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FLEXPART-IFS on the EWC Community Hub

A Practical Guide from Prototype to Published Hub Item

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EWC Workshop 2026

From a working prototype to a reusable EWC service

PROTOTYPE

A working end-to-end workflow, set up manually

1. **Get forecast data** — MARS / ECMWF IFS — *IFS meteorological data from ECMWF*
2. **Prepare model input** — flexprep — *Process and prepare input data*
3. **Run dispersion simulation** — FLEXPART-IFS — *Atmospheric transport and dispersion model*
4. **Generate maps** — Pyflexplot — *Visualisation and analysis*

Works for us …
but hard to reproduce for others

Blueprint + automation

Ansible • component versions • metadata validation • EWC integration

We package the environment and deployment knowledge so others can reuse it.

EWC COMMUNITY HUB

A published, ready-to-deploy workflow

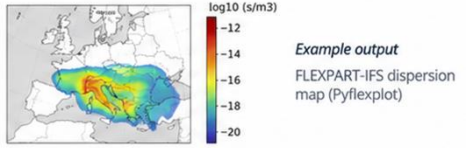
FLEXPART-IFS

Atmospheric Dispersion Workflow

v0.1.2 | Ansible Playbook | Community

```
>_  ewc hub deploy flexpart-ifs
```

Ready-to-use environment | Reproducible for other users | From data to scientific products



Example output
FLEXPART-IFS dispersion map (Pyflexplot)

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What does the blueprint actually package?

EWC COMMUNITY HUB ITEM

A complete, deployable and reproducible package

Scientific workflow
MARS / ECMWF IFS → flexprep → FLEXPART-IFS → Pyflexplot

The scientific application and processing chain.

Software environment
containers • dependencies • pinned versions

Ensures reproducibility through well-defined component versions and dependencies.

Deployment automation
Ansible roles • deploy.yml • configuration

Automates the installation and configuration on a clean EWC environment.

Hub metadata & documentation
name • version • description • tags

Makes the item discoverable, understandable and reusable in the Community Hub.

Example blueprint repository

flexpart-ifs-ewc-blueprint/

catalog/	Catalogue definition (for local testing and publication)
roles/	Ansible roles for deployment
group_vars/	Configuration variables
deploy.yml	Main Ansible playbook
requirements.yml	Python/Ansible dependencies
component-versions.yml	Pinned component versions
README.md	Usage instructions and documentation

The blueprint packages code, configuration and knowledge
so others can deploy, run and reproduce the workflow.

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From dev blueprint to published Community Hub item

1 BUILD

Create the blueprint repository

- deploy.yml
- roles/
- component-versions.yml
- README.md

Ansible roles, configuration, versions and metadata

2 TEST WITH LOCAL CATALOGUE

Use a custom catalogue during development

```
custom_catalog.yml
```

EWCCLI points to the development version

3 DEPLOY ON EWC

Create or reuse a VM and run the deployment

```
ewc hub --path-to-catalog
./custom_catalog.yml deploy
flexpart-ifs
```

Real EWC environment (VM + Ansible)

4 VALIDATE & ITERATE

Does the workflow actually run?

- Check deployment logs
- Run the workflow
- Inspect scientific output
- Fix issues and repeat

5 PUBLISH

Add to the Community Hub catalogue

Published Hub item

- Versioned
- Discoverable
- Reusable by the community

Fix & repeat

During development (local catalogue)

```
ewc hub --path-to-catalog ./catalog/custom_catalog.yml \
deploy flexpart-ifs
```

After publication (for users)

```
ewc hub deploy flexpart-ifs
```

Ansible in practice: from role to user command

1 Playbook chooses roles

deploy.yml

```
roles:
  - role: system
  - role: ecmwf_data_flavour
  - role: docker
  - role: flexpart_workflow
  - role: validation
```

Highlight the role that installs the workflow interface.

2 One role groups tasks

roles/flexpart_workflow/tasks/main.yml

```
- import_tasks: directories.yml
- import_tasks: orchestrator.yml
- import_tasks: configuration.yml
- import_tasks: compose.yml
```

- **directories.yml** → data / runs / plots
- **orchestrator.yml** → installs flexpart-workflow
- **configuration.yml + compose.yml** → configs + containers

3 The VM gains capabilities

Result on the VM

- /usr/local/bin/flexpart-workflow
- /etc/flexpart-ifs/workflow.yml
- Docker images FLEXPART + Pyflexplot
- /var/lib/flexpart-ifs/ data • runs • plots

One real task

```
- name: Create system-wide orchestrator command
  ansible.builtin.file:
    src: "{{ flexpart_orchestrator_executable
}}"
    dest: /usr/local/bin/flexpart-workflow
    state: link
```

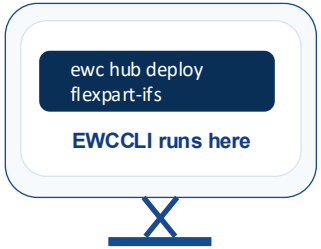
This task exposes the orchestrator as a system-wide command.

```
flexpart-workflow --help
```

playbook → roles → tasks → concrete state on the VM.

What happens behind `ewc hub deploy`?

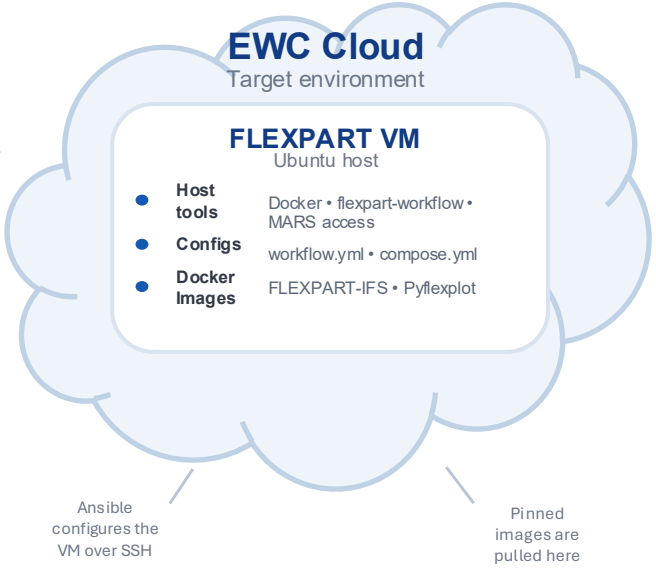
1 On your local computer



- Reads the Hub item name
- Contacts the EWC services
- Requests or reuses a VM
- Opens SSH access to the VM

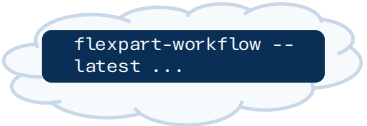
EWCCLI triggers deployment

2 In the European Weather Cloud



Same VM, now ready to use

3 Later on the same VM



This is the workflow sequence after deployment.
Everything runs on the prepared EWC VM.

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Demo ewc hub deploy

```
(ewccli) bun@lab-vm:~/Documents/00_pilot_ecmwf/blueprint/flexpart-ifs-ewc-blueprint$ ewc hub   --path-to-ca
talog ./catalog/custom_catalog.yml   deploy flexpart-ifs   --flavour-name 8cpu-16gbmem-80gbdisk
[09/22/26 14:01:23] INFO     Using `default` profile.
[09/22/26 14:01:23] INFO     SSH private and public keys are matching! Continuing...
                    INFO     The item will be deployed on ECMWF (CCI1) side of the EWC.
You selected flexpart-ifs item from the EWC Community Hub.
                    INFO     📦 Classified source
                             '/home/bun/Documents/00_pilot_ecmwf/blueprint/flexpart-ifs-ewc-blueprint' as:
                             directory
                    INFO     The item flexpart-ifs uses Ansible Playbook techonology.
                    INFO     Pre deploy server setup starting...
[09/22/26 14:01:26] INFO     Keypair 'bun-ewccli-keypair' already exists on Openstack. Using this key to
                             deploy the VM.
                                                    OK
                    [Identify Server Reconfiguration] Server flexpart-ifs doesn't exists.

                    INFO     Deploy server flexpart-ifs starting...
                 🧾 Server Configuration Inputs Summary
```

Parameter	Value
Image	Ubuntu-24.04-20260519071420
Flavour	8cpu-16gbmem-80gbdisk
Network	private-cci1-ewcloud-ch-meteoswiss-flexpart
Security Groups	ssh
Keypair	bun-ewccli-keypair

```
                    INFO     [Deploy server] Requesting server from Openstack...
```

From tested blueprint to Community Hub

My blueprint repo

MeteoSwiss / flexpart-ifs-ewc-blueprint

PR to Hub catalogue

github.com/ewcloud/ewc-community-hub

ewcloud / ewc-community-hub

Pull requests

Pull request

Add FLEXPART-IFS Community Hub item

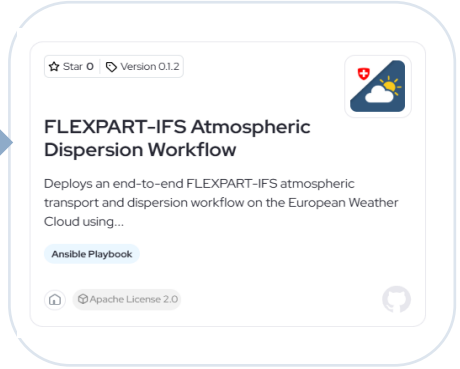
Merged

What I needed to add

`items.yaml`	+ flexpart-ifs metadata entry
`sources`	+ link to MeteoSwiss blueprint repo
`ewccli`	+ playbook + requirements paths
`maintainers`	+ support contact / ownership
`version`	+ support level, license, category

Schema / catalogue checks passed

Feedback addressed



The useful part

- Quick review loop
- Concrete comments
- Support was available

Ask before everything is "perfect".

MeteoSwiss

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What I wish I knew when I started

If I started again...

I would ask earlier, test earlier, and keep the first version simpler.

1 **Workflow first**

Automating unclear manual steps just makes the confusion reproducible.

2 **Ask early**

The EWC Community Hub team was really helpful, quick feedback, concrete answers. 🙂

3 **AI helped me get started with Ansible**

It was useful to draft playbook tasks. 🙂

4 **Publishing ≠ moving everything**

My blueprint stayed in my repo; the Hub item links to it and makes it discoverable.

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Thank you

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