LDEO Officers of Research:
Salary Study

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Office of the Director
Lamont-Doherty Earth Observatory
Columbia University
Salary Study for Officers of Research: Lamont-Doherty Earth Observatory

I. Introduction & Background

In response to the salary study of 2009 carried out by the Office of the Provost, Columbia University, the Lamont-Doherty Earth Observatory Directorate has carried out a salary study for its Officers of Research in the categories of Doherty scientist\(^1\), project scientist, and postdoctoral researcher. This report outlines the findings of that study.

Data and Methodology

The study includes 58 Doherty scientists (endowed scientist positions at LDEO), 14 project scientists, and 29 postdoctoral researchers. These scientists are further divided according to rank within a title (for Doherty and project scientists) and source of salary (for postdoctoral researchers, according to whether they are externally funded or funded by LDEO). After taking into account these subdivisions, the data showed the problem of small numbers, thereby severely limiting the statistical analyses that could be performed. Accordingly, basic statistical measures were used, and detailed descriptions have been provided along with charts and graphs wherever appropriate.

The data for this study was taken from the LDEO annual merit review – a detailed review process of the scientific staff, comparing scientists within each rank based on annual performance, year in rank, and year of Ph.D. (a subsequent section of this document

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\(^1\) As of July 1, 2010 the Doherty titles have been replaced by the Lamont research professor titles. This report looks at data spanning the fiscal year 2009-2010 when the Doherty titles were still applicable.
provides details on the LDEO annual merit review process). Where appropriate, equity adjustments to salary are made based on perceived gender and/or racial differentials in salary.

Findings

The findings of the LDEO salary study reveal a great deal of variation in terms of salary equity on the basis of race and gender. In some ranks there is no discernible difference when taking race and gender into account; in others the difference is pronounced. In the latter cases we analyze the data down to the level of individuals in order to ensure that race and/or gender are not the determining factors for this. The demographic composition of the Doherty scientists and the project scientists is predominantly Caucasian male. However recent efforts have been made to recruit diverse candidates and it is expected that data for future years will show a greater number of women and/or minorities. Table 1 provides a summary of the findings of this salary study with respect to gender.

Table 1: Salary Differentials for Gender

<table>
<thead>
<tr>
<th>Rank (no. of individuals)</th>
<th>Salary Differential Females cf Males (for 2010-2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Only ranks with &gt;2 individuals shown)</td>
<td></td>
</tr>
<tr>
<td>DARS (18)</td>
<td>–3%</td>
</tr>
<tr>
<td>DRS (17)</td>
<td>–5% (–2%*)</td>
</tr>
<tr>
<td>DSRS (19)</td>
<td>+4.5%</td>
</tr>
<tr>
<td>ARS (6)</td>
<td>+3.6% (+9.6%*)</td>
</tr>
<tr>
<td>RS (6)</td>
<td>+2.2% (+8.8%*)</td>
</tr>
<tr>
<td>PD (22)</td>
<td>–0.2%</td>
</tr>
</tbody>
</table>

*indicates that one extreme outlier is discounted
II. Salary Study for LDEO Officers of Research:

The following Officers of Research were included for this study: Doherty scientists, Research (project) scientists, and postdoctoral researchers.

1. Doherty scientists:

The 58 Doherty scientists included in this study are divided into four ranks:

- Doherty Associate Research Scientist (DARS)
- Doherty Research Scientist (DRS)
- Doherty Senior Research Scientist (DSRS)
- Doherty Senior Scholar (DSS).

- Doherty Associate Research Scientist (DARS):

This includes 18 scientists appointed over the period 2003-2010. Of these 18 scientists 3 are women, and 1 individual belongs to a racial minority. Salaries of the female scientists have been compared to those of their male counterparts as shown in the following chart.
As can be seen from Figure 1, for the DARS appointed in 2007 (4 individuals – 2 male and 2 female) the average male salary is approximately 10% higher than the average female salary for 2009-2010, and approximately 8% higher for 2010-2011. For those appointed in 2008 (4 individuals – 1 female and 3 males), these percentages are 8.5% and 5% respectively. Overall, taken as a group, the average male salary is 6% higher than the average female salary for 2009-2010, and 3% higher for 2010-2011. This decreased disparity is partly due to gender-based equity adjustments made to reduce the salary differential between male and female DARS.
• **Doherty Research Scientist (DRS):**

This includes 17 scientists appointed over the period 2001-2010. Of these 17 scientists, 4 are female of whom 2 belong to a racial minority. Among the 13 males, 2 belong to a racial minority. Figure 2 below shows the salary comparisons between these groups. For DRS appointed in 2004 (3 individuals) the average male salary is approximately 21% higher than the female salary for 2009-2010, and approximately 22% higher for 2010-2011. For those appointed in 2006 (3 individuals), these percentages are 11% and 8% respectively. For those appointed in 2009-2010 (2 individuals), these percentages are 6% and 7% respectively.

Overall, taken as a group, the average male salary is 5% higher than the average female salary for both 2009-2010, and 2010-2011. It is noteworthy that the salary of one individual in this group is a strong outlier (approximately 36% higher than the average male salary) and when this outlier is dropped, the average male salary is 2% higher than the average female salary.
• **Doherty Senior Research Scientist (DSRS):**

This includes 19 scientists appointed over the period 2001-2010. Of these 19 scientists, 4 are female of whom 1 belongs to a racial minority. Among the 15 males, 3 belong to a racial minority. Figure 3 shows that for the DSRS appointed in 1999, (2 individuals) the average female salary is approximately 10% higher than the male salary for 2009-2010 and for 2010-2011. For those appointed in 2003 (2 individuals) the male salary is higher by 1.7% and 0.5% respectively. For those appointed in 2007 (3 individuals), the female salary is higher by 3.6% and 6.8% respectively. Overall, taken as a group, the average female salary is 3.2% higher than the average male salary for 2009-2010, and 4.5% for 2010-2011.
• **Doherty Senior Scholar (DSS):**

  This group consists of 4 male scientists including 1 non-Caucasian. There are no female scientists in this group. Accordingly no gender-based chart could be produced.

• **Salary Differences based on Race:**

  Figure 4 compares the salaries of Doherty scientists with respect to race.

**Figure 4: Salary by Race and Year in Title**
For DARS the salary of the 1 individual representing a racial minority (Asian male) is marginally (i.e. 0.8%) higher than the average for his cohort (people appointed in the same year).

The Caucasian DRS salary for scientists appointed in 2004 (including the previously mentioned outlier) is 20% higher than the non-Caucasian DRS salary. After excluding the outlier, the Caucasian DRS salary is marginally (i.e. 0.7%) higher than that of the non-Caucasian DRS salary. For those appointed in 2008-2009 the Caucasian DRS salary is 5% higher than the non-Caucasian salary. For those appointed in 2010 the Caucasian DRS salary is 3% higher than the non-Caucasian salary.

The salary for non-Caucasian DSRS scientists appointed over the period 1989-1992 is 13.5% higher than the Caucasian DSRS salary in 2009-2010 and 13% higher in 2010-2011. For those appointed in 2003-2004 the Caucasian DSRS salary is 3.7% higher than the non-Caucasian salary in 2009-2010 and 1.9% higher in 2010-2011. The salary for the non-Caucasian scientist is approximately 23% higher than the average for both 2009-2010 as well as 2010-2011.

The salary for the non-Caucasian DSS is approximately 19% greater than the average salary for DSS appointed in that cohort (1998-1999), and approximately 14% higher than the overall average DSS salary.
2. **Research Scientists:**

There are 14 research scientists at LDEO. Of these 14 individuals, 3 are female and 2 are racial minorities (both male). Research scientists are divided into three ranks:

- Associate Research Scientist (ARS)
- Research Scientist (RS)
- Senior Research Scientist (SRS)

Figure 5 illustrates the salary differences based on gender.

**Figure 5: Research Scientist Salary**

![Graph showing salary differences based on gender, rank, and time period.](image)

Note: Gridlines indicate increments of $20,000

- **Associate Research Scientist (ARS)**

  This includes 6 scientists appointed over 2004-2008. Of these 6 individuals only 1 is female. The salary of the female ARS is approximately 3.6% higher than the average male ARS salary. The male ARS salary contains one outlier (which is approximately
25% higher than the average male ARS salary) which when removed makes the female salary approximately 9.6% higher than the average male salary.

• **Research Scientist (RS)**
  
  This includes 6 scientists appointed over 2004-2010. Of these 6 individuals only 1 is female. The female RS salary is approximately 2.2% higher than the average male salary. As in the case of the ARS, the average male RS salary contains one outlier (approximately 24% higher than the average male RS salary) which when removed makes the female salary approximately 8.8% higher than the average male salary.

• **Senior Research Scientist (SRS)**
  
  There are 2 SRS – 1 male and 1 female. The male SRS salary is approximately 37% higher than the female salary.

• **Salary Differential by Race**
  
  Of the 14 project scientists, 2 males are racial minorities, both at the rank of RS. The average RS salary is approximately 1.3% higher than the salary for the minority RS. Figure 6 illustrates this.
3. Postdoctoral Researchers:

Postdoctoral researchers are divided into two titles:

- Postdoctoral Research Scientist (PDRS)
- Externally Funded Postdoctoral Fellows (PDRF).

For salary comparisons the externally funded postdoctoral fellows have been excluded from this study since their salaries are determined and paid by external institutions. Accordingly, only 22 postdoctoral researchers (PDRS) were included. However, when looking at the overall demographic composition of the postdoctoral researchers as a group, all 29 postdoctoral researchers have been taken into account. The average male postdoctoral salary is 0.2% higher than the average female postdoctoral salary.
When comparing salaries with respect to race, the average salary of Caucasian postdoctoral researchers is 0.4% higher than the average non-Caucasian salary. The average non-Caucasian male salary is 0.3% higher than the average Caucasian male salary, while the average Caucasian female salary is 1.6% higher than the average non-Caucasian female salary. Figure 7 illustrates this.

**Figure 7: Postdoctoral Researcher Salary by Race and Gender**

![Bar chart showing salary differences by race and gender]

II. Discussion on Salary Differences

As can be seen from the results, there is a great deal of variability in the salary differences among the research staff at LDEO. The general pattern shows that Caucasian males tend to earn higher salaries than females and/or minorities, a result consistent with the salary study done by the Office of the Provost, Columbia University. However, there are exceptions to this as in the case of the Doherty Senior Research Scientists where the average female salary is higher, as well as the Associate Research Scientist and Research Scientist. With regard to race, even though there is some variation, it is relevant to point
out that the highest salary among all LDEO Officers of Research is given to a non-
Caucasian scientist.

A significant problem encountered in this salary study is the problem of small numbers
for each rank and title, which makes detailed statistical analysis difficult. A case in point
is the Doherty Research Scientist title where the existence of one outlier makes the
average male salary 21% higher than the female salary, compared to 2% higher when the
outlier is excluded.

With regard to differentials in starting salaries, a large part of this is historical, going as
far back as several decades. The LDEO annual merit review process has begun to place
an increasing importance on narrowing any unexplained salary differentials between male
and female researchers and this gap is expected to reduce even further in the future. The
Office of Academic Affairs & Diversity was created to address concerns pertaining to
diversity especially as they relate to academic affairs such as salaries, promotions,
appointments, and overall career advancement, and in this role the office is involved in
recommending equity adjustments for salaries in the event of unexplained salary
differences. The following section describes the LDEO Annual Merit Review.

III. The LDEO Annual Merit Review Process

The annual merit review process is a two-day meeting that takes place in May of each
year. The review committee is comprised of the Director, LDEO, the Associate Directors
of the five research divisions, the Assistant Director for Finance & Administration, and
the Assistant Director for Academic Affairs & Diversity. At this review, the performance
of each individual member of the research staff is evaluated based on a predetermined list
of criteria (including research activities, grant proposals written and/or funded,
publications submitted and/or published, education & outreach efforts, mentoring
activities, and leadership roles, among others).

One of the display tools used in the annual merit review process is illustrated in Figure 8.
It compares salaries of research scientists taking into consideration their year of title as
well as their year of Ph.D. The objective of this exercise is to try to ensure that
individuals with comparable qualifications and seniority have comparable salaries. There
is an awareness of gender throughout the deliberations and this is specifically considered
in the overall review at the end. Figure 8 illustrates this where the top half of the figure
compares individual salaries based on their year of Ph.D., and the second half compares
salaries based on year of title. As can be observed, each candidate’s gender is listed as
well, to check for disparities after taking into account the merit review, year of title, and
year of PhD.

Following the salary study by the Provost’s Office, future LDEO annual merit reviews
will continue to pay close attention to gender and race for each title and rank. It is also
expected that efforts will be made to develop guidelines for establishing minimum and
maximum salaries for each rank.
Figure 8: LDEO Annual Merit Review Process*

Note: Gridlines indicate increments of $5,000

* Figures for the Annual Merit Review Process have been developed by Jennifer Verdin from the Human Resources Division, LDEO
IV. Concluding Comments

This report has been a response to the salary study conducted by the Office of the Provost in March 2010. Efforts are in place to improve the consistency of salaries across race, gender, qualifications and seniority. LDEO implements a thorough and detailed review of all its salaries on an annual basis, and awareness of gender and race is an important part of this process. The creation of a new position within the LDEO Directorate in October 2008 – the Assistant Director for Academic Affairs and Diversity – is a key action designed to bring focused attention and continuing analysis on this topic.

In recruiting new staff and determining the magnitude of annual raises, performance at an established set of activities (e.g. research, mentoring, leadership, etc.) drive the decisions about financial reward. It is critical that vigilance is maintained to ensure that other factors do not skew salaries unfairly. In this regard, the toughest issue that LDEO faces is the highly competitive nature of ‘soft-money’ research in the US. Every year we fight retention battles against other institutions that try to lure our research stars away with promises of increased salaries and improved facilities. In addition, to remain healthy and competitive it is essential that LDEO hire some portion of its new staff at mid and senior levels. In order to attract world-class talent to LDEO, offers of salaries for new external recruits are frequently substantially higher than those of existing staff. This process creates the ‘outlier’ salaries mentioned in this report. At the time of writing this report, LDEO is negotiating with a senior female ‘star’ whose recruitment salary will be high, and will prove that these extraordinary packages are not restricted to males.
Nevertheless, following the salary study by the Provost's Office, LDEO will consider establishing new guidelines that reduce the variation in salary for a given title and rank, taking into account qualifications and experience. In the process of doing this, we hope to eliminate unexplained salary differentials across race and gender to the greatest extent possible for Officers of Research at LDEO.
Appendix 1: Demographic Composition of LDEO Officers of Research

**DARS - Demographic Composition**

- White Male: 17%
- White Female: 6%
- Minority Male: 6%
- Minority Female: 77%

**DRS - Demographic Composition**

- White Male: 12%
- White Female: 12%
- Minority Male: 12%
- Minority Female: 64%

**DSRS - Demographic Composition**

- White Male: 16%
- White Female: 16%
- Minority Male: 5%
- Minority Female: 63%
Demographic Composition of LDEO Officers of Research (Cont’d)

**DSS - Demographic Composition**

- 75% White Male
- 25% Minority Male

**Project Scientists - Demographic Composition**

- 65% White Male
- 21% White Female
- 14% Minority Male

**Postdoctoral Researchers - Demographic Composition**

- 35% White Male
- 21% White Female
- 10% Minority Male
- 34% Minority Female