
Subject: Re: NCDF_ATTPUT _FillValue problem for string arrays?

Posted by [Foldy Lajos](#) on Mon, 06 Jul 2009 19:38:24 GMT

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On Mon, 6 Jul 2009, Paul van Delst wrote:

```
> Hello,
>
> I've encountered a strange problem with some netCDF output using IDL.
>
> I define a character string array variable in my output netCDF file like so:
>
> VarId = NCDF_VARDEF( fid, 'Absorber_Units_Name', [32,n_Absorbers_DimId], /CHAR)
>
> where the "32" is the maximum string length.
>
> Now if I try to set a fill value attribute for that variable, like so
>
> NCDF_ATTPUT, fid, VarId, '_FillValue', ' '
> or
> NCDF_ATTPUT, fid, VarId, '_FillValue', 0B
>
> when I run the code I get the following error when I take the file out of
> define mode:
>
> % NCDF_CONTROL: Attempt to take the file out of define mode (ENDEF) failed.
> (NC_ERROR=-45)
>
> If I simply comment out the call to NCDF_ATTPUT for these character
> variables, there's no problem.
>
> I do this sort of thing (i.e. _FillValue of " " for character string
> variables) all the time using the Fortran90 API to netCDF so I assume an
> empty space is a valid fill value.
>
> Has anyone else encountered this behaviour in IDL? I.e. is this a known bug
> in the IDL netCDF interface, or do I need to do something special with
> character fill values?
>
> Thanks for any info.
>
> cheers,
>
> paulv
>
>
```

NCDF_VARDEF needs dimension ID, not dimension size. The following code

```
ncid=ncdf_create('test.nc', /clobber)
dim32=ncdf_dimdef(ncid, 'dim1', 32)
n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)
varid = ncdf_vardef( ncid, 'absorber_units_name', [dim32,n_absorbers_dimid], /char)
ncdf_attput, ncid, varid, '_fillvalue', ''
ncdf_control, ncid, /endef
ncdf_close, ncid
```

```
netcdf test {
dimensions:
    dim1 = 32 ;
    dim2 = 9 ;
variables:
    char absorber_units_name(dim2, dim1) ;
        absorber_units_name::_fillvalue = " " ;
data:
```

regards,
lajos

Fi₂LDY Lajos wrote:
>
>
> On Mon, 6 Jul 2009, Paul van Delst wrote:
>

```

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>> known bug in the IDL netCDF interface, or do I need to do something
>> special with character fill values?
>>
>> Thanks for any info.
>>
>> cheers,
>>
>> paulv
>>
>>
>
> NCDF_VARDEF needs dimension ID, not dimension size. The following code
> works for me:

```

Yeah, I fat-fingered my code when I typed the message. Cutting-and-pasting directly from my script I have:

```

; ...Define dimensions
n_Levels_DimId  = NCDF_DIMDEF(fid, LEVEL_DIMNAME      , self.n_Levels)
n_Layers_DimId  = NCDF_DIMDEF(fid, LAYER_DIMNAME      , self.n_Layers)
n_Absorbers_DimId = NCDF_DIMDEF(fid, ABSORBER_DIMNAME  , self.n_Absorbers)
pdsI_DimId      = NCDF_DIMDEF(fid, DESCRIPTION_DIMNAME , PDSL)
aunsl_DimId     = NCDF_DIMDEF(fid, ABSORBER_UNITS_DIMNAME, AUNSL)
n_Profiles_DimId = NCDF_DIMDEF(fid, PROFILE_DIMNAME   , /UNLIMITED)

; Define variables
VarId = NCDF_VARDEF( fid, DESCRIPTION_VARNAME, [pdsI_DimId,n_Profiles_DimId],
/CHAR)
NCDF_ATTPUT, fid, VarId, LONGNAME_ATTNAME , DESCRIPTION_LONGNAME
NCDF_ATTPUT, fid, VarId, DESCRIPTION_ATTNAME, DESCRIPTION_DESCRIPTION
NCDF_ATTPUT, fid, VarId, UNITS_ATTNAME    , DESCRIPTION_UNITS
; NCDF_ATTPUT, fid, VarId, FILLVALUE_ATTNAME , DESCRIPTION_FILLVALUE

```

where I have a parameters include file containing:

```

LONGNAME_ATTNAME  = 'long_name'
DESCRIPTION_ATTNAME = 'description'
UNITS_ATTNAME     = 'units'
FILLVALUE_ATTNAME = '_FillValue'

DESCRIPTION_LONGNAME  = 'Profile Description'
DESCRIPTION_DESCRIPTION = 'Description of atmospheric profile and modification'
DESCRIPTION_UNITS     = 'N/A'
DESCRIPTION_FILLVALUE = ''

```

....etc for other variables

Your example code works for me too. Hmmm....

```

>
> ncid=ncdf_create('test.nc', /clobber)
> dim32=ncdf_dimdef(ncid, 'dim1', 32)
> n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)
> varid = ncdf_vardef( ncid, 'absorber_units_name',
> [dim32,n_absorbers_dimid], /char)
> ncdf_attput, ncid, varid, '_fillvalue', ''
> ncdf_control, ncid, /endef
> ncdf_close, ncid

```

AHA!!!

When I change your above test code to use the conventional fill value attribute name as specified in the netCDF Interface Guide, "_FillValue", I get the following:

```

ncid=ncdf_create('test.nc', /clobber)
dim32=ncdf_dimdef(ncid, 'dim1', 32)
n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)
varid = ncdf_vardef( ncid, 'absorber_units_name', [dim32,n_absorbers_dimid], /char)
ncdf_attput, ncid, varid, '_FillValue', '' ; <---**** Note the attribute name
ncdf_control, ncid, /endef
ncdf_close, ncid

```

```

IDL> .run blah
% Compiled module: $MAIN$.
% NCDF_CONTROL: Attempt to take the file out of define mode (ENDEF) failed.
(NC_ERROR=-45)
% Execution halted at: $MAIN$          6 scratch/blah.pro

```

So:

- if I use "_fillvalue" for the attribute name, the code works fine.
- if I use "_FillValue" for the attribute name, the code crashes.

Given that netCDF attribute, dimension, and variable names are case-sensitive, this would appear to be a bug....somehow.

Thanks for writing the little test case. I never would have figured it out otherwise.

cheers,

paulv

```

>
> and 'ncdump test.nc' produces:
>
> netcdf test {
>   dimensions:
>     dim1 = 32 ;
>     dim2 = 9 ;
>   variables:
>     char absorber_units_name(dim2, dim1) ;
>       absorber_units_name:_fillvalue = "" ;
>   data:
>
>   absorber_units_name =
>     "",
>     "",
>     "",
>     "",
>     "",
>     "",
>     "",
>     ""

```

```
> ""',
> ""',
> ""',
> }
>
> NCDF_VARDEF does not print an error message, it returns -1 on failure :-(
>
> regards,
> lajos
```

Subject: Re: NCDF_ATTPUT _FillValue problem for string arrays?
Posted by [Paul Van Delst\[1\]](#) on Mon, 06 Jul 2009 21:41:28 GMT
[View Forum Message](#) <> [Reply to Message](#)

Fi 1/2LDY Lajos wrote:

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>
>
>
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> n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)
> varid = ncdf_vardef( ncid, 'absorber_units_name',
> [dim32,n_absorbers_dimid], /char)
> ncdf_attput, ncid, varid, '_fillvalue', ''
> ncdf_control, ncid, /endef
> ncdf_close, ncid
```

Just a final followup - I changed the definition of the offending attribute to
"_fillvalue" in my production code and now the ncdf_attput works as expected.

thanks again. I have little hair left to tear out when these annoyances arise so you've
saved me a tuft or two! :o)

cheers,

paulv

p.s. I should note that the futzing up of the _fillvalue attribute *only* occurred for
character variable output. Any other datatype (byte, long, float, double etc) handled the
camel case attribute name fine. Weird.

Subject: Re: NCDF_ATTPUT _FillValue problem for string arrays?

On Mon, 6 Jul 2009, Paul van Delst wrote:

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> IDL> .run blah
> % Compiled module: $MAIN$.
> % NCDF_CONTROL: Attempt to take the file out of define mode (ENDEF) failed.
> % (NC_ERROR=-45)
> % Execution halted at: $MAIN$          6 scratch/blah.pro
>
>
> So:
> - if I use "_fillvalue" for the attribute name, the code works fine.
> - if I use "_FillValue" for the attribute name, the code crashes.
>
```

I have found the solution: _FillValue needs to be the same type as the variable. '' is an IDL string, which is converted to something, probably BYTE. So let's add an explicite /CHAR to ncdf_attput:

```
ncid=ncdf_create('test.nc', /clobber)
dim32=ncdf_dimdef(ncid, 'dim1', 32)
n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)
varid = ncdf_vardef( ncid, 'absorber_units_name', [dim32,n_absorbers_dimid], /char)
ncdf_attput, ncid, varid, '_FillValue', '', /CHAR
ncdf_control, ncid, /endef
ncdf_close, ncid
```

It works now! :-)

regards,
lajos

Subject: Re: NCDF_ATTPUT _FillValue problem for string arrays?

Posted by [R.Bauer](#) on Wed, 08 Jul 2009 13:55:57 GMT

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Paul van Delst schrieb:

> Füzü LDY Lajos wrote:

>>

>>

>>

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>> works for me:

>>

>> ncid=ncdf_create('test.nc', /clobber)

>> dim32=ncdf_dimdef(ncid, 'dim1', 32)

>> n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)

>> varid = ncdf_vardef(ncid, 'absorber_units_name',

>> [dim32,n_absorbers_dimid], /char)

>> ncdf_attput, ncid, varid, '_fillvalue', ''

>> ncdf_control, ncid, /endef

>> ncdf_close, ncid

>

> Just a final followup - I changed the definition of the offending

> attribute to "_fillvalue" in my production code and now the ncdf_attput

> works as expected.

>

Not really. Now you just use the internal defined _FillValue of the netCDF format. You have now just added an additional attribute which is not used as initial value for creating the netCDF variable.

That var is similiar to make_array(10,value=FillValue, /string)

Also it breaks the standard definition of attributes but this would make only problems when you share your data.

And we have run in this problems too. using a double fill var and having float arrays makes also some fun. q_icg_struct was changed in 2003 to care on that.

(since idl6.0 netCDF3.5.0 fill values must checked to be same type as param. missing value is checked too.)

cheers

Reimar

> thanks again. I have little hair left to tear out when these annoyances

> arise so you've saved me a tuft or two! :o)

>
> cheers,
>
> paulv
>
> p.s. I should note that the futzing up of the `_fillvalue` attribute
> *only* occurred for character variable output. Any other datatype (byte,
> long, float, double etc) handled the camel case attribute name fine. Weird.

Subject: Re: NCDF_ATTPUT _FillValue problem for string arrays?

Posted by [Paul Van Delst\[1\]](#) on Wed, 08 Jul 2009 19:12:40 GMT

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Fiç½LDY Lajos wrote:

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>
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>> attribute name as specified in the netCDF Interface Guide,
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>>
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>> `varid = ncdf_vardef( ncid, 'absorber_units_name',`
>> `[dim32,n_absorbers_dimid], /char)`
>> `ncdf_attput, ncid, varid, '_FillValue', '' ; <---**** Note the`
>> `attribute name`
>> `ncdf_control, ncid, /endef`
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>> IDL> .run blah
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> variable. `''` is an IDL string, which is converted to something,

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> probably BYTE. So let's add an explicit /CHAR to ncdf_attput:  
>  
> ncid=ncdf_create('test.nc', /clobber)  
> dim32=ncdf_dimdef(ncid, 'dim1', 32)  
> n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)  
> varid = ncdf_vardef( ncid, 'absorber_units_name',  
> [dim32,n_absorbers_dimid], /char)  
> ncdf_attput, ncid, varid, '_FillValue', ' ', /CHAR  
> ncdf_control, ncid, /endef  
> ncdf_close, ncid  
>  
> It works now! :-)
```

Yes, it does for me also.

You, sir, are a star!

Thanks,

paulv
