



Participant Profile

for the
Turkish-German Strategy Workshop 2006
TÜBİTAK Marmara Research Center,
Istanbul- Gebze Turkey
13 – 15 December 2006



International Bureau (IB)
of the Federal Ministry of
Education and Research
(BMBF)

1. Contact details and personal information

Name:	Dr. Frank Wendland	Phone:	++49 2461 61 3165
Role/function¹:	Working group leader	Fax:	2518
Institution:	Research Centre Juelich	E-Mail:	f.wendland@fz-juelich.de
Department:	Institute of Chemistry and Dynamics of the Geosphere - ICG –IV Agrosphere	Website:	http://www.fz- juelich.de/icg/icg-iv/index.php
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Postcode and City:	52425 Juelich		

¹ **Role/function** e.g. working group leader, managing director, postdoc, PhD etc.

² **Organisation type** e.g. university, research institution, small and medium enterprise (SME), industry etc.

Working Group:	<input type="checkbox"/> 1 Material Technologies <input type="checkbox"/> 2 Biotechnology, Genomics and Food <input type="checkbox"/> 3 Energy <input type="checkbox"/> 4 Information and Communication Technologies <input checked="" type="checkbox"/> 5 Environmental Protection, Climate Change and Sustainable Development	
Areas of activity:	<input checked="" type="checkbox"/> research <input type="checkbox"/> technology development <input type="checkbox"/> demonstration	<input checked="" type="checkbox"/> training <input type="checkbox"/> dissemination <input type="checkbox"/> other:
Keywords characterising your area of research:	Please choose the appropriate key words (max. 5) from the following list: http://www.cordis.lu/fp6/keywords environmental geology, agricultural hydrology, modelling (environmental risks), catchment scale water management, integrated water management	



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**Expertise,
technologies and
infrastructures
available in your
institution:**

Research activities / expertise (Frank Wendland):

environmental geology, agricultural hydrology, modelling (environmental risks), catchment scale water management, integrated water management

Methods (Frank Wendland): Water balance models; nutrient flux models

Key technologies of ICG - IV: Lysimeter, Tracer experiments, GIS

Infrastructures of ICG - IV: LCMSMS, NMR, radioisotope lab

Key publications Frank Wendland (2002 – 2005, only reviewed articles):

Kunkel, R.; Wendland, F. (2002):

The GROWA98 model for water balance analysis in large river basins - the river Elbe case study. *Journal of Hydrology* 259, 152-162.

Wendland, F.; Kunkel, R.; Grimvall, A.; Kronvang, B.; Müller-Wohlfeil, D.I. (2002): The SOIL-N/WEKU model system - a GIS-supported tool for the assessment and management of diffuse nitrogen leaching at the scale of river basins. *Water Science and Technology* 45 (9), 285-292.

Gömann, H.; Kreins, P.; Kunkel, R.; Wendland, F. (2003): Koppelung agrarökonomischer und hydrologischer Modelle. *Agrarwirtschaft* 52 (4), 195-203.

Wendland, F.; Kunkel, R.; Voigt, H.-J. (2004): Assessment of groundwater residence times in the pore aquifers of the River Elbe Basin. *Environmental Geology* 46, 1-9.

Wendland, F.; Bogena, H.; Gömann, H.; Hake, J. F.; Kreins, P.; Kunkel, R. (2005): Impact of nitrogen reduction measures on the nitrogen loads of the river Ems and Rhine (Germany). *Physics and Chemistry of the Earth* 30 (8-10), 527-541.

Wendland, F.; Hannappel, S.; Kunkel, R.; Schenk, R.; Voigt, H.-J.; Wolter, R. (2005): A procedure to define natural groundwater conditions of groundwater bodies in Germany. *Water Science and Technology* 51 (3-4), 249-257.



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2. Past and present research collaborations

Are you familiar
with the European
Framework
Programme?

Yes

No

- with Framework Programme 5
 with Framework Programme 6
 with Framework Programme 7

EU-projects you are
involved in:

**Programme title / contract number / title / acronym / your function
(coordinator / partner / contractor)**

Past projects

FP4/ ???/ Regional analysis of subsurface nitrogen retention and its impact on the nitrogen export from land to sea/ RANR/ partner

FP5/ EVK1-2000-00510/European Catchments.- Catchment Changes and their Impact on the Coast/EUROCAT/contractor

Present projects

STREPS/006538/Background criteria for the identification of groundwater thresholds/BRIDGE/partner

LIFE/ENV/D/000182/Water resources management in cooperation with agriculture/WAGRICO/partner

**Other international
collaborations:**

BMBF –IB / TÜBİTAK supported research collaboration (TUR 04/001):

Integrated modelling of nutrient loads and eutrophication in the catchment area of the Izmit Bay, the Tahtali and the Porsuk river basins, Turkey

**Name(s) and
contact details of
potential partners:**

If you would like to suggest the participation of particular partners from the partner country based on existing contacts or collaboration experience, you are welcome to indicate their names and contact details below:

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3. Presentation at the Workshop

I will give a presentation at the workshop (approx. 10 min.) to present my institution, my expertise, and my collaboration interests. The contents of my presentations is summarised below (max. 1 page).



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INTEGRATED MODELLING OF NUTRIENT LOADS IN TURKISH CATCHMENT AREAS

Frank Wendland
Research Centre Juelich, ICG – IV
52425 Juelich

Eutrophication is a major concern in many Turkish and German river basins and marginal seas due to high nutrient concentrations. These originate both from point sources, e.g. municipal sewage treatment plants and from diffuse sources, e.g. from agricultural land. To tackle eutrophication, integrative analyses of nutrient sources, their pathways into surface and groundwater as well as biogeochemical processes are at present performed in a joint German – Turkish research project supported by 'The Scientific and Technological Research Council of Turkey' (TUBITAK) (research project No: CAYDAG-104I071) and the International Bureau of the Federal Ministry for education and research (IB-BMBF, Project-Code: TUR 04/001).

In this project interdisciplinary knowledge from agriculture, hydrology, hydrogeology, ecology and environmental engineering are bundled and form the basis for the development of an integrated nutrient model system. Research work carried out so far has shown that the concept of the water balance model GROWA can be transferred to river basins in Turkey. In this way the most important runoff components, which are also responsible for the transport of nitrate to groundwater and surface water, are identified. The next steps for integrated modelling concern the coupling of the GROWA model with the Regional Agricultural and Environmental Information System (RAUMIS) and the modelling of nitrate retention (residence time) and degradation with the WEKU model. In a more general sense the joint research project will provide a mutual understanding for integrated watershed modelling and the legal aspects of the water quality legislations in Germany and in Turkey within the EU framework.

With regard to the essential aims of the European framework directive (EU-WFD) the promotion of sustainable water management strategies is of great importance. A fundamental problem with the implementation of the EU-WFD is the applicability of the sustainability principle by using suitable measures against the background of ecological and economical boundary conditions. A long term objective in the area of nutrient pollution is a standardisation of methodologies in order to achieve a comparability of analyses. For this purpose the existing German - Turkish research network (Kocal et al, 2006) needs to be extended. Testing and further developing the interdisciplinary model network in two fundamentally different areas i.e. in Turkey and in Germany may provide a significant step for an area wide application of instruments and methodologies. In this framework, plausibility checks of model input parameters (e.g. soil parameters derived from maps) as well as model results (e.g. modeled nitrate concentrations in groundwater vs. observed groundwater data) have to be performed.

Extending the German – Turkish research activities in the field of integrated modeling of nutrient loads in river basins in the way described above may enhance the development of a general applicable model system, which can to be used by planners, industrial associations, manufacturers and decision makers.

Reference:

M. Kocal, M. Karpuzcu, F. Wendland, B. Tetzlaff, A. Pekdeger, S. Oncel, H. Voigt, G. Engin (2006): PRELIMINARY INVESTIGATION ON INTEGRATED MODELLING OF NUTRIENT LOADS IN CATCHMENT AREAS. A CASE STUDY: THE PORSUK RESERVOIR CATCHMENT.- Proceedings of the 10th Diffuse pollution conference, Istanbul 18. – 22. Sept. 2006.

I agree with the publication of my data on the Workshop website!



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PLEASE FILL IN THIS FORM **UNTIL 22 SEPT. 2006** AND RETURN IT TO:

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