Themes

- Raw computing power needed
  - You need a supercomputer – what kind?
  - What kind of interfaces you show?
  - Linked with manpower
  - What you want to compute 10 years from now?
- Emerging links between disciplines
  - Astronomy and atmospheric research
  - Env. Modelling and agriculture, health
    - Saline tolerant crops, invasive species, increased infection risks
- Actionable knowledge issues
  - Who is going to jail?
  - „is this really a trend?“
- Multi-scale issues
  - E.g. global-to-urban climate model, tsunami cases
  - „Bottom up“ phenomena: aerosols on climete, plankton on
  - typhoons

Themes 2

- Communications
  - „Why can‘t you just...?“ (downscale existing models,
  - Cost of doing simulations – fitting the mid map of funding agencies
- Potential showcases/flagships
  - E.g. Taiwan Earth System Model
  - Role of Phytoplankton in typhoon formation
  - Pseudo global warming case (“no mitigation approach can cope”)
  - “What would happen if we restored palm forests?”
  - DMCC
  - Traffic analysis
  - Flooding in Mekong delta
- Problem focused approach
- Vocabularity
  - Ontologies (“gravity” issue)
  - Partnerships
- Urbanisation, Climate and canopy effect mentioned often

Themes 3

- Limitations mentioned often – common framework?
  - Computing capacity related (computing, memory, storage, network,…)
  - Other technical issues (measurement accuracy, coverage)
  - Access issues (cost of computing and data sets)
  - Sustainability (funding, retaining skills)
  - Process issues (version mgt practices)
  - Policy issues (mandates of organisations, AUPs)
  - Manpower (available amount, skillsets)

Panel discussion

- What is Environmental Computing?
  - Use models as a tool to explore complex phenomena, disaster mitigation
  - Two sides: #1 science to provide hypothesis, #2 disaster mitigation to save lives (even with incomplete data)
  - Model natural resources
  - Communication approach
  - Next level of understanding
  - Way to apply scientific results in practice?

Panel discussion

- Using (major) IT infrastructures, best practices
  - "I don't use them, I train others"
  - Own cluster, close collaboration with computing centre
  - Resolving the equipment/services budget issue open issue
    - One approach: federating dedicated equipment
  - Scalability limits can appear early with current model software
    - Individual CPUs are not noticeably getting faster
  - Urgent computing is of definite interest
- Cloud in limited use, attractive vision
  - Put all data in the cloud?
  - Open data easier starting point than computing?
  - Cost?
- Open data interesting, brings up issues
  - Governance, regulations,…
  - Limits the scope of possible research activities

Panel discussion

- Data issues
  - Openness inversely proportional to political sensitivity
  - Face to face meetings needed
- Training and education
  - “Urgent programming approach” shows promise – in Asia
  - Awareness of the available services
  - Professors approach and practices an important factor
  - Partnership between model developers and IT resource managers important
- Research to production?
  - Consulting model a pathway to commercial use
  - Public sector funding is still largely project-based, sustainability difficult even for mature commponents
  - Gap between ministries
  - Lack of understanding of the power of simulation

- Link to the practitioners (government,…) best practices
  - Personal contact, message tuned to the audience
  - Media is important
  - Researcher to researcher communication often easy, government less so
- Closing statements

- Thank you!!
  - Morning presentations already at www.envcomp.eu
  - This will follow soon
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Questions

- Knowledge discovery – how do you find experts?
  - Own field/adjacent ones
  - Which are the important hubs?
- Time to impact?
  - How long does it take to have an impact on the ground?
  - What it depends on?
  - How to speed up the process?

Questions

- Criteria for issuing a warning?
  - Does this change if you need to rely on someone else's results?
- Best practices related to collaboration
  - Inter-actor, interdisciplinary,…
- Key organisations and other collaboration structures
  - WMO, NASA mentioned many times
  - Others?