Risk Management as a Key Strategy in Climate Change Adaptation

TEM and TER Joint Expert Meeting 2013

6-11 October 2013, Bad Gastein/Austria

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Outline

- alpS Centre for Climate Change Adaptation – Who We Are
- Climate Change
  - Temperature!
  - Rainfall?
  - Extreme Events?
- alpS Risk Management Cycle
  - Risk Analysis
    - Technical
    - Bottom-Up
  - Risk Control
    - Prevention
    - Preparedness
  - Risk Monitoring
    - ORTIS Risk Information System

alpS – Who We Are

R&D centre based in Innsbruck/Austria

Topics: natural hazard research and risk management

100+ employees at three locations

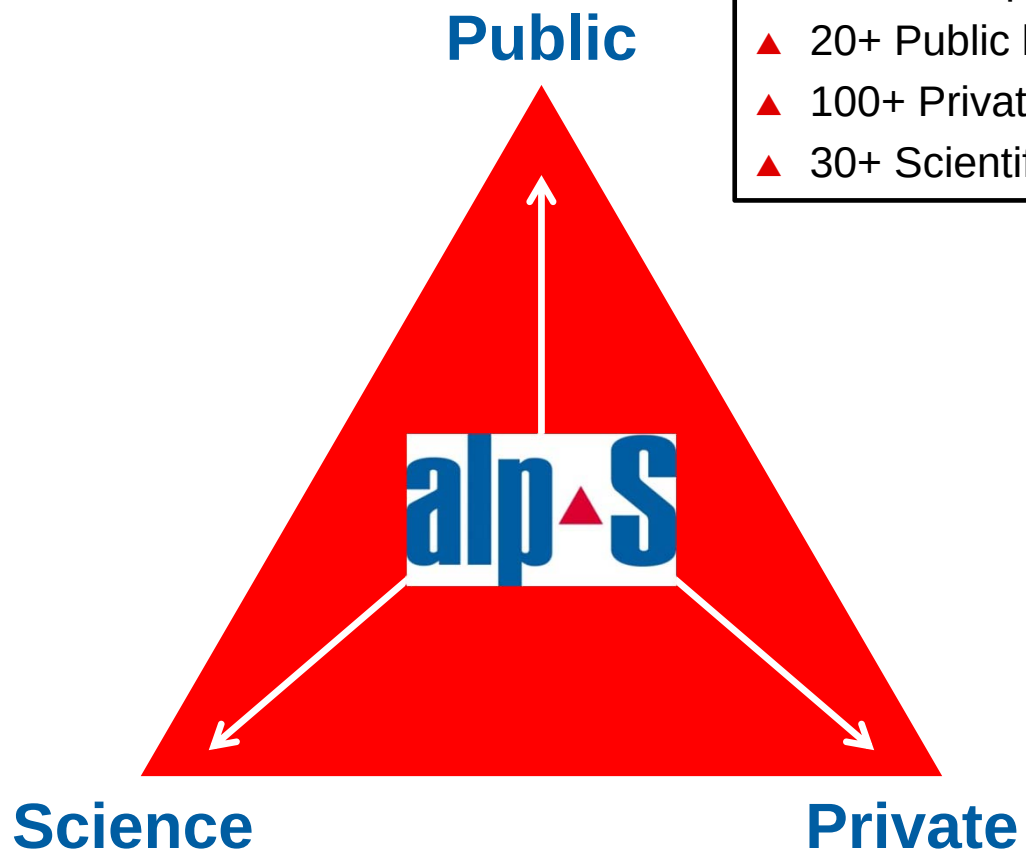
Projects in Geology, Hydrology,…

Official risk management partner of the State Government of the Tyrol

ORTIS Risk Management Solutions were developed and are maintained by alpS

The Red Triangle

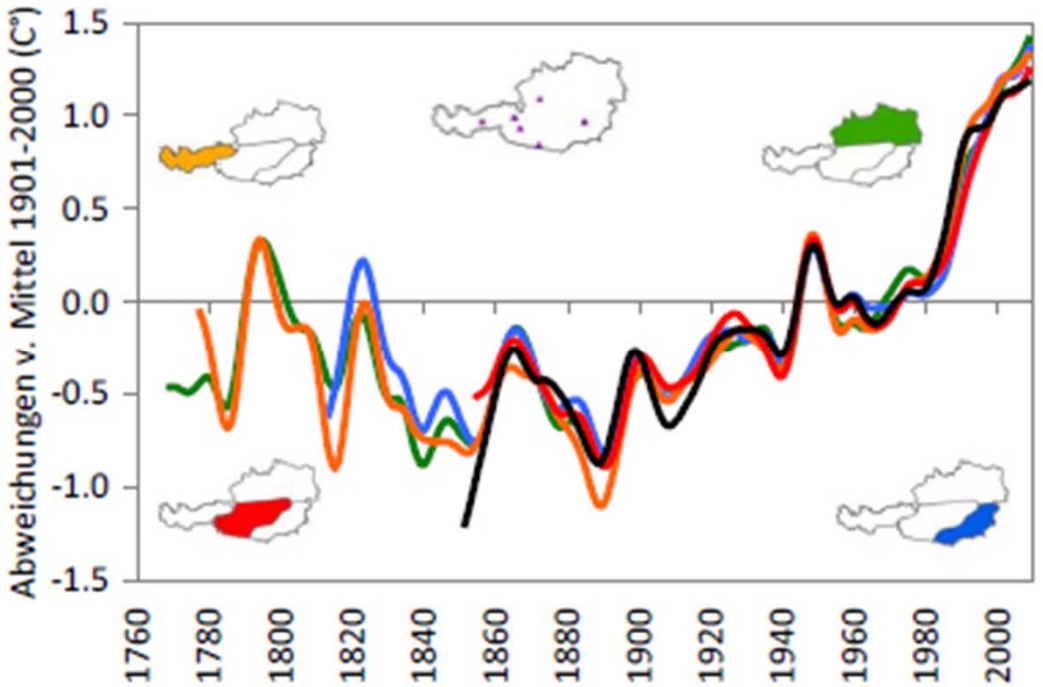
- 30+ local, regional & national Public Authorities
- 20+ Semi-public organizations
- 20+ Public held enterprises
- 100+ Private Enterprises
- 30+ Scientific Institutions



True or False?

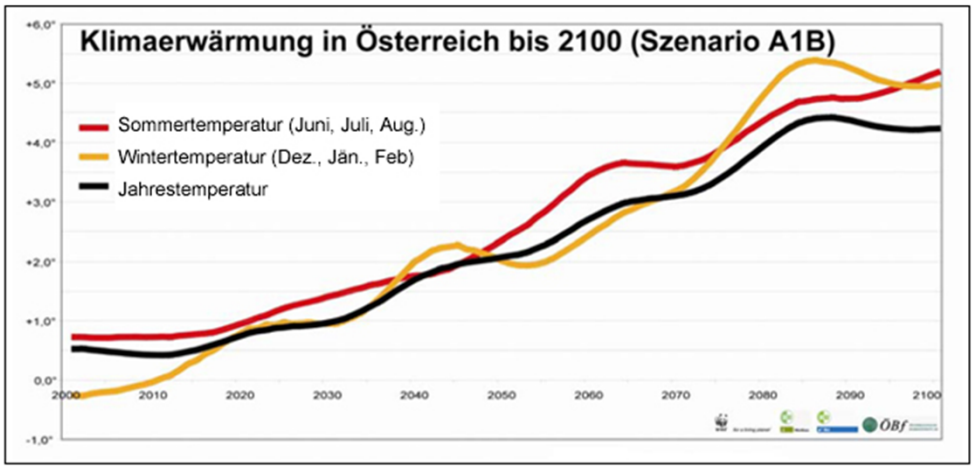
„Climate Change leads to massivly increasing temperatures“

Climate Change – Temperature! (1)

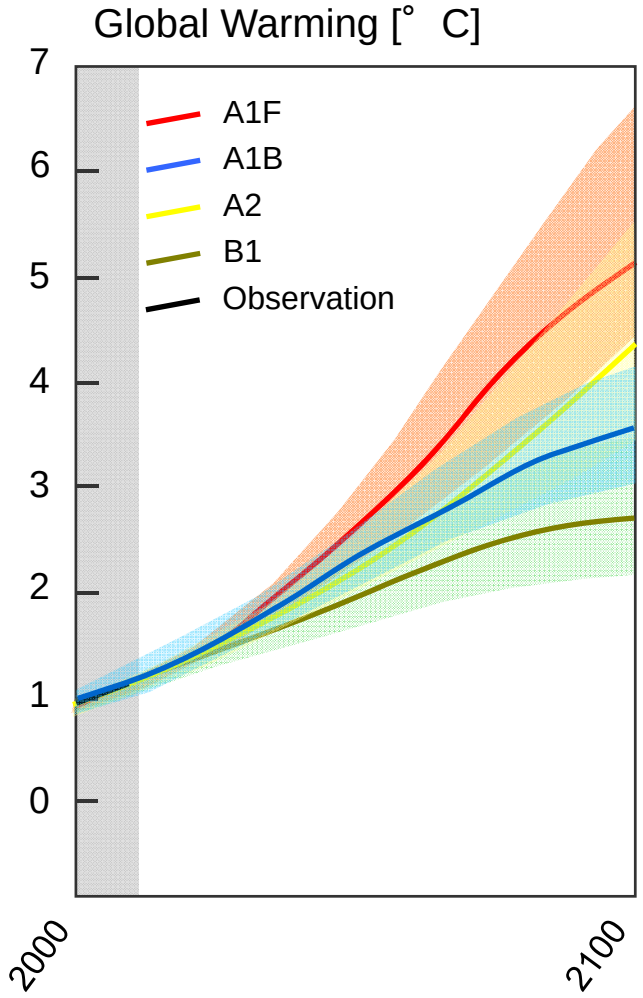


- Increasing variation of average temperature
- Significant increase in temperature since 1850

Climate Change – Temperature! (2)



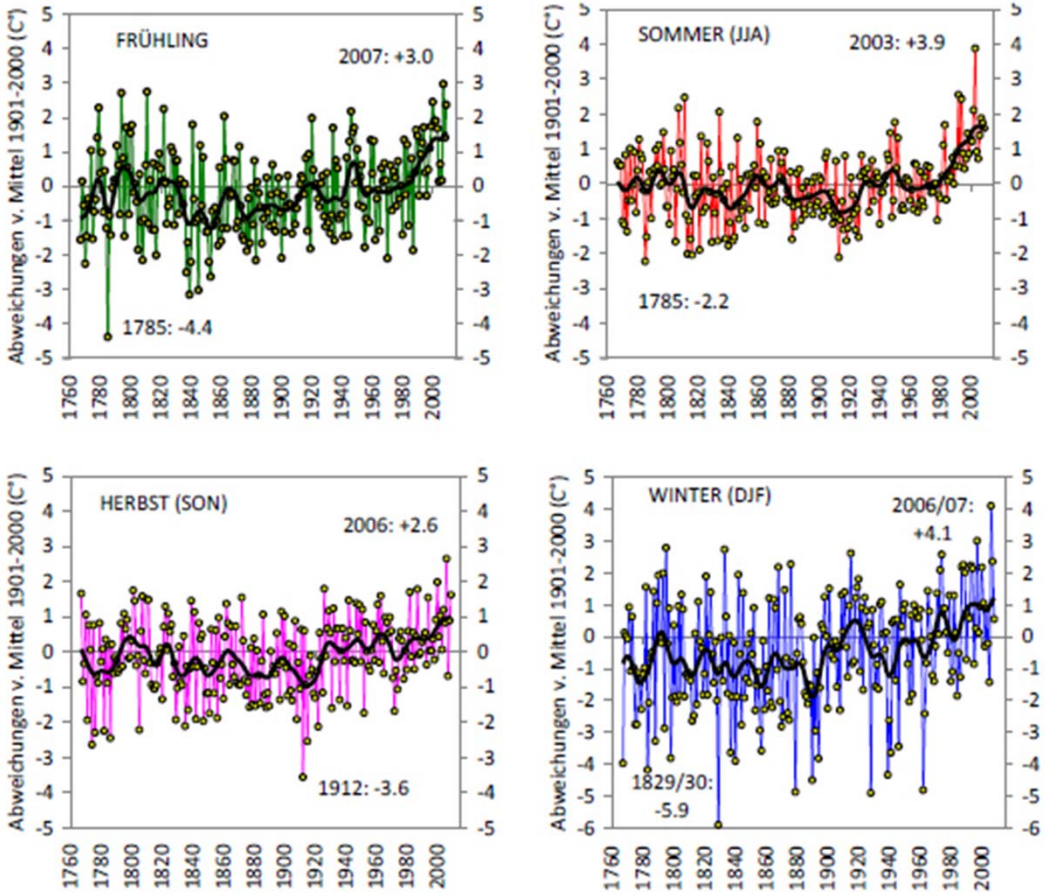
Klimaerwärmung in Österreich bis 2100 (basierend auf dem SRES-Emissionsszenario A1B), Institut für Meteorologie, Universität für Bodenkultur Wien



- Nearly all scenarios show the same direction
- Increase in temperature in until 2100

Climate Change – Temperature! (3)

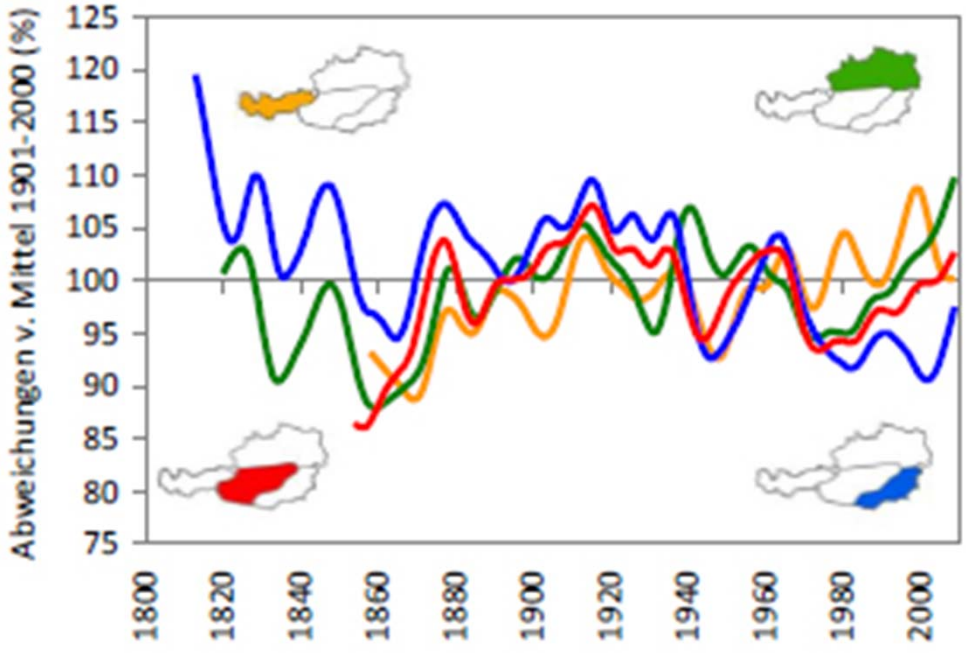
- Increasing variation of average temperature in all seasons



True or False?

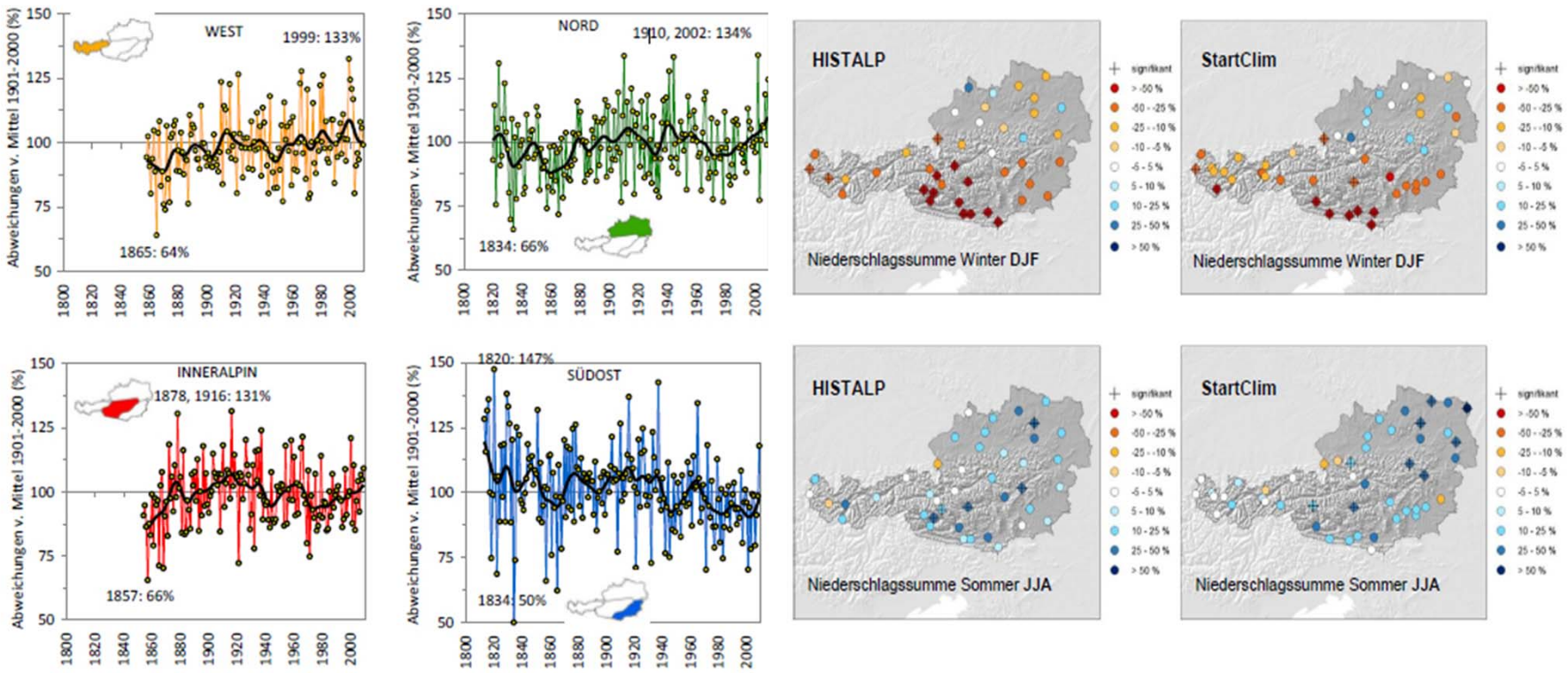
„Climate Change leads to massivly increasing amounts of rainfall.“

Climate Change – Rainfall? (1)



- No significant change in rainfall
- No clear trends for changes in rainfall

Climate Change – Rainfall! (2)



- Regional differences
- Seasonal differences

True or False?

„Climate Change leads to more and bigger natural disasters.“

Climate Change – Extreme Events? (1)

Debris Flows

Climate Change – Extreme Events? (2)

Flooding, Thunderstorms & Hailstorms

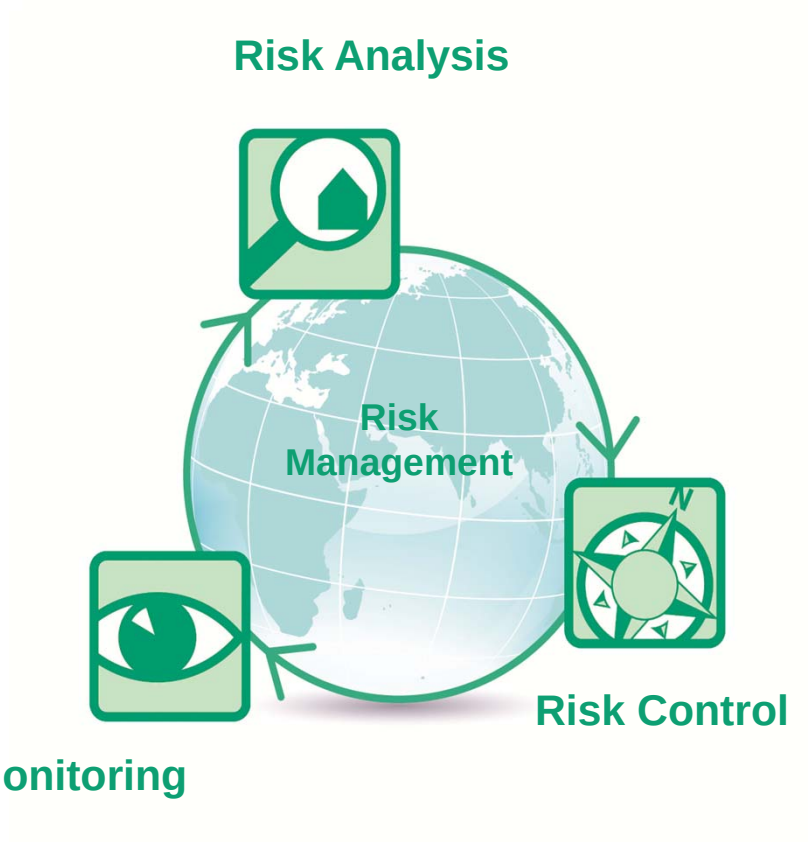
Climate Change – Extreme Events? (3)

Avalanches & Falling Wood

Climate Change – Extreme Events? (4)

Heat Waves & Wildfires

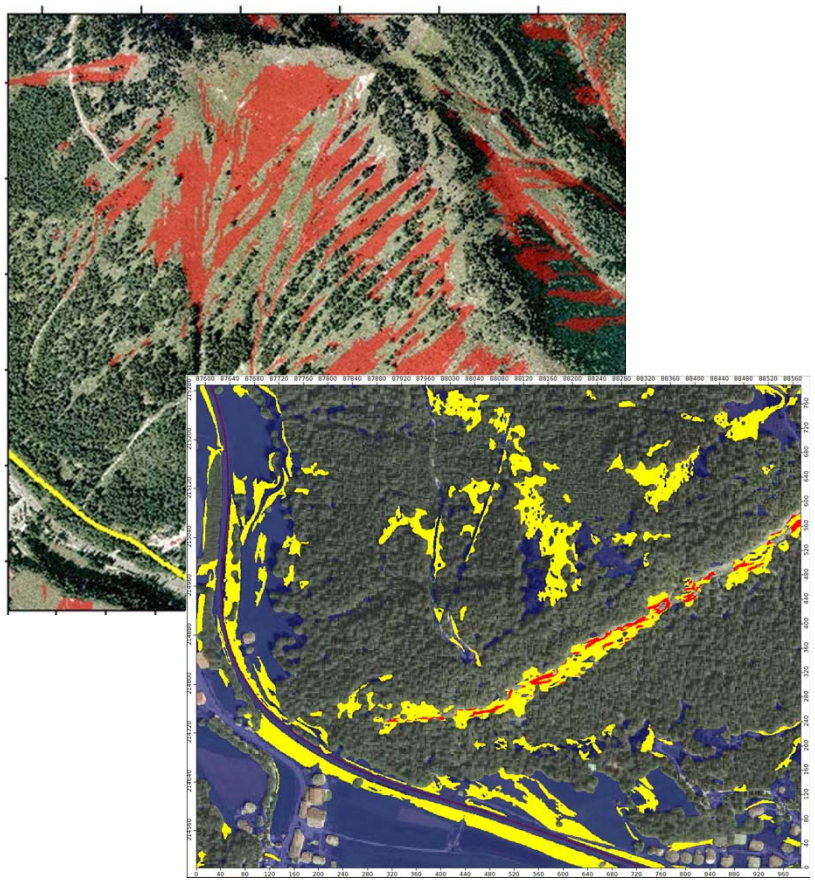
alpS Risk Management Cycle



Technical Risk Analysis (1)

Spaceborne, airborne and terrestrial remote sensing tools

- for climate change impact detection, quantification and adaptation support
- for multi-risk assessments and cascading-effect-analysis



alpS project „CCID“
Development of software tools for climate change induced environmental changes, impact detection and analysis based on laser scanning data.

Technical Risk Analysis (2)

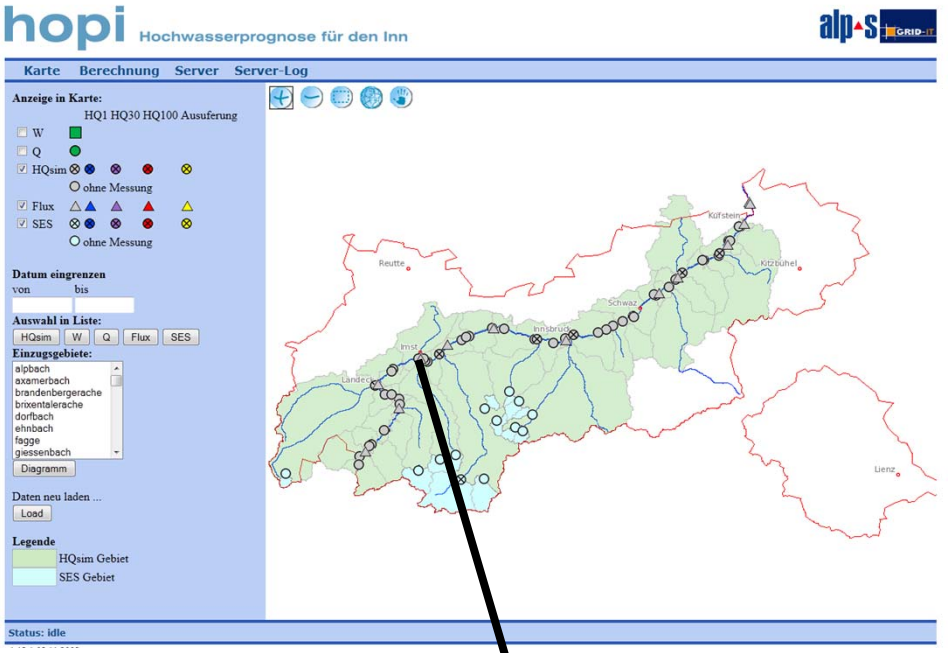
Monitoring Systems for Hazardous Rock Walls and implementation of the corresponding intervention strategies

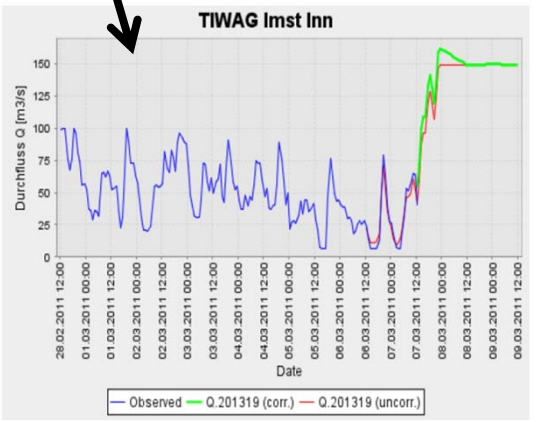
alpS project „MoreExpert“
State of the Art monitoring system for rockfall and permafrost interaction has been established at the Kitzsteinhorn Skiresort (3203m) in Austria.

Technical Risk Analysis (3)

Flood-prognoses systems

- to increase preparedness
- to plan corresponding intervention strategies





alpS project „HoPi“
Flood forecasting system for the Tyrolean river Inn that runs with a 48h prognosis horizon. Different sources of uncertainty were analyzed to further improve the overall model performance

Technical Risk Analysis (4)

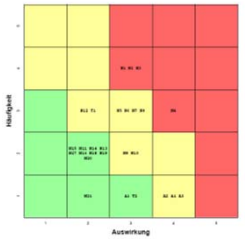
Process Analyses, Monitoring and Modelling of Deep-seated Landslides in High Mountain Areas

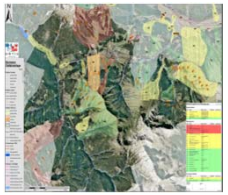
alpS project „ProMM“
In depth analysis of deep seated land slides in the surroundings of the infrastructure operated by TIWAG (Tyrolean Water Supply Company).

Bottom-Up Risk Analysis (1)

- Bottom-up risk assessment workshops
  - Capture local knowledge/experiences
  - Add-on to technical analysis
  - Ensure a sense of ownership
- Potential participants
  - Company experts
  - Volunteer organizations
  - Emergency units
  - Critical Infrastructure Experts
  - …
- Methodology
  - Moderated story telling
  - Expert interviews
  - Group discussions

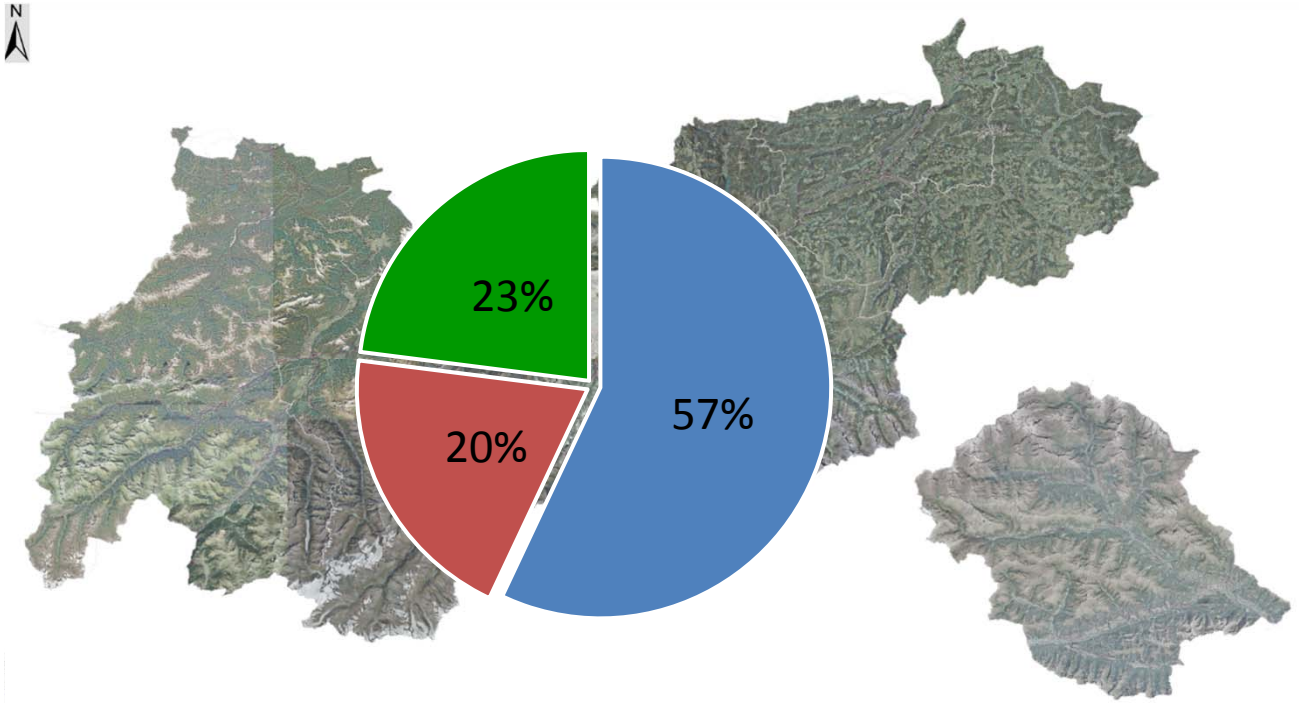
Bottom-Up Risk Analysis (2)





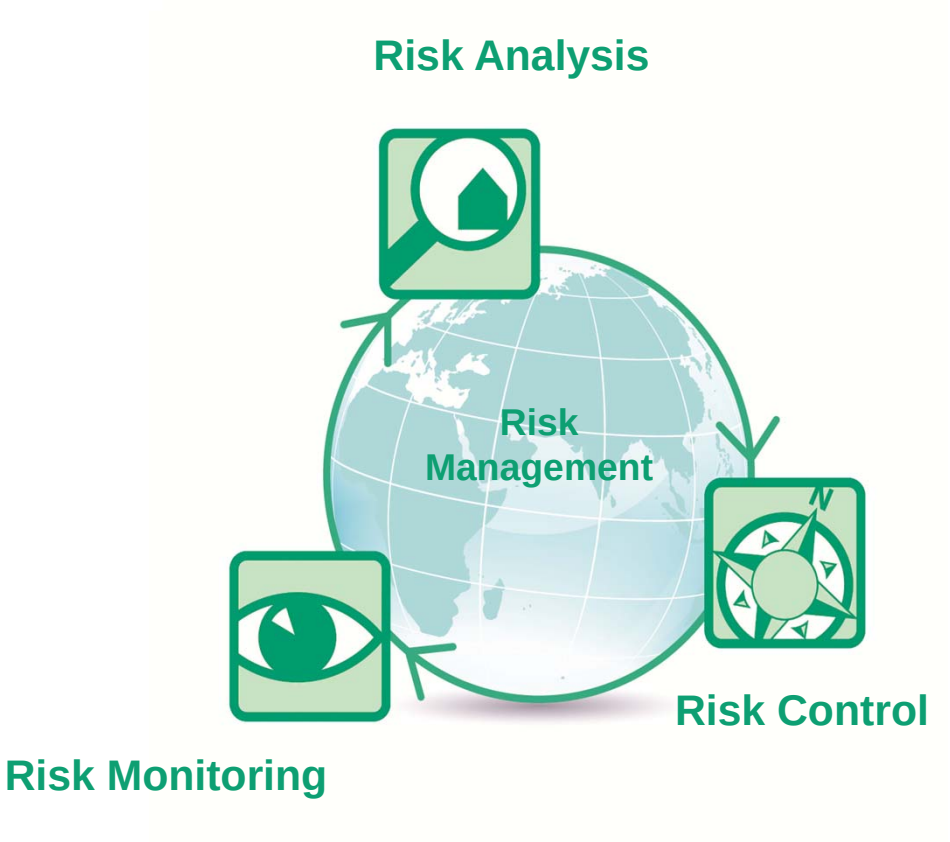
Local DRR Team

Area Wide Risk Assessment in the Province of the Tyrol



- 1700+ local participants
- 1500+ members of emergency units
- 300+ Political leaders
- 300+ Experts for critical infrastructure

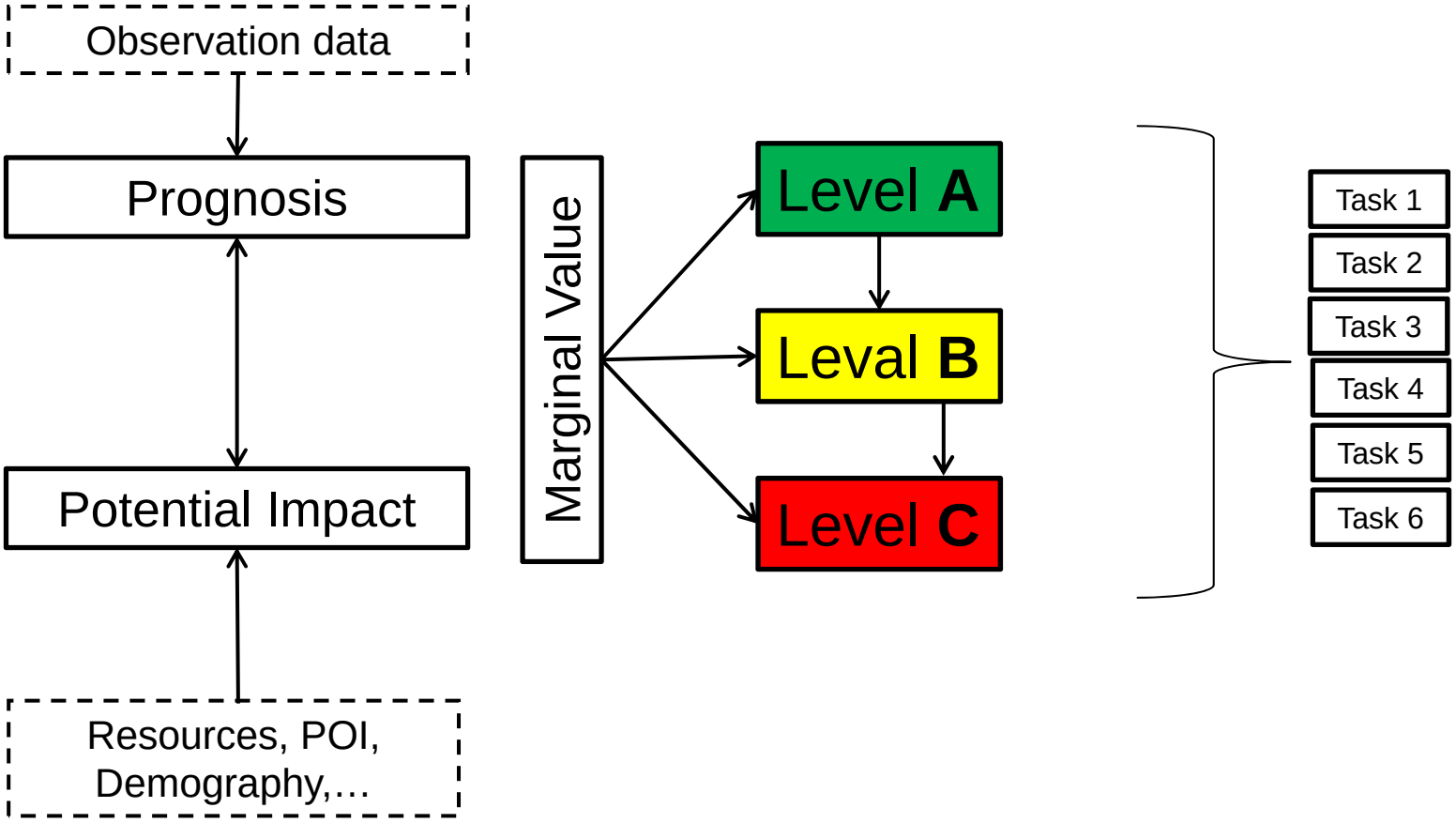
279 Local Emergency Management Teams with 3500+ members


Risk Analysis
Risk
Management
Risk Control
Risk Monitoring

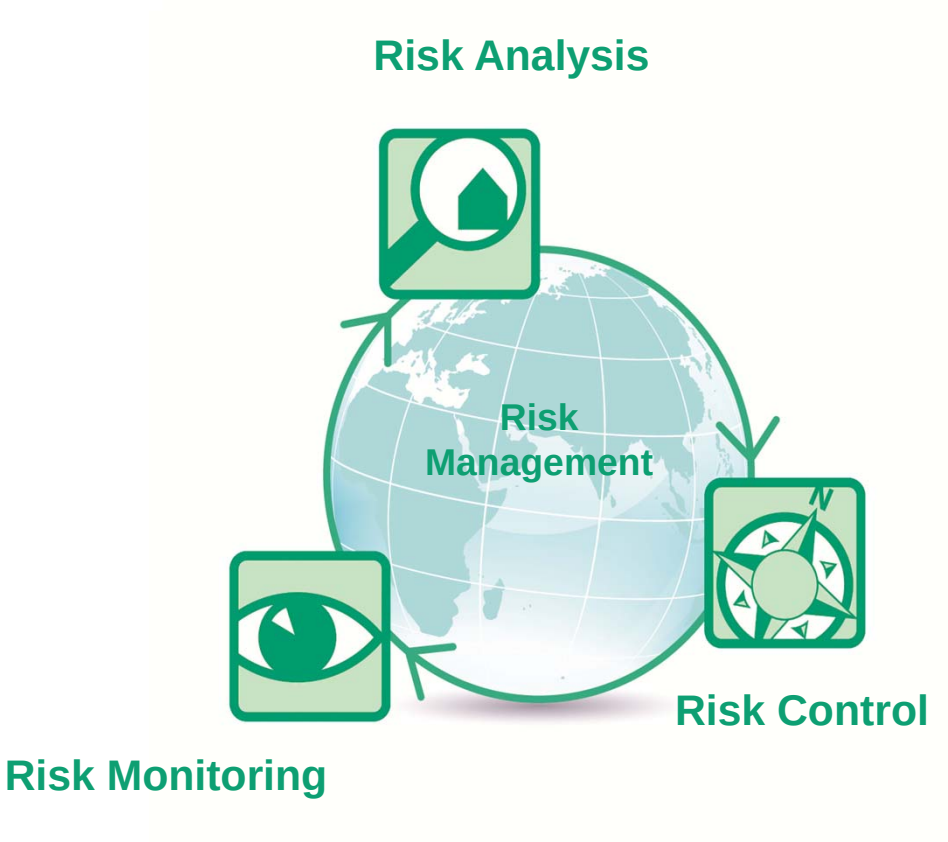
Risk Control – Increase Preparedness (1)

- Based on the Bottom-Up Risk Assessments
- Setting up a Crisis Management Group
- Tailored education
  - Online training
  - Lectures
  - Adjusted to the needs
- Tailored Trainings & Exercises
  - Table-top-exercises
  - Dry runs
- Review and feedback sessions

alpS Intervention Concept

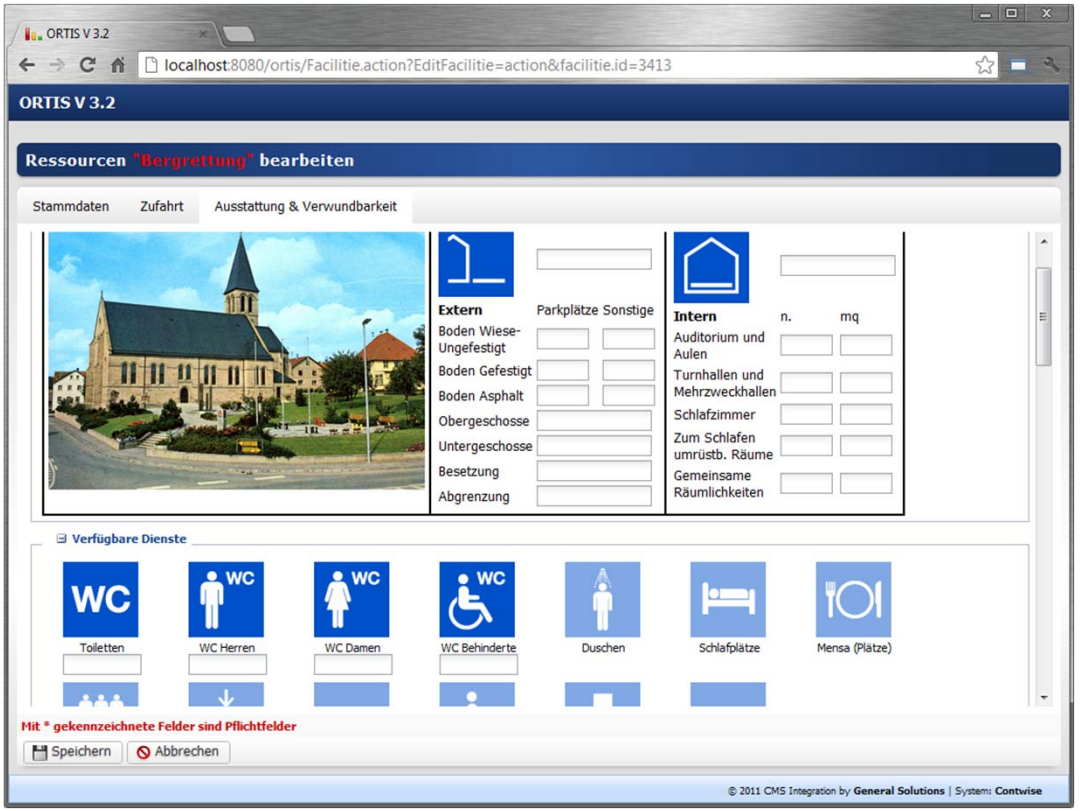


alpS Risk Management Cycle



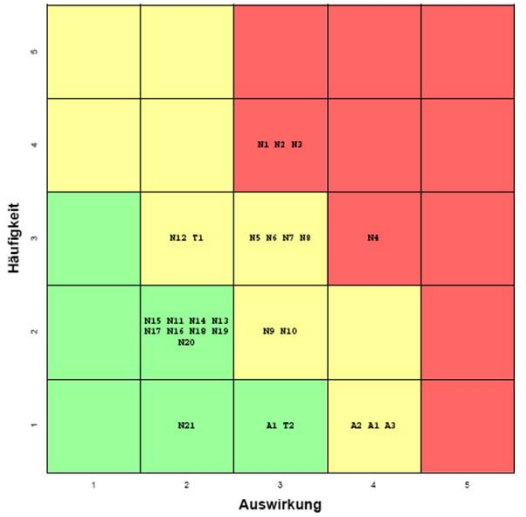
Risk Monitoring – ORTIS Risk Information System (1)

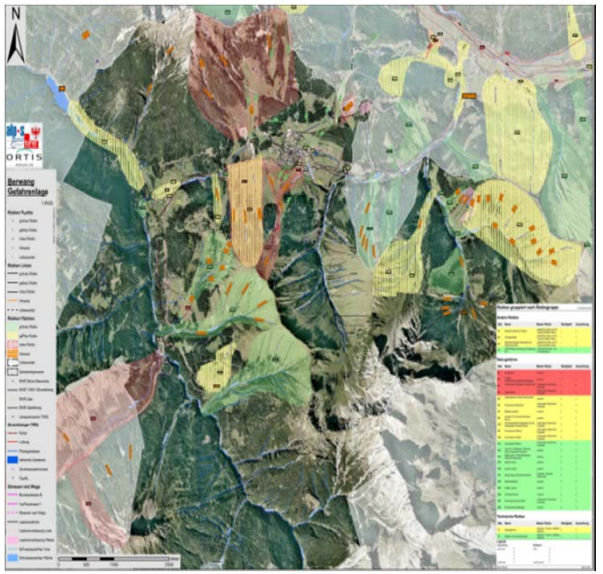
- Developed to support the risk management process
- A clearly structured guideline and assists municipalities
- User-friendly, web-based tool and a dynamic knowledge repository
- Offers illustration, visualization and reporting functions



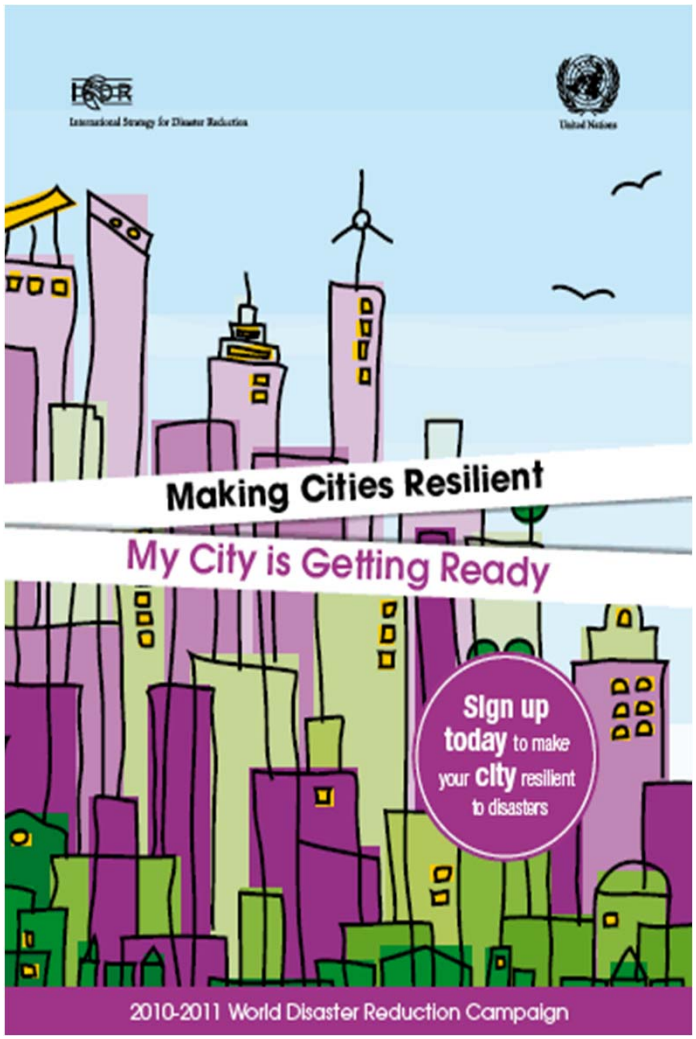
Risk Monitoring – ORTIS Risk Information System (2)

- ORTIS knowledge repository tool
  - Identify and structure resources
  - Store, structure, develop and analyze information
  - Focus on strength and share knowledge
  - Make local knowledge available on higher administrative levels
  - Allow easy transfer of information top-down and bottom-up
  - Integrate and enrich existing data
  - Map risks
  - Map resources
  - Map intervention strategies





alpS and the United Nations International Strategy for DRR (UNISDR)



Province of the Tyrol/alpS and City of Lienz: "***Role models*** *for community-based risk assessment, management and reduction*" within the UNISDR campaign "Making Cities Resilient"

Discussion!

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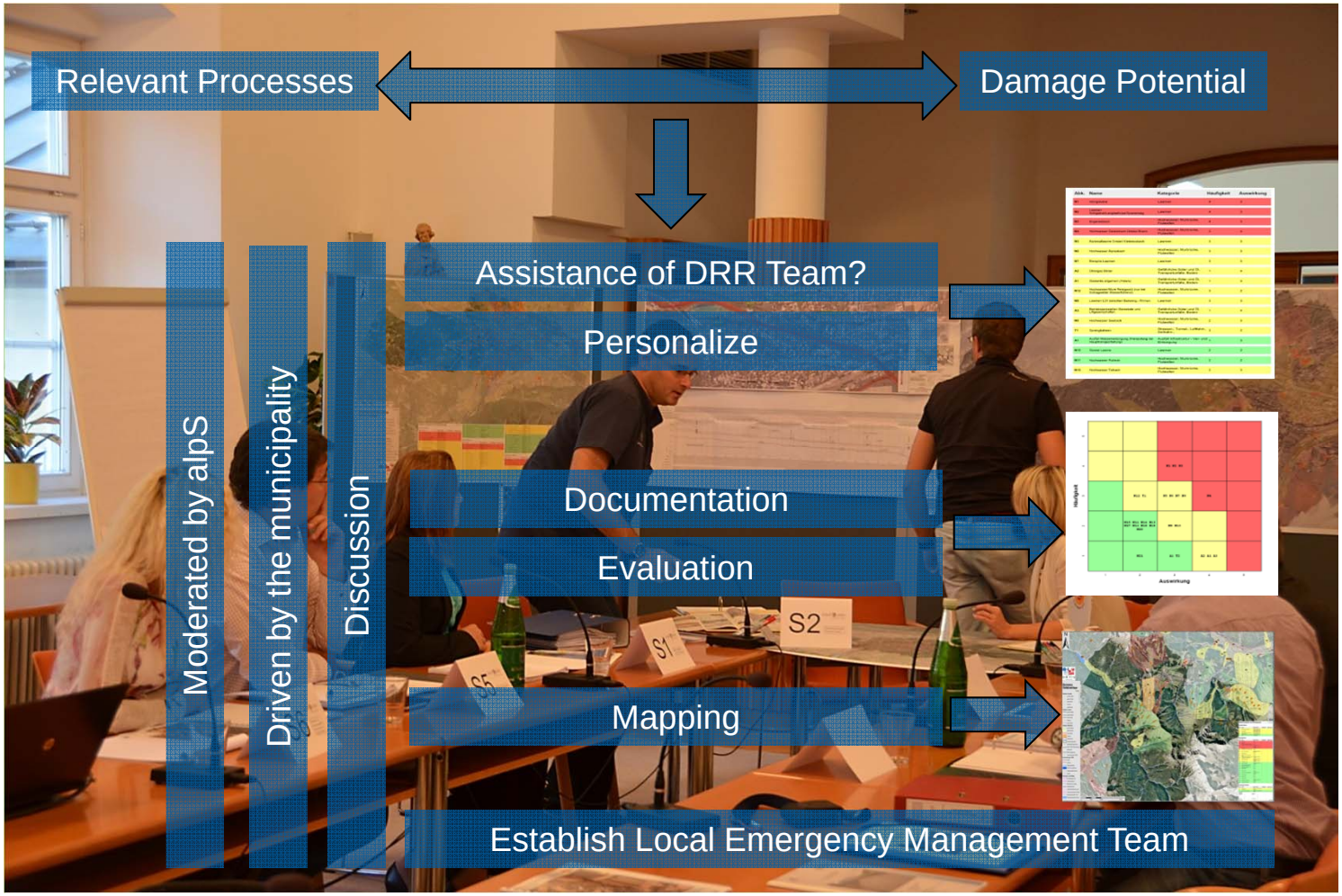
Risk Assessment Workshops (1)

- General Information about the project
  - Political level (mayors)
  - Separate for each district
- Organization
  - Date, Location, Duration
  - Participants
    - Mayor!
    - Ranger/Woodsman/Municipality Worker
    - Fire Brigade
    - Red Cross/Mountain Rescue/Water Rescue
    - Critical Infrastructure Experts (Water Supply, Energy, Hospital,…)
    - Dominating Companies/Institutions (Ski resort Operators, Event manager,…)
    - Anyone who wants to share knowledge/experiences
    - Opinion Leaders
  - Final Call!
- Preparation
  - Technical (maps, existing activities,…)
  - Soft facts (who? what? how? when?)
    - *“Pick them up where they are now”*

Risk Assessment Workshops (2)

Ranger | Fire Brigade | Infrastructure | Mayor | Local Population | …

External Experts (alpS)



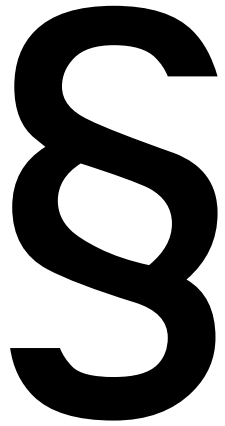
Experts from Provincial Level (EWEMC Tyrol)

Legal and Structural Framework (1)

- 9 Provinces → 9 different DRR legal frameworks
- Tyrolean Disaster Management Act 1970 (revised in 2006)
- Mayor is responsible for implement on local level:
  - Know your risks!
    - Identify, Evaluate, Map
  - Establish, educate and train your capacities
  - Include local communities and stakeholders in your Risk Assessments
  - Establish a local Emergency Management Team
  - Provide results to higher level authorities
- Provincial Early Warning and Emergency Management Centre
  - Personal DRR support for municipalities
  - Provide services and tools/Educate and Train
  - Guarantee a minimum level of DRR area-wide
  - Further support those who want to do more

§ 3
Gefahrenlage, Gefahreneinschätzung

Im Gemeinde-Katastrophenschutzplan sind unter Darstellung der katastrophenrelevanten örtlichen Stellen und Einrichtungen die Katastrophen, insbesondere hervorgerufen durch Hochwasser, Muren, Flutwellen, Lawinen, Wildbäche, Steinschlag, Felssturz, Erdrutsch und andere Naturgefahren sowie durch Brand, Großbrand, Explosion, Chemiegefahr, Ölunfall, Strahlungsquellen und sonstige Katastrophenfälle (beispielsweise Terrorakte, Seuchen und Epidemien) und deren potentielles Gefahrenausmaß, vor allem wie viele Personen und welche Gebäude und sonstige Einrichtungen durch diese gefährdet werden können, anzugeben.



Legal and Structural Framework (2)

§ 3
Gefahrenlage, Gefahreneinschätzung

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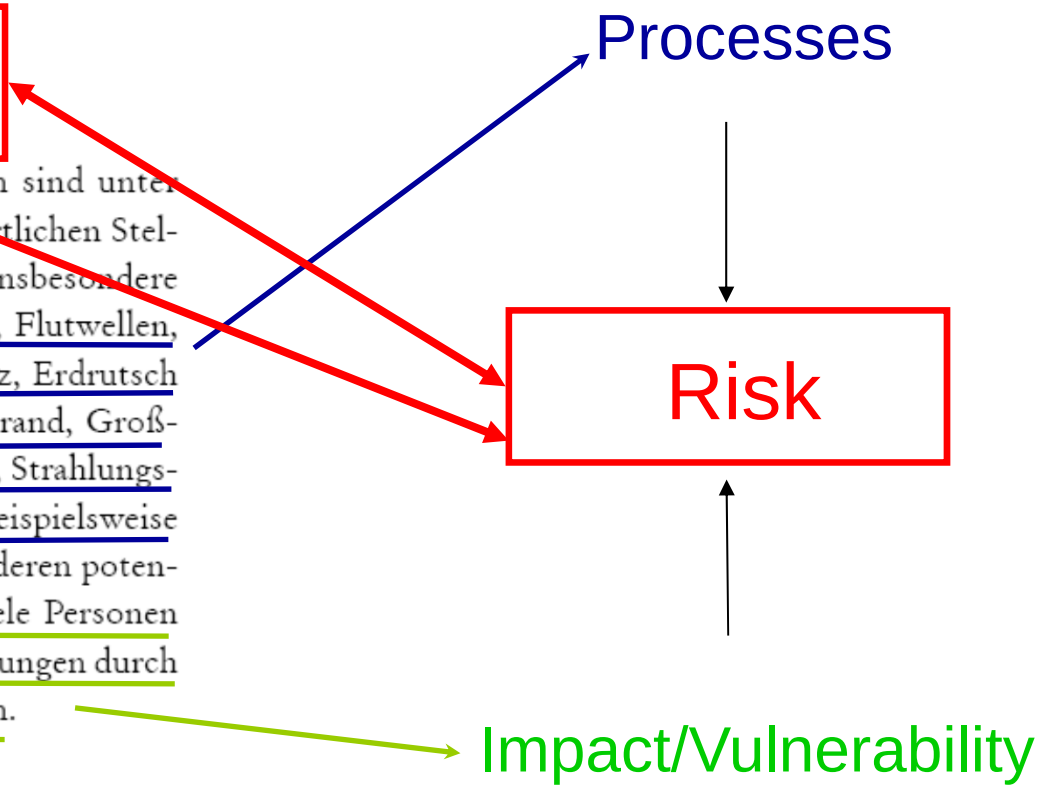
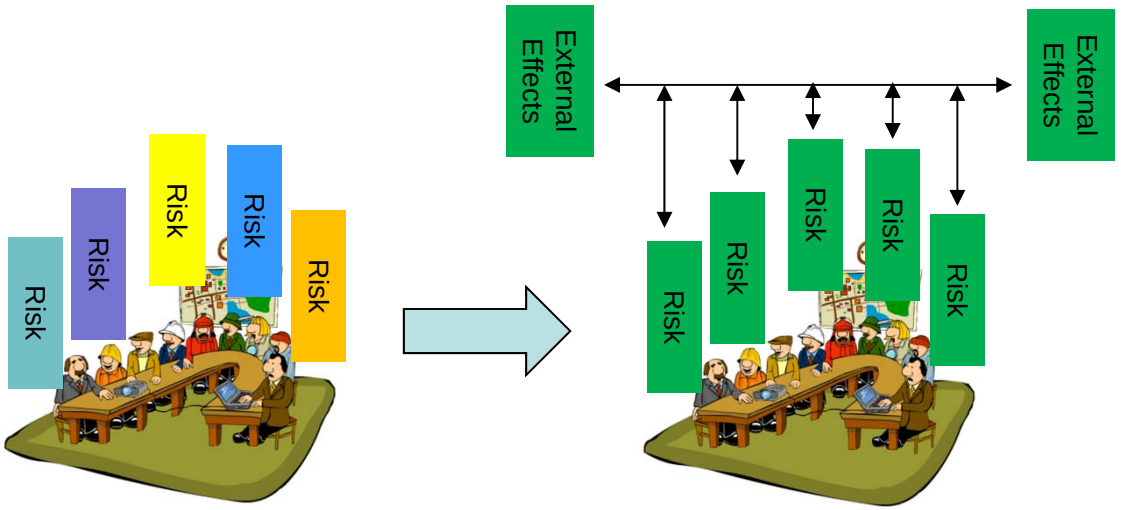


Risk Assessment Workshops

- Why is DRR important for your municipality?
- Are you already active in DRR?
- Introduce the concept of Multi-risk
- Learn how to discuss about risks
- How to identify cascading effects and correlations
- How to deal with measures that have been taken
- “Moderated Story-telling”

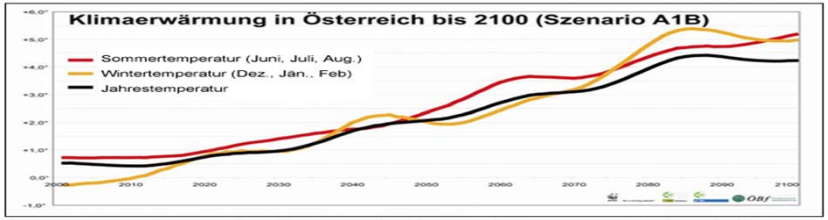


How to talk about Climate Change?

- Review the last decades
  - Maximum water level
  - Glacier development
  - Extreme weather events
  - New challenges
    - Heat Waves → drought
    - Permafrost

- Focus on “Change” and its implications for DRR in local level
  - Climate
  - Demographic
  - Structural
  - …

“We want our municipalities to get started but it is not really important why they start!”



Klimaerwärmung in Österreich bis 2100 (basierend auf dem SRES-Emissionsszenario A1B), Institut für Meteorologie, Universität für Bodenkultur Wien

Pedagogical Aspects in working on local level

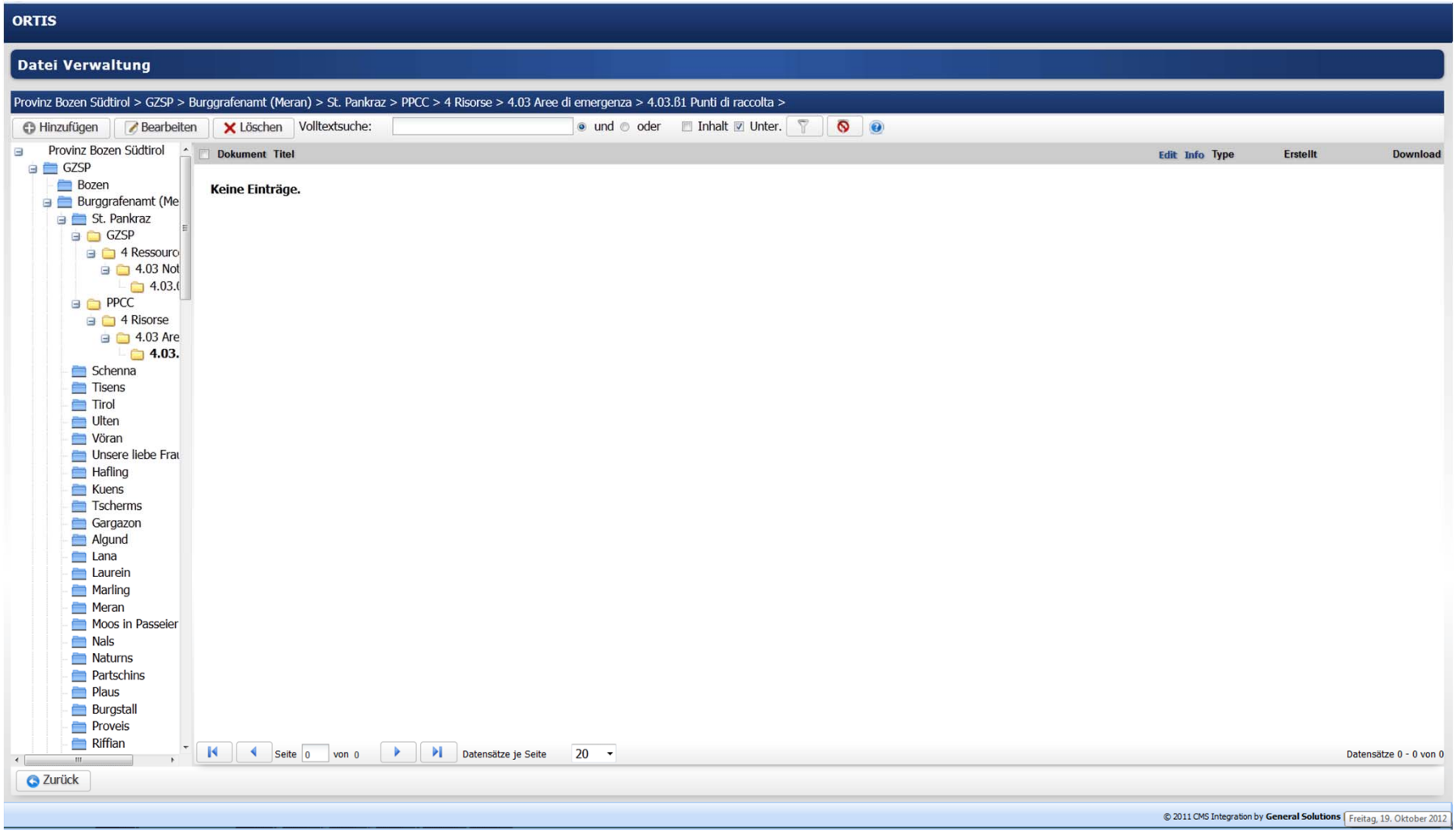
- Structural Differences
  - Exposed to risks vs. not exposed to risks
  - Big Municipalities (130.000) vs. Small Municipalities (60)
  - Natural Hazard Dominated vs. Dominated by other issues
  - Rich vs. Poor
  - Tourism intensive vs. agriculture dominated
  - Professional emergency units vs. volunteer units
  - Technical ability vs. “old-school”
- Different persons participating
  - Interactive Group Discussion vs. Dominating Persons (Mayor!)
  - Small Groups vs. Big Groups
  - Motivated Team vs. Conscripted
- Different levels to start from
  - Newcomers in DRR vs. Experienced Players
  - Structured capacities in place vs. chaotic systems
  - Multi Stakeholder vs. Dominating organization (fire brigade!)

“Pick them up where they are now”

Creating a sense of ownership

“Risks have to be identified on a local level in order to make sure that municipalities feel responsible. Confronting mayors with top-down results leads to a defensive behavior.

ORTIS


ORTIS
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Marling
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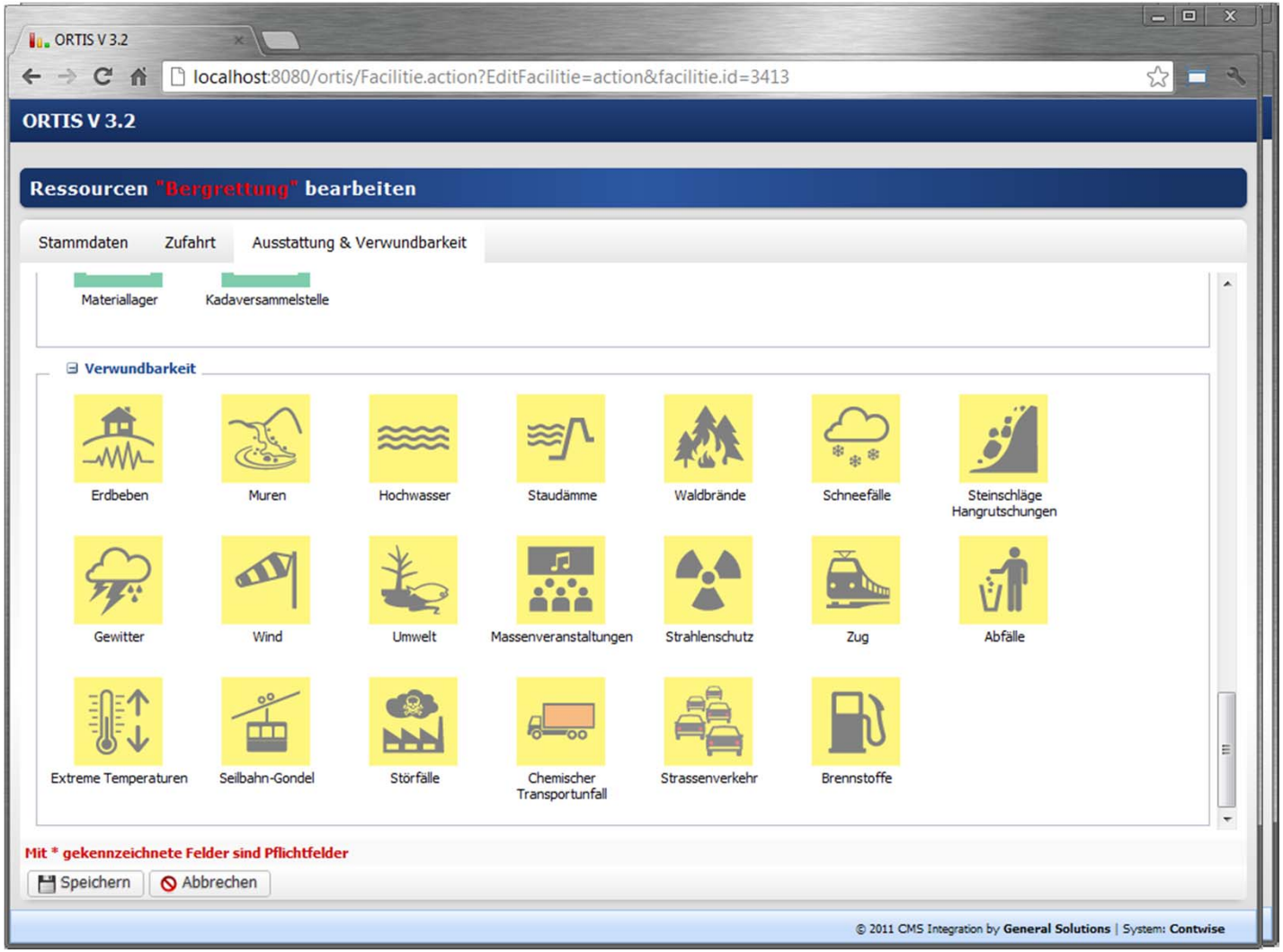
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ORTIS V 3.2
Ressourcen "Bergrettung" bearbeiten
Stammdaten
Zufahrt
Ausstattung & Verwundbarkeit
Materiallager
Kadaversammelstelle
Verwundbarkeit
Erdbeben
Muren
Hochwasser
Staudämme
Waldbrände
Schneefälle
Steinschläge Hangrutschungen
Gewitter
Wind
Umwelt
Massenveranstaltungen
Strahlenschutz
Zug
Abfälle
Extreme Temperaturen
Seilbahn-Gondel
Störfälle
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Mit * gekennzeichnete Felder sind Pflichtfelder
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