Flood Hydrometeorology & Hydroclimatology –
Implications for a Future of Global Change and Extreme Hydrology
1-3 units / Tuesdays 5:00 – ~7:30 pm  Bannister Tree-Ring Building  424

Instructors:  Katie Hirschboeck ¹ &  Victor Baker ²

¹ Associate Professor of Climatology Laboratory of Tree-Ring Research
with Joint Appointments in: HWRS, ATMO, and School of Geography & Development
² Regents Professor, Hydrology & Water Resources, with Joint Appointments
in Geosciences and Planetary Sciences

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Office Hours: Wed 2 – 3 pm or by email appt.

Vic’s office:  Harshbarger 246a  phone: 621-7875
Email:  baker@email.arizona.edu  Webpage:  www.hwr.arizona.edu/users/baker
Office Hours:  TBA

CLASS WEBPAGE:  www.ltrr.arizona.edu/kkh/hwrs/696f.htm

Course Description:  This graduate seminar course will focus on the meteorological and climate-related
causes of floods, both regionally and globally, and the overarching scientific issues related to floods. After
an overview of flood-generating processes, participants will examine and present case studies of a selection
of past major flood events in the United States based on published post-flood reports (USGS, NOAA). In
tandem with these case studies, we will review and discuss relevant classic and current scientific literature
on flood hydrometeorology, hydroclimatology, extreme precipitation events, and flooding & climate
change. The semester will also include readings and discussion on the policy and planning implications that
emerge from this physically based, climate-linked understanding of the underlying causes of flooding
variability. To critically evaluate and apply the knowledge gained, 3-unit participants will complete an
individual or class project, such as the analysis of a selected watershed’s flood history to assess past,
present, and (projected) future climate-related drivers of its floods, a study of the Rillito watershed
decades after the 1983 and 1993 floods, a group publication manuscript, etc. Project options will be
discussed and agreed upon in class.

Course Objectives:
-- To become familiar with regional and global patterns of flooding and the weather and climate processes
that produce them
-- To gain a deeper understanding of the atmospheric and hydrologic causes of floods in specific regions by
examining and reporting on case studies of selected floods
-- To review and discuss the relevant classic and current scientific literature on flood hydrometeorology,
hydroclimatology, extreme precipitation events, and flooding & climate change
-- To examine and discuss the overarching scientific issues related to flood analysis, and the policy and
planning implications of flood hazard assessment for present and future flooding
-- To critically examine and apply this information by completing an individual or class project (3 unit
enrollment requirement)

Prerequisites:  Background in the basics of one or more of the following areas:  hydrology, meteorology,
climatology, geomorphology and/or water resources; plus basic statistics (probability)

Grading Criteria & Expectations:  Your grade will be based on effort and performance in the following areas:

(1) Readings & Discussion  1-unit  3-unit
   50%  33%
(2) Case Study Research & Presentations
   50%  33%
(3) Research Project & Presentation
   ----  34%
Attendance: Required. If unavoidable problems require you to miss a class, arrangements can be made to make-up one absence.

Academic Integrity: A synopsis of the UA’s Code of Academic Integrity can be found at: deanofstudents.arizona.edu/policies-and-codes/code-academic-integrity You are to know it, understand it, and adhere to it.

Assigned readings will be linked to the class webpage as password-protected PDFs or as links to items in the U.S.G.S. Publications Warehouse: pubs.er.usgs.gov/ Some USGS files need the DjVu browser plugin available at djvu.org/resources/

VERY TENTATIVE CLASS SCHEDULE
To be updated based on class interests & input!

<table>
<thead>
<tr>
<th>Wk</th>
<th>DATE</th>
<th>TOPIC</th>
<th>CLASS ACTIVITY</th>
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<tbody>
<tr>
<td>1</td>
<td>Jan 20</td>
<td>Overview of Course</td>
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<tr>
<td>2</td>
<td>Jan 27</td>
<td>Flood Hydroclimatology, Scale &amp; Climate Change</td>
<td>KKH presentation &amp; discussion</td>
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<td>3</td>
<td>Feb 3</td>
<td>Flood Hydrogeomorphology, Paleofloods &amp; Science</td>
<td>VRB presentation &amp; discussion</td>
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<tr>
<td>4</td>
<td>Feb 10</td>
<td>Flash Flood Hydrometeorology</td>
<td>Guest speaker: Bob Maddox</td>
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FLOOD CASE STUDIES

|   | Feb 17 * | TBD / Flood Case Study Selections               |                                        |
|   | Feb 24   | Flood Case Study Presentations                  | presentations                           |
|   | Mar 3    | Flood Case Study Presentations                  | presentations                           |
|   | Mar 10 / 12* | Flood Case Study Presentations          | presentations                           |
|   | Mar 17   | Spring Break                                    |                                        |

“TESTING THE CONVENTIONAL WISDOM”
PAST, PRESENT & FUTURE FLOODING: EXTREMES / TRENDS / CLIMATE CHANGE

|   | Mar 24   | Readings & Discussion TBD                       |                                        |
|   | Mar 31   | “                                                |                                        |
|   | Apr 7    | “                                                |                                        |

FLOOD FREQUENCY ANALYSIS & SCIENCE / POLICY & PLANNING IMPLICATIONS

|   | Apr 14   | AAG meeting / work on project this week          |                                        |
|   | Apr 21   | Readings & Discussion TBD                        |                                        |
|   | Apr 28   | “                                                |                                        |

|   | May 5 (or alt date) | Class Finale: Research presentations & Class Wrap Up | student research presentations |

Dates with * - an alternative day, time and/or location may be set up for these dates, agreeable to all

NOTE: Information contained in the course syllabus, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.