

GraphCast Dataset

```
# Map model choice to assets path
model2assets = {
    "fourcastnetv2-small": "./fcnv2",
    "panguweather": "./pw",
    "aurora-2.5-finetuned": "./au",
    "graphcast": "./gc",
    "graphcast-1p00": "./gc"
}

assets = model2assets[model]

# Runs the ai-models-gfs command
!ai-models-gfs \
  --input {input_data} \
  --date {date} \
  --time {time} \
  --assets {assets} \
  --path {output_path} \
  --lead {forecast_lead} \
  {model}
```

ERA5 Dataset

```
import xarray as xr
ds_fc = xr.open_dataset("/content/drive/MyDrive/Fmodel/merged_era5_6hourly_june2021.nc")
```

Mean Sea Level Pressure

```
import matplotlib.pyplot as plt
import ipywidgets as widgets
from ipywidgets import interact
import xarray as xr

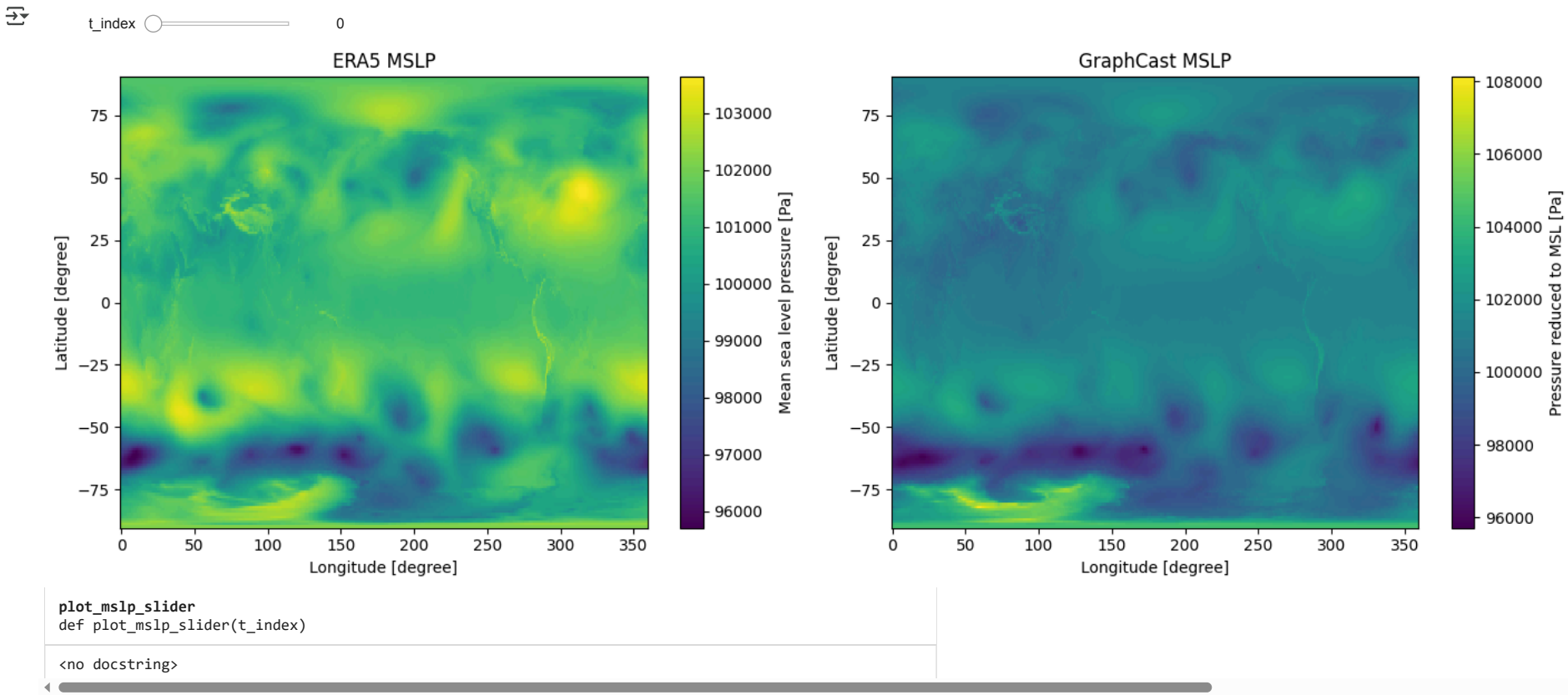
# Helper function for plotting at a given time index
def plot_mslp_slider(t_index):
    fig, axs = plt.subplots(1, 2, figsize=(14, 5))

    # ERA5 interpolated
    msl_era5_interp.isel(valid_time=t_index).plot(ax=axs[0])
    axs[0].set_title(f"ERA5 MSLP")

    # GraphCast
    msl_gc.isel(time=t_index).plot(ax=axs[1])
    axs[1].set_title(f"GraphCast MSLP")

    plt.tight_layout()
    plt.show()

# Create interactive slider (assumes 6-hour intervals up to 240h)
interact(plot_mslp_slider, t_index=widgets.IntSlider(min=0, max=len(msl_gc.time)-1, step=1, value=0))
```



```
# ✅ Interpolate ERA5 to GraphCast grid
t_era5_interp = t_era5.interp(
    latitude=t_gc.latitude,
    longitude=t_gc.longitude,
    method="linear"
)

# ✅ Rename time axis if needed
if "valid_time" in t_era5_interp.dims:
    t_era5_interp = t_era5_interp.rename({"valid_time": "time"})

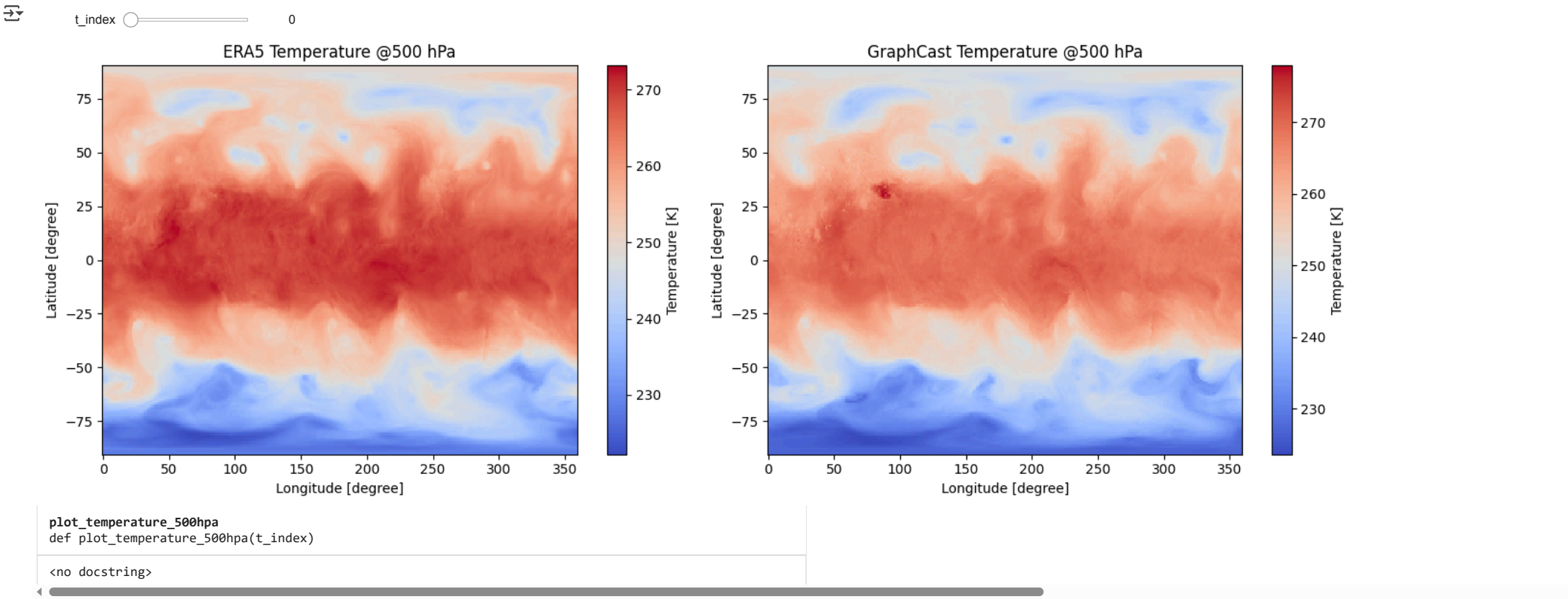
# ✅ Interactive plot function
def plot_temperature_500hpa(t_index):
    fig, axs = plt.subplots(1, 2, figsize=(14, 5))

    # ERA5
    t_era5_interp.isel(time=t_index).plot(ax=axs[0], cmap="coolwarm")
    axs[0].set_title(f"ERA5 Temperature @500 hPa")

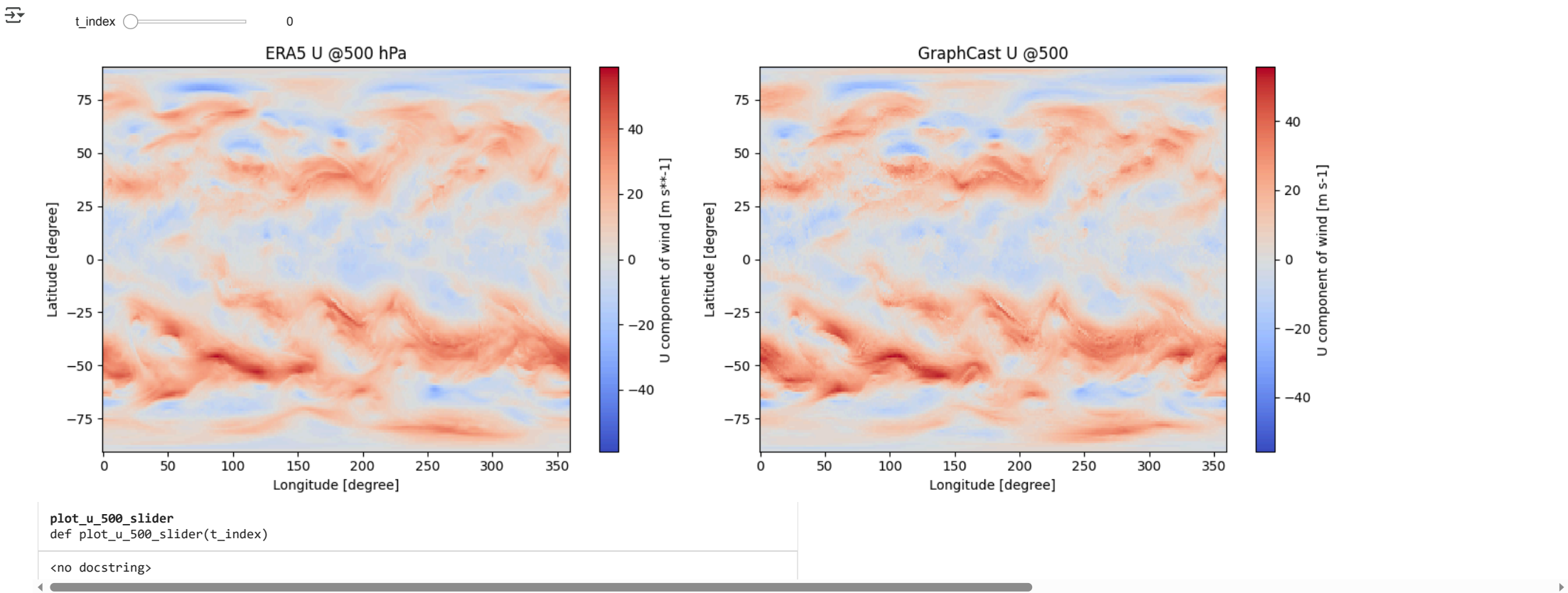
    # GraphCast
    t_gc.isel(time=t_index).plot(ax=axs[1], cmap="coolwarm")
    axs[1].set_title(f"GraphCast Temperature @500 hPa")

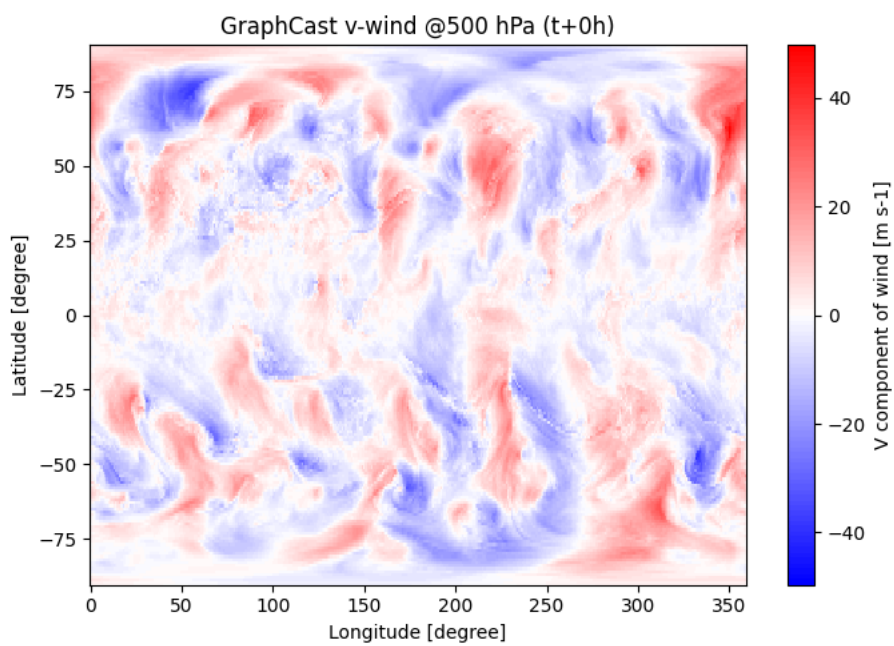
    plt.tight_layout()
    plt.show()

# ✅ Create interactive slider
interact(
    plot_temperature_500hpa,
    t_index=widgets.IntSlider(min=0, max=len(t_gc.time)-1, step=1, value=0)
)
```



```
# Slider for time steps
interact(
    plot_u_500_slider,
    t_index=widgets.IntSlider(min=0, max=len(u_gc.time)-1, step=1, value=0)
)
```

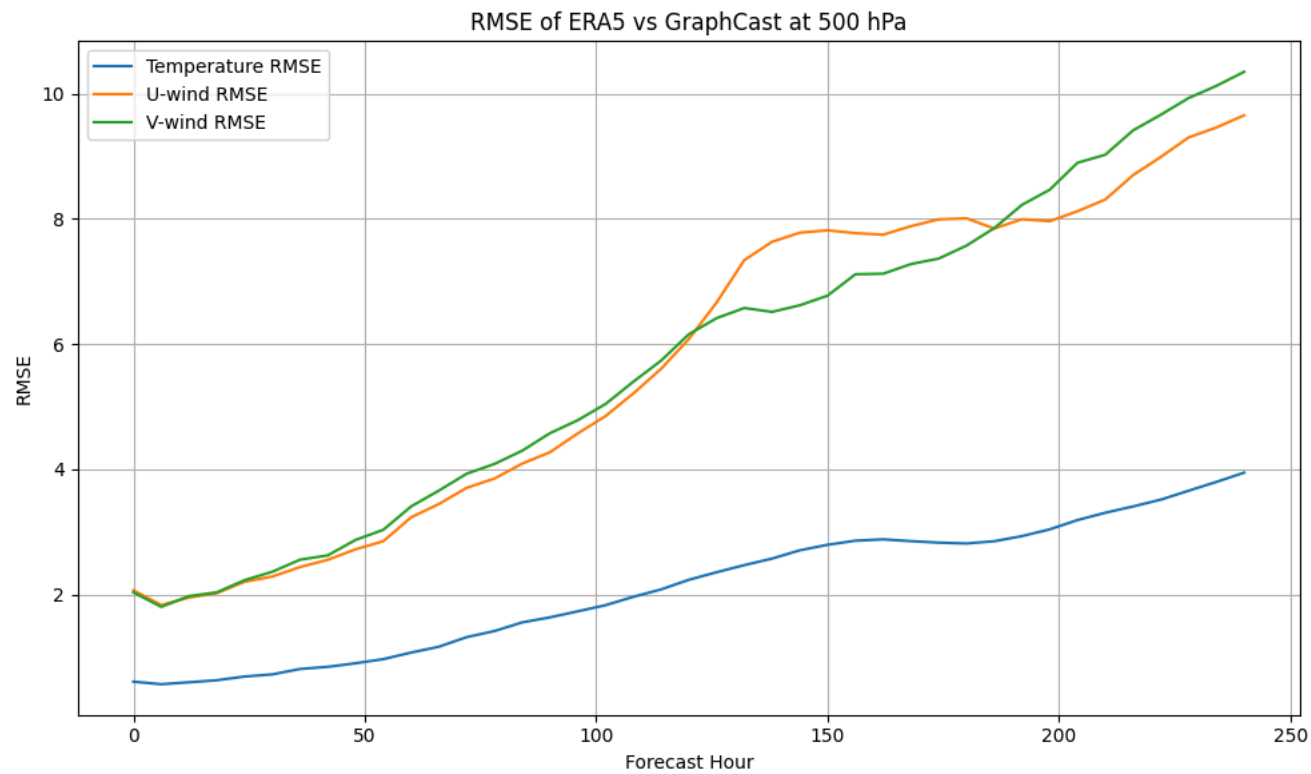




```
<no docstring>
```

## RMSE Results

```
plt.xlabel("Forecast Hour")
plt.ylabel("RMSE")
plt.title("RMSE of ERA5 vs GraphCast at 500 hPa")
plt.legend()
plt.grid(True)
plt.tight_layout()
plt.show()
```



Start coding or generate with AI.

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