

```

#
-----
# Login to AWS Console
#
-----
# Open https://console.aws.amazon.com/ in your browser
# OR use your institution's AWS SSO login URL (unique per
organization)

# After login, switch region --> N. Virginia (us-east-1)
# Navigate to: EC2 --> Instances

# Locate your Linux-based Utility Host instance
# Click "Instance ID" --> "Connect" --> choose "SSM Session Manager"
--> "Connect"

#
-----
# Connect to Ubuntu parallel cluster
#
-----
sudo su - ubuntu
ls -lrt

#
-----
# Navigate to tutorial directory & ensure Land DA v3 container image
exists
#
-----
cd LandDATutorial
ls -lrt

#
-----
# Export environment variables
#
-----
export img=$PWD/ubuntu22.04-intel-landda-release-public-v3.0.0.img
export LANDDA_INPUTS=/home/ubuntu/misc/inputs

#

```

```
-----  
-----  
# Check available modules  
#  
-----
```

```
-----  
module avail  
  
#  
-----
```

```
-----  
# (Optional) Enter Singularity container & explore directory/file  
structure  
# Since you've already setup $img environment variable, you can use  
# singularity shell $img  
# in place of  
# singularity shell ubuntu22.04-intel-landda-release-public-v3.0.0.img  
#  
-----
```

```
-----  
singularity shell ubuntu22.04-intel-landda-release-public-v3.0.0.img  
ls /opt/  
ls -lrt /opt/land-DA_workflow/  
ls -lrt /opt/land-DA_workflow/setup_container.sh  
exit  
  
#  
-----
```

```
-----  
# Copy setup_container.sh from container  
#  
-----
```

```
-----  
singularity exec -H $PWD $img cp -r /opt/land-DA_workflow/  
setup_container.sh .  
ls -lrt  
  
#  
-----
```

```
-----  
# Run container setup script  
#  
-----
```

```
-----  
./setup_container.sh -c=intelmpi/2021.13 -m=intelmpi/2021.13 -i=$img  
ls -lrt  
  
# Note: If you see "permission denied" error when running the above  
container  
# setup script, add execute permission to "land-DA_workflow" directory
```

```
# chmod 755 land-DA_workflow --recursive
# Then, rerun the container setup script.
```

```
#
```

```
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```

```
# Enter workflow directory
#
```

```
-----
```

```
cd land-DA_workflow
ls -lrt
```

```
#
```

```
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```

```
# Add modulefiles path + load workflow module
#
```

```
-----
```

```
module use modulefiles
module load wflow_singularity
```

```
#
```

```
-----
```

```
# Move into parameter directory
#
```

```
-----
```

```
cd parm
ls -lrt
ls -lrt config_samples/
```

```
#
```

```
-----
```

```
# Copy sample config --> working config.yaml
#
```

```
-----
```

```
cp config_samples/config.LND.era5.3dvar.ims.DA-fcst.warmstart.yaml
config.yaml
```

```
# Edit config.yaml
vi config.yaml
```

```
# update EXP_CASE_NAME: lndDA_Tutorial
```

```
#
```

```
-----  
-----  
# Setup workflow environment  
#  
-----
```

```
-----  
./setup_wflow_env.py -p=singularity  
#  
-----
```

```
-----  
# Move into experiment case directory  
#  
-----
```

```
-----  
cd ../../..  
ls -lrt  
cd exp_case  
cd lndDA_Tutorial  
ls -lrt  
#  
-----
```

```
-----  
# Launch workflow automation (with intervals, -i=15)  
#  
-----
```

```
./automate_launch_script.py -i=15  
#  
-----
```

```
-----  
# Check ROCOT0 workflow status in a new terminal window  
#  
-----
```

```
-----  
cd /path/to/exp_case/lndDA_Tutorial  
rocotostat -w land_analysis.xml -d land_analysis.db  
#  
-----
```

```
-----  
# Inspect tmp/, log/, com/ directories  
#  
-----
```

```
-----  
ls -lrt  
ls tmp_dir/  
ls -lrt log_dir/*
```

```
vi log_dir/forecast_2025012000
ls -lrt com_dir/
ls -lrt com_dir/landda.20250119/
ls -lrt com_dir/landda.20250119/plot
```

```
#
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```
-----
# Upload output plots to S3 bucket & then download it to your local
machine
```

```
# New users need to create an S3 bucket
```

```
#
```

```
-----
# (Optional) Create bucket in AWS Console
```

```
# AWS console --> S3 --> then click "create bucket"
```

```
# Bucket type --> general purpose [Select]
```

```
# Bucket namespace --> global namespace [Select]
```

```
# Bucket name: landda-plots-dwnld (a unique alphanumeric name with no
caps & underscores, hiphens are accepted)
```

```
# Object Ownership --> ACLs disabled
```

```
# Block all public access [Select]
```

```
# Encryption: SSE-S3
```

```
# Bucket Key: Enabled
```

```
# Bucket versioning: disable
```

```
# Encription type: Server-side encryption with Amazon S3 managed keys
(SSE-S3)
```

```
# Bucket Key: Enable
```

```
# Then "Create bucket"
```

```
#
```

```
-----
# Upload PNG plots to S3
```

```
#
```

```
-----
cd /path/to/com_dir/landda.20250120/
```

```
aws s3 cp plot s3://landda-plots-dwnld --recursive
```

```
# Refresh S3 bucket and download plots to your local machine to
explore them
```

```
# If you want to delete the bucket, go to buckets, select the bucket
you want to delete
```

```
# then click on the "delete" button that appears on the top of the
screen.
```

```
#####
#####
```