

# Synthetic images of corals (*Desmophyllum pertusum*) with object detection models

**SND-ID:** 2022-98-1. **Version:** 1. **DOI:** <https://doi.org/10.5878/hp35-4809>

## Download data

409\_coral\_images\_cropped.zip (33.69 MB)

StyleGan2.zip (310.05 MB)

synthetic\_images.zip (607.35 MB)

YOLOv4.zip (451.85 MB)

## Download all files

2022-98-1-1.zip (~1.37 GB)

## Citation

Obst, M., Al-Khateeb, S., Anton, V., & Germishuys, J. (2023) Synthetic images of corals (*Desmophyllum pertusum*) with object detection models (Version 1) [Data set]. University of Gothenburg. Available at: <https://doi.org/10.5878/hp35-4809>

## Creator/Principal investigator(s)

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## Research principal

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## Description

Two object detection models using Darknet/YOLOv4 were trained on images of the coral *Desmophyllum pertusum* from the Kosterhavet National Park. In one of the models, the training image data was amplified using StyleGAN2 generative modeling.

The dataset contains 2266 synthetic images with labels and 409 original images of corals used for training the ML model. Included is also the YOLOv4 models and the StyleGAN2 network.

The still images were extracted from raw video data collected using a remotely operated underwater vehicle.

409 JPEG images from the raw video data are provided in 720x576 resolution. In certain images, coordinates visible in the OSD have been cropped.

The synthetic images are PNG files in 512x512 resolution.

The StyleGAN2 network is included as a serialized pickle file (\*.pkl).

The object detection models are provided in the .weights format used by the Darknet/YOLOv4 package. Two files are included (trained on original images only, trained on original + synthetic images).

The machine learning software packages used is currently (2022) available on Github:

StyleGAN2: <https://github.com/NVlabs/stylegan2>

YOLOv4: <https://github.com/AlexeyAB/darknet>

## **Data contains personal data**

No

## **Language**

[English](#)

## **Time period(s) investigated**

1999 – 2001

## **Data format / data structure**

[Still image](#)

[Software](#)

## **Species and taxons**

[Desmophyllum pertusum](#)

[Lophelia pertusa \(formerly\)](#)

## **Data collection 1**

- Mode of collection: Recording
- Description of the mode of collection: Video recordings from 35 research cruises in the Kosterhavet National Park using a ROV.
- Time period(s) for data collection: 1999 – 2004
- Data collector: Department of Marine Sciences, University of Gothenburg

## **Data collection 2**

- Mode of collection: Transcription
- Description of the mode of collection: The classification of *Desmophyllum pertusum* in still images from the video data has been performed as citizen science by volunteers using the classification tool on the Koster seafloor observatory website.
- Data collector: The Koster seafloor observatory

## **Geographic spread**

Geographic location: [Sweden](#)

Geographic description: Kosterhavet National Park

## **Responsible department/unit**

Department of Marine Sciences

## **Funding 1**

- Funding agency: Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (FORMAS)
- Funding agency's reference number: 2021-02465\_Formas
- Project name on the application: National implementation of a platform for analysis of sub-sea images (PLAN-SUBSIM)

- Funding information: The data set collection was funded through Swedish Biodiversity Data Infrastructure (SRC), Ocean Data Factory (Vinnova), and PLAN-SUBSIM (FORMAS)

## **Funding 2**

- Funding agency: Swedish Research Council
- Funding agency's reference number: 2019-00242
- Project name on the application: Swedish Biodiversity Data Infrastructure
- Funding information: The data set collection was funded through Swedish Biodiversity Data Infrastructure (SRC), Ocean Data Factory (Vinnova), and PLAN-SUBSIM (FORMAS)

## **Funding 3**

- Funding agency: Vinnova
- Funding agency's reference number: 2019-02256
- Project name on the application: Ocean Data Factory
- Funding information: The data set collection was funded through Swedish Biodiversity Data Infrastructure (SRC), Ocean Data Factory (Vinnova), and PLAN-SUBSIM (FORMAS)

## **Research area**

[Zoology](#) (Standard för svensk indelning av forskningsämnen 2011)

[Ecology](#) (Standard för svensk indelning av forskningsämnen 2011)

[Imagery / base maps / earth cover](#) (INSPIRE topic categories)

[Biota](#) (INSPIRE topic categories)

[Oceans](#) (INSPIRE topic categories)

## **Keywords**

[Benthic ecosystem](#), [Corals](#), [Habitats and biotopes](#), [Protected sites](#), [Machine learning](#), [Computer vision](#), [Object detection](#), [Underwater image](#), [Image recognition](#), [Benthic monitoring](#), [Data augmentation](#)

## **Publications**

Alkhateeb, Sarah, Obst, Matthias, Anton, Victor and Germishuys Jannes. (2023). A methodology to detect deepwater corals using Generative Adversarial Networks. GigaScience. [Submitted manuscript].

If you have published anything based on these data, [please notify us](#) with a reference to your publication(s). If you are responsible for the catalogue entry, you can update the metadata/data description in DORIS.

## **Polygon (Lon/Lat)**

10.862684, 58.71157

11.175991, 58.71157

11.175991, 59.018317

10.862684, 59.018317

10.862684, 58.71157

## **Accessibility level**

Access to data through SND

Data are freely accessible

## Use of data

[Things to consider when using data shared through SND](#)

## License

[CC0 1.0](#)

## Versions

Version 1. 2023-04-12

## Homepage

[Koster Seafloor Observatory](#)

## Contact for questions about the data

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## This resource has the following relations

Requires [Darknet/YOLOv4](#)

Requires [StyleGAN2](#)

## Related research data in SND's catalogue

[Marine images and movies from Remotely Operated Vehicle \(ROV\) - SO Hamnero](#)

[Marine images and movies from Remotely Operated Vehicle \(ROV\) - Pockmark Bratten NO](#)

[Marine images and movies from Remotely Operated Vehicle \(ROV\) - SO Spiran, KH52](#)

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