

# On the conduct of responsible research

First training session ...

on research and professional ethics

For: Water Resources Science Graduate Program  
Fall Semester Orientation

August 2009

# WHAT THIS PRESENTATION IS ABOUT

Five issues related to responsible research and professional practice

1. What do we mean by the term ethics?
2. What are the ideals of science and engineering?
3. Why is ethics a concern?  
*in an absolute sense*  
*at this point in your lives*
4. What are the major ethical issues regarding responsible research conduct and professional behavior?
5. What are university rules and regulations relating to responsible conduct of research?

# *1. Definitions of ethics*

1. Set of principles of right conduct;  
a theory or system of moral values.
2. The study of the general nature of morals and  
the specific moral choices made by a person;  
moral philosophy.
3. The rules or standards governing the conduct  
of members of a group or profession.

These are based on some fundamental moral values:

**integrity**

**trust**

**truthfulness**

**fairness**

## Further terminology

Plethora of related terms, but not all synonymous:

**research integrity**

**responsible research/science**

**scientific/research conduct**

**research/professional ethics**

and the negative terms

**scientific misconduct**

**scientific fraud**

## **NSF definition of misconduct in science and engineering:**

“fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF, or retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith.”

*(This is a fairly narrow perspective)*

## **HHS Commission on research integrity**

“...is significant misbehavior that fails to respect the intellectual contributions or property of others, that intentionally impedes the progress of research or that risks corrupting the scientific record or compromising the integrity of scientific practices.”

## ***2. Ideals of Science and Engineering***

**Science:** the search for truth and understanding

**Engineering:** the application of science to enhance human welfare and wellbeing

**"SCIENCEENGINEERING"**

a continuum, not a dichotomy

***Hallmarks of sciencengineering***

Honesty

Objectivity

Integrity

***Antithesis***

Fraudulence

Bias

Conflicts of interest

An important difference between science and engineering with regard to ethical standards:

**Incompetence and negligence are sufficient grounds for misconduct in *engineering practice* but less so in the sciences.**

(This is not to excuse reckless endangerment of one's coworkers because of incompetence or ignorance about proper operating procedures in lab or field situations, however.)

***Intent to deceive* generally is an important criterion for serious *scientific* misconduct**

### *3. Why is this a concern now?*

#### **Nationally:**

- Widely publicized examples over past 25 years of scientific misconduct, including data fabrication, especially in highly competitive biosciences, leading to loss of public confidence in science and scientists
- Generally increasing public awareness regarding ethical issues; possibly increasing standards for what constitutes appropriate, responsible behavior in the conduct of science
- The National Institutes of Health (NIH) requires its grantees to conduct training in research ethics and NSF now requires ethics training as part of its large grant programs (e.g., STCs)

## Locally: *Why a concern, cont.*

- Embarrassing cases of serious scientific and academic misconduct at University of Minnesota in 1990s, including: misuse of federal grant funds; data fabrication; plagiarism; improper use of University facilities for private gain.
- University placed on “exceptional” status by NIH: took away some local control over management of grant funds; served as source of embarrassment.  
**With hard work, this status was removed in 2000.**
- Graduate School mandated ethics training for all graduate students in 1999; all programs have implemented this.
- University Senate mandated training in “responsible conduct of research (RCR) for all faculty and academic staff; OVPR has implemented such programs.  
**U of MN now a national leader in such efforts.**

## *Why a concern, cont.*

**For you, now:**

- **Embarking on a new stage in your educational and professional development**
- **(Probably) your first opportunity to be involved in research at more than the technician level**
- **Skills and work practices you learn in your graduate studies will stay with you during your career, whether you continue to do research or not. Ethical standards you develop regarding research will apply equally in your professional career as a scientist, engineer, or technical manager**

## *4. Areas and issues of ethical concern in research and responsibilities of researchers in the bio-physical sciences*

### *A. Areas of concern*

- 1. Conducting research**
- 2. Rights to data, research materials, topics, and intellectual property**
- 3. Reporting research results**
- 4. Peer review**

# *Topics to be covered under Responsible Conduct of Research\**

1. Data: acquisition, management, retention, sharing, and ownership
2. Mentor/trainee responsibilities: pre- and post-doctoral
3. Publications: practices and responsible authorship
4. Peer review: confidentiality of privileged information
5. Collaborative science: setting the ground rules
6. Human subjects: informed consent, privacy, IRBs, risks and benefits
7. Research involving animals: regulations, ethical principles
8. Research misconduct: legal aspects and reporting responsibilities
9. Conflicts of interest: definitions and how to handle them
10. Institutional compliance: policies of funding agencies

\*Adapted from U.S. Public Health Service guidelines for RCR training

**New: HIPAA requirements**

## *4 b. Social Responsibilities of Researchers*

**Ethical behavior is more than of list of “don’ts”:**  
(don’t lie, don’t cheat, don’t steal (e.g., other peoples ideas))

**Ethical behavior involves our *positive* responses to the obligations we have to everyone in society who may be affected by what we do**

## *4 b. As researchers, we have social responsibilities to:*

- **Funding agencies, your advisor, scientific community, (and yourself):** to disseminate (i.e. publish) the results of your research
- **Funding agencies and employers:** as employees (TAs and RAs *are* employees) or as a beneficiary of financial support (as a fellow)
- **Funders:** fiduciary responsibilities  
(It's not your money!)

## *4 b. Social responsibilities to..., cont.*

- **Coworkers:** e.g., to maintain a safe, clean, and supportive work environment
- **Human and animal research subjects:** e.g., to conduct research in humane and non-exploitive way, to minimize pain and suffering, respect privacy (humans)
- **Society:** to report misconduct or potential misconduct, and to produce results that promote human welfare
- **Owners of copyrighted materials--software, journal articles and books:** to respect their ownership rights and not steal their intellectual property

## *5. Ethics and ethical standards at the University of Minnesota*

See:

<http://www.research.umn.edu/ethics/>

and the relevant University policies, e.g.:

<http://www.research.umn.edu/ethics/policies/>

<http://www1.umn.edu/regents/polindex.html>

Others:

[http://www1.umn.edu/regents/policies/humanresources/Academic\\_Misconduct.html](http://www1.umn.edu/regents/policies/humanresources/Academic_Misconduct.html)

<http://www1.umn.edu/usenate/policies/intelproperty.html>

[http://www.fpd.finop.umn.edu/groups/ppd/documents/policy/record\\_retention.cfm](http://www.fpd.finop.umn.edu/groups/ppd/documents/policy/record_retention.cfm)

[http://www.fpd.finop.umn.edu/groups/ppd/documents/policy/public\\_access.cfm](http://www.fpd.finop.umn.edu/groups/ppd/documents/policy/public_access.cfm)

[http://www1.umn.edu/regents/policies/academic/Openness\\_in\\_Research.pdf](http://www1.umn.edu/regents/policies/academic/Openness_in_Research.pdf)

[http://www.fpd.finop.umn.edu/groups/ppd/documents/procedure/Reporting\\_Misconduct\\_proc1.cfm](http://www.fpd.finop.umn.edu/groups/ppd/documents/procedure/Reporting_Misconduct_proc1.cfm)

# *Responsible Conduct of Research*

Practical issues and University requirements:

1. Laboratory safety
2. Hazardous waste disposal
3. Humane treatment of vertebrate research subjects
4. Human subjects
5. Privacy issues

# *Responsible Conduct of Research*

Practical issues and University requirements:

1. Laboratory safety [http://www.dehs.umn.edu/ressafety\\_rsprg.htm](http://www.dehs.umn.edu/ressafety_rsprg.htm)

Your safety

Safety of subordinates

Safety of university community

Proper training in lab safety

You and subordinates

[http://www.dehs.umn.edu/training\\_newlabsafety.htm](http://www.dehs.umn.edu/training_newlabsafety.htm)

[http://www.dehs.umn.edu/training\\_labsafety.htm](http://www.dehs.umn.edu/training_labsafety.htm)

Other workplace safety issues <http://www.dehs.umn.edu/index.htm>

# *Responsible Conduct of Research*

Practical issues and University requirements:

## 2. Hazardous waste disposal

Your safety

Safety of subordinates & university community

Environmental responsibility - current and future generations

Proper training in waste disposal

You and subordinates

[http://www.dehs.umn.edu/hazwaste\\_cwt.htm](http://www.dehs.umn.edu/hazwaste_cwt.htm)

Also special training for radioactive materials

<http://www.dehs.umn.edu/training.htm#rm>

# *Responsible Conduct of Research*

Practical issues and University requirements:

## 3. Humane treatment of vertebrate research subjects

Federal laws

Ethical treatment of animals

Public Relations

Institutional Animal Care and Use Committee

<http://www.research.umn.edu/iacuc/index.cfm>

Proper training handling animals

You and subordinates

<http://www.research.umn.edu/iacuc/training/>

**All** research/teaching use of vertebrates requires an approved protocol

<http://www.research.umn.edu/iacuc/download/>

# *Responsible Conduct of Research*

Practical issues and University requirements:

## 3. Humane treatment of vertebrate research subjects

Federal laws

Ethical treatment of animals

Public Relations

**All** research/teaching use of vertebrates requires an approved protocol

<http://www.research.umn.edu/iacuc/download/>

Note - this includes any sampling or handling of fish.

Electrofishing, seining, etc. Even WRSIA activities may fall under this. Need 2-4 month lead time.

# *Responsible Conduct of Research*

Practical issues and University requirements:

## 4. Human research subjects

Federal laws

Ethical treatment of humans

Public Relations

## Institutional Review Board

<http://www.research.umn.edu/irb/>

## Proper training

You and subordinates

<http://www.research.umn.edu/irb/training/>

**All** research/teaching involving human subjects requires an approved protocol <http://www.research.umn.edu/irb/applying/>

# *Responsible Conduct of Research*

Practical issues and University requirements:

## 4. Human research subjects

Federal laws

Ethical treatment of humans

Public Relations

**All** research/teaching use of humans requires an approved protocol

<http://www.research.umn.edu/irb/applying/>

Note - this includes surveys and interviews.

Even WRSIA activities may fall under this. Need 2-4 month lead time.

# *Responsible Conduct of Research*

Practical issues and University requirements:

## 5. Privacy issues

Regulations governing access to and sharing of private data

[http://www.fpd.finop.umn.edu/groups/ppd/documents/policy/public\\_access.cfm](http://www.fpd.finop.umn.edu/groups/ppd/documents/policy/public_access.cfm)

FERPA

Important for TA's, faculty, administrators

# *Responsible Conduct of Research*

Practical issues and University requirements:

Additional Resources:

Fostering Integrity in Research, Scholarship, and Teaching (Formerly RCR)

<http://www.research.umn.edu/FIRST>

Research Reporting System

<http://www.research.umn.edu/FIRST/RecordsManagement.htm>

Medical records

<https://eresearch.umn.edu/rohp/>

# *Responsible Conduct of Research*

Practical issues and University requirements:

Be responsible

Your safety

Other's safety

Ethical treatment of animals and humans

Privacy

It's the Law

Plan ahead -

Training requires time

Protocol approvals generally require revision

# *Ethics Training*

Spring 2010:

WRS 8581 0.5 cr

First 8 weeks of semester Twin Cities  
Duluth? (ITV in 2011)

Alternatives

Departmental RCR training (e.g., Biological  
Practitioner if required)

Other Deptl RCR course  $\geq 0.5$  cr