Searching for scientific information and citation basis for your Design Project

Valérie Charbonnier,
Lauréline Grandjean and
Miriam Petrilli
23.02.2021

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Learning Objectives

- Build an information retrieval strategy
- Get familiar with some of the EPFL Library information resources
- Evaluate and use information
- Distinguish document types: take the quiz
- Break – 15 min
- Avoid plagiarism by citing correctly: take the quiz
Your most important contact

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Valérie’s duty period: Friday 12h-13h Room GR A2 355
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Information retrieval strategy

- Define the topic in the form of a question
- Pull out the main concepts, keywords
- Think of synonyms and related concepts
- Write a search equation
- Use multiple resources
Information retrieval strategy

• Define the topic in the form of a question
  
  *Develop a methodology to automatically estimate the snowmelt parameters of the hydrological model*
  
  *How to automatically calculate snowmelt parameters?*

Pull out the main concepts, keywords

  *snowmelt* / *automatic* / *parameter* / *calculate* 

• Think of synonyms and related concepts
• Write a search equation
• Use multiple resources
Boolean operators and more

**AND** to combine key concepts

**OR** to add key concepts

**NOT** to exclude concepts

() * « »
Information retrieval strategy

• Pull out the main concepts, keywords
  
  snowmelt* / automatic* / parameter*/ calcul*

• Think of synonyms and related concepts
  
  meltwater / « hydrolog* model* » / model /
  measure*/ estim* / automatic* / « automatic method* »

• Write a search equation
  
  ( snow-melt* AND automatic* AND calcul*) OR (« hydrolog*
  model* » AND measure*)

• Use multiple resources
Choosing information resources

Use scientific resources

- Encyclopaedies
- Books
- Articles
- Conference papers
- Thesis
- Patents

Cross-check information

Is the information reliable, valid, objective and accurate?

✓ Is the information up-to-date?
✓ Who is the author?

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Take the quiz

Kind of documents
MODÈLE DE PRÉVISION ET DE GESTION DES CRUES
OPTIMISATION DES OPÉRATIONS DES AMÉNAGEMENTS HYDROÉLECTRIQUES À ACCUMULATION POUR LA RÉDUCTION DES DÉBITS DE CRUE

THÈSE N° 3711 (2007)
PRÉSENTÉE LE 17 JANVIER 2007
À LA FACULTÉ DE L’ENVIRONNEMENT NATUREL, ARCHITECTURAL ET CONSTRUCTIF
Laboratoire des constructions hydrauliques
GESTION DE GÉNIE CIVIL

ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE
POUR L’OBTENTION DU GRADÉ DE DOCTEUR DES SCIENCES

PAR

Frédéric JORDAN

Ingénieur civil diplômé EPFL
du nationalité suisse et originaire de Genève (CH)

accepted sur proposition du jury:
Prof. M. Hirt, président du jury
Prof. A. Schiess, directeur du thèse
Dr O. Béroud, rapporteur
Prof. D. Gellie, rapporteur
Prof. A. Marzouk, rapporteur

ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE
Lausanne, EPFL
2007
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ALPINE LAKES

Reginald W. Horsley
Hydrology Consultant, Reading, UK

Definition

Thorais (1969) divides the central European Alpine lakes into the following groups:

1. Bavarian lakes situated on the Bavarian-Alpine plateau at about 500 m a.s.l. in tectonically active catchments, lakes in the Salzkammergut,

Alpine Lakes, Table 1 Morphometric characteristics of 60 Alpine lakes: \( Z_{\text{max}} \) maximum depth, \( Z_{\text{mean}} \) mean depth, \( T \) theoretical retention time (Computed from several sources)

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Characterization of snowmelt flux and groundwater storage in an alpine headwater basin

Jaime L. Hodd 1,2, Mastad Hayashi 1,2,3

1 Department of Soils, University of Calgary, Calgary, Alberta, Canada
2 Cross Consulting, Calgary, Alberta, Canada

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Alpine catchments
Talus slope
Snow energy balance

SUMMARY

Snowmelt recharge of groundwater and its delayed release is considered an important mechanism for sustaining the baselines of alpine streams, but relatively little is known about groundwater storage capacities in alpine regions. The goal of this study is to quantify the storage capacity and the timing of recharge and discharge of a glacially and snowmelt-influenced watershed in the Canadian Rockies using detailed measurements of hydrologic input and output fluxes. We computed daily mass balance from direct measurements of snow accumulation at 3,000 points within the watershed and sub-snowpack precipitation data from a nearby weather station during the 2013 season, and high resolution (2 m) snowmelt simulation using a field-based snowmelt energy balance model, which estimated the amount and timing of water storage within the snowpack during the late season. The peak storage amount was on the order of 30-50 mm averaged over the watershed, which was relatively small compared to the pre-melt water equivalent (350–450 mm), but significant in comparison to the fall and winter baseflow (3–5 m d^-1) containing the aquatic ecosystems. This is an important finding demonstrating the critical role of groundwater storage and delayed release in alpine environments, which generally have little soil and water storage.

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1. Introduction

Mountains are important regions of water storage for downstream regions. The hydrologic regime of mountains is dominated by snowmelt and inter-annual storage of water in the snowpack and in glaciers, which is slowly released to rivers throughout the melt season (Viviroli et al., 2007). These processes are subject to changes resulting from climate variability (Beven et al., 2005; Stewart et al., 2005), and these changes may affect the water supply of downstream consumers (Figer et al., 2012), as well as the conditions of alpine stream habitats (Brown, 2006). Despite the importance of understanding alpine hydrological conditions (Bales et al., 2000), field-based research has been limited due to difficulties with access and instrumentation in alpine environments and research is often focused on one aspect of the hydrologic cycle, such as glacier mass balance or snow accumulation and melt. Comprehensive field studies that address all components of the hydrologic cycle, including groundwater, are still relatively rare in alpine environments. Recent studies have found that groundwater storage and flow in alpine regions may be more important than previously thought. Analysis of daily precipitation and discharge records in a Himalayan region showed that deep groundwater contributes as much as 20% to stream flow (Anand et al., 2007). Studies in the Colorado Rocky Mountains in the USA have documented that subsurface flow contributed as much as 60% of water, even during early snowmelt times (Bier et al., 2004), with groundwater being important at a range of watershed scales (Bier et al., 2011). A study in the Sierra Nevada in the USA using chemical and isotopic tracers showed that the majority of flow in a mountain headwater system was provided by shallow groundwater sources (Blair et al., 2014). Understanding the storage and pathways of groundwater will help us understand how groundwater may or may not buffer the effects of climate variability on mountain rivers (Huybrechts, 2008).

Conditions of alpine aquifers have not been well documented, and will likely vary from watershed to watershed. Factors that play a role in subsurface water storage include soil depth and distribution (Hayashi et al., 2008), vadose-glacial and glacial-geologic aquifers (Warsi et al., 1999), and geological (Katayama et al., 2010)
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Characterization of snowmelt flux and groundwater storage in an alpine headwater basin

Jaime L. Hayashi, Masaki Hayashi

A QUESTBRAIN
INFO
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Keywords
Mountain hydrology
Alpine aquifer
Talus
Periglacial terrain
Snow energy balance

SUMMARY
Snowmelt recharge of groundwater and its delayed release is considered an important mechanism for sustaining the baseflow of alpine streams, but relatively little is known about groundwater storage capacity in alpine regions. The goal of this study is to quantify the storage capacity and timing of recharge and discharge in a partially glaciated, first-order watershed in the Canadian Rockies using detailed measurements of hydrological input and output fluxes. We compared daily input fluxes from direct measurements of snow accumulation at 1300 points within the watershed with the peak accumulation date, time-lapse photography during the melt season, and high-resolution (25 m) snowmelt simulation using a field-validated snowmelt energy balance model; and estimated the amount and timing of water storage within the watershed from the water balance. The peak storage amount was on the order of 60-100 mm averaged over the watershed, which was relatively small compared to the pre-melt snow water equivalent in the watershed (500-650 mm), but significant in comparison to the fall and winter baseflow (0.3 mm d⁻¹) sustaining the aquatic ecosystem. This is an important finding demonstrating the critical role of groundwater storage and delayed release in alpine environments, which generally have little soil water storage.

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1. Introduction

Mountainous regions are an important source of water for downstream regions. The hydrologic regime of mountains is dominated by seasonal and inter-annual storage of water in the snowpack and in glaciers, which is slowly released to rivers throughout the melt season (Viviroli et al., 2007). These processes are subject to changes resulting from climate variability (Barrett et al., 2005; Stewart et al., 2005), and these changes may affect the water supply of downstream communities (Finney et al., 2012), as well as the condition of alpine stream habitats (Brown, 2006). Despite the importance of understanding alpine hydrological processes (Bales et al., 2006), field-based research has been limited due to difficulties with access and instrumentation in alpine environments and research is often focused on one aspect of the hydrologic cycle, such as glacier mass balance or snow accumulation and melt. Comprehensive field studies that address all components of the hydrologic cycle, including groundwater, are still relatively rare in alpine environments.

Recent studies have found that groundwater storage and flow in alpine regions may be more important than previously thought. Analysis of daily precipitation and discharge records in a Himalayan region showed that deep groundwater contributes as much as 20% to stream flow (Andermatt et al., 2012). Studies in the Colorado Rocky Mountains in the USA have ascertained that subsurface flows contributed as much as 60% of water, even during early snowmelt times (Jibson et al., 2004), with groundwater being important at a range of watershed scales (Friedeburg et al., 2011). A study in the Sierra Nevada in the USA using chemical and isotopic tracers showed that the majority of flow in a mountain headwater stream was provided by shallow groundwater sources (Shaw et al., 2014). Understanding the storage and pathways of groundwater will help us understand how groundwater may or may not buffer the effects of climate variability on mountain rivers (Tague et al., 2008).

Conditions of alpine aquifers have not been well documented, and will likely vary from watershed to watershed. Factors that play a role in subsurface water storage include soil depth and distribution (Gouldby et al., 2000), sub-glacial and pro-glacial aquifers (Ward et al., 1995), and geological (Katsumata et al., 2010)
The present invention relates to an underwater propelling device (10) for an underwater vehicle comprising: a central aperture (31, 32) and having a circumferential array of radially extended magnetized poles (34) embedded therein, said magnetized poles (34) generating a magnetic field which interacts with the electromagnetically induced field of the stator (20) to cause the rotation of said stator (31, 32) about a central axis (ZZ) parallel to said axial direction, at least one ring-shaped propeller (33) defined by its outer periphery and its inner periphery, said propeller being received inside the central apertures (31, 32) of said plates (31, 32) and freely secured therein, a plurality of propeller blades (35) projecting inward from the inner periphery of said propeller (33), said blades (35) producing a thrust along the central axis (ZZ) when the plate (31, 32) rotates, whereas the rotor (20) is axially separated from the stator (20) by a gap, preferably less than 3 mm, so as to permit the formation of a hydraulic film inside said gap, said hydraulic film being adapted to provide lubrication of the rotor, thus reducing friction between the rotor and the stator, and to transmit the axial thrust force of the rotor to the stator.
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Return Period, Probability and Risk

In this chapter we show that the probability of occurrence of an event being greater than a given magnitude should never be the sole criterion on which to base a decision to execute a project or upgrade an existing project, and should never be the sole criterion for designing a structure. Once we have exposed this issue, we look at the concept of risk in relatively summary fashion, but with enough detail to understand the fundamental aspects of this very important idea, which is complementary to the concept of probability. We will also clarify as precisely as possible some of the terms and concepts connected to the notion of risk, because many of these related words are often poorly understood, or interpreted differently in various references. This is also why, for reasons of clarity, we use the term probability of failure in the second half of this chapter, and keep the term risk for later on when we have defined it more precisely in Section 2.3.

But before we get to this concept of risk and its related context, it is helpful to define the concept of return period, as we have mentioned in the previous chapter. We also explore how return period is computed using probabilities.

2.1 RETURN PERIOD

The concept of return period is well known in the hydrological community. Hydrologists are also frequently misunderstood by other scientists simply because they fail to clearly explain that return period is not related to calendar time but is a probabilistic concept. This confusion is also induced by the fact that the term period of occurrence is sometimes used. We are emphasizing this aspect so that, at least, hydrologists do not make this same error themselves!
What kind of document is it?
Please write your answer in the empty space
Tapping hidden hydropower potential in Swiss Alpine catchments in the context of the planned nuclear power phase out

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In its Energy Strategy 2050, Switzerland is revising its energy perspectives with a strong focus on renewable sources of energy and in particular hydropower. In this context, the Swiss Government funded a number of competence centers for energy research (SCCERs), including one on the Supply of Energy (SCCER-SoE), which develops fundamental research and innovative solutions in geoenergies and hydropower.

Hydropower is already the major energy source in Switzerland, corresponding to approximately 55% of the total national electricity production (which was 69 TWh in 2014). The Energy Strategy 2050 foresees at least a net increase by 1.53 TWh/year in average hydrological conditions, in a context where almost all major river systems are already exploited and a straightforward application of recent environmental laws will impact (reduce) current hydropower production.

In this contribution, we present the roadmap of the SCCER-SoE and an overview of our strategy to unravel currently non-exploited hydropower potential, in particular in river systems that are already used for hydropower production. The aim is hereby to quantify non-exploited natural flows, unnecessary water spills or storage volume deficits, whilst considering non-conventional approaches to water resources valuation and management.

Such a better understanding of the current potential is paramount to justify future scenarios of adaptation of the existing hydropower infrastructure combining the increase of storage capacity with new connections between existing reservoirs, heightening or strengthening existing dams, increasing the operational volume of natural lakes (including new glacier lakes), or by building new dams. Tapping hidden potential shall also require operational changes to benefit from new flow patterns emerging under an evolving climate and in particular in the context of the ongoing glacier retreat. The paper shall present a broad view over the mentioned issues and first conclusions of ongoing research at the country scale.
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Take the quiz
Copyright...

... applies automatically (no need to ask)

... comprises, in Swiss and European law, the **moral right** which is inalienable (recognition of authorship, integrity of the work) and the **property rights** which are transferable (diffusion, commercial use)

... protects the form, and not the idea!

... provides, conditionally, some exceptions. In particular, those related to **education** and to **citation** (LDA art. 19 al. 1b et art. 25)
1. Why should you cite when you write a report? (several answers may be correct)

A. Assign the ideas/words to their author
B. Reuse what was already done
C. Help the reader who wants to know more
D. Write a longer document
E. Avoid plagiarism
Citing enables you to...

... make the difference between your **own AND new input** and the one that comes from previous publications;

... add **credibility** to your work (you have read what was published in your domain and you know what you are talking about);

... replace your work in its context and demonstrate the **originality** of your input;

... provide the reader with the **references** that were useful to you in case she or he would like to know more;

... reuse an **extract** of a document as it is.
Not citing means...

claim someone else’s work for yourself

OR

present as new something that is not new

⇒ this is what we call plagiarism

⇒ no matter if it is intentional or not
2. How to insert a section borrowed from another document? (several answers may be correct)

Highlight the borrowed section...

A. in italics
B. in bold
C. with quotation marks
D. in a separate paragraph

Borrowed sections should be **highlighted** no matter how.
How to Insert a citation or a section borrowed from another document

Example 1:
In his article *The biology of dying democracies*, Kováč (2019) states that «Marxist communism became a gigantic experiment in the 20th century to test the European rationalism. The experiment failed.»

Example 2:
The approach chosen for this article is the one presented by Kováč in *The biology of dying democracies* (2019), described as follows:

Humans are controversial beings, an inconsistent mixture of nature and culture and dominated by both. Biological hominization was followed by cultural humanization. So far, biologists mostly tended to conceive the biological individual as a Darwinian unit communicating with another individual in interest of one's own Darwinian fitness. Signals should serve to modify the behaviour of the receiver to benefit the signaller.
How to insert a citation or a section borrowed from another document

Example 3:
Experts believe that information literacy knowledge helps students to judge the appropriateness of information (Smith, 2016, McDowell, 2018 and Alhazmi, 2012).

OR

Experts believe that better information literacy knowledge will help students to judge the appropriateness of information[1-3].
How to insert a citation or a section borrowed from another document

Example 4 – Paraphrasing

The original:
- « A variety of evidence points to the existence of dark matter in the universe. As it is not directly observable with conventional astronomical techniques, we must rely on computer modules to guide our understanding. »

The paraphrase:
- Research about the universe suggests that dark matter exists. However, scientists must use computer models to learn about it because dark matter can’t be studied directly (Lanzel and Barnes, 2009)

3. What should I do to borrow a section from someone else’s work?

A. Highlight the borrowed section
B. Ask the permission to the author
C. Cite the original source

Copy-Paste
  +
Highlight of the borrowed section
  +
Indication of the source

A. 29%
B. 0%
C. 71%
4. If I use a document that has not been published (yet) I need to cite it.

A. True  
B. False

Always cite your sources.

Anyway, it would be better not to use documents that are inaccessible to the reader, such as confidential or internal documents.

Pre-prints:  
Not always accessible for the reader  
Various versions
5. I have to cite a document that I published previously.

A. True
B. False

Reminder

Citing enables you to make the difference between your own AND new input and the ones that come from previous publications.

SELF-PLAGIARISM is also plagiarism
6. I have the right to adapt a quotation.

A. True
B. False

Highlighting modifications

« As [John Smith] commented in the 1st chap. of his book [Introduction to statistics], statistics hide sum and substance. […] therefore one should not forge [sic] that interpretation leads to bias. »
7. In the bibliography, I have to mention everything I have read to write my article/report.

A. True  
B. False

cited references ➔ bibliography
other interesting references ➔ separate list
8. To reuse an image or a graph found in another document, I have to: (several answers may be correct)

A. Copy-Paste  
B. Obtain the author’s permission  
C. Cite the source

Image = integral work
Graph = protected layout

cite (correctly) the source  
+  
Ask explicit authorization from copyright owner
**Tips**

**Image:**
Freely usable images under [Creative Commons](https://commons.wikimedia.org/wiki/准则) licenses

- Cite the source
- Search one of these sites:
  - [https://www.flickr.com/](https://www.flickr.com/)
  - [https://commons.wikimedia.org/wiki/准则](https://commons.wikimedia.org/wiki/准则)

**Graph:**
Recreate the graph yourself
- Cite the source
9. You consult an article [1] in which a section from another article [2] (that you haven’t read) is cited. You would like to insert this section from article [2] in your report. Which source do you cite?


Do not cite a document that you have not consulted!
Suggestions

In the text
Kim S. (2004) suggests that the technique described by Zaldivar J. (2001) as « being by far the most efficient on most continents » is not the only way to follow for the development of the bioethanol production.

In the bibliography

OR

10. To cite a webpage, it is enough to simply indicate the URL

A. True
B. False

**URL is useful but not enough, because**
- not permanent

Reference to a webpage:
- page title, author, website title, URL,
- consultation date (or time)
- + any piece of information that may help to identify the source
11. Which reference is correct?


You
Check that the collected information is correct and complete.

Tip: use a reference manager software
like Zotero to create a bibliography according to the chosen citation style.
To know more about citation...

Refer to our Rational Bibliographic guide to create and verify your references: [go.epfl.ch/guide-bibliographique](go.epfl.ch/guide-bibliographique)