## How can interpreters benefit from the use of digital text analysis?

#### Introduction

- Who we are:
  - Siiri Alouja (University of Tartu, Estonia)
  - Virginija Masiulionytė (Vilnius University, Lithuania)
  - Victoria Sîrbu (University of Duisburg-Essen, Germany)
  - Eva Zitta (University of Duisburg-Essen, Germany)
- About the project "KoGloss":
  - glossaries
  - constructions
  - collaborative work
  - corpus-based
- What are we going to do today?

#### **Agenda**

- (1) Creating Digital Text Collection: Corpus (Victoria Sîrbu)
- (2) Processing Data with Corpus Analysis Tools: AntConc
  - some theoretical details (Eva Zitta)
  - practical use (Virginia M.)
- (3) Options for Data Storage: **Moodle** (Siiri Alouja)
- (4) Room for **Questions** and **Comments**

### CORPUS

Victoria Sîrbu

#### Contents

- 1. What is a corpus?
- 2. Why could a corpus be useful for interpreters?
- 3. How to build a corpus.

A corpus is a collection of pieces of language text in electronic form, selected according to external criteria to represent, as far as possible, a language or language variety as a source of data for linguistic research.

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#### Criteria on which the texts can be selected

- Language(s) or language varieties
- mode of the text: written or spoken
- domain of the text: academic, popular, institutional, religious, business etc.
- genres: e.g. if academic: essays, reports, case studies, research proposals, book reviews.
- date of the texts
- size of the corpus and corpus texts

A corpus is a collection of pieces of language text in electronic form, selected according to external criteria to represent, as far as possible, a language or language variety as a source of data for linguistic research.

#### Corpus – in brief

- Authentic language data
- Electronic/machine readable form
- Built according to explicit design criteria
- Representative for a language
- For linguistic investigation

Why should interpreters use a corpus?

#### Why is a corpus useful?

Working with a corpus can:

- Provide you with specialist terms
- Enable you to search for more than one word, e. g. strings of words
  - Provide you with special fixed word pairs (collocations)
- Guarantee that you will use an appropriate language
- Save your time

#### Ready-made corpora

Department of German Language and Linguistics Berlin University

### Figure double Sprache und Linguistik [praixa Junt linguistik]

Department of German Language and Linguistics > Das Institut > Professuren > Korpuslinguistik und Morphologie > Links

General | Corpora | Software | Dictionaries

#### Corpora

#### **Overview**

- Synchronic
  - German
  - English
  - French
  - Spanish
  - Italian
  - Catalan
  - Swedish
  - Czech
  - Finnish
  - Russian
  - Turkish
  - Multilingual
- Diachronic
  - German



Philosophische Fakultät II

Department of German Language and Linguistics

Deutsch

#### Das Institut

Studium

Nachwuchsförderung

Forschung

Kooperationen

Mitarbeiter

Studiengänge

Kommentiertes Vorlesungsverzeichnis

Moodle

Abschlussarbeiten

Protokolle

News

Search

Sitemap

# Why should you build your **own** corpora?

### Ready-made corpora

| Ready-made corpora                   |  |
|--------------------------------------|--|
| Large size                           |  |
| General in nature                    |  |
| Have their own non-replaceable       |  |
| analysis software                    |  |
| Some corpus material can be outdated |  |
| Not always accessible to the general |  |
| public                               |  |
| Users do not have access to entire   |  |
| texts                                |  |

#### Advantages of building your own corpus

| Ready-made corpora                                      | Own corpora  |
|---|--|
| Large size  | Adaptable size   |
| General in nature                                       | Specialized  |
| Have their own <b>non-replaceable</b> analysis software | You are free to chose the software that serves your usage best |
| Some corpus material can be outdated                    | Outdated material can be removed or replaced                   |
| Not always accessible to the general public             | Always available for you                                       |
| Users do not have access to entire texts                | Unlimited access to to the entire text material                |

#### How to build a corpus?

1

Finding the right texts

2

Collecting texts

Storing texts as a corpus

#### 1. Finding the right texts

- Topic of the texts
- Type of the text
- Register/Style
- Date of texts
- Texts written by native speakers?

#### 2. Collecting texts

- Access to material
- File names and logging
- How large a corpus should be?

#### 2. Collecting texts

- Access to material
- File names and logging
- Size of the corpus

#### Text recognition with OCR

Scan document



Save as editable text document

#### Finding information on the Internet



## List of academic databases and search engines

| Name  | Discipline(s)                             | Description  | Access Cost | Provider(s)                |
|---|---|--|-------------|----------------------------|
| Academic Publications eJournal                  | Multidisciplinary science (student based) | Student driven<br>research abstracts,<br>posters, articles,<br>science specific search<br>engine, public forum | Free        | APeJ search <sup>[</sup>   |
| CHBD: Circumpolar Health Bibliographic Database | <u>Medicine</u>                           |  | Free        | University of Calgary      |
| Citebase Search                                 | Mathematics, Computer science, Physics    | Semi-autonomous citation index of free online research   | Free        | University of Southampton[ |
| BASE: Bielefeld Academic<br>Search Engine       | Multidisciplinary                         | Several versions:<br>Complete, Elite,<br>Premier, and Alumni<br>Edition  | Free        | Bielefeld University       |

http://en.wikipedia.org/wiki/List\_of\_academic\_databases\_and\_search\_engines

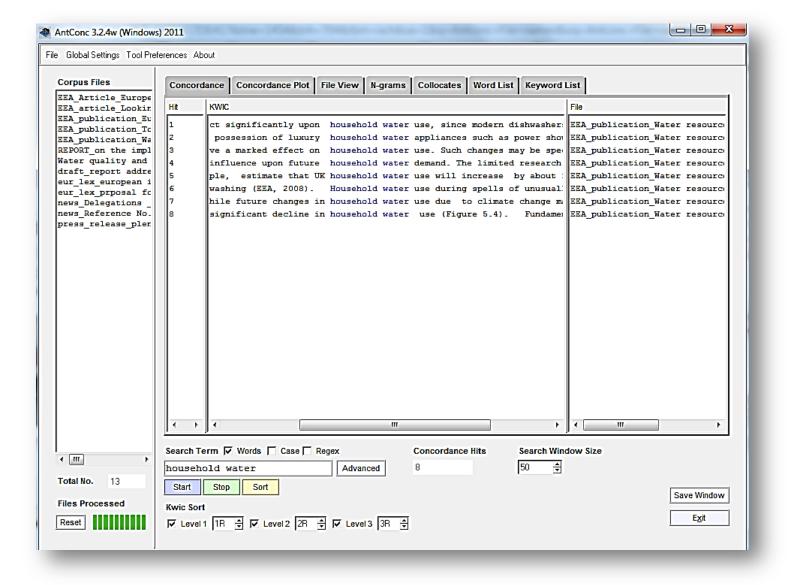
#### Search on EU issues

- europa.eu:
  - EU news and press releases,
  - links to EU Web sites, including the European Parliament, banks, courts and agencies and
  - collection of EU legal materials on the Web, via the <u>EUR-</u> <u>Lex</u> portal.
- EU's Publications Office
- European Commission Libraries Catalogue (ECLAS)
- EU Bookshop

#### 2. Collecting texts

- Access to material
- File names and logging
- Size of the corpus

#### File names



File logging

| Full title   | Publication year - | Type of text ▼           | Full link   | Topics  |
|--|--------------------|--------------------------|---|---|
| Water quality and wastewater treatment — WISE interactive maps updated   | 25.07.2011         | EEA Article              | http://www.eea.europa.eu/highligh<br>ts/water-quality-and-wastewater-<br>treatment          |   |
| Europe's water information at your fingertips  | 22.032.011         | EEA Article              | http://www.eea.europa.eu/highligh<br>ts/europe2019s-water-information<br>at-your-fingertips |   |
| Looking beneath the surface: how good is our water?  | 21.03.2011         | EEA Article              | http://www.eea.europa.eu/articles<br>/looking-beneath-the-surface-how                       | Water Agriculture<br>Urban environment  |
| COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS on the European Innovation Partnership on Water | 10.05.2012         | Communication            | http://eur-<br>lex.europa.eu/LexUriServ/LexUriSer<br>v.do?uri=COM:2012:0216:FIN:EN:P<br>DF  | hydrology<br>technical<br>cooperation<br>environmental<br>cooperation<br>water management<br>hydraulic works<br>innovation<br>water supply<br>water resources |
| Proposal for a COUNCIL DIRECTIVE laying down requirements for the protection of the health of the general public with regard to radioactive substances in water intended for human consumption         | 28.03.2012         | Proposal for a directive | http://eur-<br>lex.europa.eu/LexUriServ/LexUriSer<br>v.do?uri=COM:2012:0147:FIN:EN:P<br>DF  | health control environmental standard drinking water water consumption radioactive materials qualitative analysis radioactive pollution water pollution       |

#### 2. Collecting texts

- Access to material
- File names and logging
- Size of the corpus

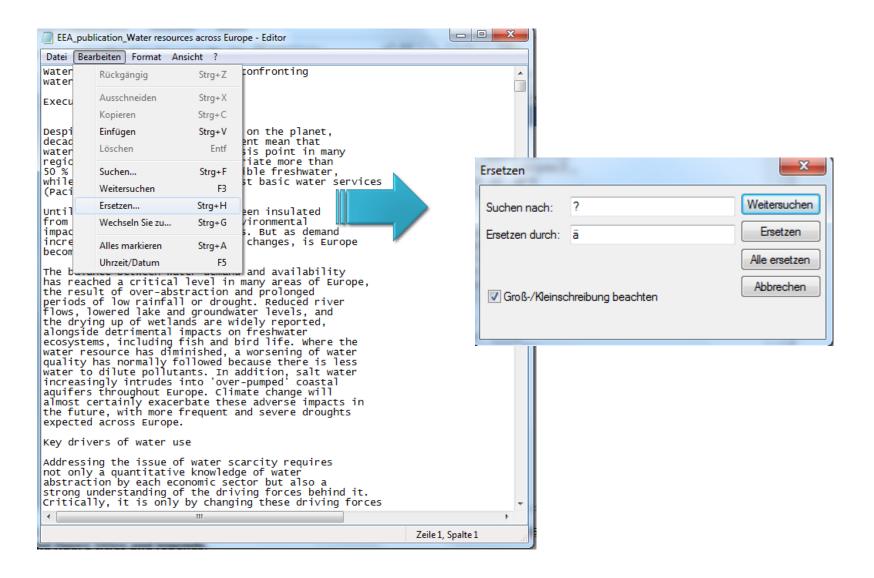
#### 3. Storing texts as a corpus

- Is conversion needed?
  - > Depends on the analysis tool you will choose

#### Storing texts as a corpus

- Text cleaning?
  - reference lists, foot notes or of table and figure titles and legends
  - extra spaces
  - > anomalous characters

#### 'replace' anomalous characters



#### Process of corpus building: Summary

1

Finding the right texts by developing corpus design criteria

2

Collecting texts by finding the appropriate sources

3

Storring and documenting the texts in an appropriate manner

## PROCESSING DATA WITH CORPUS ANALYSIS TOOLS

Eva Zitta

#### **Outline**

I General Facts about Digital Text Analysis
 Tools

II How to use AntConc

III Some interesting tools in detail

IV What to do with your research results

# I General Facts about Digital Text Analysis Tools

- What you have: a collection of relevant texts
- What you need: lists of specific words and word patterns and linguistic information about them
- How you can get there: analyze your corpus with the aid of a digital text analysis program

## The idea of digital text analysis software

- useful for a variety of research interests
- in detail: it offers the opportunity to
  - search texts for frequent words or word patterns
  - find out more about a word's usual context and its range of meanings
  - find the correct partner words
  - learn more about the style of a special linguistic domain or a foreign language

# Digital text analysis and foreign languages

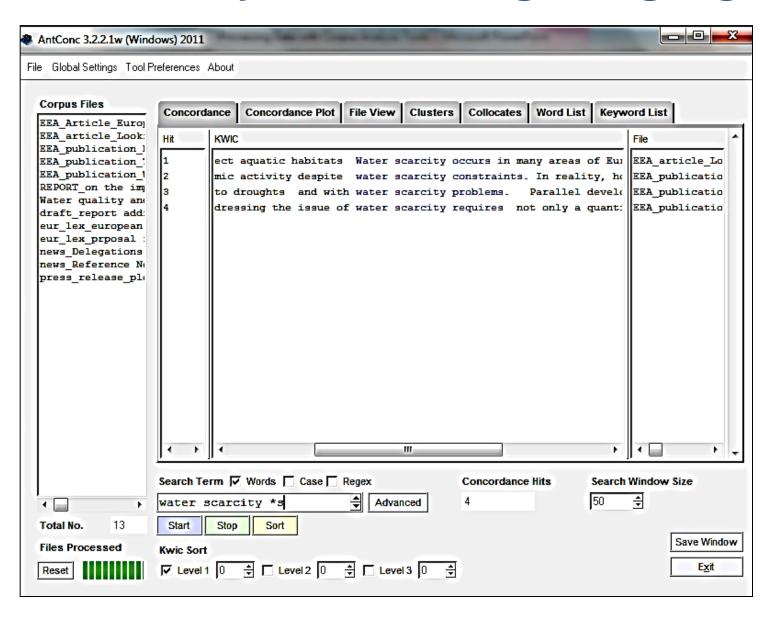
 improve your language awareness, vocabulary and the right way to express complex ideas properly

#### example:

- a learner of English would like to write a text about 'water scarcity in a third world country'
- possible problems:
  - What is the correct terminology?
  - Which word is the right one for the focused context?
  - Which word fits another word?

•

## Digital text analysis and foreign languages



# Digital text analysis and special languages

- special languages as a kind of foreign language
- every profession and domain has its own way of referring to their subject-matters by using specific word patterns and terminology
- example: business language
  - what is the 'dotcom boom'
  - What does it mean if someone 'takes out liquidity' from somewhere?
  - if someone sells shares it is called to 'unload stocks on the market'

## Digital text analysis for interpreters

- obviously: interpreters have to handle both, foreign languages as well as special languages
- besides: time for preparation is limited
- → Where can you find language resources to meet the need of quickly available and easily integrated linguistic material?
- the idea of digital text analysis: prepare your own linguistic resources

## **Examples of digital text analysis** software

- There is a number of different programs created for analyzing texts.
- They vary in different respects: freeware or not, for smaller or larger amount of text material, number of tools, etc.
- some examples:

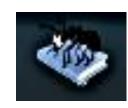
WordSmith



COSMAS



**AntConc** 



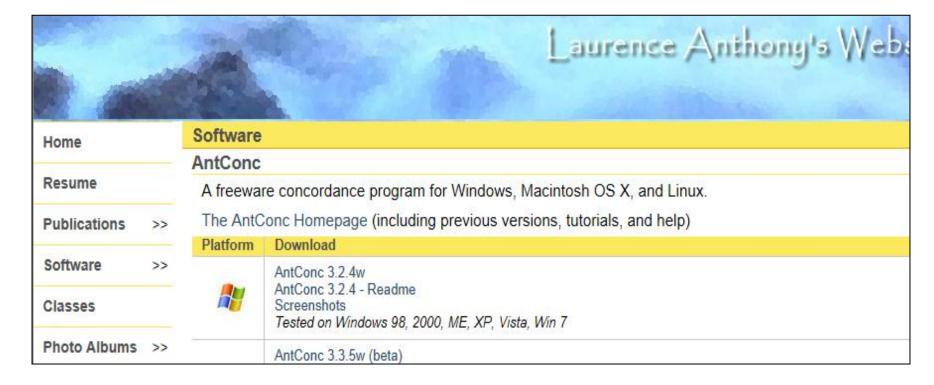
# Il How to use AntConc

## **Getting started**

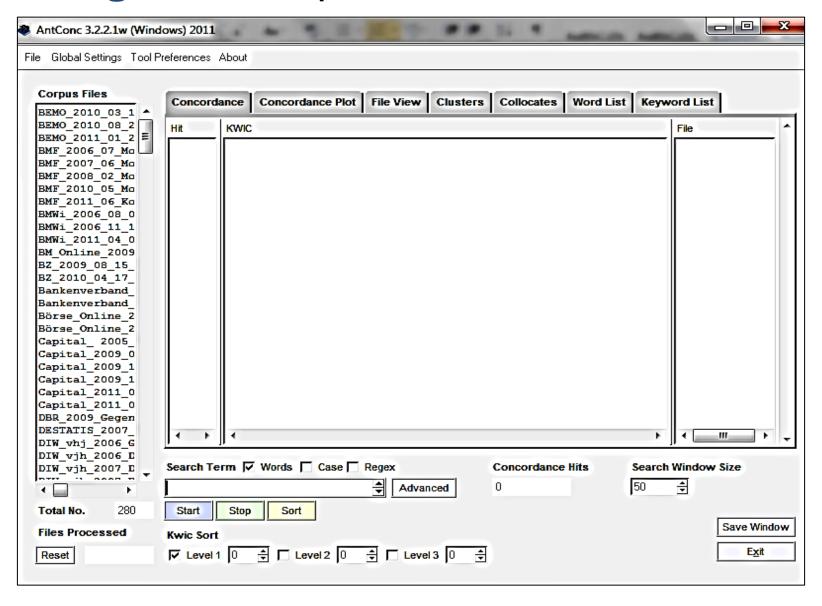
- download the AntConc executable file
- make some setting adjustments
- feed your collection of texts into the program

## **Getting started**

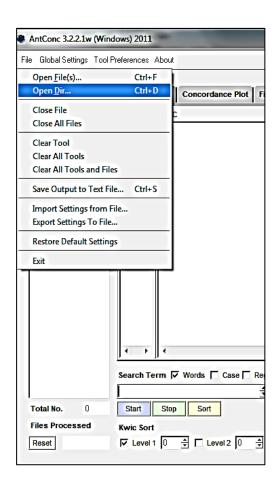
 Download the executable-file from Laurence Anthony's Homepage: <a href="http://www.antlab.sci.waseda.ac.jp/software.html">http://www.antlab.sci.waseda.ac.jp/software.html</a> (freeware, no installation needed)

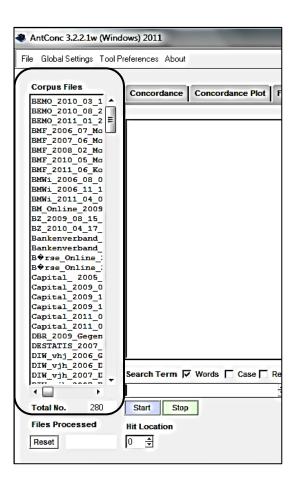


### Getting started: open the executable-file

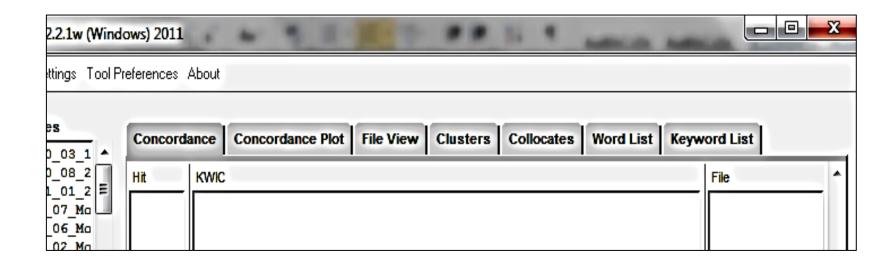


### Getting Started: Feed your corpus into AntConc





### **Overview of tools**



- Concordance
- Concordance Plot
- File View
- Clusters

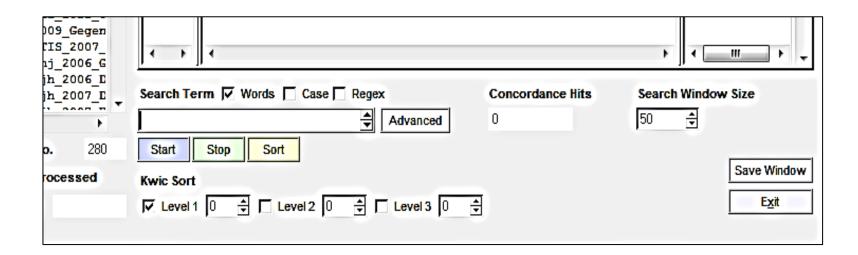
Collocates

Word List

**Keyword List** 

#### **Overview of Tools**

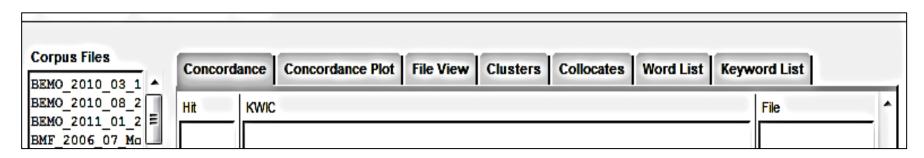
the search field:



# Ill Some interesting tools in detail

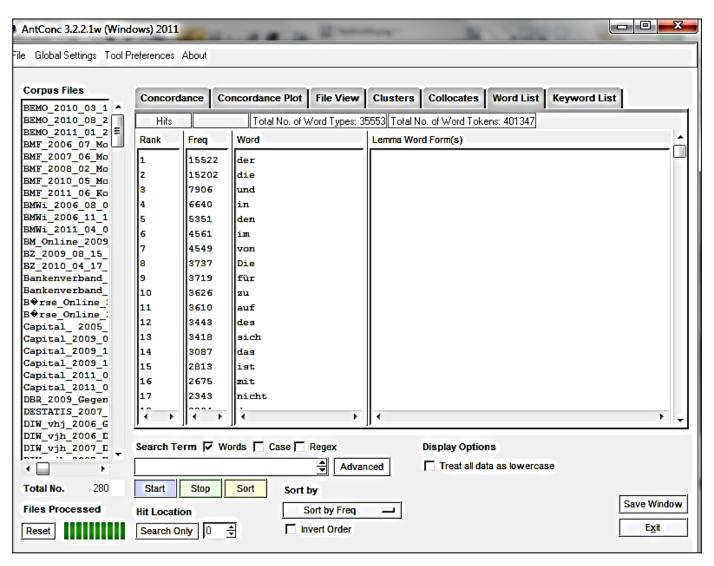
#### General Information about the search tools

the search tools provide different types of information:

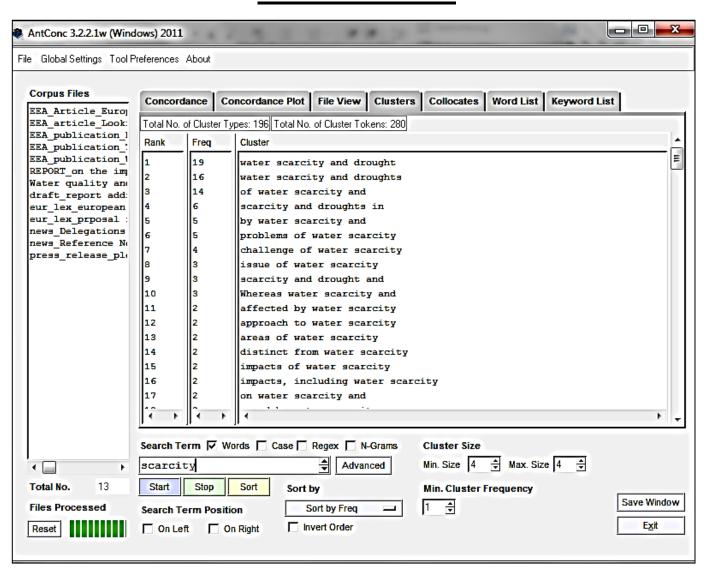


- (1) Information about single words: Word list, Key Word List
- (2) Information about word patterns and partner words that can be found in your corpus: <u>Clusters-/ N-Grams Tool</u> and <u>Collocates Tool</u>
- (3) Information about the semantic, syntactic and pragmatic context of a word or a word pattern:
   Concordance Tool, File View Tool

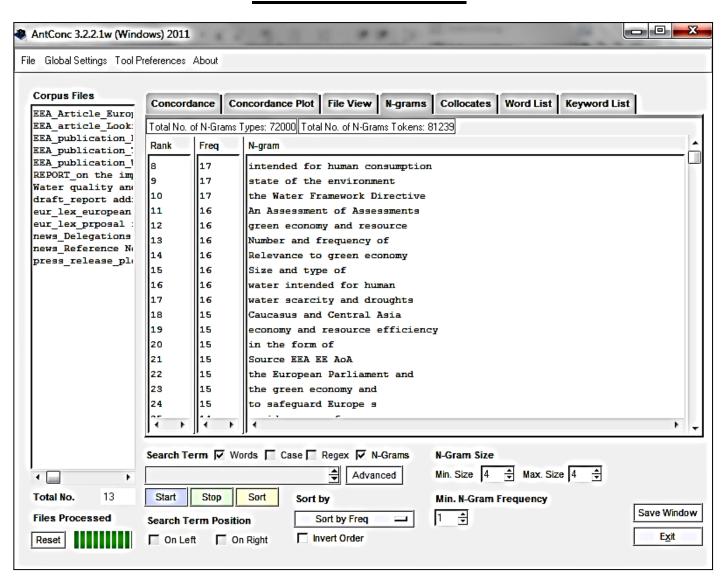
## Information about single words: Word List Tool and Keyword List Tool



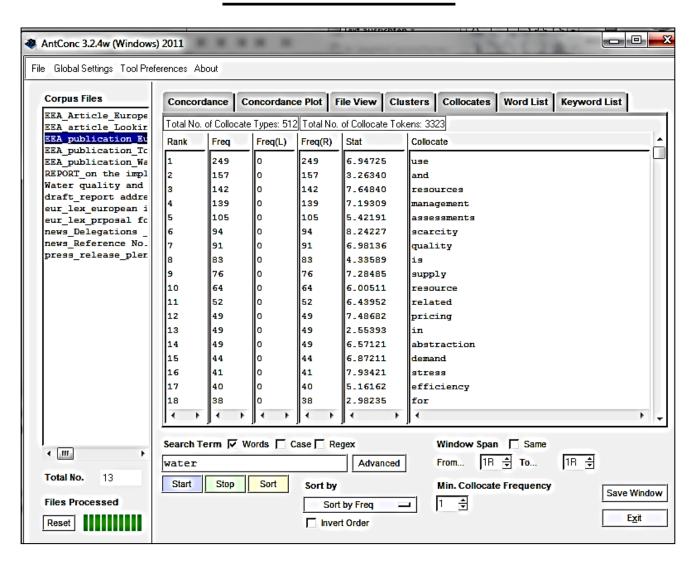
## Information about word patterns and partner words: Clusters Tool



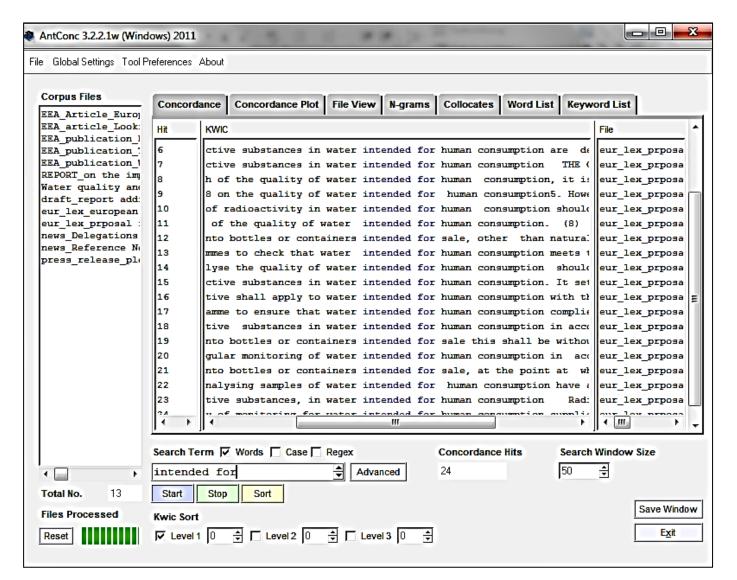
## Information about word patterns and partner words: N-Grams Tool



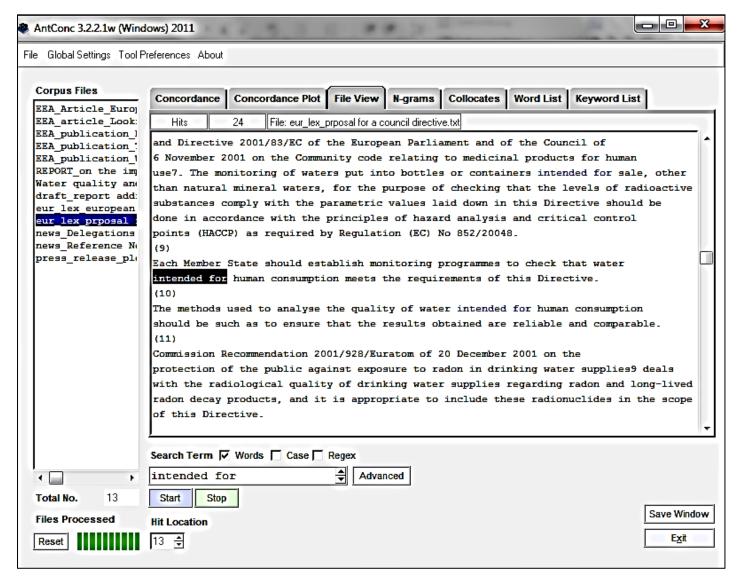
## Information about word patterns and partner words: Collocates Tool



## Information about the semantic, syntactic and pragmatic context: Concordance Tool



## Information about the semantic, syntactic and pragmatic context: File View Tool



#### Overview of tools: Wildcards

- + one or no character
- \* one or more characters
- ? exactly one character
- @ one word or no word
- # exactly one word
- search term 1 OR search term 2

#### Overview of tools: Wildcards

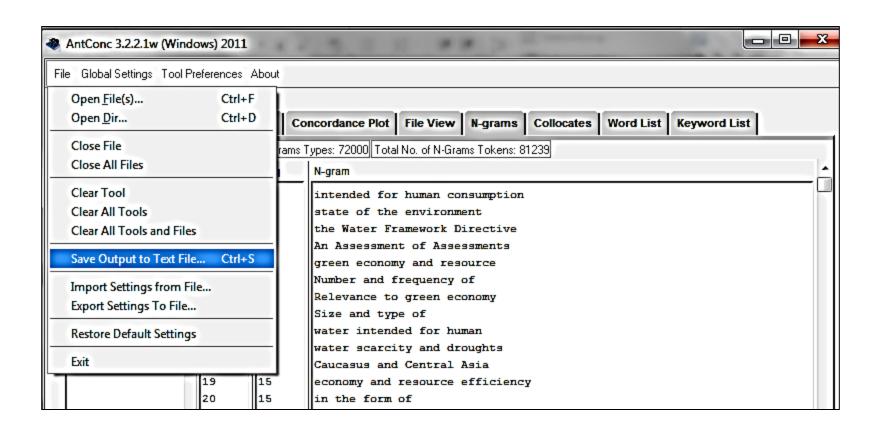
possible ways to start queries with wildcards:

- live+ → live, lives, lived, liver
- liv\* → lively, Liverpool, living
- cit+++  $\rightarrow$  city, cities
- water @ → water management, water use, water policy

# IV What to do with your research results

## **Export research results**

you can save the results of your queries in text files:



## **Export research results**

AntConc creates files in the txt.-file format

they contain all verbal elements as well as information on rank and frequency

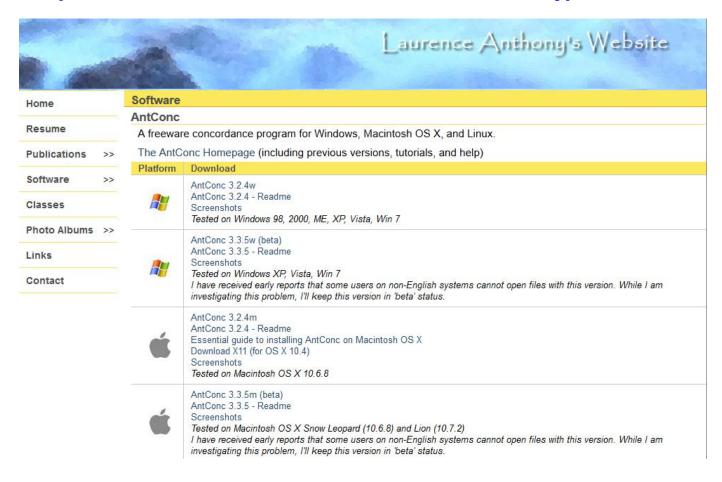
| antconc_results - Editor          |          |   |  |
|-----------------------------------|----------|---|--|
| Datei Bearbeiten Format Ansicht ? |          |   |  |
| 1<br>2<br>3<br>4<br>5<br>6<br>7   | 26       | of the green economy  |  |
| 2                                 | 21       | calls on the Commission                                       |  |
| 3                                 | 21       | on the Commission to  |  |
| 4                                 | 21       | the pan European region                                       |  |
| 2                                 | 19       | water scarcity and drought                                    |  |
| 6                                 | 17       | and frequency of assessments                                  |  |
|                                   | 17       | and type of assessments                                       |  |
| 8                                 | 17       | intended for human consumption                                |  |
| 9                                 | 17<br>17 | state of the environment                                      |  |
| 10<br>11                          | 17<br>16 | the Water Framework Directive<br>An Assessment of Assessments |  |
| 12                                | 16       | green economy and resource                                    |  |
| 13                                | 16       | Number and frequency of                                       |  |
| 14                                | 16       | Relevance to green economy                                    |  |
| 15                                | 16       | Size and type of  |  |
| 16                                | 16       | water intended for human                                      |  |
| 17                                | 16       | water scarcity and droughts                                   |  |
| 18                                | 15       | Caucasus and Central Asia                                     |  |
| 19                                | 15       | economy and resource efficiency                               |  |
| 20                                | 15       | in the form of  |  |
| 21                                | 15       | Source EEA EE AOA   |  |
| 22                                | 15       | the European Parliament and                                   |  |
| 23                                | 15       | the green economy and   |  |
| 24                                | 15       | to safeguard Europe s   |  |
| 25                                | 14       | a wide range of   |  |
| 26                                | 14       | Blueprint to safeguard Europe                                 |  |
| 27                                | 14       | of the EE AOA   |  |
| 28                                | 14       | of water scarcity and   |  |
| 29                                | 14       | over the past years   |  |
| 30                                | 13       | European Parliament and of                                    |  |
| 31                                | 13       | in the EE AOA   |  |
| 32                                | 13       | of the European Parliament                                    |  |
| 33                                | 13       | Parliament and of the   |  |
| 34                                | 13       | portal as of May  |  |
| 35                                | 13       | SoE and water assessments                                     |  |
| 36<br>37                          | 13<br>13 | the Member States to  |  |
|                                   | 12       | to the green economy  |  |
| •                                 |          | III   |  |

## You take what you need

- in order to extract helpful information and use it efficiently:
  - What kind of information do you need?
  - How would you like to organize your research results?

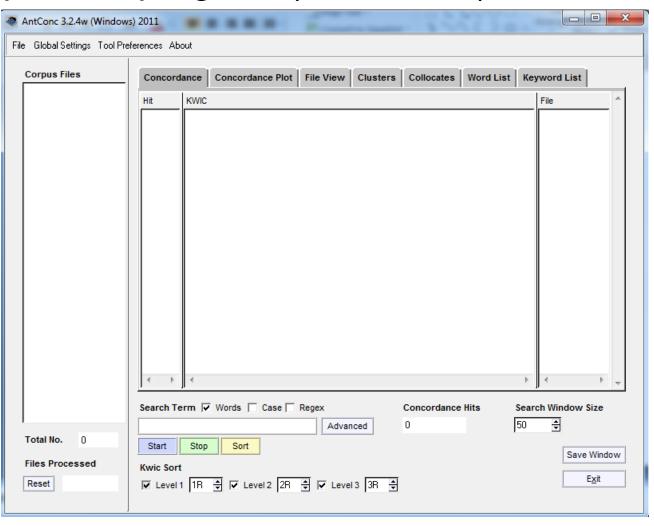
## Practically applying AntConc

 Download the software <u>http://www.antlab.sci.waseda.ac.jp/software.html</u>



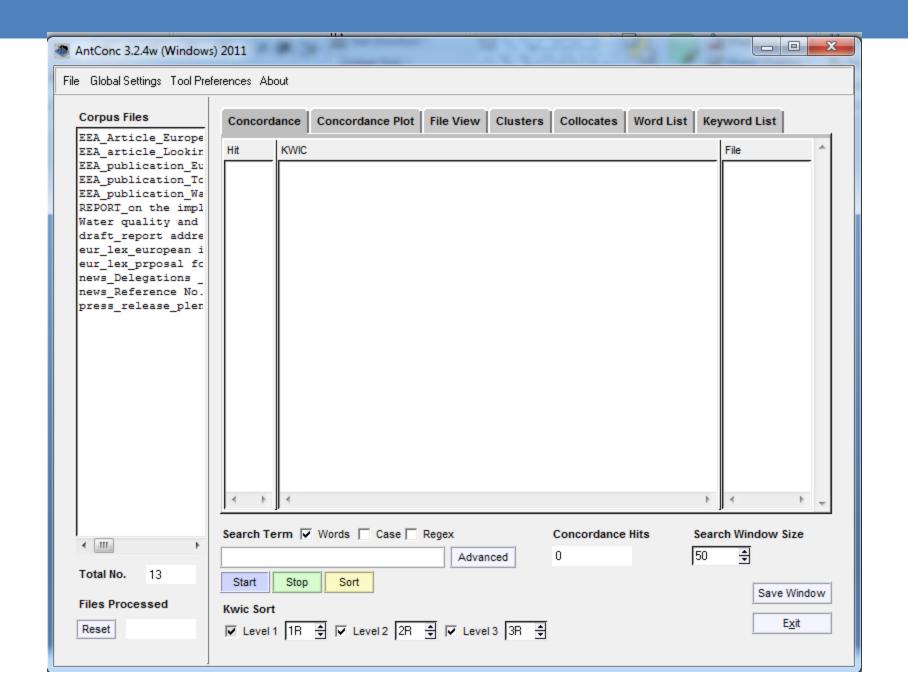
## Practically applying AntConc

Open the program (click "Run")



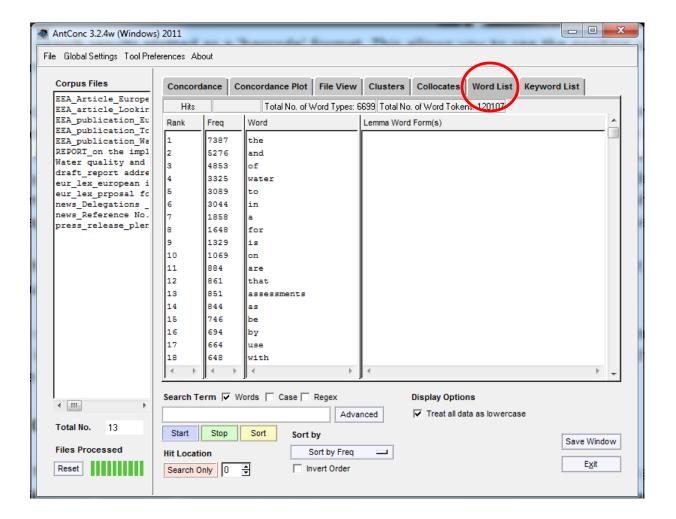
## Practically applying AntConc

- Download the corpus from <a href="http://goo.gl/7XojX">http://goo.gl/7XojX</a> →
  "Extract to" → save the corpus on your computer
- Click "File" → "Open Dir" and select the folder with the corpus
- Click "Global settings" → "Language encodings"
   → "Edit" → "Standard encoding" and select
   "Unicode (utf8)" → "Apply"



## Finding the most frequent words

5. Click "Word List" and press "Start"



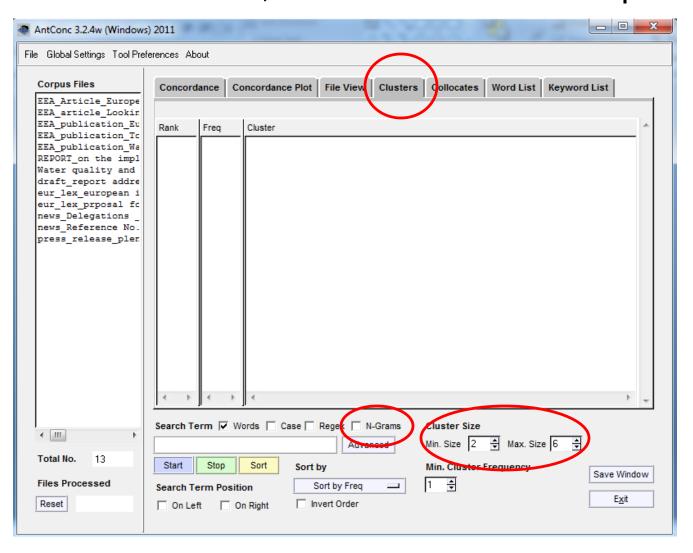
# Content words (nouns, verbs, adjectives, adverbs)

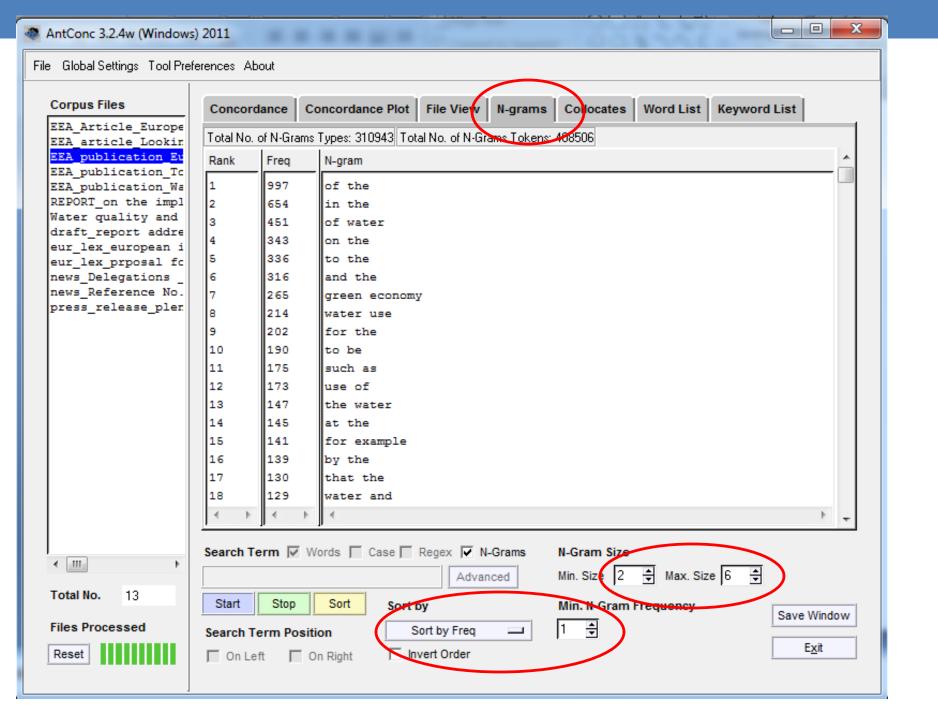
- water
- assessments
- use
- environmental
- information
- Europe
- green
- energy
- economy
- European
- efficiency

- resource
- countries
- assessment
- management
- economic
- environment
- policy
- data
- national
- · resources etc.

## Finding common expressions

Click "Clusters", select "N-Grams" and press "Start"





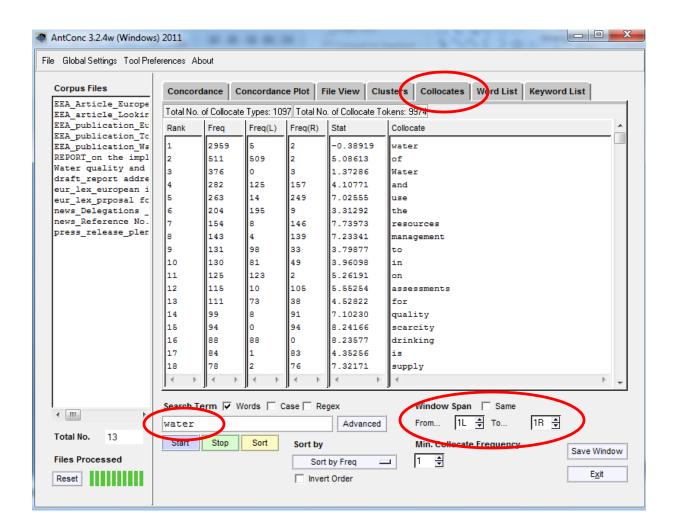
## Common meaningful expressions

- green economy
- water use
- water resources
- resource efficiency
- water management
- drinking water
- water assessments
- water scarcity
- water quality
- water supply

- climate change
- environmental impacts
- •
- The Drinking Water Directive
- the drying up of wetlands
- the distribution of water in areas facing shortages etc.

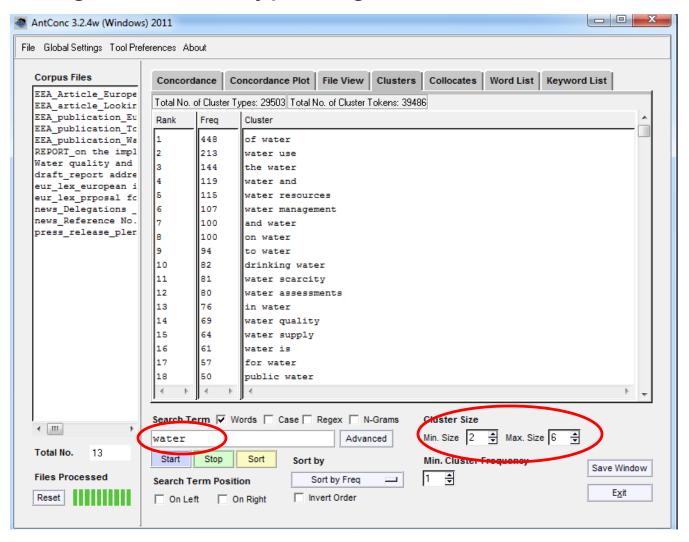
#### Finding phrases with one specific word

· Using "Collocates" type e. g. "water" into the search field



#### Finding phrases with one specific word

Using "Clusters" type e. g. "water" into the search field



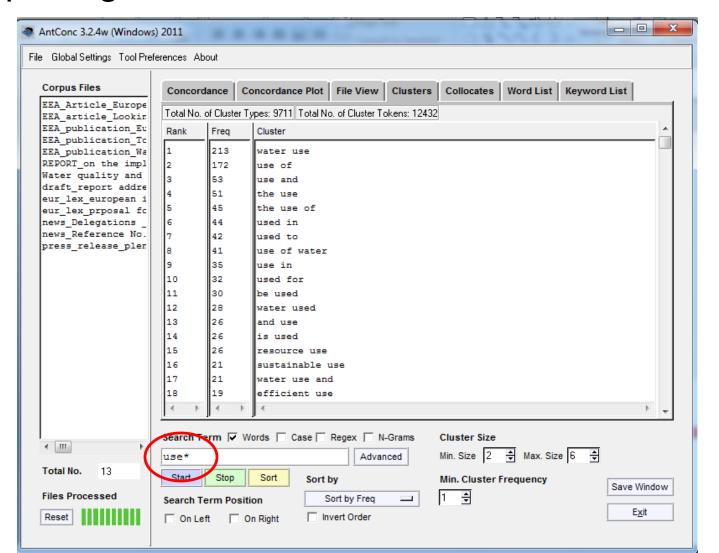
## Meaningful expressions with "water"

- water use
- water resources
- water management
- drinking water
- water scarcity
- water assessments
- water quality
- water supply
- public water
- use of water
- sustainable water

- water demand
- water abstraction
- agricultural water
- water stress
- surface water etc.

## Search using wildcards characters

Type e. g. "use\*" into the search field

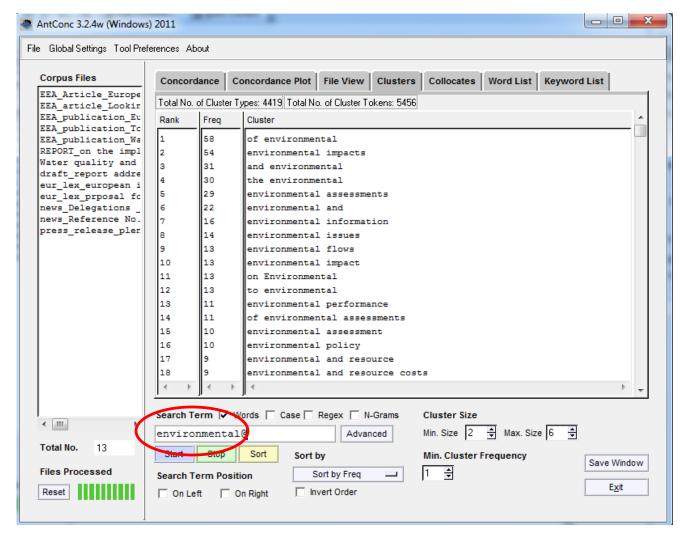


## Meaningful expressions with "use"

- water use
- use of water
- to be used in/for/as
- efficient use of (water)
- re-use of
- sustainable use of (water)
- total water use
- land use
- more efficient use
- use of natural capital etc.

## Search using wildcards characters

Type e. g. "environmental@" into the search field

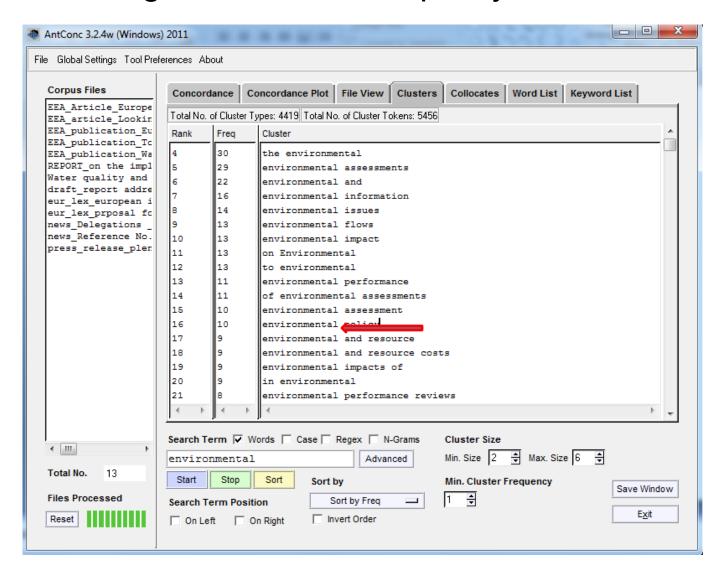


# Meaningful up to 2 words expressions with "environmental"

- Environmental impacts/impact
- Environmental assessments
- Environmental information
- Environmental issues
- Environmental flows
- Environmental performance
- Environmental policy etc.

## Using "Concordance" Tool

Click e. g. "environmental policy" in the results field

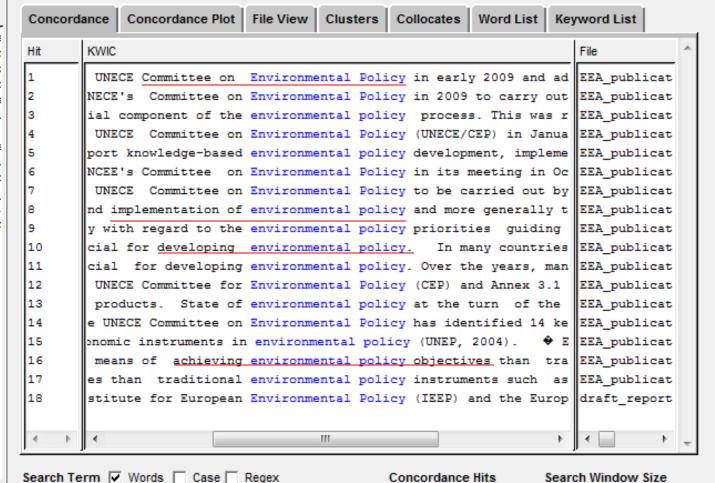


- - X

#### File Global Settings Tool Preferences About

#### Corpus Files

EEA\_Article\_Europe
EEA\_article\_Lookin
EEA\_publication\_Eu
EEA\_publication\_Tc
EEA\_publication\_Wa
REPORT\_on the impl
Water quality and
draft\_report addre
eur\_lex\_european i
eur\_lex\_prposal fc
news\_Delegations\_
news\_Reference No.
press\_release\_pler



18

Advanced

Total No. 13
Files Processed

4 .III.

Reset

Kwic Sort

✓ Level 1 1R 🕏 🗸 Level 2 2R 🕏 🗸 Level 3 3R 🕏

Sort

environmental policy

Stop

Start

Save Window

**l**50

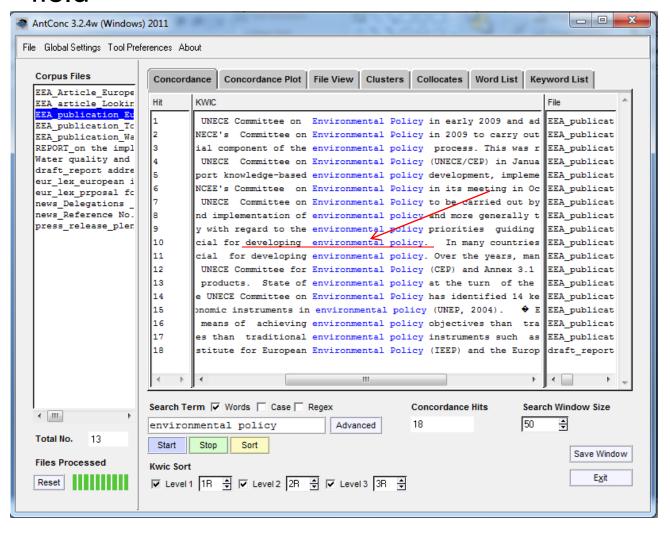
E<u>x</u>it

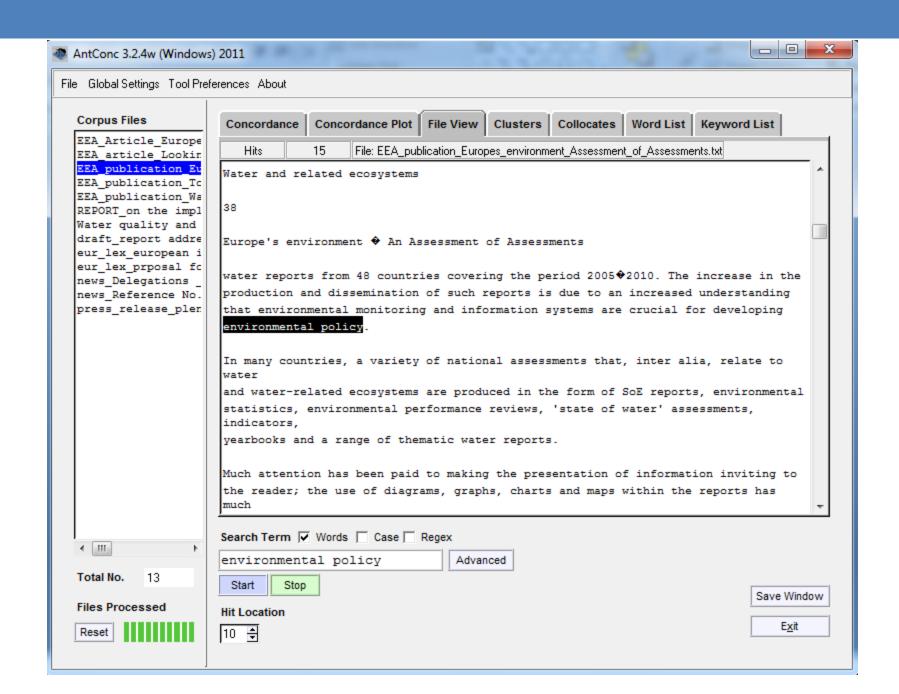
#### Noun phrases → verb phrases

- Implementation of environmental policy → to implement an environmental policy
- Consideration of environmental impacts → to consider environmental impacts

### Using "File View" Tool

 Click e. g. "developing environmental policy" in the results field





# Possibilities to organize the results: noun phrases with "water"

"water" as attributive noun:

#### water ...

- use
- resources
- management
- scarcity
- assessments
- quality
- supply
- demand
- abstraction etc.

phrase with attributive adjective:

- drinking
- public
- sustainable
- agricultural
- clean

... water

# Possibilities to organize the results: noun phrases with "water"

#### with relative clauses

- water intended for human consumption
- water abstracted for [...]
- water used in […]
- water assessments based on [...] etc.

#### prepositional phrases

- use of water
- amount of water
- information on water
- approach to water
- management of water
- availability of water
- access to water etc.

# Possibilities to organize the results: verb phrases with "water"

- to improve water efficiency
- to address water scarcity/problems
- to use water resources efficiently
- to reduce water use/consumption
- to safe drinking water etc.

## Using AntConc by yourselves

- Find clusters with one specific word of your choice using "Clusters" Tool
- Try different cluster length ("Cluster Size")
- Try different wildcards characters (see Global settings → Wildcard settings) using different Tools
- Select phrases which seem useful for you
- Organize them according to their components like shown above (or use your own system)

## Options for data storage

- simple static glossaries
- terminology management tools
- web-based termbases

#### Moodle

 Moodle is a open-source community-based Web application for producing Internet-based courses and web sites

www.moodle.org

#### Used in different environments

- Education
- Training and development
- Business settings

# Used by a variety of institutions and individuals

- Universities, high schools, primary schools
- Government departments
- Healthcare organisations, military organisations, airlines
- Independent educators

## Different types of activities

- forums
- glossaries
- Wikis
- assignments
- quizzes
- choices (polls)
- databases
- etc

### Glossary module

- allows participants to create and maintain a list of definitions
- easily customizable
- different display formats
- different user roles

## Glossary module

- allows communication and cooperation
- restricted to a single author or collaborative
- → entries can be added by different authors
- → entries can be edited by different authors
- → entries can be commented

RSS feed

#### Entries can be

#### browsed by

- alphabet
- author
- date
- category

searched using the search field

#### Entries can be

- interlinked within an entry and between different glossaries
- exported and imported

## Example of an entry form

- Expression or keyword
- Equivalent in target language
- Syntactic structure
- Definition
- Usage
- Examples in the corpus
- Additional information

#### Exar

Browse by alphabet Browse by category Browse by date Browse by Author Browse the glossary using this index Special | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | ALL A acid a sour tasting, corrosive substance - the opposite of a base substance. Acidic solutions will turn a litmus red. Χď В battery a device that produces electricity by means of chemical reaction. A battery consists of one or more units called electric cells. Each cell has all the chemicals and parts needed to produce an electric current. Χď C capacitor a device that stores electric energy in the form of an electric charge. ΧÆ D decibel a unit of measurement for sound, it measures the loudness or volume of the sound waves. Χď

#### Euro-Zone

Estnisch: euroala

Morphologie: (Det.,fem.) +) Substantiv(Sq., fem.)

#### Angabe zur syntaktischen Struktur der Konstruktion:

Einbettung im Satz: syntaktische Funktion meist Subjekt oder Akkuastivobjekt

Bedutung(en): Gebiet der 17 Länder (Stand 1. Januar 2011), die den Euro eingeführt haben.

Synonyme: Euroraum

#### Verwendungsbeispiele der Konstruktion aus dem Korpus:

"Für den Euro-Raum ist ein breit angelegter Aufschwung nicht in Sicht. Im Gegenteil: Die von uns unterstellte globale Wachstumsverlangsamung wird auch die Konjunktur in der Euro-Zone bremsen." (Bundesverband deutscher Banken, 16. 2010, Frankfurt am Main, "Konjunkturprognose des Ausschusses für Wirtschaftsund Währungspolitik")

"Gestärkte Euro-Zone Im dritten Quartal profitierte Euroland nicht nur von weitersteigenden Exporten, sondern auch von einer Belebung der Binnennachfrage." (Börse Online, 26. Oktober 2006, "Die Weltwirtschaft bleibt im Sommer auf Kurs")

"Ein Fall Griechenland war nicht vorgesehen. Er hätte gar nicht passieren dürfen. Bevor weitere Länder in die Euro-Zone aufgenommen werden, muss diese Lücke geschlossen werden." (FOCUS Online 13.04.2010, "Griechenland ist ein Warnschuss")

"Besonders hohe Defizite erwartet die Kommission in Italien, Portugal und Griechenland. Italien als drittgrößte Volkswirtschaft der Euro-Zone dürfte sich in diesem Jahr mit einem Defizit von 3,6 % unter die Defizitsünder einreihen und ohne Gegenmaßnahmen im kommenden Jahr sogar 4,6 % seines Inlandsproduktes an neuen Schulden aufnehmen." (Handelsblatt 04.04.2005, "EU: Rote Laterne geht an Deutschland")





Moodle2.uni-due.de

# **Any Questions or Comments?**

# Thank you for your attention!