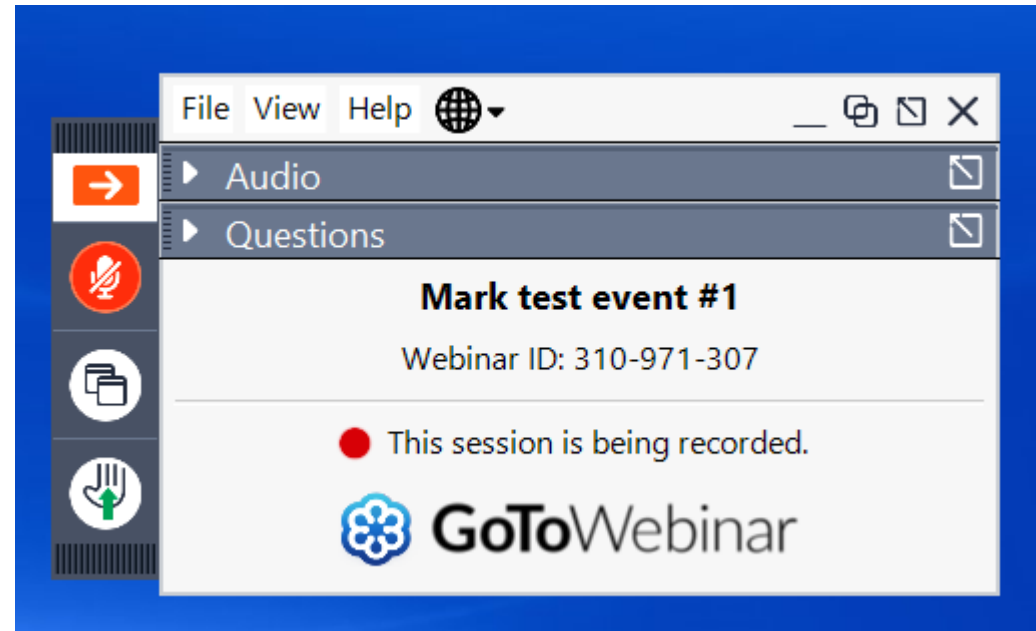
This link is not a real webinar but an example...

Using the Go-to-Webinar Desktop App Interface



Click the red arrow to toggle between hidden and not-hidden

If the Go-to-Webinar Control Panel is hidden (minimized) it will look like this

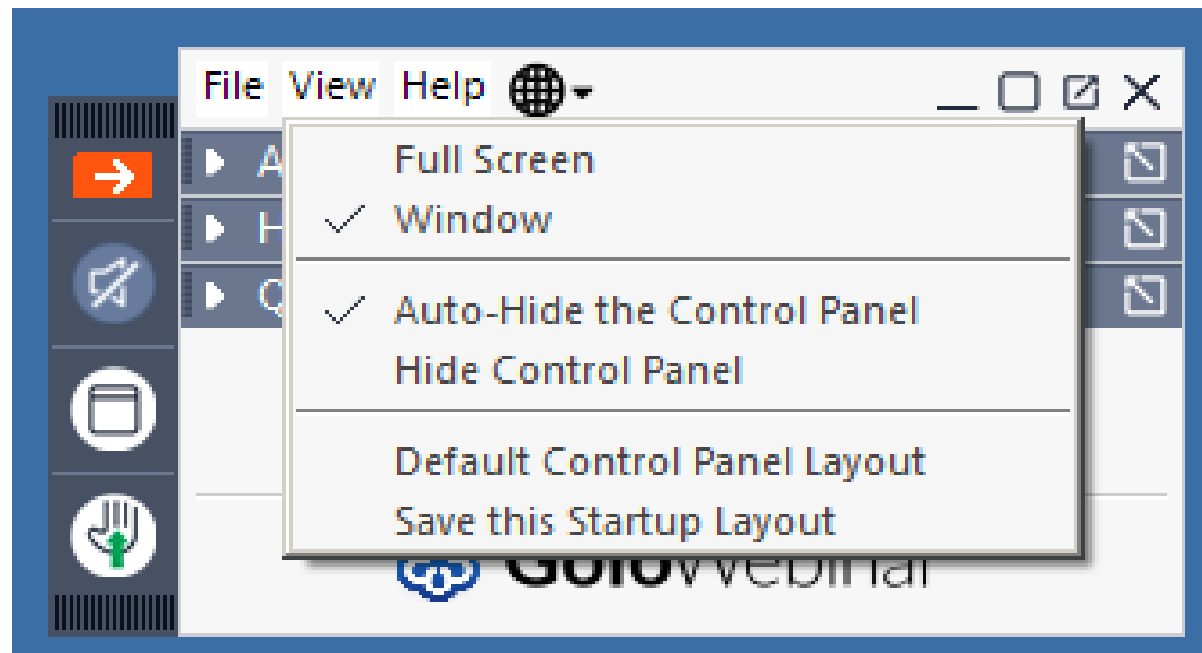


If not hidden, the Go-to-Webinar Control Panel will look something like this

Using the Go-to-Webinar Desktop App Interface

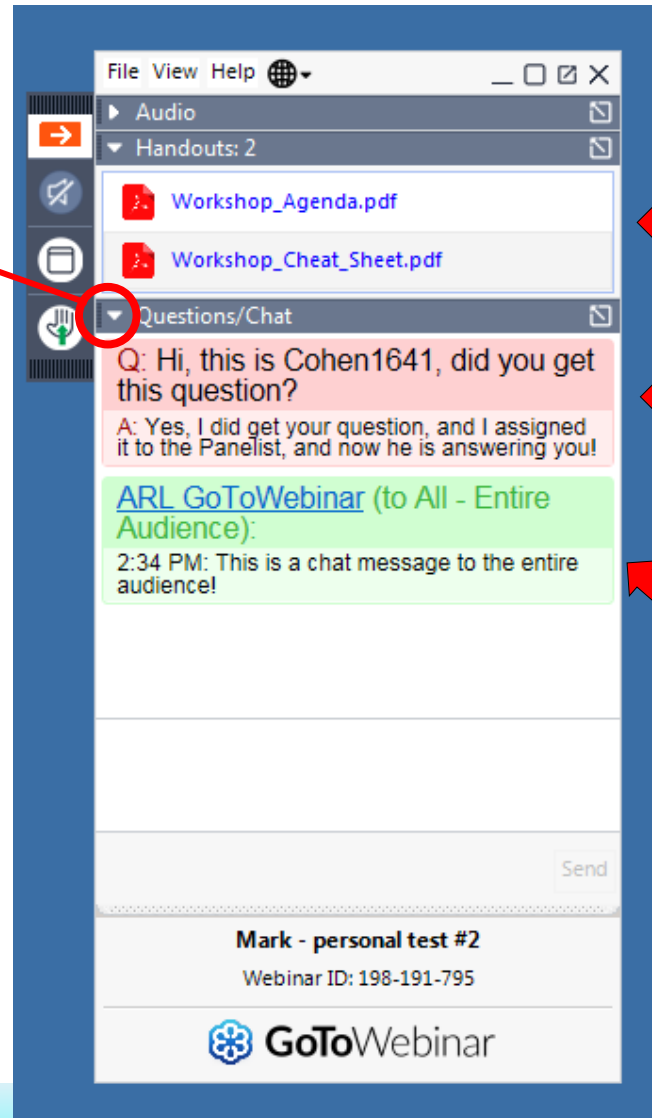
Use the View drop-down menu, for example:

- ✓ to autohide control panel or not
- ✓ to restore the basic default layout if something disappears



Using the Go-to-Webinar Desktop App Interface

By toggling the little triangle by each Control Panel section, you can expand it or contract it

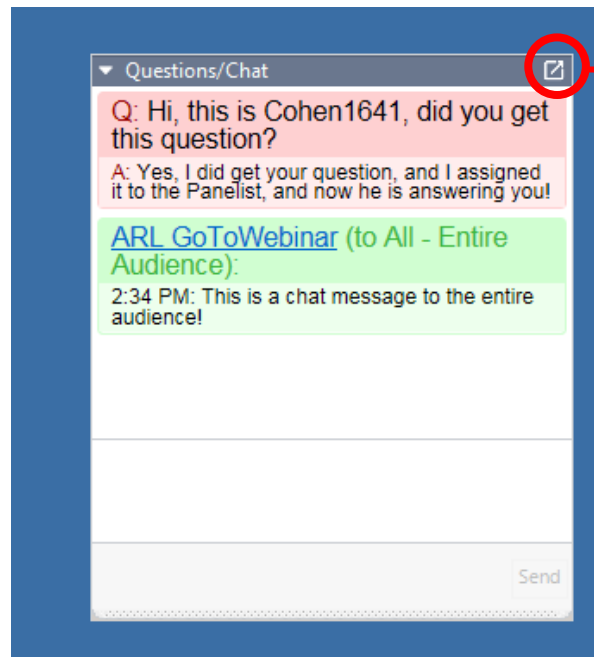
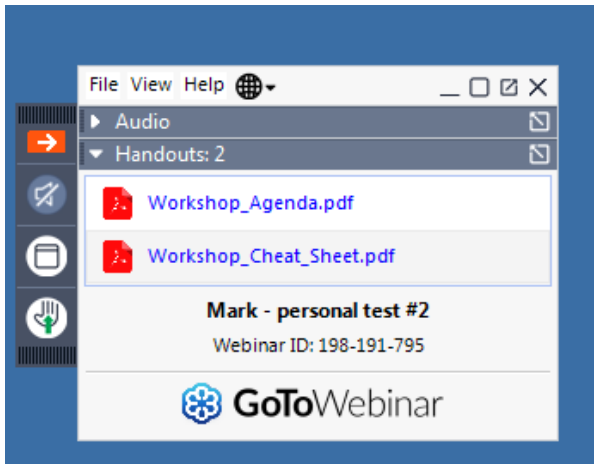


We will put important handouts in this section

When you ask questions of the staff, your questions and answers will be shown in this section

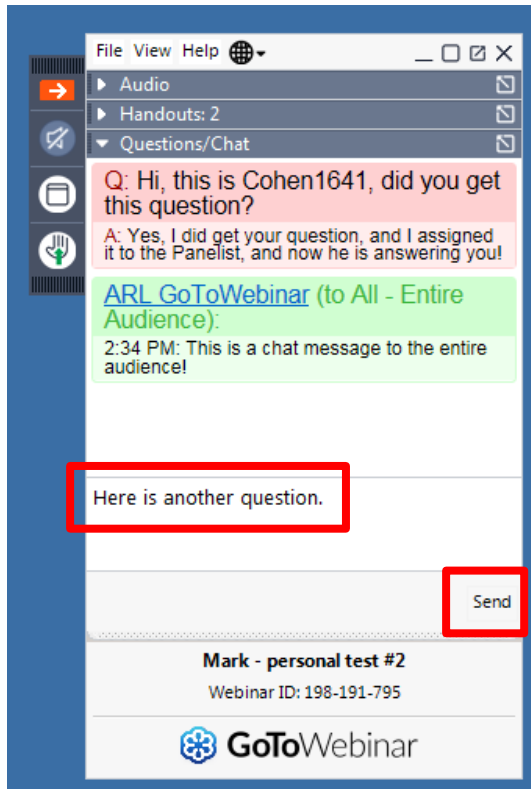
Or when the staff sends the audience a message, you will also see it here

Using the Go-to-Webinar Desktop App Interface

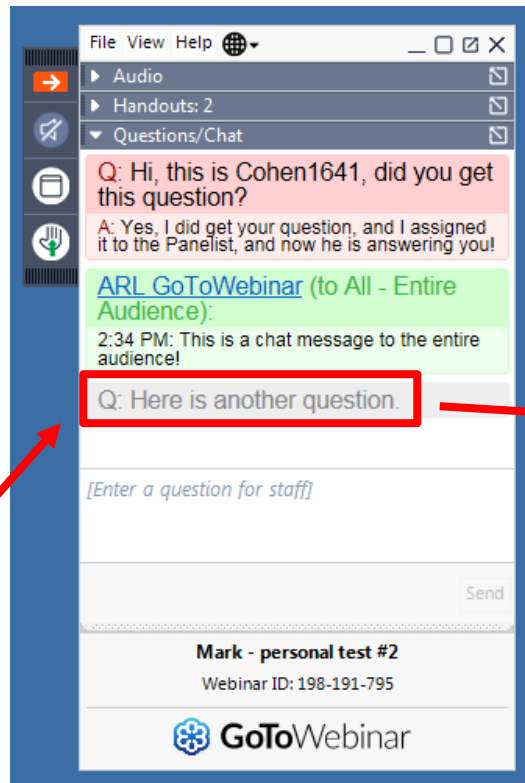


By toggling the little box in the upper right-hand corner of a given section, you can undock it or redock it

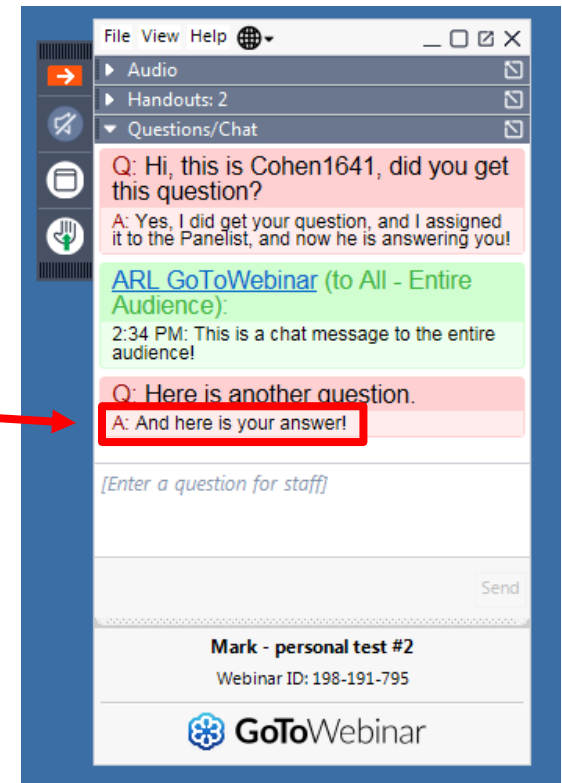
Using the Go-to-Webinar Desktop App Interface



To ask a question, you type in the empty box, and then hit “send”



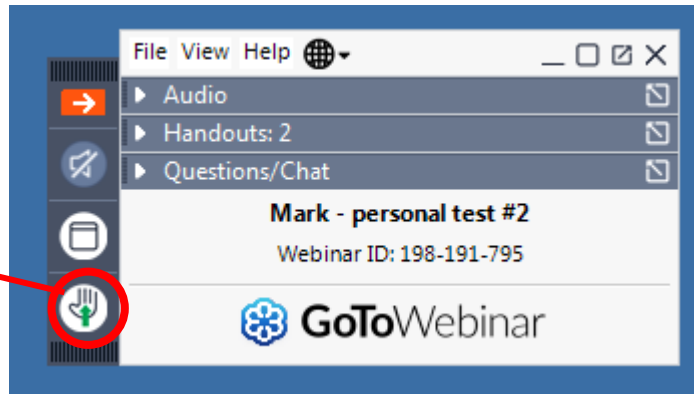
The question you asked should then show up in *your* Control Panel



When we answer it, the answer will show up in *your* Control Panel

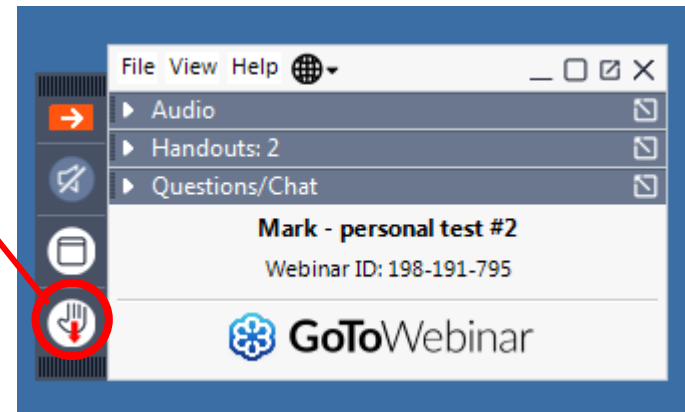
Using the Go-to-Webinar Desktop App Interface

Sometimes we will ask for a show of hands on a particular question. You click the little hand icon to raise your hand



To lower your hand, you click again on the same icon.

Normally, after we get the answers, we will automatically lower everyone's hand

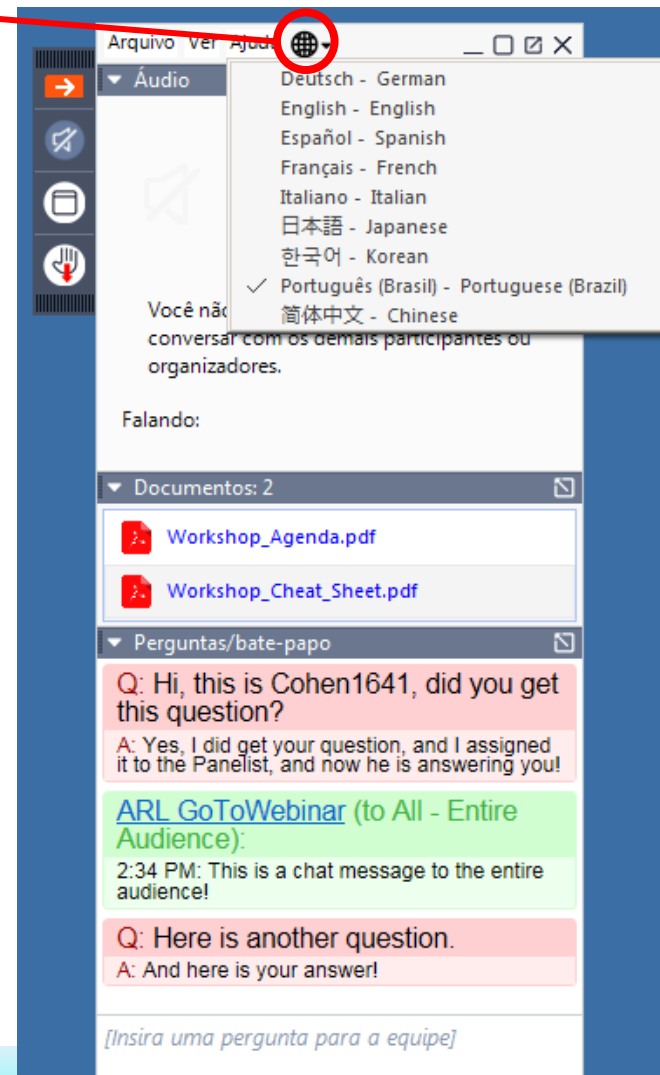


You are in listen-only mode, so you don't raise your hand to ask a question.

Using the Go-to-Webinar Desktop App Interface

You can click on the “globe” icon to change the language of the Control Panel.

Although Questions and Answers will be in English

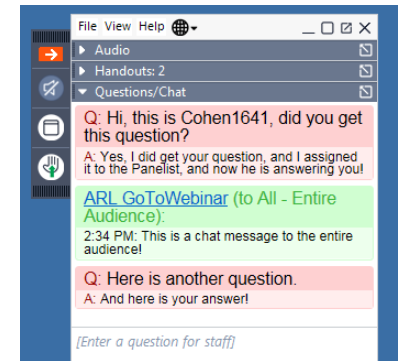


4. Asking Questions

Asking Questions

- Ask general or logistical questions about the Webinar or Go-to-Webinar in the Control Panel that was just discussed

...if viewing a recording, can ask general questions by emailing arl.webmaster@noaa.gov



- Ask questions about HYSPLIT and the Tutorial in the HYSPLIT Forum

<https://hysplitbbs.arl.noaa.gov/viewforum.php?f=76>

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HYSPPLIT Forum: hysplitbbs.arl.noaa.gov
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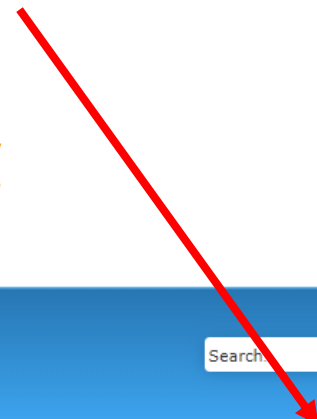
Board index < [HYSPPLIT Workshop](#) < [2022 HYSPPLIT Workshop Questions](#)

2022 HYSPPLIT Workshop Questions

FORUM	TOPICS	POSTS	LAST POST
☰ 1. Installing HYSPLIT	1	4	Re: GUI screen is black by sonny.zinn June 8th, 2022, 6:44 am
☰ 2. Testing the installation	0	0	No posts
☰ 3. Gridded meteorological data files	0	0	No posts
☰ 4. Trajectory calculations	0	0	No posts

Asking Questions

If you have not already registered for the HYSPLIT Forum, you can do so easily by clicking on the “Register” icon at <https://hysplitbbs.arl.noaa.gov/>



The screenshot shows the top navigation bar of the HYSPLIT Forum. On the left is the phpBB logo with the tagline 'creating communities'. Next to it is the forum title 'HYSPLIT Forum: hysplitbbs.arl.noaa.gov' and a subtitle 'A Forum for HYSPLIT Dispersion Model Users to Communicate Questions, Problems, and Ideas for Upgrades, etc.'. On the right is a search bar with a magnifying glass icon and a gear icon. Below the search bar is a navigation bar with 'Quick links' and 'FAQ' on the left, and 'Register' (with a checkmark icon) and 'Login' (with a power icon) on the right. The 'Register' button is highlighted with a red box. At the bottom right of the header, it says 'It is currently June 7th, 2020, 7:32 pm'.

Asking Questions

CONFIRMATION OF REGISTRATION

Can you put the following famous cities to their respective country?
Please drag the options to the correct list, to avoid automated registrations.

Other Countries	United States of America
Vancouver	Phoenix
Kuala Lumpur	Chicago
Beijing	Boston

- Registration process asks you to place a series of cities either in the
 - United States of America
 - Other Countries

- Think of the biggest most important version of the city...

- E.g., even though there is a “Rome” in the U.S. and a “Paris” in the U.S., the correct answer is that they are in “Other Countries”

- One ambiguous one is “San Jose”, and for this purpose, identify it as being in the “United States of America” (*even though it is also the Capital of Costa Rica*)

Asking Questions

HYSPLIT Forum: hysplitbbs.arl.noaa.gov
 A Forum for HYSPLIT Dispersion Model Users to Communicate Questions, Problems, and Ideas for Upgrades, etc.

Search...

Quick links [FAQ](#) [MCP](#)
Notifications **11** [MarkCohen](#)

[Board index](#)

It is currently June 18th, 2020, 6:36 pm

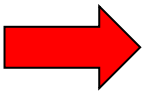
Last visit was: June 16th, 2020, 10:13 am

[Mark forums read](#)

HYSPLIT	TOPICS	POSTS	LAST POST
Users General questions and postings pertaining to the use of HYSPLIT regardless of the platform. For platform specific questions, use the HYSPLIT Platform forums.	190	715	Re: Meteorological Data by barbara.stunder May 26th, 2020, 8:52 am
Developers Questions and postings pertaining to the development of HYSPLIT, feature enhancements, and HYSPLIT internals. HYSPLIT source code and algorithms are discussed here.	19	70	Trying to Recreate This image by munleyj May 11th, 2020, 9:48 am
Bugs Post any defects you find in the HYSPLIT software here. The HYSPLIT Developers carefully monitor this list and will work diligently to repair any reported problems. When posting a bug report, please specify both the HYSPLIT version and operating system you are using.	42	145	Re: question about DATEM form... by lida May 18th, 2020, 9:37 pm
Announce Announcements pertaining to HYSPLIT, training materials, dispersion related jobs or research positions, or related software. This list is moderated and will not be used for any discussion.	25	47	Re: TAPPAS by alicec January 27th, 2020, 12:26 pm



in the atmosphere. This section is also to facilitate collaborations between researchers involved in chemical transport and dispersion.			January 22nd, 2020, 3:56 am
Radiological Post questions, comments and links to research (research papers, web sites, etc) involving HYSPLIT and radiological nuclides. This section is also to facilitate collaborations between researchers involved in radiological nuclide transport and dispersion.	12	38	Re: Fukushima Calculation by ariel.stein September 20th, 2018, 9:25 am
Cluster Analysis Topics about the trajectory clustering program for HYSPLIT.	31	133	Re: Generate cluster trajecto... by barbara.stunder August 26th, 2019, 7:35 am



FORUM	TOPICS	POSTS	LAST POST
HYSPLIT Workshop	17	34	? Re: Moderator test by alicec June 12th, 2020, 11:30 am

Asking Questions



HYSPPLIT Forum: hysplitbbs.arl.noaa.gov
 A Forum for HYSPPLIT Dispersion Model Users to Communicate Questions, Problems, and Ideas for Upgrades, etc.

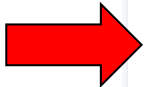
Quick links [FAQ](#)

Notifications [Mark_Cohen_personal](#)

[Board index](#) < [HYSPPLIT Workshop](#)

HYSPPLIT Workshop

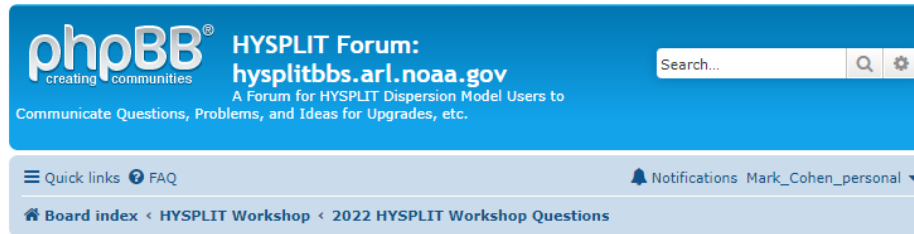
[Mark subforums read](#)



FORUM	TOPICS	POSTS	LAST POST
2022 HYSPPLIT Workshop Questions	1	4	Re: GUI screen is black by sonny.zinn June 8th, 2022, 6:44 am
2021 HYSPPLIT Workshop Questions	59	234	Re: daily concentration conto... by davidglenn August 11th, 2021, 11:25 am
2020 HYSPPLIT Workshop Questions Questions from the 2020 Online HYSPPLIT Workshop.	88	349	Re: ImageMagick version - up ... by nobella April 14th, 2021, 12:22 am
2019 HYSPPLIT Workshop Questions During the four weeks of the 2019 HYSPPLIT Workshop, users will be able to post questions on the week's topics to this Forum and model developers will try to answer them as soon as possible.	3	5	Re: Depositions calculated wi... by ariel.stein June 17th, 2019, 3:58 pm

Asking Questions

<https://hysplitbbs.arl.noaa.gov/viewforum.php?f=57>




HYSPLIT Forum:
hysplitbbs.arl.noaa.gov
 A Forum for HYSPLIT Dispersion Model Users to
 Communicate Questions, Problems, and Ideas for Upgrades, etc.













Search...

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[Board index](#) < [HYSPLIT Workshop](#) < [2022 HYSPLIT Workshop Questions](#)

2022 HYSPLIT Workshop Questions

Mark subforums read

FORUM	TOPICS	POSTS	LAST POST
 1. Installing HYSPLIT	1	4	Re: GUI screen is black by sonny.zinn <input type="button"/> June 8th, 2022, 6:44 am
 2. Testing the installation	0	0	No posts
 3. Gridded meteorological data files	0	0	No posts
 4. Trajectory calculations	0	0	No posts
 5. Trajectory options	0	0	No posts
 6. Trajectory statistics	0	0	No posts
 7. Air concentration calculations	0	0	No posts
 8. Configuring the CAPTEX simulation	0	0	No posts
 9. Air concentration parameter sensitivity	0	0	No posts
 10. Alternate display options	0	0	No posts
 11. Pollutant transformations and deposition	0	0	No posts
 12. Air concentration uncertainty	0	0	No posts

You can post your question in the appropriate section, based on where in the Tutorial your question refers to.

Asking Questions

You can look to see if there already is a similar question, and if not, you can create a **New Topic**

phpBB® HYSPPLIT Forum: hysplitbbs.arl.noaa.gov
creating communities A Forum for HYSPLIT Dispersion Model Users to Communicate Questions, Problems, and Ideas for Upgrades, etc.

Quick links FAQ MCP
Notifications 11 [MarkCohen](#)

Board index < HYSPPLIT Workshop < 2020 HYSPLIT Workshop Questions < 1. Installing HYSPLIT

1. Installing HYSPLIT

New Topic

Mark topics read • 4 topics • Page 1 of 1

TOPICS	REPLIES	VIEWS	LAST POST
I cannot Run Hysplit after following the installaction <small>by Cares » June 18th, 2020, 12:30 pm</small>	1	3	<small>by MarkCohen</small> <small>June 18th, 2020, 6:57 pm</small>
Desktop icon Run Hysplit not working ? <small>by Claudia_Rivera » June 18th, 2020, 2:01 pm</small>	0	0	<small>by Claudia_Rivera</small> <small>June 18th, 2020, 2:01 pm</small>
Failure in unzipping the contents of 'Tutorial.zip' <small>by flaviaviéira » June 2nd, 2020, 10:02 am</small>	3	300	<small>by sonny.zinn</small> <small>June 9th, 2020, 1:45 pm</small>
tutorial/index.html not working <small>by kschwager » May 28th, 2020, 8:58 am</small>	1	57	<small>by sonny.zinn</small> <small>May 29th, 2020, 11:48 am</small>

New Topic

Mark topics read • 4 topics • Page 1 of 1

[Return to Board Index](#)

Jump to

Asking Questions

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Search... [Q] [G]

Quick links [FAQ] Notifications 11 MarkCohen

Board index < HYSPLIT Workshop < 2020 HYSPLIT Workshop Questions < 1. Installing HYSPLIT

1. Installing HYSPLIT

POST A NEW TOPIC

Subject:

[B] [I] [U] [Quote] [Code] [List] [Image] [Link] [Normal]

Add your question text in this box.

Please avoid putting any links in your post.

Do not start any line with two dashes "--"

Smilies [Smiley icons]

BBCode is ON
[img] is ON
[flash] is OFF
[url] is ON
Smilies are ON

Save draft Preview Submit

Options Attachments Poll creation

- Disable BBCode
- Disable smilies
- Do not automatically parse URLs
- Attach a signature (signatures can be altered via the UCP)
- Notify me when a reply is posted
- Lock topic

Board index The team Members Delete all board cookies All times are UTC-04:00

you can add attachments, e.g., one or more screen shots, and/or a CONTROL file and/or a SETUP.CFG file

Once you submit your post, it can be approved and then answered by ARL staff

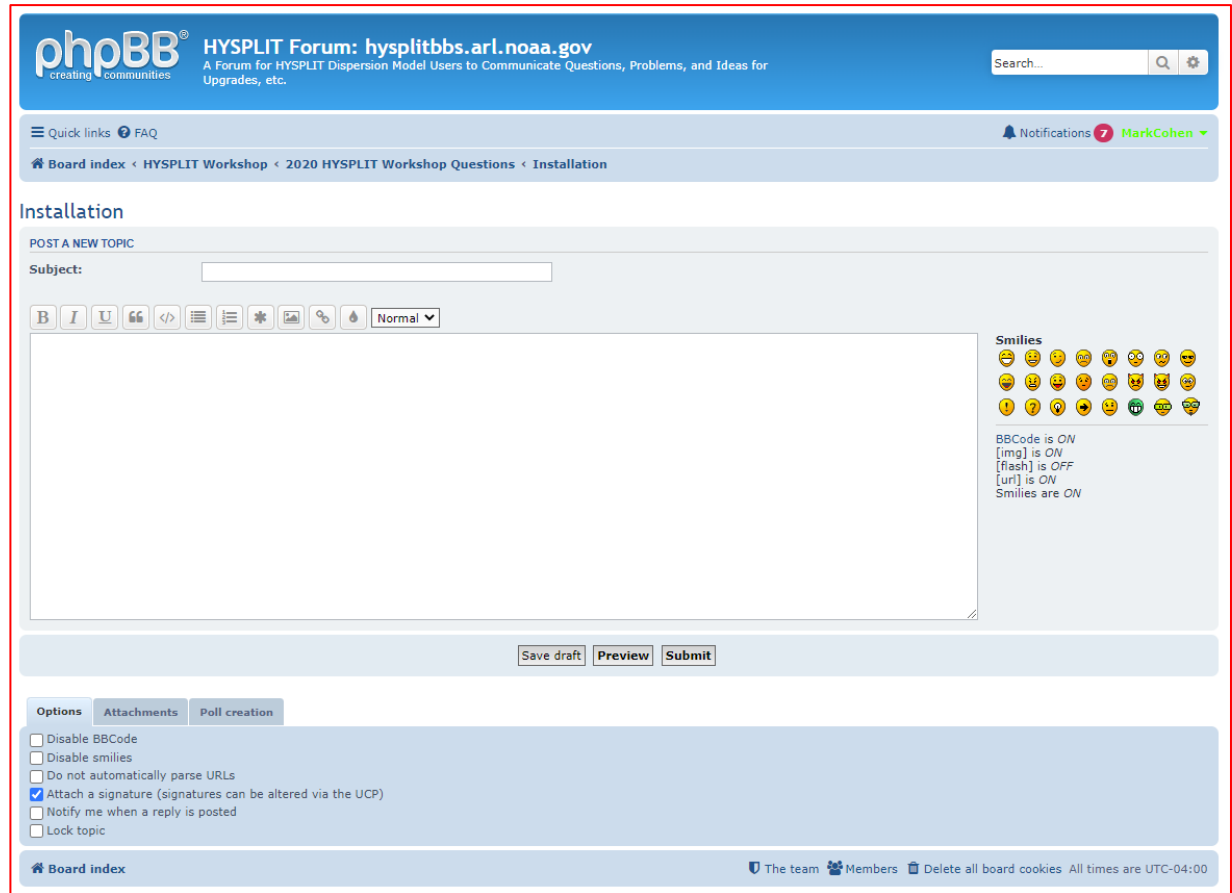


Notify me when a reply is posted



Asking Questions

- You can ask more detailed questions, e.g., can attach screen shots
- We can provide more detailed answers
- There can be an exchange back and forth, if needed
- Can see other questions – in case you have a similar question
- We can give you a link to the answer to a similar question
- Accessible to people just viewing the recordings



phpBB® HYSPLIT Forum: hysplitbbs.arl.noaa.gov
creating communities A Forum for HYSPLIT Dispersion Model Users to Communicate Questions, Problems, and Ideas for Upgrades, etc.

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Quick links FAQ Notifications 7 MarkCohen

Board index < HYSPLIT Workshop < 2020 HYSPLIT Workshop Questions < Installation

Installation

POST A NEW TOPIC

Subject:

B *I* U Normal

Smilies

BBCode is ON
[img] is ON
[flash] is OFF
[url] is ON
Smilies are ON

Save draft Preview Submit

Options Attachments Poll creation

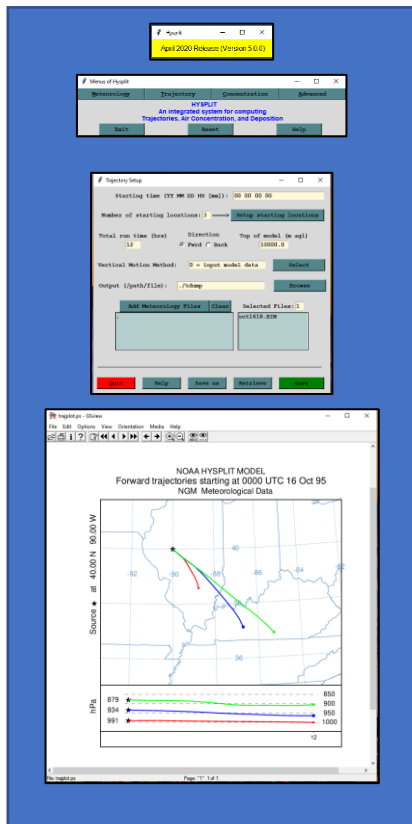
Disable BBCode
 Disable smilies
 Do not automatically parse URLs
 Attach a signature (signatures can be altered via the UCP)
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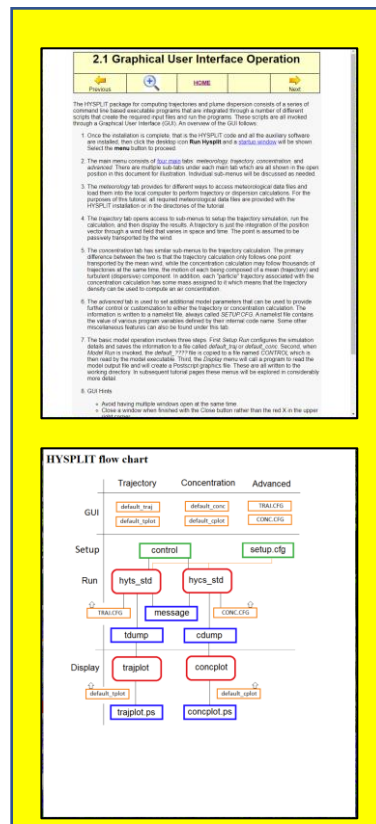
5. Screen Considerations

Screen Considerations

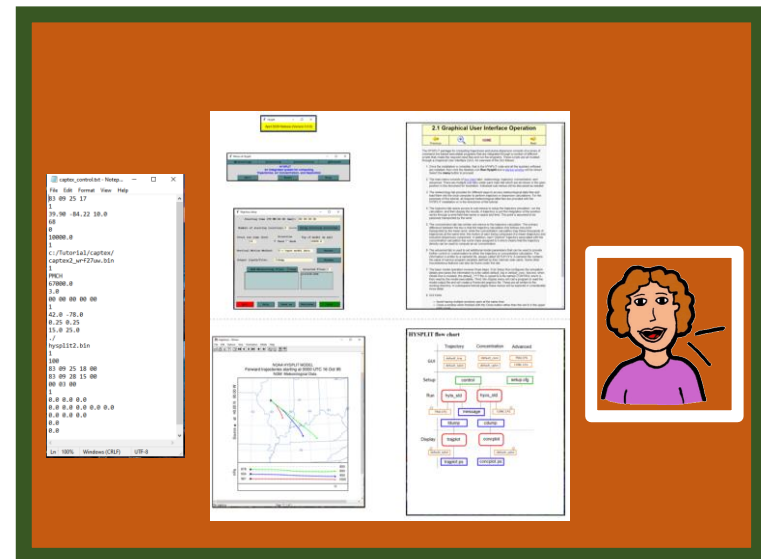
Screen area devoted to your *own* hands-on HYSPLIT modeling



Screen area devoted to your *own* viewing of Tutorial



Screen area devoted to viewing the Webinar



We recommend that a 2nd screen be used, if this is possible, e.g., to display the Workshop Webinar video. In this way, the participant can carry out their hands-on HYSPLIT work, in conjunction with the Workshop, and still conveniently view the ongoing, associated instructions.

6. Recordings

Recordings

Access recordings from the Workshop Web Page:
https://www.ready.noaa.gov/register/HYSPLIT_hyagenda.php

- ❑ Recordings of each day's on-line sessions are being created, *but processing takes significant time* (~4 to 8+ hours *after* a day's session ends)
- ❑ [Workshop Web Page](#) – once the video is posted on our site, the corresponding item in the list below will turn into a link you can click to view

Workshop Logistics

Handouts, Notes, and Recordings. Videos of each day's on-line sessions are being created for review by participants, e.g., for those in time zones that would make online participation difficult. Processing of the videos to make them viewable takes significant time. When the video is posted, the corresponding entry below will become a link. When you click on one of these links, you should be able to view the video directly. To download a video recording, start playing it. Then place your mouse anywhere in the video area and right click the mouse. Choose the "Save As" menu.

•Installation Day (Mon, June 13)

- [Installation day introduction](#)
- [Workshop video recording installation day](#) and [unfinished transcript](#). The transcript is machine-generated and it may contain inaccurate captions. See the above paragraph on how to download the video file.

7. Installation

Installation

From the Workshop Web Page:
https://www.ready.noaa.gov/register/HYSPLIT_hyagenda.php

Key Steps to Take *Before* the Workshop

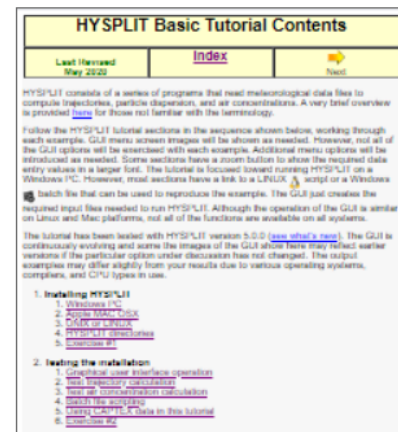
1. Download the primary course materials - [Tutorial.zip](#) - and unzip the contents consistent with preconfigured input files, but placing the file elsewhere is also acceptable. On any operating system, if unzipping to a different directory than the Home directory. On any operating system, if unzipping to a different directory than the Home directory, HYSPLIT system use the space as a file name delimiter.
2. Navigate to the Tutorial directory and open Index.html in a browser window. A screenshot is provided at right.
3. Click on the link in section 1. Installing HYSPLIT to the instructions for your operating system (WINDOWS, MAC OSX, or UNIX-LINUX) and follow the instructions there to install HYSPLIT on your computer. As described in the Installation instructions, graphical utilities should be installed prior to installation. For Windows installations, Tcl/Tk, and ImageMagick should be installed prior to installation.
 - ▶ For Windows users only: Two legacy executables included in versions 1.0.0 and 1.0.1 were found to have an issue. They are txt2dbf.exe and dbf2txt.exe. They should be replaced with the newer versions.

From the Workshop Web Page:

https://www.ready.noaa.gov/register/HYSPLIT_hyagenda.php

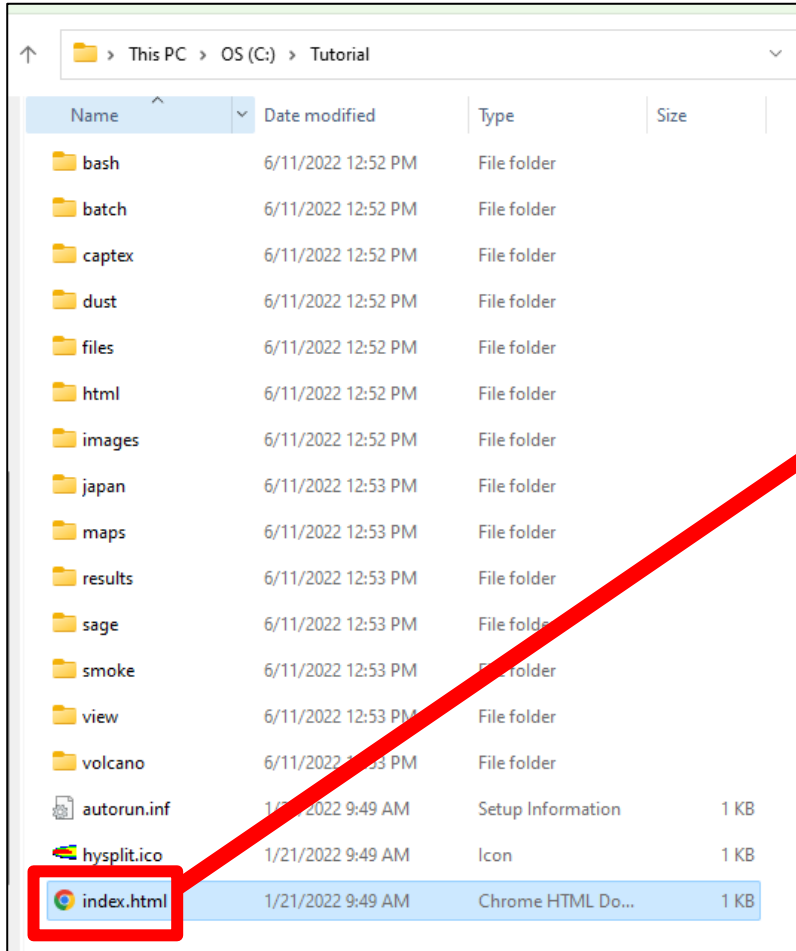
Key Steps to Take *Before* the Workshop

1. Download the primary course materials - [Tutorial.zip](#) - and unzip the contents. For Windows users, unzipping to c:\Tutorial is recommended, to be most fully consistent with preconfigured input files, but placing the file elsewhere is also possible, e.g., c:\users\your_name\tutorial. For MAC users, the file can be unzipped to the Home directory. On any operating system, if unzipping to a different directory name, avoid directories with embedded spaces because many programs in the HYSPLIT system use the space as a file name delimiter.
2. Navigate to the Tutorial directory and open Index.html in a browser window. You should see something like the screenshot at right.
3. Click on the link in section 1. *Installing HYSPLIT* to the instructions for your operating system (Windows PC, Apple MAC OSX, or UNIX-LINUX) and follow the instructions there to install HYSPLIT and associated software on your computer. As described in the Installation instructions, graphical utilities should be installed prior to HYSPLIT. E.g., for Windows installations, Tcl/Tk, and ImageMagick should be installed prior to installing HYSPLIT.
 - ▶ For Windows users only: Two legacy executables included in versions 5.2.0 and 5.2.1 (and earlier releases) were found to have an issue. They are txt2dbf.exe and dbf2txt.exe. They create and check DBF files for Geographic Information System (GIS). Please download and unzip the [dbf_util.zip](#) file and place the executables in the hysplit exec directory to overwrite the existing.
4. Installation may require administrative privileges, and we urge you to work with your IT colleagues to successfully complete this installation process if necessary. The Workshop is intended to be hands-on, i.e., the participants will be following along and will be carrying out the steps in the Tutorial themselves.
 - ▶ Due to the large number of participants, it will be difficult for us to provide significant installation help *once the Workshop starts*. We will try to answer questions, but installation issues can be difficult to efficiently resolve remotely. Thus, we strongly encourage all participants to make every effort to complete the installation before the Workshop starts.
 - ▶ If you encounter any installation issues *prior to the Workshop*, please post your questions [[Forum > 2022 HYSPLIT Workshop Questions > Installation](#)], and we will assist you. A separate registration is required to post to the Forum (see item 6 below).
 - ▶ For all remaining installation issues, we will attempt to provide assistance by appointment on Monday June 13, between the hours of 11 AM and 5 PM Eastern Daylight Time. To make an appointment, please use our web application for scheduling at <https://apps.arl.noaa.gov/pickurfm>. Your email address used for the workshop registration will be required.
5. If possible, try "test" the installation by following instructions in section 2 of the Tutorial, "Test trajectory calculation" and "Test air concentration calculation". If you can successfully reproduce the steps outlined in these sections on your computer, the installation process has most likely been successful.
6. If you are not already registered for the HYSPLIT Forum, create a free account at <https://hysplitbbs.arl.noaa.gov/>, by clicking on the Register link near the top right of the page. Questions before the Workshop, e.g., about installation, can be posted here. *The Forum will also be the primary way that participants will be able to ask questions during the Workshop itself.*



2. Double-click or “open” **index.html** in Tutorial main directory to open the Tutorial in a browser.

1. Download and unzip Tutorial.zip to somewhere on your computer



File | C:/Tutorial/html/index.html

HYSPLIT Basic Tutorial Contents

Last Revised May 2022	Index	Next
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HYSPLIT consists of a series of programs that read meteorological data files to compute trajectories, particle dispersion, and air concentrations. A very brief overview is provided [here](#) for those not familiar with the terminology.

Follow the HYSPLIT tutorial sections in the sequence shown below, working through each example. GUI menu screen images will be shown as needed. However, not all of the GUI options will be exercised with each example. Additional menu options will be introduced as needed. The GUI just creates the required input files needed to run HYSPLIT. Although the operation of the GUI is similar on Linux and Mac platforms, not all of the functions are available on all systems.




Some sections have a zoom button to show the required data entry values in a larger font. The tutorial is focused toward running HYSPLIT on a Windows PC. However, most sections have a link to a LINUX script or a Windows batch file that can be used to reproduce the example.

The time at the bottom left of most pages shows the wall-clock time for that example. For some of the more computationally intense sections, the model output files can be found in the *results* directory of the tutorial.

The tutorial has been tested with HYSPLIT version 5.2.0 ([see what's new](#)). The GUI is continuously evolving and some the images of the GUI show here may reflect earlier versions if the particular option under discussion has not changed. The output examples may differ slightly from your results due to various operating systems, compilers, and CPU types in use.

1. **Installing HYSPLIT**
 1. [Windows PC](#)
 2. [Apple MAC OSX](#)
 3. [UNIX or LINUX](#)
 4. [HYSPLIT directories](#)
 5. [Exercise #1](#)
2. **Testing the installation**
 1. [Graphical user interface operation](#)
 2. [Test trajectory calculation](#)
 3. [Test air concentration calculation](#)
 4. [Batch file scripting](#)
 5. [Using CAPTEX data in this tutorial](#)
 6. [Exercise #2](#)

1.1 Windows PC HYSPLIT Install

 Previous	 HOME		 Next
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The public-unregistered or registered versions of HYSPLIT should be downloaded as noted below. The installation contains all the executables, documentation, and some test meteorological data. Starting with HYSPLIT v5.2.0, the graphical user interface only requires Tcl/Tk because the Postscript graphics have been replaced by Scalable Vector Graphics (SVG) which can be displayed through any browser. Ghostscript and Ghostview are no longer needed. ImageMagick should also be installed if SVG is to be converted to other formats. Other optional programs such as Google Earth and ArcExplorer may be installed if desired. Each software component must be downloaded from its own vendor or distributor web page, unless noted below. For some programs, selections exist for either a 32-bit or 64-bit download. HYSPLIT is provided only for a 64-bit OS. If you are unsure of which system is installed on your computer, check the control panel system tab for the operating system.

1. Tcl/Tk Graphical User Interface

Version 8.5 or later is required.

A Tcl/Tk script interpreter is required to run the HYSPLIT GUI. Further, various computations can be automated through the use of Tcl scripts. The standard HYSPLIT installation includes all the GUI scripts, but the Tcl/Tk interpreter is not part of the distribution. You can download and compile the source code, use one of the precompiled binaries available from the Tcl/Tk web site, or download and unzip the ARL compiled version (tcl.zip) to a directory on your computer (C:\tcl for example) which will contain the Windows executable (tcl\bin\wish86t.exe). For other versions, install the software to the suggested default directory prior to installing HYSPLIT.

- o [ARL pre-compiled Tcl/Tk 8.6 executable](#)
- o [Tcl/Tk Developers Home Page](#)

2. ImageMagick File Converter

Tested versions include up to 7.0.7.

The GUI has a built in link that permits the conversion of the SVG output to most other

1.2 Apple MAC OSX HYSPLIT install



Previous



HOME



Next

The HYSPLIT Mac installation is similar to a Windows PC. Starting with HYSPLIT v5.2.0, the graphical user interface only requires Tcl/Tk because the Postscript graphics have been replaced by Scalable Vector Graphics (SVG) which can be displayed through any browser.

1. Tcl/Tk Graphical User Interface

Version 8.5 or later is required.

Although not required to run HYSPLIT, a GUI composed of multiple Tcl/Tk scripts is provided with HYSPLIT. The model can also be run using a command line interface. However, it is easier for novice users to use the Tcl/Tk interface. The HYSPLIT installation includes all the GUI scripts, but the Tcl/Tk interpreter is not part of the distribution. Most Unix / Linux operating system distributions, as well as Mac OS X, include Tcl/Tk. If not already installed, you can download Tcl/Tk from the Tcl/Tk web site. Install the software to the suggested default directory prior to installing HYSPLIT.



- [Tcl/Tk Home Page](#)

2. ImageMagick Converter

Tested versions include up to 7.0.7.

The capability to convert SVG to other graphical formats is enabled within the GUI through ImageMagick. However, on MAC systems the *Preview* function can also be used to export

1.3 UNIX - LINUX HYSPLIT install

 Previous		HOME	 Next
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Like the Windows and Mac distributions, pre-compiled LINUX distributions come with all executables. However, for installation on a UNIX or some LINUX systems, the code must be compiled locally. See the [HYSPLIT web page](#) for more information about how to obtain either LINUX version. The remainder of this section discusses (1) how to install a pre-compiled LINUX distribution and (2) how to obtain and compile the source code from the repository.

Installing pre-compiled Linux distribution

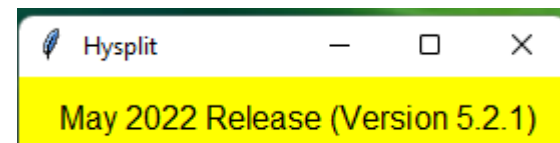
1. Similar to all pre-compiled versions, Windows, Mac, and LINUX, the prerequisite software should be installed prior to installing HYSPLIT. The graphical user interface requires [Tcl/Tk](#) version 8.5 or later. The default graphical format for HYSPLIT is now SVG, which can be viewed using any browser. The GUI and tutorial scripts search for the installation location of **Firefox**. You may need to change the browser if Firefox is not found on your system.
2. SVG can be converted to other formats using [ImageMagick](#). If not already available on your system, they may be easily installed using **yum**, **apt**, or **brew**. For some systems, just entering one of the commands, for instance **wish** for Tcl, or **convert** for ImageMagick will prompt the system to download and install the required libraries and software.
3. A pre-compiled LINUX distribution is a compressed tarball named **hysplit.vX.Y.Z_OS.tar.gz** where X Y Z and OS denote a HYSPLIT version and an operating system, respectively.

		Windows	MacOS	Linux
Tutorial		Download and unzip Tutorial.zip		
Graphical Utilities	Tcl/Tk ** Required to run Graphical User Interface (GUI)	<ul style="list-style-type: none"> ➤ Install from Tcl/Tk website ➤ Or -- Download pre-compiled executable from ARL website 	Already installed on most MacOS systems	Already installed on most Linux systems
	ImageMagick	<i>Optional – can do almost everything in Workshop except create animation or convert graphics to other formats</i>		
	Python	<i>Optional – not required for Workshop</i>		
HYSPLIT		<ul style="list-style-type: none"> ➤ Download and run self-extracting executable ➤ Or -- Download and unzip model files 	<ul style="list-style-type: none"> ➤ Download hysplit_v5.2.1.dmg and then run Install_hysplit.app 	<ul style="list-style-type: none"> ➤ Precompiled executables ➤ Or -- Compile locally

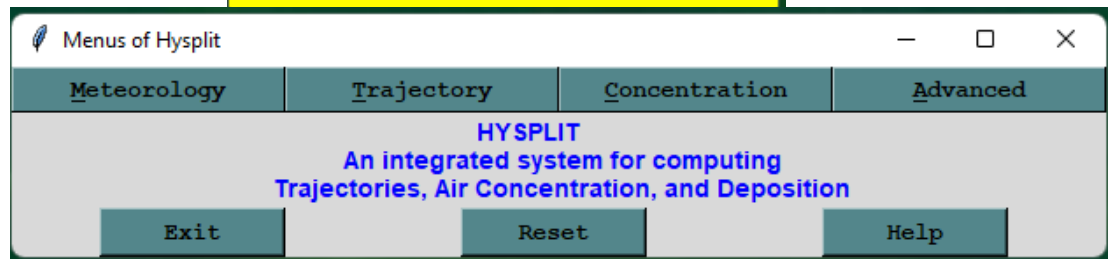
What does a successful installation look like?



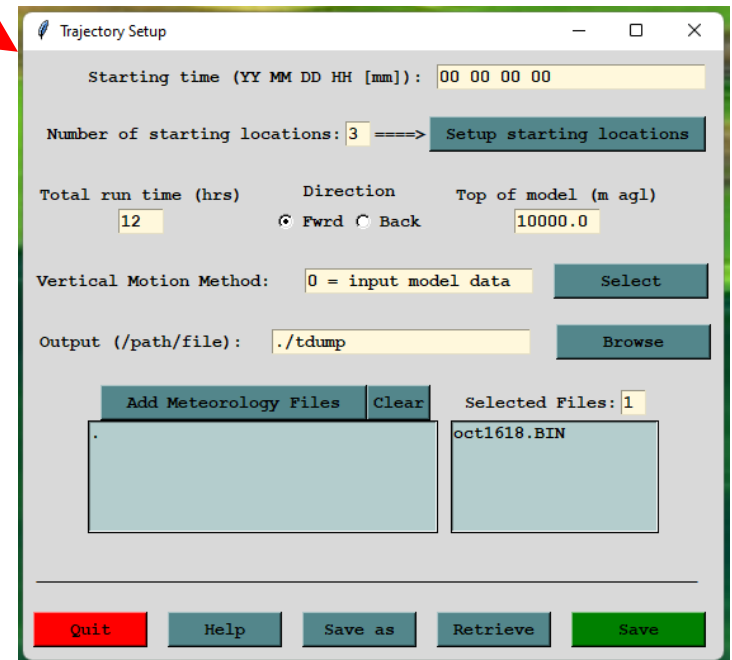
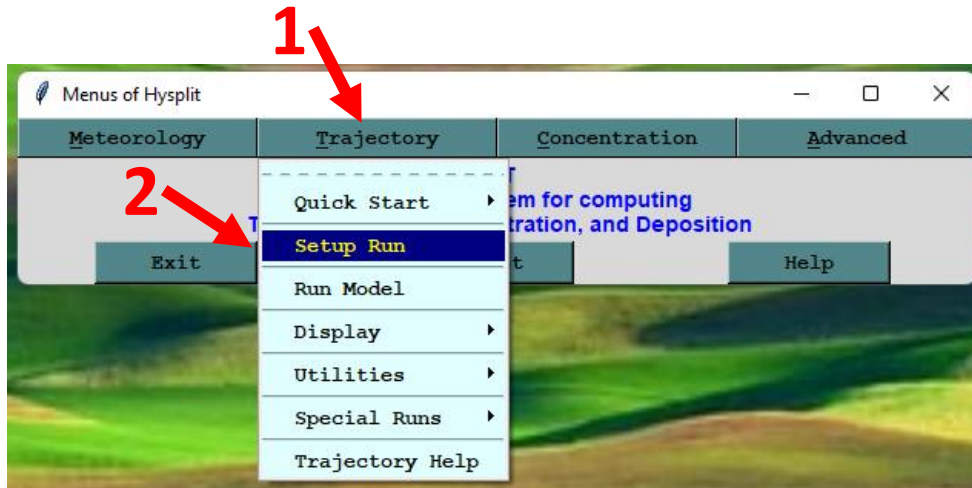
Menu



Sometimes this “yellow” window is behind the “Menus of Hysplit” window

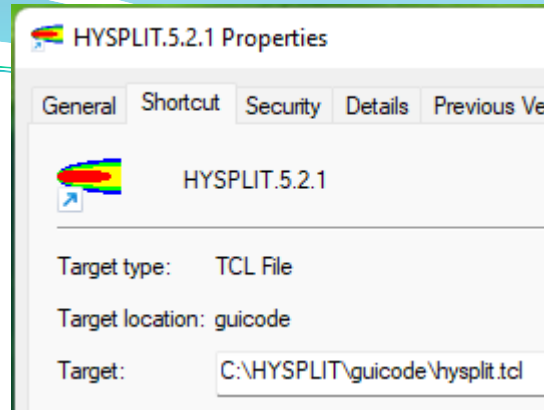
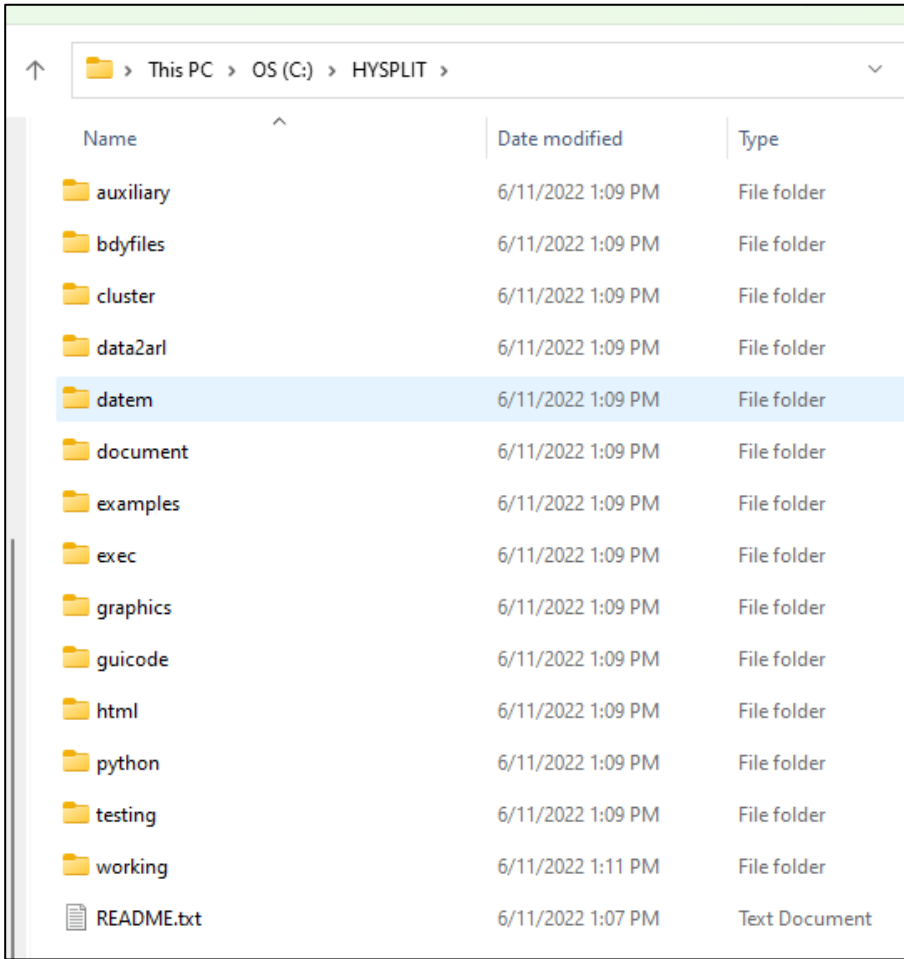


What does a successful installation look like?

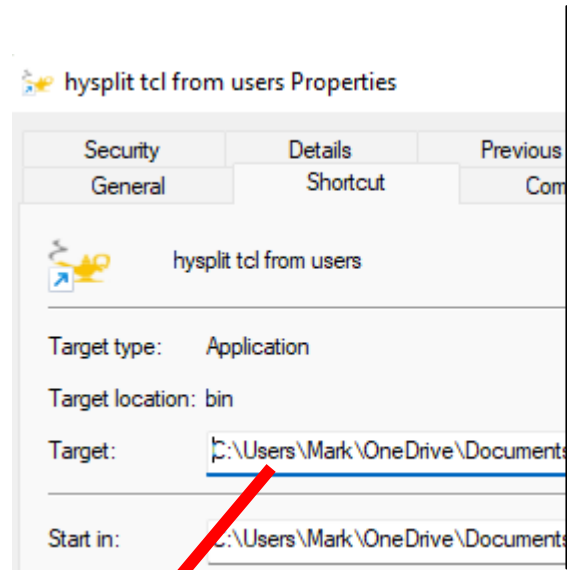


If you are getting these types of things on your screen, then you have likely installed HYSPLIT successfully, and, that Tcl/Tk interpreter has been installed and is working properly on your computer.

What does a successful installation look like?



Desktop shortcut if TCL installed in default location and your computer knows how to open *.tcl files.



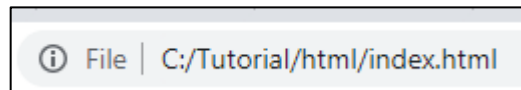
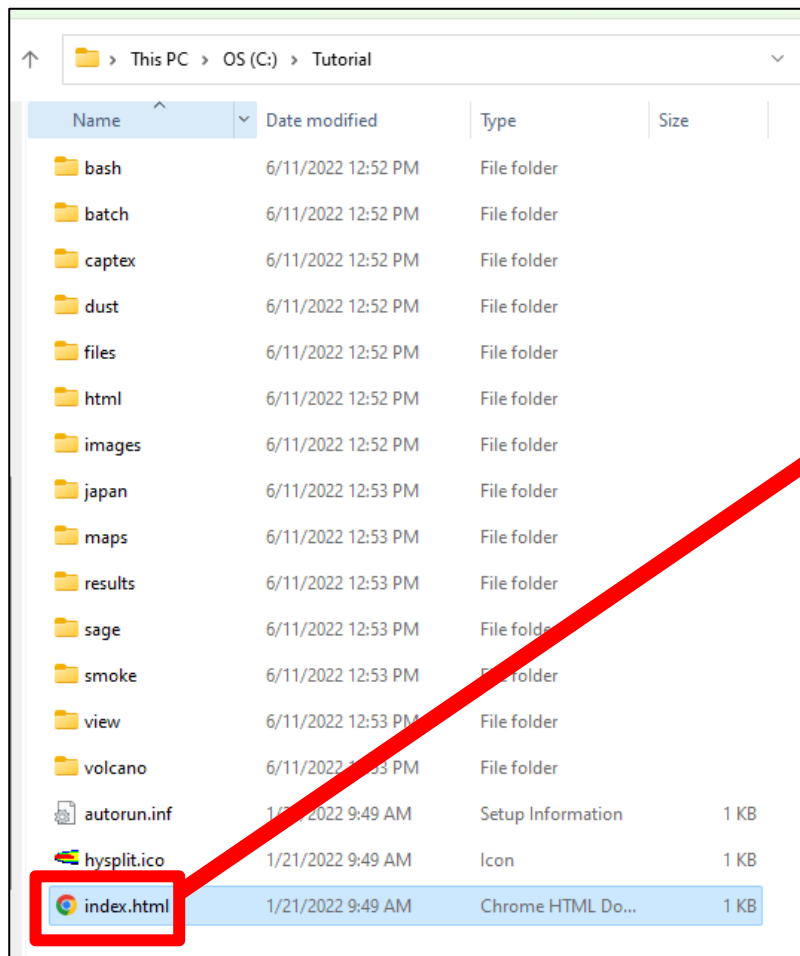
Desktop shortcut if you downloaded pre-compiled TCL executable and placed it in a directory of your choosing (in this example, it was in my Users directory)

Target: C:\Users\Mark\OneDrive\Documents\tcl\tcl\bin\wish86t.exe
 C:\hysplit\guicode\hysplit.tcl

8. Working with the Tutorial

2. Double-click or “open” **index.html** in Tutorial main directory to open the Tutorial in a browser.

1. Download and unzip Tutorial.zip to somewhere on your computer



HYSPLIT Basic Tutorial Contents

Last Revised May 2022	Index	Next
--------------------------	-----------------------	------

HYSPLIT consists of a series of programs that read meteorological data files to compute trajectories, particle dispersion, and air concentrations. A very brief overview is provided [here](#) for those not familiar with the terminology.

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 3. [UNIX or LINUX](#)
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 5. [Exercise #1](#)
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 1. [Graphical user interface operation](#)
 2. [Test trajectory calculation](#)
 3. [Test air concentration calculation](#)
 4. [Batch file scripting](#)
 5. [Using CAPTEX data in this tutorial](#)
 6. [Exercise #2](#)

3. Gridded Meteorological Data Files

1. [Tutorial meteorological data](#)
2. [FTP Meteorological data](#)
3. [Convert meteorological data](#)
4. [Meteorological data servers](#)
5. [User entered meteorological data](#)
6. [Exercise #3](#)

4. Trajectory calculation

1. [The trajectory calculator](#)
2. [The trajectory editor](#)
3. [Estimating mixed layer height](#)
4. [Mixed layer trajectory](#)
5. [Computational options](#)
6. [Meteorology trajectory](#)
7. [Absolute trajectory](#)
8. [Exercise #4](#)

5. Trajectory options

1. [Trajectory vertical](#)
2. [Trajectory flow](#)
3. [Trajectories and](#)
4. [Multiple trajectory](#)
5. [Multiple trajectory](#)
6. [Meteorological](#)
7. [Exercise #5](#)

6. Trajectory statistics

1. [Frequency analysis](#)
2. [Cluster analysis](#)
3. [Clustering](#)

3.1 Tutorial Meteorological Data



Most of the CAPTEX example calculations in the following tutorial sections use one or more of the eight meteorological data files provided in the [Tutorial/captex](#) directory. Additional meteorological files are provided for the *Customized Concentration Simulations* section at the end of this Tutorial in their own directories ([Japan](#), [Smoke](#), [Dust](#), [Sage](#)). All meteorological files contain the data (u,v component wind speeds, temperature, and several other variables) on a regular grid at multiple levels and time periods. These files are already in a format that can be read by HYSPLIT directly. Converting data in other formats for use by HYSPLIT will be discussed in the next section. There are several programs available through the GUI that can be used to examine the contents of the meteorological data files.

If the tutorial contents have been downloaded, then all the meteorological data files are provided. If the tutorial is being run through the web, these files need to be downloaded. Insure that the data transfer is binary.

1. To start, select the *Meteorology / Display Data / Grid Domain* [menu tab](#) to open the [grid domain menu](#) and set the file name to each of the meteorological files to see the spatial domain covered:

- o Weather Research Forecast Model (27 km) UW version: [captex2_wrf27uw.bin](#)
- o Weather Research Forecast Model (27 km): [captex2_wrf27mc.bin](#)
- o Weather Research Forecast Model (27 km): [captex2_wrf27.bin](#)

3.1 Tutorial Meteorological Data



On each Tutorial page, when you click on the “+” sign (or the magnifying glass) you can see more information

Most of the CAPTEX example calculations in the following tutorial sections use one or more of the eight meteorological data files provided in the [Tutorial/captex](#) directory. Additional meteorological files are provided for the *Customized Concentration* in their own directories ([Japan](#), [Smoke](#), [Dust](#), [Sage](#)) component wind speeds, temperature, and several levels and time periods. These files are already in a Converting data in other formats for use by HYSPLIT are several programs available through the GUI that meteorological data files.

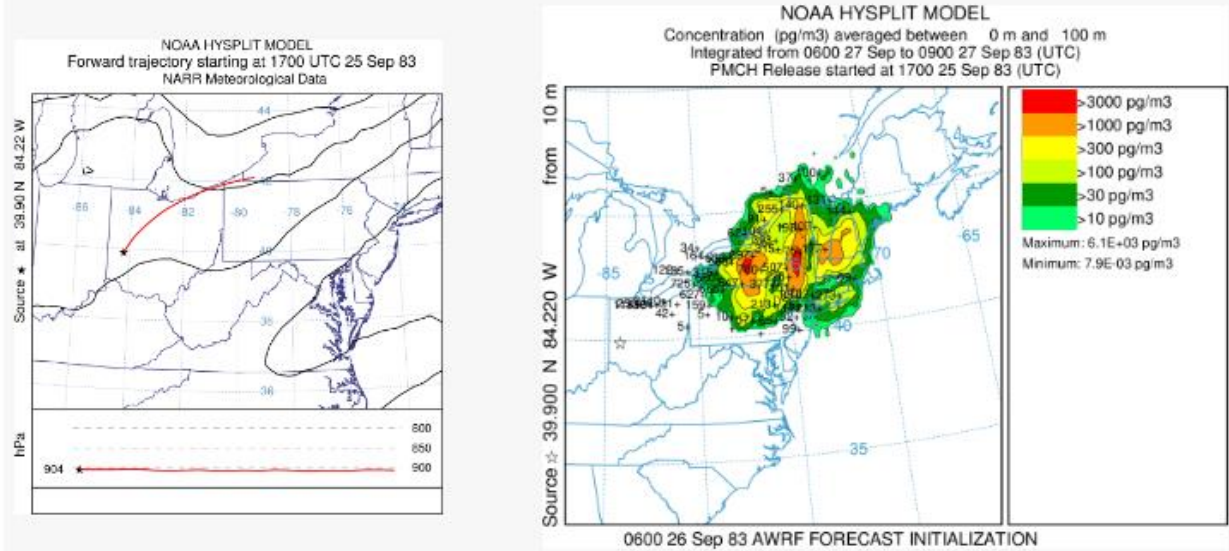
If the tutorial contents have been downloaded, then If the tutorial is being run through the web, these file transfer is binary.

1. To start, select the *Meteorology / Display Data domain menu* and set the file name to each of domain covered:

- o Weather Research Forecast Model (27 k
- o Weather Research Forecast Model (27 k
- o Weather Research Forecast Model (27 k

And the links on the page also show you images or data relevant to this section of the Tutorial

Gridded Meteorological Data



- A file contains data for one or more time periods
- Each time period consists of two types of fixed-length records
 - o The header record: information about the grids and variables
 - o The data records: are one per variable and level

9. Different Ways of Working with HYSPLIT

Different Ways to Use HYSPLIT

1. Online - READY Website: <https://www.ready.noaa.gov/index.php>

- Specialized applications (e.g., Volcanoes, Fires, Locusts, ...)
- Researcher access; public access
- Can use met data directly on our servers, without downloading it

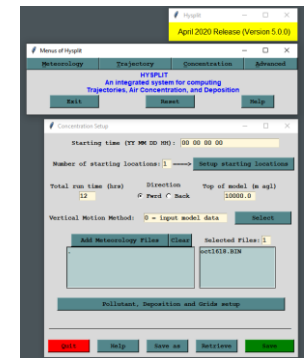
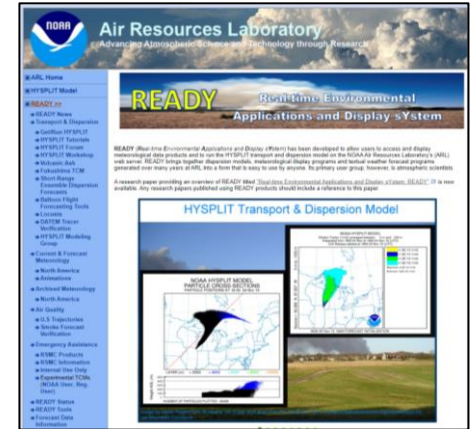
2. Download model (free) and run on your local computer using the Graphical User Interface (GUI)

- This Workshop deals almost exclusively with the GUI
- Menu driven, context sensitive help, integrated applications
- Can generally do more with the GUI than you can online, as we have imposed some limitations due to computational resource constraints
- Download (free) forecast and archive met data to run HYSPLIT

3. Use the same model you downloaded to run on your local computer using the Command Line (terminal) and scripts

- At a basic level, a script is just a series of command line entries
- More features available from command line / scripts than in GUI
- Re-do runs by re-running a script; easy to change parameters
- And you have a record of exactly what you did.

- **But the GUI is a great way to learn how to use HYSPLIT.** Most experienced users will use the GUI when trying something new, and only try a script once they understand what is happening in the GUI.



4.1 The Trajectory Calculation

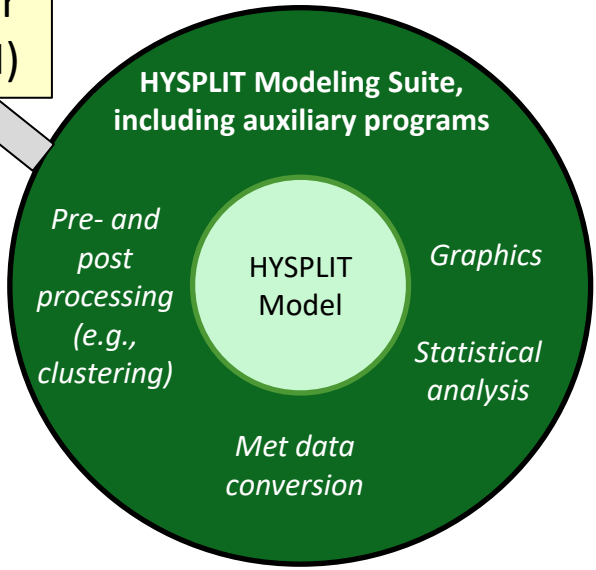


```
echo "$syr $smo $sda $sht"    ">>CONTROL
echo "1"                      ">>CONTROL
echo "$olat $olon $olvl"     ">>CONTROL
echo "$run"                  ">>CONTROL
echo "0"                      ">>CONTROL
echo "$ztop"                  ">>CONTROL
echo "1"                      ">>CONTROL
echo "$MET/"                  ">>CONTROL
echo "$data"                  ">>CONTROL
echo "$OUT/"                  ">>CONTROL
echo "tdump"                  ">>CONTROL
```

Workshop

Tutorial

Graphical User Interface (GUI)



Running HYSPLIT and auxiliary programs from the command line & scripts

Public, on-line READY system

Other public, on-line systems, e.g., new Locust Forecasting system

Proprietary, on-line systems used by National Weather Service and other emergency response agencies & applications (nuclear, volcano, chemicals)

- ❑ **If you haven't installed the software on your computer yet, or if you sometimes get a little behind (e.g., things aren't working for you)**
 - It *is* hard to listen, watch, and do your own hands-on modeling
 - At some points, ok to watch as “demo” and then you can go back and do sections of Tutorial on your own; the Tutorial is designed to be done independently, and self-paced, so this is ok
 - What you are getting, though, in this Workshop, different from doing the Tutorial on your own, are the instructor's insights and guidance. So in some cases, might be best to listen and watch, rather than get too far behind?
 - Also, we are making daily recordings, and you can watch these once they are ready, and you can pause them when you need to catch up

Quick Recap of Logistics

- **General questions:**
 - use Go-to-Webinar Question box and we will do our best to answer
 - We are not using the “raise hand” feature for questions
- **Detailed questions, e.g., about the model:**
 - use the HYSPLIT Forum
 - if haven’t already, “register” in upper right corner of Forum web page
- **Handouts:**
 - Other documents – e.g., this presentation – provided as Handouts in Go-to-Webinar and also on the Workshop Web Page
- **Recordings:**
 - Each day’s recording will be posted to the Workshop Web Page as soon as it is ready, generally 4-8 hours after the day’s session ends.
- **If not installed, or if get too far behind:**
 - Perfectly ok to view one or more sessions as “demonstrations” and then go back and do the sessions on your own. The Tutorial is designed to be done on one’s own in self-paced environment.

Thanks to the

IT Team and the **HYSPLIT Team**

of the NOAA Air Resources Laboratory
for providing the instruction and the
behind-the-scenes support throughout
this Workshop

*...we will try our best to answer all of your questions,
but we ask for your patience, as there are 100's of
people in this Workshop and only a few of us...*

Agenda – Day 1

UTC	EDT	Agenda Item
13:00 – 13:30	09:00 – 09:30	Welcome, Introduction and Logistics
13:30 – 14:45	9:30 – 10:15	3. Gridded meteorological data sets
14:45 – 14:30	10:15 – 10:30	Break
14:30 – 16:00	10:30 – 12:00	4. Trajectory calculations
16:00 – 17:15	12:00 – 13:00	Break
17:15 – 18:30	13:00 – 14:15	5. Trajectory options
18:30 – 18:45	14:15 – 14:30	Break
18:45 – 19:45	14:30 – 15:45	6. Trajectory statistics
19:45 – 20:00	15:45 – 16:00	Day 1 Wrap-up