

# ERM Quality Management

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# Producers meeting Amsterdam – September 2016



# Many different validation tools

ArcGIS Data Reviewer

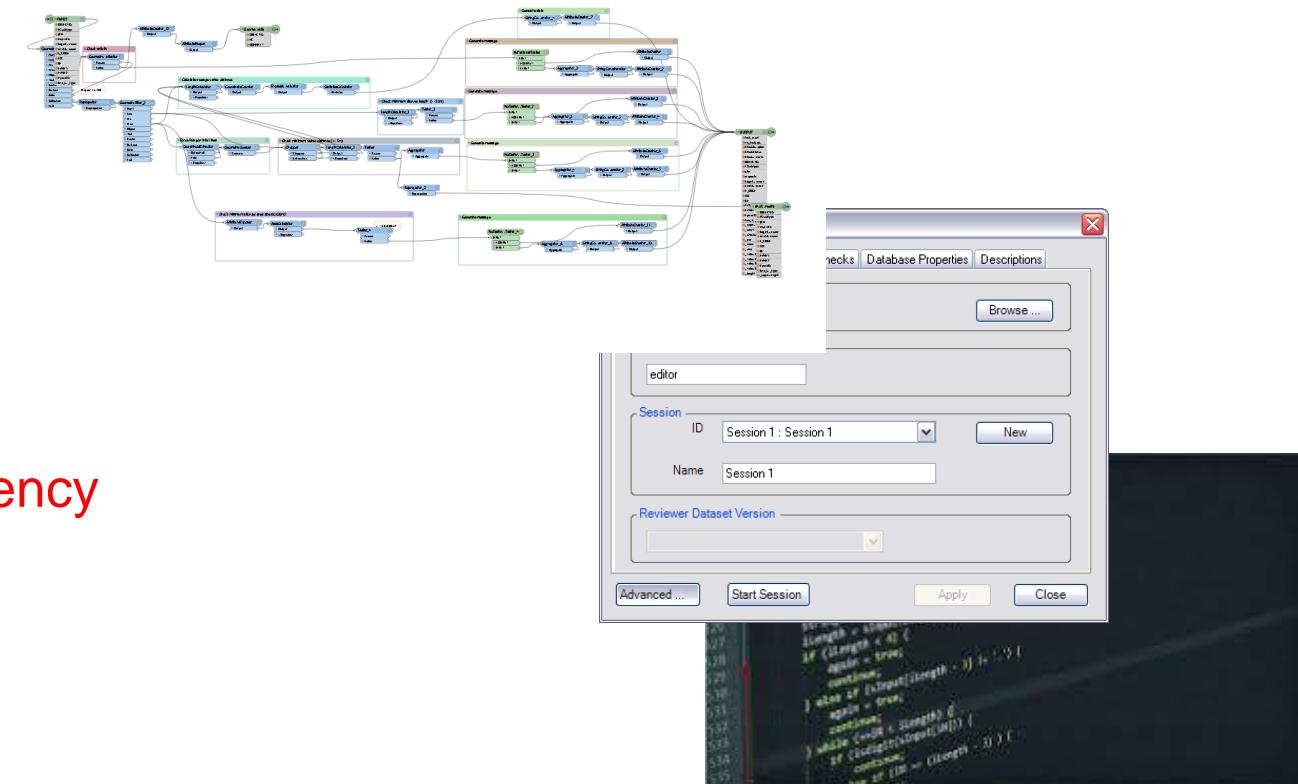
C# Tools

ExM Python tools

FME

National checks

Problems: **licenses, maintenance, consistency**



# Idea

One validation tool:

Used by producers, RCs and PMT

Objectives:

ArcGIS >10.1

Easy to use

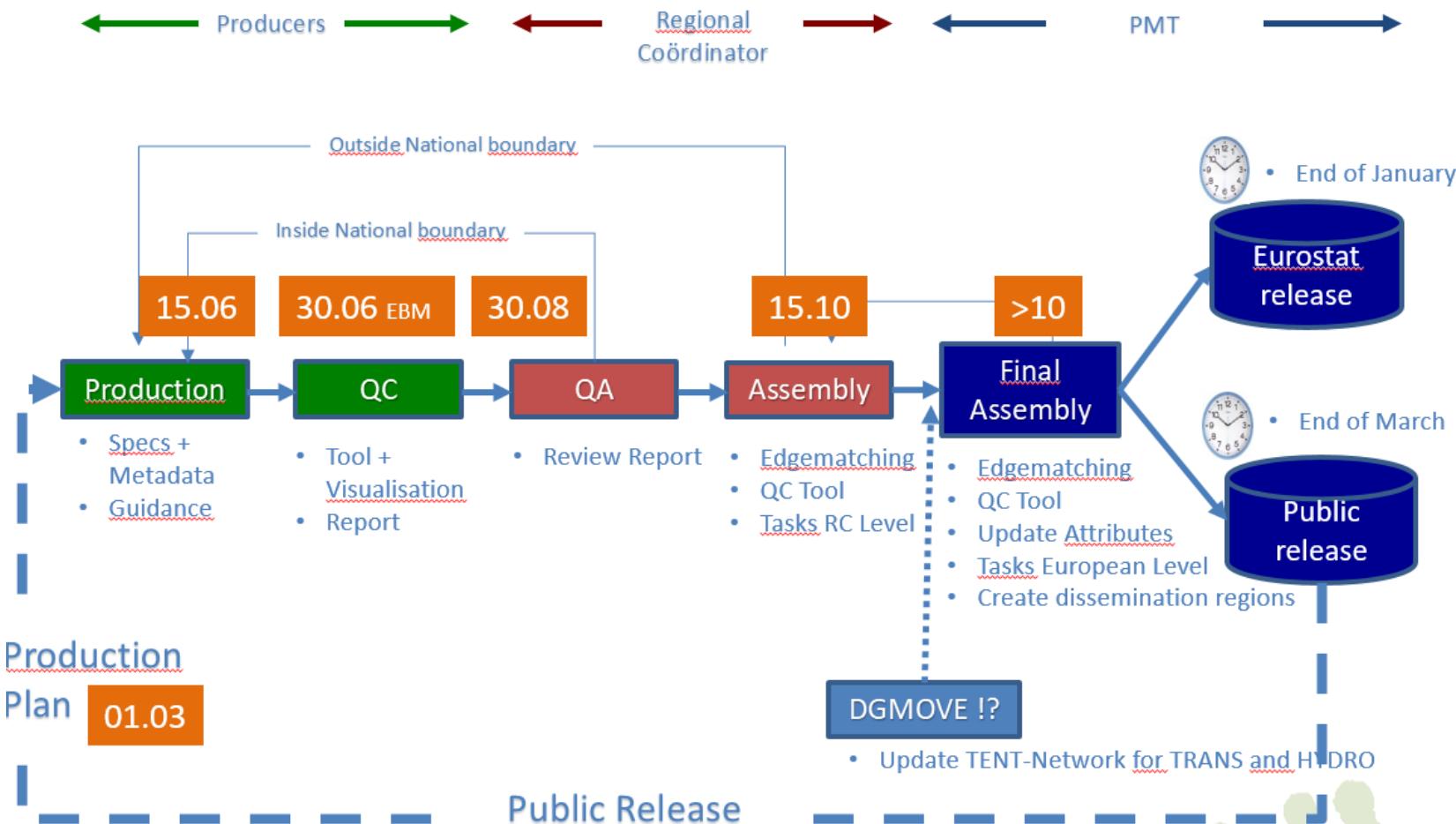
Simple documentation

Flexible & adjustable

Spatial display of results

Raise quality of ERM data

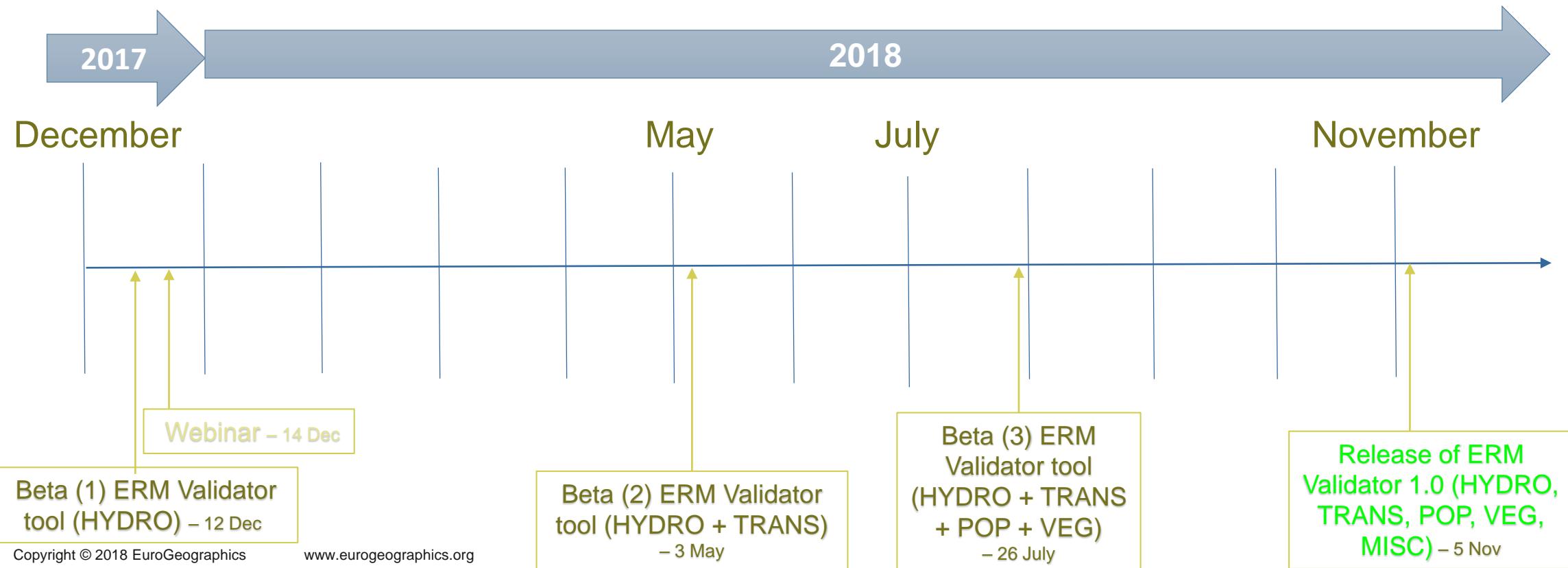
# Approach



# Producers Meeting Lisbon - November 2017



# Releases



# Feedback

Most countries

22 responses via GoogleForms survey

+/- 100 emails (producers/RCs)

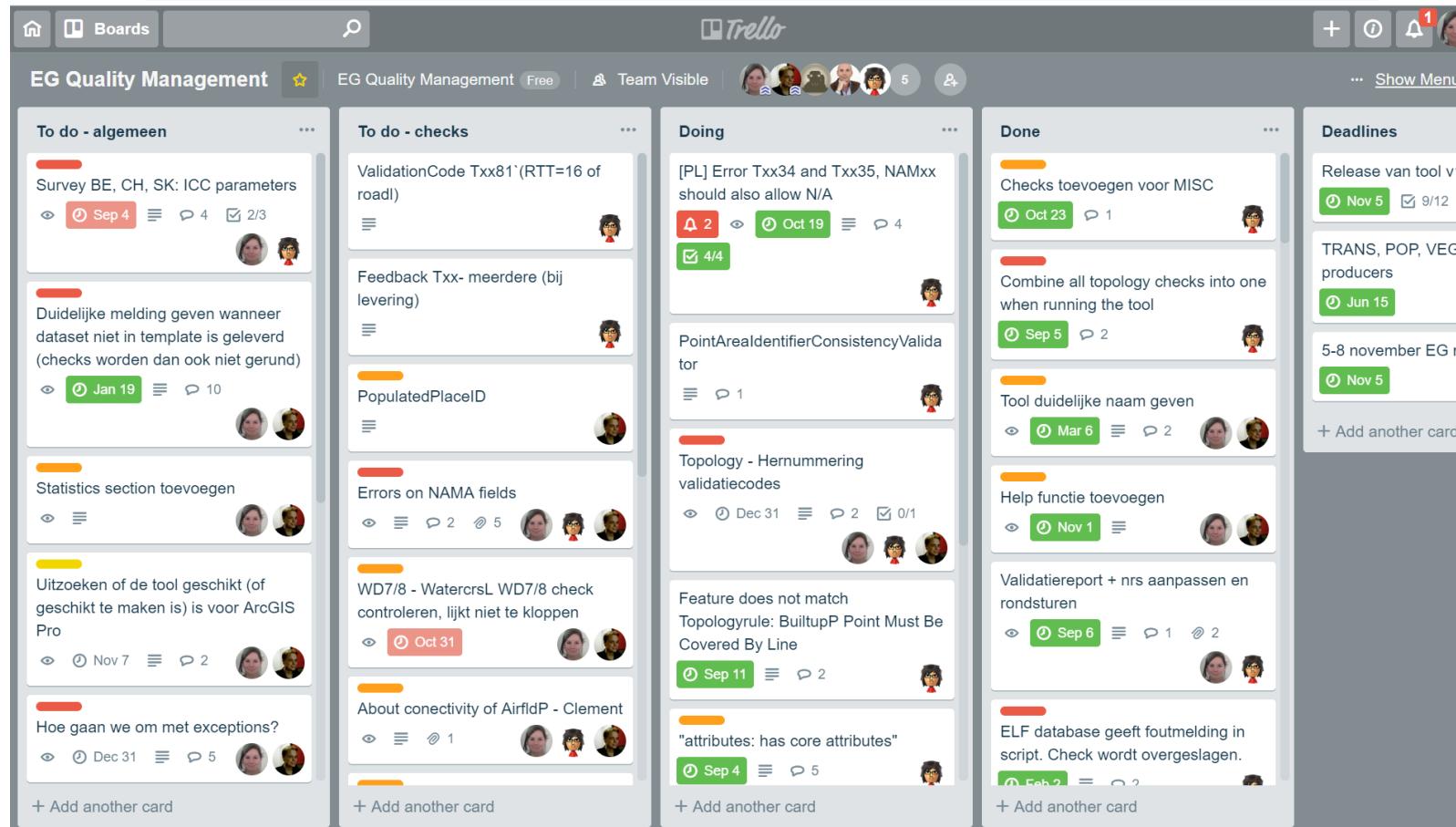
Face-to-face at Producer Meeting

ftp-BKG

Thank you so much!!



# Backlog



**EG Quality Management**

**To do - algemeen**

- Survey BE, CH, SK: ICC parameters (Due Sep 4, 2/3)
- Duidelijke melding geven wanneer dataset niet in template is geleverd (checks worden dan ook niet gerund) (Due Jan 19, 10)
- Statistics section toevoegen
- Uitzoeken of de tool geschikt (of geschikt te maken is) is voor ArcGIS Pro (Due Nov 7, 2)
- Hoe gaan we om met exceptions? (Due Dec 31, 5)

**To do - checks**

- ValidationCode Txx81` (RTT=16 of road)
- Feedback Txx- meerdere (bij levering)
- PopulatedPlaceID
- Errors on NAMA fields
- WD7/8 - WatercrsL WD7/8 check controleren, lijkt niet te kloppen (Due Oct 31)
- About connectivity of AirfldP - Clement
- "attributes: has core attributes" (Due Sep 4, 5)

**Doing**

- [PL] Error Txx34 and Txx35, NAMxx should also allow N/A (Due Oct 19, 4, 4/4)
- PointAreaIdentifierConsistencyValidator
- Topology - Hernummering validatiecodes (Due Dec 31, 2, 0/1)
- Feature does not match Topologyrule: BuiltupP Point Must Be Covered By Line (Due Sep 11, 2)

**Done**

- Checks toevoegen voor MISC (Due Oct 23, 1)
- Combine all topology checks into one when running the tool (Due Sep 5, 2)
- Tool duidelijke naam geven (Due Mar 6, 2)
- Help functie toevoegen (Due Nov 1, 1)
- Validatiereport + nrs aanpassen en rondsturen (Due Sep 6, 1, 0/2)
- ELF database geeft foutmelding in script. Check wordt overgeslagen. (Due Feb 2, 2)

**Deadlines**

- Release van tool v1.0 (Due Nov 5, 9/12)
- TRANS, POP, VEG d producers (Due Jun 15)
- 5-8 november EG me (Due Nov 5)

+ Add another card

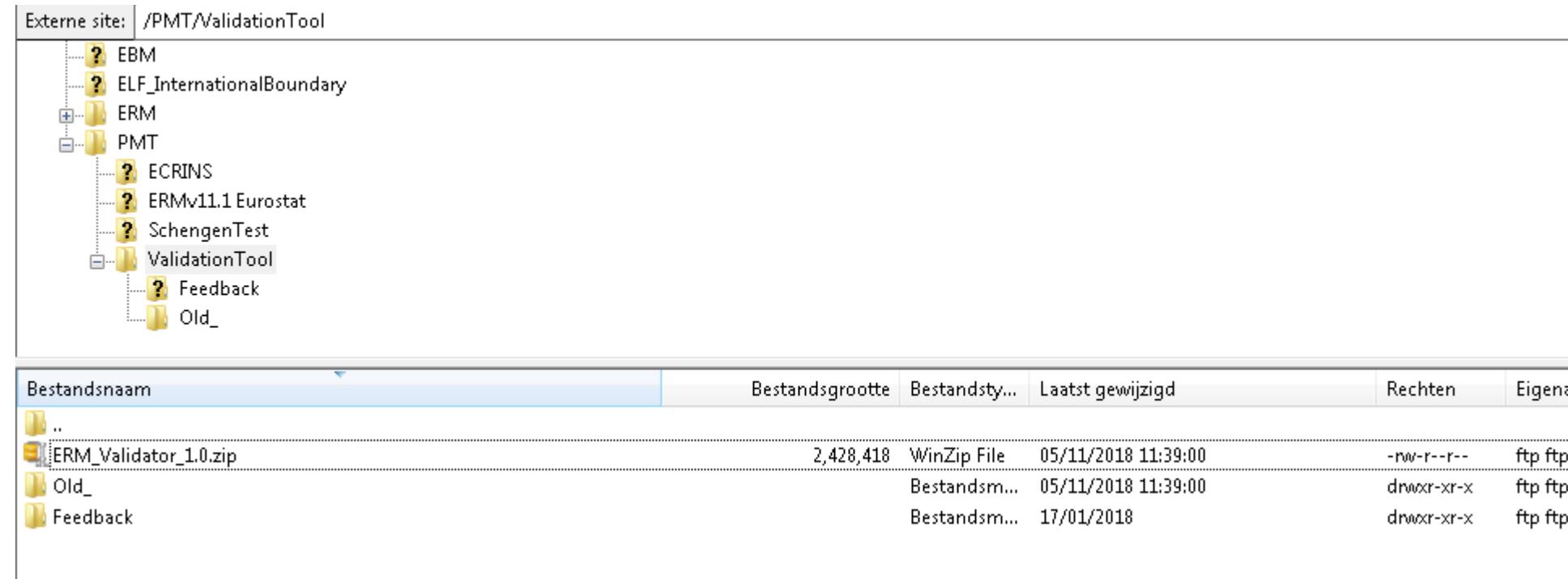
# Producers meeting Zagreb – November 2018



# Release *ERM Validator 1.0*

## BKG-ftp server

Externe site: /PMT/ValidationTool



The interface shows the following directory structure:

- EBM
- ELF\_InternationalBoundary
- ERM
- PMT
  - ECRINS
  - ERMv11.1 Eurostat
  - SchengenTest
  - ValidationTool
    - Feedback
    - Old\_

Below the directory tree is a table showing the contents of the 'ValidationTool' folder:

Bestandsnaam	Bestands grootte	Bestandstyp...	Laatst gewijzigd	Rechten	Eigenaa
..					
ERM_Validator_1.0.zip	2,428,418	WinZip File	05/11/2018 11:39:00	-rw-r--r--	ftp ftp
Old_		Bestandsm...	05/11/2018 11:39:00	drwxr-xr-x	ftp ftp
Feedback		Bestandsm...	17/01/2018	drwxr-xr-x	ftp ftp

# License

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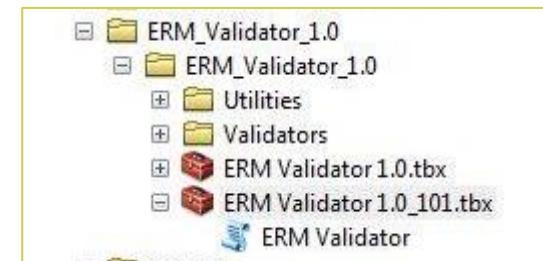
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# Zip-file

Excel report

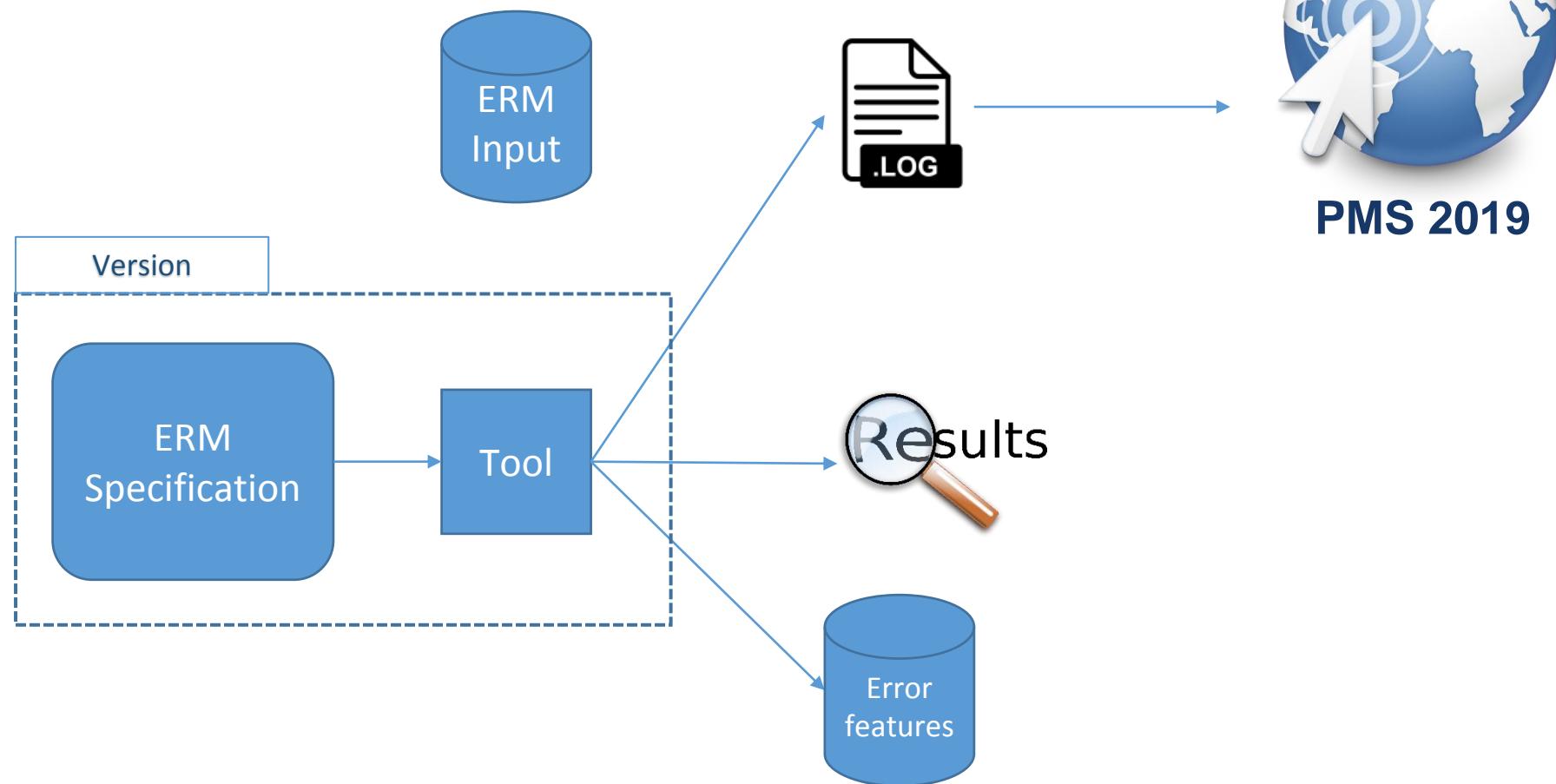
generic	test code	test	implemented in the tool?
General Data Delivery	H001	feature classes AQUEDCTL, COASTA, COASTL, DAML, DAMC, LAKERESA, LANDICEA, ISLANDA, SEAA, SEASTRTL, SPRINGP, SPRINGC, SWAMPA, RAPIDL, RAPIDSC, WATRCRSA, WATRCRSL, WELLP	<input checked="" type="checkbox"/>
	H002	coordinate system (GEOGRAPHIC, decimal degrees)	<input checked="" type="checkbox"/>
	H003	map extent ( -25° < Lambda < 40° and 30° < Phi < 80° )	<input checked="" type="checkbox"/>
	H004	mandatory feature classes COASTA, COASTL, DAML, DAMC, LAKERESA, LANDICEA(BJ030), ISLANDA, SEAA, SWAMPA, WATRCRSA, WATRCRSL must have features	<input checked="" type="checkbox"/>
	H005	Empty or missing tables	<input checked="" type="checkbox"/>
Geometric resolution (Tested in projection Lambert_Conformal_Conic_WGS84)	H006	Valid Geometry	<input checked="" type="checkbox"/>
	H007	minimum allowed area size: 60 000m <sup>2</sup>	<input checked="" type="checkbox"/>
	H008	minimum allowed distance between vertices of line and area features: 5m	<input checked="" type="checkbox"/>
	H009	minimum allowed length of a line segment: 50m	<input checked="" type="checkbox"/>
	H010	statistics of average distance between vertices	<input type="checkbox"/>
Selection criteria (Tested in projection Lambert_Conformal_Conic_WGS84)	H011	The number of LAKERESA less than 400 000m <sup>2</sup>	<input checked="" type="checkbox"/>
	H012	The number of WATRCRSA less than 200 000m <sup>2</sup>	<input checked="" type="checkbox"/>
	H013	The number of SWAMPA, LANDICEA less than 400 000m <sup>2</sup>	<input checked="" type="checkbox"/>
	H014	The number of ISLANDA less than 400 000m <sup>2</sup>	<input checked="" type="checkbox"/>
	H015	The number of dams and locks less than 125m	<input checked="" type="checkbox"/>
	H016	The number of dangling AQUEDCTL, WATRCRSL shorter than 1600m	<input checked="" type="checkbox"/>
	H017	The number of shoreline construction (SEASTRTL)	<input checked="" type="checkbox"/>

Tool



Naam	Gewijzigd op	Type	Grootte
Utilities	24-10-2017 14:13	Bestandsmap	
Validators	24-10-2017 14:13	Bestandsmap	
BNDValidations.py	10-10-2017 11:27	Python File	1 kB
BNDValidations.pyc	24-10-2017 14:13	Compiled Python ...	1 kB
ERM Validation_101.tbx	1-11-2017 10:33	ArcGIS Toolbox	12 kB
EuropeanLevelValidations.py	10-10-2017 11:31	Python File	1 kB
EuropeanLevelValidations.pyc	24-10-2017 14:13	Compiled Python ...	1 kB
GenericValidations.py	10-10-2017 12:10	Python File	2 kB
GenericValidations.pyc	24-10-2017 14:13	Compiled Python ...	2 kB
Hydro_Topology.json	9-10-2017 20:08	JSON-bestand	16 kB
HydroValidations.py	10-10-2017 11:03	Python File	19 kB
HydroValidations.pyc	24-10-2017 14:13	Compiled Python ...	11 kB
main.py	10-10-2017 20:29	Python File	8 kB
MiscValidations.py	10-10-2017 11:28	Python File	1 kB
MiscValidations.pyc	24-10-2017 14:13	Compiled Python ...	1 kB
NameValidations.py	10-10-2017 11:29	Python File	1 kB
NameValidations.pyc	24-10-2017 14:13	Compiled Python ...	1 kB
POIValidations.py	10-10-2017 11:31	Python File	1 kB
POIValidations.pyc	24-10-2017 14:13	Compiled Python ...	1 kB
PopValidations.py	10-10-2017 11:36	Python File	1 kB
PopValidations.pyc	24-10-2017 14:13	Compiled Python ...	1 kB
RunValidations.bat	10-10-2017 20:36	Windows-batchbe...	1 kB
TransValidations.py	10-10-2017 11:30	Python File	1 kB
TransValidations.pyc	24-10-2017 14:13	Compiled Python ...	1 kB
VegValidations.py	10-10-2017 11:30	Python File	1 kB
VegValidations.pyc	24-10-2017 14:13	Compiled Python ...	1 kB

# Scheme tool process



# Framework

## 25 validators

```

projectedDataset = ValidationUtilities.ProjectDataset(params["SourceDatabase"], "EuroRegionalMap", params["ResultDatabase"])

arcpy.env.workspace = projectedDataset#params["SourceDatabase"]
ValidationUtilities.AddOrigIDField()

resultDatabase = params["ResultDatabase"]
resultFolder = params["ResultFolder"]
runTime = params["RunTime"]

results = []
results.extend(FeatureCountValidator.Run("H001", "AquadctL",1))
results.extend(AllowedAttributeValidator.Run("H002", "WatrcrsA", "SN", "5020,5030"))
results.extend(AllowedAttributeValidator.Run("H002", "WatrcrsA", "ICC", "'SK'"))
results.extend(AllowedAttributeValidator.Run("H002", "SpringP", "SNT", "999"))
results.extend(AllowedAttributeValidator.Run("H003", "WatrcrsA", "ICC"))
results.extend(AllowedAttributeValidator.Run("H003", "WatrcrsL", "SN"))

results.extend(ExtentValidator.Run("H004", "WatrcrsA", -25,30,40,80))
results.extend(MinimumAreaValidator.Run("H005", "WatrcrsA", 60000))
results.extend(MinimumLengthValidator.Run("H006", "WatrcrsL", 50))
results.extend(MinimumVertexDistanceValidator.Run("H007", "WatrcrsA", 5))

results.extend(AxisValidator.Run("H008", "WatrcrsL", "LOC=984", ["LakeresA", "WatrcrsA", "SwampA"], mustBeInside=True))
#results.extend(AxisValidator.Run("H008", "WatrcrsL", "LOC <> 984 AND LOC <> 25 AND LOC <> 40", ["LakeresA", "WatrcrsA"], mustBeInside=False))

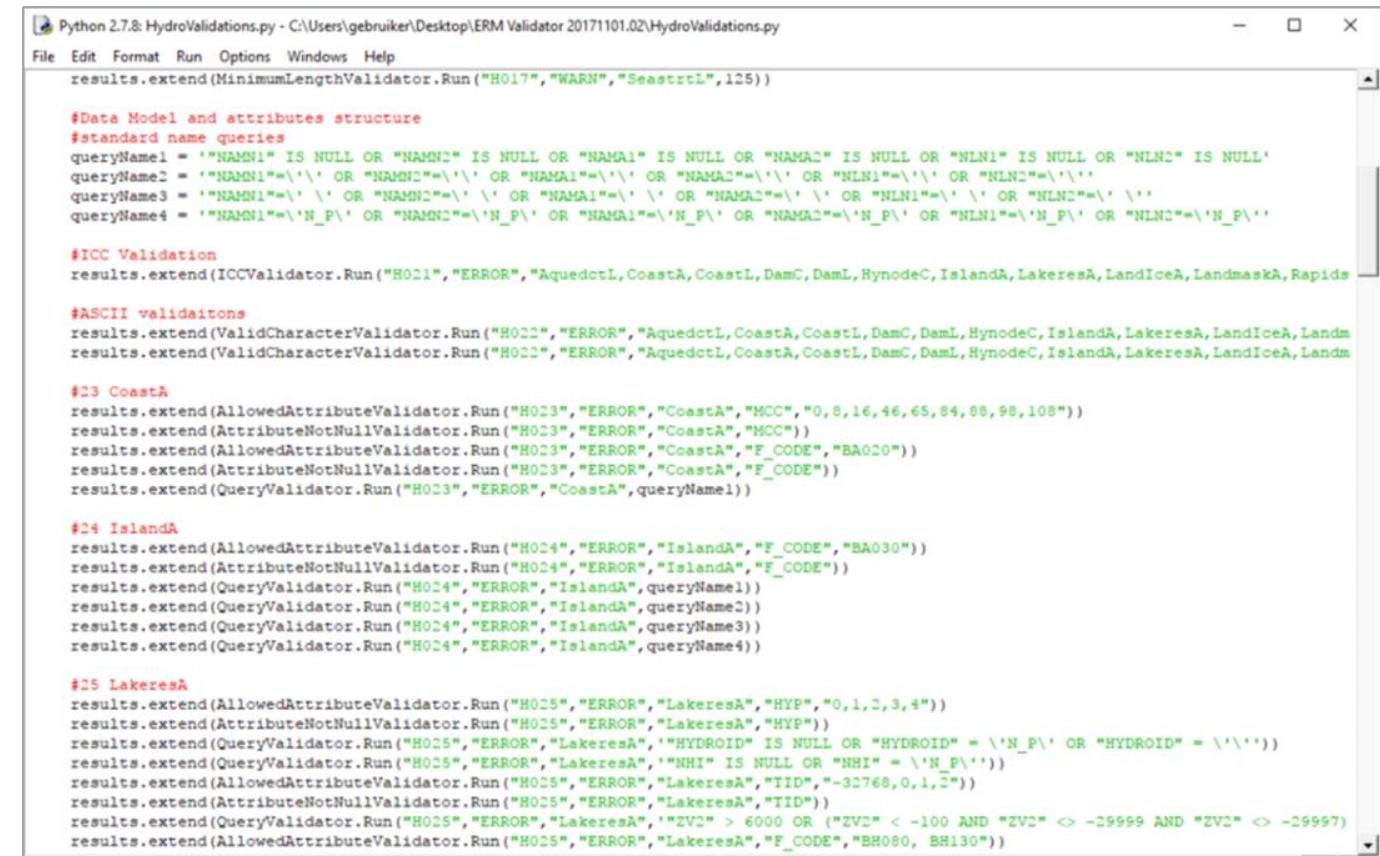
```

 AllowedAttributeValidator.py	11/09/2018 15:10	Python File	2 kB
 AttributeNotNullValidator.py	11/09/2018 15:10	Python File	2 kB
 AxesValidator.py	11/09/2018 15:10	Python File	4 kB
 ClassTableConsistencyValidator.py	11/09/2018 15:10	Python File	3 kB
 CompletionRateValidator.py	11/09/2018 15:10	Python File	4 kB
 ExtentValidator.py	11/09/2018 15:10	Python File	2 kB
 FeatureCountValidator.py	11/09/2018 15:10	Python File	2 kB
 GeodatabaseTemplateValidator.py	11/09/2018 15:10	Python File	11 kB
 ICCValidator.py	11/09/2018 15:10	Python File	2 kB
 MinimumAreaValidator.py	11/09/2018 15:10	Python File	2 kB
 MinimumLengthValidator.py	11/09/2018 15:10	Python File	2 kB
 MinimumVertexDistanceValidator.py	11/09/2018 15:10	Python File	4 kB
 MustBeOutsideValidator.py	11/09/2018 15:10	Python File	4 kB
 MustBeSinglePartValidator.py	11/09/2018 15:10	Python File	2 kB
 NameFieldValidator.py	11/09/2018 15:10	Python File	3 kB
 PointAreaIdentifierConsistencyValidator.py	11/09/2018 15:10	Python File	4 kB
 ProximityValidator.py	14/09/2018 10:57	Python File	3 kB
 QueryValidator.py	11/09/2018 15:10	Python File	2 kB
 RegexValidator.py	11/09/2018 15:10	Python File	3 kB
 TableClassConsistencyValidator.py	11/09/2018 15:10	Python File	3 kB
 TopologyValidator.py	11/09/2018 15:10	Python File	16 kB
 TransSpecificChecks.py	11/09/2018 15:10	Python File	20 kB
 ValidationUtilities.py	31/10/2018 11:36	Python File	11 kB
 ValidCharacterValidator.py	11/09/2018 15:10	Python File	3 kB
 ValidGeometryValidator.py	11/09/2018 15:10	Python File	2 kB

# Themes

5 ERM themes:

HYDRO, MISC, POP, TRANS, VEG,  
POI, NAME, BND



```

Python 2.7.8: HydroValidations.py - C:\Users\gebruiker\Desktop\ERM Validator 20171101.02\HydroValidations.py
File Edit Format Run Options Windows Help
results.extend(MinimumLengthValidator.Run("H017", "WARN", "SeastrlL", 125))

#Data Model and attributes structure
#standard name queries
queryName1 = "'NAMN1' IS NULL OR 'NAMN2' IS NULL OR 'NAM1' IS NULL OR 'NAM2' IS NULL OR 'NLN1' IS NULL OR 'NLN2' IS NULL"
queryName2 = "'NAMN1"=\'\'' OR "NAMN2"=\'\'' OR "NAM1"=\'\'' OR "NAM2"=\'\'' OR "NLN1"=\'\'' OR "NLN2"=\'\''"
queryName3 = "'NAMN1"=\' \\' OR "NAMN2"=\' \\' OR "NAM1"=\' \\' OR "NAM2"=\' \\' OR "NLN1"=\' \\' OR "NLN2"=\' \\'"
queryName4 = "'NAMN1"=\'N_P\' OR "NAMN2"=\'N_P\' OR "NAM1"=\'N_P\' OR "NAM2"=\'N_P\' OR "NLN1"=\'N_P\' OR "NLN2"=\'N_P\'"

#ICC Validation
results.extend(ICCValidator.Run("H021", "ERROR", "AqueductL,CoastA,CoastL,DamC,DamL,HynodeC,IslandA,LakeresA,LandIceA,LandmaskA,Rapids"))

#ASCII validaitons
results.extend(ValidCharacterValidator.Run("H022", "ERROR", "AqueductL,CoastA,CoastL,DamC,DamL,HynodeC,IslandA,LakeresA,LandIceA,LandmaskA,Rapids"))
results.extend(ValidCharacterValidator.Run("H022", "ERROR", "AqueductL,CoastA,CoastL,DamC,DamL,HynodeC,IslandA,LakeresA,LandIceA,LandmaskA,Rapids"))

#23 CoastA
results.extend(AllowedAttributeValidator.Run("H023", "ERROR", "CoastA", "MCC", "0,8,16,46,65,84,88,98,108"))
results.extend(AttributeNotNullValidator.Run("H023", "ERROR", "CoastA", "MCC"))
results.extend(AllowedAttributeValidator.Run("H023", "ERROR", "CoastA", "F_CODE", "BA020"))
results.extend(AttributeNotNullValidator.Run("H023", "ERROR", "CoastA", "F_CODE"))
results.extend(QueryValidator.Run("H023", "ERROR", "CoastA", queryName1))

#24 IslandA
results.extend(AllowedAttributeValidator.Run("H024", "ERROR", "IslandA", "F_CODE", "BA030"))
results.extend(AttributeNotNullValidator.Run("H024", "ERROR", "IslandA", "F_CODE"))
results.extend(QueryValidator.Run("H024", "ERROR", "IslandA", queryName1))
results.extend(QueryValidator.Run("H024", "ERROR", "IslandA", queryName2))
results.extend(QueryValidator.Run("H024", "ERROR", "IslandA", queryName3))
results.extend(QueryValidator.Run("H024", "ERROR", "IslandA", queryName4))

#25 LakeresA
results.extend(AllowedAttributeValidator.Run("H025", "ERROR", "LakeresA", "HYP", "0,1,2,3,4"))
results.extend(AttributeNotNullValidator.Run("H025", "ERROR", "LakeresA", "HYP"))
results.extend(QueryValidator.Run("H025", "ERROR", "LakeresA", "'HYDROID' IS NULL OR 'HYDROID' = \'N_P\' OR 'HYDROID' = '\''"))
results.extend(QueryValidator.Run("H025", "ERROR", "LakeresA", "'NHI' IS NULL OR 'NHI' = 'N_P'"))
results.extend(AllowedAttributeValidator.Run("H025", "ERROR", "LakeresA", "TID", "-32768,0,1,2"))
results.extend(AttributeNotNullValidator.Run("H025", "ERROR", "LakeresA", "TID"))
results.extend(QueryValidator.Run("H025", "ERROR", "LakeresA", "'ZV2' > 6000 OR ('ZV2' < -100 AND 'ZV2' < -29999 AND 'ZV2' < -29997"))
results.extend(AllowedAttributeValidator.Run("H025", "ERROR", "LakeresA", "F_CODE", "BH080, BH130"))

```

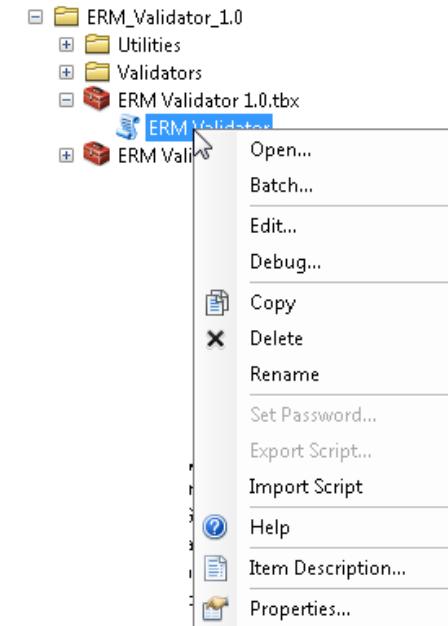
# To get started

Download the latest version on BKG ftp server.

Dataset in ERM template format !

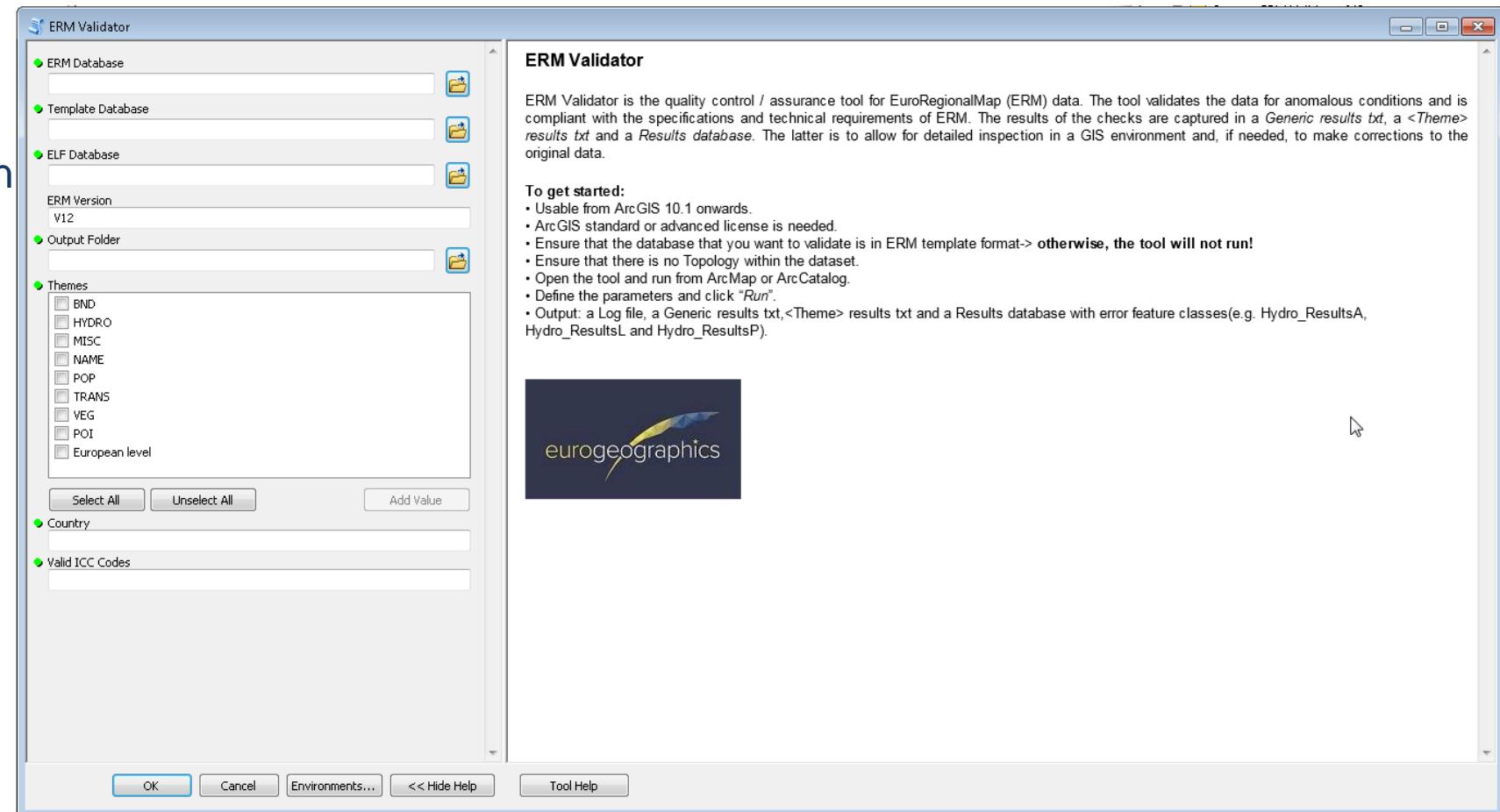
No topology in dataset allowed.

Open the tool from ArcMap or ArcCatalog



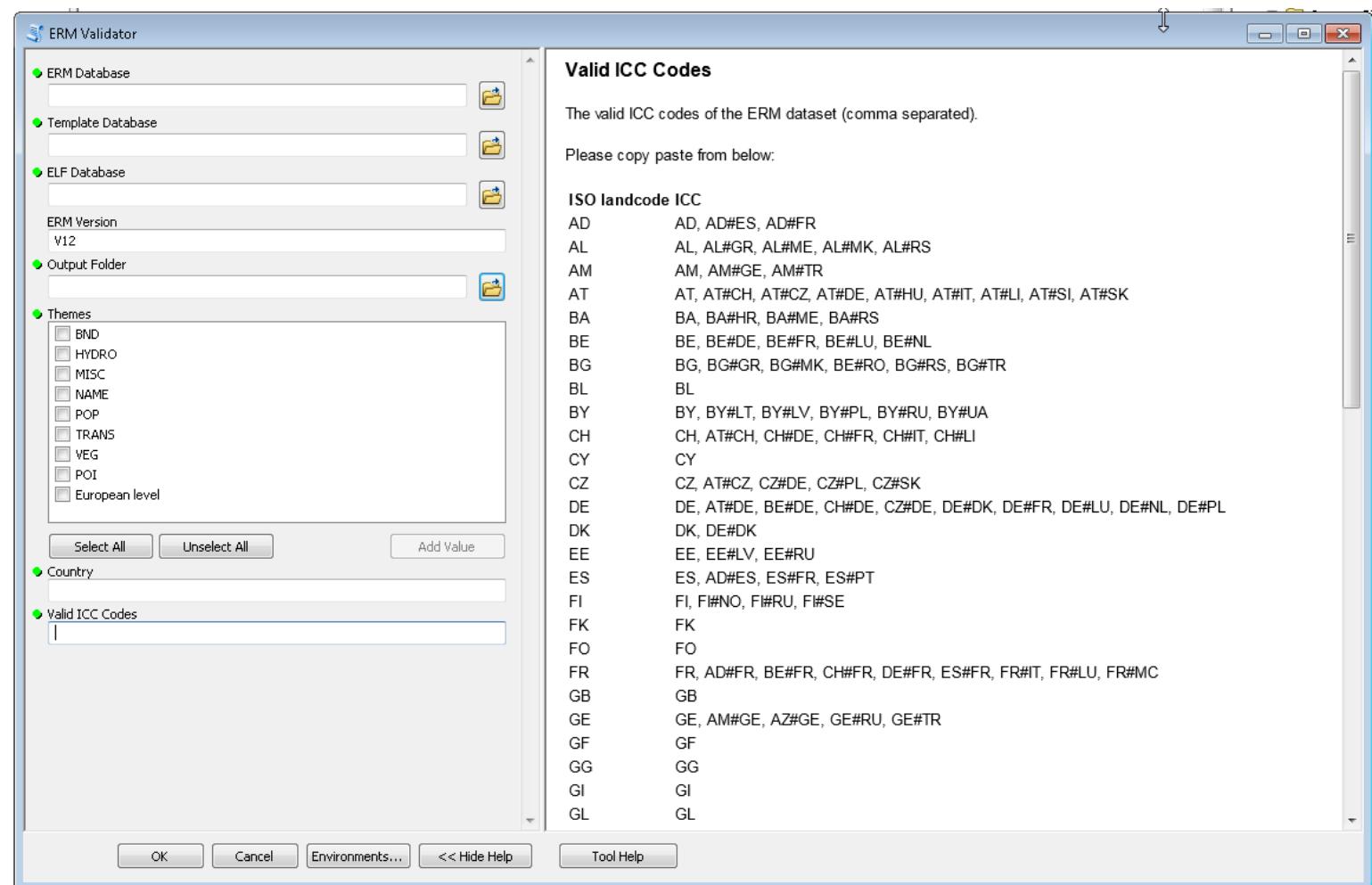
# Parameters

Information added to 'Help' section



# ICC

For now: please copy – paste the valid ICC codes from the 'Help' menu



# Results

Runtime

Log file

Generic Results txt file

<theme> Results txt file

Results database

 Results_20181101-085759.gdb	05/11/2018 09:21	Bestandsmap
 ERMValidator_20181101-103251.log	01/11/2018 11:12	Tekstdocument
 GENERIC_Results_20181101-103251.txt	01/11/2018 10:35	Tekstdocument
 Hydro_Results_20181101-103251.txt	01/11/2018 10:58	Tekstdocument
 Misc_Results_20181101-103251.txt	01/11/2018 11:00	Tekstdocument
 POP_Results_20181101-103251.txt	01/11/2018 11:01	Tekstdocument
 Topo_Results_20181101-103251.txt	01/11/2018 10:52	Tekstdocument
 Trans_Results_20181101-103251.txt	01/11/2018 11:12	Tekstdocument
 Veg_Results_20181101-103251.txt	01/11/2018 11:12	Tekstdocument

# Log (.txt)



```
ERMValidator_20171110-170048.log - Kladblok
Bestand Bewerken Opmaak Beeld Help

20171110-17:00:48 MainProcess MainThread INFO Logging Created, logfile: H:\output\ERMvalidator_20171110-170048.log
20171110-17:00:48 MainProcess MainThread INFO Start ERM Validator version: 20171010.01
20171110-17:00:48 MainProcess MainThread INFO Start with parameters:
20171110-17:00:48 MainProcess MainThread INFO Input database : H:\ERM_v11_ETRS89_R06_2017_edits_10oct2017.gdb
20171110-17:00:48 MainProcess MainThread INFO Template database: L:\GMA\Projecten\EuroGeographics\ERM\Templates\database\ERM_v11_template.gdb
20171110-17:00:49 MainProcess MainThread INFO ERM Version : V11
20171110-17:00:49 MainProcess MainThread INFO Result folder : H:\output
20171110-17:00:49 MainProcess MainThread INFO Themes : HYDRO
20171110-17:00:49 MainProcess MainThread INFO Country : The Netherlands
20171110-17:00:49 MainProcess MainThread INFO Valid ICC Codes : NL, BE#NL, DE#NL
20171110-17:00:49 MainProcess MainThread DEBUG ArcGIS Licence : ArcInfo
20171110-17:00:49 MainProcess MainThread DEBUG ArcGIS Version : 10.5
20171110-17:00:49 MainProcess MainThread INFO ****
20171110-17:00:49 MainProcess MainThread INFO Creating results database: H:\output\Results_20171110-170049.gdb
20171110-17:00:49 MainProcess MainThread VERBOSE Utilities::starttimer::CreateDB
20171110-17:01:00 MainProcess MainThread VERBOSE Utilities::stopTimer::CreateDB
20171110-17:01:00 MainProcess MainThread DEBUG Database created in 00h:00m:11s
20171110-17:01:00 MainProcess MainThread INFO ****
20171110-17:01:00 MainProcess MainThread INFO Starting Generic validations
20171110-17:01:00 MainProcess MainThread VERBOSE Utilities::starttimer::genericvalidations
20171110-17:01:00 MainProcess MainThread INFO Running GeodatabaseTemplateValidation
20171110-17:01:31 MainProcess MainThread DEBUG Checking H:\ERM_v11_ETRS89_R06_2017_edits_10oct2017.gdb\EuroRegionalMap\wellP
20171110-17:01:52 MainProcess MainThread VERBOSE Executing: GetCount H:\ERM_v11_ETRS89_R06_2017_edits_10oct2017.gdb\EuroRegionalMap\wellP
20171110-17:01:52 MainProcess MainThread VERBOSE Start Time: Fri Nov 10 17:01:49 2017
20171110-17:01:52 MainProcess MainThread VERBOSE Row Count = 0
20171110-17:01:52 MainProcess MainThread VERBOSE Succeeded at Fri Nov 10 17:01:52 2017 (Elapsed Time: 2.28 seconds)
20171110-17:01:52 MainProcess MainThread VERBOSE Validationutilities::CreateResult: count COUNT wellP None 0 records
20171110-17:01:52 MainProcess MainThread VERBOSE Checking datatype
20171110-17:01:52 MainProcess MainThread VERBOSE Checking geometrytype
20171110-17:01:52 MainProcess MainThread VERBOSE Checking Fields
20171110-17:01:52 MainProcess MainThread VERBOSE Checking OBJECTID
20171110-17:01:52 MainProcess MainThread VERBOSE Checking shape
20171110-17:01:52 MainProcess MainThread VERBOSE Checking FCSubtype
20171110-17:01:52 MainProcess MainThread VERBOSE Checking inspireid
20171110-17:01:52 MainProcess MainThread VERBOSE Checking beginLifespanversion
20171110-17:01:52 MainProcess MainThread VERBOSE Checking F_CODE
20171110-17:01:52 MainProcess MainThread VERBOSE Checking ICC
20171110-17:01:52 MainProcess MainThread VERBOSE Checking SN
20171110-17:01:52 MainProcess MainThread DEBUG Checking H:\ERM_v11_ETRS89_R06_2017_edits_10oct2017.gdb\EuroRegionalMap\watrcrsl
20171110-17:02:10 MainProcess MainThread VERBOSE Executing: GetCount H:\ERM_v11_ETRS89_R06_2017_edits_10oct2017.gdb\EuroRegionalMap\watrcrsl
20171110-17:02:10 MainProcess MainThread VERBOSE Start Time: Fri Nov 10 17:02:07 2017
20171110-17:02:10 MainProcess MainThread VERBOSE Row Count = 22354
20171110-17:02:10 MainProcess MainThread VERBOSE Succeeded at Fri Nov 10 17:02:10 2017 (Elapsed Time: 2.92 seconds)
20171110-17:02:10 MainProcess MainThread VERBOSE Validationutilities::CreateResult: count COUNT Watrcrsl None 22354 records
20171110-17:02:10 MainProcess MainThread VERBOSE Checking datatype
20171110-17:02:10 MainProcess MainThread VERBOSE Checking geometrytype
20171110-17:02:10 MainProcess MainThread VERBOSE Checking Fields
```

# Generic results (.txt)



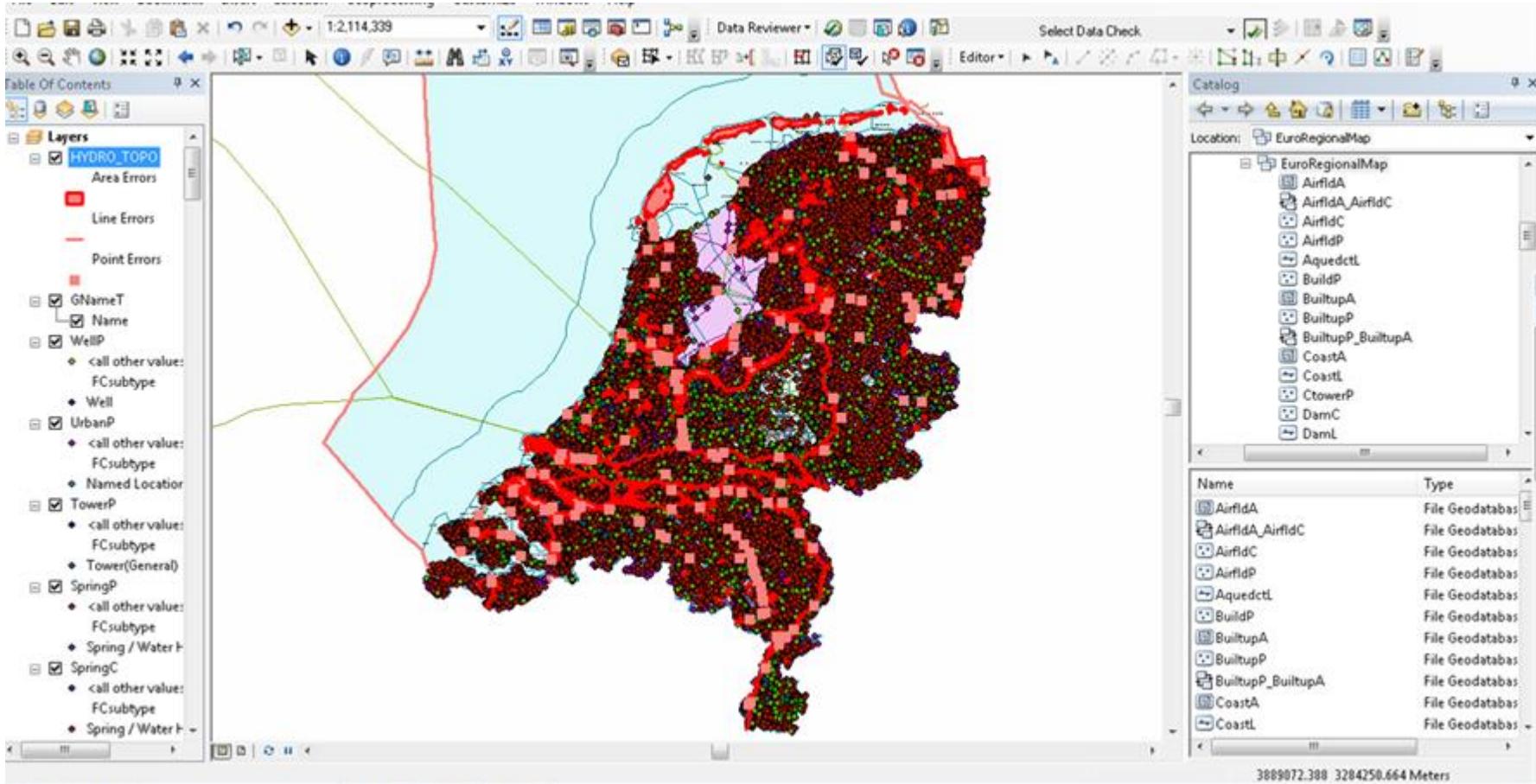
====			
====			
validationdate + time	:	20171110-170049	
Tool version	:	20171010.01	
Country Name	:	The Netherlands	
User (windows login)	:	kuijem	
ERM version	:	v11	
Theme	:	GENERIC	
Database name	:	H:\GMA\Projecten\EuroGeographics\ERM\Templates\Database\ERM_v11_template.gdb	
Template database name	:	L:\GMA\Projecten\EuroGeographics\ERM\Templates\Database\100ct2017.gdb	
====			
==COUNT			
====			
== count == 71 records found			
====			
ValidationCode   FeatureClass   objectID   Message			
count	wellP	None	0 records
count	watrcrsl	None	22354 records
count	watrcrsa	None	187 records
count	VegA	None	1419 records
count	UrbanP	None	0 records
count	TowerP	None	575 records
count	SwampA	None	33 records
count	SpringP	None	0 records
count	SpringC	None	0 records
count	SoilA	None	52 records
count	ShoreL	None	0 records
count	SeastrL	None	1079 records
count	SeaA	None	2 records
count	RunwayL	None	32 records
count	RoadL	None	63713 records
count	RestC	None	801 records
count	RapidsL	None	0 records
count	RapidsC	None	0 records
count	RailrdL	None	3363 records
count	RailrdC	None	436 records
count	PowerP	None	22 records
count	PowerL	None	353 records
count	Polbndl	None	1388 records
count	PolbndA	None	488 records
count	PhysP	None	0 records

# Theme specific results (.txt)



```
Hydro_Results_20171110-170049.txt - Kladblok
Bestand Bewerken Opmaak Beeld Help
=====
ERM QA Condition report
=====
validationdate + time : 20171110-170049
Tool version          : 20171010.01
Country Name          : The Netherlands
User (windows login) : kuijsem
ERM version           : v11
Theme                 : Hydro
Database name         : H:\ERM_v11_ETRS89_R06_2017_edits_10oct2017.gdb
Template database name: L:\GMA\Projecten\EuroGeographics\ERM\Templates\database\ERM_v11_template.gdb
=====
==ERROR
=====
=====
== H004 == 1 records found
=====
| validationCode | FeatureClass | ObjectID | Message
| H004           | LandIceA     | None      | FeatureClass LandIceA has 0 records, minimum: 1
=====
== H008 == 1225 records found
=====
| validationCode | FeatureClass | ObjectID | Message
| H008           | CoastL       | 401      | Distance between vertices is 0.527207975284 meters, minimumvalue is 5 meters
| H008           | SeastrlL    | 6        | Distance between vertices is 0.348552692997 meters, minimumvalue is 5 meters
| H008           | SeastrlL    | 170     | Distance between vertices is 2.78797970001 meters, minimumvalue is 5 meters
| H008           | SeastrlL    | 182     | Distance between vertices is 0.33576292202 meters, minimumvalue is 5 meters
| H008           | SeastrlL    | 194     | Distance between vertices is 4.98816311807 meters, minimumvalue is 5 meters
| H008           | SeastrlL    | 201     | Distance between vertices is 1.727954611149 meters, minimumvalue is 5 meters
```

# Results database (.gdb)



The screenshot shows the ArcGIS Data Reviewer interface. On the left, the Table of Contents pane displays a list of layers under the HYDRO\_TOPO category, including Area Errors, Line Errors, Point Errors, GNameT, WellP, UrbanP, TowerP, SpringP, and SpringC. The main map view shows the Netherlands with a dense distribution of error features, primarily represented by red and green dots and polygons. On the right, the Catalog pane shows the structure of the 'Results\_20181101-085759.gdb' geodatabase, which contains various subfolders and geodatabases corresponding to the error types listed in the TOC.

Table of Contents

- HYDRO\_TOPO
  - Area Errors
  - Line Errors
  - Point Errors
  - GNameT
    - Name
  - WellP
    - <all other values: FCsubtype
    - Well
  - UrbanP
    - <all other values: FCsubtype
    - Named Location
  - TowerP
    - <all other values: FCsubtype
    - Tower(General)
  - SpringP
    - <all other values: FCsubtype
    - Spring / Water F
  - SpringC
    - <all other values: FCsubtype
    - Spring / Water F

Catalog

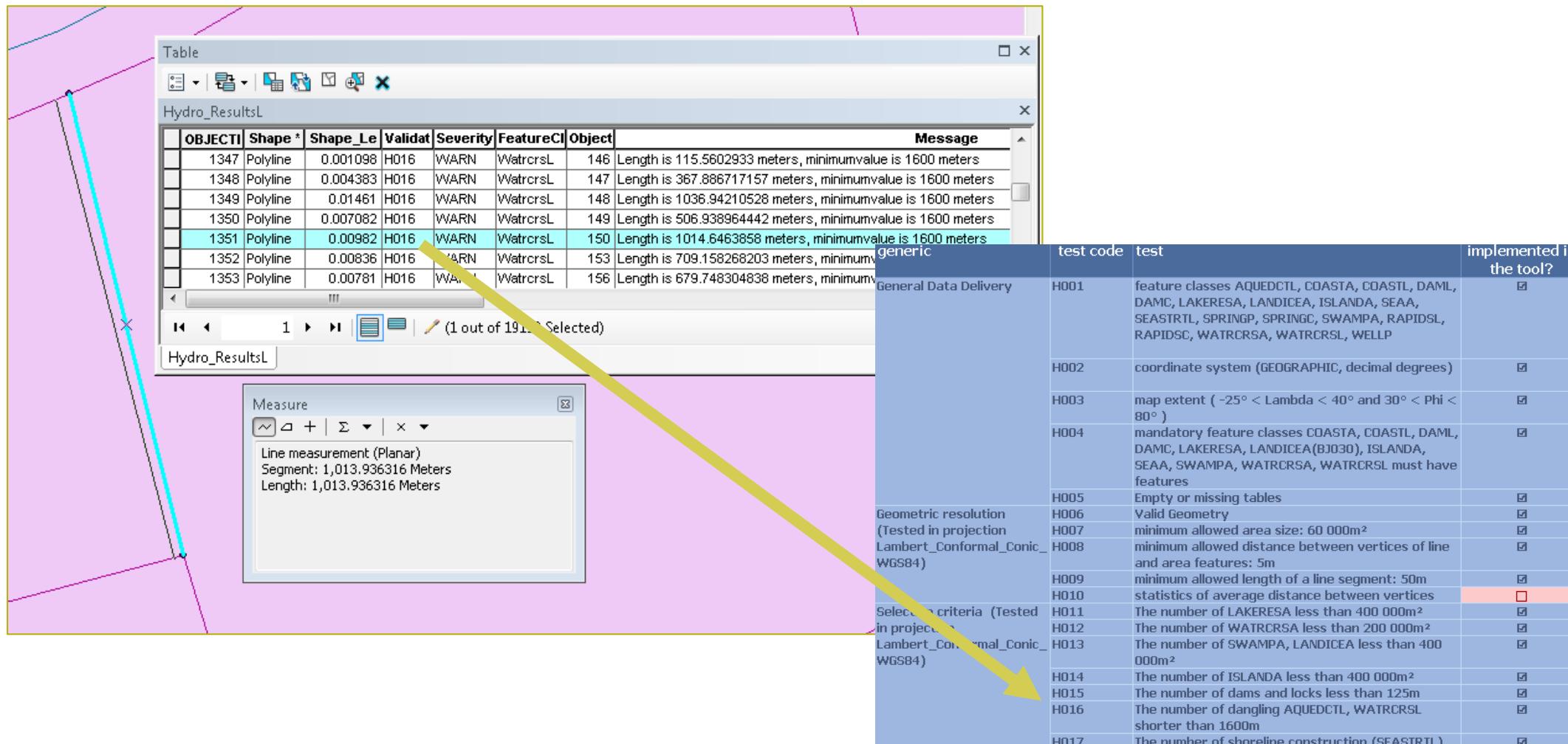
- Location: EuroRegionalMap
  - EuroRegionalMap
    - AirfldA
    - AirfldA\_AirfldC
    - AirfldC
    - AirfldP
    - AquedctL
    - BuildP
    - BuiltupA
    - BuiltupP
    - BuiltupP\_BuiltupA
    - CoastA
    - CoastL
    - CtowerP
    - DamC
    - DamL
  - Results\_20181101-085759.gdb
    - EuroRegionalMap
      - HYDRO\_MISC\_POP\_TRANS\_VEG\_TOPO\_line
      - HYDRO\_MISC\_POP\_TRANS\_VEG\_TOPO\_point
      - HYDRO\_MISC\_POP\_TRANS\_VEG\_TOPO\_poly
    - Hydro\_ResultsA
    - Hydro\_ResultsL
    - Hydro\_ResultsP
    - IntercC\_joinMotorways
    - Misc\_ResultsL
    - Misc\_ResultsP
    - POP\_ResultsA
    - RailrdL\_Network
    - RoadL\_Network
    - Topo\_ResultsA
    - Trans\_ResultsL
    - Trans\_ResultsP
    - Veg\_ResultsA



Table

Hydro\_ResultsL

OBJECTID *	Shape *	Shape_Length	ValidationCode	Severity	FeatureClassName	Object_ObjectId	Message
1212	Polyline	0.342998	H008	ERROR	WatrcrsL	22453	Distance between vertices is 0.342997740443 meters, minimumvalue is 5 meters
1213	Polyline	0.931634	H008	ERROR	WatrcrsL	22457	Distance between vertices is 0.93163351146 meters, minimumvalue is 5 meters
1214	Polyline	1.280222	H008	ERROR	WatrcrsL	22457	Distance between vertices is 1.28022201212 meters, minimumvalue is 5 meters
1215	Polyline	3.370807	H008	ERROR	WatrcrsL	22463	Distance between vertices is 3.37080711978 meters, minimumvalue is 5 meters
1216	Polyline	1.099411	H008	ERROR	WatrcrsL	22474	Distance between vertices is 1.09941076938 meters, minimumvalue is 5 meters
1217	Polyline	4.347994	H008	ERROR	WatrcrsL	22475	Distance between vertices is 4.34799369066 meters, minimumvalue is 5 meters
1218	Polyline	3.84941	H008	ERROR	WatrcrsL	22475	Distance between vertices is 3.84940964807 meters, minimumvalue is 5 meters
1219	Polyline	0.756976	H008	ERROR	WatrcrsL	22475	Distance between vertices is 0.756975672256 meters, minimumvalue is 5 meters
1220	Polyline	2.167425	H008	ERROR	WatrcrsL	22475	Distance between vertices is 2.16742485452 meters, minimumvalue is 5 meters
1221	Polyline	4.789757	H008	ERROR	WatrcrsL	22475	Distance between vertices is 4.78975682154 meters, minimumvalue is 5 meters
1222	Polyline	1.232783	H008	ERROR	WatrcrsL	22475	Distance between vertices is 1.23278297059 meters, minimumvalue is 5 meters
1223	Polyline	2.63628	H008	ERROR	WatrcrsL	22475	Distance between vertices is 2.6362795167 meters, minimumvalue is 5 meters
1224	Polyline	0.604365	H008	ERROR	WatrcrsL	22478	Distance between vertices is 0.604364864321 meters, minimumvalue is 5 meters
1225	Polyline	4.678775	H008	ERROR	WatrcrsL	22480	Distance between vertices is 4.67877528976 meters, minimumvalue is 5 meters
1226	Polyline	0.00032	H009	WARN	SeastrlL	53	Length is 23.5232607198 meters, minimumvalue is 50 meters
1227	Polyline	0.000287	H009	WARN	WatrcrsL	11325	Length is 31.8671387887 meters, minimumvalue is 50 meters
1228	Polyline	0.000973	H015	WARN	DamL	4	Length is 107.482305827 meters, minimumvalue is 125 meters
1229	Polyline	0.004717	H016	WARN	AquedctL	1	Length is 341.378883927 meters, minimumvalue is 1600 meters
1230	Polyline	0.003542	H016	WARN	AquedctL	2	Length is 294.724644768 meters, minimumvalue is 1600 meters
1231	Polyline	0.012312	H016	WARN	AquedctL	3	Length is 851.211175742 meters, minimumvalue is 1600 meters
1232	Polyline	0.0046	H016	WARN	AquedctL	4	Length is 321.482013634 meters, minimumvalue is 1600 meters
1233	Polyline	0.004072	H016	WARN	AquedctL	5	Length is 364.465483081 meters, minimumvalue is 1600 meters
1234	Polyline	0.013864	H016	WARN	WatrcrsL	4	Length is 1480.56256671 meters, minimumvalue is 1600 meters
1235	Polyline	0.010273	H016	WARN	WatrcrsL	6	Length is 730.53615716 meters, minimumvalue is 1600 meters
1236	Polyline	0.01463	H016	WARN	WatrcrsL	7	Length is 1033.21925549 meters, minimumvalue is 1600 meters
1237	Polyline	0.002811	H016	WARN	WatrcrsL	9	Length is 215.457326836 meters, minimumvalue is 1600 meters



The screenshot illustrates the ERM Quality Management process within a GIS environment. On the left, a table titled 'Hydro\_ResultsL' displays validation results for various objects. A yellow arrow points from this table to a detailed validation report on the right, which is organized into sections: General Data Delivery, Geometric resolution (Tested in projection Lambert\_Conformal\_Conic\_WGS84), and Selection criteria (Tested in projection Lambert\_Conformal\_Conic\_WGS84). The validation report includes test codes (H001 to H017) and descriptions of the validation rules.

OBJECTI	Shape *	Shape_Le	Validat	Severity	FeatureCl	Object	Message
1347	Polyline	0.001098	H016	WARN	WatcrsL	146	Length is 115.5602933 meters, minimumvalue is 1600 meters
1348	Polyline	0.004383	H016	WARN	WatcrsL	147	Length is 367.886717157 meters, minimumvalue is 1600 meters
1349	Polyline	0.01461	H016	WARN	WatcrsL	148	Length is 1036.94210528 meters, minimumvalue is 1600 meters
1350	Polyline	0.007082	H016	WARN	WatcrsL	149	Length is 506.938964442 meters, minimumvalue is 1600 meters
1351	Polyline	0.00982	H016	WARN	WatcrsL	150	Length is 1014.6463858 meters, minimumvalue is 1600 meters
1352	Polyline	0.00836	H016	WARN	WatcrsL	153	Length is 709.158268203 meters, minimumvalue is 1600 meters
1353	Polyline	0.00781	H016	WARN	WatcrsL	156	Length is 679.748304838 meters, minimumvalue is 1600 meters

**General Data Delivery**

H001	feature classes AQUEDCTL, COASTA, COASTL, DAML, DAMC, LAKERESA, LANDICEA, ISLANDA, SEAA, SEASTRTL, SPRINGP, SPRINGC, SWAMPA, RAPIDL, RAPIDSC, WATCRRSA, WATCRSL, WELLP	<input type="checkbox"/>
H002	coordinate system (GEOGRAPHIC, decimal degrees)	<input type="checkbox"/>
H003	map extent ( -25° < Lambda < 40° and 30° < Phi < 80° )	<input type="checkbox"/>
H004	mandatory feature classes COASTA, COASTL, DAML, DAMC, LAKERESA, LANDICEA(BJ030), ISLANDA, SEAA, SWAMPA, WATCRRSA, WATCRSL must have features	<input type="checkbox"/>
H005	Empty or missing tables	<input type="checkbox"/>
H006	Valid Geometry	<input type="checkbox"/>
H007	minimum allowed area size: 60 000m <sup>2</sup>	<input type="checkbox"/>
H008	minimum allowed distance between vertices of line and area features: 5m	<input type="checkbox"/>
H009	minimum allowed length of a line segment: 50m	<input type="checkbox"/>
H010	statistics of average distance between vertices	<input type="checkbox"/>
H011	The number of LAKERESA less than 400 000m <sup>2</sup>	<input type="checkbox"/>
H012	The number of WATCRRSA less than 200 000m <sup>2</sup>	<input type="checkbox"/>
H013	The number of SWAMPA, LANDICEA less than 400 000m <sup>2</sup>	<input type="checkbox"/>
H014	The number of ISLANDA less than 400 000m <sup>2</sup>	<input type="checkbox"/>
H015	The number of dams and locks less than 125m	<input type="checkbox"/>
H016	The number of dangling AQUEDCTL, WATCRSL shorter than 1600m	<input type="checkbox"/>
H017	The number of shoreline construction (SEASTRTL)	<input type="checkbox"/>

**Geometric resolution (Tested in projection Lambert\_Conformal\_Conic\_WGS84)**

**Selection criteria (Tested in projection Lambert\_Conformal\_Conic\_WGS84)**

**Measure**

Line measurement (Planar)  
Segment: 1,013.936316 Meters  
Length: 1,013.936316 Meters

# Next steps

- Add checks that are not yet implemented (validation report)
- Integrate consistency checks from BKG – EBM/ERM
- Send overview of feedback received
- Modify user interface based on feedback received
- Add statistics session
- False positives?
- PMS results?
- How to handle with exceptions?
- ArcGIS Pro?

# Next steps

- New version of ERM Validation tool in beginning of next production year
- More feedback is very welcome!

# Question to the producers....

Who uses or is going to use ArcGIS Pro for ERM production?

# Thank you for your attention!

Contact:

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