

Activities of the Tritium/C14 Working Group

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Fall Meeting

- **The fall meeting was held in Baden-Baden, Germany, from September 13-17, in conjunction with the 7th International Conference on Tritium Science and Technology**
- **By combining the two meetings, we were able to minimize travel costs, maximize attendance and interact with the fusion community, which is a major user of our work**
- **23 participants attended the WG meeting**
- **We regret that we can't be in Vienna with you this week**



Spring Meeting

- **The 2004 spring meeting was hosted by Lawrence Livermore National Labs in Livermore, California, April 19-22**
- **17 participants attended the meeting**



Objectives of the Tritium/C14 WG

- To establish the confidence in the predictions of environmental tritium and C-14 models
- To recommend preferred modeling approaches that will result in improved predictions
- To encourage experimental work that will lead to data sets that can be used in model testing
- To provide a forum for the exchange of ideas, experience and information related to environmental tritium and C-14
- To emphasize models of the formation and translocation of organically bound tritium (OBT)



Activities of the WG

- **On-going**
 - Aquatic scenario
 - Soybean scenario
 - Terrestrial food chain scenario
 - Scenarios involving hypothetical accidental releases
 - Pine tree scenario
- **Planned**
 - Scenarios involving OBT dynamics in large animals and aquatic organisms
 - Scenarios involving C-14

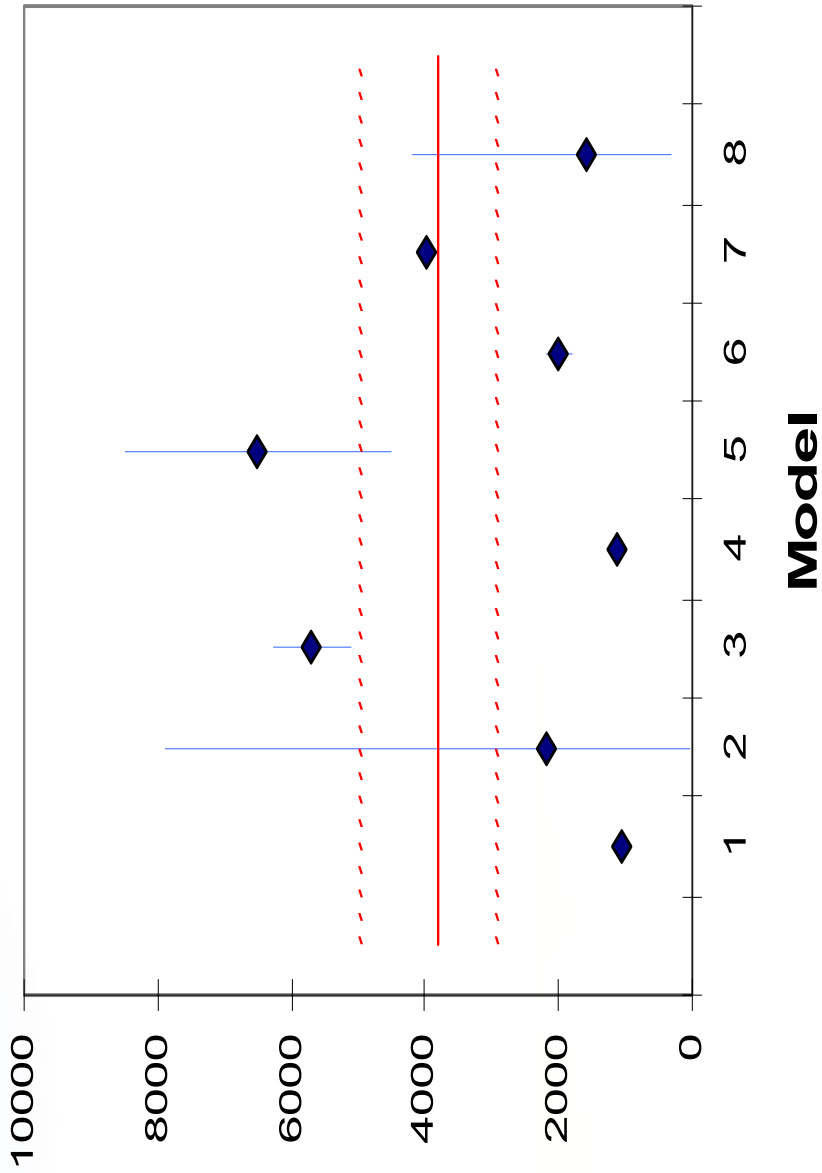


Aquatic Scenario

- A test of models that predict equilibrium tritium concentrations in an aquatic ecosystem subject to a continuous release of HTO
- Endpoints are HTO and OBT concentrations in sediments, plants and animals given the HTO concentrations in air, lake water and sediments
- Results were submitted by 8 participants and were discussed in Livermore. The scenario is now closed.
- A draft report was presented and discussed in Baden-Baden
- The final report will be prepared for the spring meeting



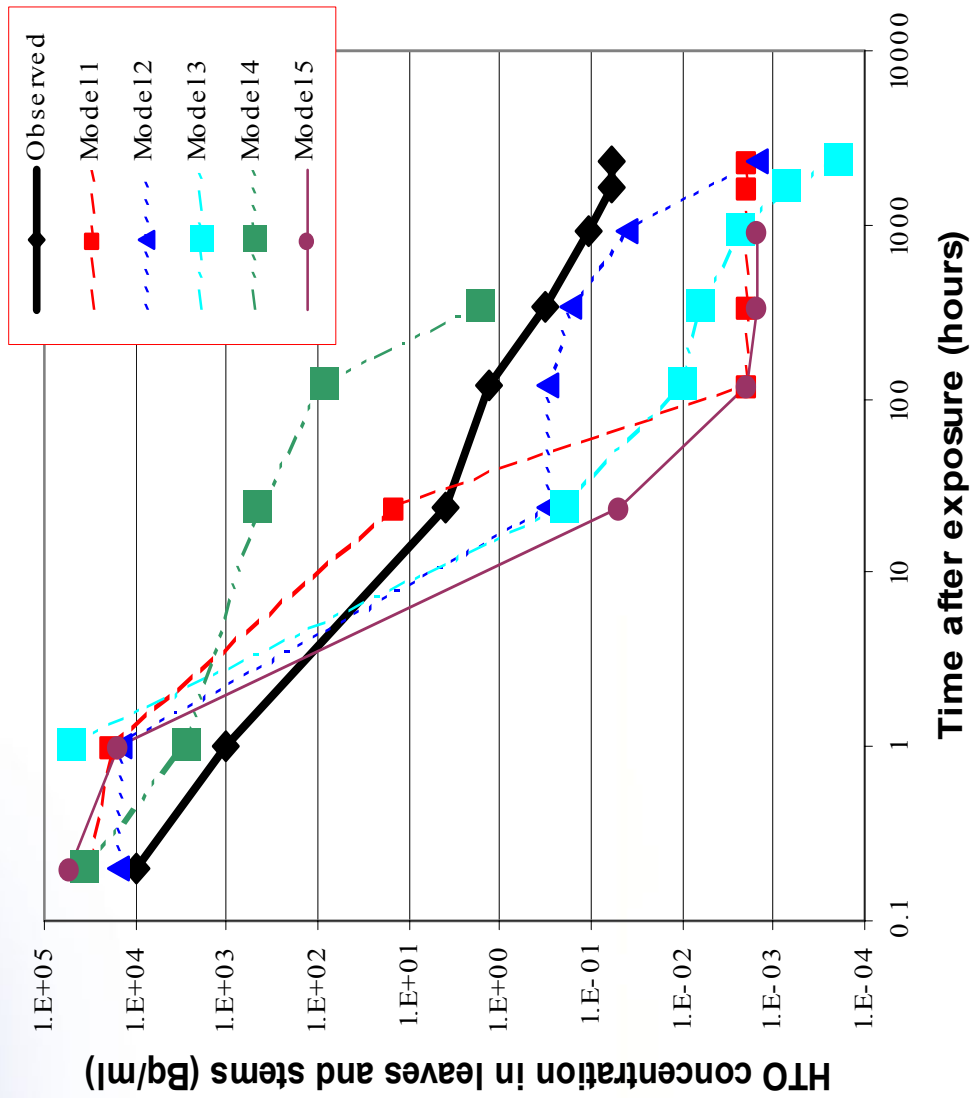
OBT concentration in bullheads (Bq/L combustion water)





Soybean Scenario

- **A test of models that predict time-dependent behaviour of tritium in plants subject to a short-term exposure to HTO in air**
- **Endpoints are HTO and OBT concentrations in various plant parts at various times after exposure, given HTO concentrations in air**
- **Results were submitted by 12 participants and were discussed in Livermore. The scenario is now closed.**
- **A draft report was presented and discussed in Baden-Baden**
- **The final report will be prepared for the spring meeting**





Food Chain Scenario

- **A test of models that predict tritium concentrations in terrestrial food chains due to continuous atmospheric releases of HTO**
- **Endpoints are HTO and OBT concentrations in market crops, animal feed and animal products (milk, beef, chicken, eggs) given HTO concentrations in air, precipitation and drinking water**
- **Results were submitted by 6 participants and were discussed at Baden-Baden**
- **The scenario remains open until the end of November**
- **A draft report will be prepared for the spring meeting**



Hypothetical Scenarios

- Scenarios based on hypothetical, short-term releases of HT and HTO to the atmosphere
- Endpoints are HTO and OBT concentrations in various environmental compartments and doses from all exposure pathways, with the aim of providing the information needed by decision-makers to manage an accidental release
- Results from 7 participants showed considerable scatter since modelers interpreted some of the input data in different ways
- A revised scenario description will be distributed shortly, followed by another round of calculations that will be discussed at the spring meeting



Pine Tree Scenario

- **A test of models that predict tritium concentrations in pine trees due to continuous atmospheric releases of HTO. Results from this scenario could help in reconstructing historical tritium releases from OBT concentrations in tree rings.**
- **Endpoints are HTO and OBT concentrations in pine needles and tree rings, given HTO release rates and meteorological data**
- **The final scenario description was distributed in early October. Calculations are due in mid-February and will be discussed at the spring meeting**



Tritium Dynamics in Fish and Large Animals

- Scenarios are under development to provide a test of dynamic models of HTO and OBT behaviour in fish and large animals in response to a change in ambient tritium levels
- An aquatic scenario involving fresh water mussels will be presented at the spring meeting
- The WG is liaising with the Russian Institute of Agricultural Radiology and Ecology in Obninsk, which may be able to supply data sets involving chickens, sheep or cows through an ISTC program



C-14 Scenarios

- Possible C-14 data sets were discussed at Livermore and Baden-Baden
- The WG decided to take on a scenario involving C-14 in rice subject to continuous atmospheric exposure and is presently looking for a scenario leader
- The WG is also interested in a data set involving short-term exposures of plants to C-14 in air
- The solicitation and evaluation of C-14 data sets is continuing



2005 Spring Meeting

- **The WG hopes to hold its 2005 spring meeting in mid to late April in Cardiff, Wales**