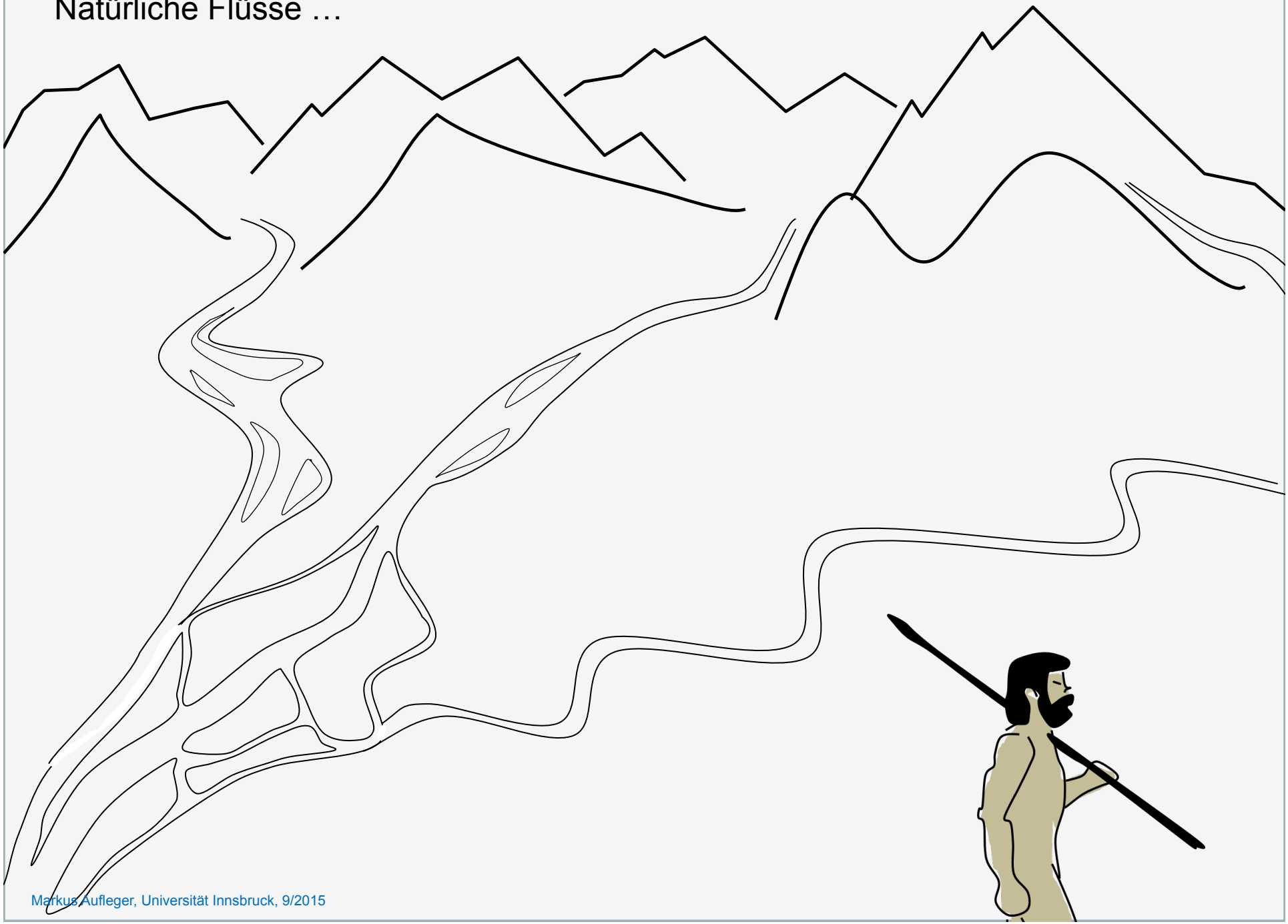
Arbeitsbereich Wasserbau
Universität Innsbruck
Techhnikerstraße 13
6020 Innsbruck
www.uibk.ac.at/wasserbau

Gesteigerter Hochwasserrückhalt durch naturnahe Retentionsräume und technische Schutzmaßnahmen

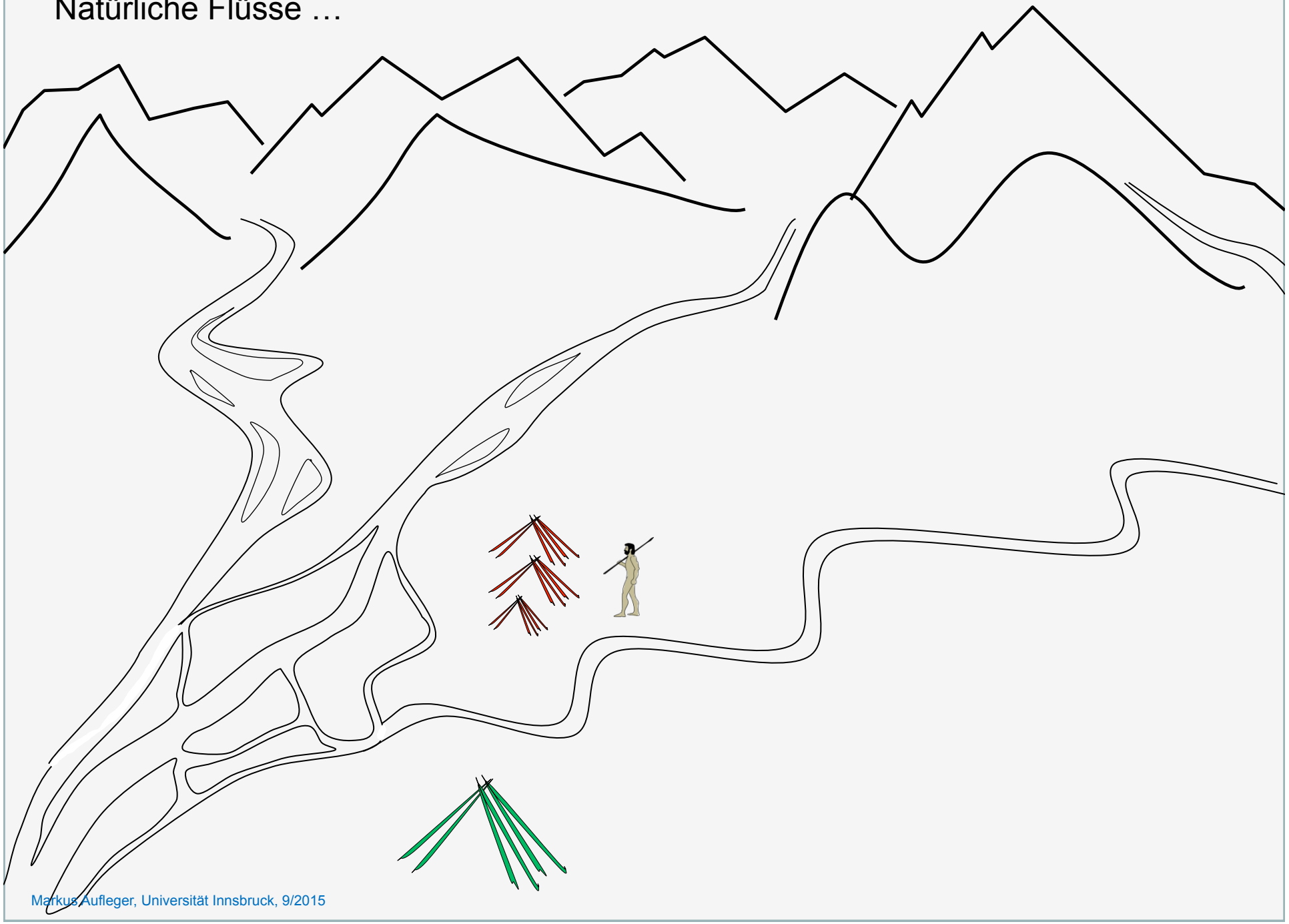
Markus Aufleger
Münchsmünster, 25.9.2015

so war das …

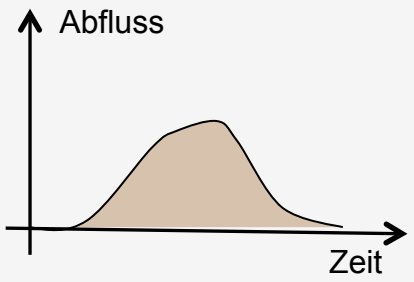
Natürliche Flüsse …



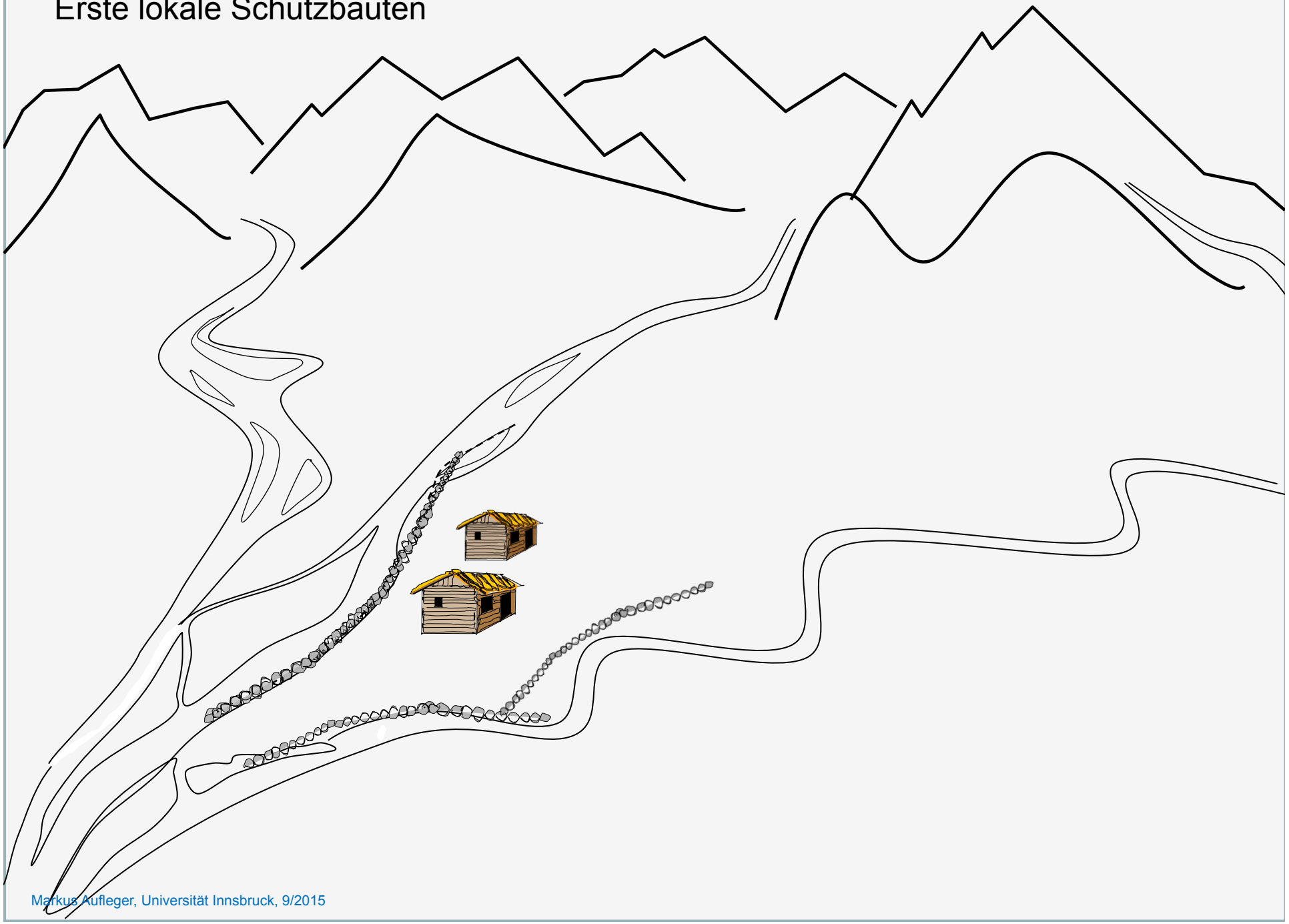
Natürliche Flüsse …



Natürliche Flüsse …

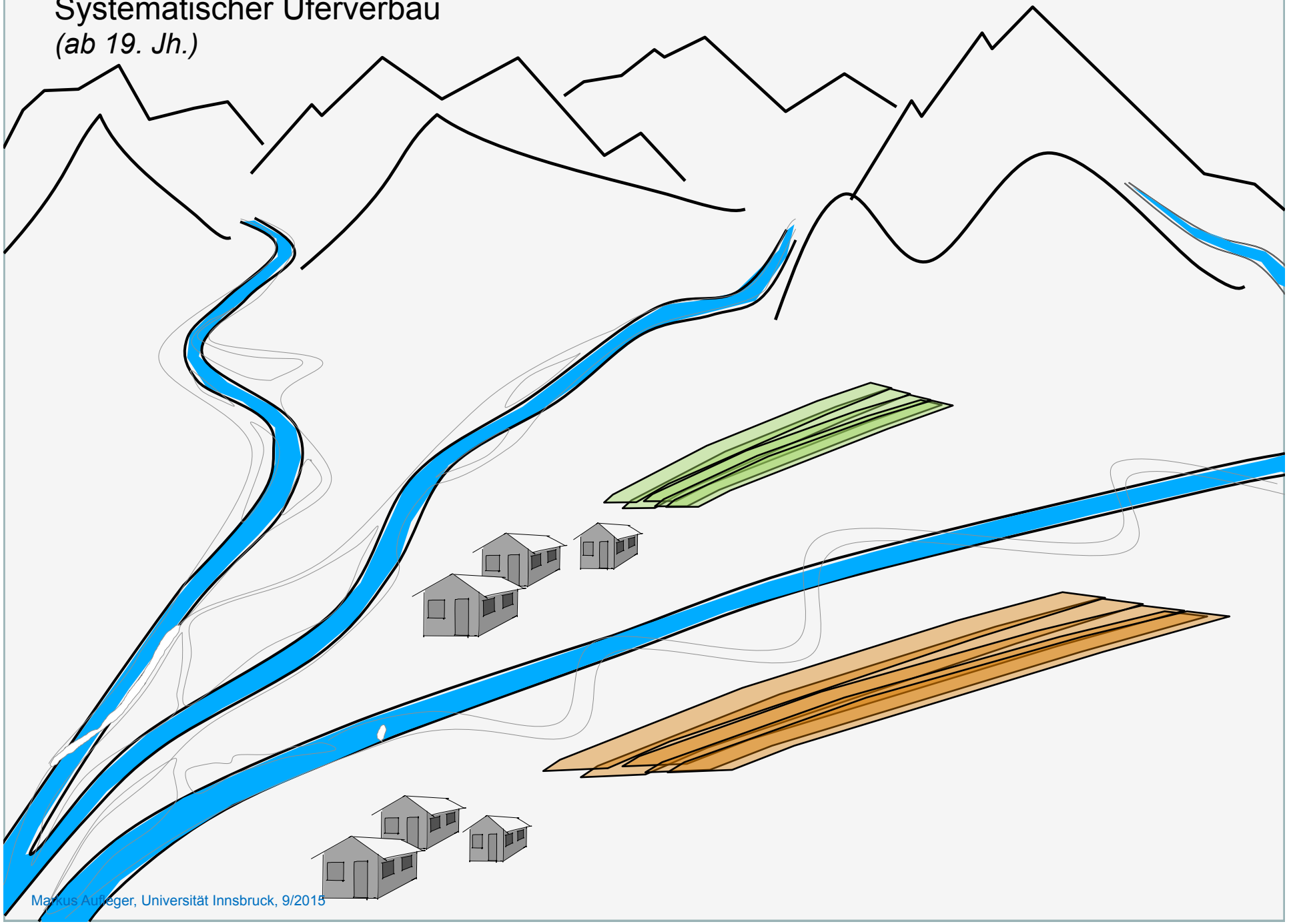


Erste lokale Schutzbauten



Systematischer Uferverbau

(ab 19. Jh.)



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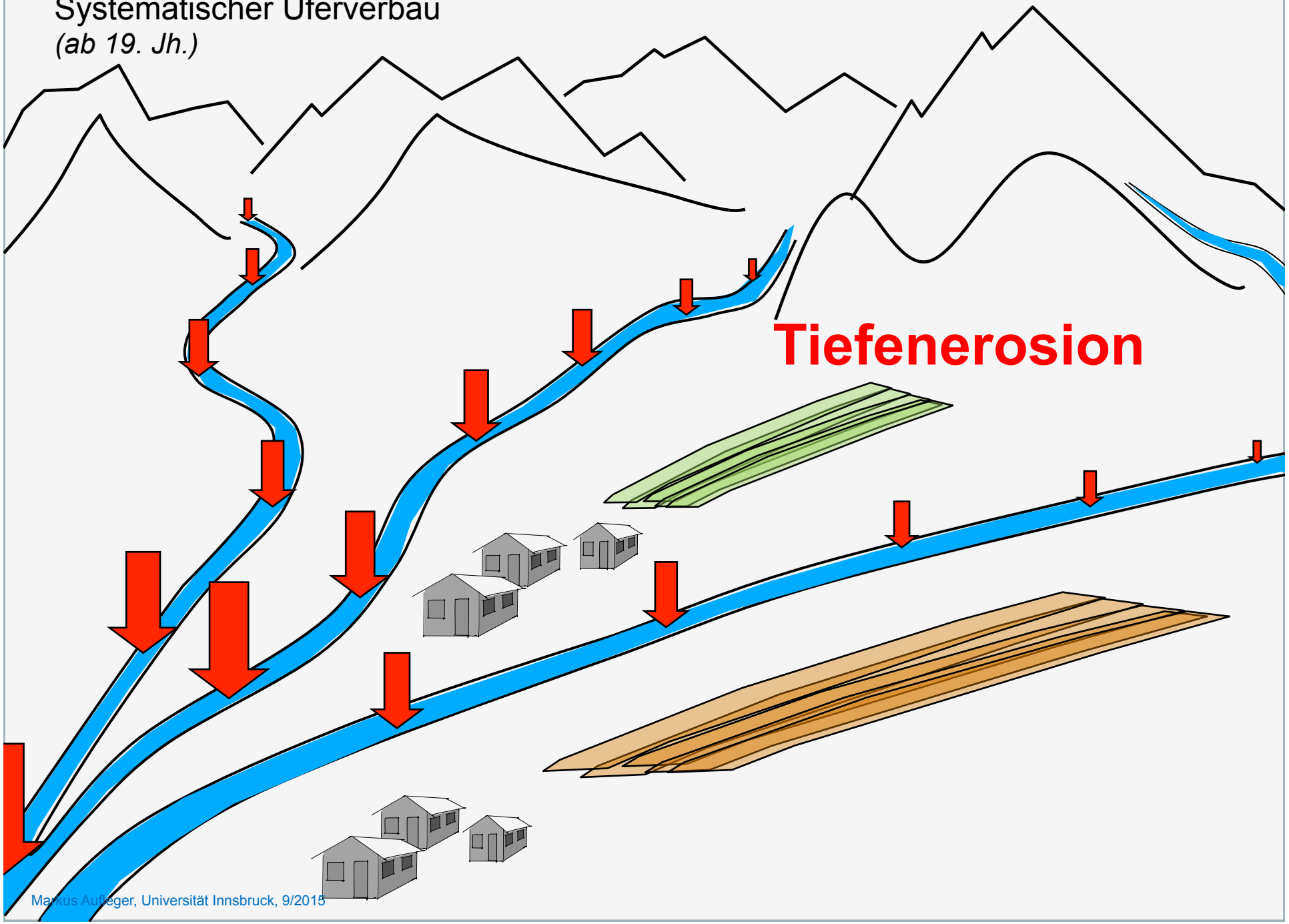
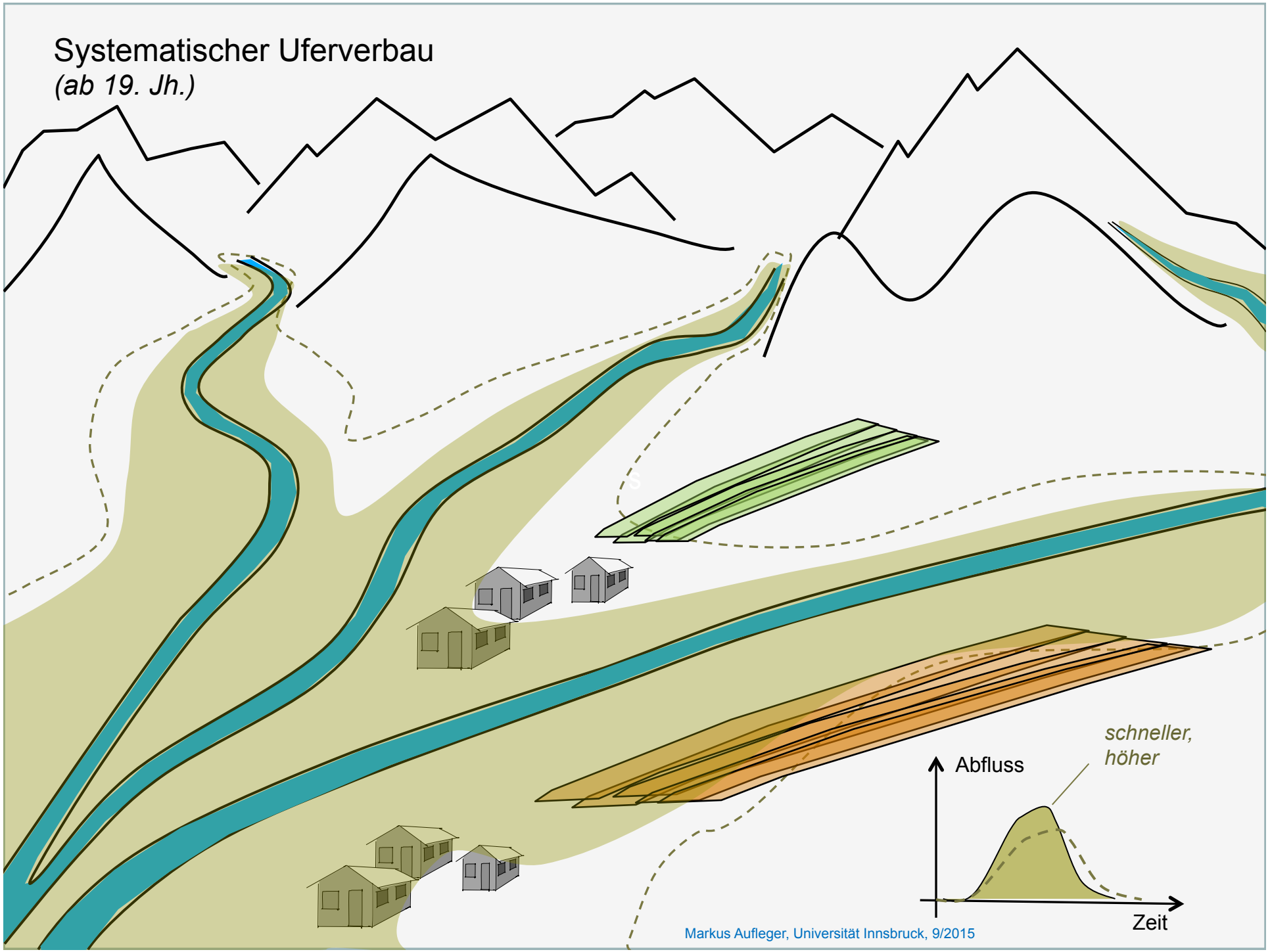
Systematischer Uferverbau
(ab 19. Jh.)



Systematischer Uferverbau

(ab 19. Jh.)



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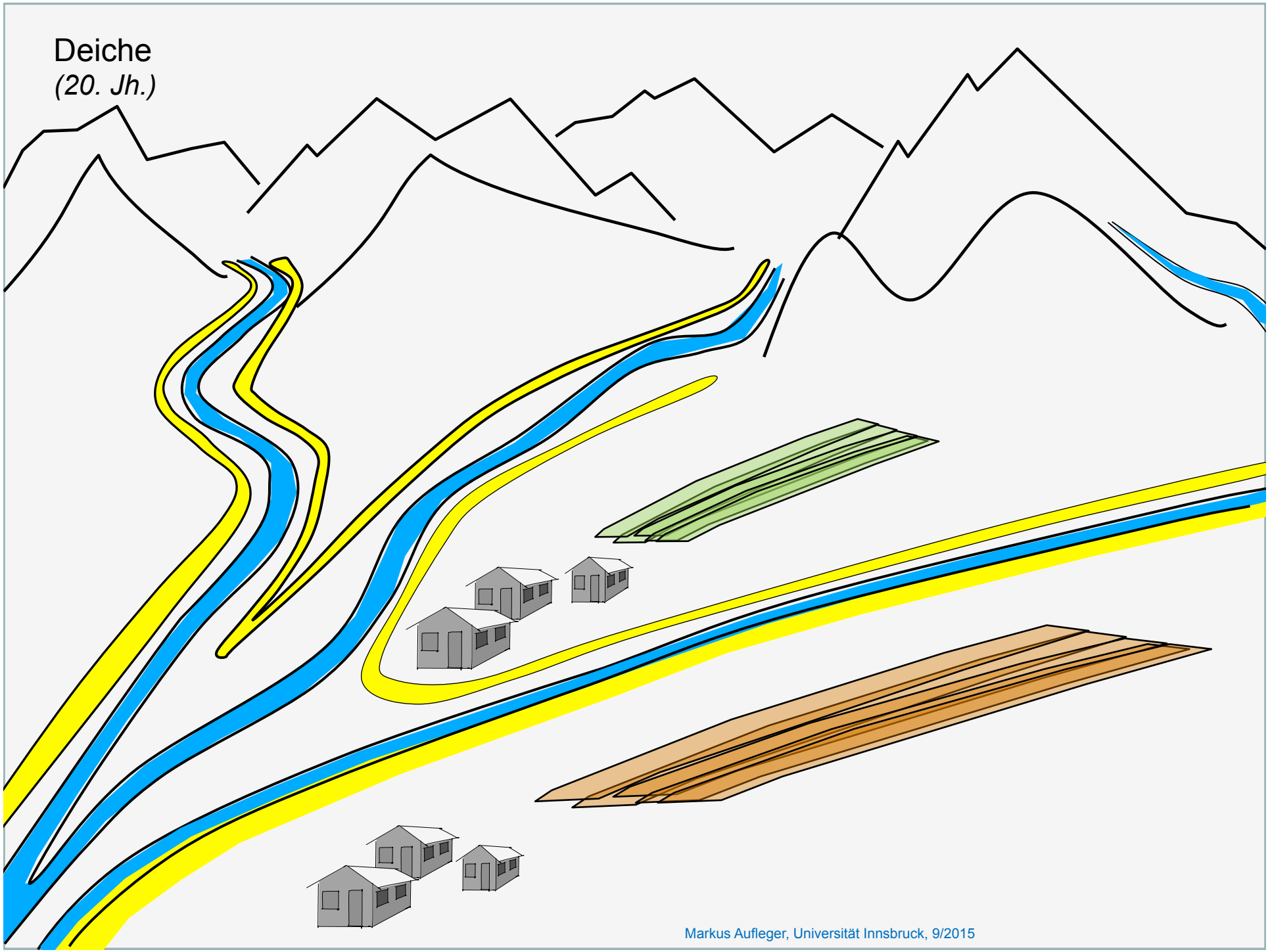
Deiche

(20. Jh.)



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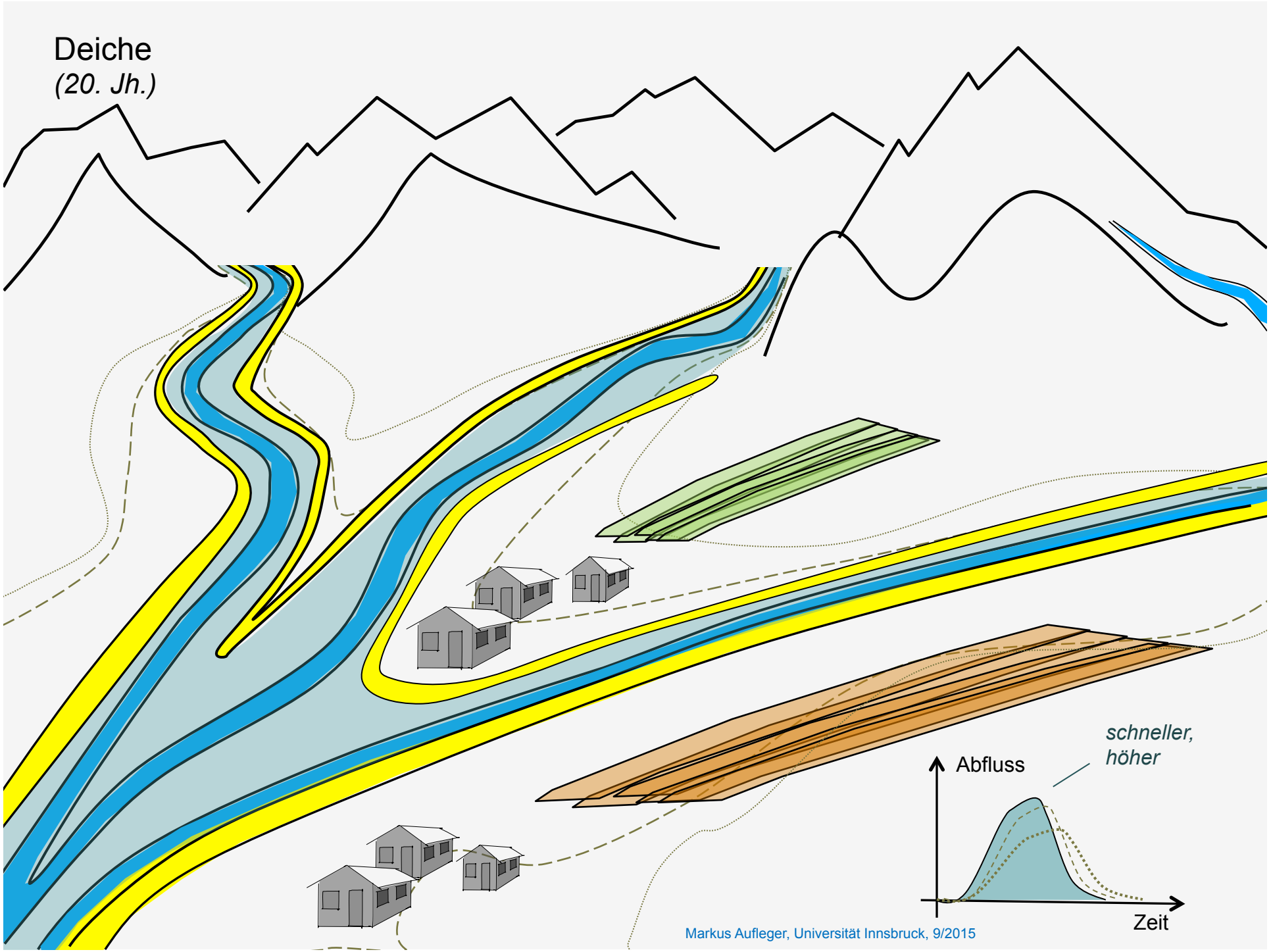
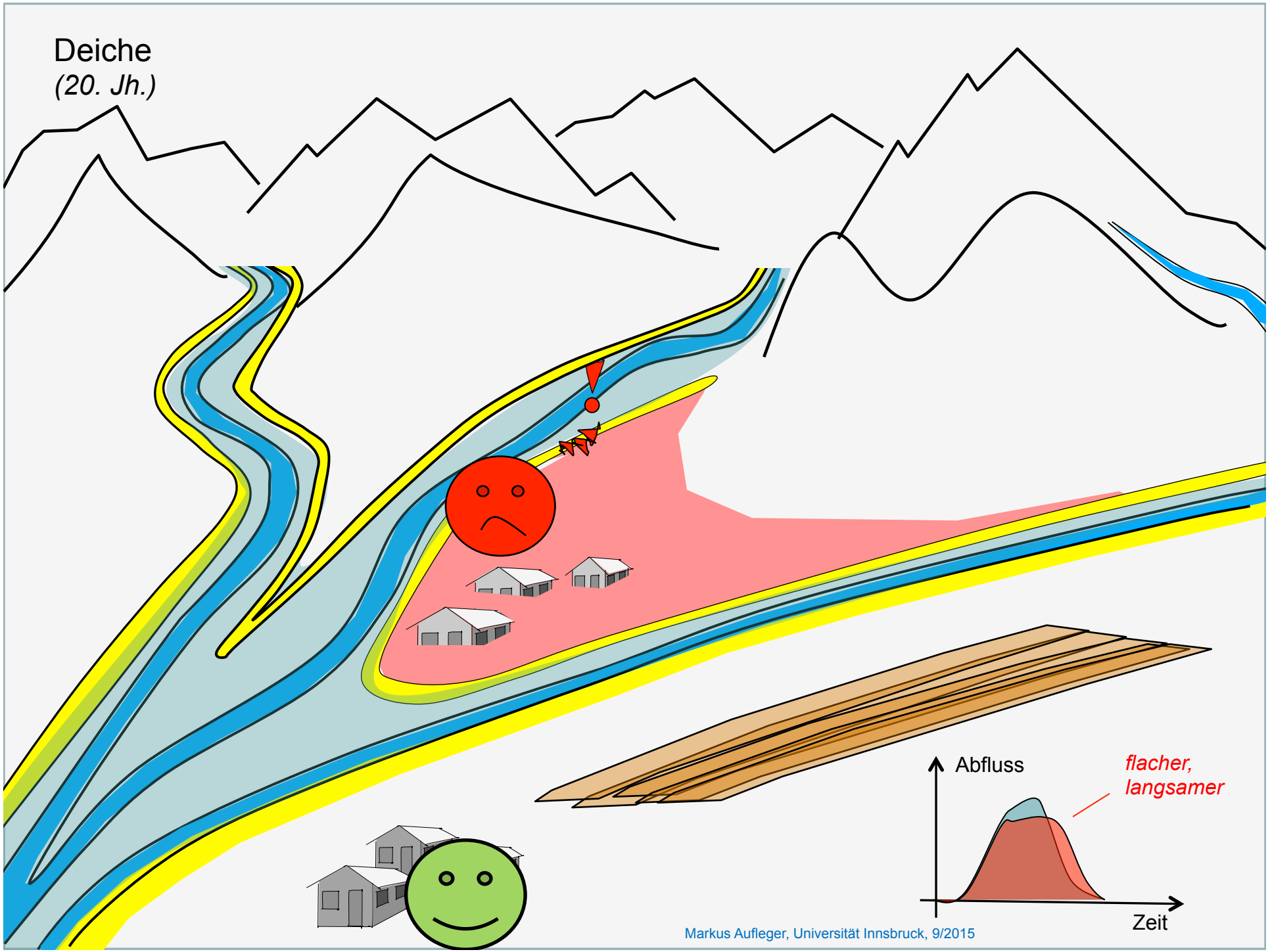
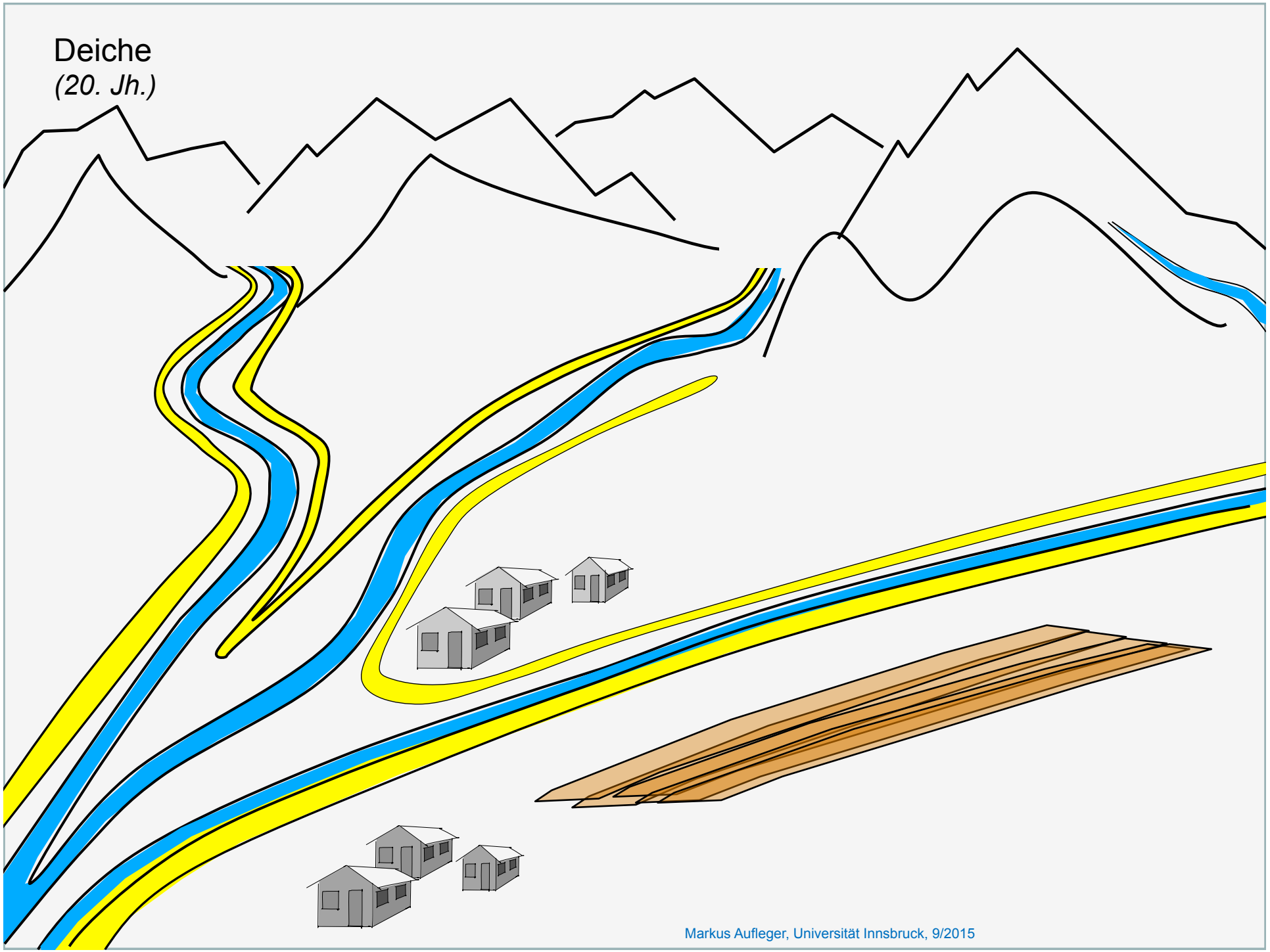

Deiche
(20. Jh.)
schneller,
höher
Abfluss
Zeit
Markus Aufleger, Universität Innsbruck, 9/2015


Deiche
(20. Jh.)
Abfluss
flacher,
langsamer
Zeit
Markus Aufleger, Universität Innsbruck, 9/2015

Deiche

(20. Jh.)



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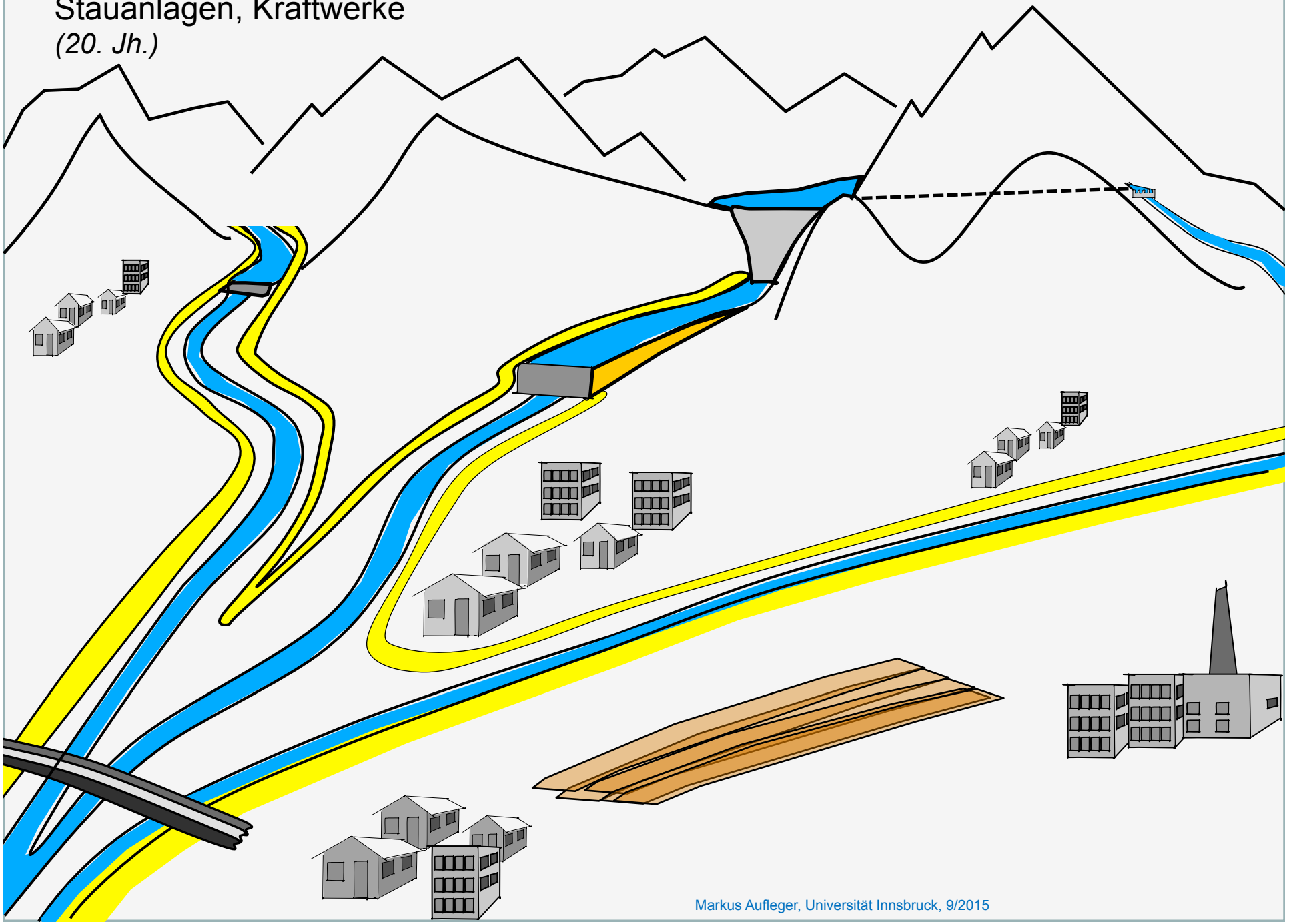
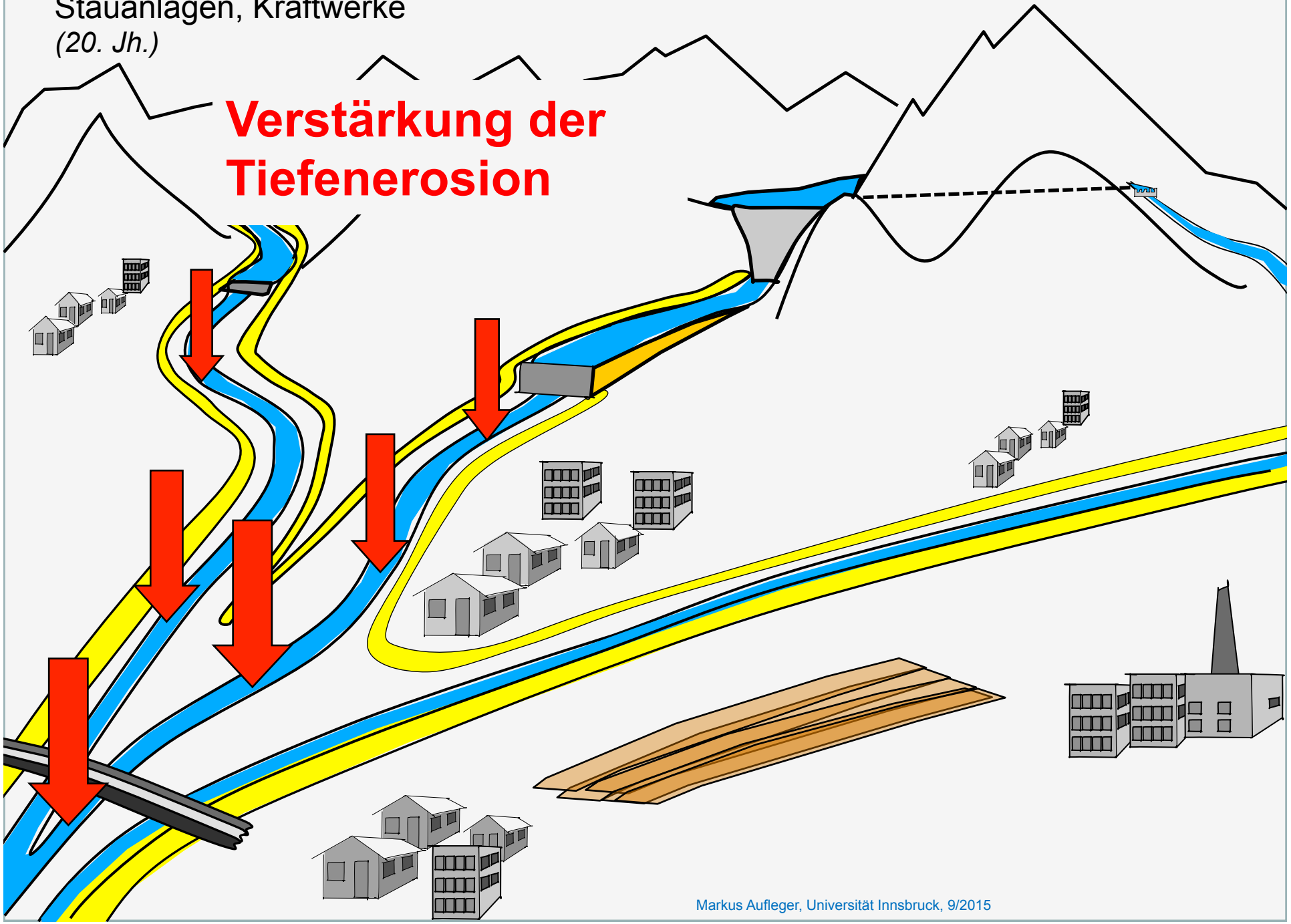
Stauanlagen, Kraftwerke

(20. Jh.)



Markus Aufleger, Universität Innsbruck, 9/2015

Stauanlagen, Kraftwerke
(20. Jh.)



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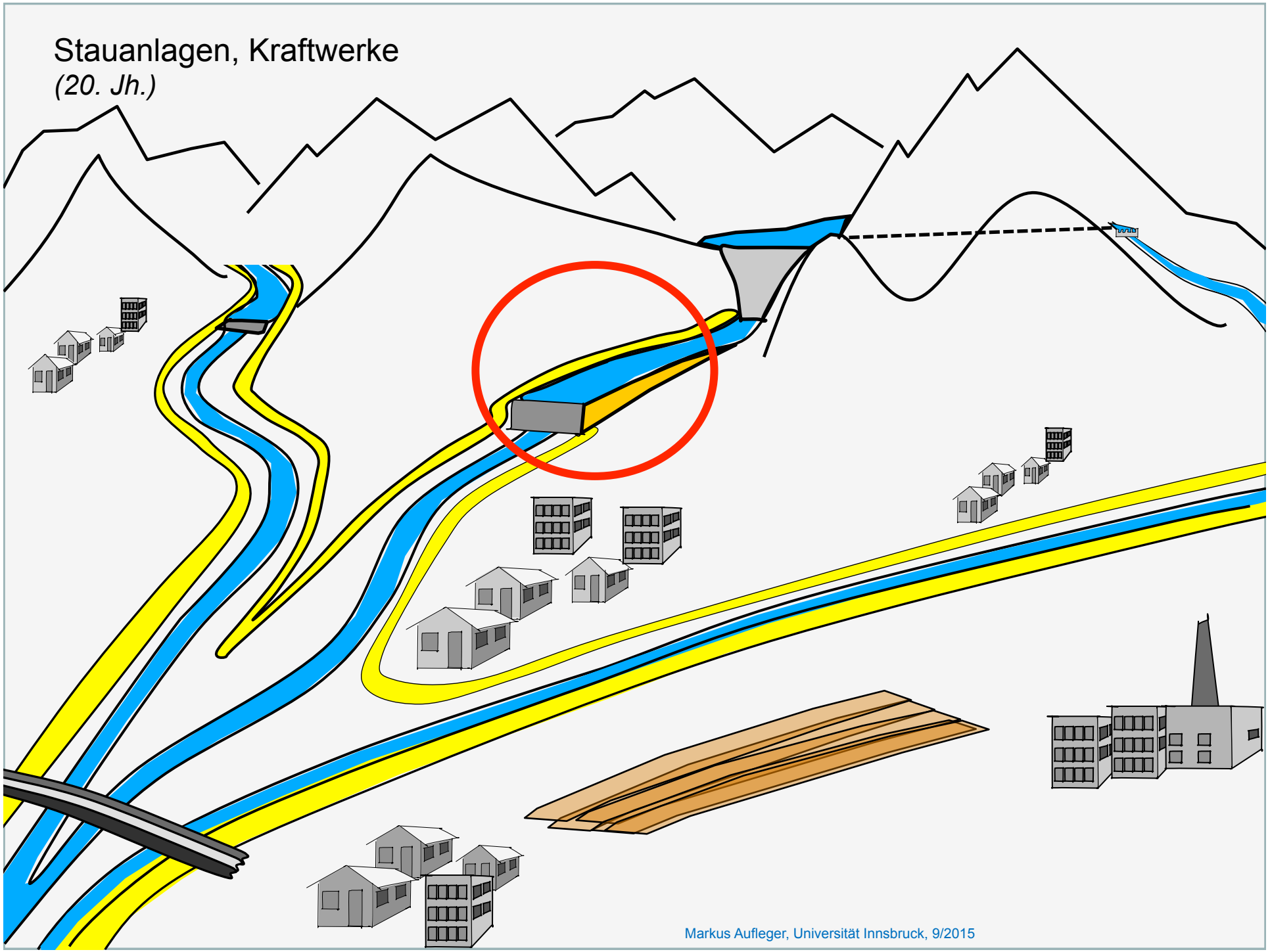
Stauanlagen, Kraftwerke

(20. Jh.)



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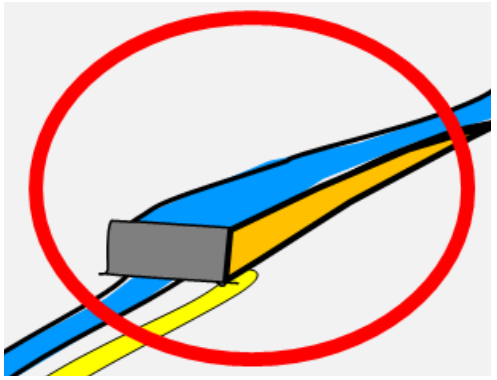
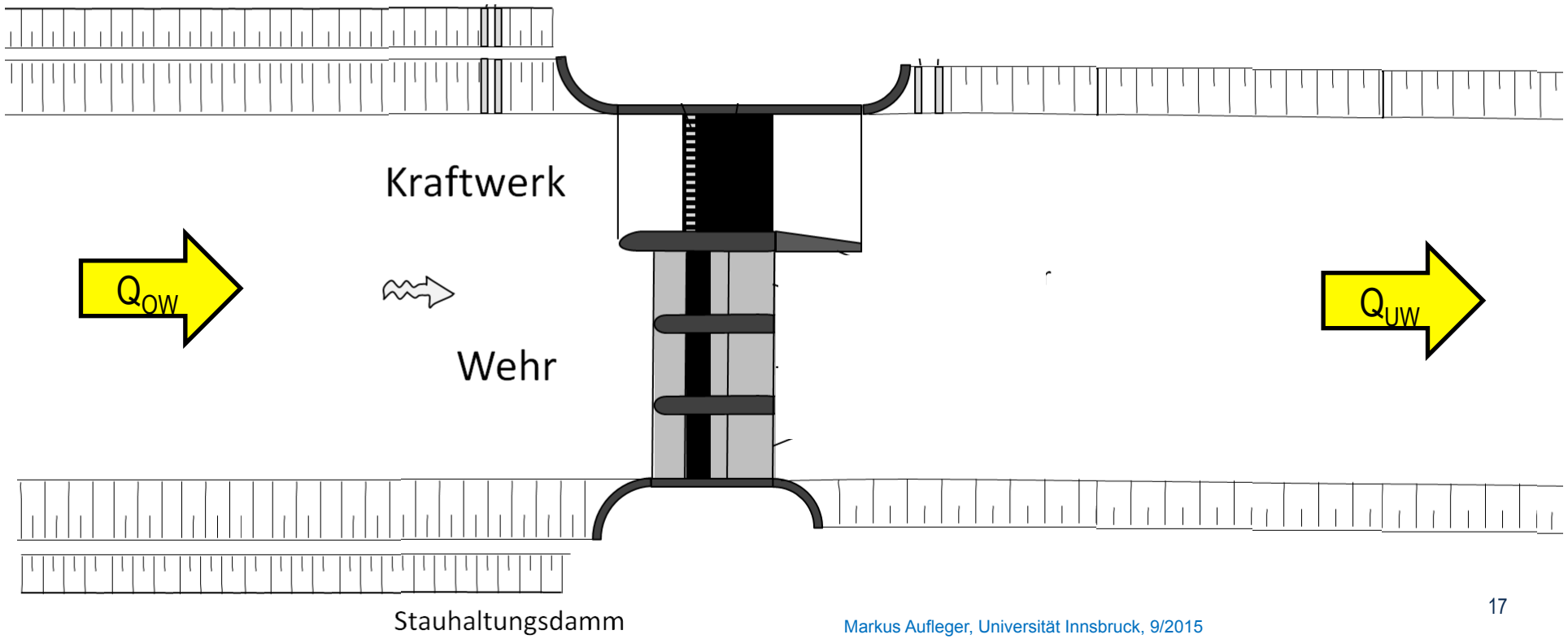
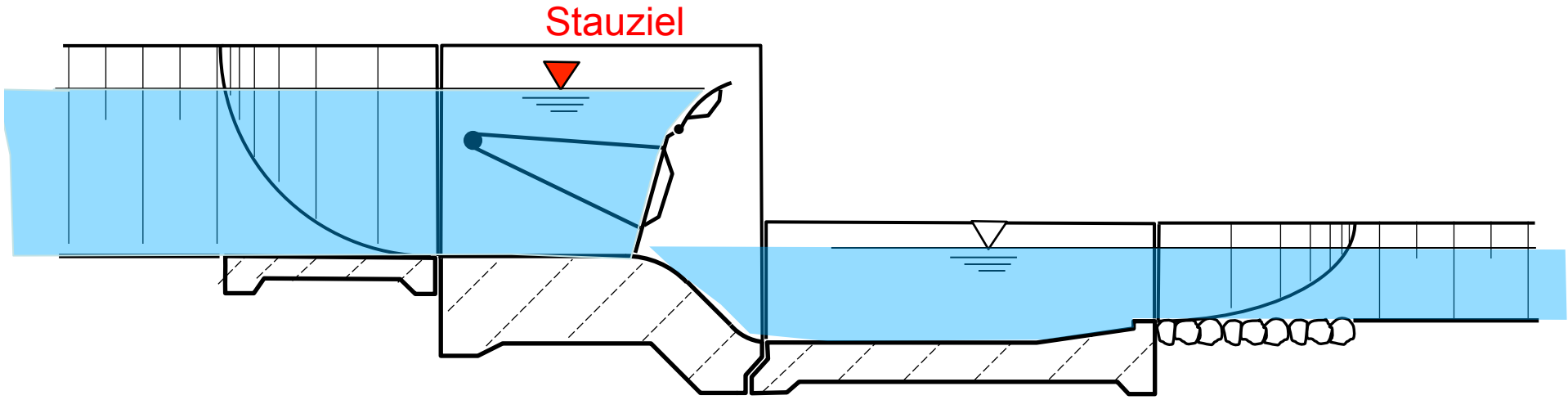
Flusskraftwerk (Laufwasserkraft)

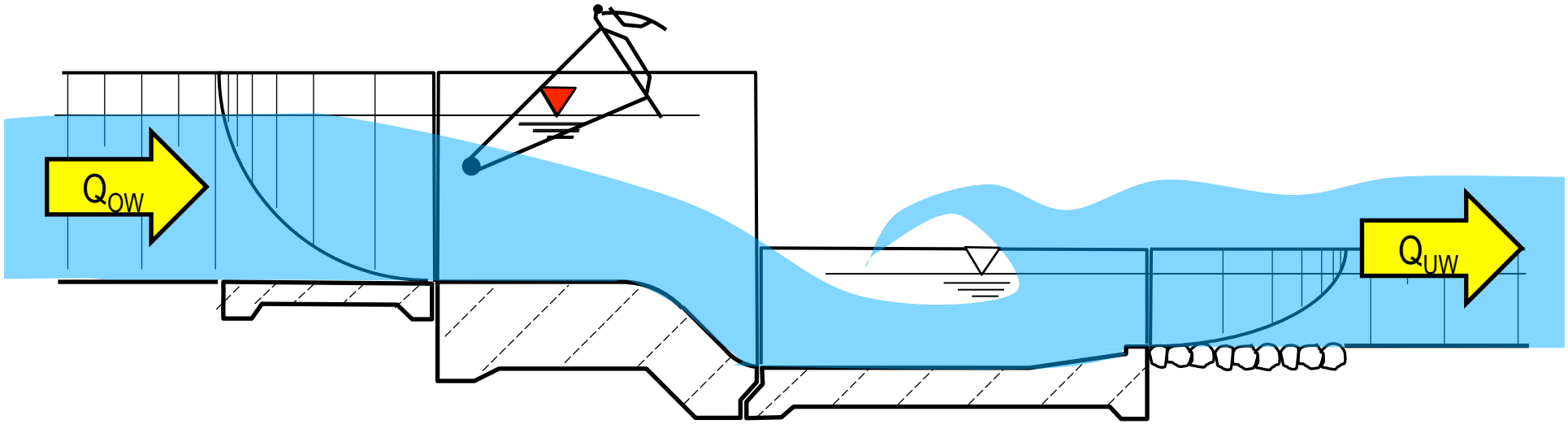


~ hochwasserneutral !

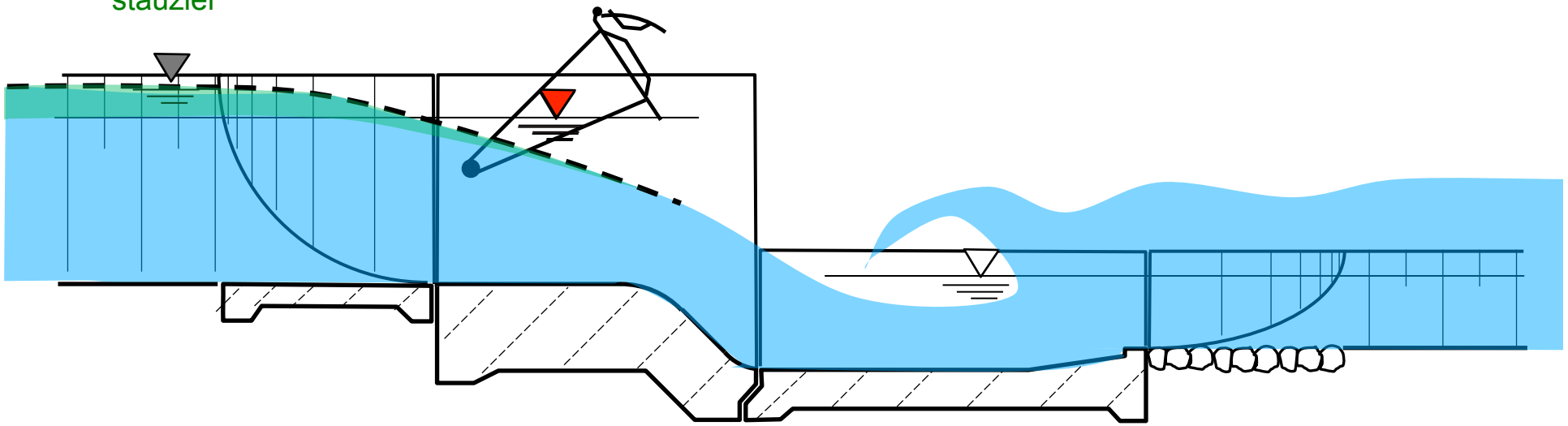
- *abhängig von Betriebsweise (Stauziel)*
- *Stauhaltungsdämme -> Hochwasserschutz / ggfs. Verlust an Retentionsraum*
- *Sedimentmanagement -> Sohllage?*




Stauziel

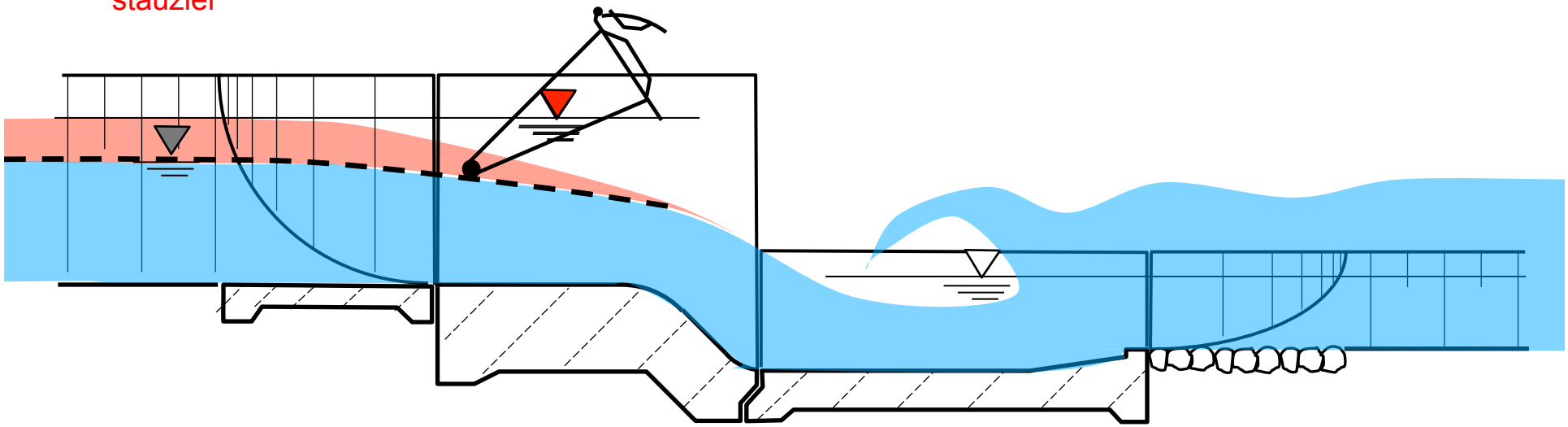

Q_{OW}
Q_{UW}

Hohes Hochwasser-stauziel → Tendenziell: Dämpfung der HW-Welle



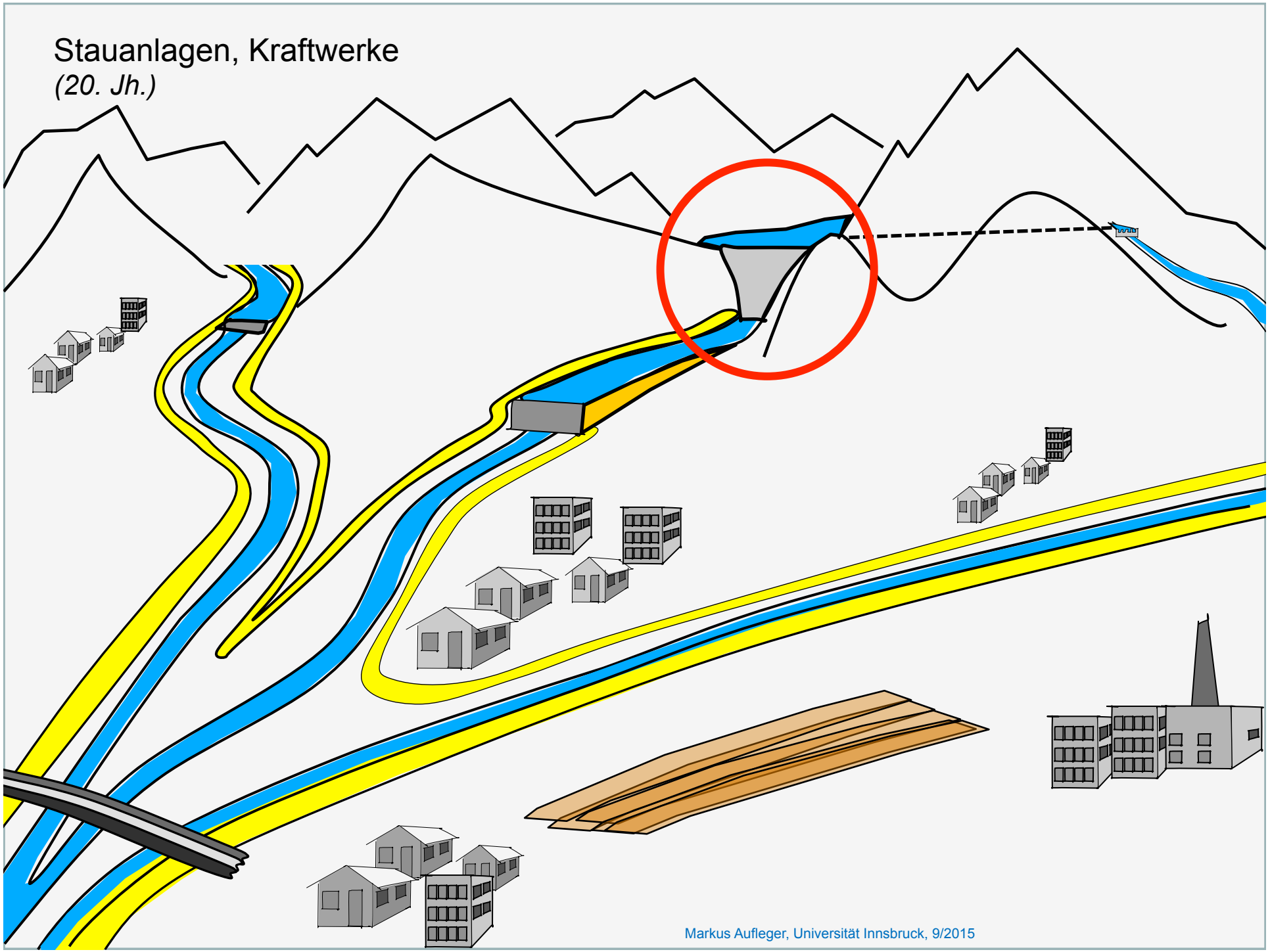
Niedriges Hochwasser-stauziel

Tendenziell: Beschleunigung der HW-Welle



Stauanlagen, Kraftwerke

(20. Jh.)



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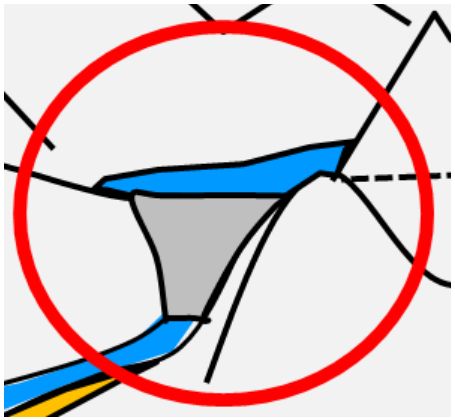
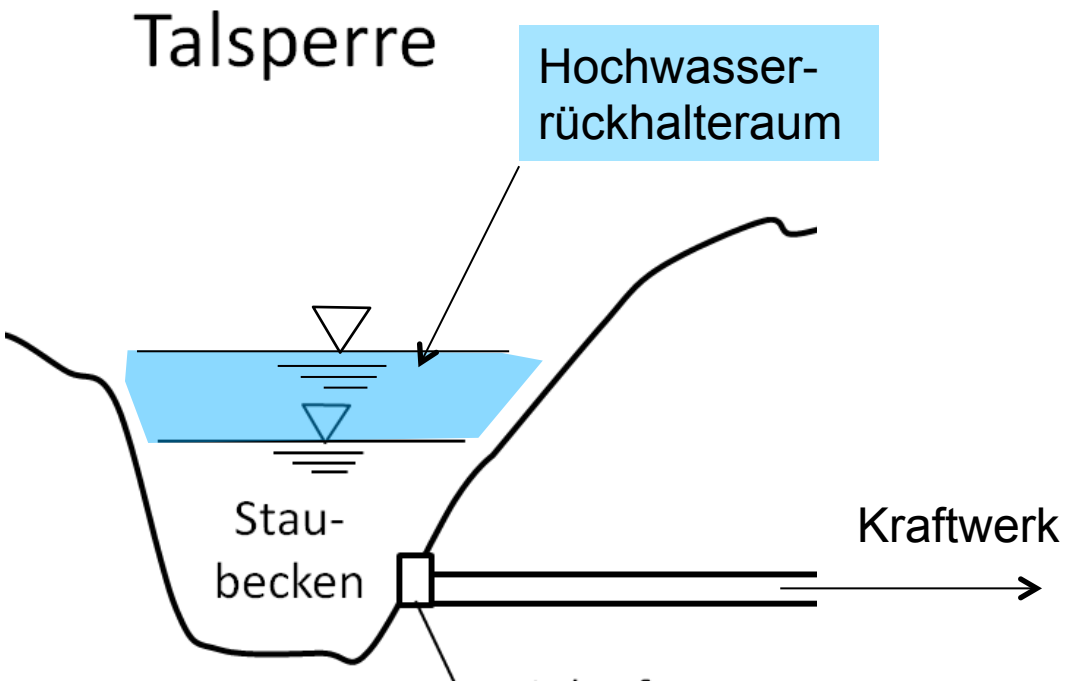
Speicherkraftwerk



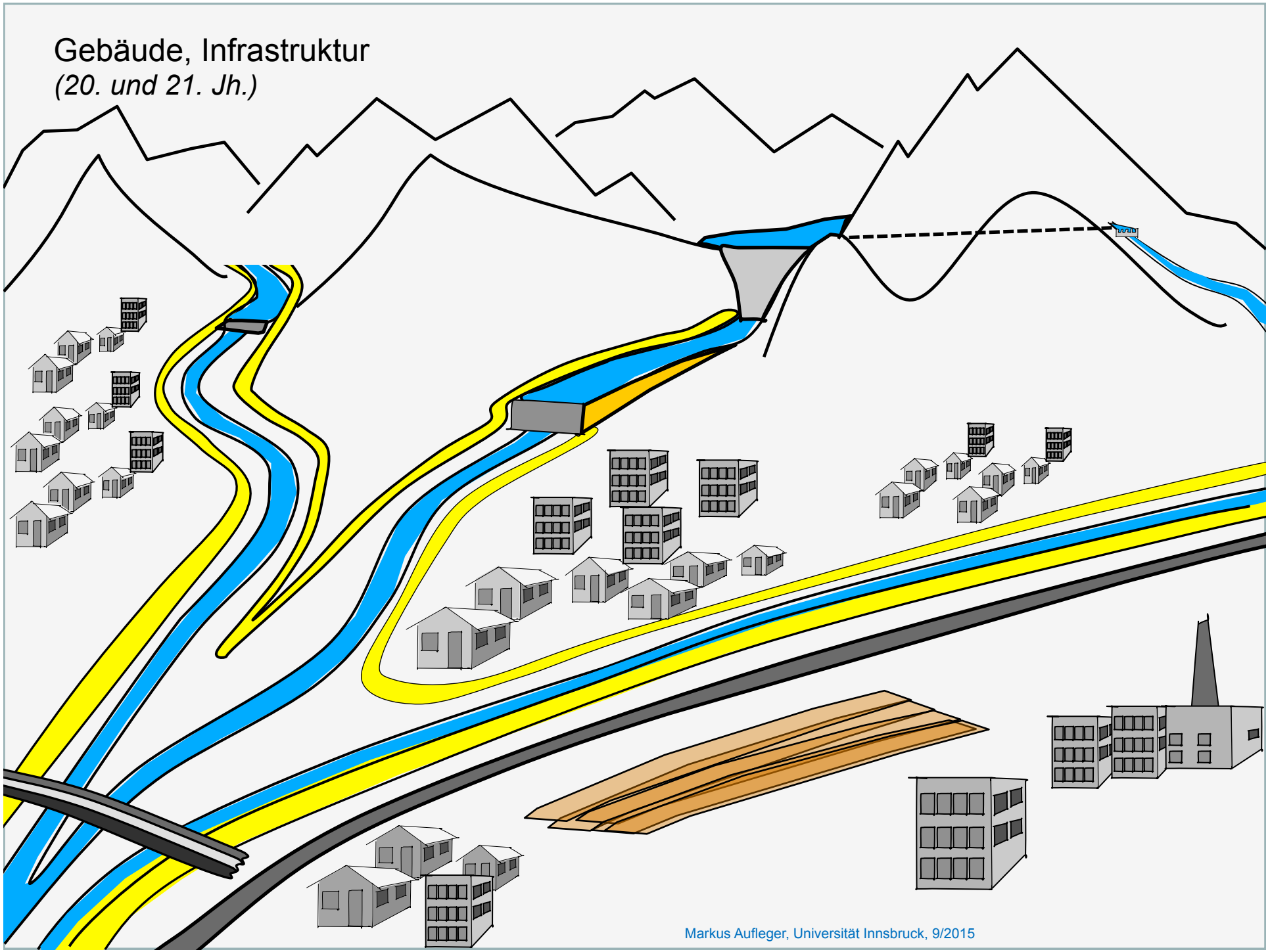
Hochwasserrückhalt !

- *abhängig von Betriebsweise (Stauziel)*



Gebäude, Infrastruktur

(20. und 21. Jh.)



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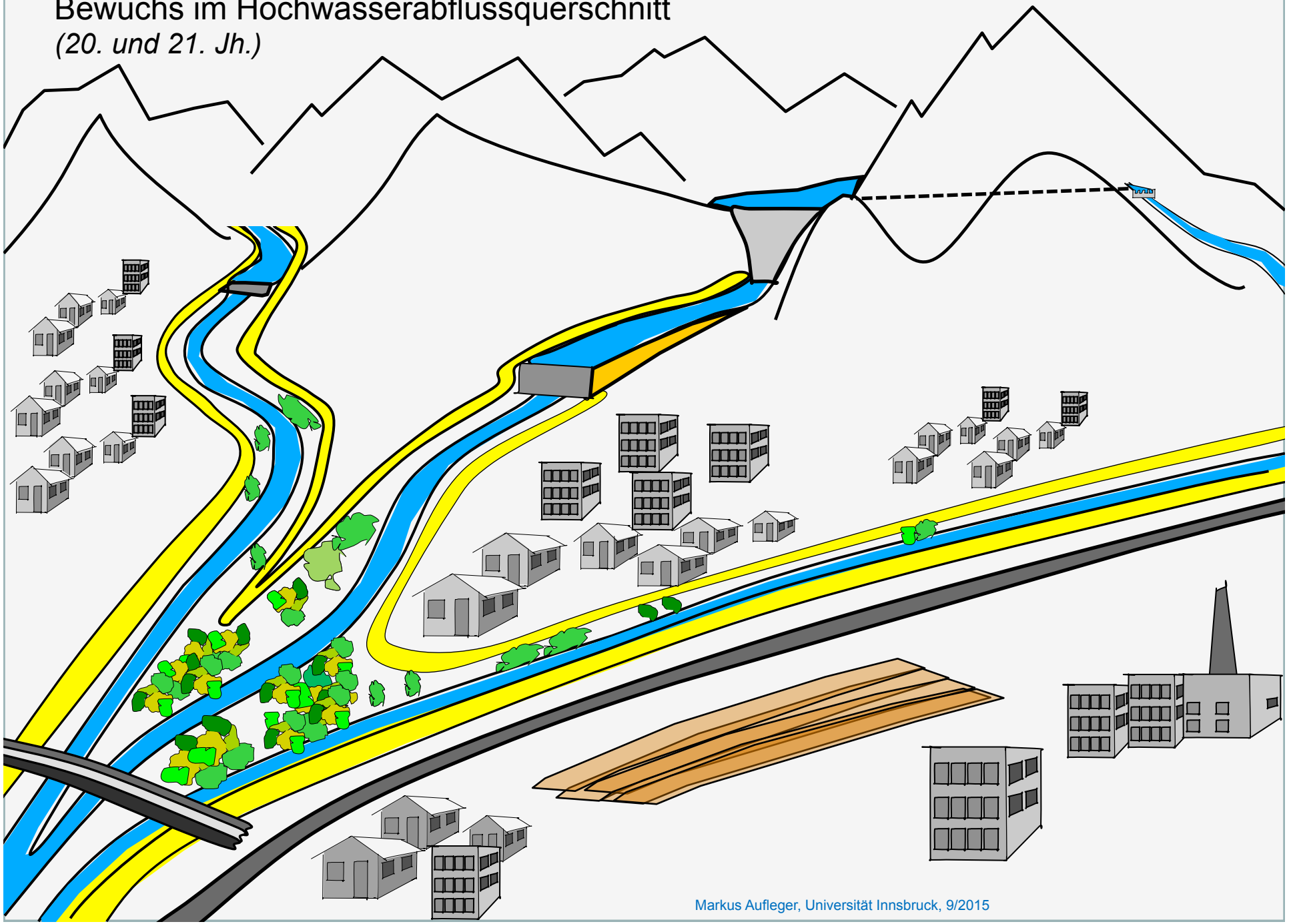
Bewuchs im Hochwasserabflussquerschnitt

(20. und 21. Jh.)



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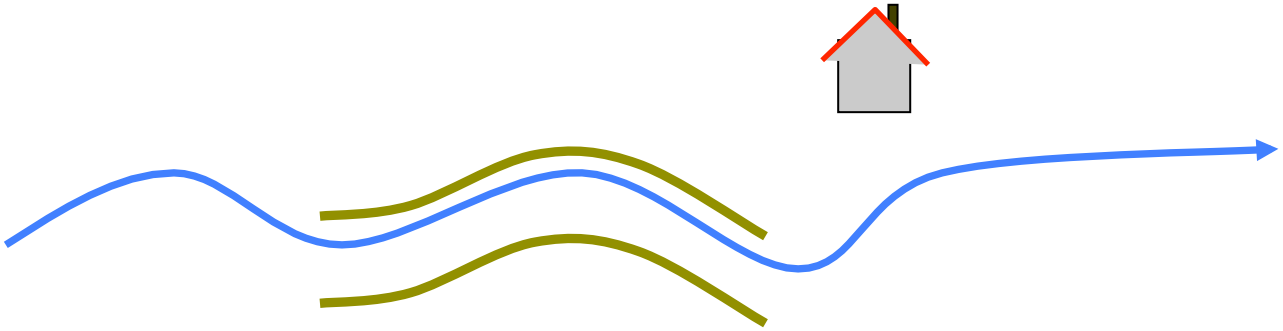
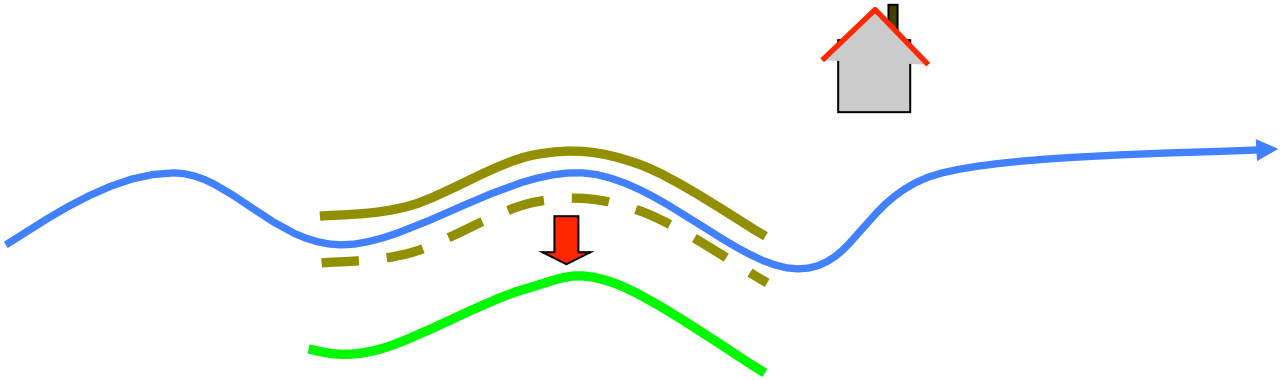
Hochwasserschutz



Naturnahe Retentionsräume


ZDF
mo:ma
morgenmagazin



„Breitwasser statt Hochwasser“

http://www.alphagalileo.org/ViewItem.aspx?ItemId=132379&CultureCode=de

Elbtalauen bei Lenzen, neuer Damm im Bau

https://www.landwirtschaftskammer.de/landwirtschaft/naturschutz/gewaesser/else.htm

Luftbild der Else während des Umbaus

Uferrückbau an der Salzach

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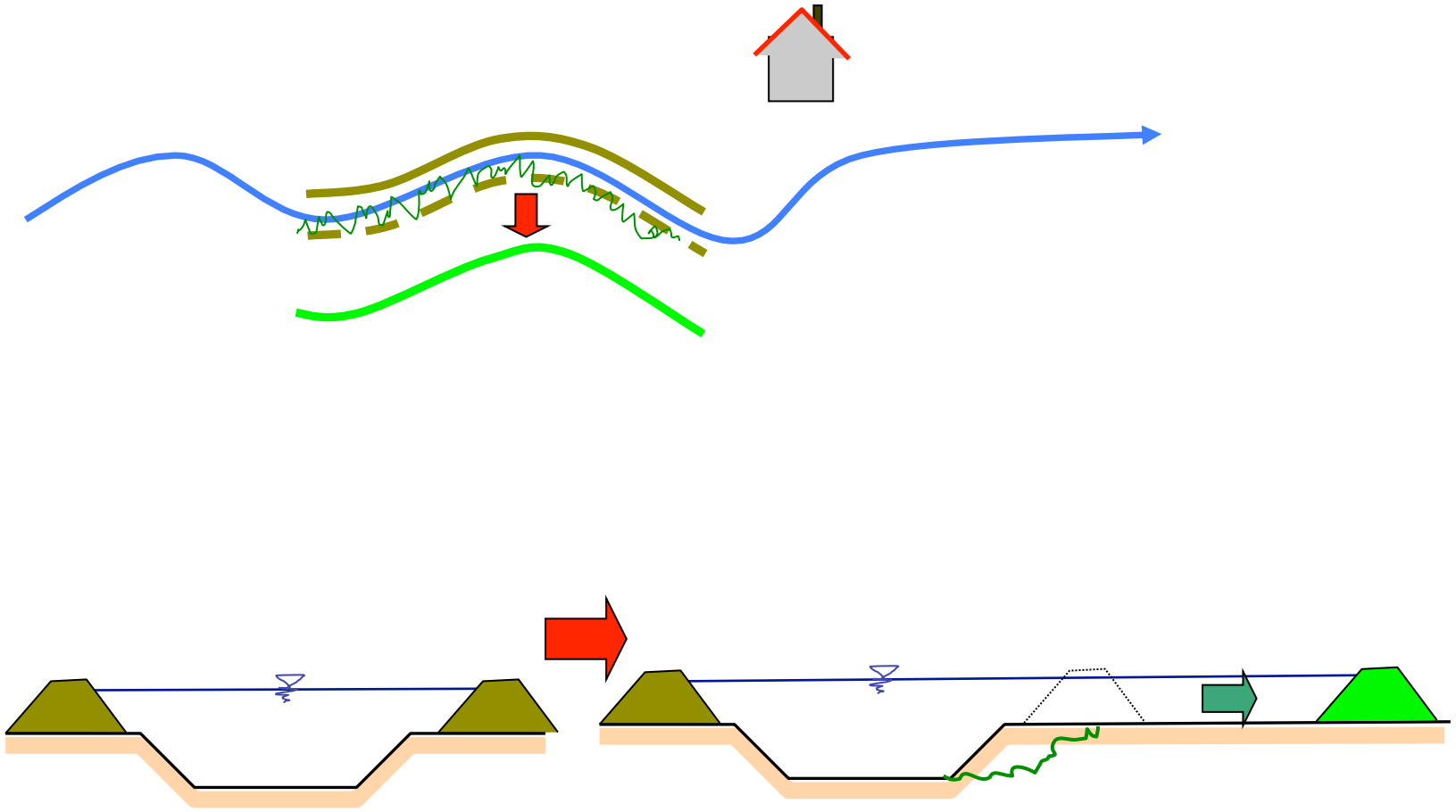
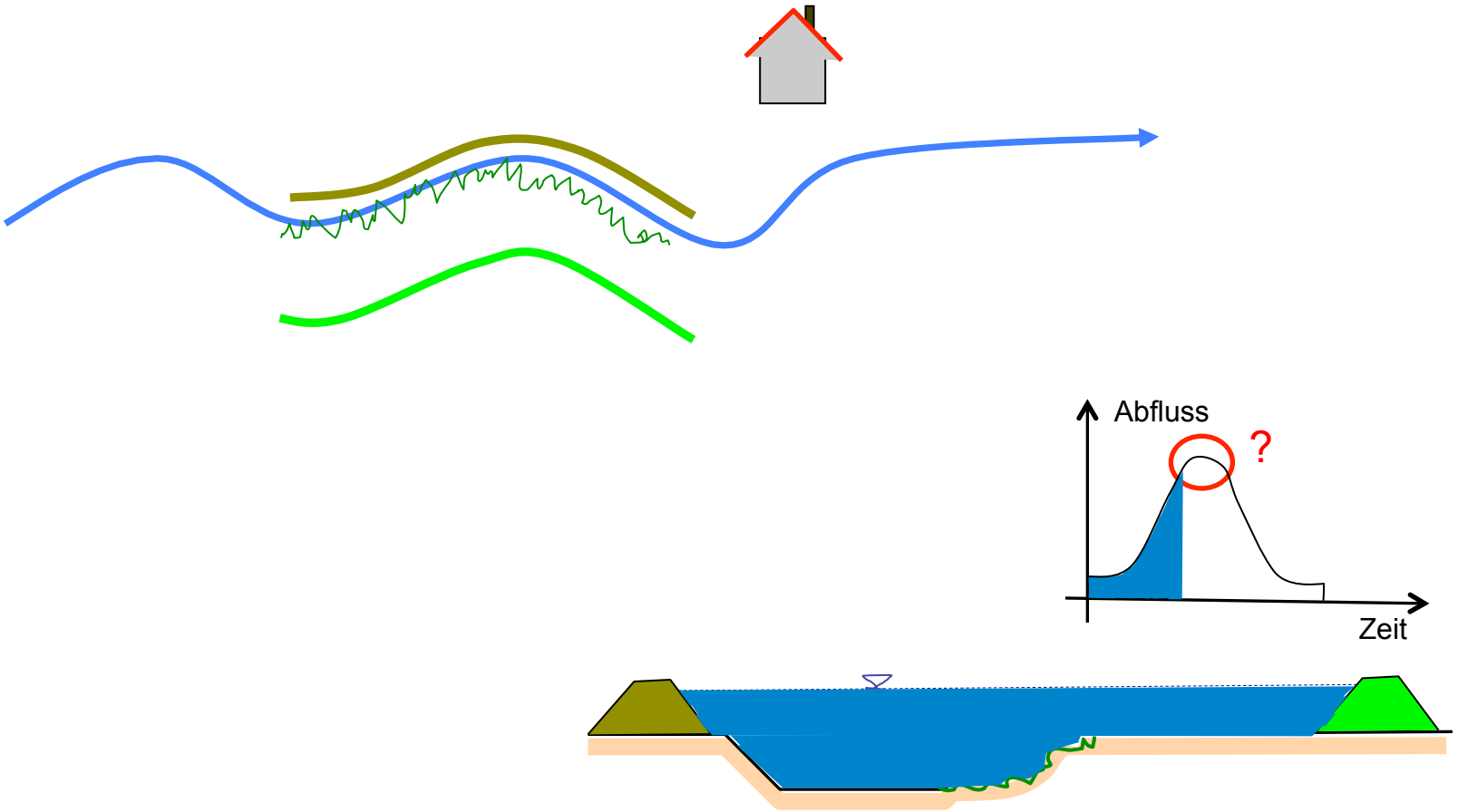
Uferrückbau an der Thur (CH)

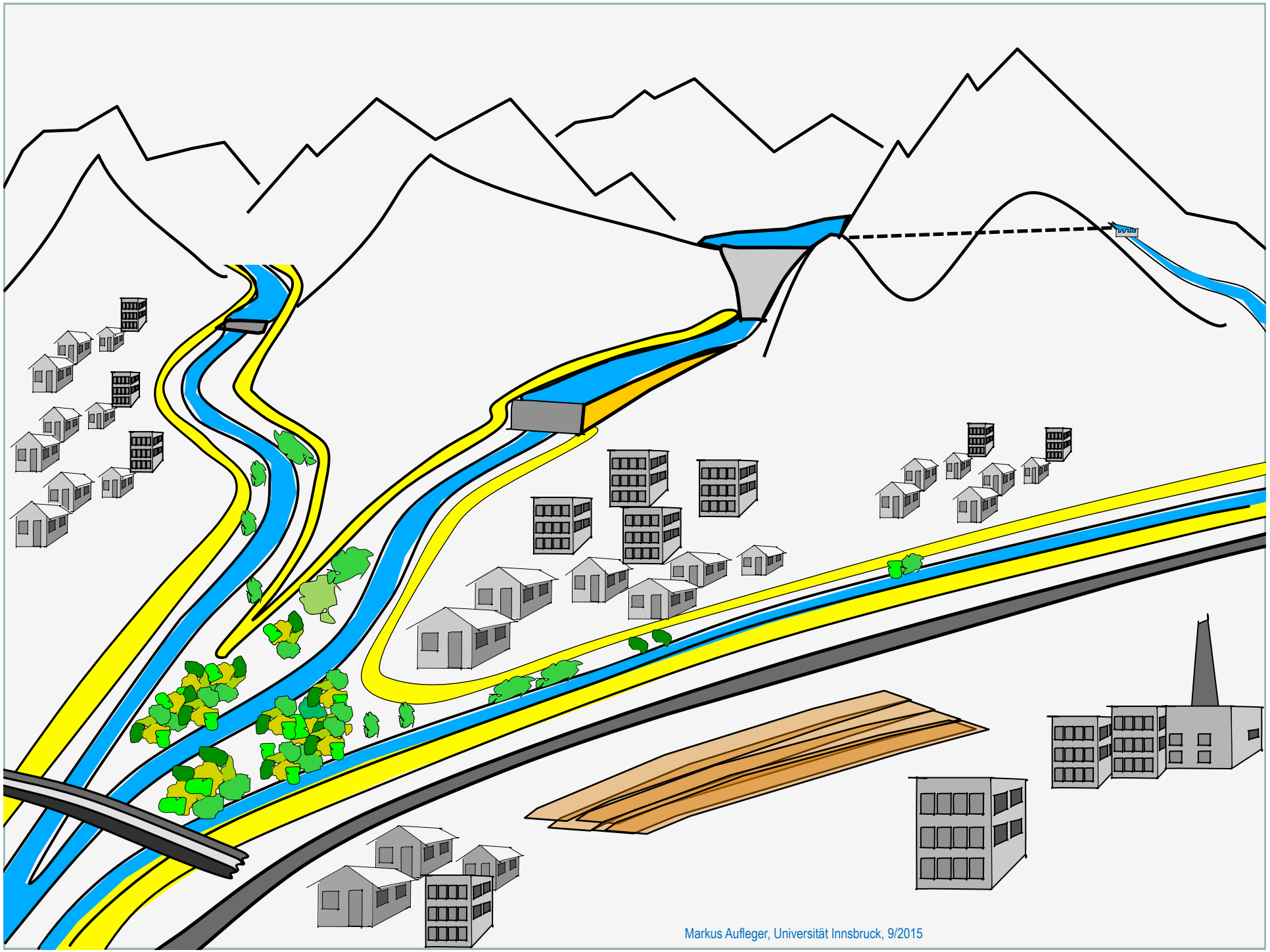

Eigenentwicklung nach Uferrückbau an der Isar

Naturnahe Retentionsräume



Naturnahe Retentionsräume





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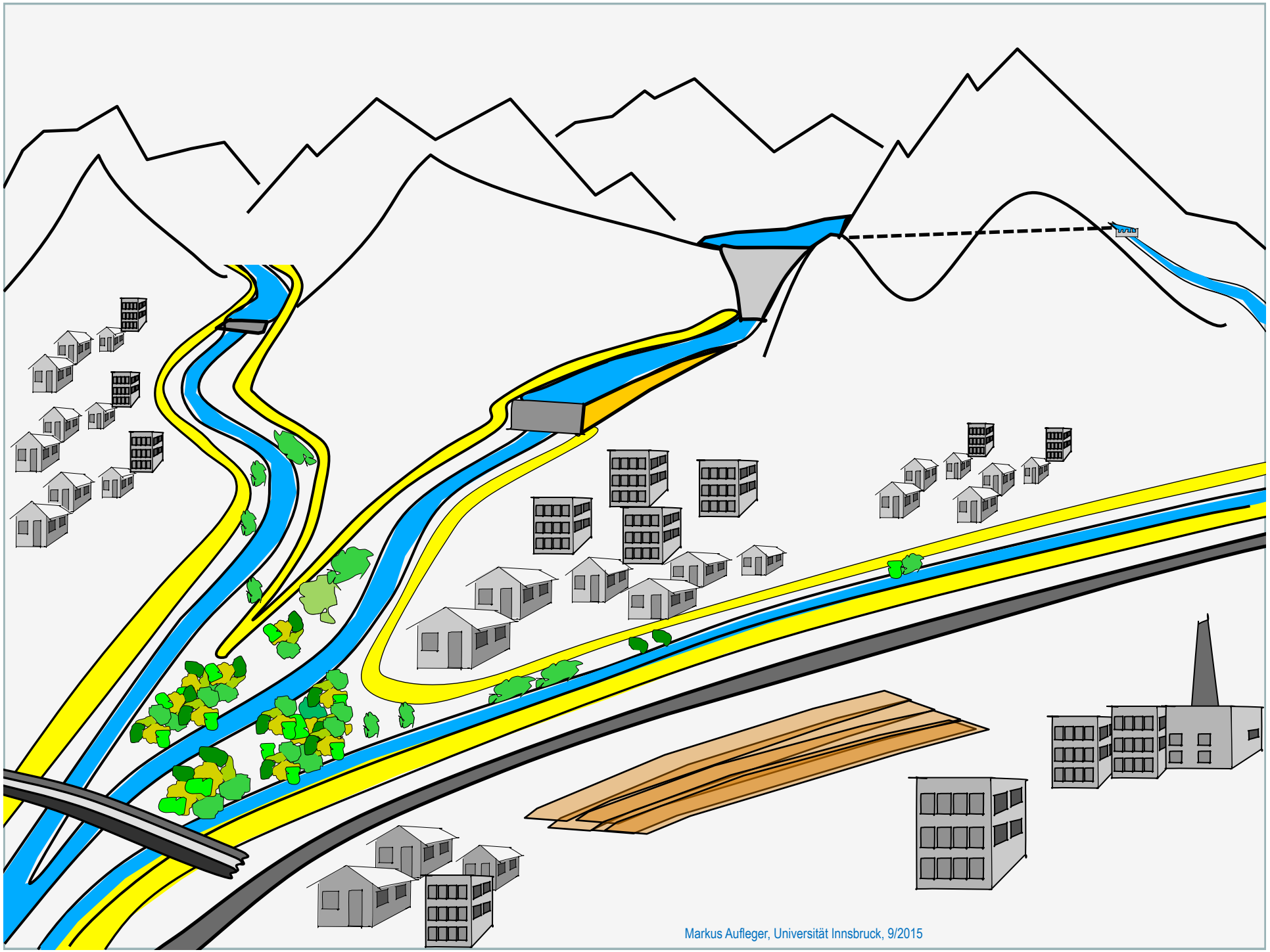

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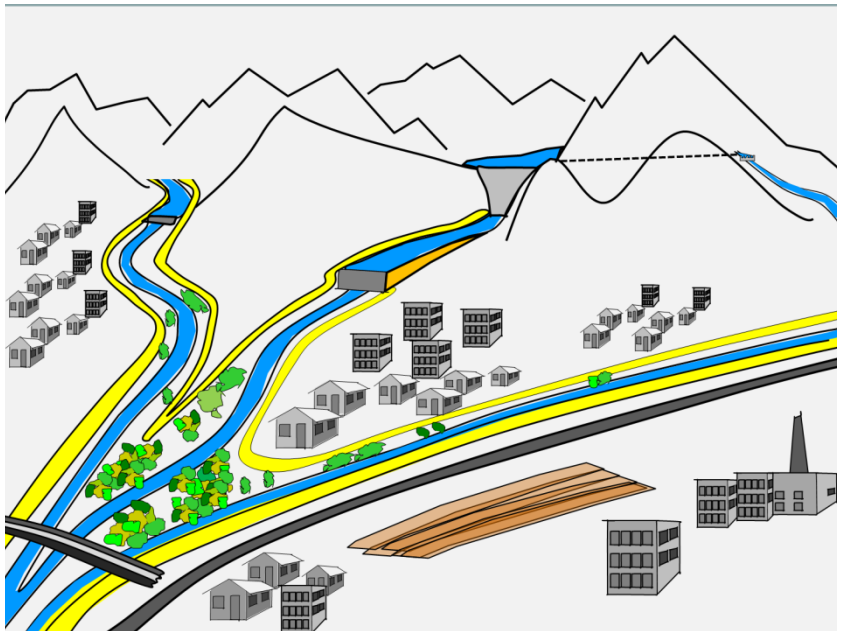
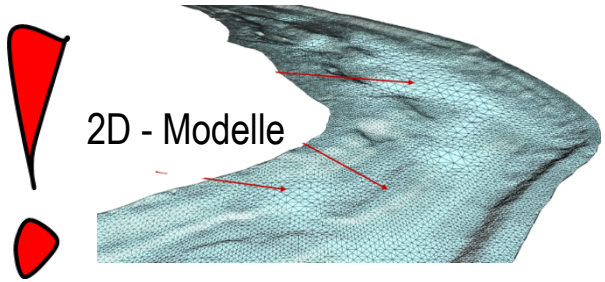
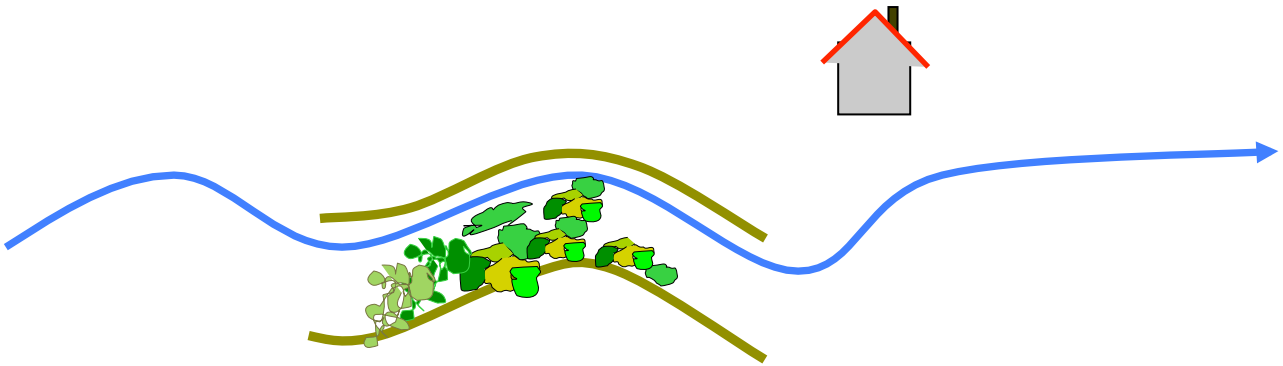


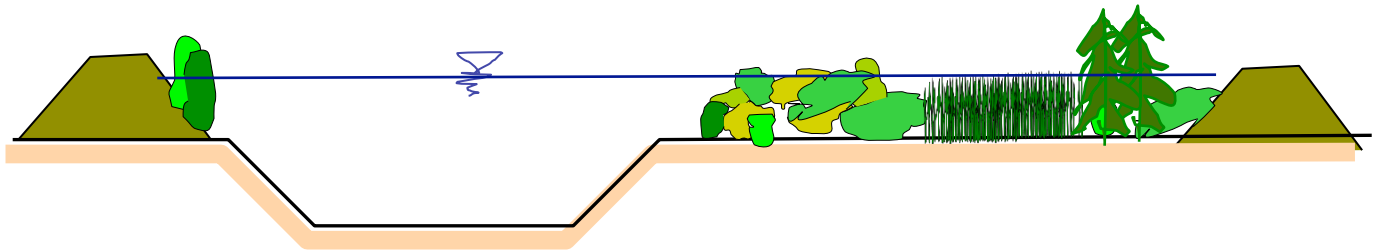
- Viel Platz !
- Großes Volumen [Mio. m^3] → kleines ΔQ [m^3/s]
- Ökologie !



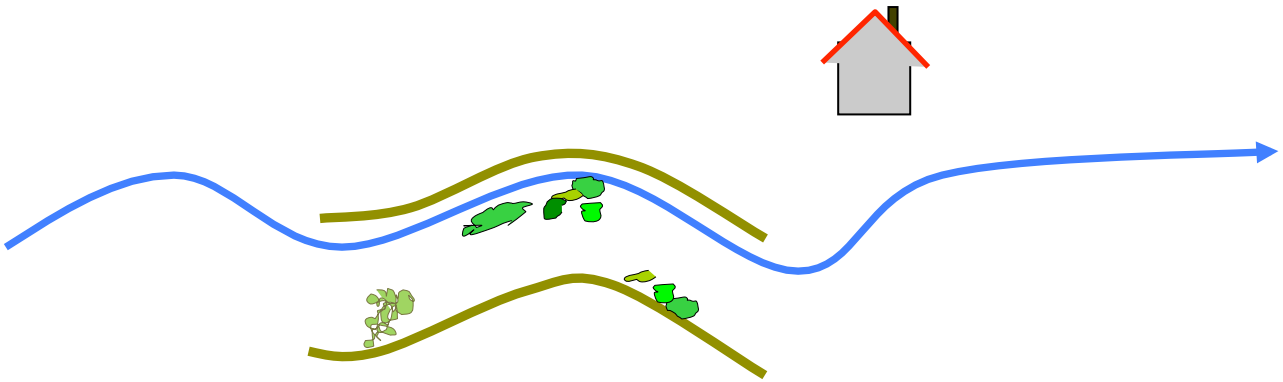
Technische Schutzmaßnahmen

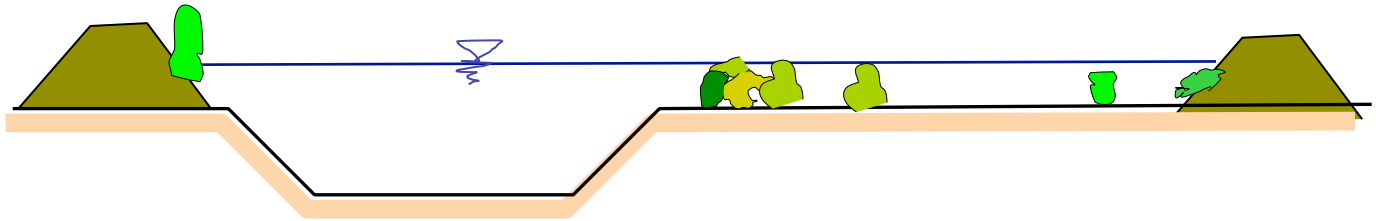
Erhöhung der Abflusskapazität



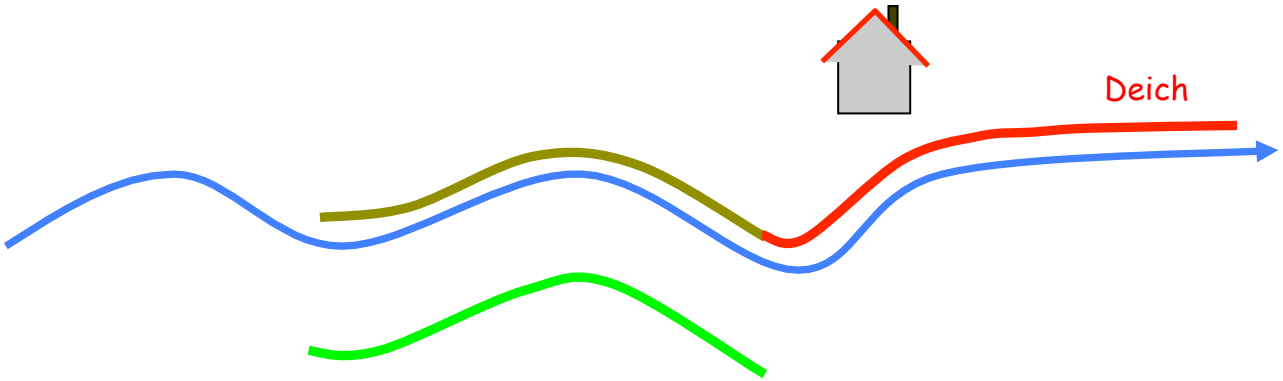


Erhöhung der Abflusskapazität

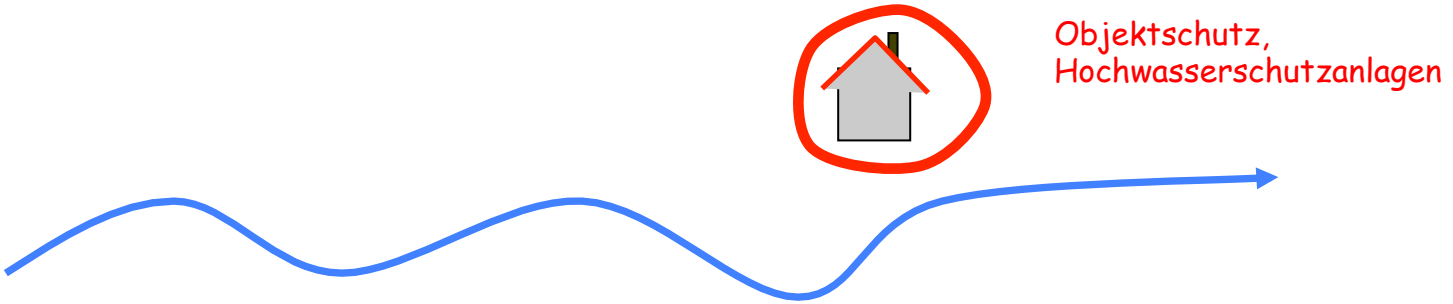




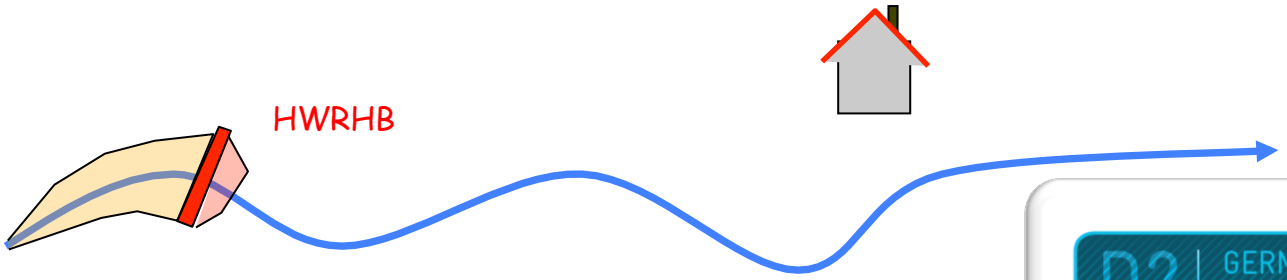
Deichbau

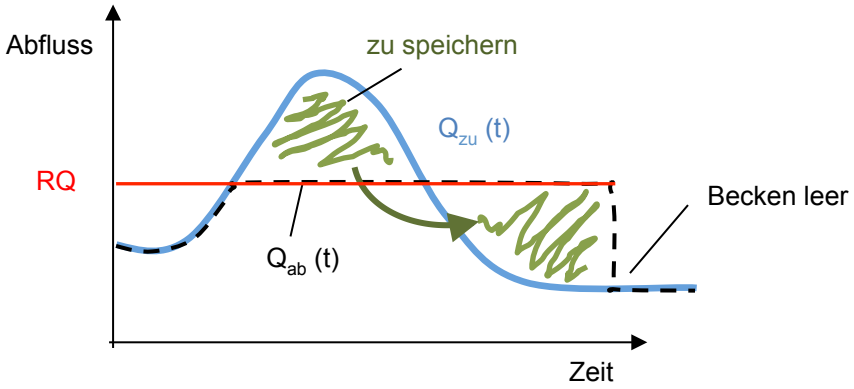


Objektschutz

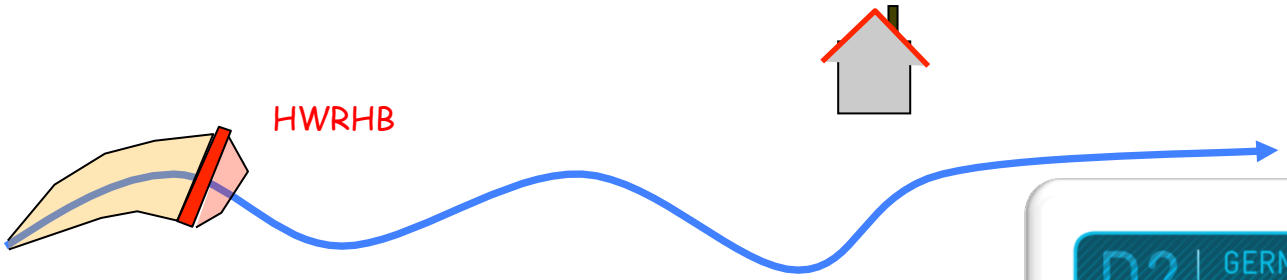


Rückhalt im Hauptschluss



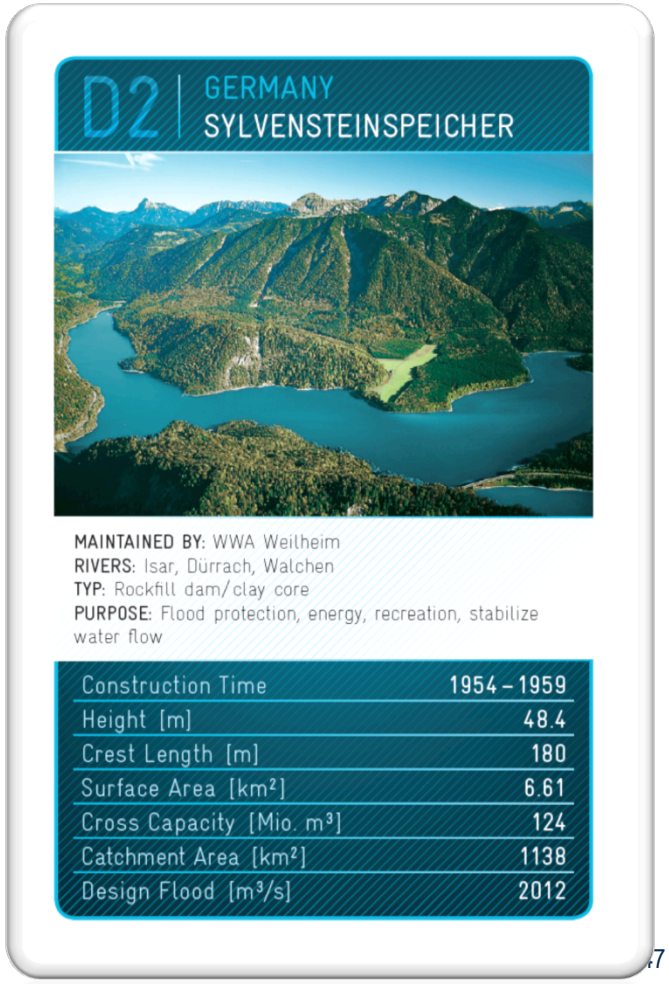


Rückhalt im Hauptschluss

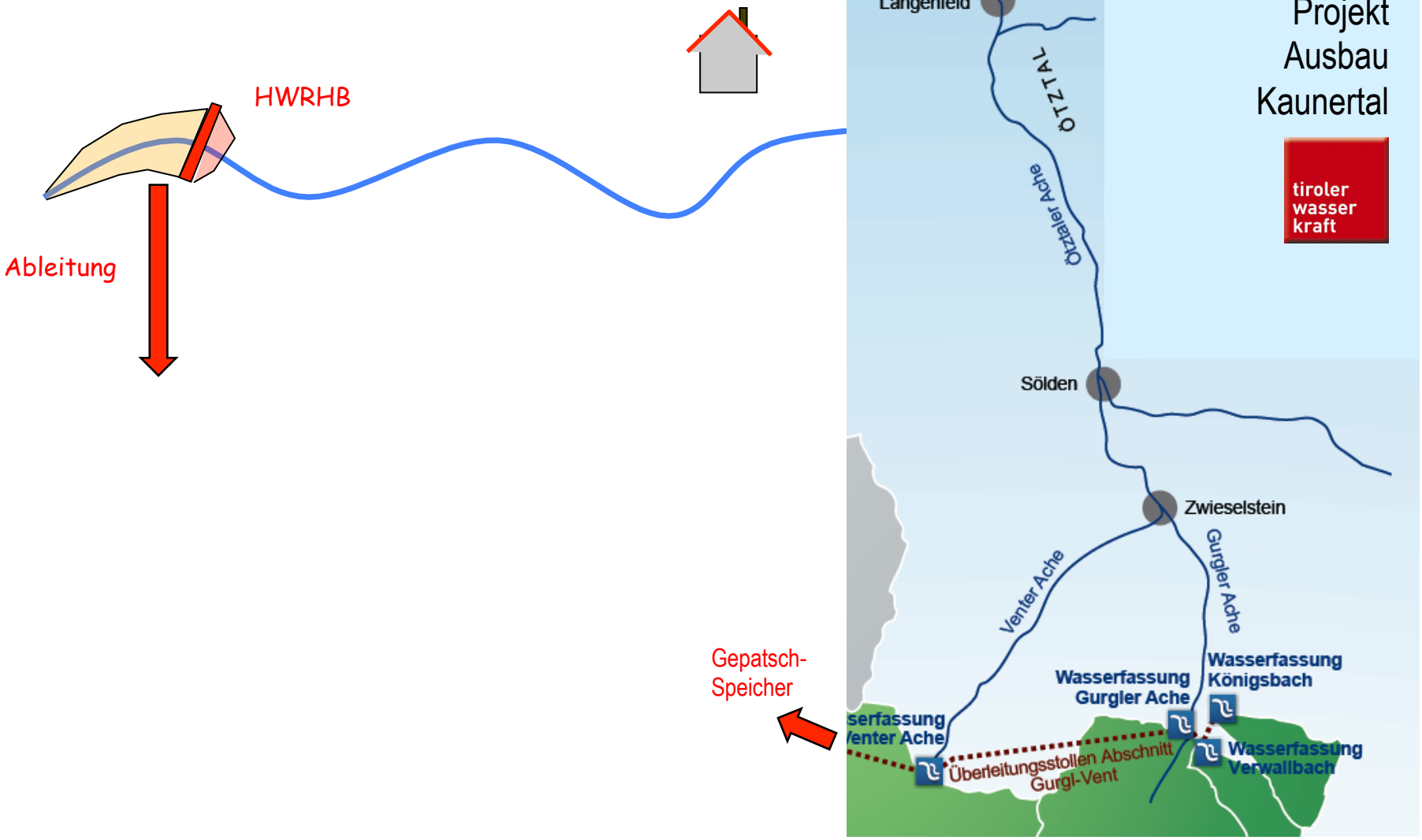


Volumen [Mio. m^3] → ΔQ [m^3/s]

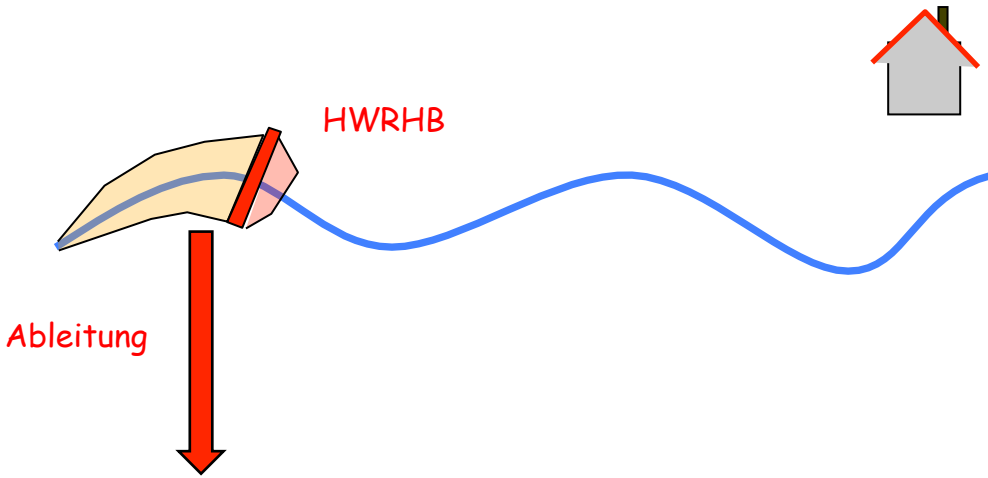
Sehr hohe Rückhaltewirkung,
abh. von
- Volumen [Mio. m^3]
- Steuerung (inkl. Vorhersage)



Ableitung von Hochwasserabfluss

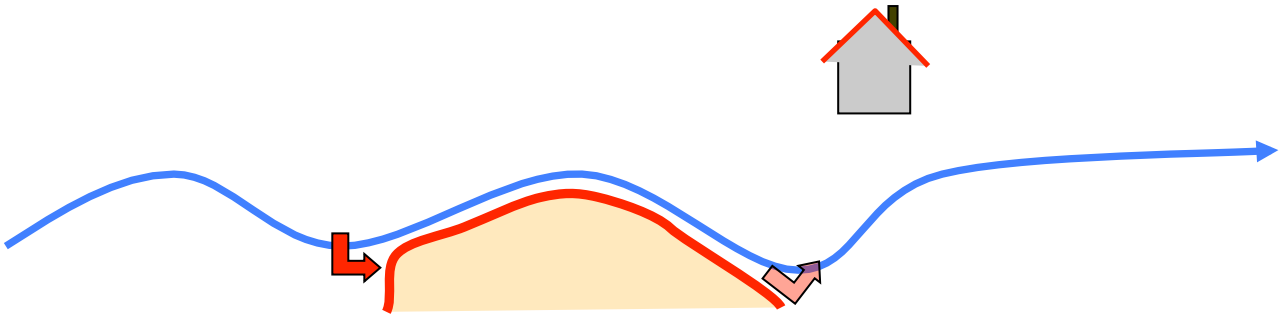


Rückhalt im Hauptschluss



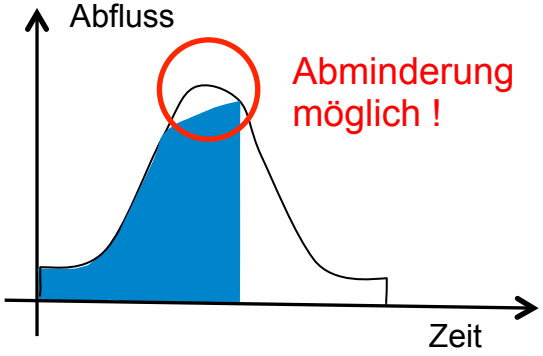
Rückhalt im Nebenschluss

a) ungesteuert

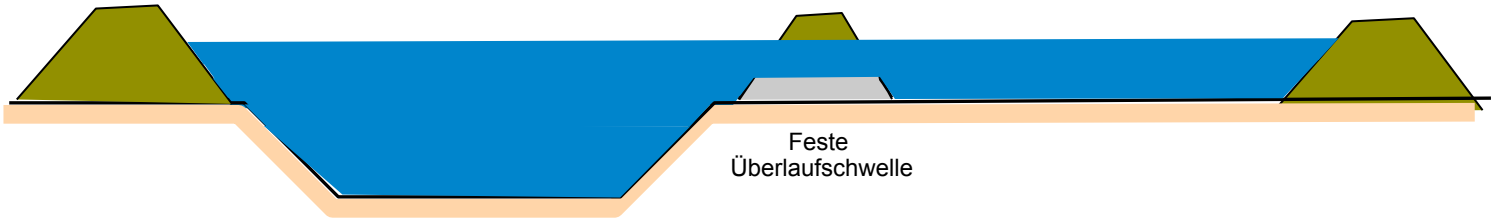


HWRHB im Nebenschluss

(Flutpolder)

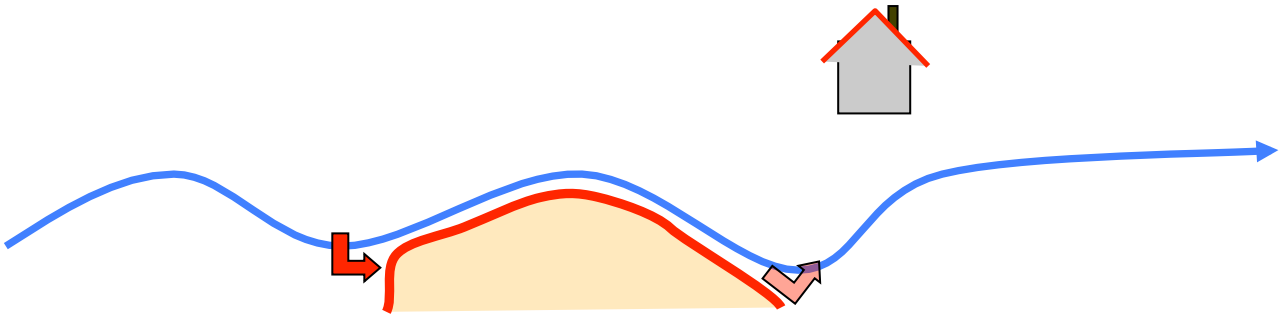


Abminderung möglich !



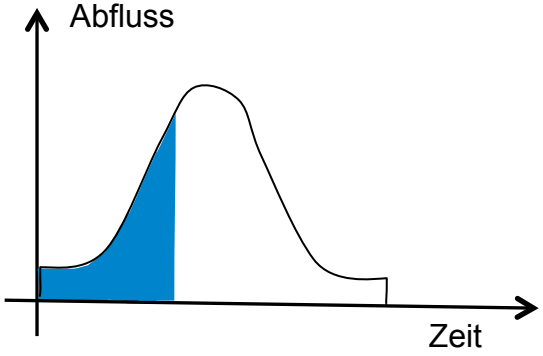
Rückhalt im Nebenschluss

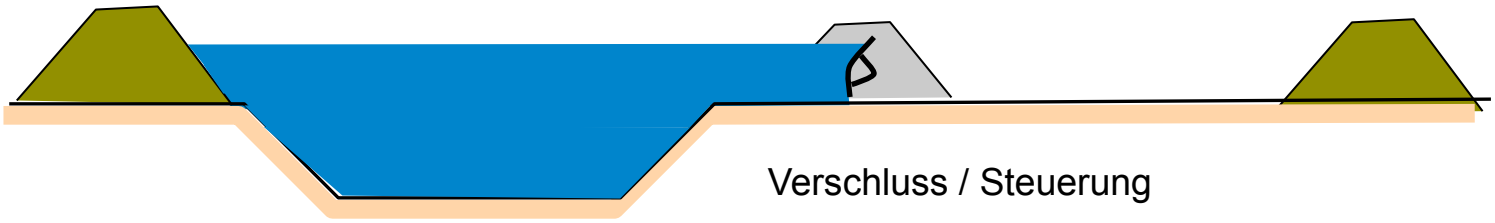
b) gesteuert



HWRHB im Nebenschluss

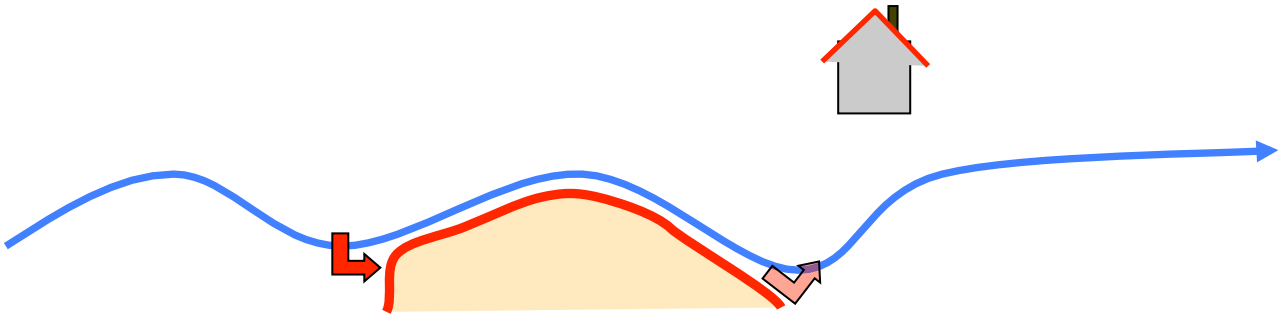
(Flutpolder)





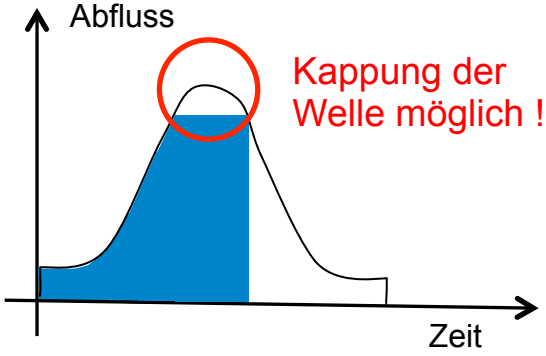
Rückhalt im Nebenschluss

b) gesteuert

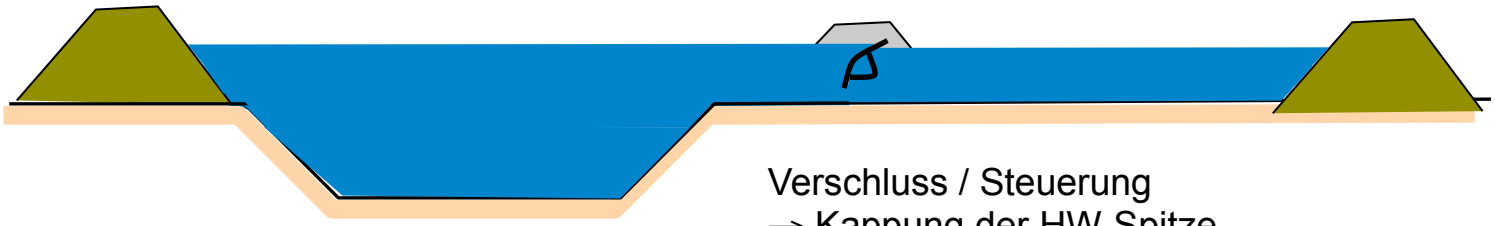


HWRHB im
Nebenschluss

(Flutpolder)

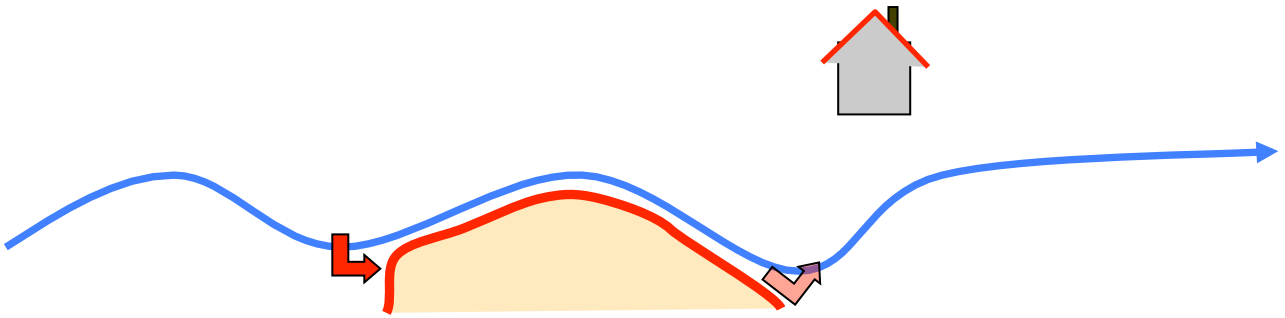


Kappung der
Welle möglich !



Verschluss / Steuerung
→ Kappung der HW-Spitze

Rückhalt im Nebenschluss



HWRHB im Nebenschluss

(Flutpolder)

Volumen [Mio. m^3] → ΔQ [m^3/s]

Hohe Rückhaltewirkung,
abh. von
- Volumen [Mio. m^3]
- Steuerung (inkl. Vorhersage)

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Gesteigerter Hochwasserrückhalt durch naturnahe Retentionsräume und technische Schutzmaßnahmen

Markus Aufleger
Münchsmünster, 25.9.2015