

FuzzyXL

Fuzzy algebra add-in for MS Excel™

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Fuzziness is *essential characteristic of nature*. Each day we meet tasks set in fuzzy terms:

- ◆ how much fuel should I pour into the tank, if there is approximately 12 gallons in it;
- ◆ should I feed my dog now, if I think that with high probability my son did it before leaving to school;
- ◆ do I need to change my tires for studded ones, if long-term weather prognosis for winter says it could be quite cold and snowy winter, etc.

More important

There exist much more important fuzzy tasks.

For example, when an *earthquake happens* and rescue team is preparing to take off, they have only *uncertain information* about the details of catastrophe.

Decision needed

At the same time definite decisions are very important, because *more than 75%* of victims could be rescued only during *few hours* and the first plane should be loaded with the *mostly needed* specialists, machines and materials.

How to calculate the needed amounts of this or that knowing only *fragmentary and uncertain information?*

We know the decision

There is *no software or hardware instrument* nowadays able to help solving this problem instantly and with reasonable accuracy.

The described task *could be solved* by *MS Excel* powered with new abilities of *FuzzyXL* add-in.

Presentation Plan

1. Market niche and possible users.
2. FuzzyXL description and usage example.
3. New benefits of MS Excel with FuzzyXL add-in
4. Summary.

- ◆ Usual software programs make calculations on bit-oriented basis (yes-no, on-off, 1-0).
- ◆ Real life is more complex, it deals with *shades of gray*.
- ◆ Software understanding such terms as "*almost*", "*few*", "*enough*", etc. is in need now.

Market snapshot

Fuzzy calculations are now offered by *highly specialized* and *complex* mathematical and engineering software packages.



Market is in need of comparatively *easy-to-use* and quite *powerful* software tool for fuzzy calculations.

In the following fields of human activity:

- ◆ Business
 - ◆ Environment Protection
 - ◆ Rescue Operations
 - ◆ Medicine
 - ◆ Housekeeping
- etc.

Fuzzy XL add-in for MS Excel

New add-in distinct from all existing add-ins, giving considerably new functionality to MS Excel.

- ◆ *Strong mathematical basis.* All MS Excel functions for which fuzziness could be reasonable are made fuzzy (27 mathematical and 12 financial functions)
- ◆ *Proven development technology*
- ◆ *Easy to install and easy to use.* There are only couple of removable additional buttons in MS Excel toolbar.

Example based on real facts

Let us consider the following situation.

Oil pipeline was damaged. A hole appeared in the pipe and oil was leaking through it during some period of time. It resulted in environmental damage.

A specialist on environment protection is to estimate the extent of damage.

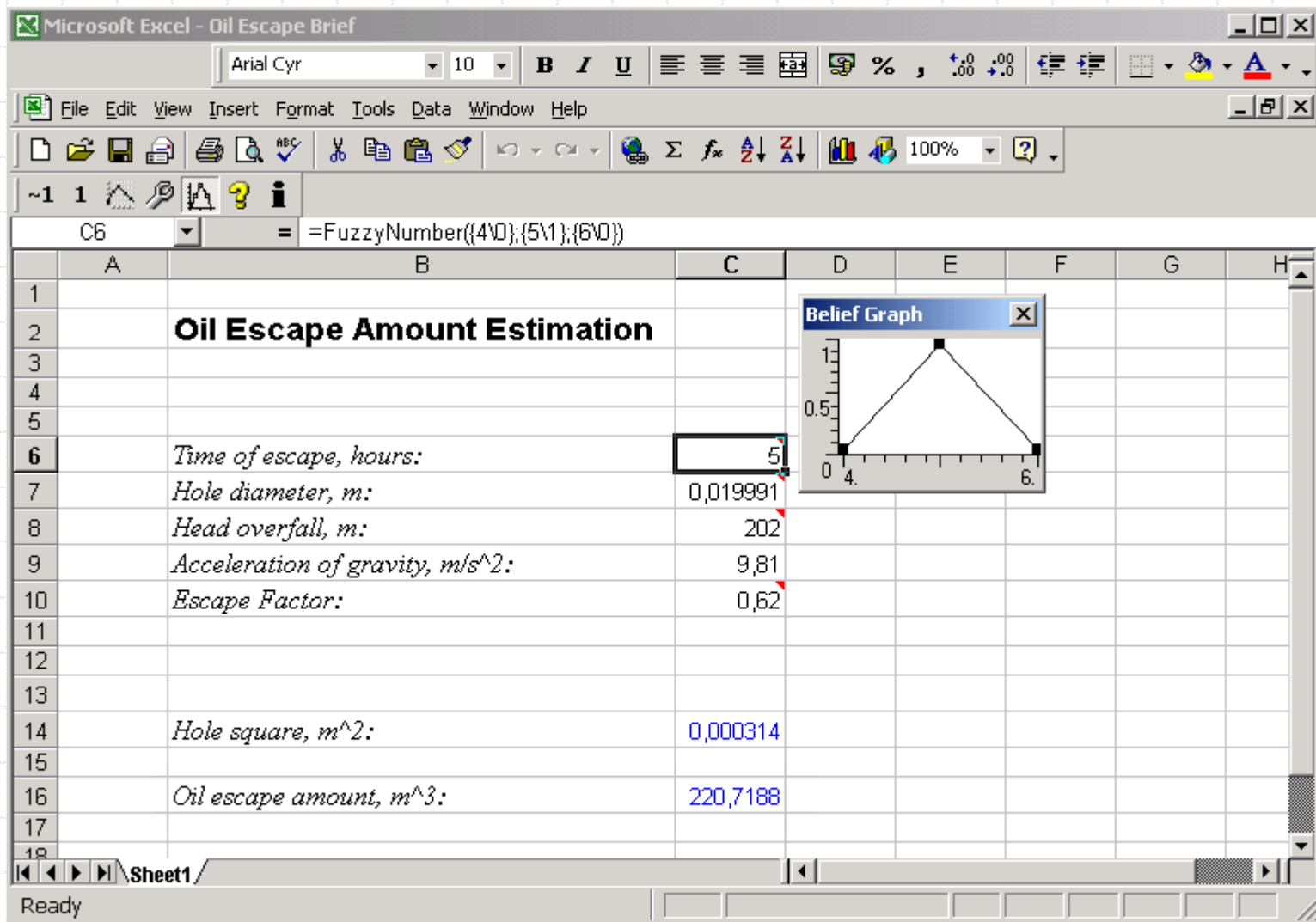
The task

To estimate the damage, first of all volume of oil spilled should be determined. There exist *mathematical formula* used by ecologists to calculate needed value.

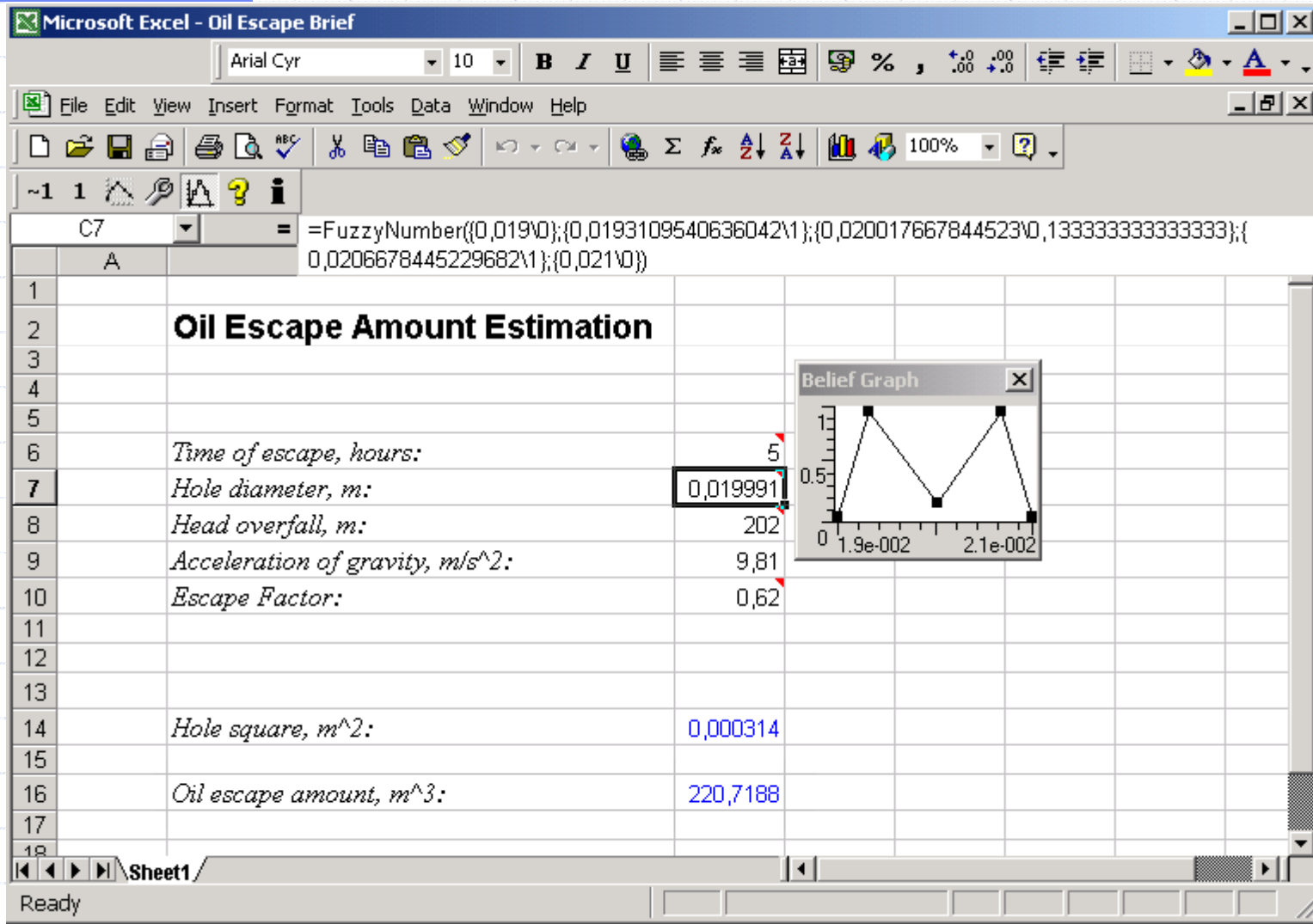
The problem is that some of the parameters in formula are *not known for sure* in real situation. We can only use uncertain estimations.

MS Excel with FuzzyXL add-in *could be used* to calculate volume of oil spilled.

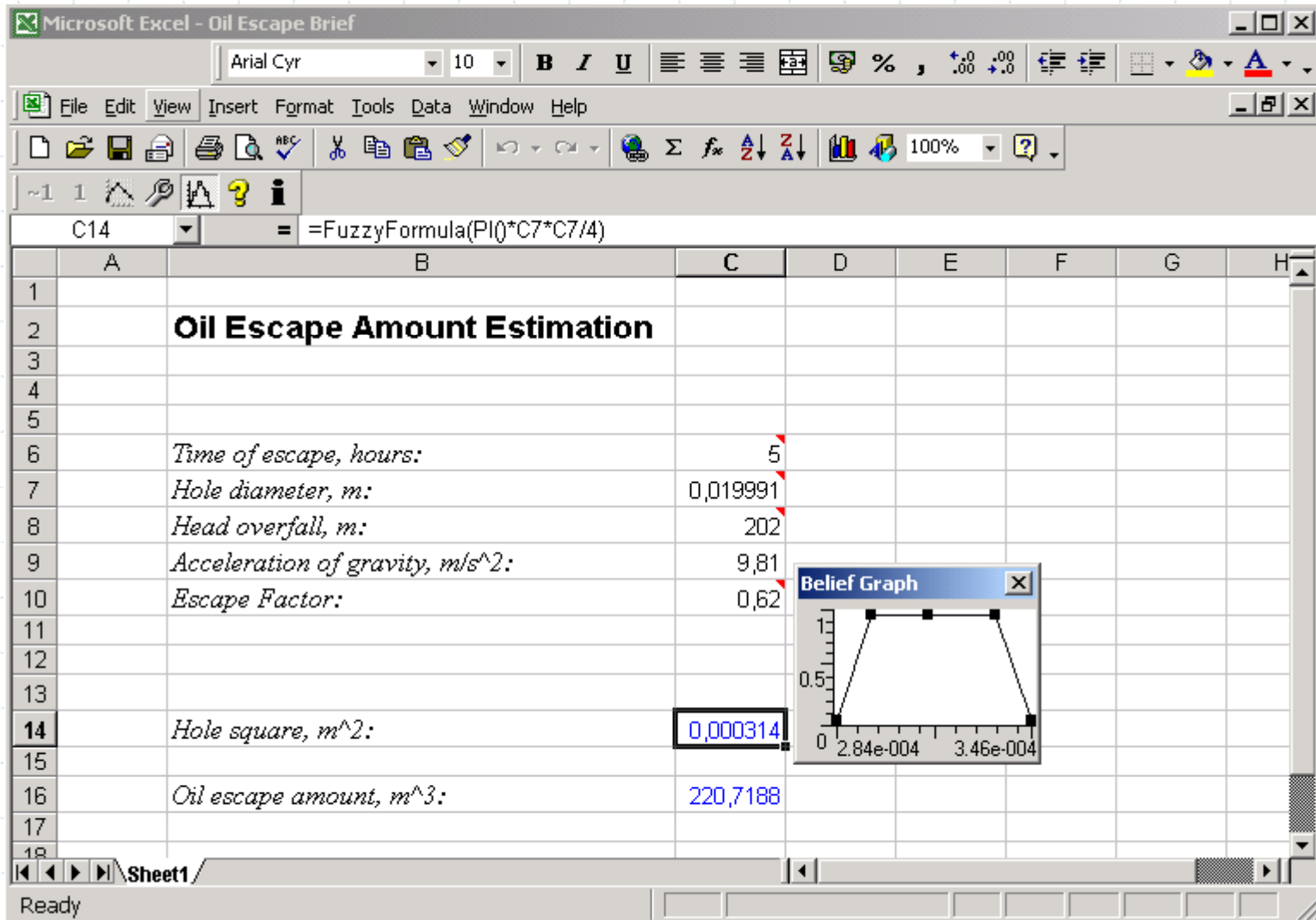
First of all we determine that Time of Escape is not less than 4 hours and not more than 6, and its most probable value is 5 hours.



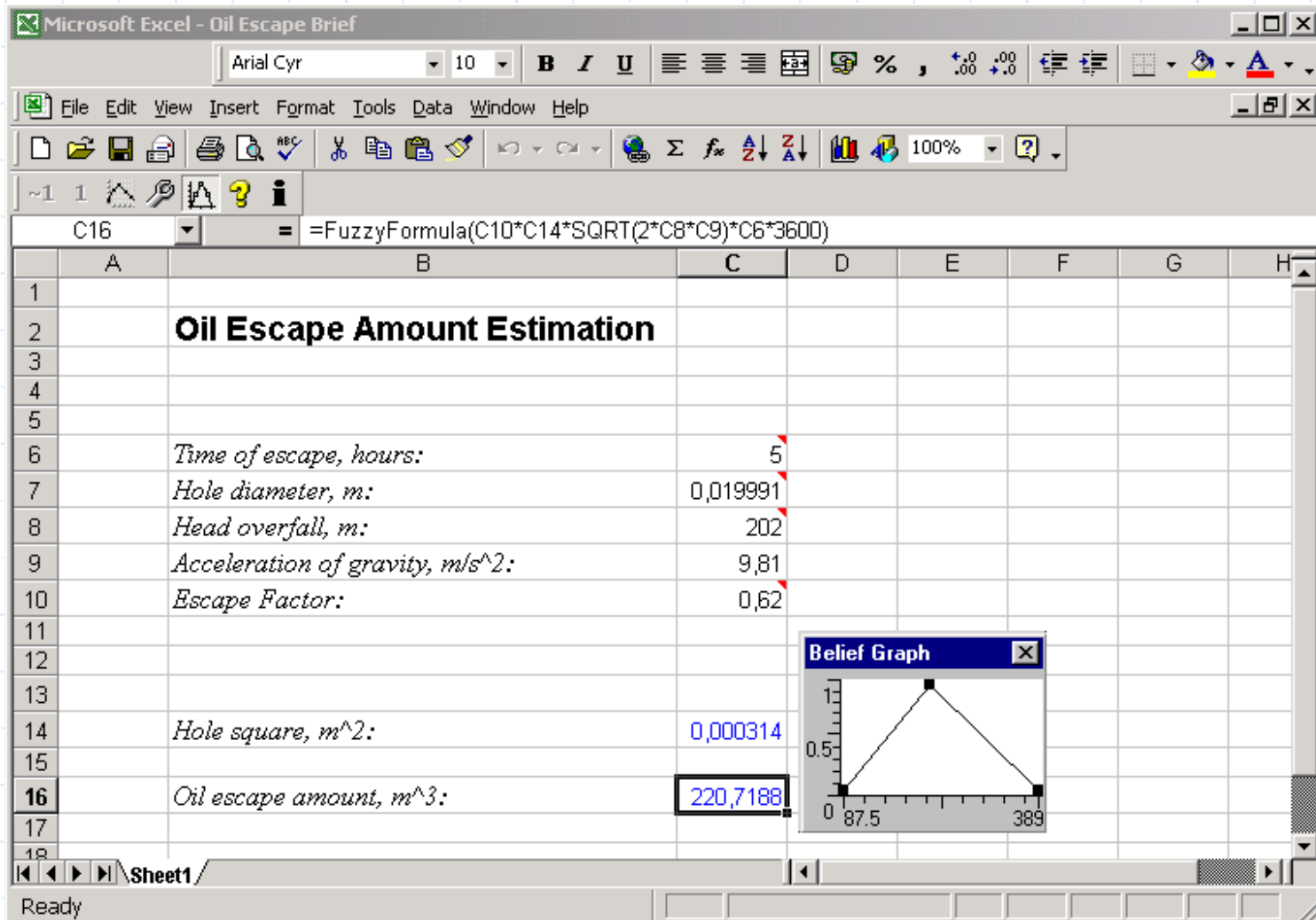
Hole Diameter is not less than 0.019 meters and not more than 0.021, and its closest value with equal probability could be 0.0192 meters and 0.0208 meters.



Hole Square is evaluated automatically. Now we are sure that it is not less than 0.000284 square meters and not more than 0.000346 square meters. With equal probability it could have any value from the range from 0.000292 to 0.000340 square meters.



Oil Escape Amount is evaluated automatically. It will most likely take on the value of 220.7188 cubic meter, and will never be less than 87.5 or more than 389 cubic meters.



So, the needed value is calculated successfully.

MS Excel becomes new remaining the same

FuzzyXL add-in gives to well-known MS Excel considerably *new features* leaving it *absolutely recognizable*.

- ◆ Fuzzy calculations for CEO
 - ◆ Fuzzy calculations for Economist
 - ◆ Fuzzy calculations for Accountant
 - ◆ Fuzzy calculations for Engineer
 - ◆ Fuzzy calculations for Scientist
- etc.

Summary

FuzzyXL is a new add-in *distinct* from all existing add-ins, giving considerably *new functionality* to MS Excel.

This new functionality meets real *market need*.

Summary

Adding considerable amount of *new knowledge* to MS Excel, FuzzyXL add-in leaves MS Excel *recognizable* and easy-to-use.

Summary

Though no special marketing activities have been held to promote FuzzyXL, it has been used for real needs of the Ministry of Environment Protection of Russian Federation, and we have sold number of FuzzyXL copies by requests from *different universities all over the world.*