



esiwace

CENTRE OF EXCELLENCE IN SIMULATION OF WEATHER
AND CLIMATE IN EUROPE

Compatibility Between ESDM and NetCDF4

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1 Files From Directory *nc_test4*

1.1 *h5testszip.c*

Example illustrates the use of SZIP compression in HDF5.

```
***PASS
```

1.2 Test *cdm_sea_soundings.c*

The cdm tests confirm compliance with the Common Data Model. This file creates some sample data structures to hold sea soundings.

ESDM does not support user defined datatypes from NetCDF!

Sorry! Unexpected result, ../../nc_test4/cdm_sea_soundings.c, line: 60

1.3 Test *t_type.c*

This test program is only built if netCDF-4 is disabled. It tests the netCDF-3 version of `NC_inq_type()`.

```
*** Tests successful!
```

1.4 Test *test_szip.c*

Example illustrates the use of SZIP compression in netCDF5. Taken from HDF5 example.

ESDM does not support compression from NetCDF!

Sorry! Unexpected result, ../../nc_test4/test_szip.c, line: 72

After removing lines 67 to 88.

```
*** Tests successful!
```

1.5 Test `tst_atts.c`

Test the netCDF-4 attribute code.

Sorry! Unexpected result, ../../nc_test4/tst_atts.c, line: 91

/* Try to rename the att, but it won't work. */

```
// if (NC_rename_att(ncid, NC_GLOBAL, OLD_NAME, NEW_NAME) != NC_EPERM)
ERR;
```

//TODO Testing the permission before rename.

Expected error: NC_EPERM

Remove lines 90 to 98.

Sorry! Unexpected result, ../../NC_test4/tst_atts.c, line: 116

Remove line 116

Expected error: NC_ENOTVAR

Sorry! Unexpected result, ../../NC_test4/tst_atts.c, line: 117

Remove line 117

Expected error: NC_EINVAL

Sorry! Unexpected result, ../../NC_test4/tst_atts.c, line: 118

Remove line 118

Expected error: NC_ENOTATT

Sorry! Unexpected result, ../../NC_test4/tst_atts.c, line: 148

Remove line 148

Expected error: NC_ENOTINDEFINE

Sorry! Unexpected result, ../../NC_test4/tst_atts.c, line: 181

Remove line 148

Expected error: NC_ENOTINDEFINE

Sorry! Unexpected result, ../../NC_test4/tst_atts.c, line: 186

Remove line 186

Expected error: NC_ENOTINDEFINE

Remove line 207, because the test works with ESDM.

Sorry! Unexpected result, ../../NC_test4/tst_atts.c, line: 234

Remove line 234

Expected error: NC_ENOTVAR

tst_atts: /home/lucy/esiwace/esdm/deps/smd/src/smd-core.c:2619: smd_attr_new_usertype:
Assertion 'name != NULL' failed.

//TODO Change the function from assertion to returning something meaningful

Expected error: NC_EBADNAME

Remove lines 235 to 242

Testing invalid parameters as input.

Remove lines 243 to 269

Check that the NC_GLOBAL reserved words are rejected ==, ESDM doesn't have this limitation.

Remove lines 280 to 317

More tests with invalid parameters as input.

Remove lines 327 to 335

More tests with invalid parameters as input.

Remove lines 341 to 343

More tests with invalid parameters as input.

Remove lines 353 to 355

More tests with invalid parameters as input.

Remove lines 365 to 367

More tests with invalid parameters as input.

Lots of people!

Sorry! Unexpected result, ../../NC_test4/tst_atts.c, line: 377

//TODO Find, fix the problem and finish the file.

1.6 Test `tst_atts1.c`

Test attributes.

// TODO This test deals with the conversion of types. It needs to be tested later.

1.7 Test `tst_atts2.c`

Test copy of attributes.

ESDM does not support user defined datatypes from NetCDF!

Sorry! Unexpected result, ../../NC_test4/tst_atts2.c, line: 57

Remove lines 57 to 78

Compound type.

Remove lines 101 to 105

More tests with invalid parameters as input.

Remove lines 157 to 212

Compound type.

Remove lines 214 to 259

Enum type.

*** Tests successful!

1.8 Test `tst_atts3.c`

This is a very simple example which writes a netCDF file with Unicode names encoded with UTF-8. It is the NETCDF3 equivalent of `tst_unicode.c`

Sorry! Unexpected result, ../../nc_test4/tst_atts3.c, line: 2396

Remove lines 2393 to 2404

More tests with invalid parameters as input.

`tst_atts3: /home/lucy/esiwace/esdm/src/esdm-datatypes.c:959: esdmI_dataset_metadata_create:`
Assertion '`d->dataspace->size != ((void *)0)`' failed.

//TODO An error out of my league.

1.9 Test `tst_atts_string_rewrite.c`

This test was provided by Jeff Whitaker as an example of a bug, specifically a segfault when re-writing an `NC_CHAR` attribute as an `NC_STRING` attribute.

*** Tests successful!

1.10 Test `tst_attsperf.c`

Too long to run!

1.11 Test `tst_bug324.c`

No description.

Sorry! Unexpected result, ../../nc_test4/tst_bug324.c, line: 71

Remove line 71

```
// if ( format != NC_FORMAT_NETCDF4_CLASSIC ) ERR;
```

*** Tests successful!

1.12 Test `tst_camrun.c`

This program writes a data file from the CAM model run.

tst_camrun: /home/lucy/esiwace/esdm/src/esdm-datatypes.c:959: esdmI_dataset_metadata_create: Assertion 'd->dataspace->size != ((void *)0)' failed.

```
//TODO An error out of my league.
```

1.13 Test `tst_chunks.c`

Test netcdf-4 variables.

ESDM does not support compression from NetCDF!

The whole test is about variable chunking.

1.14 Test `tst_chunks2.c`

Test netcdf-4 chunking.

ESDM does not support compression from NetCDF!

Sorry! Unexpected result, ../../nc_test4/tst_chunks2.c, line: 106

Remove lines 106, 102-121, 137-140, 170-176, 208-214, 246-252, 287-293, 327-333, 369-375, 408-414, 447-453

Chunking.

*** Tests successful!

1.15 Test `tst_chunks3.c`

Runs benchmarks on different chunking sizes.

ESDM does not support compression from NetCDF!

Remove lines 283-296

Too long to run.

1.16 Test `tst_compounds.c`

Test netcdf-4 compound type feature.

ESDM does not support user defined datatypes from NetCDF!

The whole test is about it.

1.17 Test `tst_compounds2.c`

Test netcdf-4 compound type feature.

ESDM does not support user defined datatypes from NetCDF!

The whole test is about it.

1.18 Test `tst_compounds3.c`

Test netcdf-4 compound type feature, even more.

ESDM does not support user defined datatypes from NetCDF!

The whole test is about it.

1.19 Test `tst_converts.c`

Test data conversions and fill value handling.

Sorry! Unexpected result, ../../nc_test4/tst_converts.c, line: 147

2 failures

7 errors detected! Sorry!

//TODO once the smd tests are finished

1.20 Test `tst_converts2.c`

tst_converts2: /home/lucy/esiwace/esdm/src/hypercube.c:62: esdmI_hypercube_make: Assertion 'offset' failed.

//TODO An error out of my league.

1.21 Test `tst_coords.c`

Test netcdf-4 coordinate variables and dimensions.

//TODO This is a test I would like to make it work.

ESDM does not support groups from NetCDF!

Remove lines 75-76, 89-90 (NC_inq_varids)

```
// if (strcmp(var_name_in, LON_NAME) —— xtype_in != NC_FLOAT —— ndims_in !=  
1 —— // dimids_in[0] != 1 —— natts_in != 0) ERR;
```

Sorry! Unexpected result, ../../NC_test4/tst_coords.c, line: 93

//TODO This is a problem that needs to be checked and fixed.

Remove lines 115, 122 (NC_set_var_chunk_cache)

Remove lines 155-157

```
// if (strcmp(att_in_classic, INSTITUTION) —— strcmp(att_in_nc4, INSTITUTION) ——  
// strcmp(att_in_classic, att_in_nc4)) ERR;
```

```
//TODO This is a problem that needs to be checked it and fixed.  
  
Remove lines 488, 490, 492, 494 (ESDM doesn't keep the same order)  
  
Remove line 497-499 (NC_inq_dimids)  
  
Remove line 504  
  
if (strcmp(institution_att_in, INSTITUTION, strlen(INSTITUTION))) ERR;  
  
//TODO This is a problem that needs to be checked it and fixed.  
  
Remove lines 537, 539 (ESDM doesn't keep the same order)  
  
Remove line 583-602  
  
ESDM doesn't work with groups  
  
Sorry! Unexpected result, ../../NC_test4/tst_coords.c, line: 627  
  
testing 2D non-coordinate variable / testing 2D coordinate variable  
  
//TODO This is a problem that needs to be understood it and fixed.
```

1.22 Test `tst_coords2.c`

Test netcdf-4 coordinate variables and dimensions.

```
ESDM does not support groups from NetCDF!  
  
Sorry! Unexpected result, ../../NC_test4/tst_coords2.c, line: 121  
  
Remove line 121  
  
// if (ndims_in != NDIMS) ERR;  
  
//TODO This is a problem that needs to be understood it and fixed.  
  
*** Tests successful!
```

1.23 Test `tst_coords3.c`

Test netcdf-4 coordinate variables and dimensions with an example from the CF conventions.

```
ESDM does not support groups from NetCDF!  
  
Remove lines 125-132 (NC_inq_varids)  
  
Remove lines 147, 149, 151, 160, 171, 180, 182, 189, 191, 198, 200
```

```
//TODO This is a problem that needs to be understood it and fixed.
```

Something seems to be really wrong with the metadata.

```
*** Tests successful!
```

1.24 Test `tst_create_files.c`

This program creates a test file.

ESDM does not support groups from NetCDF!

```
tst_create_files: /home/lucy/esiwace/esdm/src/esdm-scheduler.c:125: backend_thread: Assertion 'status-&pending_ops != 0' failed.
```

```
//TODO An error out of my league.
```

1.25 Test `tst_dims.c`

Test netcdf-4 dimensions.

ESDM does not support groups from NetCDF!

```
//TODO NC_inq_dimids
```

```
//TODO NC_inq_unlimdims
```

More tests with invalid parameters as input.

```
tst_dims: ../../libsrcesdm/esdm_dispatch.c:687: ESDM_inq_dim: Assertion 'e-&dimt.count != dimid' failed.
```

```
//TODO An error out of my league.
```

1.26 Test `tst_dims2.c`

Test netcdf-4 dimensions some more.

Remove lines 58-59 (ESDM doesn't keep the same order for the parameters.)

```
tst_dims: ../../libsrcesdm/esdm_dispatch.c:687: ESDM_inq_dim: Assertion 'e-&dimt.count != dimid' failed.
```

```
//TODO An error out of my league.
```

1.27 Test `tst_dims3.c`

Test netcdf-4 dimensions inheritance.

ESDM does not support groups from NetCDF!

1.28 Test `tst_elatefill.c`

Test proper elatefill return when fillvalue is assigned outside of the initial define.

line 41 expecting NC_ELATEFILL but got 0

Expected error: NC_ELATEFILL

1.29 Test `tst_empty_vlen_unlim.c`

This program excersizes HDF5 variable length array code.

ESDM does not support user defined datatypes from NetCDF!

1.30 Test `tst_endian_fill.c`

Create a test file with fill values for a variable of specified endianness.

NetCDF Feature not supported with ESDM!

1.31 Test `tst_enums.c`

Test netcdf-4 enum types.

ESDM does not support user defined datatypes from NetCDF!

1.32 Test `tst_files.c`

Test netcdf-4 file code.

Remove line 131.

```
// if (NC_put_var_uchar(ncid, varid, uchar_out) != NC_ERANGE) ERR;
```

Expected error: NC_ERANGE

```
tst_files: ../../libsrcesdm/esdm_dispatch.c:1149: ESDM_def_var: Assertion 'e->dimt.count
< dimid' failed.
```

```
//TODO An error out of my league.
```

1.33 Test `tst_files3.c`

This is a benchmark program which tests file writes with compressed data.

ESDM does not support compression from NetCDF!

Too long to test.

1.34 Test `tst_files4.c`

Test netcdf-4 file from user-reported error. This code based on an ncgen output.

ESDM does not support groups from NetCDF!

1.35 Test `tst_files5.c`

Test netcdf files a bit.

```
*** Tests successful!
```

1.36 Test `tst_files6.c`

Test netcdf files a bit.

Remove line 86

```
// if (NC_open(HDF5_FILE_NAME, NC_NOWRITE, &ncid) != NC_EHDFERR) ERR;
```

Expected error: NC_EHDFERR

```
*** Tests successful!
```

1.37 Test `tst_fill_attr_vanish.c`

Based on `tst_fillbug.c`

Remove lines 91-97

Expected error: NC_ELATEFILL

*** Tests successful!

1.38 Test `tst_fillbug.c`

Test for a bug that Russ found testing fill values.

Remove lines 64-67

Expected error: NC_EINVAL / NC_EBADTYPE

Remove lines 72-74, 83-86

Expected error: NC_FILL_FLOAT

*** Tests successful!

1.39 Test `tst_fills.c`

Create a test file with default fill values for variables of each type.

Create file with a 1D string var. Set its fill value to the empty string. I'm not sure this should work with ESDM.

Remove line 59.

```
// if (NC_def_var(ncid, STRING_var_NAME, NC_STRING, 0, NULL, &varid)) ERR;
```

Test using fill values. I don't understand yet.

1.40 Test `tst_fills2.c`

Create a test file with default fill values for variables of each type.

ESDM does not support NC_STRING.

1.41 Test `tst_filterparser.c`

SUCCESS!!

1.42 Test `tst_grps.c`

Test netcdf-4 group code.

ESDM does not support groups from NetCDF!

1.43 Test `tst_grps2.c`

Test netcdf-4 group code some more.

ESDM does not support groups from NetCDF!

1.44 Test `tst_h_refs.c`

This program tests fixes for reading netCDF-4 files that contain datasets with reference datatypes. The netCDF-4 library should ignore the datasets and attributes that have reference datatypes and allow the rest of the file to be accessed.

ESDM does not support HDF5!

```
// if (NC_open(FILE_NAME, NC_NOWRITE, &ncid)) ERR;
```

```
//TODO Insert a condition in FILE_NAME if the file is .h5
```

1.45 Test `tst_h_scalar.c`

This program tests reading HDF5 files that contain scalar attributes and variables, of both string and numeric datatypes. The netCDF-4 library should allow access to all of these.

ESDM does not support HDF5!

1.46 Test `tst_h_strbug.c`

This program tests fixes for bugs reported with accessing fixed-length scalar string variables and variable-length scalar string attributes from HDF5 files through the netCDF-4 API.

ESDM does not support HDF5!

1.47 Test `tst_h5_endians.c`

No description.

NetCDF Feature not supported with ESDM!

1.48 Test `tst_interops5.c`

Test that HDF5 and NetCDF-4 can read and write the same file.

ESDM does not support HDF5!

1.49 Test `tst_interops6.c`

Test that HDF5 and NetCDF-4 can read and write the same file.

ESDM does not support HDF5!

1.50 Test `tst_interops.c`

Test that HDF5 and NetCDF-4 can read and write the same file.

ESDM does not support HDF5!

1.51 Test `tst_large.c`

Test netcdf-4 large file fill values.

WARN ESDM_set_fill():503 NOT IMPLEMENTED

1.52 Test `tst_large2.c`

Test large file problems reported by user.

Not tested yet.

1.53 Test `tst_mem.c`

Test internal netcdf-4 file code.

*** Tests successful!

1.54 Test `tst_mode.c`

Test some illegal mode combinations

ESDM does not support compression from NetCDF!

Remove line 27

```
//if(retval != NC_EINVAL) ERR;
```

Expected error: NC_EINVAL

*** Tests successful!

1.55 Test `tst_mpi_parallel.c`

This just excersizes MPI file I/O to make sure everything's working properly. If this doesn't work, netcdf/HDF5 parallel I/O also won't work.

*** Tests successful!

1.56 Test `tst_opaques.c`

Test netcdf-4 opaque types.

ESDM does not support user defined datatypes from NetCDF!

1.57 Test `tst_parallel.c`

This program tests netcdf-4 parallel I/O.

WARN ESDM_var_par_access():520 NOT IMPLEMENTED

1.58 Test `tst_put_vars.c`

No description.

*** SUCCESS writing example file `tst_put_vars.nc`!

1.59 Test `tst_rehash.c`

Tests to see if the hashmap is being properly updated.

Tests successful!

1.60 Test `tst_rename.c`

Test renames of vars and dims.

ESDM does not support groups from NetCDF!

Remove lines 482-555 (groups)

*** Tests successful!

1.61 Test `tst_rename2.c`

Test more renames of vars and dims.

*** Tests successful!

1.62 Test `tst_simplerw_coll_r.c`

This test is for parallel IO and the collective access of metadata with HDF5.

WARN ESDM_var_par_access():520 NOT IMPLEMENTED

1.63 Test `tst_strings.c`

Test netcdf-4 string types.

ESDM doesn't support NC_STRING!

1.64 Test `tst_strings2.c`

Test netcdf-4 string types.

*** Tests successful!

How is this test successful if ESDM doesn't support NC_STRING?

1.65 Test `tst_sync.c`

Test netcdf-4 syncs.

Remove line 128

```
// if (NC_sync(ncid) != NC_EINDEFINE) ERR;
```

Expected error: NC_EINDEFINE

*** Tests successful!

1.66 Test `tst_types.c`

Test netcdf-4 types.

ESDM does not support user defined datatypes from NetCDF!

1.67 Test `tst_udf.c`

Test user-defined formats.

ESDM does not support user defined datatypes from NetCDF!

1.68 Test `tst_unlim_vars.c`

Test netcdf-4 variables with unlimited dimensions.

Sorry! Unexpected result, ../../nc_test4/tst_unlim_vars.c, line: 70

Works, doesn't work. Who knows...

1.69 Test `tst_utf8.c`

This is a very simple example which writes a netCDF file with Unicode names encoded with UTF-8. It is the NETCDF3 equivalent of `tst_unicode.c`

ESDM does not support Unicode names encoded with UTF-8!

```
//TODO Insert in the function that does this test this message.
```

1.70 Test `tst_v2.c`

Test internal netcdf-4 file code.

*** Tests successful!

1.71 Test `tst_varms.c`

Test netcdf-4 mapped var operations.

*** Tests successful!

1.72 Test `tst_vars.c`

Test netcdf-4 variables.

ESDM does not support groups from NetCDF!

```
//TODO WARN ESDM.inq_typeid():1549 NOT IMPLEMENTED
```

```
/* Open the file and read everything as double. */
```

Why does this not work?

Great test for the conversions.

1.73 Test `tst_vars2.c`

Test netcdf-4 variables.

ESDM does not support groups from NetCDF!

```
/* Read the first record, it should be the fill value. */
```

```
//TODO Understand and implement the fill value.
```

```
// if (NC_rename_var(ncid, 0, "something_very_new") != NC_EPERM) ERR;
```

Remove line 148.

Expected error: NC_EPERM

```
tst_vars2: ../../libsrcesdm/esdm_dispatch.c:1149: ESDM_def_var: Assertion 'e->dimt.count
; dimid' failed.
```

```
//TODO An error out of my league.
```

1.74 Test `tst_vars3.c`

Test netcdf-4 variables.

ESDM does not support groups from NetCDF!

/TODO Fix bug in ESDM_inq_dim!

```
690 strcpy(name, e->dimt.name[dimid]);
```

(gdb) bt

```
0 0x00007ffff7b481a5 in ESDM_inq_dim (ncid=65536, dimid=-1692496275, name=0x7fffffdbe0
"D2", lenp=0x7fffffa0) at ../../libsrcesdm/esdm_dispatch.c:690
```

```
1 0x00007ffff7ada869 in NC_inq_dim (ncid=65536, dimid=-1692496275, name=0x7fffffdbe0
"D2", lenp=0x7fffffa0) at ../../libdispatch/ddim.c:218
```

```
2 0x00005555555560ac in main (argc=1, argv=0x7fffffddd8) at ../../NC_test4/tst_vars3.c:116
```

1.75 Test `tst_vars4.c`

Test netcdf-4 variables.

ESDM does not support compression from NetCDF!

/TODO Fix bug in ESDM_inq_dim!

```
1 0x00007ffff7b46c65 in esdm_container_dataset_get_actual_size (ncid=65536, c=0x5555557a5bf0,
name=0x0) at ../../libsrcesdm/esdm_dispatch.c:197
```

```
2 0x00007ffff7b48202 in ESDM_inq_dim (ncid=65536, dimid=0, name=0x0, lenp=0x7fffffdbb8)
at ../../libsrcesdm/esdm_dispatch.c:695
```

```
3 0x00007ffff7ada869 in NC_inq_dim (ncid=65536, dimid=0, name=0x0, lenp=0x7fffffdbb8)
at ../../libdispatch/ddim.c:218
```

```
4 0x00005555555566c7 in main (argc=1, argv=0x7fffffddd8) at ../../NC_test4/tst_vars4.c:133
```

1.76 Test `tst_vl.c`

Test netcdf-4 variable length code.

ESDM does not support user defined datatypes from NetCDF!

Test Name	Test Objective	Steps	Expected Output	Actual Output	Status
h5testszip.c					
cdm_sea_soundings.c					
test_szip.c					
tst_atts1.c					
tst_atts2.c					
tst_atts3.c					
tst_atts.c					
tst_atts_string_rewrite.c					
tst_attsperf.c					
tst_bug324.c					
tst_camrun.c					
tst_chunks2.c					
tst_chunks3.c					
tst_chunks.c					
tst_compounds2.c					
tst_compounds3.c					
tst_converts2.c					
tst_converts.c					
tst_coords2.c					
tst_coords3.c					
tst_coords.c					
tst_create_files.c					
tst_dims2.c					
tst_dims3.c					
tst_elatefill.c					
tst_empty_vlen_unlim.c					
tst_endian_fill.c					
tst_enums.c					
tst_files3.c					
tst_files5.c					
tst_files4.c					
tst_files6.c					
tst_files.c					
tst_fill_attr_vanish.c					
tst_fillbug.c					
tst_fills2.c					
tst_fills.c					
tst_filterparser.c					
tst_grps2.c					
tst_grps.c					
tst_h5_endians.c					
tst_hdf5_file_compat.c					
tst_h_refs.c					
tst_h_scalar.c					
tst_h_strbug.c					
tst_interops5.c					
tst_interops6.c					
tst_interops.c					
tst_large2.c					
tst_large.c					

Filename	Compatible	Almost Compatible	Not Compatible Yet	Almost Incompatible	Incompatible
tst_mem.c					
tst_mode.c					
tst_mpi_parallel.c					
tst_opaques.c					
tst_parallel.c					
tst_put_vars.c					
tst_rehash.c					
tst_rename2.c					
tst_rename.c					
tst_simplerw_coll_r.c					
tst_strings2.c					
tst_strings.c					
tst_sync.c					
tst_types.c					
tst_udf.c					
tst_unlim_vars.c					
tst_utf8.c					
tst_v2.c					
tst_varms.c					
tst_vars2.c					
tst_vars3.c					
tst_vars4.c					
tst_vars.c					
tst_vl.c					
t_type.c					

Table 1.2: Test Case Report: ESDM and NetCDF compatibility

Filename	Compatible	Almost Compatible	Not Compatible Yet	Almost Incompatible	Incompatible
cdm_sea_soundings.c					✓
test_szip.c					✓
tst_atts1.c					
tst_atts2.c					✓
tst_atts3.c					
tst_atts.c					
tst_attspref.c					
tst_bug324.c					
tst_camrun.c					
tst_chunks2.c					
tst_chunks3.c					
tst_chunks.c					
tst_compounds2.c					
tst_compounds3.c					
tst_converts2.c					
tst_converts.c					
tst_coords2.c					
tst_coords3.c					
tst_coords.c					
tst_create_files.c					
tst_dims2.c					
tst_dims3.c					
tst_empty_vlen_unlim.c					
tst_endian_fill.c					
tst_enums.c					
tst_files4.c					
tst_files6.c					
tst_files.c					
tst_fill_attr_vanish.c					
tst_fillbug.c					
tst_fills2.c					
tst_fills.c					
tst_grps2.c					
tst_grps.c					
tst_h5_endians.c					
tst_hdf5_file_compat.c					
tst_h_refs.c					
tst_h_scalar.c					
tst_h_strbug.c					
tst_interops5.c					
tst_interops6.c					
tst_interops.c					
tst_large2.c					
tst_large.c					

Table 1.3

Filename	Compatible	Almost Compatible	Not Compatible Yet	Almost Incompatible	Incompatible
tst_mem.c					
tst_mode.c					
tst_opaques.c					
tst_parallel.c					
tst_put_vars.c					
tst_rename2.c					
tst_rename.c					
tst_simplerw_coll_r.c					
tst_strings2.c					
tst_strings.c					
tst_sync.c					
tst_types.c					
tst_udf.c					
tst_unlim_vars.c					
tst_utf8.c					
tst_v2.c					
tst_varms.c					
tst_vars2.c					
tst_vars3.c					
tst_vars4.c					
tst_vars.c					
tst_vl.c					
h5testszip.c	✓				
tst_atts_string_rewrite.c	✓				
tst_elatefill.c	✓				
tst_files3.c	✓				
tst_files5.c	✓				
tst_filterparser.c	✓				
tst_mpi_parallel.c	✓				
tst_rehash.c	✓				
t_type.c	✓				

Table 1.4

Filename	Justification
cdm_sea_soundings.c	ESDM does not support user defined datatypes from NetCDF!
test_szip.c	ESDM does not support compression from NetCDF!
tst_atts1.c	
tst_atts2.c	ESDM does not support user defined datatypes from NetCDF!
tst_atts3.c	
tst_atts.c	
tst_attspref.c	Too long to test now.
tst_bug324.c	ESDM does not support classic format from NetCDF!
tst_camrun.c	
tst_chunks2.c	ESDM does not support compression from NetCDF!
tst_chunks3.c	ESDM does not support compression from NetCDF!
tst_chunks.c	ESDM does not support compression from NetCDF!
tst_compounds2.c	ESDM does not support user defined datatypes from NetCDF!
tst_compounds3.c	ESDM does not support user defined datatypes from NetCDF!
tst_converts2.c	
tst_converts.c	
tst_coords2.c	ESDM does not support groups from NetCDF!
tst_coords3.c	ESDM does not support groups from NetCDF!
tst_coords.c	ESDM does not support groups from NetCDF!
tst_create_files.c	ESDM does not support groups from NetCDF!
tst_dims2.c	ESDM does not preserve the ID of the dimensions once it is closed!
tst_dims3.c	ESDM does not support groups from NetCDF!
tst_empty_vlen_unlim.c	ESDM does not support user-defined datatypes from NetCDF!
tst_endian_fill.c	ESDM does not support endianness from NetCDF!
tst_enums.c	ESDM does not support user-defined datatypes from NetCDF!
tst_files4.c	ESDM does not support groups from NetCDF!
tst_files6.c	ESDM does not support HDF5 file with circular group structure!
tst_files.c	
tst_fill_attr_vanish.c	WARN ESDM_set_fill():370 NOT IMPLEMENTED
tst_fillbug.c	WARN_NOT_IMPLEMENTED
tst_fills2.c	WARN_NOT_IMPLEMENTED
tst_fills.c	WARN_NOT_IMPLEMENTED
tst_grps2.c	ESDM does not support groups from NetCDF!
tst_grps.c	ESDM does not support groups from NetCDF!
tst_h5_endians.c	ESDM does not support endianness from NetCDF!
tst_hdf5_file_compat.c	ESDM does not support HDF5 format!
tst_h_refs.c	ESDM does not support HDF5 format!
tst_h_scalar.c	ESDM does not support HDF5 format!
tst_h_strbug.c	ESDM does not support HDF5 format!
tst_interops5.c	ESDM does not support HDF5 format!
tst_interops6.c	ESDM does not support HDF5 format!
tst_interops.c	ESDM does not support HDF5 format!
tst_large2.c	Broke my computer
tst_large.c	WARN ESDM_set_fill():526 NOT IMPLEMENTED (Tests successful!)

Table 1.5

Filename	Justification
tst_mem.c	Tests successful!
tst_mode.c	ESDM does not support compression from NetCDF! (Tests successful!)
tst_opaques.c	ESDM does not support user-defined datatypes from NetCDF!
tst_parallel.c	Not tested yet.
tst_put_vars.c	SUCCESS writing example file!
tst_rename2.c	ESDM does not support NC_NAT from NetCDF!
tst_rename.c	It works until get to a function requiring groups!
tst_simplerw_coll_r.c	ESDM does not support collective access of metadata with HDF5!
tst_strings2.c	Tests successful!
tst_strings.c	ESDM does not support NC_STRING from NetCDF!
tst_sync.c	It does not work just because ESDM does not use the NC_EINDEFINE flag!
tst_types.c	ESDM does not support user-defined datatypes from NetCDF!
tst_udf.c	ESDM does not support user-defined formats from NetCDF!
tst_unlim_vars.c	Sometimes works, sometimes doesn't work!
tst_utf8.c	ESDM does not support Unicode names encoded with UTF-8!
tst_v2.c	Tests successful!
tst_varms.c	ESDM does not support mapped var operations!
tst_vars2.c	ESDM does not support NC_NAT from NetCDF!
tst_vars3.c	
tst_vars4.c	ESDM does not support compression from NetCDF!
tst_vars.c	ESDM does not support groups from NetCDF!
tst_vl.c	ESDM does not support user-defined datatypes from NetCDF!
h5testszip.c	PASS
tst_atts_string_rewrite.c	Tests successful!
tst_elatefill.c	line 41 expecting NC_ELATEFILL but got 0
tst_files3.c	Working ESDM does not support compression from NetCDF!
tst_files5.c	Not working anymore (Tests successful!)
tst_filterparser.c	SUCCESS!!
tst_mpi_parallel.c	Tests successful!
tst_rehash.c	Tests successful!
t_type.c	Tests successful!

Table 1.6: Additional comments on ESDM and NETCDF compatibility

File	Not Tested	Not Working Build	Not Working Run	Working
bigmeta.c	✓			
openbigmeta.c	✓			
bm_file.c		✓		
bm_many_atts.c		✓		
bm_many_objs.c		✓		
bm_netcdf4_recs.c		✓		
ref_bzip2.c		✓		
test_filter.c		✓		
test_filter_misc.c		✓		
tst_ar4_3d.c		✓		
tst_ar4_4d.c		✓		
tst_ar4.c		✓		
tst_files2.c		✓		
tst_h_many_atts.c		✓		
tst_knmi.c		✓		
tst_put_vars_two_unlim_dim.c		✓		
tst_utils.c		✓		
tst_compounds.c			✓	
tst_dims.c			✓	
tst_interops4.c			✓	
tst_nc4perf.c			✓	
tst_parallel3.c			✓	
tst_parallel4.c			✓	
tst_parallel5.c			✓	
tst_xplatform2.c			✓	
tst_xplatform.c			✓	

Table 1.7: List of nc_test4 files.

File	Not Tested	Not Working Build	Not Working Run	Working
renamegroup.c				✓
test_szip.c				✓
tst_atts1.c				✓
tst_atts2.c				✓
tst_atts3.c				✓
tst_atts.c				✓
tst_attspref.c				✓
tst_atts_string_rewrite.c				✓
tst_bug324.c				✓
tst_camrun.c				✓
tst_chunks2.c				✓
tst_chunks3.c				✓
tst_chunks.c				✓
tst_compounds2.c				✓
tst_compounds3.c				✓
tst_converts2.c				✓
tst_converts.c				✓
tst_coords2.c				✓
tst_coords3.c				✓
tst_coords.c				✓
tst_create_files.c				✓
tst_dims2.c				✓
tst_dims3.c				✓
tst_elfatfill.c				✓
tst_empty_vlen_unlim.c				✓
tst_endian_fill.c				✓
tst_enums.c				✓
tst_files3.c				✓
tst_files4.c				✓
tst_files5.c				✓
tst_files6.c				✓
tst_files.c				✓
tst_fill_attr_vanish.c				✓
tst_fillbug.c				✓
tst_fills2.c				✓
tst_fills.c				✓
tst_filterparser.c				✓
tst_grps2.c				✓
tst_grps.c				✓
tst_h5_endians.c				✓
tst_hdf5_file_compat.c				✓
tst_h_refs.c				✓
tst_h_scalar.c				✓
tst_h_strbug.c				✓
tst_interops5.c				✓
tst_interops6.c				✓
tst_interops.c				✓
tst_large2.c				✓
tst_large.c				✓
tst_mem.c				✓

Table 1.6: List of nc-test4 files.

File	Not Tested	Not Working Build	Not Working Run	Working
tst_mode.c				✓
tst_mpi_parallel.c				✓
tst_opaques.c				✓
tst_parallel.c				✓
tst_put_vars.c				✓
tst_rehash.c				✓
tst_rename2.c				✓
tst_rename.c				✓
tst_simplerw_coll_r.c				✓
tst_strings2.c				✓
tst_strings.c				✓
tst_sync.c				✓
tst_types.c				✓
tst_udf.c				✓
tst_unlim_vars.c				✓
tst_utf8.c				✓
tst_v2.c				✓
tst_varms.c				✓
tst_vars2.c				✓
tst_vars3.c				✓
tst_vars4.c				✓
tst_vars.c				✓
tst_vl.c				✓
t_type.c				✓

Table 1.9: List of nc.test4 files.

NetCDF TYPE	Number	ESDM Type	ESDM Representation
NC_BYTE	1	SMD_DTYPE_INT8	int8_t
NC_UBYTE	7	SMD_DTYPE_UINT8	uint8_t
NC_CHAR	2	SMD_DTYPE_CHAR	char
NC_SHORT	3	SMD_DTYPE_INT16	int16_t
NC_USHORT	8	SMD_DTYPE_UINT16	uint16_t
NC_INT	4	SMD_DTYPE_INT32	int32_t
NC_LONG	4	SMD_DTYPE_INT32	int32_t
NC_UINT	9	SMD_DTYPE_UINT32	uint32_t
NC_INT64	10	SMD_DTYPE_INT64	int64_t
NC_UINT64	5	SMD_DTYPE_UINT64	uint64_t
NC_FLOAT	11	SMD_DTYPE_FLOAT	32 bits
NC_DOUBLE	6	SMD_DTYPE_DOUBLE	64 bits

Table 1.10: Conversion between ESDM and NetCDF4 datatypes – Datatypes sorted by size.

NetCDF TYPE	Number	ESDM Type	ESDM Representation
NC_BYTE	1	SMD_DTYPE_INT8	int8_t
NC_CHAR	2	SMD_DTYPE_CHAR	char
NC_SHORT	3	SMD_DTYPE_INT16	int16_t
NC_INT	4	SMD_DTYPE_INT32	int32_t
NC_LONG	4	SMD_DTYPE_INT32	int32_t
NC_UINT64	5	SMD_DTYPE_UINT64	uint64_t
NC_DOUBLE	6	SMD_DTYPE_DOUBLE	64 bits
NC_UBYTE	7	SMD_DTYPE_UINT8	uint8_t
NC_USHORT	8	SMD_DTYPE_UINT16	uint16_t
NC_UINT	9	SMD_DTYPE_UINT32	uint32_t
NC_INT64	10	SMD_DTYPE_INT64	int64_t
NC_FLOAT	11	SMD_DTYPE_FLOAT	32 bits

Table 1.11: Conversion between ESDM and NetCDF4 datatypes – Datatypes sorted by NETCDF4 description.

Functionality	NetCDF Support	ESDM Support
	Datatypes	
NC Data Type	NC Description	ESDM Data Type
NC_NAT	NAT = Not A Type (c.f. NaN)	NOT SUPPORTED
NC_BYTE	signed 1 byte integer	SMD_DTYPE_INT1
NC_CHAR	ISO/ASCII character	SMD_DTYPE_CHAR
NC_SHORT	signed 2 byte integer	SMD_DTYPE_INT2
NC_INT	signed 4 byte integer	SMD_DTYPE_INT4
NC_LONG	deprecated, but required for backward compatibility	SMD_DTYPE_INT4
NC_FLOAT	single precision floating point number	SMD_DTYPE_FLOAT
NC_DOUBLE	double precision floating point number	SMD_DTYPE_DOUBLE
NC_UBYTE	unsigned 1 byte int	SMD_DTYPE_UINT1
NC_USHORT	unsigned 2-byte int	SMD_DTYPE_UINT2
NC_UINT	unsigned 4-byte int	SMD_DTYPE_UINT4
NC_INT64	signed 8-byte int	SMD_DTYPE_INT8
NC_UINT64	unsigned 8-byte int	SMD_DTYPE_UINT8
NC_STRING	string	SMD_DTYPE_STRING
NC_VLEN	used internally for vlen types	NOT SUPPORTED
NC_OPAQUE	used internally for opaque types	NOT SUPPORTED
NC_COMPOUND	used internally for compound types	NOT SUPPORTED
NC_ENUM	used internally for enum types	NOT SUPPORTED
	Modes – Creating a file	
NC_CLOBBER	Overwrite existing file	ESDM_CLOBBER
NC_NOCLOBBER	Do not overwrite existing file	ESDM_NOCLOBBER
NC_SHARE	Limit write caching - netcdf classic files only	NOT SUPPORTED
NC_64BIT_OFFSET	Create 64-bit offset file	NOT SUPPORTED
NC_64BIT_DATA	Create CDF-5 file (alias NC_CDF5)	NOT SUPPORTED
NC_NETCDF4	Create netCDF-4/HDF5 file	NOT SUPPORTED
NC_CLASSIC_MODEL	Enforce netCDF classic mode on netCDF-4/HDF5 files	NOT SUPPORTED
NC_DISKLESS	Store data in memory	NOT SUPPORTED
NC_PERSIST	Force the NC_DISKLESS data from memory to a file	NOT SUPPORTED
	Modes – Opening a file	
NC_NOWRITE	Open the dataset with read-only access	ESDM_NOWRITE
NC_WRITE	Open the dataset with read-write access	ESDM_WRITE
NC_SHARE	Share updates, limit caching	NOT SUPPORTED
NC_WRITE—NC_SHARE	Open the dataset with read-write access Share updates, limit caching	NOT SUPPORTED
NC_DISKLESS	Store data in memory	NOT SUPPORTED
NC_PERSIST	Force the NC_DISKLESS data from memory to a file	NOT SUPPORTED

Table 1.12: Functionality Supported by NetCDF and ESDM.